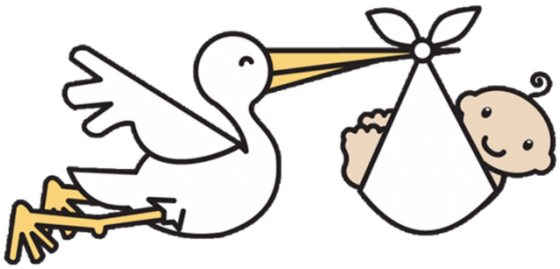
Year 5 Specialties Management Guide



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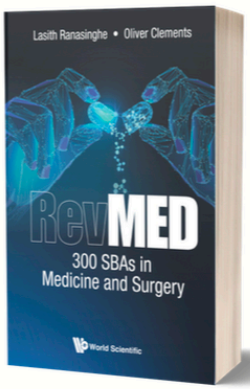

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RevMED is designed by medical students who recently sat clinical written examinations and has been reviewed by doctors/professors thereby assuring clinical accuracy.

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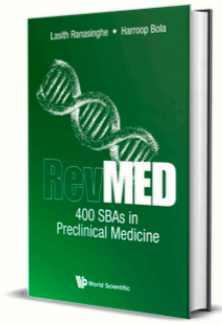

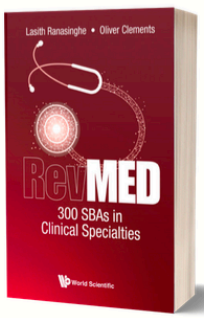

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Introduction

"The Year 5 Specialties Management Guide is the first ever guide produced focusing on the management pathways that you need to know for Year 5 Written Exams and PACES.

All the content has been summarised from the most up-to-date guidelines available on NICE, BMJ Best Practice or RCOG. This guide does not go into detail about the presentations of any conditions as that is best learnt by going through textbooks or doing practice questions.

A huge focus of Year 5 exams (both written and PACES) is management, so a solid understanding of management pathways is essential for doing well. The MedED committee have worked tirelessly to format this user-friendly guide and they have also included some useful reference tables in the guide.

I hope this resource will be useful to you and good luck for Year 5!"

- Laz

The MedED team has been working relentlessly to review, update and edit the management guide according to the published guidelines. We have also included a coloured table box under some important conditions labelled 'PACES tips'. We hope it is useful for you when it comes to PACES practice and explaining management to the patients.

In you have any questions, comments or suggestions about the events we run or on this guide please contact us at medical.education@imperial.ac.uk .

Please note: MedED does not represent the ICSM Faculty or Student Union. This guide has been produced by students and the Pathology Course lecturers. We have made every effort to ensure that the following information is accurate and reliable. However, this guide should not be used to replace formal ICSM teaching and education materials.

With best wishes,

The MedED Team

With special thanks to Year 5 coordinators of MedED 2022/23:
Keir Bhaskar and Siddhant Patki

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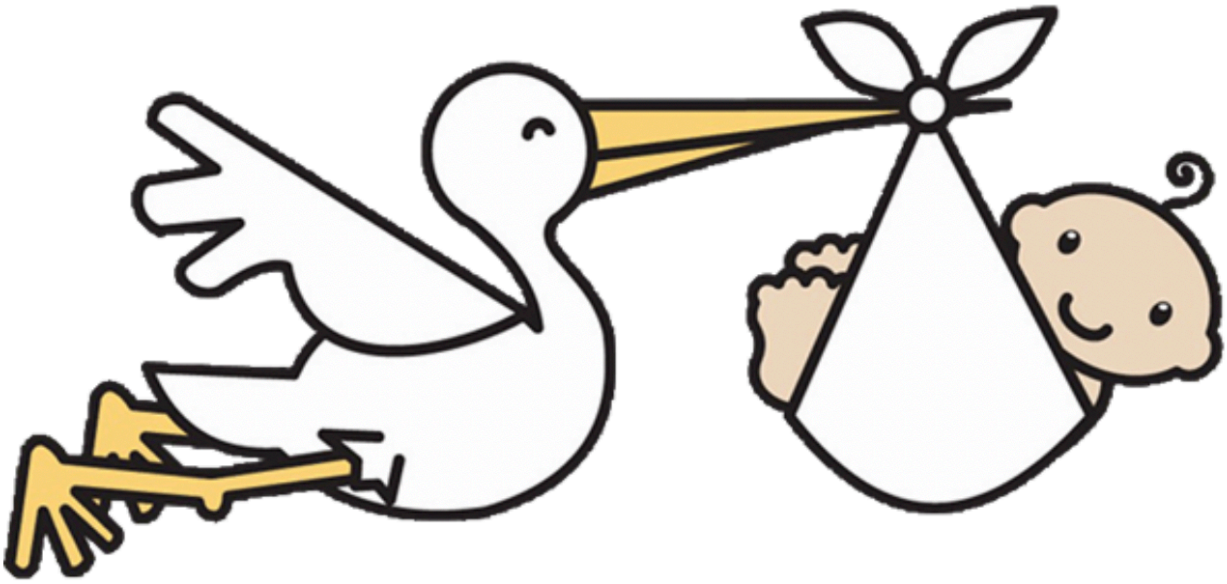


Obstetrics and Gynaecology

Updated and Edited by:
Abigail Knell, Ria Gaglani and Amy Dawson

Introduction to Obstetrics and Gynaecology

We bring you concise, relevant management options of high-yield O&G conditions, including PACES exam tips highlighted in the yellow boxes.

How to ace your PACES:
- Set up your own practice groups and **use this guide for** explaining procedures and the viva.
- Practice taking a variety of focused histories under timed conditions as you can get short 4-minute histories in your exam.
- During your placement, pay attention when doctors are communicating difficult news to the patient or discussing management options. **Keep a list of the good phrases they used.**
- If possible, practice your counselling and explanations of conditions to non-medical friends/family to ensure you're not using jargon and are clear.
- Be prepared for stations about **surgeries/procedures**, including discussing pre-operative assessments and post-operative complications and follow-up for patients including advice of when to return to work, normal activity etc
- Use **RCOG patient information leaflets** to understand the aspects the ideal doctor needs to explain – this resource will prepare you for the typical questions you can expect from your patient:

https://www.rcog.org.uk/en/patients/patient-leaflets/?q&subject=Pregnancy+and+birth&orderby=title

This resource and another one we recommend is **NHS Choices**, will help you find appropriate words to explain things concisely without jargon. Remember, the more natural you sound, the higher you will score.

Don't be shy at tutorials, always volunteer to do examinations/be examined! It's better to make mistakes when you are in a teaching environment rather than on exam day and don't forget to practice explaining examinations to patients such as a bimanual or speculum examination. Pre-read the topic before the tutorial if you can, that way you consolidate what you've already read and can ask specific questions on what you don't understand.

In your PACES exam, time management is key. You need to take a focused history, examine and then formulate your findings to develop a management plan. **Even in the early days, be strict with the 15 minute time limit with each other**! You need to cover all these sections in the real exam so that the examiner can score you across all 3!

The highest scorers do the basics well: there is no substitute for taking a thorough yet focused history. You can't go wrong if you are methodical. The key is asking the most relevant questions in your history **within the first 3-4 minutes**. You should keep a **framework** of the most relevant questions you need to ask for every common presentation, and keep editing this document while on placement as you refine the most important questions along the way.

Using a structure such as **MOSSC** (Menstrual history, Obstetric history, Sexual and STI history, smears and contraception) for gynae histories will help you to be slick and not forget any key questions.

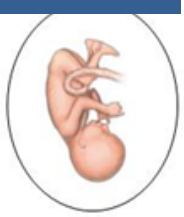
For obstetrics, as well as a previous obstetric history and any issues with the current pregnancy, always ask 4 key questions: any reduction in baby's movement? Any vaginal bleeding? Any gush of fluid from the vagina? Any abdominal pain?

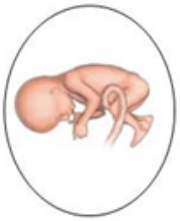
Social history is so important for O&G. 4 questions you must ask: smoking and alcohol?, well-supported at home?, impact of the presenting complaint on their life?.

5th year is a marathon, so make sure you pace yourself throughout the year. Be kind to yourself and others. Plan your time efficiently and try to enjoy the process along the way.

Abbreviations and Definitions

ARM – artificial rupture of membranes
COCP – combined oral contraceptive pill
CS – C-section
CTG – cardiotocography
CVS – chorionic villus sampling
ECV – external cephalic version
EDD – estimated date of delivery
GBS – Group B Streptococcus
HELLP Syndrome – Haemolysis, Elevated Liver enzymes, Low Platelets
HRT – hormone replacement therapy
IMB – intermenstrual bleeding
IOL – induction of labour
IUD – intrauterine device (copper coil)
IUGR – intrauterine growth restriction
IUS – intrauterine system (Mirena coil: progesterone releasing)
LMP – last menstrual period
NTD – neural tube defects
OCP – oral contraceptive pill
OGTT – oral glucose tolerance test
PCB – post-coital bleeding
PID – pelvic inflammatory disease
PMB – postmenopausal bleeding
POP – progesterone only pill
PPH – post-partum haemorrhage
P-PROM – preterm premature rupture of membranes (24+0 to 36+6 weeks)
PROM – premature rupture of membranes (≥37 weeks)
STD/I – sexually transmitted disease/infection
TOP – termination of pregnancy
TORCH – toxoplasma, rubella, CMV, herpes simplex
VBAC – vaginal birth after caesarean


LONGITUDINAL LIE,
CEPHALIC PRESENTATION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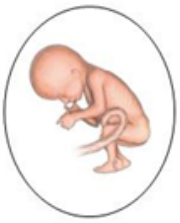
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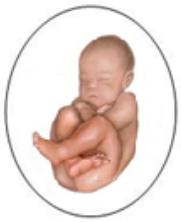
LONGITUDINAL LIE,
BREECH PRESENTATION

Gravidity – total number of pregnancies irrespective of outcome (including current pregnancy)
Parity – total number of deliveries after 24 weeks (including still births).
Lie of the foetus – describes the relationship of the foetus to the longitudinal axis of the uterus (can be longitudinal, transverse or oblique)
Presentation (N/A if transverse lie) – describes the part of the foetus that is occupying the lower segment of the uterus or pelvis (can be cephalic or breech: flexed, extended, footling, kneeling).
Engagement – if ≤ 2/5th of the foetal head is palpable abdominally, the head is said to be 'engaged' (i.e. the widest part of the head has passed through the pelvic inlet)
Position – describes the relationship of the foetal occiput to the sacrum of the mother once the foetal head is in the pelvic inlet (occipito-anterior (OA) is best for vaginal delivery)
Station – the distance of the presenting part from the ischial spines, estimated as part of the vaginal examination, in cm.
Naegele's Rule – a method for calculating the EDD. Add 7 days and 9 months to the first day of the LMP. This is only accurate if the woman has a 28-day cycle. If she does not, this needs to be accounted for. If a woman's cycle is >28 days, you adjust the EDD by adding the number of days by which the cycle is longer than 28 to the date calculated with Naegele's rule.

Obstetrics Management Guide

Antenatal Care

Appointment schedule

Labour

Normal labour
Preterm labour
P-PROM
PROM
Shoulder dystocia
Breech presentation
Other malpresentations
Unstable lie
Induction of labour
Vaginal birth after C-section
Umbilical cord prolapse
Uterine rupture
Postpartum haemorrhage

Pre-existing maternal disease

Chronic hypertension
Diabetes mellitus
Thyroid disease
Asthma
Heart disease
Epilepsy

Maternal infection

UTI
Syphilis
Toxoplasmosis
CMV
Chickenpox
Parvovirus B19
Listeria
HSV
Group B Streptococcus
HIV
Hepatitis B
Hepatitis C
Sepsis

Obstetric disease

Gestational hypertension
Pre-eclampsia
Eclampsia
Gestational diabetes
Anaemia
Obstetric cholestasis
Acute fatty liver of pregnancy
Foetal growth restriction (IUGR)
Placenta praevia
Placental abruption
Amniotic fluid embolism
Multiple pregnancy – considerations
Depression (baby blues, postnatal depression and puerperal psychos

Antenatal Care

When women get referred to the antenatal care pathway, ensure they receive early pregnancy guidance regarding smoking and alcohol cessation, pregnancy supplements and healthy diet before the booking visit.

NICE guidelines recommend:
- 10 antenatal visits in the **first** pregnancy if uncomplicated.
- 7 antenatal visits in **subsequent** pregnancies if uncomplicated.

Gestation	
8 to 12 weeks (ideally <10 weeks)	**Booking visit**: • Full history is taken including: past medical history, past obstetric history, mental health history, family history, medications, allergies and social history (occupation, family and home situation, support network) • Assess any ***risk factors for venous thromboembolism*** and refer to obstetrician if necessary to manage increased risk • Assess any ***risk factors for gestational diabetes*** – if women have previously had GDM then offer OGTT as soon as possible after booking. If no previous GDM, but other risk factors then offer OGTT at 24-28 weeks • Assess ***risk factors for pre-eclampsia*** and discuss aspirin if necessary • Folic acid supplementation – 400µg OD from pre-conception until 12 weeks gestation, OR high-dose 5mg OD if high-risk for NTD (e.g. previous NTD, sickle cell disease, BMI >30, Diabetic, either parent has NTD or on anti-epileptics). Memorise these doses! • Vitamin D supplementation – 10µg OD • Diet, smoking, alcohol cessation. Note: most women will be on Pregnacare®, which already contains 10µg vitamin D and 400µg folic acid (amongst other minerals and vitamins). **PACES TIPS** • Ask in your history if their doctor has given them EXTRA folic acid to demonstrate your knowledge of high risk NTD pregnancies. • Check BMI, BP, risk factors for gestational diabetes and pre-eclampsia, explore domestic violence risk, FGM and previous mental health Hx. • At every appointment, you do: BP, BMI, Urine dip. **Vaccinations:** **Flu vaccine straightaway**, **pertussis vaccine book for @16 weeks.** For the booking appoint do these: • Blood tests (for FBC, blood group, rhesus D status, 1st screening for anaemia, haemoglobinopathies, red cell alloantibodies, hepatitis B virus, HIV, and syphilis) • Urine dipstick and MC&S (for proteinuria and asymptomatic bacteriuria)
11^{+2} to 14^{+1} weeks	**Dating scan** • Viability, gestation, multiple pregnancy and chorionicity, nuchal translucency

11 to 13^{+6} weeks Or **15^{+0} to 20^{+0} weeks**	**Down's syndrome** screening (using either: 'combined test' between 11^{+0} – 13^{+6} weeks or 'serum screening test' (triple or quadruple test) between 15^{+0} – 20^{+0} weeks gestation).
16 weeks	• If **Hb < 11 g/dL**, give oral iron tablets. • At every appointment, you do: BP, BMI, Urine dip. • **Pertussis** vaccine give now. • Begin discussing birth preferences and risks and benefits of different delivery methods
18^{+0} - 20^{+6} weeks	**Anomaly scan** • Detect structural anomalies, placenta location, amniotic liquor volume, gender and growth of foetus ○ If placenta is low, offer another scan at 32 weeks
24 to 28 weeks	**OGTT if woman has risk factors for GDM**
25weeks (only if nulliparous)	**GP review** • At every appointment, you do: BP, BMI, Urine dip • Measure symphysis–fundal height (SFH) and offer at all appointments after 24+0 weeks • Discuss baby's movements and any concerns mother may have about this
28 weeks	**Midwife review** • 2^{nd} screening for anaemia and red cell alloantibodies. • If **Hb < 10.5 g/dL**, give oral iron tablets. (lower threshold than @16weeks) • At every appointment, you do: BP, BMI, Urine dip, SFH • First dose of anti-D prophylaxis 250 IU to rhesus negative mothers. • Discuss preparing for labour and delivery, recognising signs of active labour and the post-natal period • Advise to avoid sleeping on back
31weeks (only if nulliparous)	**GP review** • At every appointment, you do: BP, BMI, Urine dip, SFH
34 weeks	**Midwife review** • At every appointment, you do: BP, BMI, Urine dip, SFH • Second dose of anti-D prophylaxis 250 IU to rhesus negatives. • Give information about labour, birth plan, pain control
36 weeks	**Midwife review** • At every appointment, you do: BP, BMI, Urine dip, SFH • **Abdominal palpation at all appointments after 36+0** weeks to identify breech presentation • Assess foetal malpresentation on USS if breech suspected on palpation ○ Offer ECV at 36 weeks in primip. ○ Offer ECV at 37 weeks in multiparous. • Give specific information on: ○ Breastfeeding technique, care of the new baby, vitamin K prophylaxis and newborn screening tests ○ Postnatal self-care, awareness of 'baby blues' and postnatal depression
38 weeks	• At every appointment, you do: BP, BMI, Urine dip, SFH

	• Discuss prolonged pregnancy and management options available if this occurs
40weeks (only if nulliparous)	**Midwife review** • At every appointment, you do: BP, BMI, Urine dip, SFH • Further discussion of management of prolonged pregnancy
41 weeks	**Midwife review** - for women who have not given birth by 41 weeks: • At every appointment, you do: BP, BMI, Urine dip, SFH • Offer a membrane sweep/ induction of labour

Labour

Normal labour

Definition = the presence of strong, regular, painful contractions resulting in progressive cervical change

Divided into **3 stages:**

1st stage

- Begins with the onset of contractions and ends with full cervical dilatation (10cm) and effacement
- Average duration (in nulliparous women) = 8 hours, expected to be <18hours duration
- Average duration (in multiparous women) = 5 hours, expected to be <12 hours
- Subdivided into:
    - Latent phase
        - Begins with the onset of contractions and ends with 3-4cm cervical dilatation and full effacement
    - Active phase
        - Begins with 3-4cm cervical dilatation and ends with full (10cm) cervical dilatation
        - Normal progress = cervical dilatation of at least 1cm every 2 hours
        - Abnormal progress = cervical dilatation of <2cm in 4 hours

- Causes of prolonged 1st stage of labour:
    - Dysfunctional uterine activity ie weak or infrequent contractions
    - Cephalopelvic disproportion ie disproportion between foetal head and maternal pelvic size
    - Malpresentation

2nd stage

- Begins with full cervical dilatation (10cm) and ends with the birth of the baby
- Subdivided into:
    - Passive phase
        - Begins with full dilatation until head reaches pelvic floor and ends with the onset of involuntary expulsive contractions
            - I.e. there is no maternal urge to push
    - Active phase
        - Begins with the onset of involuntary expulsive contractions and ends with the birth of the baby
            - I.e. there is maternal urge to push
        - Prolonged = lasting >2 hours in a nulliparous woman, or >1 hour in a multiparous woman (allow an extra hour if the woman has an epidural)
- Causes of prolonged 2nd stage of labour:
    - Secondary dysfunctional uterine activity
    - Resistant perineum (particularly if nulliparous)

- Persistent OP foetal head
- Android pelvis

3rd stage

- Begins with the birth of the baby and ends with complete delivery of the placenta and membranes
- Average duration = 5-10 mins
- Management of the 3rd stage can be described as:
  - Physiological
    - Where the placenta is delivered by maternal effort
    - Associated with heavier bleeding
    - Prolonged = lasting >60mins
  - Active
    - Recommended to <u>all</u> women
    - Involves administering **10 iU oxytocin IM** to the mother (with the birth of the anterior shoulder or immediately after delivery)
    - Controlled traction of umbilical cord after signs of separation of the placenta
    - Reduces incidence of PPH (from 15% → 5%)
    - Prolonged = lasting >30mins

- Causes of prolonged 3rd stage of labour:
  - Uterine atony
  - Placenta accreta

Mechanism of labour:

1. Engagement
2. Descent
3. Flexion
4. Internal rotation
5. Crowning
6. Extension
7. Restitution
8. External rotation
9. Delivery of the shoulders and foetal body

Monitoring during normal labour (1-to-1 midwifery care, with obstetric and anaesthetic care available as required)

- During 1st stage:
  - Every 15 mins – foetal HR (or continuous CTG if indicated)
  - Every 30 mins – frequency of contractions
  - Every 1 hour – maternal HR, BP and **vaginal examination**
  - Every **4 hours** – maternal temperature
  - Document volume of urine passed, and test for ketones and protein

- During 2nd stage:
  - Every 5 mins – foetal HR (or continuous CTG if indicated)
  - Every 30 mins – frequency of contractions
  - Every **1 hour** – maternal HR, BP and **vaginal examination**
  - Document volume of urine passed, and test for ketones and protein
- During 3rd stage:
  - Monitor maternal observations for at least 2 hours
  - Document volume of vaginal blood loss
  - Examine the delivered placenta for completeness
  - Inspect the vulva for evidence of tears

Immediate Care of the Newborn

- The baby will usually take its first breath within seconds
- After clamping and cutting the umbilical cord, the baby should have an **Apgar score** calculated at 1 minute of age and then repeated again at 5 minutes and 10 minutes.
    - A score of 0-3 is very low score, between 4-6 is moderate low and between 7 - 10 means the baby is in a good state.
- Encourage **skin-to-skin contact** between mother and baby as soon as possible after birth
- Dry and cover the baby with a warm blanket or towel, maintaining this contact
- Encourage initiation of **breastfeeding** within the first 1 hour
- Routine measurements of newborn head circumference, birthweight and temperature should be measured soon after this hour
- Administer the first dose of **vitamin K** to the baby in the delivery room
- Attach a wrist label to the baby for identification

Preterm labour – onset of labour before 37 weeks gestation

Prevention

- Options:
    - **Prophylactic Vaginal progesterone**
        - Start treatment between 16-24 weeks gestation, and continue until at least 34 weeks gestation
        - Indications:
            - Hx of spontaneous preterm birth (<34 weeks) Mid-trimester loss (>16 weeks) and / or cervical length <25mm on TV US scan
            - (if both then offer, if only one then consider offering)
    - **'Prophylactic' cervical cerclage**
        - Indications:
            - Offer if Hx of spontaneous preterm birth (<34 weeks) or mid-trimester loss (>16 weeks) and cervical length <25mm on TV US scan
            - Consider offering if cervical length <25mm on TV US scan and Hx of cervical trauma or Hx of PPROM
    - **'Rescue' cervical cerclage**
        - Indications:
            - Cervical dilatation in the absence of uterine contractions (or other signs of labour) between 16-27^{+6} weeks gestation and unruptured membranes
            - Contraindications: bleeding, infection, uterine contractions

Management

- **Admit to antenatal ward**
- Offer **maternal corticosteroids** (to accelerate foetal lung maturation)
    - 1^{st} line = IM betamethasone 24mg in 2 divided doses 12 hours apart
- Offer **tocolytics** (to delay delivery long enough for corticosteroid administration or transfer to a unit with neonatal facilities)
    - Contraindicated in the presence of bleeding or infection
    - 1^{st} line = **nifedipine** (calcium channel blocker)
    - 2^{nd} line = atosiban (oxytocin receptor antagonist)
- Offer **IV magnesium sulphate** (for neuroprotection of the neonate) if birth is expected within the next 24 hours
    - IV loading dose of 4g over 5-15mins followed by IV infusion of 1g/hour
    - Continue the infusion until birth or for 24 hours (whichever is sooner)
    - **Beware**: toxicity can result in respiratory depression and arrhythmias
        - Monitor for signs of toxicity every 4 hours (HR, BP, RR, deep tendon reflexes)

    - **Antidote**: 10ml 10% calcium gluconate over 10mins (and stop magnesium sulphate infusion)
- Aim for delivery at 37 weeks in most cases

P-PROM – preterm premature rupture of membranes in the absence of any uterine activity i.e. rupture of membranes and no contractions before 37 weeks gestation = (24+0 to 36+6 weeks).

- **Admit to antenatal ward to perform sterile speculum examination to look for pooling of amniotic fluid** and administer following**:**
- Offer prophylactic **antibiotics**
    - 1st line = **oral erythromycin** 250mg QDS for a max. of 10 days or until the woman is in established labour, whichever is sooner
    - 2nd line = oral penicillin
- **Intense clinical surveillance** for signs of chorioamnionitis and pre-term labour
    - There is a lack of consensus whether this is best inpatient or outpatient
    - Within Imperial NHS trust, best practice is to admit until 28 weeks, after which 2-3x/week outpatient monitoring until delivery
- Offer **maternal corticosteroids** (to accelerate foetal lung maturation)
    - 1st line = IM betamethasone 24mg in 2 divided doses 12 hours apart
- Offer **IV magnesium sulphate** (for neuroprotection of the neonate) if birth is expected within the next 24 hours.
- Do not administer tocolytics (due to increased risk of infection)
- Delivery is advised if lung maturity is confirmed, or clinical evidence of infection appears
- If neither of the above are present, do not offer IOL before 34+0 weeks
- If >34 weeks and positive group B strep at any point in current pregnancy, offer immediate IOL

PACES TIPS

- **Risk Factors**: smokers, STI, previous P-PROM, multiple pregnancy
- Explain need for admission
- Explain the risks of P-PROM (infection which can cause damage to the baby) and use of antibiotics
- Explain the risks of prematurity (and that you'd ideally like to keep the baby inside for as long as possible, but this has to be balanced with the infection risk)
- Explain the importance of close monitoring (CTG, maternal observations)
- Explain the role of antenatal steroids
- Discuss the likelihood of delivery

PROM – premature rupture of membranes in the absence of any uterine activity (i.e. after 37 weeks gestation)

- **Admit to antenatal ward for speculum, 4hrly temperature and 24hr foetal monitoring.**
- Offer prophylactic **antibiotics, Intense clinical surveillance** for signs of chorioamnionitis
- **If amniotic fluid is clear:**
    - **If 0-24 hours** after rupture of membranes – offer expectant management. 60% of women will go into labour within 24 hours.
    - **If >24hrs**: offer IOL
- If positive group B strep, offer immediate IOL
- **If Meconium**: Induce labour ASAP.
- Monitor neonate for at least 12 hours after delivery (when the risk of infection is greatest) – measure temperature, HR, RR at 1, 2, 6 and 12 hours

Shoulder dystocia

- Shoulder dystocia is an **emergency** and should be managed systematically, escalating to the next manoeuvre if the initial manoeuvre was unsuccessful

- Lie woman flat and tell her to **STOP** pushing = as pushing can increase risk of foetal complications.

1. Call for senior, anaesthetist and neonatal **help** (press the emergency buzzer or 2222).
2. **External manoeuvres:** the whole point is to increase the relative anterior-posterior diameter of the pelvis.
    1) **McRobert's manoeuvre** – place patient with hips hyper-flexed and abducted ("thighs to abdomen, successful **in 90%** of cases).
    2) **McRobert's manoeuvre with suprapubic pressure** – this is used to improve McRobert's. You apply pressure down and forward to decrease the shoulder diameter.
3. Consider **episiotomy** if this will make internal manoeuvres easier
4. **Internal manoeuvres:** the whole point is to reduce the shoulder diameter by abducting the shoulder and allowing rotation into the wider oblique pelvis diameter. These can be performed in any order depending on clinical circumstances and operator experience.
    1) **Rubin II manoeuvre** – insert a hand behind the anterior shoulder and push it towards baby's chest.
    2) **Wood's screw manoeuvre** – Rubin 2 + insert second hand to apply pressure to front of posterior shoulder to aid further rotation.
    3) **Deliver posterior arm** – this reduces shoulder diameter by arm width. The baby's wrist should be grasped, and the posterior arm should be gently tugged from the vagina in a straight line. Risk of humeral Fractures!
5. Change position to **all fours** – this may help dislodge the anterior shoulder OR repeat all of the above manoeuvres
6. **Third-line manoeuvres** should be considered very carefully to avoid unnecessary maternal morbidity and mortality, particularly by inexperienced practitioners: **foetal cleidotomy, maternal symphisiotomy** or **Zavanelli** (vaginal replacement of the foetal head followed by a CS – this can be used in bilateral shoulder dystocia).

Post-delivery: baby should be reviewed by neonatologist and clinical incident reporting form must be completed

Complications of shoulder dystocia in baby:
- BPI (brachial plexus injury) in 2.3% to 16%.
- Humerus, clavicle fractures.
- Pneumothorax
- Hypoxic brain damage

Complications in mum:
- PPH (11%)
- 3rd / 4th degree tears (3.8%)
- Uterine rupture
- Cervical tears
- Sacroiliac joint dislocation.
- Bladder rupture
- Vaginal lacerations

Breech presentation: 1 in 4 breech at 28 weeks, 3-5% still breech at term.

- If breech at <36 weeks, wait and re-scan at 36/40 at which point if foetus is still breech:
- Offer **external cephalic version** (ECV) to all women – unless absolute contraindication
    - Performed at 36 weeks if nulliparous, or 37 weeks if multiparous
    - Success rate = 50%
    - Rhesus negative mothers will require anti-D immunoglobulin
    - Contraindications:
        - Where C-section delivery is required (irrespective of ECV outcome)

        - Abnormal CTG
        - Major uterine anomaly
        - Recent antepartum haemorrhage (last 7 days)
        - Ruptured membranes
        - Multiple pregnancy
    - Risks:
        - Failure – 50%
        - Foetal distress or bradycardia
        - Antepartum haemorrhage
        - Emergency C section (1 in 200)
        - Placental abruption
        - Premature rupture of membranes
- If ECV unsuccessful / declined → counsel about risks and benefits of **vaginal breech delivery** vs **elective C-section**
    - C-section:
        - Small reduction in foetal mortality and neonatal morbidity (0.5:1000 with CS compared to 2:1000 with vaginal breech birth)
        - Small increase in risk of immediate complications for the mother compared to vaginal breech delivery
        - Implications on future pregnancy (VBAC, placenta praevia, uterine rupture)
    - Vaginal breech delivery:
        - 40% risk of needing an emergency C-section (which has highest maternal risk of all breech delivery options)
        - Slightly increased risk to foetus compared to elective CS – increased risk of low Apgar scores and immediate complications, but no increased risk of long-term foetal morbidity
        - Factors associated with successful delivery = normal-size foetus, multiparity, positive mental attitude of woman
        - Factors associated with higher risk = hyperextended neck, foetal weight >3.8kg or estimated foetal weight <10th centile, evidence of antenatal foetal compromise
        - Absolute contraindications = footling breech

PACES TIPS
- **Risk Factors**: uterine malformations, fibroids, placenta praevia, poly/oligohydramnios, foetal anomaly (CNS malformations, chromosomal disorders), prematurity, multiple pregnancy, nulliparity
- Explain what breech means
- Offer ECV and explain the risks (50% success rate, placental abruption, foetal distress requiring an emergency C-section)
- Explain the benefits and risks of vaginal breech and C-section
    - **Vaginal**: if successful, has the fewest complications, however, 40% risk of needing an emergency C-section
    - **C-section**: small reduction in perinatal mortality, implications on future pregnancy (placenta praevia, VBAC, uterine rupture)

- Vaginal breech delivery
    - Induction of labour is not recommended
    - Advise to deliver in labour ward, with continuous CTG monitoring
    - Epidural analgesia increases the likelihood of intervention being necessary
    - Maternal position: all fours or semi-recumbent
    - Technique of delivery
        - (1) Delivery of buttocks
            - **'Hands off'** approach

        - If handling is needed, put thumbs on the sacrum and fingers on the ASIS of the baby
    - (2) Delivery of legs and lower body
        - If the legs are flexed → they will deliver spontaneously
        - If the legs are extended → **Pinard's manoeuvre** – poke the baby in the popliteal fossa which will make them bend their knees
    - (3) Delivery of shoulders
        - If the baby gets stuck once the body has delivered, you will see winging of the scapulae
        - **Loveset's manoeuvre** – rotate the baby into the transverse position and pull the anterior arm down
        - If the second arm hasn't delivered, rotate the baby into the opposite anterior position and pull the other arm down
    - (4) Delivery of head
        - **Mauriceau-Smellie-Veit manoeuvre** – rest the baby on your forearm and pull the head downwards
        - If this doesn't work, use forceps
    - Other considerations: G&S, X-match, FBC, CTG, make sure theatre is ready.

- Twin breech delivery
    - If first twin is breech, a planned C section should be advised
    - If presenting twin is cephalic and second is breech, routine C section is not recommended

Other Malpresentations

Face presentation:

- If chin anterior (mento-anterior position) = vaginal delivery is possible with delivery by flexion
- If chin posterior (mento-posterior position) = delivery by C-section

Brow presentation:

- Delivery by C-section

Unstable lie

- Consider ECV, or elective C-section

Induction of labour (IOL)

- **BISHOP score:**
    - High scores (≥8) = favourable cervix meaning there is a high chance of spontaneous labour, or response to interventions made to induce labour.
    - Low scores (≤6) = induction needed to start labour.
- The station is '0' when the head is directly at the level of the ischial spines,
- if the station was described as -2, it would be 2cm **above** the ischial spines,
- If it was +2 it would be 2cm **below** the ischial spine.
- Method of induction offered depends on the Bishops score

Score	0	1	2	3
Dilation of cervix (cm)	0	1-2	3-4	≥5
Consistency of cervix	Firm	Medium	Soft	-
Effacement (cm)	>4	2-4cm	1-2	<1
Position of cervix	Posterior	Central	Anterior	-
Foetal station of presenting part	-3	-2	-1 or 0	+1 or +2

Score ≤6: offer IOL with **vaginal prostaglandin** first. If not suitable (VBAC, high risk of hyperstimulation) or not wanted, offer mechanical method eg balloon catheter, osmotic cervical dilator

Score >6: offer IOL with ARM followed by IV oxytocin infusion

Methods of Induction:

1. **Membrane Sweeping**
    - Often offered prior to formal induction to prevent prolongation of pregnancies
    - At antenatal visits after 39+0 weeks discuss with women whether they want a vaginal examination for membrane sweeping
    - Offered weekly from 40 weeks gestation in a nulliparous woman (or 41 weeks gestation in a multiparous woman)
    - Involves the insertion of a gloved finger through the cervix and its rotation around the inner rim of the cervix
        - Only possible if the cervix is beginning to dilate and efface
    - Releases **physiological** prostaglandins, stimulating effacements, and moves membranes away from the cervical os
    - **Note**: placenta praevia must be excluded before it is performed
2. **Vaginal Prostaglandin E_2**
    - Offered 1st line if low Bishop score or if 24 hours after a membrane sweep no progress has been made
    - Can be administered as a vaginal tablet, vaginal gel or pessary
        - **Tablet or Gel** (Prostin®): 1 dose, followed by a 2nd dose after 6 hours (**max: 2 doses**)
        - **Pessary** (Propess®) 1 dose over 24 hours
        - Risk of uterine hyperstimulation
3. In times of Covid, they started using **Mechanical induction to break waters** = a catheter is inserted into the cervix which has a small balloon that can be filled with water; commonly referred to as a cervical ripening balloon (CRB). This is just as effective but preferred to Vaginal prostaglandin as **this avoids risk of uterine hyperstimulation, and is considered safer for baby.**

4. **Artificial Rupture of Membranes** (ARM) aka **Amniotomy**
    - Should not be used first-line for induction if low Bishops score
    - Only possible if the cervix is beginning to dilate and efface
    - Avoid if the presenting part is mobile or high
    - Risk of umbilical cord prolapse
    - (Can also be used to augment or accelerate labour)
5. **IV Syntocinon**
    - Should not be used first-line for induction if low Bishops score
    - **Offered if 2 hours after membranes have ruptured,** labour has not ensued
    - To increase uterine contractions, until 3-4 contractions are achieved every 10mins
    - **Risk**: uterine hyperstimulation, ↑ risk of uterine rupture (esp. in VBAC or previous uterine myomectomy)
    - (Can also be used to augment or accelerate labour)

Summary:

- Induction:
    - Membrane sweep to stimulate physiological prostaglandins
    - Vaginal PGE_2 or Mechanical balloon
    - If still no ROM, then ARM
    - After 2hrs of ARM, start IV Syntocinon

- With pharmacological methods of induction, uterine activity and foetal monitoring should be performed regularly

- If induction fails:
  - Rest period followed by attempting induction again (only if there is no major threat to foetal or maternal condition)
  - C-section

- Special circumstances:
  - **Mifepristone** (anti-progesterone) and **misoprostol** (prostaglandin)
  - Often used to induce labour following intrauterine foetal death when you would give vaginal prostaglandins.

Vaginal Birth After C-section (VBAC)

- Birth options for women with a Hx of previous C-section:
  - Vaginal Birth After C-section (VBAC)
    - Success rate = 72-75%
    - (Increased number of successful VBACs had, the greater the success rate of future VBAC: 2nd VBAC ~80%, 3rd VBAC ~90%)
      - Factors associated with increased success: previous successful VBAC is the single best predictor of successful VBAC and has a success rate of 85-90%), previous vaginal delivery, spontaneous onset of labour, normal size baby, vertex presentation, singleton pregnancy
    - Risk of uterine rupture = 1 in 200 (increased to 1 in 100 with the use of syntocinon)
    - Benefits of avoiding a further CS with its implications on future pregnancies
    - Benefits on increasing likelihood of success of future vaginal births
    - Successful VBAC has the fewest complications
    - If unsuccessful will need emergency C section
  - Elective Repeat C-section (ERCS)
    - Risk of another CS with its implications on future pregnancies (risk of placenta praevia / accreta in future pregnancies, risk of pelvic adhesions complicating future abdominopelvic surgery)
    - Avoids risk of uterine scar rupture
    - Avoids risk of requiring an emergency CS

- If having VBAC:
  - Continuous foetal monitoring
  - If IOL needed, 2-3 fold increased risk of uterine rupture. Risk is lower with mechanical IOL than with prostaglandins

- Contraindications of VBAC:
  - RELATIVE:
    - ≥2 previous C-sections
    - Need for IOL
    - Previous labour outcome suggestive of cephalopelvic disproportion
  - ABSOLUTE:
    - Previous classical C-section
    - Previous uterine rupture
    - Other absolute contraindications to vaginal birth that apply irrespective of the presence or absence of a scar (e.g. placenta praevia)

PACES TIPS

- Discuss options: elective repeat C-section (ERCS) or attempted vaginal birth after C-section (VBAC)
- Explain the risks of VBAC (uterine rupture risk of 1 in 200, success rate 70-75% remainder require emergency CS)
- Explain the risks of ERCS (implications for future pregnancies)

Umbilical cord prolapse

Definition: descent of umbilical cord through the cervix either alongside or past the presenting part in the presence of ruptured membranes

Prevention: avoid ARM if presenting part is mobile or high, or if cord is felt below presenting part on vaginal examination

When diagnosed:

- Call for senior **help, continue foetal monitoring with CTG, theatre for immediate delivery.**
- If the cord is out of introitus → avoid handling the cord (as this can cause cord vasospasm)
    - Keep warm and moist, but do not force it back inside
- **Prevent further cord compression** by:
    - Elevating the presenting part (manually or by filling the urinary bladder)
    - Re-positioning mother into either:
        - All fours
        - Knee-to-chest position
        - Left lateral position (with head down)
- Consider tocolysis while preparing for C-section if after attempts to prevent compression there are still foetal heart rate abnormalities,
- **ASAP delivery** by quickest route possible – Emergency CS (recommended if vaginal delivery is not imminent) or expedited vaginal delivery.

Uterine rupture

- Call for senior **help**
- **ABCDE approach**
    - 2x large bore cannulae
    - Urgent bloods for: FBC, clotting, G&S (if not done previously) and cross-match
    - Transfuse blood as soon as possible
- **Expedite delivery**
- **Urgent laparotomy** to examine and repair (or remove) the uterus

Postpartum haemorrhage (PPH)

Minimising Risk

- Prophylactic uterotonics should be routinely offered in the management of the 3rd stage of labour to all women to reduce risk of PPH
    - For women delivering vaginally, offer **IM oxytocin (10 iU)**
    - For women delivering by C-section, offer **IV oxytocin (5 iU)** (± tranexamic acid if risk factors for PPH)
    - For women with increased risk of haemorrhage, consider ergometrine-oxytocin (syntometrine) (contraindicated if have hypertension)

Minor PPH (500-1000 mL without shock)

- Alert midwife in charge and first-line obstetric and anaesthetic staff
- ABCDE approach

    - 1x IV access
    - Urgent bloods for: FBC, clotting, G&S (if not done previously) and cross-match 4 units
    - Commence warmed crystalloid infusion
- HR, RR and BP every 15 mins

Major PPH (>1000 mL)
- Call for senior **help** and initiate **major obstetric haemorrhage MOH protocol** (obstetric consultant, anaesthetic team, haematologist and blood transfusion lab)
- **ABCDE approach**
    - Position the patient flat
    - Keep patient warm
    - 2x large bore IV cannulae
    - Urgent bloods for: FBC, clotting, G&S (if not done previously) and cross-match 4 units, baseline U&E and LFTs
    - Transfuse blood as soon as possible
    - Until blood is available, infuse upto 3.5L of warmed clear fluids (initially 2L warmed crystalloid)
- Continuous HR, BP and RR monitoring
- Monitor temperature every 15minutes
- Catheterise
- If the placenta is undelivered → attempt removal by controlled cord traction
- If the placenta is delivered → check for completeness (empty uterus and vagina of clots)

When uterine atony is the suspected cause, follow:
- **Massage the uterus** to stimulate uterine contractions
- Stepwise approach to pharmacological and surgical options:
    - **Phamacological:**
        - **Step 1**: 5iU oxytocin (syntocinon) slow IV infusion
        - **Step 2:** 0.5mg ergometrine/ syntometrine slow IV infusion or IM (contraindicated in HTN)
        - **Step 3:** Oxytocin IV infusion (40iU in 500ml isotonic crystalloids)
        - **Step 4:** IM Carboprost (contraindicated in asthmatics)
    - **Surgical:**
        - **Step 5**: intrauterine balloon tamponade i.e. Bakri balloon.
        - **Step 6**: other surgical measures (e.g. B lynch sutures, iliac artery ligation, uterine artery embolization IR, hysterectomy)

Pre-existing maternal disease

Chronic hypertension = Hypertension present before 20 weeks.

- **Pre-conception**
    - Adjust medications
        - Advise to stop **ACE inhibitors**, **ARBs**, **thiazides,** and **thiazide-like diuretics** and contact GP to arrange an alternative (1st line = labetalol, 2nd line = nifedipine, 3rd line = methyldopa) within 2 days of +ve pregnancy test
- **Antenatal**
    - Conservative
        - Advice regarding salt intake, exercise, lifestyle
    - Monitoring
        - BP monitoring (weekly if HTN poorly controlled, every 2-4 weeks if HTN well controlled)
        - Aim for BP <135/85 mmHg
        - **Serial growth scans** every 4 weeks from 28-36 weeks

- Medical
  - Low-dose **aspirin 75mg** OD from 12 weeks gestation until birth.
- **Intrapartum**
  - As long as BP is <160/110, induction <37 weeks gestation should **not** be offered
  - If >160/110 mmHg, senior input and patient involvement is required
- **Postnatal**
  - Monitoring
    - BP monitoring
      - Daily for the first 2 days after birth
      - At least once between day 3 and day 5 after birth
      - As clinically indicated if antihypertensive treatment is changed after birth
    - Aim to keep BP <140/90 mmHg
    - Arrange F/U at 2 weeks with GP or specialist for antihypertensive review.
    - If prescribed methyldopa intrapartum, stop within two days after birth and change to an alternative antihypertensive (due to risk of postnatal depression)

Diabetes Mellitus

- **Pre-conception**
  - Adjust medications
    - Advise to stop all glucose-lowering agents except metformin and insulin
    - Stop ACEi and ARB and use alternative antihypertensives
  - High-dose **folic acid 5mg** OD from pre-conception until 12 weeks gestation
- **Antenatal**
  - Measure HbA1c at booking appointment
  - Arrange immediate contact with **joint diabetes and antenatal clinic** and then every 1-2 weeks
  - Conservative
    - Ensure mother is up to date with retinal and renal screening
    - Give advice about possible implications of diabetes on pregnancy
  - Monitoring
    - **Capillary blood glucose monitoring** should be performed by the patient a min. of 7x/day (check fasting, pre-meal, 1-hour post-meal and bedtime glucose daily)
      - Pre-prandial target = <5.3 mmol/l, 1hr post-prandial target = <7.8 mmol/l, 2 hours post-prandial target = <6.4
    - **Specialist foetal cardiac scan** at 19-20 weeks
    - **Serial growth scans** every 4 weeks from 28-36 weeks
    - Repeat maternal retinal and renal screening (if abnormal at booking repeat at 16-20weeks, if normal at booking repeat at 28 weeks)
  - Medical
    - Continue high-dose folic acid 5mg OD until 12 weeks gestation
    - Low-dose **aspirin 75mg** OD from 12 weeks gestation
    - Since insulin resistance increases throughout pregnancy, advise patients to increase their dose of metformin or insulin during the 2nd half of pregnancy

- **Intrapartum**
  - Organise elective birth between 37^{+0} – 38^{+6} weeks (IOL or CS)
  - Consider delivery before this in the presence of foetal / maternal complications
    - If antenatal corticosteroids are needed, additional insulin therapy must be given concurrently (to maintain normoglycaemic)
  - Advise birth in hospital
  - Monitor capillary glucose every hour during labour and birth
  - For women on insulin, commence a sliding scale during labour (aim blood glucose levels between 4-7 mmol/l)

- **Postnatal**
  - Monitoring
    - Check neonatal blood glucose within 4 hours of birth (to exclude neonatal hypoglycaemia)
    - Women should feed baby within 30 minutes after birth and then every 2-3 hours until their pre-feed capillary glucose maintains at least 2.0mmol/l
    - Refer women back to their routine diabetes care arrangements
  - Medical
    - Adjust insulin and metformin doses back to those of pre-pregnancy immediately after birth

Thyroid disease

Hypothyroidism

- **Antenatal**
  - Urgent specialist referral to a joint obstetric and endocrinology clinic
  - Monitoring
    - Immediately once pregnancy confirmed measure TSH, FT4, FT3 and TSH receptor antibodies if current or history of Graves' disease, then
    - TFTs should be checked every 2-4 weeks to ensure biochemical euthyroidism (TSH <4mmol/L)
  - Medical
    - Continue thyroid replacement therapy
    - Adjust dose throughout pregnancy according to TFTs
      - Women often require higher doses, esp. during the 1st trimester

- **Postnatal**
  - Monitoring
    - TFTs monitoring at 6-8 weeks postnatal check with GP
  - Postpartum Thyroiditis Management:
    - Thyrotoxic phase: propranolol (anti-thyroid drugs are avoided).
    - Hypothyroid phase: thyroxine.

Hyperthyroidism

- **Antenatal**
  - Monitoring
    - TFTs should be checked every 2-4 weeks to ensure biochemical euthyroidism (TSH <4mmol/L)
  - Medical
    - ONLY in 1st trimester: Propylthiouracil. It crosses the placenta and in high doses may cause foetal goitre and hypothyroidism.
    - For the rest of pregnancy: Carbimazole.
    - Continue carbimazole/propylthiouracil at lowest acceptable doses according to TFTs
      - Safety-net regarding agranulocytosis
      - Radioactive iodine is **contraindicated**
    - Adjust dose throughout pregnancy according to TFTs
      - Women often require lower doses (and 1/3 are able to stop treatment altogether during pregnancy)
- **Postnatal**
  - Monitoring
    - TFTs monitoring at 6-8 weeks postnatal check with GP

Asthma

- **Antenatal**
  - Conservative
    - Re-educate on inhaler technique, smoking cessation etc.
  - Medical
    - Continue pre-existing asthma treatment regimen as normal
- **Intrapartum**
  - Avoid use of ergometrine (bronchoconstrictor) and carboprost
  - Regional anaesthesia is preferable over general anaesthesia, in the case of C-section

Heart disease

- **Pre-conception**
  - Adjust medications
    - Advise to stop all teratogenic drugs (ACEi, ARBs, thiazide diuretics, statins and warfarin)
- **Antenatal**
  - Arrange contact with **joint cardiac and obstetric clinic** (every 2-4 weeks until 20 weeks gestation, every 2 weeks until 24 weeks gestation, and weekly thereafter)
  - Monitoring
    - Maternal **echocardiogram at booking and repeat at 28** weeks
    - **Specialist foetal cardiac scan** at 22 weeks
  - Medical
    - VTE prophylaxis with LWMH SC
- **Intrapartum**
  - Aim for spontaneous labour, and avoid IOL where possible (however in women with mechanical heart valves offer planned birth)
  - Consider planned C-section if high risk aortic disease, pulmonary arterial hypertension of New York Heart Association class III or IV heart disease
  - Advise epidural anaesthesia to reduce pain-related cardiac strain
  - Use prophylactic antibiotics if structural heart defect present
  - **Minimise length of 2nd stage of labour** (using forceps or ventouse because we want to reduce maternal effort and the need for more Cardiac output).
  - Active management of 3rd stage of labour is with syntocinon alone, but introduce slowly
    - Avoid use of ergometrine (vasoconstrictor)
  - Prophylactic antibiotics for mothers with a structural heart defect
    - Reduce the risk of bacterial endocarditis
- **Postnatal**
  - Monitoring
    - Transfer to HDU for close monitoring for first 12-48 hours
    - Arrange obstetric and cardiac F/U

Epilepsy

- **Pre-conception**
  - Adjust medications
    - Reduce to **monotherapy** where possible
      - Preferred anti-epileptic drugs (AEDs): lamotrigine
      - Use lowest effective dose of most appropriate anti-epileptic
      - Contraindicated: sodium valproate due to NTDs.
  - High-dose **folic acid 5mg** OD from pre-conception until 12 weeks gestation
- **Antenatal**
  - Arrange contact with **joint epilepsy and obstetric clinic**
  - Monitoring

        - **Serial growth scars** every 4 weeks from 28-36 weeks gestation
        - No need to monitor AED levels routinely
- **Postnatal**
    - Encourage breastfeeding
    - Provide information on **safe handling** of the **neonate**
    - Restart contraception
    - Continue AEDs
    - If AED dose was increased during pregnancy, dose review should occur within 10 days of delivery to avoid toxicity

Maternal infection

UTI

- Ensure absence of systemic symptoms (indicating pyelonephritis)
- **Conservative**
    - Simple analgesics (e.g. paracetamol) and encourage plentiful fluid intake
- **Medical**
    - 1st line = nitrofurantoin 50mg QDS or 100mg modified-release BD for 7 days
        - Avoid in women at full term.
    - 2nd line (if no improvement after 48 hours) =
        - Amoxicillin (only if culture results available and susceptible) 500mg TDS for 7 days
        - Cefalexin 500mg BD for 7 days

Syphilis

- **Refer to GUM clinic** (for appropriate contact tracing)
- **Antibiotics**
    - 1st line = **IM stat benzylpenicillin** or doxycycline BD for 14 days.
- Note: If the woman is not treated during pregnancy, treat the baby immediately after delivery

Toxoplasmosis

- **Antibiotics**
    - 1st line = **spiramycin** (3-week course of 2-3g OD)
- If foetal infection is confirmed discuss the options:
    - Continuation of pregnancy with more aggressive antibiotic treatment (e.g. sulfadiazine and pyrimethamine)
    - **Treat baby for up to 1 year after delivery (if no TOP).**
    - Adjunct can be prednisolone.

Prevention: avoid eating raw meat, avoid handling cats and cat litter, wear gloves and wash hands when gardening or handling soil

CMV

- No prenatal treatment available
- Refer to **foetal medicine specialist** for regular foetal surveillance
    - Foetal US examination every 2-4 weeks from diagnosis
    - ± Foetal MRI at 28-32 weeks gestation
    - Audiology + ophthalmology F/U
- If there is evidence of foetal infection on US discuss the options:
    - Continuation of pregnancy with expectant management
    - TOP
- Offer postnatal antiviral therapy for the baby (e.g. valganciclovir, ganciclovir) for 6 months and

start within 4 weeks of life.

Chickenpox

Chickenpox vaccine is contraindicated in pregnancy.

Management of non-immune women exposed to chickenpox with no past history of chickenpox

- **If <20 weeks pregnant or >20 weeks pregnant with NO rash** = Administer **VZ Ig** ASAP.
  - This is effective when given up to 10 days after contact
- Advice to avoid contact with other pregnant women and neonates
  - Beware: women are considered infectious for 21 days after exposure if they don't receive VZ Ig, and for 28 days after exposure if they do receive VZ Ig

Management of chickenpox infection

- **If >20 weeks pregnant and presents within 24hrs onset of rash:**
  - Prescribe **oral aciclovir** (800mg 5/day for 7 days).
    - This should be given around 7-14 days after exposure.
    - IV aciclovir if severe chickenpox
  - VZ Ig offers no benefit once chickenpox infection has developed
  - Advice to avoid contact with other pregnant women and neonates until the lesions have crusted over (roughly 5 days after onset of rash)
  - Refer to **foetal medicine specialist** at 16-20 weeks or 5 weeks after infection for detailed US assessment
  - Avoid secondary bacterial infections of the lesions via good hygiene and symptomatic treatment
- **Delivery**
  - If infection occurs within the last 4 weeks of pregnancy, elective delivery should be delayed until 7 days after the onset of the rash (to allow for the passive transfer of antibodies to the foetus)
- **Postnatal**
  - Arrange **neonatal ophthalmic examination** after birth
  - If birth occurs within 7 days of the onset of the rash or the mother develops chickenpox within 7 days of delivery, the neonate should be given **VZ Ig** and monitored for signs of infection until 28 days after the onset of maternal infection
  - If neonatal infection occurs, treat with aciclovir

Prevention: in women who have not had chickenpox, advise them to avoid contact with anyone with chickenpox or shingles during pregnancy

Parvovirus B19

- **Conservative management** of the mother (rest, fluids, paracetamol)
- Urgently refer to **foetal medicine specialist** for regular foetal surveillance [within 4 weeks of onset of symptoms]
  - Serial foetal ultrasounds and Doppler assessment (detecting heart failure, anaemia or hydrops)
  - 30% risk of transmission to fetus
- If there is evidence of foetal anaemia or hydrops foetalis consider the options:
  - Expectant management
    - Spontaneous resolution occurs in 50% of cases with **no long-term sequelae**
  - *In utero* transfusion
    - Always offer if infection occurs in the first 20 weeks of pregnancy (where the risk of foetal loss is high = 10%)
    - Allows for complete recovery

Listeria monocytogenes

- **Antibiotics**
  - 1st line = **IV amoxicillin** 2g every 6 hours for 14 days, as gram-positive bacilli.

Prevention: avoid high-risk foods (unpasteurised milk, uncooked soft cheeses, pâté, undercooked food)

HSV

- **Refer to GUM clinic**
- If **first episode** of genital HSV:
  - Treat HSV infection with **oral aciclovir** (400mg TDS for 5 days)
  - If infection occurred in the 1st or 2nd trimester:
    - Recommend **daily suppressive oral aciclovir** (400mg TDS) from 36 weeks gestation until delivery
    - Offer **vaginal delivery**
  - If infection occurred in the 3rd trimester:
    - Continue oral acyclovir (400mg TDS) **until delivery**
    - Recommend delivery by **elective C-section**
    - If the woman chooses vaginal delivery:
      - Recommend intrapartum IV aciclovir to the mother (and IV aciclovir to the neonate after birth)
  - Avoid artificial rupture of membranes and invasive procedures during labour if there are genital lesions
- If **recurrent episode** of genital HSV:
  - **400mg TDS oral aciclovir from 36 weeks gestation until delivery**
  - Episodes are usually self-limiting, and resolve in 7-10 days without treatment
  - Offer vaginal delivery
  - Avoid artificial rupture of membranes and invasive procedures during labour if there are genital lesions

Group B Streptococcus

- **Intrapartum antibiotic prophylaxis**
  - 1st line = **IV benzylpenicillin** 3g as soon after the onset of labour, and 1.5g 4-hourly thereafter until delivery
  - Alternatives if penicillin allergic:
    - If mild allergy = cephalosporin
    - If severe allergy = vancomycin
  - Note: antibiotics are not required if undergoing an elective C-section in the absence of labour and with intact membranes
- **Monitor newborn baby** for the first 12 hours of life
  - If there is evidence of neonatal infection, treat with postnatal antibiotics
  - 1st line = IV penicillin and gentamicin

HIV

- **Antenatal**
  - Arrange contact with **joint HIV physician and obstetric clinic** every 1-2 weeks
  - **Monitor CD4 counts** at baseline and at delivery**, HIV viral load** every 2-4 weeks, at 36 weeks gestation and at delivery.
  - **ART: all women should be offered ART regardless of whether they were previously taking it!**
- **Intrapartum**
  - Mode of delivery depends on viral load at 36 weeks gestation:

        - < 50 copies/mL → reassure that vaginal delivery is appropriate (and ECV is allowed)
        - >50 copies/mL or co-existent hepatitis C → recommend elective C-section with intrapartum IV zidovudine @ 38 weeks.
    - Cord should be clamped as soon as possible and the baby should be bathed immediately after birth.
- **Postnatal**
    - Advise women **not to breastfeed**
        - Beware: this advice is only relevant for women in the UK, and is different for women living in under-resourced countries
    - Treat all newborns with **ART** within 4 hours of birth
        - If low-risk of transmission → zidovudine monotherapy for 2-4 weeks
        - If high-risk of transmission → triple ART (zidovudine, lamivudine and nevirapine) for 4 weeks
    - Confirm or deny diagnosis of HIV in the neonate with **direct viral amplification by PCR** (normally carried out at birth, on discharge, 6 weeks and 6 months)

PACES TIPS
- Explain the need to be seen at a joint HIV physician and obstetric clinic every 1-2 weeks
- Explain the need to monitor viral load every 2-4 weeks, at 36 weeks and at delivery
- Stress the importance of good compliance with ART
- Discuss options for delivery (depending on viral load at 36 weeks gestation)
- Advise not to breastfeed
- Explain neonatal treatment with ART for 2-4 weeks and testing to confirm / deny HIV transmission

Hepatitis B

- **Antenatal**
    - **Refer to hepatologist**
    - Offer tenofovir to women with high HBV viral load (HBV DNA >10^7 IU/ml)
        - Start in the 3rd trimester and stop 4-12 weeks after delivery unless the mother meets criteria for long-term treatment
        - Monitor HBV viral load every 2 months and LFTs monthly
- **Postnatal**
    - Offer **hepatitis B Ig** and **hepatitis B immunisation** to the newborn
        - HBV Ig – given within 24 hours of delivery
        - Hep B vaccine **extra doses** compared to routine schedule: at birth, 4 weeks, 12 months
    - Confirm or deny diagnosis of hepatitis B in the neonate with **blood test for serology** (normally carried out at 12 months following completion of immunisation schedule)
    - **Encourage breastfeeding (carries no risk of transmission)**

Hepatitis C

- **Antenatal**
    - **Refer to hepatologist**
    - Beware: the usual treatments for HCV, interferon and ribavirin, are contraindicated in pregnancy and should be deferred to the postpartum period
- No specific precautions on mode of delivery, or postnatal care, are recommended (there is no strong evidence that suggests such precautions reduce rates of vertical transmission).

Sepsis

- **ABCDE approach**

- **Sepsis 6:**
    - Start O_2 and titrate to saturation targets
    - Take blood cultures
    - Administer IV antibiotics
    - Measure serum lactate and send required blood tests
    - Start IV fluid resuscitation
    - Accurate urine output measurement
- Monitor foetus with continuous CTG when appropriate
- Investigate cause

Obstetric disease

Gestational hypertension (= new HTN without proteinuria occurring after 20 weeks gestation)

- Benign, not associated with adverse outcomes in itself (but may progress into pre-eclampsia)

Antenatal

- Consider admission to antenatal ward if severe hypertension (>160/110 mmHg) until BP is controlled
- **Monitoring**
  - BP and urinalysis 1-2x/week until BP is controlled, thereafter weekly
  - Bloods (FBC, LFTs, U&Es) weekly
  - US foetal surveillance (growth, liquor, UA blood flow) every 2-4 weeks
  - PlGF-based testing on 1 occasion if suspicion of pre-eclampsia
- **Medical**
  - **Antihypertensives** (1st line = labetalol, 2nd line = nifedipine, 3rd line = methyldopa)
    - Aim for BP <135/85 mmHg

Postnatal

- Monitor BP
  - Daily for the first 2 days after birth
  - At least once between days 3 and 5
  - As clinically indicated if antihypertensive treatment changed after birth
- Medical
  - Continue use of antenatal antihypertensive treatment if required
    - If the woman was taking **methyldopa** during pregnancy, stop within 2 days after birth and change to alternative agent if necessary
  - Reduce antihypertensive treatment if their BP falls **<130/80 mmHg**
- Arrange F/U with GP at 2 weeks after discharge from hospital if still on antihypertensive treatment for medication review
- Arrange F/U again at 6-8 weeks postnatal (to ensure resolution of hypertension)
  - Hypertension should resolve within 6 weeks → if this fails to resolve consider diagnosis of chronic hypertension

Pre-eclampsia (= new HTN with proteinuria occurring after 20 weeks gestation)

Prevention

- **Measure BP** and **test urine** for proteinuria at each antenatal appointment
  - If dipstick 1+ → use albumin:creatinine or protein:creatinine ratio to quantify proteinuria
    - 30mg/mol threshold for protein:creatinine
    - 8mg/mol threshold albumin:creatinine
- Offer **aspirin 75-150mg** OD from 12 weeks gestation until delivery in women with 1 high-risk right factor or ≥2 moderate-risk risk factors:
  - High-risk risk factors:
    - Hypertensive disease in a previous pregnancy
    - Pre-existing maternal disease (chronic hypertension, renal disease, diabetes, autoimmune disease [SLE, antiphospholipid syndrome])
  - Moderate-risk risk factors:
    - First pregnancy (primigravid)
    - Age >40 years
    - Pregnancy interval of >10 years
    - BMI >35 at booking visit
    - FH of pre-eclampsia
    - Multiple pregnancy
  - N.B. *NICE states to consider more frequent BP measurements for women with any of the above risk factors*

Management

- **Antenatal**
  - Indications for admission to antenatal ward:
    - Severe hypertension (BP >160/110mmHg)
    - Symptoms of severe late-stage disease (headache, visual disturbance, epigastric pain, hyperreflexia, impending pulmonary oedema)
    - Biochemical abnormalities (deranged LFTs, abnormal U&Es)
    - Haematological abnormalities (low platelets, DIC)
    - Suspected foetal compromise
    - Adverse events suggested by the full PIERS or PREP-S risk prediction models
  - **Monitoring**
    - BP at least every 2 days, and more frequently if woman is admitted to hospital
    - Bloods (FBC, LFTs, U&Es) 2x/week
    - US foetal surveillance (growth, liquor, UA blood flow) every 2 weeks
  - **Medical**
    - **Antihypertensives** (1^{st} line = labetalol, 2^{nd} line = nifedipine, 3^{rd} line = methyldopa)
      - Aim for BP <135/85 mmHg
    - Consider IV magnesium sulphate in women with features of severe pre-eclampsia if birth is planned within 24 hours (to prevent eclampsia)
- **Intrapartum**
  - Timing:
    - Arrange delivery for **37 weeks gestation** (or earlier if any concerns for the wellbeing of the woman or the baby – see below)
      - Inability to control maternal BP, maternal SpO_2 <90%, deterioration in maternal bloods, neurological/eclamptic features, placental abruption, reversed end diastolic flow
      - If delivery < 34 weeks: IV magnesium sulfate + course of antenatal corticosteroids
      - If delivery 34 – 36 weeks: consider course of antenatal corticosteroids
  - Mode:
    - Offer choice between elective C-section or induction of labour
    - If induction is preferred:
      - Advise to deliver in labour ward, with continuous CTG monitoring
      - Analgesia (encourage use of epidural anaesthesia which helps control BP)
      - Avoid use of ergometrine
- **Postnatal**
  - Keep under observation for at least 24 hours
  - Monitor BP:
    - At least 4x/day whilst still an inpatient
    - Every 1-2 days for up to 2 weeks after discharge from hospital until the woman is off treatment and has no hypertension
  - Medical:
    - Continue use of antenatal antihypertensive treatment if required
      - If the woman was taking **methyldopa** during pregnancy, stop within 2 days after birth and change to alternative agent if necessary
      - Breastfeeding/expressing milk: Avoid diuretic treatment, drugs that are safe = labetaolol, nifedipine, enalapril, captopril, atenolol, metoprolol
    - Reduce antihypertensive treatment if their BP falls **<130/80 mmHg**
  - Arrange F/U with GP at 2 weeks after discharge from hospital if still on antihypertensive treatment for medication review
  - Arrange F/U again at 6-8 weeks postnatal (to ensure resolution of hypertension)

        - Hypertension and proteinuria should resolve within 6 weeks → if this fails to resolve consider diagnosis of chronic hypertension or renal disease
- Note: here is no cure for pre-eclampsia other than to **end the pregnancy** by delivery the baby (and placenta).

PACES TIPS

- **Risk Factors**: previous hypertensive disease in pregnancy, multiple pregnancy, diabetes mellitus, kidney disease, first pregnancy, obesity, over 35 or under 20 years, family history, PCOS, IVF
- **Adapt the counselling based on severity**
- Explain that admission is needed (at least until BP can be controlled)
- Explain pre-eclampsia and the risks (early delivery, reduced placental function, IUGR, risks to mother)
    - Epidemiology: 2-3% of pregnancies
- Explain treatment (labetalol)
- Explain that BP will be monitored closely with regular blood tests (2/week) and foetal surveillance (every 2 weeks)
- Explain that early delivery before 37 weeks may be necessary
- Risk of Recurrence: ~15%
- Safety net (if not admitted) to attend hospital immediately if: ongoing/severe headaches, visual changes, nausea/vomiting, epigastric pain, oliguria, seizures
- Note: risk of future CVS disease if a women has hypertension in current or previous pregnancy (major adverse events, stroke, hypertension)

Eclampsia

- **ABCDE approach + call senior help**
- **IV magnesium sulphate**
    - IV loading dose of 4g (in 100ml 0.9% NaCl) over 5-15mins followed by IV infusion of 1g/hour
    - Continue the infusion for 24 hours after the last seizure or after delivery
    - If recurrent seizures → give a second loading dose of 4g over 5-15mins and involve anaesthetist
    - **Beware**: toxicity can result in respiratory depression and arrhythmias
        - Monitor for signs of toxicity every 4 hours (HR, BP, RR, deep tendon reflexes)
        - **Antidote**: 10ml 10% calcium gluconate over 10mins (and stop magnesium sulphate infusion)
- **Antihypertensives**
    - Options: IV/oral labetalol, oral nifedipine or IV hydralazine
- **Expedite delivery** (the only definitive treatment)
    - Mother must be stable before delivery
    - Most likely C-section (unless maternal BP well-controlled and fetus not severely compromised, then can possibly attempt vaginal birth)
    - Antenatal corticosteroids if gestation < 34 weeks

Gestational diabetes

- **Antenatal**
    - Offer a review with the joint diabetes and antenatal clinic within 1 week, clinics should be in contact with women with diabetes every 1 to 2 weeks throughout pregnancy
    - **Monitoring**
        - Teach self-monitoring of glucose
        - Encourage women to maintain blood glucose levels:
            - Pre-prandial target = <5.3 mmol/l, 1hr post-prandial target = <7.8 mmol/l
        - T2DM or gestational diabetes on a multiple daily insulin injection regimen: fasting, pre-meal, 1-hour post-meal and bedtime blood glucose

        - T2DM or gestational diabetes managing their diabetes with diet and exercise changes alone/oral therapy/single dose insulin: fasting and 1-hour post-meal blood glucose
        - Serial growth scans every 4 weeks from 28-36 weeks gestation

    - **Medical**
        - **1st line** (provided fasting blood glucose <7 mmol/L) = changes in diet and exercise
            - Change to low glycaemic index foods
            - Refer to dietician
            - Regular exercise (e.g. walking 30 mins after a meal)
        - **2nd line** (if targets are not met by diet and exercise after 1-2 weeks) = metformin
            - If metformin is contraindicated, go straight for insulin
        - **3rd line** (if diet, exercise and metformin are ineffective) = add insulin
            - Can also consider glibenclamide if insulin therapy is declined
        - If fasting glucose at diagnosis >7 mmol/L or >6 mmol/L with complications, offer insulin straight away +/- metformin

- **Intrapartum**
    - Organise elective birth for no later than **40^{+6} weeks** gestation**.**
        - If not given birth by 40+6 weeks → offer induction of labour or C-section
- **Postnatal**
    - **Discontinue** blood glucose lowering treatment immediately after delivery
    - Baby: blood glucose is assessed 2-4 hours after birth and early feeding to prevent hypoglycaemia
    - **Monitoring**
        - **Fasting blood glucose** at 6-13 weeks postnatal (or HbA1c if after 13 weeks) to exclude new diagnosis of diabetes
            - If <6.0 mmol/L = moderate risk of developing T2DM, offer annual HbA1c and diet and lifestyle advice
            - If 6.0-6.9 mmol/L = high risk of developing T2DM, offer annual HbA1c and diet and lifestyle advice
            - If >7.0 mmol/L = likely to have T2DM at present, offer diagnostic test to confirm
    - **Future pregnancies**
        - Offer early OGTT in subsequent pregnancies (as soon as possible after booking, and again at 24-28 weeks gestation if the results of the first screening are normal)

PACES TIPS

- **Risk Factors**: age, FH of PMH, obesity, multiple pregnancy, Asian background
- Explain the diagnosis (diabetes that occurs in pregnancy because the body isn't able to produce enough insulin to meet the demands of carrying a baby)
- Estimated prevalence: 2-3%
- Explain the risks (MATERNAL: hypertensive disease, traumatic delivery, stillbirth; FOETAL: macrosomia, neonatal hypoglycaemia, congenital abnormalities)
- Reassure patients that with good glycaemic control/treatment adherence, this minimises risks to mother and baby
- Treatment options (diet/exercise, metformin, insulin) and the importance of good glycaemic control
- Explain how to monitor blood glucose (using glucometer)
- Need to be seen at a joint diabetes and antenatal clinic within 1 week (and every 2 weeks thereafter)
- Need to have ultrasound growth scans every 4 weeks from 28-36 weeks

- Explain that medication will be stopped after delivery but that they will be followed up to check if glucose problem continues

Anaemia

- **Antenatal**
  - 100-200mg oral iron (ferrous sulphate) for IDA (defined by Hb <110g/l in 1st TM, <105g/l in 2nd/3rd TM , <100g/l postpartum)
    - Re-check Hb in 2-3 weeks
    - Once Hb in normal range, continue oral iron for 3 months and until 6 weeks postpartum (to replenish iron stores)
  - Increased animal food in diet and advice
    - Iron – green leafy vegetables, nuts, beans, seeds
    - B12 – meat and dairy
    - Folate – green leafy vegetables, nuts, yeast, liver
- **Intrapartum**
  - Advise to deliver in labour ward
  - IV access and group and screen on admission
  - Active management of 3rd stage
  - Active management of PPH
  - Consider prophylactic syntocinon infusion

Obstetric Cholestasis

- **Antenatal**
  - **Monitoring**
    - **LFTs and bile acid levels**: weekly until delivery
    - No specific foetal monitoring can be recommended as no current methods have been shown to be effective in predicting foetal death
  - **Conservative**
    - Wear cool, loose, cotton clothing
    - Soak in a cool bath
    - Apply ice packs for short periods to affected areas
    - Topical emollients, e.g. Menthol 0.5% with aqueous cream
  - **Medical**
    - Antihistamines (eg. chlorphenamine) – improves sleep (sedative), but no impact on pruritus
    - Ursodeoxycholic acid – improves pruritus and LFTs but no protection against still birth
    - Vitamin K
- **Intrapartum**
  - Offer induction of labour at 37 weeks (and aim to deliver no later than 40 weeks)
  - Advise to deliver in labour ward, with continuous CTG monitoring
- **Postnatal**
  - Measure LFTs 6 weeks postnatal (to ensure resolution)

PACES TIPS

- **Risk Factors**: personal or family history of OC, history of liver disease, multiple pregnancy
- Explain diagnosis and risks (stillbirth and premature birth)
- Explain need for early delivery (37 weeks)
- Explain regular monitoring with weekly LFTs
- Advise paying close attention to foetal movements
- Symptomatic treatment with ursodeoxycholic acid and emollients (and maybe vitamin K)
- Remember to provide conservative treatment advice too (e.g. loose cotton clothing etc)
- High recurrence rate (up to 90%)

- Note: Women with persistent pruritus and normal biochemistry should have LFTs and bile acid levels repeated every 1–2 weeks (until the pruritus resolves)

Acute fatty liver of pregnancy

- **Supportive care**
  - Admit to ITU (if high risk of multiorgan failure and death) + early liaison with liver team
  - Continuous maternal and foetal monitoring
  - Correct coagulopathy, electrolytes and hypoglycaemia [treat using FFP and vitamin K, 50% dextrose]
- **Expedite delivery** (as soon as maternal condition is stable, or as soon as possible if maternal condition deteriorating)
  - Screen baby for LCHAD deficiency

Foetal growth restriction (IUGR)

- NOTE: IUGR = describes a fetus with reduced growth rate → baby becomes SGA
  - ~All IUGR foetuses are SGA, but not all SGA babies are IUGR
- **Antenatal**
  - **Monitoring**
    - Serial growth scans every 2 weeks
    - Doppler ultrasound scans 2x/week (look at umbilical artery blood flow)
    - Advise mothers to monitor foetal movements
- **Delivery**
  - Indications for immediate delivery:
    - Abnormal CTG (and reduced foetal movements)
    - Abnormal Doppler waveform (reversal of end-diastolic flow)
  - Delivery by 37 weeks is usually necessary
  - Decision is consultant-led and dependent on severity and gestation (steroids should be given <36 weeks, magnesium sulfate in preterm if delivery <30 weeks)

Placenta praevia

- **Definitions:** (apply after 16 weeks)
  - Placenta praevia = placenta lies directly over the internal os
  - Low-lying placenta = placental edge lies <2 cm from the internal os

- **Asymptomatic low-lying placenta or placenta praevia** (identified at 20 week scan)**:**
  - Advise to avoid sex
  - Rescan at 32 weeks gestation (only 10% go on to have a low-lying placenta later in pregnancy)
    - If still low-lying/praevia at 32 weeks → rescan at 36 weeks
    - If still low-lying/praevia at 36 weeks → recommend elective C-section at 36-37 weeks gestation (i.e. before allowing for spontaneous labour to occur)

- **Symptomatic placenta praevia** (with painless bleeding):
  - **ABCDE approach**
    - Gain IV access
    - Bloods (FBC, Rhesus status, cross-match, clotting screen)
    - Continuous foetal monitoring
  - Give **anti-D immunoglobulin** in Rh-negative women
  - Decide on delivery:
    - If mother is haemodynamically unstable or there is evidence of foetal distress →
      - Expedite delivery (irrespective of gestation)
    - If mother is haemodynamically stable, with no evidence of foetal distress →
      - Give steroids and admit until bleeding has stopped (and for a further 48 hours for observation)
      - Re-scan at 36 weeks
        - If still low-lying/praevia → recommend elective C-section at 34-36 weeks gestation and a history of vaginal bleeding or other factors at risk of preterm delivery

PACES TIPS

- **Risk Factors**: previous placenta praevia, multiple pregnancy, previous C-section, smoking and drug use, advanced maternal age
- **Presenting with Asymptomatic Low-Lying / Placenta Praevia**
  - Explain the importance of the finding (increases risk of bleeding)
  - Explain that 90% of placentas will move away from the os
  - Rescan at 32 weeks and then go from there (if present on 36 week scan → recommend C-section)
  - Advise to avoid having sex
- **Presenting with Symptomatic Placenta Praevia** (with bleeding)
  - Admit until bleeding has stopped and for a further 48 hours
  - Explain the importance of the finding and that the foetus needs to be monitored
  - Explain that prompt delivery needs to be discussed (based on gestation)
  - Explain the risks of delivery:
    - Major blood loss
    - May require a blood transfusion
    - May require a hysterectomy

Placental abruption

- **ABCDE approach**
  - Gain 2x IV access
  - Bloods (FBC, Rhesus status, cross-match and clotting screen)
  - Continuous foetal monitoring
  - Kleihauer test and anti-D if needed
  - Fluid, antifibrinolytics, blood, or blood-product replacement, as indicated
- Give **anti-D immunoglobulin** in Rh-negative women
- **Decide on delivery**:
  - If mother is haemodynamically unstable or there is evidence of foetal distress →
    - Expedite delivery (irrespective of gestation)
  - If mother is haemodynamically stable, and there is no evidence of foetal distress →
    - If >37 weeks gestation → induction of labour
    - If <37 weeks gestation → give steroids and admit to antenatal ward for close monitoring
      - If bleeding settles, consider discharging home with weekly serial growth scans until term

Amniotic fluid embolism

- ABCDE approach
  - Supportive management (largely in ITU)
    - Fluid resus
    - Inotropes
    - Correct coagulopathy (FFP, platelets, cryoprecipitate, transfuse etc)
    - Uterine atony → PPH management
  - No specific treatment available
- If delivery hasn't yet occurred:
  - Aim to stabilise the mother's condition first
  - In a situation of peri-arrest → category 1 CS (with the aim to both save the foetus' life and improve the effect of resuscitation on the mother)
- Poor prognosis = **10% survival** overall (with 30% dying in the 1st hour)

Multiple pregnancy – considerations

- **Determining gestational age, chorionicity and amnionicity**
  - Determine on the 1st trimester dating scan (10 – 13^{+6} weeks gestation)
  - **Gestational age**
    - Use largest baby to estimate gestation age (to avoid the risk of estimating it from a baby with early growth pathology)
  - **Chorionicity** (number of placentae) **and Amnionicity** (number of amnions)
    - Determine by using: number of placental masses, lambda (dichorionic) or T-sign (monochorionic) and membrane thickness, discordant foetal sex
    - Assign nomenclature to each baby (e.g. left and right, upper and lower) and document this clearly in the woman's notes to ensure consistency throughout pregnancy
- **Antenatal care**
  - **Obstetric-led** antenatal care
  - Increase screening for anaemia
    - Perform **FBC** at **20 weeks** (as well as at booking and 28 weeks as in routine antenatal care)
    - To identify women who need extra supplementation of iron or folic acid (due to increased risk of anaemia in multiple pregnancy)
  - Arrange **serial growth and Doppler US scans** (monitoring for IUGR and TTTS)
    - 2-4 weekly depending on chorionicity and amnionicity
  - Consider need for **referral** to **tertiary level foetal medicine centre**
    - Indications:
      - Pregnancy with shared amnion
      - Discordant foetal growth (>25% difference)
      - Foetal anomaly (structural or chromosomal)
      - Discordant foetal death
      - Twin-to-Twin Transfusion Syndrome (TTTS)
      - Twin Anaemia Polycythaemia Sequence (TAPS)
      - Twin reverse arterial perfusion sequence (TRAP)
      - Conjoined twins or triplets
- Support group for multiple pregnancy: Twins and Multiple Birth Association (TAMBA)

Type of multiple pregnancy	N° of antenatal appointments	Schedule of serial growth and Doppler US scan	
Dichorionic-diamniotic twin	At least 8	Every 4 weeks	From 20 weeks gestation

Monochorionic-diamniotic twin	At least 11	Every 2 weeks	From 16 weeks gestation
Trichorionic-triamniotic triplet	At least 9	Every 2 weeks	From 20 weeks gestation
Monochorionic-triamniotic or dichorionic-triamniotic triplet	At least 11	Every 2 weeks	From 16 weeks gestation
Pregnancy with shared amnion (monochorionic-monoamniotic twin, monochorionic-diamniotic triplet, monochorionic-monoamniotic triplet)	Individual assessment by specialist centre		

- **Delivery**
  - **Mode of delivery:**
    - For dichorionic-diamniotic and monochorionic-diamniotic twin pregnancies, **vaginal delivery** is possible provided the first twin is in a cephalic presentation
      - Advise to deliver in labour ward, with continuous CTG monitoring
      - If 'suspicious' or 'pathological' CTG, and vaginal birth cannot be achieved within 20 minutes, discuss caesarean section
      - Inform of small 4% risk of second twin requiring C-section
    - For monochorionic-monoamniotic twin pregnancies and triplet pregnancies, recommend delivery by elective **C-section**

  - **Timing of delivery**:
    - Recommend an **elective birth** at the gestations shown below depending on chorionicity and amnionicity

Type of multiple pregnancy	Timing of elective delivery
Dichorionic-diamniotic twin	37 weeks
Monochorionic-diamniotic twin	36 weeks (after a course of steroids)
Monochorionic-monoamniotic twin	32 weeks (after a course of steroids)
Trichorionic-triamniotic or dichorionic-triamniotic triplet	35 weeks (after a course of steroids)
Monochorionic-triamniotic or triplet with shared amnion	Individual assessment by specialist centre

    - Explain that continuing an uncomplicated pregnancy beyond these points is associated with an **increased risk of foetal death**
      - If elective birth is declined, offer weekly appointments with specialist obstetrician (including weekly Doppler US and fortnightly growth scans)
    - Inform of the **risk** of **preterm birth**
      - 60% of twin pregnancies result in spontaneous birth before 37 weeks
      - 75% of triplet pregnancies result in spontaneous birth before 35 weeks

Depression (baby blues, postnatal depression and puerperal psychosis) – see Psych section

Cardiotocography

CTG monitors uterine activity and foetal heart rate. It is most commonly used during high-risk labour but may be used at other times if foetal compromise is suspected. It is important to have

a systematic approach when interpreting CTGs, and this could come up in PACES. On labour ward ask to practice interpreting CTGs in front of one of the doctors and get feedback.

Mnemonic: DR C BRAVADO

DR – Define Risk i.e. the indications for doing the CTG. These might include:

Maternal	Foetal	Intrapartum
Previous caesarean section	IUGR	Epidural anaesthesia
Pre-eclampsia	Oligohydramnios	Oxytocin
Antepartum haemorrhage	Preterm	Maternal pyrexia
Post-term pregnancy (>42 weeks)	Multiple pregnancy	
Prolonged rupture of membranes (>24 hr)	Breech	
Significant maternal disease (e.g. diabetes)	Meconium-stained liquor	

C – Contractions – look for frequency and regularity of electrical activity (in labour aim for 4 contractions every 10 minutes; 4:10)

- Beware: height of the wave does not correlate with the strength of the contraction (this can only be determined by palpation)

BRA – Baseline Rate – calculated as the average heart rate over a period of 5-10mins (normal = 100 – 160 bpm)

- *Tachycardia* = maternal pyrexia, foetal infection, prematurity, foetal hypoxia, exogenous β-agonists (e.g. salbutamol)
- *Bradycardia* = hypotension, maternal sedation, postmaturity, hypoxia, foetal distress due to placental abruption or uterine rupture

V – Variability – calculated as the heart rate variability over a period of 5-10mins, excluding decelerations and accelerations (normal = >5 bpm)

- *Reduced variability* = foetal sleep cycle (usually lasts <45 minutes preceded and followed by normal CTG trace), early gestation, drugs (e.g. opiates, BDZ), foetal hypoxia, foetal infection

A – Accelerations – defined as a rise from baseline heart rate of at least 15bpm lasting at least 15 seconds (normal = >2 accelerations on a 20-30mins CTG trace)

- *Absent accelerations* = foetal hypoxia

D – Decelerations – defined as a fall from baseline heart rate of at least 15bpm lasting at least 15 seconds (normal = no decelerations)

- *Decelerations present* = foetal hypoxia, umbilical cord compression
- 3 types of decelerations:
    - *Early* – when deceleration occurs during a uterine contraction
        - Usually benign (uniform in depth, length and shape), due to a normal response to head compression during labour
    - *Variable* – where the time and shape of decelerations varies in relation to uterine contraction
        - Classically reflect cord compression
    - *Late* – when decelerations occur during contractions and persist after the end of the contraction
        - Always abnormal, suggestive of foetal hypoxia.

O – Overall – each feature can be described as ‘reassuring’, ‘non-reassuring’ or ‘abnormal’ and used to define the CTG overall as: normal, suspicious or abnormal

Description	Feature		
	Baseline rate (bpm)	Variability (bpm)	Decelerations
Reassuring	110-160	5-25	None or only early decelerations Variable decelerations with no concerning features occurring for <90mins
Non-reassuring	100-109 161-180	<5 for 30-50mins >25 for 15-25mins	Variable decelerations with no concerning features occurring for >90mins Variable decelerations with any concerning features occurring in <50% of contractions for >30mins Variable decelerations with any concerning features occurring in >50% of contractions for <30mins Late decelerations occurring for <30mins
Abnormal	<100 >180	<5 for >50mins >25 for >25mins Sinusoidal	Variable decelerations with any concerning features occurring in >50% of contractions for >30mins Late decelerations occurring for >30mins Acute bradycardia Single prolonged deceleration lasting >3mins

Taken from NICE guideline CG190 (February 2017)

Defining the CTG overall:

- If all features are reassuring = **normal CTG**
- If 1 feature is non-reassuring = **suspicious CTG**
- If 2 or more features are non-reassuring OR any 1 abnormal feature = **pathological CTG**

Management based on interpretation of CTG trace:

- If **normal** CTG →
  - Continue usual care
- If **suspicious** CTG →
  - Involve senior midwife or obstetrician
  - **Conservative management** (mobilise patient / adopt left lateral position, observe maternal observations, offer fluids (PO/IV), hold oxytocin)
- If **pathological** CTG →
  - Involve senior midwife and obstetrician
  - Conservative management (as above)
  - Offer **foetal blood sampling** (FBS)
    - If pH ≥7.25 (normal) and CTG trace remains pathological → repeat FBS in 1h
    - If pH 7.21-7.24 (borderline) → repeat FBS in 30 mins
    - If pH ≤7.20 (abnormal) → expedite delivery
- If **acute bradycardia** or **single prolonged deceleration for >3mins** → start conservative measures, and if bradycardia persists beyond 9mins → **expedite delivery**

Gynaecology Management Guide

Early Pregnancy and Implantation

Ectopic pregnancy
Gestational trophoblastic disease (incl. choriocarcinoma)
Hyperemesis gravidarum
Miscarriage
Pregnancy of unknown location
Termination of pregnancy

Subfertility, reproductive health and menopause

Contraception
Menopause
Polycystic ovarian syndrome
Subfertility

Genitourinary medicine

Bacterial vaginosis
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Benign gynaecological conditions

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Pruritus vulvae

Urogynaecology

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Urogenital prolapse
Urodynamic stress incontinence

Gynaeoncological Cancers

Cervical Cancer and intraepithelial neoplasia
Endometrial cancer (and endometrial hyperplasia)
Ovarian tumour (benign and malignant)
Vulval cancer

Early Pregnancy and Implantation

Miscarriage

- **Remember -** In miscarriages to also do an ABCDE assessment
- **Threatened Miscarriage**
  - Return for further assessment if the bleeding gets worse or persists beyond 14 days
  - Continue routine antenatal care if the bleeding stops
- **Expectant Management for confirmed miscarriage**
  - Use expectant management for **7-14 days** as **1st line** in women with confirmed miscarriage **unless**:
    - Increased risk of haemorrhage (e.g. late first trimester)
    - Previous adverse/traumatic event associated with pregnancy
    - Increased risk from effects of haemorrhage (e.g. unable to have blood transfusion)
    - Evidence of infection
  - If bleeding and pain resolves within **7-14 days** of starting expectant management, advise taking a **pregnancy test after 3 weeks** and returning to see the doctor if it is positive
  - Offer advice on analgesia and warn them to expect heavier bleeding with clots
  - Offer repeat scan if, after the period of expectant management, the bleeding and pain:
    - Has not started (suggests miscarriage has not begun)
    - Persisting and/or increasing (suggesting incomplete miscarriage)
- **Medical Management** (10% failure rate)
  - Offer medical management if expectant management is not acceptable or according to patients' wishes
  - Offer **vaginal misoprostol** (or oral preparation)
    - If the bleeding has NOT started **within 24 hours** of treatment, contact a healthcare professional [if no bleeding within 48 hours, may need to repeat or move onto surgical management]
    - Offer pain relief and anti-emetics to all patients undergoing medical management of miscarriage
    - Warn them to expect to bleed in next 4 – 48 hours
  - Inform patient about what to expect: vaginal bleeding, pain, diarrhoea and vomiting
  - Advise taking pregnancy test **3 weeks** after medical management
- **Surgical Management**
  - **Manual vacuum aspiration** under local anaesthetic **or** surgical management in theatre under GA
    - Vaginal or sublingual **misoprostol** if often used to ripen the cervix to facilitate cervical dilatation for suction insertion
  - Offer anti-D prophylaxis to all Rhesus-negative women undergoing surgical management of miscarriage

PACES TIPS

- **Risk Factors**: advanced maternal age, previous miscarriages, chronic conditions (e.g. uncontrolled diabetes), uterine or cervical anomalies, smoking, alcohol and illicit drug use, underweight or overweight
- **Breaking bad news**
  - Explain the diagnosis
  - Reassure that this is common and under-reported (1 in 5 pregnancies)
    - Explain that risk increases with age
    - Having a single miscarriage does not affect future pregnancies
    - If asked about cause: explain that most of the time there is no cause
  - Explain the management options (expectant, medical and surgical)
    - If medical: explain what to expect (pain, bleeding, nausea)

        - Antiemetics and pain relief will be given
    - Advise to do a pregnancy test after 3 weeks
- **Safety net**: return if symptoms get worse, bleeding persists after 7-14 days
- **Psychological/Counselling support**: both patient and partner can go to GP for advice and support, but also charities such as The Miscarriage Association

Ectopic Pregnancy

ABCDE approach

Expectant
 	
Suitable for patients who are haemodynamically stable and asymptomatic
	• The patient should have **serial hCG measurements** until the levels are undetectable [repeat on days 2, 4 and 7 after original test]
	  ○ If hCG levels do not fall by 15%, stay the same or rise from the previous value, review the woman's clinical condition and seek senior advice to help decide further management
	• This can only be done if:
	  ○ Size < 35 mm
	  ○ Asymptomatic
	  ○ No foetal heartbeat
	  ○ Serum hCG < 1000 IU/L (may consider 1000-1500)
	  ○ Able to return for follow up
	  ○ Compatible if there is another intrauterine pregnancy

Medical
 	
IM methotrexate as 1st line if able to attend F/U and provided that all of the following criteria are fulfilled:
	• No significant pain
	• Unruptured ectopic pregnancy with adnexal mass < 35 mm with no visible heartbeat
	• Serum β-hCG < 1500 iU/L
	• No intrauterine pregnancy (confirmed by USS)
	• Able to return for follow up
	• **F/U with serial hCG**
	  ○ Day 4 & 7 then once/week until -ve
	  ○ Avoid sexual intercourse during treatment
	  ○ Avoid conceiving for 3/12 after methotrexate
	  ○ Avoid alcohol and prolonged exposure to sunlight

Surgical
 	
Offer surgery as 1st line if unable to return for F/U or any of the following:
	• Significant pain
	• Adnexal mass > 35 mm
	• Ectopic pregnancy with a foetal heartbeat visible on ultrasound scan
	• Serum β-HCG > 5000 iU/L
	• **Operation** = Laparoscopic where possible
	  ○ Offer **salpingectomy** unless there are other risk factors for infertility
	  ○ Consider **salpingotomy** if there are risk factors for infertility or contralateral tubal damage
	  ○ **WARNING**: 1 in 5 women who have salpingotomy need further treatment (methotrexate and/or salpingectomy)
	  ○ **Do not offer copper IUD if laparoscopic salpingectomy**
	  ○ **F/U for Salpingotomy**: 1 serum hCG at 1 weeks, then 1 serum hCG per week until negative result is obtained

	○ **F/U for Salpingectomy**: urine pregnancy test at 3/52 • Anti-D prophylaxis ○ Offer anti-D prophylaxis (250 iU) to all RhD-negative women who have surgical management ○ Do NOT do Kleihauer test
NOTE: Offer the choice of **either methotrexate or surgical rx** to women with an ectopic pregnancy who have a serum hcG level of 1500 - 5000 IU/litre, who are able to return for F/U and who meet all of the following criteria: • no significant pain • an unruptured ectopic pregnancy with an adnexal mass smaller than 35 mm with no visible heartbeat • no intrauterine pregnancy (as confirmed on an ultrasound scan).	
PACES TIPS • Remember to explain that an ectopic pregnancy cannot be saved, won't develop into a baby, can put mother's health at risk and must be removed • **Risk Factors**: PID, smoking, IUD/IUS, assisted reproductive technology, tubal surgery ○ Explain the diagnosis (implantation of a pregnancy outside the womb, meaning that it is not viable) ○ Explain the risks of an ectopic (damage to surrounding structures, bleeding and rupture) ○ Explain that the treatment options available are based on ultrasound findings and the level of a pregnancy hormone in the blood (and explain which options are available) • **Medical Management** ○ Explain administration (1 x IM injection) ○ Manage expectations (tummy pain, nausea, diarrhoea – should pass within a few days) ○ Explain that they can go home after the injection but will need to come back a couple of times over the next week for a blood test ○ Avoid sex during treatment, don't conceive for 6 months and avoid drinking alcohol and excessive exposure to sunlight ○ Explain that there is a risk of treatment failure, requiring further intervention • **Surgical Management** ○ Explain that salpingectomy is the best procedure (but salpingotomy can be considered if fertility issues or problems with contralateral tube) ○ Explain that salpingotomy has a 1 in 5 risk of requiring further intervention ○ Reassure that fertility isn't drastically reduced by salpingectomy vs salpingotomy (salpingotomy still leaves behind a damaged tube) ○ Explain follow-up • Discuss ongoing contraception • **Psychological/Counselling support**: both patient and partner can go to GP for advice and support, but also charities such as The Ectopic Pregnancy Trust	

Gestational Trophoblastic Disease

1st line: Suction curettage for complete and partial* molar pregnancies molar pregnancies	• **Anti-D prophylaxis** after evacuation of a molar pregnancy • **Perform urine pregnancy test** 3/52 after medical rx of failed pregnancy (if products of conception are not sent for histological examination)
	• Histological assessment of material obtained from medical or surgical rx of **all failed pregnancies** is recommended to exclude trophoblastic disease

*except when the size of the foetal parts deters the use of suction curettage and then medical evacuation can be used	○ There is no need to routinely send products of conception for histological assessment after TOP (provided foetal parts have been identified on prior US) • Patient should be referred to a trophoblastic screening centre for F/U, depending on hCG level at 56 days of pregnancy event ○ Reverted to normal: F/U 6/12 from the date of uterine evacuation ○ Not reverted to normal: F/U 6/12 from normalisation of hCG ○ Note: follow up for parital molar pregnancy is concluded once hCG has returned to normal on 2 samples at least 4 weeks apart
Urgent referral to specialist centre (if evacuation of uterus is performed)	• Future pregnancies ○ Do not conceive until F/U complete ○ Recommend barrier contraception until hCG normalises ○ COCP can be used once hCG normalised ○ Avoid IUDs until hCG normalised (risk of uterine perforation) If receiving chemotherapy, **do not** conceive for 1 year after completion of treatment → effective contraception is recommended

PACES TIPS

- **Risk Factors**: advanced maternal age (or younger than 20), prior molar pregnancy (1-2% risk of recurrence), prior miscarriages, Asian heritage
- **Breaking bad news**
  - Explain the diagnosis (when the foetus doesn't form properly, and a baby doesn't develop, instead there is an irregular mass of pregnancy tissue)
  - Explain risks (important to treat because it can invade and damage other tissues)
  - Explain immediate management (suction curettage)
  - Explain follow-up (referral to trophoblastic screening centre to monitor pregnancy hormone levels)
  - Molar pregnancy **does not** affect fertility (but there is a 1 in 80 chance of recurrence)
  - **Do not** try to get pregnant until after follow-up is complete

Subfertility, reproductive health and menopause

Emergency Contraception

Copper Coil Ideally within 120hrs of UPSI (99% effective)	• Most effective method of emergency contraception, only method effective after ovulation • **Mechanism:** Spermicide and prevents implantation • STI screening if at high risk of STI • May be left in for long-term contraception • Not known to be affected by BMI/weight or by other drugs
Levonorgestrel (Levonelle) Must be within 72hrs of UPSI (95% effective 0-24hrs, 84% effective 48-72hrs)	• **Mechanism**: Inhibits ovulation for next 5 days – less effective in late follicular phase **(just before ovulation)** • Safe and well tolerated (may cause slight menstrual cycle disturbance) • Can be used more than once in a menstrual cycle if needed • **Warning**: If vomiting occurs within 2 hours of dose, should be repeated
Ulipristal (EllaOne)	• **Mechanism**: Progesterone receptor modulator – inhibits ovulation • Should NOT be used with levonorgestrel

Must be within 120hrs of UPSI (95% effective)	• If patient normally uses hormonal contraception, they should restart it 5 days after ulipristal (and use barrier contraception in the meantime) • Caution if severe asthma • Insufficient evidence to use more than once in a cycle • **Warning**: If vomiting occurs within 3 hours of dose, should be repeated

- **Important**: for women with a bodyweight **> 70 kg** or a **BMI > 26**
  - **EllaOne** is the recommended method (continue oral contraception after 5 days)
  - **Levonelle**: if Levonelle is taken, give a double dose (3 mg) and the woman should start ongoing contraception immediately
- **ADVICE**: offer an STI screen and recommend taking a pregnancy test if her next period is late
- **Side-Effects of Emergency Contraception (not IUD)**: nausea and vomiting, headache, breast tenderness, abnormal menstrual bleeding

Contraception

- Key Aspects of History
  - Risk factors: Smoking, previous personal history of VTE, migraine, breast cancer, stroke and hypertension, liver disease; family history of DVT/VTE in 1st degree relative
  - Menstrual problems (e.g., heavy periods)
- **Explain that the contraception can be divided into:**
  - **Long-acting** (things you insert and leave for a long time)
    - IUS/IUD
    - Injection
    - Implant
  - **Short-acting** (things you have to remember to take)
    - Pills (POP vs COCP)
    - Patches
    - Rings

Long-acting Reversible Contraception

Copper Coil **5 or 10-year options**	• **Mechanism**: causes sterile inflammation meaning that implantation is not possible, spermicide • Works immediately and can be inserted at any point in the menstrual cycle provided the patient is not pregnant • **Side-Effects**: heavy, painful periods; risk of expulsion, infection, perforation, ectopic
Mirena (LNG-IUS) Hormone: **Levonorgestrel** Inserted into the uterus and stays for 3-5 years	• **Mechanism**: thins the lining of the womb and prevents implantation • Tend to experience lighter, less painful menses (however, bleeding may initially be heavier) • Additional contraception needed for 7 days after insertion unless inserted in the first 7 days of a cycle • **Side-Effects**: acne, breast tenderness, mood disturbance, headaches • **Risk:** infection , ectopic, perforation, expulsion ○ **Jaydess**: smaller form of the LNG-IUS that is effective for contraception but not for heavy periods. Lasts 3 years. Smaller so it is easier to put in (especially if nulliparous).
Implant (Nexplanon)	• **Mechanism**: prevents ovulation • Inserted subdermally into the non-dominant arm (small rod containing progesterone)

Hormone: **etonogestrel** Works for **3 years**	• Fertility restored immediately after removal • **Progestogenic side-effects** (irregular bleeding, mood changes, breast tenderness, nausea) • Additional contraception needed for 7 days if not inserted on day 1-5 of the menstrual cycle • Antiepileptic drugs and rifampicin can reduce its efficacy

Short-acting contraception

Combined oral contraceptives (COCP)

- **Hormone**: ethinyl oestradiol + progesterone
- **Mechanism**: prevents ovulation
- **How to Take**: 1 tablet per day for 3 weeks followed by 1 week off (withdrawal bleed). Can tricycle (take back-to-back without pill-free break) to reduce the frequency of withdrawal bleed.
    - Women may like to have periods as they are used to it and having a controlled period for a breakthrough bleed does reduce the likelihood of having an unexpected breakthrough bleed
    - If started on first 5 days of cycle (provided 28-day cycle), it confers immediate protection (**caution** in women with shorter cycles)
- **Benefits**
    - Very effective if taken properly (>99%)
    - Reversible upon stopping
    - Usually makes periods regular, lighter and less painful
    - Reduced risk of ovarian, endometrial and bowel cancer
- **Disadvantages**
    - Forgetting to take it
    - No protection against STIs
    - Increased risk of VTE, breast cancer, cervical cancer, stroke, IHD
- **Side-Effects**: headache, nausea, breast tenderness
    - **Vomiting**: if vomiting within 2 hours of taking the pill, take another
- **Surgery**: stop at least 4 weeks before surgery
- **Antibiotics**: take care, extra precautions may need to be taken, discuss with GPs whenever receiving antibiotics
- **Missed Pill** – take missed pill ASAP even if this means taking 2 in 1 day
    - **Late restarting after pill-free week**: Consider emergency contraception if UPSI during pill-free period, and alternate contraception until 7 continuous days of COCP
    - **1 missed pill** (48-72hrs since last pill taken)
        - Emergency contraception not required, take missed pill as soon as possible, no additional precautions needed
    - **2/> missed pills** (>72hrs since last pill taken)
        - **In week 1 after pill-free week**: Consider emergency contraception if UPSI during pill-free period, and alternate contraception until 7 continuous days of COCP

Absolute contraindications:

- < 6 weeks postpartum and breastfeeding
- Smoker over the age of 35 (>15 cigarettes a day)
- Hypertension (sys> 160 or dias> 100mmHg)
- Coagulopathies: Current/history of VTE, major surgery with prolonged immobilization, Known thrombogenic mutations (e.g., Factor V Leiden, protein C or protein S deficiencies)
- Diabetes with retinopathy/nephropathy/neuropathy
- Cardiovascular: Ischemic heart disease, AF, impaired cardiac fn, complicated valvular heart disease (pulmonary HTN, history of subacute bacterial endocarditis), vascular disease
- Neuro: History of cerebrovascular accident, migraine with aura
- Hepatic: Liver tumour (adenoma or HCC), severe (decompensated) cirrhosis
- Current breast cancer
- SLE with positive antiphospholipid antibodies

        - **In week 2/3 after pill-free week**: Emergency contraception not required, take missed pill as soon as possible
    - **>7 missed pills**: Manage as new start contraception, consider emergency contraception

Progesterone only pill (POP)
- **Hormone**: desogestrel (cerazette), levonorgestrel or norethistrone
- **Mechanism**: thickens cervical mucus
    - **NOTE**: desogestrel stops ovulation
- Tends to only be used in women who cannot have the COCP
- **How to Take**: 1 pill at the same time every day with NO pill-free week
    - If starting within the first 5 days of your cycle, provides immediate protection
    - If starting at any other time, use additional measures for the first 2 days
    - If switching over from the COCP, it provides immediate protection
- **Benefits**
    - Doesn't have the risks of oestrogen pills
- **Disadvantages**
    - Must be taken at the same time every day
    - Irregular bleeding
    - Ovarian cysts
- **Missed Pill**
    - **Traditional POP** – take missed pill ASAP even if this means taking 2 in 1 day
        - < 3 hours late: continue as normal
        - 3+ hours late: continue with rest of pack, extra precautions (condoms) until 48 hours of continuous POP
            - If missed 2/> pills: Consider emergency contraception if UPSI during pill-free period, and alternate contraception until continuous 48 hours of POP
    - **Cerazette POP** – Same rules but 12-hour window to take pill if late
- **Side-Effects**: irregular vaginal bleeding, acne, breast tenderness, mood changes, headache

Combined Hormonal Transdermal Patch
- **Hormone**: norelgestromin + ethinyl oestradiol
- Applied for 3 weeks (replace the patch at the end of each week) and take 1 week off (withdrawal bleed)
- **Missed Patches**
    - Delayed change **< 48 hours**: change immediately with no further precautions
    - Delayed change **> 48 hours** in **week 1 or 2**: change immediately and use barrier contraception for 7 days (if UPSI within previous 5 days or during extended patch-free period, consider emergency contraception)
    - Delayed removal **> 48 hours** in **week 3**: remove immediately and apply next patch on the usual start date of the next cycle (no additional contraception is needed)
    - Delayed at the **end of the patch-free week**: use barrier contraception for 7 days
- Tricycling is possible
- No increased risk of clots
- Patch adherence and skin sensitivity can be a problem

Combined Hormonal Ring
- Flexible ring is inserted into the vagina
- Worn vaginally for 21 days followed by a 7-day hormone-free period

Polycystic Ovarian Syndrome (PCOS)
- Diagnosis using **Rotterdam Criteria for PCOS** (at least 2 of the following)

- Oligo/anovulation (> 2 years)
- Clinical or biochemical features of hyperandrogenism
- Polycystic ovaries on ultrasound (≥ 12 in one/both ovaries measuring 2-9 mm)

Before/not planning pregnancy - Management of Menstrual Issues

- **Lifestyle advice** – 1st line treatment
  - Dietary modification and exercise if at increased risk of developing T2DM and cardiovascular disease – increased screening programme
  - Weight reduction
- **COCP or Cyclical oral progesterone –** if amenorrhoea/dysfunctional uterine bleeding
  - This increases sex hormone-binding globulin which helps relieve androgenic symptoms
  - If too many RFs for COCP: Can have 3 monthly progesterone to induce withdrawal bleed (should take place **at least every 3-4 months**) & protect endometrium
- **Treatment of hirsutism/androgenic symptoms:**
  - Topical eflornithine cream
  - **Co-cyprindol (dianette)**: cyproterone acetate + ethinyloestradiol, used in PCOS complicated by hirsutism and acne (also acts as contraception)
  - Cyproterone acetate (antiandrogen)
  - Metformin
  - GnRH analogues (reserved for women who are intolerant of other therapies)
  - Surgical treatment (laser or electrolysis)

If planning pregnancy - Management of subfertility

- **Encourage weight loss** (if overweight)
- **Clomiphene -** 1st line in women with a normal BMI (selective oestrogen receptor modulator)
  - Can induce ovulation if subfertility is an issue; used for up to 6 months
  - Increased risk of multiple pregnancy
  - Given with/without **metformin** (usually added after 3 failed cycles with clomiphene)
- **Laparoscopic ovarian drilling**
  - Procedure that destroys the ovarian stroma and may prompt ovulatory cycles

PACES TIPS

- **Risk Factors**: family history, obesity
- Explain the diagnosis (a disease with no clear cause that leads to abnormalities in hormone levels (which, in turn, result in the symptoms experienced))
- Explain that it is very common (1 in 10 in the UK (many are unaware))
- Explain the main consequences (irregular periods, subfertility, metabolic syndrome (sugar dysregulation, easier to gain weight), cardiovascular disease, acne)
- Explain the management tailored to patient's biggest concern:
  - **Fertility**: recommend weight loss → clomiphene +/- metformin → consider LOD
  - **Periods**: COCP or progestogens (aiming for at least 3-4 bleeds per year)
  - **Metabolic Syndrome**: check for DM, high cholesterol, heart disease (manage accordingly)

Termination of Pregnancy

Medical Management

- **Mifepristone** (oral) followed 24-48 hours later by **misoprostol** (vaginal, buccal, or sublingual)
- Suitable at any gestation
- Onset of contractions to expel foetus can be painful, simple analgesia recommended
- **0-9 weeks**
  - Can be **administered at home** provided the patient is easy to follow-up and can seek medical attention if necessary
  - Bleeding usually starts within 4 hours of misoprostol and continues for up to **2 weeks** after abortion

    - Recommend urine pregnancy test in **2-3 weeks**
- **9+ weeks** – 200mcg mifepristone & 800mcg misoprostol (vaginally)
    - Should be done in a clinical setting (because of increased bleeding and discomfort)
    - Repeated doses of (400mcg) misoprostol usually needed every 3 hours until expulsion (MAX: 5)
- **Special Consideration after 21+6 Weeks**: Feticide (intracardiac KCl injection) should be given to eliminate the possibility of aborted foetus showing any signs of life

Surgical Management

- **Vacuum Aspiration – < 14 weeks**
    - Involves gently dilating the cervix and using vacuum suction to evacuate the uterus
    - Can be performed under local or general anaesthetic
    - Cervix is usually pre-treated with misoprostol
    - Prophylactic antibiotics (metronidazole) can be given to reduce the risk of infection
- **Dilatation and Evacuation (D&E) → 14 weeks**
    - Required good cervical dilatation to remove larger foetal parts
    - **Misoprostol** (3 hours pre-surgery) is used to ripen the cervix to allow easier dilatation
    - Contents of the uterus extracted using aspiration and other instruments (e.g., forceps)
    - **Ultrasound** is required to confirm evacuation
- **Risks of Surgical Management**
    - Failure to end pregnancy
    - Haemorrhage
    - Infection
    - Perforation
- NO effect on future reproductive potential or ectopic pregnancy
- **IMPORTANT**: with all abortion patients, discuss the insertion of long-acting reversible contraception (e.g. copper IUD, LNG-IUS, Nexplanon)
- **IMPORTANT**: 2 doctors need to sign a form agreeing to termination of pregnancy (they don't both need to see the patient)

PACES TIPS

- Explain the options available based on the gestation (medical and surgical)
    - Explain that the best option is dependent on how many weeks pregnant they are (higher gestation = more pregnancy tissue)
- **Medical**: explain that one pill will be taken by mouth followed by another in 24-48 hours either buccal/sublingual/oral
    - Bleeding can last about 2 weeks
    - Pregnancy test after 3 weeks
    - Occasionally unsuccessful and requires surgical removal
- **Surgical**: explain that it involves gently dilating the cervix and removing the pregnancy tissue using a suction tube (only takes about 10 mins)
    - May need to ripen cervix before hand
    - Can be done under local or general anaesthesia

Subfertility

Investigations

Blood hormone profile	• Look at early follicular phase FSH, LH and oestradiol levels (day 2-3)
	• Anti-Mullerian hormone (AMH) is helpful for assessing ovarian reserve
	  ○ It is independent of the menstrual cycle
	  ○ Produced by granulosa cells and **does not** change in response to gonadotrophins, so it is the most successful biomarker of ovarian reserve
	• Mid-luteal progesterone should also be measured to confirm ovulation

	• If irregular menstrual cycle: TFTs, prolactin and testosterone may also be useful
STI screen	• HIV, hepatitis B and hepatitis C screening if **assisted reproductive technology (ART)** is being considered

TVUSS	• Assessment of pelvic anatomy
	• Antral follicle count (important parameter of ovarian reserve)
	  ○ < 4 = poor response
	  ○ 16+ = good response
	• Identify pathology

Tubal Assessment	• Usually assessed using **hysterosalpingography (HSG)** using X-ray or ultrasound or a **laparoscopy and dye** • Tubal patency is not the same as tubal function • Usually only performed if there are risk factors for tubal damage (e.g., PID, endometriosis, ectopic pregnancy)
Semen analysis	• Usually consists of 2 tests which are done 3 months apart

Medical Management

- **Ovulation induction - clomiphene or FSH**
  - If anovulation (PCOS, idiopathic)
- **Intrauterine insemination (with or without stimulation with FSH)**
  - Unexplained subfertility
  - Anovulation unresponsive to OI
  - Mild male factor
  - Minimal to mild endometriosis
- **Donor insemination (with or without stimulation with FSH)**
  - Presence of azoospermia
  - Single women
  - Same sex couples
- **In-vitro fertilisation**
  - Patients with tubal pathology
  - Patients who underwent above treatments with no success
- **Donor egg with IVF**
  - Women whose egg quality is poor
  - Previous surgery/chemotherapy where ovarian function was adversely affected

Surgical Management

- **Operative laparoscopy to treat disease and restore anatomy**
  - Adhesions
  - Endometriosis
  - Ovarian cyst
- **Myomectomy - hysteroscopy, laparoscopy, laparotomy, fibroid embolisation**
  - Fibroid uterus
- **Tubal surgery**
  - Blocked Fallopian tubes amenable to repair
- **Laparoscopic ovarian drilling**
  - PCOS unresponsive to medical treatment
- **Often used as an adjunct to ART (e.g., removal of hydrosalpinges is associated with a significant improvement in the success of IVF)**
- Usually a **minimum access surgery (MAS)** approach is taken

PACES TIPS

- **Risk Factors**: advanced maternal age, smoking and alcohol use, obesity, irregular periods, STI, low BMI
- Explain that 80% couples will fall pregnant if trying regularly for 12 months (& of those that don't 50% will conceive in 2nd year of trying)
- Explain that you would like to start investigations (blood test looking at hormone levels, ultrasound scan looking at structure of the uterus, and follicle count and HSG if there are risk factors)
- Encourage continuing regular unprotected sex at least every other day
- Discuss management options depending on likely cause of subfertility

Menopause

Diet and Lifestyle

- Stop smoking
- Reduce alcohol consumption
- Normal BMI
- 'Alternative' treatments are popular in the media, but they don't have a scientific basis (e.g. acupuncture, hypnosis, herbal remedies, phytoestrogens)

Hormonal Replacement Therapy (HRT)

- **Oestrogens Alone** - Only suitable for women who have had a hysterectomy
  - **Brand**: Elleste Solo
  - If BMI > 30, oestrogen only HRT should be given as a **transdermal patch** rather than oral
- **Oestrogen with Progestogen** - Progestogen necessary to protect the endometrium
  - **Brand**: Elleste Duet
  - **Cyclical**
    - **Monthly**: oestrogen every day of the month + progesterone for the last 14 days
    - **Three Monthly**: oestrogen every day for 3 months + progesterone for the last 14 days
    - Withdrawal bleed occurs when on progesterone
    - Suitable for perimenopause
  - **Continuous** - Suitable if definitely post-menopausal
    - Take oestrogen & progesterone daily
- **Routes**
  - Oral
  - Transdermal
  - Vaginal creams (if predominantly vaginal symptoms)
- **Benefits**
  - Improved vasomotor symptoms, sleep, and performance
  - Prevention of osteoporosis
  - Improved genital tract symptoms (dryness, dyspareunia)
- **Risks** (all these risks are small)
  - Breast cancer (and, to a lesser degree, endometrial (if no progestogens))
  - Cardiovascular disease (in older women)
  - VTE
  - **Side-Effects**:
    - **Oestrogenic**: breast tenderness, nausea, headaches
    - **Progestogenic**: fluid retention, mood swings, depression
- **Contraindications**
  - **Absolute**: pregnancy, breast cancer (current or past), endometrial cancer, uncontrolled hypertension, current VTE, current thrombophilia

Non-Hormonal Treatments

- Alpha agonists (e.g., clonidine)

- Beta-blockers (e.g., propranolol)
- SSRIs (e.g., fluoxetine) – particularly effective for vasomotor symptoms
- Symptomatic: lubricants, osteoporosis treatments (e.g., bisphosphonates)

Summary

- **Lifestyle**
  - Regular exercise, weight loss, reduce stress, sleep hygiene
- **HRT**
  - **Contraindications**: current or past breast cancer, undiagnosed vaginal bleeding, untreated endometrial hyperplasia
  - **No Uterus**: oestrogen-only (give as patch if BMI>30)
  - **Uterus**: should be given with progesterone component (e.g. Mirena)
  - **Risks**: VTE, stroke, coronary heart disease, breast and ovarian cancer
- **Non-HRT**
  - Vasomotor: fluoxetine, citalopram, venlafaxine
  - Vaginal dryness: lubricant
  - Psychological: self-help, CBT, SSRIs
  - Urogenital: topical oestrogens, lubricants

PACES TIPS

- Explain that changes that typically occur at menopause (hot flushes, sexual dysfunction, mood changes) – may present with one of these symptoms and not realized its menopause
- Explain lifestyle factors (healthy diet, weight loss, smoking cessation)
- Explain medical options (HRT, SSRIs, topical lubricants/oestrogens)
  - Tailor to needs of the patient
  - Explain risks/side-effects
- Explain need for contraception
  - Until > 1 year amenorrhoeic if > 50 yrs
- Until > 2 years amenorrhoeic if < 50 yrs
- Advice on bone health, keeping up to date with national screening (breast and cervical), contraception, support groups

Genitourinary medicine

Bacterial Vaginosis

- **Investigations**: vaginal pH, whiff test, Gram-stain, HIV test, NAAT, VDRL
- Oral or intravaginal treatment with **metronidazole 400mg BD** (5-7 days)
  - Alternative: **intravaginal metronidazole/ clindamycin gel**
- Advice: vaginal douching and excessive genital washing should be avoided
- **Risks in Pregnancy**: preterm labour, chorioamnionitis

Vulvovaginal Candidiasis

Prescribe antifungal treatment

- **Most women**:
  - Local: **clotrimazole pessary or cream** (e.g. clotrimazole 500 mg PV stat)
  - Oral: **itraconazole 200 mg PO BD** for 1 day or **fluconazole 150 mg PO stat**
- **Girls aged 12-15 years**: consider prescribing topical clotrimazole 1% or 2% applied 2-3 times per day (do not prescribe intravaginal or oral antifungal)
  - **Pregnant women**: intravaginal clotrimazole (Do not use oral antifungals)
- **If vulval symptoms**: topical imidazole (clotrimazole, ketoconazole) in addition to an oral or intravaginal antifungal
- NOTE: intravaginal clotrimazole (**Canesten**), oral fluconazole, topical clotrimazole → OTC

Advice

- Return if symptoms have not resolved in 7-14 days
- Avoid predisposing factors:
    - Washing and cleaning the vulval area with soap or shower gels, wipes, and feminine hygiene products
    - Cleaning the vulval area more than once per day
    - Washing underwear in biological washing powder and using fabric conditioners
    - Vaginal douching
    - Wearing tight-fitting and/or non-absorbent clothing
- Wash the vulval area with a soap substitute - used externally and not more than once per day
- Use simple emollient to moisturise vulval area
- Consider probiotics (e.g. live yoghurts) orally or topically to relieve symptoms
- Do not routinely treat asymptomatic sexual partner

Summary

- Either local or oral treatment
- Local: **clotrimazole pessary or cream** (e.g., clotrimazole 500 mg PV stat)
- Oral: **itraconazole 200 mg PO BD** for 1 day or **fluconazole 150 mg PO stat**
- **Pregnancy**: only use local treatments (e.g., creams or pessaries)

PACES TIPS

- **Risk Factors**: recent antibiotic use, oral contraceptives, diabetes mellitus, excessive washing
- Explain the diagnosis – not an STI/STD
- Explain treatment (usually either intravaginal clotrimazole or oral fluconazole)
- Explain hygiene measures (not cleaning too often, avoiding using fabric conditioners and soap substitutes)

Pelvic inflammatory disease

Management

- Consider removal of IUD if it is *in situ*
    - Usually if the patient has failed to respond to treatment after 72 hours
- **Outpatient Antibiotic Regimen**
    - **Ceftriaxone** 1g IM (single dose),
    - **Doxycycline** 100 mg BD (oral) for 14 days, &
    - **Metronidazole** 400 mg BD (oral) for 14 days
- **Alternative**: ofloxacin + metronidazole for 14 days
- **If pyrexial or oral management has failed**
    - **1st line: IV cefoxitin + doxycycline**
    - 2nd line: IV clindamycin + gentamicin
- **STI screening and contact tracing**
    - Chlamydia and gonorrhoea tests should be offered
    - Current and recent partners (within last 6 months) should be contacted and offered advice, screening, and treatment
- Advise about barrier contraception
- Counsel about the small risk of subfertility (increased risk with recurrence)

Follow-Up

- If managed as outpatients, should be seen **within 72 hours** to assess response
- If no improvement, admit for IV antibiotics
- Further follow-up at **2-4 weeks** to:
    - Ensure resolution
    - Reiterate importance of STIs
    - Reassure that if compliant, fertility is not affected

- Complications:
  - Infertility
  - Ectopic pregnancy
  - Chronic pelvic pain

PACES TIPS
- **Risk Factors**: younger women (< 25 years), STI, multiple sexual partners, past PID
- **Assess whether severely unwell and needing admission**
- Explain diagnosis (infection that has spread up to the womb)
- Explain risks of PID: infertility, ectopic pregnancy, chronic pelvic pain
- It will be treated with antibiotics (1 injection and 2 tablets taken for 14 days)
- Do not have sex until course is complete
  - Recommend full STI screen and encourage contact tracing
- Discuss contraception (consider removal of IUD if present)
- **Follow Up**: in 3 days' time and in 2-4 weeks

Urogynaecology

Urinary Incontinence/Overactive Bladder Syndrome

Classification *(management depends on the predominant symptom)*
- **Stress incontinence**: involuntary leakage of small amounts of urine when there is increased intra-abdominal pressure i.e. coughing or laughing
- **Urge incontinence**: involuntary leakage of urine which is accompanied or preceded by an "urge" to pass urine
- **Overactive bladder syndrome** = increased frequency and nocturia, not necessarily with incontinence (if incontinent, classed as urge incontinence)
- **Mixed incontinence**: both urge and stress
  - **Overflow incontinence**: can be due to detrusor underactivity or bladder outlet obstruction causing urinary retention and leakage of urine
  - **Continuous**: can either indicate severity or due to a fistula

Stress Incontinence Management
- *Note = stress incontinence is due to pelvic floor weakness / intrinsic sphincter deficiency*
- **Conservative**: avoid caffeinated drinks, avoid drinking either excessive/reduced amounts of fluids daily, weight loss if BMI > 30kg/m^2 and smoking cessation if applicable
- **1st line: Pelvic floor muscle training**
- Supervised training involving least 8 contractions performed 3 times per day for a minimum of 3 months
- **2nd line: Surgical procedures (only initiated by 2° services)**
  - Colposuspension - *sutures are used to lift the neck of the bladder and fix in place to Cooper's ligaments*
  - Autologous rectus fascial sling - *elevate the urethra*
  - Retropubic mid-urethral mesh sling - *elevate the urethra*
  - Intramural urethral bulking agents - *injection of a bulking agent around the urethra*
- **3rd line:** Duloxetine *(enhances sphincter contraction)* then r/v in 2-4 weeks if unsuitable for surgery/prefer pharmacological to surgical Rx

Urge Incontinence Management
- **Conservative**: avoid caffeinated drinks, avoid drinking either excessive/reduced amounts of fluids daily and weight loss if BMI > 30kg/m^2
- **1st Line: Bladder retraining for 6 weeks**
  - Aim is to gradually increase the intervals between voiding

- **2nd Line: Bladder stabilising drugs - antimuscarinics**
  - NICE recommend oxybutynin (immediate release), tolterodine (immediate release) or darifenacin (once daily preparation). Immediate release oxybutynin should, however, be avoided in 'frail older women'
- **3rd Line: Mirabegron (beta-3 agonist)**
  - May be useful if there is concern about anticholinergic side-effects in frail elderly patients
- **4th Line: Surgical Procedures**
- Botox injection
  - Percutaneous tibial nerve stimulation (PTNS) or sacral nerve stimulation (SNS)

PACES TIPS

- **Risk Factors**
  - **Stress**: age, traumatic delivery (forceps), obesity, previous pelvic surgery
  - **Urge**: age, obesity, smoking, family history, diabetes mellitus
- Explain diagnosis and mechanism
- Explain lifestyle measures (e.g. controlling fluid intake, avoiding caffeine, losing weight)
- Explain treatment
  - **Urge**: bladder retraining for 6 weeks – trying to gradually increase the time in between going to the toilet
  - **Stress**: pelvic floor training for 3 months
- Explain medical and surgical options

Vaginal prolapse

General lifestyle advice	• Losing weight if BMI >30kg/m^2 • Avoiding heavy lifting • Prevent/ treat constipation
Medical	• Pelvic floor exercises (16-week course) • Oestrogens – pill, patch, cream or implant (can help with symptom relief + if woman also has signs of vaginal atrophy) • Vaginal ring pessary (changed every 6 months) ○ **Side-Effects**: unpleasant discharge, irritation, UTI, interference with sex (sex is not possible with a shelf pessary)

Surgical	• No preference regarding preservation of uterus
	  ○ Vaginal hysterectomy ± vaginal sacrospinous fixation *(removal of the uterus ± stitching the top of the vagina to a ligament in the pelvis)*
	  ○ Vaginal sacrospinous hysteropexy *(cervix is stitched to a ligament in the pelvis)*
	  ○ Manchester repair *(shortening of the cervix to support the uterus)*
	  ○ Sacro-hysteropexy with mesh *(mesh used to attach the uterus to sacral vertebra)*
	• Preservation of uterus
	  ○ Vaginal sacrospinous hysteropexy
	  ○ Manchester repair (unless the woman wishes to have children in the future)
	• Vault prolapse
	  ○ Vaginal sacrospinous fixation
	  ○ Sacrocolpopexy *(mesh used to attach the vagina to sacral vertebra)*
	• Colpocleisis = only offered if the woman does not intend to have penetrative sex or they are at high surgical risk *(the procedure involves closure of the vagina)*

PACES TIPS

- **Risk Factors**: multiparity, age, obesity, prolonged second stage of labour, heavy lifting
- Explain the diagnosis
- Explain lifestyle modifications (lose weight, healthy diet, stop smoking)
- Explain conservative management (pelvic floor exercises, oestrogens)
- Explain ring pessary or surgery

Benign gynaecological conditions

Asherman Syndrome

- Surgical breakdown of intrauterine adhesions (**hysteroscopic adhesiolysis**) + insertion of paediatric Foley catheter or IUCD to prevent re-formation
- 2 cycles of cyclical oral oestrogen and progesterone given after to aid endometrial proliferation

Atrophic vaginitis

- *Must exclude malignancy (endometrial cancer)*
- Vaginal lubricants before intercourse and regular moisturisers
- Topical oestrogens and inform patient will be relieved after 3 weeks of treatment
    - Ring can be inserted into vaginal posterior fornix and changed every 3 months
- Systemic HRT if co-existent menopausal Sx
- Reconsider alternative Dx if continued treatment failure

Bartholin's Cyst/Abscess

- **Asymptomatic (smaller) cyst =** conservative approach with sitz bath/ warm compression
- **Symptomatic (larger) cyst =** marsupialisation/ catheter drainage ± oral broad-spectrum antibiotics. May also be managed using surgical excision, silver nitrate cauterisation or sclerotherapy
    - Marsupialisation of the cyst = involves suturing the internal aspect of the cyst to the outside of the cyst to prevent the cyst from reforming
    - Catheter drainage = uses a Word catheter, which is in place for 4-6 weeks
- **Abscess =** conservative management (sitz bath and analgesia) or incision and drainage may be required + broad spectrum antibiotics
    - May require marsupialisation or catheter insertion

PACES TIPS

- **Risk Factors**: nulliparous, child-bearing age, previous Bartholin's cyst
- Explain the diagnosis (blockage of a duct in your vagina, it has become infected)
- Explain management
    - Conservative: observation and antibiotics
    - Word catheter insertion
    - Marsupialisation
- Recommend STI screen

Endometriosis

- Endometriosis is known to recur throughout reproductive life, so it is impossible to guarantee complete cure
- Treatment should be based on the age, symptoms, extent of disease and desire to have children

Medical Therapy

- **Analgesics**

- **NSAIDs** or **paracetamol** are useful for reducing severity of dysmenorrhoea and pelvic pain
- Codeine/opiates should be avoided because it could worsen co-existing IBS

- **COCP**
  - It can be taken for 21 days with a 7-day pill-free break but it may be more effective at alleviating symptoms if **tricycled** (3 packets taken back to back)
  - It can also be taken without a break to induce amenorrhoea
  - If this achieves symptomatic relief, it can be continued for several years until pregnancy is intended. Do not offer if trying to conceive.
  - If ineffective, consider treatment for co-existing conditions (e.g. IBS) and changing the medical management
- **Progestogens** - Used to induce amenorrhoea in those with contraindications for the COCP. Do not offer if trying to conceive.
  - The **depot-medroxyprogesterone acetate** and **levonorgestrel IUS** are particularly effective for providing long-term therapeutic effect (particularly after surgery)
  - Can also use the progesterone only pill or the implant (Nexplanon)
- **GnRH Agonists** (e.g. Leuprorelin)
  - Effective at relieving the severity and symptoms of endometriosis
  - Usually administered as slow-release depot formulations (lasting 1 month or more)
  - It should not be used for > 6 months because of the risk of osteoporosis
  - Also available as multiple, daily-administered intranasal sprays

Surgical Treatment

- **Fertility-Sparing Surgery**
  - Laparoscopy is used to both diagnose and treat endometriosis – excision or ablation. **Preferred management if fertility is a priority.**
  - Adjunct: 3 months of GnRH agonists prior to surgery
  - Hormonal treatment can be considered post-surgery to manage symptoms
  - Risk of recurrence following surgery is as high as 30% so long-term medical therapy is often necessary and started straight after surgery
  - Specialist surgery may be needed if the endometriosis has caused extensive adhesions or involved other organs
- **Hysterectomy and Oophorectomy**
  - Hysterectomy with removal of the ovaries and all visible endometriosis lesions should be considered in women who have completed their family and failed to respond to conservative treatments
  - The woman should be informed that hysterectomy will NOT necessarily cure the symptoms or the disease

PACES TIPS

- **Risk Factors**: early menarche, family history, nulliparity, prolonged menstruation (> 5 days), short menstrual cycles (< 28 days)
- Explain diagnosis (a condition where the tissue that lines the womb starts appearing outside the womb)
- Explain that it is very common (10% of women of reproductive age)
- Explain management options
  - Conservative: NSAIDs
  - Medical: COCP, LNG-IUS, POP
  - Surgical: diagnostic laparoscopy and excision/ablation
- Explain potential impact on fertility

Fibroids

Medical Treatment

- Conservative management if asymptomatic fibroids

- Common symptom of fibroids is HMB, therefore treatment can include:
    - **LNG-IUS**
    - Non-hormonal = tranexamic acid/ NSAIDs
    - Hormonal = COCP or oral progesterones
    - May be ineffective in the presence of submucous fibroid or an enlarged uterus that is palpable abdominally
- **Injectable GnRH Agonist**
    - Only effective medical treatment
    - Induces a menopausal state (shuts down ovarian oestradiol production)
    - Poorly tolerated because of severe menopausal symptoms
- **Ulipristal Acetate** (selective progesterone receptor modulator) - currently use is suspended due to safety review regarding liver injury
- NOTE: neither of the above options are long-term - fibroids regrow as soon as ovarian function returns

Surgical Treatment

- Depends on presenting complaint and patient's preferences re menstrual function and fertility
- Minimally invasive **hysteroscopic surgery** can be used to remove submucous fibroids and fibroid polyps (which relieved HMB symptoms)
- If the patient has a bulky fibroid uterus causing pressure symptoms or where HMB is refractory to medical interventions:
    - **Myomectomy**
    - Preferred if preservation of fertility is required
    - Can be done laparoscopically (power morcellation is used to shrink the fibroids for removal)
    - There is a small but significant risk of uncontrolled life-threatening bleeding during myomectomy which may require a hysterectomy
    - **Hysterectomy**
- Hysterectomy and myomectomy could be preceded by **GnRH agonist pre-treatment** for 3 months to reduce the bulk and vascularity of the fibroids
    - This can facilitate a suprapubic incision and vaginal hysterectomy rather than midline abdominal incision and abdominal hysterectomy
    - This is associated with quicker recovery and fewer complications

Radiological Treatment

- **Uterine artery embolisation (UAE)** – only offered if not desiring fertility
    - Embolisation induces infarction and degeneration of fibroids leading to a reduction in fibroid volume of around 50%
    - Patients usually require admission to deal with the pain associated with uterine artery occlusion (opiate analgesia)
    - **Complications**: fever, infection, fibroid expulsion, potential ovarian failure
    - 1/3 of women require further medical, radiological or surgical treatment within 5 years
    - As effective as myomectomy for alleviating fibroid-related HMB and pressure sx

Summary

- **1st line symptomatic: LNG-IUS**
    - Other options: tranexamic acid, COCP
    - GnRH agonists may be used to reduce the size of the fibroid (usually only in the short-term prior to surgery)
- **Surgery**: myomectomy, hysteroscopic endometrial ablation, hysterectomy
- **Interventional Radiology**: uterine artery embolisation

PACES TIPS

- **Risk Factors**: increasing age until menopause, early puberty, obesity, Afro-Caribbean, family history
- Explain the diagnosis (common smooth muscle masses that can cause heavy menstrual bleeding and fertility issues)
- Explain that it is very common (increases in prevalence with age until menopause – 20-50% of women over 30 years)
- Explain the management
    - **HMB**: LNG-IUS, COCP
    - **Fertility**: surgery, tranexamic acid
    - **Symptomatic**: tranexamic acid

Gynaecological Polyp (endometrial)

- Some small polyps may resolve spontaneously
- **Polypectomy** recommended to alleviate AUB symptoms, optimise fertility and exclude hyperplasia/cancer
    - Can be performed as a day-case under general anaesthesia
    - Can also be performed as an outpatient with or without local anaesthesia
- A hysteroscope is used to visualise the polyp and small instruments are used to remove the polyp

Female Genital Mutilation

- Any case of FGM must be reported in the notes
- Any case of FGM in children **< 18 years** must be referred to the police and social services
- The mandatory duty to tell the appropriate agency will not apply to at risk or suspected cases **> 18 years**
- Check to see if there are young girls in the family who are at risk
- **De-infibulation** (reversal of infibulation)
    - Ideally should be identified pre-conceptually
    - Should be performed with adequate analgesia to avoid flashbacks of FGM
    - Incision is made along the vulval incision scar
    - Women should receive prior urinary infection screening and given appropriate antibiotics
    - Access to specialist services and support groups is necessary

Lichen Sclerosus

- Good skin care – soap substitute, emollients and avoid irritants
- Strong steroid ointments (e.g. clobetasol propionate for 3 months, then review)
- Biopsy is indicated if the condition does not resolve with treatment

Ovarian Cysts

- **Asymptomatic (tend to be an incidental finding on ultrasound in pre-menopausal women)**
    - **Simple and small (<50mm diameter)** = likely to be physiological, and likely to resolve within 3 menstrual cycles. Do not require follow up
    - **Simple of 50-70mm diameter** = require yearly ultrasound follow-up
    - **>70mm diameter** = require further imaging i.e. MRI or surgical intervention (laparoscopic removal)
        - If the mass is large with solid components e.g. dermoid cyst = laparotomy may be indicated
- **Acutely unwell**
    - Requires urgent surgical exploration (laparoscopy or laparotomy) to manage possible ovarian torsion/cyst rupture or haemorrhage + resus + broad spectrum antibiotics
- **Post-menopausal with solid or complex ovarian cyst**

- Regarded as suspicious for malignancy and so should undergo TVUSS to determine risk of malignancy index (RMI) **RMI** = ultrasound features of cyst + menopausal status + CA125
- Requires gynaecological oncology ± laparotomy

Premenstrual Syndrome

- **Conservative – offer to all women regardless of severity**
  - Stress reduction
  - Alcohol and caffeine limitation
  - Smoking cessation
  - Regular exercise
  - Regular sleep
  - Regular, frequent (2-3 hourly) small balanced meals (inc complex carbs)
  - Offer pain relief if required - paracetamol or NSAIDs
- **Moderate** (some impact on personal, social and professional life)
  - **COCP**
    - Yasmin – has the best evidence base
    - Can be cyclical or continuous (current data prefers continuous use)
  - Referral for **CBT**
- **Severe** (causes withdrawal from social and professional activities and prevents normal functioning)
  - Same as moderate PMS
  - **SSRI**
    - Can be continuous or just during the luteal phase
    - Must monitor treatment response closely (esp regarding self-harm) and initially trial for **3 months**

Pruritus Vulvae

- General advice
  - Shower vulval area with emollient (avoid using water only or soap), dab dry after
  - Avoid OTC, wet wipes, perfumed products, tight-fitting clothes, fabric softener, spermicide condoms
  - Liberal use of emollients
  - Antihistamine at bedtime to help if sleep affected
- **Manage underlying cause**
  - Contact dermatitis – remove irritant exposure and use emollients as soap substitutes
    - 1% hydrocortisone if mild
    - Betamethasone or clobetasol if severe/lichenified
    - Refer to dermatology if irritant removal has not resolved the condition
  - Lichen simplex – treat underlying sin condition
    - Potent topical corticosteroid betamethasone for 14 days
    - Emollient as soap substitute
  - Lichen sclerosus – see condition above
  - Unknown cause – emollient and mildly anxiolytic antihistamine hydroxyzine for symptomatic treatment
    - Consider 1% hydrocortisone
    - Refer to derm/gynae/vulval clinic AND use emollient + antihistamine while waiting if Sx persist
- Refer to secondary care if symptom persist despite known cause + treatment/unclear cause/pre-malignant condition
- Refer to specialist under 2 week wait if cancer suspected/lymphoma

Gynaecological Cancers

Cervical Intraepithelial Neoplasia (CIN) + Cervical Cancer

Stage	Management
CIN	Colposcopy (examination of the cervix) biopsy can be taken. If there are moderate to severe abnormalities can excise or ablate the region. Excision – LLETZ (large loop excision of the transformation zone). Involves removal of abnormal cells using a thin wire loop that is heated by electric current. Risk = Large excision or repeat excisions are associated with an **increased risk of midtrimester miscarriage** and **preterm delivery.** Cone biopsy can also be done (less common). Requires a test of cure 6mo later
IA1 (microinvasive)	Conservative approach

IA2 – IIA (early)	**≤ 4 cm** = radical hysterectomy + lymphadenopathy
	Radical hysterectomy risks
	• Bladder dysfunction (atony)
	  ○ Common in the immediate post-operative period
	  ○ may require intermittent self-catheterisation
	• Sexual dysfunction (due to vaginal shortening)
	• Lymphoedema (due to pelvic lymph node removal)
	  ○ Can be managed with leg elevation, good skin care and massage
	> 4 cm = chemoradiation

IIB – IVA (locally advanced)	Chemoradiation
	Radiotherapy
	• TWO ways of delivering radiotherapy:
	  ○ **External beam radiotherapy**
	  ▪ Usually given over 4 weeks
	  ▪ Each delivery of radiotherapy usually lasts about 10 mins
	  ○ **Internal radiotherapy** (brachytherapy)
	  ▪ Rods of radioactive selenium inserted into the affected area
	  ▪ The effects extend up to 5 mm away from the rod
	• **Risks**
	  ○ Lethargy
	  ○ Bowel and bladder urgency
	  ○ Skin erythema (external beam radiotherapy)
	  ○ Long-term:
	  ▪ Fibrosis
	  ▪ Vaginal stenosis
	  ▪ Cystitis-like symptoms
	  ▪ Malabsorption and mucous diarrhoea
	  ▪ Radiotherapy-induced menopause
	Chemotherapy
	• Usually cisplatin
	• Ideally given in conjunction with radiotherapy (improves cure rates)

IVB (metastatic)	Combination chemo (alt single agent therapy + palliative care

- **Pregnant –** MDT approach + delivery post 35wks
- **Recurrent disease –** surgery / palliative chemo / supportive care

PACES TIPS

- Explain the purpose of screening and the results
- Explain that management:
  - CIN1: repeat smear in 1 year
  - CIN2, CIN3 and CGIN: LLETZ or cone biopsy
    - LLETZ: outpatient procedure with local anaesthetic
    - Cone biopsy: used for larger lesions and done under general anaesthetic
    - **Risk**: mid-trimester loss and preterm birth (may need prophylactic cerclage)
- Explain follow up:
  - Repeat smear in 6 months for test of cure

Endometrial Hyperplasia + Endometrial Cancer

Stage	Management
Endometrial hyperplasia without atypia	1. Address risk factors I.e. obesity, HRT, tamoxifen therapy and anovulation. Can consider observation 2. LNG- IUS 3. Oral progestogen (continuous) Surveillance (endometrial biopsy) at 6 months
Atypical hyperplasia	Non-fertility preserving = total hysterectomy + bilateral salpingo-oophorectomy Fertility preserving = LNG-IUS or oral continuous progestogen Surveillance (endometrial biopsy) at 3 months
FIGO 1	Total hysterectomy + bilateral salpingo-oophorectomy
FIGO 2	Radical hysterectomy + lymph node assessment (+ adjuvant radiotherapy)
FIGO 3	If possible; maximal debulking surgery + chemotherapy + radiotherapy
FIGO 4	If possible; max debulking surgery, may take palliative approach = low dose radio/ high dose progesterone

Adjuvant Treatment

- Postoperative radiotherapy reduces local recurrence rate but does not improve survival
- Local radiotherapy or brachytherapy are options
- Chemotherapy is used for advances or metastatic disease (little evidence to support its use)

Hormone Treatment

- High-dose oral or intrauterine progestins (**LNG-IUS** is preferred)
- Useful for women with complex atypical hyperplasia and low-grade stage 1A endometrial tumours
- Relapse rates are high
- May be suitable for women who are not fit for surgery or want to avoid surgery for fertility reasons

Endometrial Cancer and Fertility

- Primary infertility due to PCOS is a risk factor for pre-menopausal endometrial cancer
- Alternatives to hysterectomy for pre-menopausal women are only possible for pre-cancer or early-stage low-grade endometrial cancers
- Hormone therapy (oral progestogens or LNG-IUS) is associated with moderate response and high relapse rates
- Women faced with losing their fertility should be referred to a specialist to discuss ovarian conservation and/or stimulation for egg retrieval and surrogacy

Summary

- Localised disease: **total abdominal hysterectomy with bilateral salpingo-oophorectomy**
- High risk patients may receive radiotherapy
- **Progestogen therapy** is used in frail elderly women who are not suitable for surgery

PACES TIPS

- Explain the diagnosis (abnormal thickening of the endometrium)
- Explain that it is taken seriously because of the risk of progression to cancer
- Explain management:
    - NO atypia: LNG-IUS, review in 3-6 months
    - Atypia: total hysterectomy + BSO
        - If having medical management – endometrial surveillance with biopsy every 3 months

Ovarian Cancer

Risk of malignancy index (RMI) can help to derive the risk of ovarian cancer.

- RMI = U X M X Ca125 (>250 then referral to gynae)
    - M = menopausal status (1 – pre, 2 – post)
    - U = ultrasound score inc: multilocular cyst, solid areas, mets, ascites, bilateral lesions (0 - no features, 1 – 1 feature, 2 - ≥2 features)
    - Ca125 = units/ml

Stage	Management
1	Total hysterectomy with bilateral salpingo-oophorectomy ± chemo. If fertility needs to preserved, only the affected ovary can be removed (only 1a).
2	Debulking surgery to remove as much of the cancer as possible, chemo may be given as neo-adjuvant or adjuvant.
3	Similar to stage 2, with the addition of targeted treatment bevacizumab (targets VEGF-A). In some cases, surgery may not be possible in which case chemo (platinum based) can be given as well as symptomatic treatment e.g. ascitic drain/ constipation treatment.
4	Same as stage 3, but palliative care is more likely

Chemotherapy

- Can be given as primary treatment, an adjunct following surgery or for relapse of disease
    - **1st line**: combination of a platinum compound with paclitaxel
    - Most are given as an outpatient, 3 weeks apart for 6 cycles
- **Platinum compounds**
    - Most effective in ovarian cancer
    - Cause cross-linkage of DNA stands leading to cell cycle arrest
    - **Carboplatin** is the main platinum compound used as it is less nephrotoxic and causes less nausea than cisplatin
    - Does of carboplatin is calculated using the GFR
- **Paclitaxel**
    - Causes microtubular damage
    - Prevents replication and cell division
    - Pre-emptive steroids are given to reduce hypersensitivity reactions and reduces side-effects (e.g. peripheral neuropathy, neutropaenia and myalgia)
    - Causes total loss of body hair
- **Bevacizumab**
    - Monoclonal antibody against VEGF
    - Inhibits angiogenesis
    - Not routinely prescribed in ovarian cancer due to cost
    - Available for the treatment of recurrent disease
- Patients will undergo a CT scan following completion of chemotherapy to assess response to treatment
- Follow-up includes clinical examination and CA125 measurement

- CA125 tends to rise prior to the onset of clinical evidence of disease recurrence
- When disease recurs, treatment is largely palliative

PACES TIPS
- **Risk Factors**: age, family history, obesity, hormone replacement therapy, endometriosis, smoking, diabetes
- **Protective Factors**: COCP, pregnancy and breastfeeding, hysterectomy
- Explain diagnosis
- Explain that further investigations may be necessary
- Explain that definitive management will be surgical with or without chemotherapy

Vulvar Cancer

Vulval Excision
- Radical surgical excision aiming for a clear margin of 15 mm is the mainstay
- Large lesions may be shrunk with neoadjuvant radiotherapy, often with chemotherapy

Sentinel Lymph Node Biopsy
- Untreated groin node metastases will be fatal
- Affected nodes cannot be reliably identified with radiology
- Current approach: **full inguinofemoral lymphadenectomy** (for all tumours with depth of invasion > 1 mm)
  - NOTE: groin lymphadenectomy is a very morbid procedure with complications including wound healing problems, infection, VTE and chronic lymphoedema
  - Groin nodes are involved in 15% of women with vulval cancer
  - Full groin lymphadenectomy may be avoided by doing a sentinel lymph node biopsy (first node that the area drains to)
  - A dye and radioactive nucleotide can be injected into the vulval tumour to identify the sentinel node
  - If the sentinel node is positive for disease, then full groin lymphadenectomy is indicated

Radiotherapy
- Adjuvant radiotherapy is indicated if the excision margins are close or in the presence of two or more groin node metastases
- Radical radiotherapy may be used instead of surgery if the patient is unfit for surgery

Paediatrics

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Introduction to Paediatrics

Paediatrics is commonly the most feared specialty in both the written and the practical papers, owing to its large depth and breadth. It is multifaceted and can be unpredictable, but with this management guide, we aim to demystify the friendly giant that is paediatrics. You may, in fact, find that much of paediatrics is general medicine, with which you should already be familiar from your previous clinical attachments! You just need to tweak that knowledge to suit a child or adolescent.

Of course, there is also a large volume of new material, relevant only to paediatrics. It is beyond the scope of this revision guide to cover all of this. This information may be found in the many fantastic textbooks suggested to you by the faculty.

Paediatrics is fun and interesting! Your learning and revision can be made much easier by being proactive during your paeds firm. Try to speak to and examine as many children/parents as you can, and then read up about their condition(s) afterwards. Prepare for tutorials – do some reading beforehand. That way, you'll already be aware of the areas that you find more difficult, and can ask the questions that you need to ask while you have the opportunity. Carry your textbook(s) around with you – this way, if you're unfamiliar with something you can look it up immediately while you remember to, and you can spend the hours waiting for deliveries productively.

Practise with your friends. If you haven't already, set up a small PACES revision group and meet at least once a week to go over cases. It is not too early to start doing this – the more cases you've gone over before the exam, the more prepared you will be to face anything that they might throw at you in your PACES. In each station you will need to take a focussed history, examine and then formulate your findings to develop a management plan, so go over this as many times as you can, and stick to the 15 minute time limit set in PACES. Practice explaining diagnoses as you would to children/parents, not only to other medics. Don't forget to use your GP placement as an opportunity to revise all of the specialties, in particular to observe the roles of healthcare professionals in the MDT setting, as you will come to learn this is an invaluable phrase!!

Try to keep up to date with your notes, and use the resources on the intranet and Blackboard. They are helpful to direct your learning!! Combine your revision for the written exam with that for PACES. As your knowledge improves, so will your performance in your PACES sessions, and you will become much more confident - very important in the exam!

Most importantly, try to enjoy the attachment. You'll find it so much easier to revise later on if you have been actively involved in the team and enjoyed the firm.

The aims of the resources below are not to teach you paediatrics, or to replace the resources available in the core textbooks and through the medical school. Instead, in this section you will find the management plans, based on various resources, that we believe you will find helpful as aids to your own PACES revision.

Good luck!

Paediatrics Management Guide

Neonatal Medicine

Chromosomal Childhood Syndromes
Chronic Lung Disease of Prematurity
Cleft Lip and Palate
CMV in the Newborn
Congenital Diaphragmatic Hernia
Conjunctivitis in the Neonate
Down Syndrome
Group B Streptococcal Infection
Haemolytic Disease of the Newborn
Hepatitis B Virus
Herpes Simplex Virus
Hypoxic-Ischaemic Encephalopathy
Listeria monocytogenes infection
Meconium Aspiration
Necrotising Enterocolitis
Neonatal Hypoglycaemia
Neonatal Jaundice
Persistent Pulmonary Hypertension of the Newborn
Pneumothorax
Respiratory Distress Syndrome
Sudden Infant Death Syndrome
Toxoplasmosis in the Newborn
Tracheoesophageal Fistula and Oesophageal Atresia
Transient Tachypnoea of the Newborn

Cardiac Disease

Aortic Stenosis
Atrial Septal Defect
Coarctation of the Aorta
Congenital Cyanotic Heart Disease
Heart Failure
Infective Endocarditis
Patent Ductus Arteriosus
Pulmonary Stenosis
Rheumatic Fever
Supraventricular Tachycardia
Tetralogy of Fallot
Transposition of the Great Arteries
Tricuspid Atresia
Vasovagal Syncope
Ventricular Septal Defect

Allergy and Respiratory Disorders

Acute Otitis Media
Acute Epiglottitis
Allergy
Allergic Rhinitis
Angioedema
Asthma
Asthma Attack
Bronchiectasis
Bronchiolitis
Common Cold
Cough
COVID-19
Cow's Milk Protein Allergy
Croup
Cystic Fibrosis
Food Allergy
Foreign Body Inhalation
Lactose Intolerance
Laryngitis
Laryngomalacia
Otitis Externa
Pneumonia
Scarlet Fever
Sinusitis
Sleep Disordered Breathing
Sore Throat
Urticaria
Viral Episodic Wheeze
Whooping Cough

Gastroenterology

Anal Fissure
Appendicitis
Coeliac Disease
Constipation
Crohn's Disease
Dehydration and Fluids
Failure to Thrive
Gastroenteritis
Gastro-oesophageal Reflux
Hernia
Hirschsprung Disease
Infant Colic
Intussusception
Irritable Bowel Syndrome
Meckel's Diverticulum
Malrotation
Mesenteric Adenitis
Peptic Ulcer Disease

Pyloric Stenosis
Recurrent Abdominal Pain
Small Bowel Atresia
Ulcerative Colitis
Volvulus

Liver Disorders

Acute Liver Failure
Autoimmune Hepatitis
Biliary Atresia
Cirrhosis and Portal Hypertension
Hepatic Encephalopathy
Hepatitis A
Hepatitis B
Hepatitis C
Non-Alcoholic Fatty Liver Disease
Wilson's Disease

Infection and Immunity

Bacterial Meningitis
Chickenpox
Dengue
EBV
Encephalitis
Fever
Hereditary Immunodeficiency
HHV-6 and HHV-7
HIV
Human Parvovirus B19
Impetigo
Kawasaki Disease
Malaria
Measles
Mumps
Rubella
Staphylococcal Scalded Skin Syndrome
Toxic Shock Syndrome
Tuberculosis
Typhoid

Dermatology

Acne Vulgaris
Atopic Eczema
Cellulitis
Guttate Psoriasis
Haemangioma
Hand, Foot and Mouth Disease
Insect Bites and Stings
Milia
Molluscum Contagiosum
Mongolian Blue Spot
Nappy Rash
Necrotising Fasciitis
Pediculosis
Periorbital Cellulitis
Ringworm
Scabies
Seborrhoeic Dermatitis
Viral Warts

Kidneys and Urinary Tract Disorders

Glomerulonephritis
Acute Kidney Injury
Chronic Kidney Disease
Enuresis
Haemolytic Uraemic Syndrome
Henoch-Schonlein Purpura
Nephrotic Syndrome
Urinary Tract Calculi
Urinary Tract Infection

Genitalia Disorders

Epididymo-Orchitis
Hydrocoele
Hypospadias
Paraphimosis
Testicular Torsion
Undescended Testes/Cryptorchism

Malignant Disease

Acute Lymphoblastic Leukaemia
Brain Tumours
Hodgkin's Lymphoma
Neuroblastoma
Retinoblastoma
Wilm's Tumour

Haematological Disease

Beta Thalassaemia
Bruising
Disseminated Intravascular Coagulation
G6PD Deficiency
Haemophilia A and B
Hereditary Spherocytosis
Immune Thrombocytopaenic Purpura
Iron Deficiency Anaemia
Sickle Cell Disease
Von Willebrand Disease

Musculoskeletal Disorders

Developmental Dysplasia of the Hip
Fractures
Juvenile Idiopathic Arthritis
Osgood-Schlatter Disease
Osteochondritis Dissecans
Osteomyelitis
Perthes Disease
Reactive Arthritis
Rickets
Septic Arthritis
Slipped Capital Femoral Epiphysis
Transient Synovitis

Neurological Conditions

Attention Deficit Hyperactivity Disorder
Autism Spectrum Disorders
Becker Muscular Dystrophy
Breath Holding Attacks
Cerebral Palsy
Developmental Delay
Duchenne Muscular Dystrophy
Epilepsy
Extradural Haemorrhage
Febrile Convulsion
Headaches
Hydrocephalus
Migraine
Myotonic Muscular Dystrophy
Neurocutaneous Syndrome
Status Epilepticus
Subarachnoid Haemorrhage
Subdural Haematoma
Tension Headache
Tic Disorder
West Syndrome

Endocrinological Disorders

Congenital Adrenal Hyperplasia
Congenital Hypothyroidism
Delayed Puberty
Diabetic Ketoacidosis
Diabetes Mellitus Type 1
Hyperthyroidism
Hypocalcaemia
Hypoglycaemia
Obesity
Precocious Puberty
Severe Hypercalcaemia

Paediatric Emergencies

ABCDE Approach
Anaphylaxis
Cyanosis
Neonatal Resuscitation Guidelines
Paediatric BLS
Sepsis

Ophthalmological Disorders

Conjunctivitis
Hypermetropia
Myopia
Retinopathy of Prematurity
Strabismus

Other Topics

Gillick Competence
MMR Contraindications and Side Effects
Non-Accidental Injury
School Exclusion
Somatisation
Paediatric Vital Signs
Paediatric hydration assessment
Fluid Balance
Maintenance Fluid
UK Vaccination Schedule

Neonatal Medicine

Chromosomal Childhood Syndromes

- Most require an MDT approach and include the following:
  - Patau (trisomy 13)
  - Edward's (trisomy 18)
  - Fragile X
  - Noonan
  - Pierre-Robin
  - Prader-Willi
  - William's (7q11 deletion)
  - Cri du Chat (5p deletion)
  - Turner
  - Klinefelter
  - DiGeorge (22q11.2 microdeletion)
- **Disclaimer:** Although these are in Sofia, specific management plans are beyond the scope of this guide

Chronic Lung Disease of Prematurity (Bronchopulmonary Dysplasia)

- **Definition:** oxygen requirement in preterm infants after 28 days of list with associated CXR findings
- **Prophylaxis:**
  - **Corticosteroids** for women in suspected, diagnosed or established preterm labour <34 weeks (consider if 34-36 weeks)
- **Respiratory support:**
  - High flow oxygen
    - Via nasal cannula or incubator oxygen
    - If >2L per min humidify oxygen
  - CPAP
  - Invasive ventilation
    - Give surfactant
- **Medications:**
  - Dexamethasone
    - If ≥ 8 days old and on ventilator
  - Caffeine citrate
    - If ≤ 30 weeks corrected gestational age. Start within 3 days of birth
    - Consider if preterm and apneic
  - Nitric oxide
    - Only if pulmonary hypoplasia or pulmonary hypertension

Cleft Lip and Palate

- **Cleft lip and palate MDT team**
  - Early referral required
  - Speech and language therapy input may be required long term
- **Surgery**
  - Primary lip closure at 3 months
  - Primary closure at 6-12 months
  - As a child grows they may require further corrective and cosmetic procedures
- **Feeding**
  - Most babies will be able to breast feed normally
  - May require support with bottle feeding e.g. dental plates
  - Early feeding assessment and intervention may be required e.g. NG feeds/ specialised teat/ dental palate
- Potential airway problems (e.g. Pierre-Robin sequence) may occur

    - May require airway management
- Pre-surgical lip taping, oral appliances or pre-surgical nasal alveolar molding (PNAM) may be needed to narrow the cleft

CMV in the Newborn

- Urine or salivary PCR for CMB
    - Definitive test for congenital CMV if done in first 2 weeks of life
- CMV usually has no long-term implications
- Barrier nursing
    - As CMV is shed in urine and body secretions
- Anti-virals for 6 months if:
    - CNS infection
    - Acutely unwell
- Oral valganciclovir preferred, if concerns with absorption, then give ganciclovir IV

Congenital Diaphragmatic Hernia

- **Antenatal**
    - MDT with birth at neonatal surgical centre
- **Resuscitation after birth**
    - Intubate – avoid face mask to minimize gastric distention
    - Positive pressure ventilation +/- HFOV
    - Wide-bore NG tube (8 Fr)
    - IV and arterial access
    - Sedation and muscle relaxation
    - Persistent pulmonary hypertension of the New-born
        - Common and may require iNO
- **Surgery**
    - Delayed surgical repair
        - Stable and improving pulmonary hypertension
    - Diaphragmatic defect is closed with primary repair or synthetic patch
- **ECMO**
    - If pulmonary hypertension not improving

Ophthalmia neonatorum (conjunctivitis in the neonate)

- All cases of acute bacterial conjunctivitis require an urgent **same day referral** to an ophthalmologist
- Mild bacterial conjunctivitis:
    - **Chloramphenicol eye drops**
- Moderate-severe bacterial conjunctivitis:
    - Systemic antibiotics
        - Chlamydial:
            - Oral **erythromycin**
        - Gonococcal:
            - Single dose of parenteral (IV or IM) **cefotaxime**/ **ceftriaxone**
        - Pseudomonal:
            - **Gentamicin** eye drops plus systemic antibiotics
- **Viral:** no specific antiviral, may use topical antihistamine and artificial tears to relieve itching
- For chlamydia or gonococcal infections, the mother and her sexual partner also require treatment

Down Syndrome

- Take blood for genetics and request **urgent PCR for trisomy 21**
- Full clinical examination paying particular attention to cardiovascular system
- **Echocardiogram**

    - If abnormal then refer to cardiologist
    - Congenital heart defects very common
        - Occur in 45% of Down syndrome babies (mainly AVSD)
- **FBC and blood film**
    - 10% of Down syndrome babies will have **transient abnormal myelopoiesis**
        - Baby is higher risk of leukaemia
            - Refer to haematologist
- **MDT approach**
- **Hearing screening test**
    - Then annual hearing testing (auditory thresholds, impedance testing (tympanometry) and otoscopy)

- **Monitor for associated problems**
    - Hypothyroidism: TFTs at birth, 6months, 1 year of age and annually after
    - Duodenal atresia
    - Hirschsprung disease
    - Coeliac disease
    - Epilepsy
    - Hearing and visual defects
    - Periodontal disease
    - Atlantoaxial instability

- **Speech and language therapist**
    - If difficulty swallowing
- Ophthalmologist (3-6 months)
- Parental counselling and education
    - Recommend support groups to the parents
        - Charity: **Down's Syndrome Association**
    - Genetic counselling
- Early intervention therapies in childhood, refer to
    - Physiotherapy
    - Occupational therapy for fine motor skills
- Individualised educational plan (special schools)

Group B Streptococcal Infection

- **Prevention**:
    - Offer intrapartum antibiotic prophylaxis using intravenous benzylpenicillin (or clindamycin if allergic to penicillin) to pregnant women who have had:
        - a previous baby with an invasive group B streptococcal infection
        - group B streptococcal colonisation, bacteriuria, or infection in the current pregnancy
- **Penicillin (IV Benzylpenicillin)** and **gentamicin**
    - Given to babies with clinical signs of Group B Strep infection
- If the cerebrospinal fluid culture is positive for group B streptococcus, consider changing the antibiotic treatment to:
    - **Benzylpenicillin** 50 mg/kg every 12 hours
        - Normally for at least 14 days, and
    - **Gentamicin** in a starting dosage of 5 mg/kg every 36 hours
        - With subsequent doses and intervals adjusted if necessary, based on clinical judgement and blood gentamicin concentrations
        - Gentamicin should be continued for 5 days

Haemolytic Disease of the New-born

- Prevention

- **Anti-D immunoglobulin**
  - Given at 28 and 34 weeks and at birth
  - can be given as a single dose (1500IU) between 28 and 30 weeks
  - Further doses may be required e.g. in event of antenatal haemorrhage or surgical procedures [see O&G]

- Baby:
  - **Resuscitation**
    - A to E approach particularly if preterm, anaemic or hydropic
  - **Exchange transfusion**
    - Indicated if:
      - Bilirubin rapidly rising (>8-10 µmol/l/hr) despite adequate phototherapy
      - Severe hyperbilirubinaemia insufficiently responsive to phototherapy and supportive care
      - Significant anaemia (Hb <100 g/l)
  - **Phototherapy**
    - Do not delay if baby thought to clinically have significant jaundice
      - Transcutaneous bilirubin measurement can be taken to confirm/ if unsure
  - **IVIG**
    - Only for immune haemolysis; if bilirubin continues to rise by > 8.5mmol/L/hour
  - Follow-up
    - Check for late anaemia at 4-6 weeks
      - Consider folate supplementation to protect against this
    - Hearing screen
- Parent:
  - Should be counselled on recurrence of HDN in subsequent pregnancies

Hepatitis B Virus

- Infants of mothers who are HBsAg positive should receive exposure immunization schedule:
  - **Monovalent Hepatitis B vaccine** within 24 hours of birth (also at 4 weeks and 1 year of age)
  - Hexavalent vaccine (DT/aP/IPV/Hib/HepB) at usual times (8, 12 and 16 weeks)
- **HBIG** should be given to the neonate if:
  - Mother is HBsAg positive (even if she is HBeAg negative)
  - Mother had acute hepatitis B during pregnancy
  - Mother had an HBV DNA level equal or above 1x10^6IUs/ml in any antenatal sample during the current pregnancy
- HBIG should be ideally given simultaneously as initial Hep B vaccine, but at a different site
- Acute Hep B infection: supportive care

Herpes Simplex Virus

- If the mother is identified as having primary disease or genital herpetic lesions at the time of delivery, **Caesarean section** is indicated
- If primary infection occurs earlier in the pregnancy, offer prophylactic oral aciclovir from 36 weeks until delivery
- **Aciclovir** or **valaciclovir** can be given prophylactically to the baby during the at-risk period
- Suspected symptomatic neonatal infection
  - Blood and CSF PCR
  - IV acyclovir
- **If infant treatment is required**: Aciclovir

Hypoxic-Ischaemic Encephalopathy (HIE)

Grade	Mild (I)	Moderate (II)	Severe (III)
Conscious level	Hyper-alert	Lethargic	Comatose
Tone	Normal	Mild hypotonia	Flaccid
Posture	Mild distal flexion	Strong distal flexion	Intermittent decerebrate
Reflexes	Increased	Increased	Decreased/ absent
Clonus	Present	Present	Absent
Suck	Weak	Weak/ absent	Absent
Moro	Strong	Weak, incomplete	Absent
Pupils	Dilated	Pinpoint	Unequal, unreactive
Autonomic	Sympathetic	Parasympathetic	Depressed
HR	Tachycardia	Bradycardia	Variable
GI motility	Normal/ decreased	Increased	Variable
Seizures	None	Common, focal	Difficult to control

- Clinical grading of HIE:

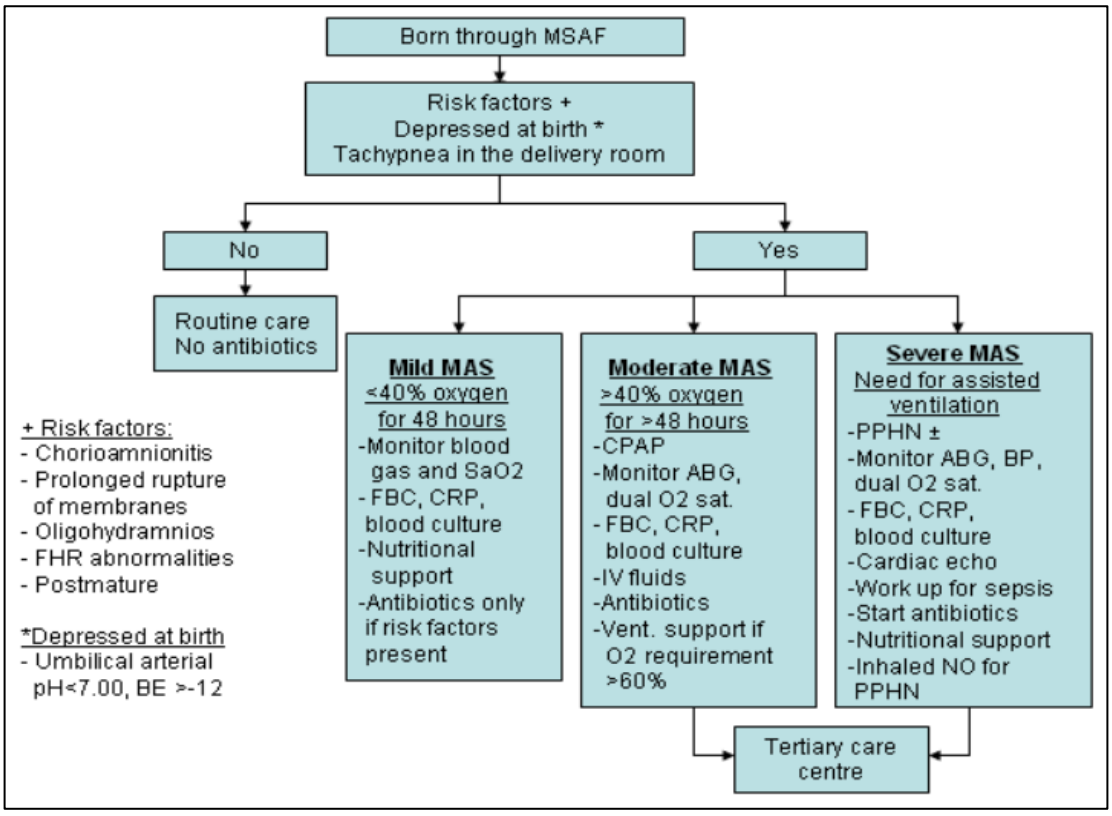
- Mild
    - **Resuscitate**
        - Follow ABC guidelines
    - **Therapeutic hypothermia**
    - **Ventilation**
        - Consider respiratory support early
        - Ensure $PaCO_2$ 4.5-6 kPa
    - **Cardiovascular**
        - Consider invasive monitoring of BP and inotropic support early
        - Consider dobutamine to maintain blood pressure (>40 mmHg mean arterial blood pressure in term infants)
    - **Fluids**
        - 60-80% of maintenance (40 ml/kg in first 24 hours)
        - Monitor urine output
- Moderate
    - As above plus:
        - Prompt treatment of seizures
            - EEG to be considered
        - Maintain normoglycaemia (2.6-8.0 mmol/l)
        - Treat hypocalcaemia if present
        - Measure LFTs to assess liver injury
        - Ensure IM phytomenadione (vitamin K) is given
        - Monitor coagulation
        - Withhold feeding for at least 48 hours (due to increased risk of NEC)
- Severe
    - As above plus:
        - Cranial ultrasound scan
            - Important in excluding other causes of encephalopathy e.g. haemorrhage
        - MRI brain
        - Consider switching to **palliative care**
            - Continuing efforts with intensive care may be futile
            - Requires MDT approach and discussion with family

Listeria monocytogenes Infection

- Amoxicillin and gentamicin
    - If blood cultures or CSF comes back as positive for Listeria

Meconium Aspiration

- If normal term infant with meconium-stained amniotic fluid but no history of GBS, **observation** is recommended
- If there are risk factors or laboratory findings that are suggestive of infection, consider **antibiotics**
    - IV ampicillin AND gentamicin
- Oxygen therapy and non-invasive ventilation (e.g. CPAP) may be used in more severe cases
- Boluses of surfactant and inotropes given in moderate cases



Adapted from BMJ Best Practice

Necrotising Enterocolitis

- **Stop enteral feeding and medications**
    - TPN may be required if feeds stopped >24 hours
    - For confirmed NEC cases feeds stopped for 7 days
- **NG tube**
    - Leave on free drain
    - Monitor hourly gastric aspirates
- **Broad-spectrum antibiotics**
    - Must cover both aerobic and anaerobic organisms
    - For example: cefotaxime and vancomycin
- **Respiratory support**
    - May require high ventilation pressures due to abdominal distension
- **Fluids**
    - For cardiovascular support, may require addition of inotropes
- **Surgery**

- Indicated if:
  - Perforation
  - Failure to respond to medical treatment
- Laparotomy with resection of necrosed bowel with either a primary anastomosis or a defunctioning stoma

Neonatal Hypoglycaemia

- **Prevention**
  - Feed baby within 30 mins of birth
  - Subsequent frequent milk feeding (every 2-3hrs)
- If sugar <1.5mmol/l
  - Admit to **neonatal unit (NNU)**
  - Confirm hypoglycaemia with laboratory blood glucose assay
  - **IV 10% glucose** 2ml/kg bolus
  - Followed by an infusion of 3.6ml/kg/hr of 10% glucose
  - Frequently recheck glucose until stable
    - Aim for 3-4mmol/l
- If sugar 1.5-2.5 mmol/l
  - **Feed immediately**
  - Recheck glucose after 30 mins
    - If glucose still low, consider admitting and starting IV glucose
- If hypoglycaemia persistent refer to endocrinology team for further investigation
- If hypoglycaemia is secondary to hyperinsulinism give one of:
  - Glucagon infusion
  - Diazoxide + chlorthiazide
  - Somatostatin analogue

Neonatal Jaundice

- Physiological:
  - Reassurance and observation
- Pathological unconjugated:
  - Acute bilirubin encephalopathy:
    1. **Immediate exchange transfusion**
    2. Phototherapy
    3. Hydration
    4. IVIG
  - Total bilirubin >95th centile for phototherapy (plot level on treatment graph)
    1. **Phototherapy**
    2. Hydration
  - Total bilirubin >95th centile for exchange transfusion (plot level on treatment graph)
    1. **Exchange transfusion**
    2. Phototherapy
    3. Hydration
    4. IVIG
- Pathological conjugated
  - Treat underlying cause – e.g. surgery for biliary atresia
- Breast milk jaundice:
  - Breast feeding can usually continue as normal
  - Use bilirubin levels to direct management

PACES TIPS

- Explain that neonatal jaundice is common
  - If < 1 day or > 14 days explain that you will investigate the cause
  - If physiological explain why it happens
- Explain treatment (light therapy)
- Reassure that the light therapy is not harmful (but eyes will be protected, and blood samples will need to be taken quite regularly)
- Breastfeeding can continue as per usual
  - Encourage frequent breastfeeding (e.g. every 3 hours) and to wake the baby up to feed
- Explain need to stay in after phototherapy has stopped to check rebound hyperbilirubinaemia
- Resources
  - NHS Choices Neonatal Jaundice Factsheet
  - The Breastfeeding Network (information and support for breastfeeding mothers)
  - Bliss (for premature and sick babies)

Persistent Pulmonary Hypertension of the Newborn

- **Oxygen**
  - Aim to maintain relatively high PO_2 (10-13kPa in infants born >34 weeks gestation or 7-9kPa for those born <34 weeks)
- **Ventilation**
  - **Intubate**
  - Use appropriate pressures to achieve and maintain good lung inflation
  - Consider sedation and paralysis to optimise efficiency of ventilation
- **High-frequency oscillatory ventilation**
  - If oxygenation is still problematic despite optimal conventional ventilation and surfactant
- **Minimise handling**
- **Surfactant**
  - Consider to optimise lung inflation
- **Treat underlying cause**
- **Suction of secretions from ETT**
- **Fluids and inotropes**
  - To optimise cardiac output
- **Inhaled nitric oxide**
  - If FiO2 requirements remain high
- **Correct any pH abnormalities**

Pneumothorax

- **Prevention** – careful titration of pressures in intubated neonates to achieve effective ventilation, but minimise risk of barotrauma & pneumothoraces
- Small pneumothorax
  - Close observation (even if ventilated)
  - 100% oxygen for 1-2 hrs to 'wash out' nitrogen
- **Needle drainage**
  - If urgent decompression is required e.g. infant at immediate risk of respiratory failure
- **Chest drain insertion**
  - For all tension pneumothoraces
  - For all ventilated or preterm infants with non-tension pneumothoraces who deteriorate

Respiratory Distress Syndrome (Hyaline Membrane Disease)

- **ABC resuscitation**
- Review history and examine baby to identify cause of respiratory distress

- **Respiratory support**
  - Ambient/headbox/ nasal cannula O_2
    - If baby
      - Looks comfortable
      - FiO_2 <0.3
      - Blood gas normal
  - Nasal continuous positive airway pressure (nCPAP)
    - If baby
      - >30 wks and >1000g
      - Baby looks well
      - FiO_2 <0.4
      - pH <7.20, PCO_2 <7.0-7.5
  - Positive pressure ventilation
    - If baby does not meet above parameters (e.g. <30 wks, looks unwell etc.)
- **N.B** - Hyperoxia can increase risk of retinopathy of prematurity or chronic lung disease, once stabilized, wean oxygen to target saturations of 91-95%

- **Fluids**
  - Usually 60ml/kg/day
  - Initially dextrose
- **IV antibiotics**
  - Broad spectrum combination
    - Such as benzylpenicillin and gentamicin (unless listeria in which case start amoxicillin and gentamicin)
- **Exogenous surfactant**
  - Consider in very pre-term infants or those resistant to initial resuscitation

- **CXR**
  - Do ASAP unless mild respiratory distress where this can be delayed

Sudden Infant Death Syndrome

- **Prevention**
  - Infants should be put to sleep on their back
  - Avoid overheating
  - Place 'feet to foot' position i.e. feet at foot of cot
  - No smoking exposure
  - Baby at parents' bedroom for the first 6 months
  - Baby not in parents' bed when they are tired, have taken alcohol, sedative medicines or drugs
  - Ideally infant should be breastfed

Toxoplasmosis in the Newborn

- Symptomatic babies
  - **Pyrimethamine** + **Sulfadiazine** + **Folinic acid**
    - Continue all 3 for 1 year
  - Monitor LFTs and FBCs every 4-6 weeks
  - + **Glucocorticoids** (prednisolone)
    - If CSF protein >1g or active chorioretinitis threatens vision

- Asymptomatic babies with positive serology
  - No definitive guidelines present as treatment is controversial
  - Discuss individual cases with infection and virology specialists
- Ongoing ophthalmology and audiology assessment recommended for delayed presentation

Tracheoesophageal fistula and Oesophageal atresia

- Primarily surgical correction
- Type A:
  - Stabilisation and gastrostomy #1
  - Oesophageal replacement
- Type B/D:
  - Suction catheter and surgical correction
- Type C:
  - Stabilisation and surgical correction
- Type E:
  - NBM and surgical division of fistula

Transient tachypnoea of the newborn

- Supportive therapy – O2 through hood/nasal cannula maintaining O2 sats >90%
- Maintain neutral thermal environment
- Provide nutrition – if respiratory rate 60-80 breaths per minute, then use NGT or TPN
- If tachypnoea persists more than 4-6hrs begin antibiotics (ampicillin + gentamicin)
- Fluid restriction may be helpful in severe cases

Cardiac Disease

Aortic Stenosis

- Associated with Williams syndrome
- **Balloon valvulotomy (=valvuloplasty)**
  - If high resting pressure gradient (>65mmHg)
  - If symptomatic
  - Critical aortic stenosis is very rare in infants and children. Sometimes used palliatively before child is old enough for surgery or TAVR
- **Transcatheter aortic valve replacement (TAVR)**
  - Most children with significant stenosis will require this

Atrial Septal Defect (ASD)

- Caused by persistence of the **patent foramen ovale.**
- **Ejection systolic murmur** best heard at the **upper left sternal edge** and fixed wide-split second heart sound
- **Observation**
  - Main management strategy as the defect may close or shrink with time
- **Indications** for treatment:
  - Measurement ratio of pulmonary to systemic blood flow (**Qp:Qs**)
    - If **>1.5.**
    - **NB.** If **<1.5** then does not require closure
  - If ASD large enough to cause right ventricular dilatation will require closure
  - If symptomatic: fatigue, exertional dyspnoea, palpitations and syncope
- Closure of ASD
  - Usually undertaken pre-school age
  - Approaches:
    - **Transcatheter closure**
      - Ostium secundum ASD (commonest type); inserts occlusive device
    - **Open heart surgery**
      - Primum ASD (and sometimes Secundum ASD); direct repair

Coarctation of the Aorta

- 98% occur distal to the left subclavian artery

- Most common presentation is at 48 hours old when the ductus arteriosus closes
- **Prostaglandin E1 infusion**
  - To maintain duct patency
- **Surgical repair**
  - End-to-end anastomosis or arch reconstruction with patch placement or bypass graft
  - Older patients may require stent insertion or surgical resection

Congenital Cyanotic Heart Disease

- **Includes – Transposition of great arteries, Tricuspid atresia, Tetralogy of Fallot**
- Stabilise the **airway and breathing**:
  - **Intubate** if indicated
  - Consider **hyperoxia test**: start 10 minutes 100% oxygen. If SpO2 persistently low, likely congenital cyanotic heart disease (or primary pulmonary pathology).
  - Supplemental oxygen to maintain saturations 75-85%
- **Circulation**
  - Gain access: site 2 IV cannulae or consider placing umbilical vein/artery catheter (UVC/UAC)
  - 10ml/kg crystalloid bolus (maximum 30ml/kg) for hypotension. Give adrenaline for resistant hypotension.
- Maintain **duct patency:** key to early survival
  - Start **prostaglandin E1 infusion** at 5-10 nanograms/kg/minute
  - Most infants with cyanotic heart disease presenting in the first week of life, are **duct-dependent**
  - Side-effects of prostaglandins: apnoea, hypoglycaemia (jitteriness, flushing), seizures, vasodilation, hypotension, fever
- Check **blood glucose** levels regularly

Heart Failure

- Aims:

Reduce preload	Using diuretics (e.g. furosemide) or more rarely, venous dilators (e.g. nitroglycerin)
Enhance cardiac contractility	Using IV agents (e.g. dopamine) Other options: digoxin, dobutamine, adrenaline, milrinone
Reduce afterload	Oral ACE inhibitors IV agents (e.g. hydralazine, nitroprusside, alprostadil)
Improving oxygen delivery	Beta-blockers (e.g. carvedilol)
Enhancing nutrition	Increased caloric needs and may tire with feeding, so intermittent/continuous nasogastric/gastrostomy tube feeds are needed
Exercise and physical activity	Routine daily exercise depending on capacity

- Stage A:
  - Patients at risk of HF with normal cardiac function = **no** treatment for HF
- Stage B:
  - Asymptomatic patients with abnormal systemic ventricular function = **ACE inhibitors** or **ARBs** if intolerant of ACE inhibitors
- Stage C:
  - Current/past symptoms and structural/functional heart disease = initial **ACE inhibitor + mineralocorticoid receptor antagonist**
  - Add a **diuretic** as needed for fluid overload
  - A few weeks of stability but no improvement in function = add **beta blocker**
  - **Low dose digoxin** may be used to symptom relief

- Stage D:
  - End stage HF, refractory to oral medical therapy = **IV inotropes and diuretics**
  - May need **positive pressure ventilation, cardiac resynchronisation therapy +/- heart transplant**
- If heart failure is thought to be due to a cardiac malformation:
  - If cyanotic, start **prostaglandin infusion**
    - This maintains a PDA in duct-dependent heart disease and buys time before surgical correction can be performed

Infective Endocarditis

- **Antibiotic prophylaxis:** Recommended for patients at increased risk of developing IE:
  - Acquired valvular heart disease with stenosis or regurgitation
  - Valve replacement: prosthetic valve, including a transcatheter valve, or those in whom any prosthetic material was used for cardiac valve repair
  - Previous episode of IE
  - HOCM
  - Structural congenital heart disease:
    - Any type of cyanotic CHD
    - Any type of CHD repaired with a prosthetic material, whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if residual shunt or valvular regurgitation remains
    - Excludes isolated ASD, fully repaired VSD or fully repaired PDA and closure devices deemed to be endothelialised
- **MDT**
  - Cardiologists, cardiac surgeons, infectious disease specialists, and microbiologists
- **Antibiotics**
  - **Initial 'blind' therapy:**
    - Native valves
      - **Beta-lactam +/- low-dose gentamicin**
        - Beta-lactams: benzylpenicillin, ampicillin, ceftriaxone, amoxicillin
      - **Low-dose gentamicin** PLUS **vancomycin**
        - Use in instead of beta-lactams if **penicillin allergic**
        - Use with beta-lactam if **MRSA suspected**
        - Use if **severe sepsis**
      - **Vancomycin** PLUS **meropenem**
        - Use instead of beta lactams **if severe sepsis** with risk factors for **Gram-ve infection**
    - Prosthetic valves
      - **Vancomycin** PLUS **rifampicin** PLUS **low-dose gentamicin**
  - **Penicillin-sensitive *Streptococci***
    - **Benzylpenicillin sodium** for 4-6 weeks. NB: 6 weeks for prosthetic valve endocarditis
    - Penicillin allergic: give **vancomycin (or teicoplanin) PLUS low-dose gentamicin**. For 4-6 weeks, stopping gentamicin after 2 weeks
  - **Less sensitive Streptococci**
    - **Benzylpenicillin sodium** PLUS **low-dose gentamicin**
    - If penicillin allergic or highly penicillin resistant, give **vancomycin (or teicoplanin) PLUS low-dose gentamicin.**
    - Continue for 4-6 weeks (6 weeks if prosthetic valves). Review need to continue gentamicin at 2 weeks and stop if micro-organism is moderately sensitive to penicillin. If indicated to continue gentamicin beyond 2 weeks, seek specialist advice.

- ***Staphylococci***
  - **Native valve:** Continue antibiotics for 4 weeks (or at least 6 weeks if secondary abscess or osteomyelitis occurs)
    - **Flucloxacillin**
    - Penicillin allergic or MRSA, give **vancomycin** PLUS **rifampicin**
  - **Prosthetic valve:** Continue antibiotics for at least 6 weeks. Review gentamicin at 2 weeks and seek specialist advice if need to continue further.
    - Flucloxacillin PLUS rifampicin PLUS low-dose gentamicin
    - Penicillin allergic or MRSA, give **vancomycin** PLUS **rifampicin** PLUS **low-dose gentamicin**

- **Surgery**
  - Indicated for removal of infected prosthetic material

Patent Ductus Arteriosus (PDA)

- Closure is recommended to abolish lifelong risk of **bacterial endocarditis** and of **pulmonary vascular disease**
- If a cyanotic disease is dependent on a patent ductus arteriosus (e.g. transposition of the great arteries), the patient should start a **prostaglandin infusion** to keep the PDA open until corrective surgery can be performed
- The duct can be closed using:
  - IV Indomethacin – 1st line treatment
  - Prostacyclin synthetase inhibitor
  - Ibuprofen
    - Usually done in premature/VLBW infants
- If pharmacological methods are unsuccessful, **surgical ligation** or **percutaneous catheter device closure** may be used
- Term infants:
  - Symptomatic >6mo, percutaneous catheter device closure ASAP
  - Usually closed using a coil or occlusive device introduced through a cardiac catheter at about 1 year of age, or delayed until 1yo
  - Diuretics can be given if delay of closure, to manage symptoms

Pulmonary Stenosis

- Mild form is asymptomatic and rarely progresses, so only need follow-up
- Moderate and severe disease:
  - Transcatheter balloon dilatation is the treatment of choice
  - Surgical valvuloplasty is 2nd line
  - **Endocarditis prophylaxis** given before high-risk procedures

Rheumatic Fever

- Acute rheumatic fever is treated with antibiotic therapy, antiinflammatory therapy, heart failure management

- **Anti-inflammatory therapy**
  - **NSAIDs (Naproxen/ Ibuprofen preferred,** [Aspirin previously]**)** are very effective at suppressing the inflammatory response of the joints and heart
    - Note: it should be given at a high dose for 1-2 or 6-8 weeks

- **Anti-streptococcal antibiotics**
  - (e.g. **penicillin V**, **benzathine benzylpenicillin**, **amoxicillin**)
  - may be used if there is any evidence of persistent infection

- **Symptomatic heart failure**
  - Treated with **diuretics** and **ACE inhibitors**

- **Prednisolone** may be required

- After the acute episode, recurrence should be prevented
- The most effective prophylaxis is monthly injections of **benzathine penicillin**
  - Alternative: oral penicillin OD or If proved penicillin allergy – oral erythromycin
  - Most recommend prophylaxis either 10 years after the last episode of acute rheumatic fever OR until the age of 21 years
  - Lifelong prophylaxis is recommended for those with severe valvular disease
- **Surgical** treatment with valve repair or replacement may be required

Supraventricular Tachycardia

- If haemodynamically stable:
  - 1st line: **vagal manoeuvres** preferably in the supine position with legs raised
  - 2nd line: **adenosine**
    - 50-100mcg/kg then 100-200mcg/kg then increase in increments up to a single dose of 500mcg/kg)
  - 3rd line is a choice of one of the following:
    - DC cardioversion
    - Amiodarone 5 mg/kg
    - Procainamide 15mg/kg
    - Flecainide 2mg/kg
- If haemodynamically unstable:
  - Attempt vagal manoeuvres and adenosine as above but do not delay **DC cardioversion**
- **Catheter ablation** is recommended if recurrent/ accessory pathway

Tetralogy of Fallot

- If severe with worsening cyanosis:
  - **Prostaglandin E1 infusion**
  - **Blalock-Taussig shunt**
    - Artificial tube between the subclavian artery and pulmonary artery
- Definitive **surgery** to repair underlying heart defect from 4 months of age onwards
  - Involves closing the VSD and relieving right ventricular outflow tract obstruction
- Complication:
  - **Hypercyanotic spells** (attacks of paroxysmal hyperpnoea and increased cyanosis that occur spontaneously/ after feeding/ prolonged crying/ defecation)
    - Place the patient in the knee-to-chest position
    - Administer oxygen
    - Insert IV line and administer phenylpephrine, morphine sulphate and propranolol
    - Prolonged attacks require sodium bicarbonate
    - Refer to cardiac centre

Transposition of the Great Arteries

- Maintain body temperature
- Correct acidosis and hypoglycaemia if present
- **Prostaglandin E1 infusion**
- **Balloon atrial septostomy**
  - Breaks the flap valve of the foramen ovale and encourages mixing of blood
  - Bolus of heparin given before BAS
- Arterial switch procedure in the first 2 weeks of life
  - Note: the coronary arteries also need to be transferred to the new aorta

Tricuspid Atresia

- Initial medical:
  - Maintain adequate flow through PDA = **prostaglandin E1 infusion**
  - Cardiorespiratory support = O2 and mechanical ventilation, inotropes, IV fluid
- Surgical:
  - First stage in neonates:
    - Early palliation to maintain a secure supply of blood to the lungs at low pressure by:
      - **Blalock-Taussig shunt insertion** (between subclavian and pulmonary arteries)
      - Pulmonary artery banding operation to reduce pulmonary blood flow if breathless
  - Second stage at 3-6m old:
    - Removal of shunt and direct anastomosis of SVC to Right pulmonary artery = Glenn
  - Third stage at 2-5yo:
    - Direct venous pathway from IVC into pulmonary arteries = Fontan
  - Needs antibiotic prophylaxis
- **Important**: complete corrective surgery is <u>not</u> possible in most cases because there is only one functioning ventricle

Vasovagal syncope

- **Patient education** is main treatment – teaching how to spot warning symptoms, avoid triggers and learn how to abort attacks
- Physical techniques such as **physical counter-pressure manoeuvres and tilt training** stop the faint when warning signs appear
- Increase volume – increase dietary salt and electrolyte rich sports drinks
  - May give fludrocortisone

Ventricular Septal Defect (VSD)

- **Murmur**: loud pansystolic murmur at the lower left sternal edge, quiet pulmonary second heart sound
- Small shunts will close <u>spontaneously</u>
  - This is demonstrated by disappearance of the murmur and a normal echocardiogram
  - **Observation** is first line treatment
- Whilst the VSD is present, bacterial endocarditis should be prevented by maintaining good dental hygiene
  - **Prophylactic amoxicillin** to patients at high risk of developing endocarditis
- **Large VSD (Qp: Qs >1.5)**
  - Heart failure is treated with **diuretics** (furosemide), or may need furosemide + captopril ± digoxin
  - Additional calorie input
  - Open surgery is usually performed to:
    - Prevent permanent lung damage from pulmonary hypertension and high blood flow (i.e. prevent Eisenmenger syndrome)
    - Manage heart failure and faltering growth
- **AVSD**
  - Treat heart failure medically and surgical repair at 3-6 months

Allergy and Respiratory disorders

Acute Otitis Media

- Admit if:
  - Severe systemic infection

    - Complications (e.g. meningitis, mastoiditis, facial nerve palsy)
    - Children < 3 months with a temperature > 38 degrees
- Advise that the usual course of acute otitis media is about 3 days but can last up to 1 week
- Advise regular doses of paracetamol or ibuprofen for pain
- There is no evidence to support the use of decongestants or antihistamines
- Antibiotic prescription management:
    - **No antibiotic prescription** - most cases will resolve spontaneously. Advise to seek help if the symptoms haven't improved after 3 days or if the child deteriorates clinically
    - **Back-up antibiotic prescription** - advise that the antibiotic is NOT needed immediately but should be used if the symptoms have not improved after 3 days or if they have worsened significantly at any time
    - **Immediate antibiotic prescription** - seek medical help if the symptoms worsen rapidly or the patient becomes systemically unwell
        - **Amoxicillin** - 5-7 days is first-line
        - Penicillin allergy: clarithromycin, erythromycin
- Note: antibiotics marginally reduce the duration of the pain but have no effect on risk of hearing loss

Acute Epiglottitis

- If acute epiglottitis is suspected, urgent hospital admission to intensive care unit and treatment are required
- Secure the airway- **intubation** (Usually endotracheal, tracheostomy if unsuccessful) and give supplemental oxygen
- Take a blood culture
- Start IV 2nd or 3rd generation cephalosporins (e.g. **ceftriaxone**) for 7-10 days
- In some patients, steroids and adrenaline may be used to reduce inflammation
- In severe cases, prolonged intubation may be necessary
- With appropriate treatment, most children will recover completely within 2-3 days
- Once stable and extubated, give oral co-amoxiclav
- **Rifampicin** prophylaxis to close contacts

Allergy

- See food allergies section
- See allergic rhinitis section
- See anaphylaxis section

Allergic Rhinitis

- Try to identify the most likely causative allergen
- Assess for atopy, including asthma, allergic conjunctivitis and eczema
- Look for signs of chronic nasal congestion (e.g. mouth breathing, cough, halitosis)
- Examine the nose for nasal polyps, deviated nasal septum, mucosal swelling or depressed or widened nasal bridge
- Sublingual immunotherapy is available only in house dust mite allergen, mixed grass pollens, timothy grass pollen and short ragweed pollen. It has the potential to modify the disease but is reserved for those patients resistant to other medications

Mild-mod intermittent, or mild persistent	Persistent moderate to severe, uncontrolled	Add-ons for ineffective therapy
1st: Allergen avoidance Consider **nasal irrigation** with saline to rinse nasal cavity. **Intranasal antihistamines** +/- **PO non-sedating**	1st: Continue as per treatment for less severe. Add regular **intranasal corticosteroid** during allergen exposure, e.g. intranasal mometasone,	Check compliance **Intranasal decongestants**, e.g. ephedrine or xylometazoline for up to 5-7 days.

antihistamines (e.g. loratidine or cetirizine) 2nd: If intranasal antihistamines contraindicated or not tolerated, use **intranasal chromone,** e.g. sodium cromoglycate.	fluticasone. Onset of action 6-8h after first dose and maximal effects may take 2 weeks 2nd: Consider **short course PO corticosteroids** (e.g. prednisolone) for 3-7 days.	**Intranasal anticholinergic** e.g. ipratropium bromide If symptoms of asthma, consider **leukotriene receptor antagonist** Sublingual or subcutaneous **immunotherapy**

- NB: intranasal antihistamines (e.g. azelastine) have faster onset of action and are more effective than oral antihistamines.
- **Review** in 2-4 weeks after initiating any treatment to consider step-up treatment if symptoms persist.
- If adequate symptom control with drug treatment achieved, advise patient to continue treatment until they are no longer exposed to the suspected allergen.

Angioedema

- For people with rapidly developing angio-oedema without anaphylaxis:
  - **Chlorphenamine** and **hydrocortisone**
    - Given slowly as infusion (IV) or intramuscularly (IM)
    - Arrange emergency **admission**
    - Arrange a review after the person has been discharged from hospital
  - For people with stable angio-oedema without anaphylaxis, identify the underlying cause so that further episodes can be avoided
- For people with mild symptoms of angio-oedema, treatment may not be needed
- For people with symptoms requiring treatment:
  - **Cetirizine** (or other non-sedating antihistamine such as fexofenadine, or loratadine)
    - For up to 6 weeks (use clinical judgement to determine the duration of treatment)
  - **Oral corticosteroid** (for example prednisolone 40 mg daily for up to 7 days)
    - If symptoms are severe
    - Given in addition to the non-sedating oral antihistamine
  - Advise the person to seek immediate medical help (by dialing 999 or attending A&E) if symptoms progress rapidly or if symptoms of anaphylaxis develop
- Provide additional information on urticaria:
  - The British Association of Dermatologists (BAD) information leaflet on Urticaria and Angioedema
  - Allergy UK website

Asthma

- **Medical Management in Children < 5 Years** (it may be impossible to diagnose asthma at this young age therefore these guidelines not only apply to children with diagnosed asthma but also apply to children with **suspected asthma**)
  - **STEP 1**: offer a **SABA** (e.g. salbutamol) as reliever therapy
    - Go to step 2 straight away if indications for requirement of maintenance therapy
      - Asthma-related symptoms 3 times a week or more
      - Waking at night due to asthma
      - OR Asthma not controlled by SABA reliever alone
  - **STEP 2**: add a paediatric **moderate-dose ICS** for an 8-week trial
    - If symptoms do not resolve at 8 weeks go to step 3 or consider alternative diagnosis

        - If symptoms resolve at 8 weeks:
            - Stop ICS and see if symptoms reoccur
                - If symptoms reoccur within 4 weeks of stopping:
                    - Restart **ICS** at a **low-dose**
                - If symptoms reoccur >4 weeks of stopping
                    - Repeat 8-week trial of moderate dose ICS
    - **STEP 3**: add a **LTRA** (e.g. montelukast) to the low dose ICS
    - **STEP 4**: stop **LTRA** and **refer** to a health care professional with expertise in asthma
- **Medical Management in Children aged 5-16 years**
    - **STEP 1**: offer a **SABA** (e.g. salbutamol) as reliever therapy
        - Go to step 2 straight away if indications for requirement of maintenance therapy
            - Asthma-related symptoms 3 times a week or more
            - Waking at night due to asthma
            - OR asthma not controlled by SABA reliever alone
    - **STEP 2**: add a paediatric **low-dose ICS**
    - **STEP 3**: add a LTRA and review response to treatment in 4-8 weeks.
    - **STEP 4**: stop LTRA and add a **LABA**
    - **STEP 5**: switch ICS and LABA to a **MART regimen** with a paediatric low-dose ICS
    - **STEP 6**: Increase ICS to paediatric **moderate-dose ICS** (by either continuing MART regimen or changing to a fixed-dose of an ICS and a LABA, with a SABA as a reliever therapy)
    - **STEP 7**: **seek advice** from a healthcare professional with expertise in asthma and consider either:
        - Increasing to **high-dose ICS**
        - Trial of an additional drug e.g. theophylline
- **Non-Pharmacological Aspects of Management**
    - Assess patient's baseline asthma status (can be done using Asthma Control Questionnaire or a lung function test (e.g. spirometry))
    - Provide self-management education and a **personalised asthma action plan** (available from **Asthma UK**)
    - Ensure child is up to date with routine immunisations
    - Provide information about sources of support (**Asthma UK**)
    - Advise about **trigger avoidance** (specific allergens, smoke, beta-blockers, NSAIDs)
    - Assess for the presence of anxiety and depression
    - Ensure that the patient has their own **peak flow meter**
    - Explain **how to use inhalers**
- **At Review**
    - Confirm adherence to medication
    - Review inhaler technique
    - Review if treatment needs to be changed
    - Ask about occupational asthma and triggers

PACES TIPS

- Explain the diagnosis (a condition where the airways are very sensitive and can tighten suddenly making it difficult to breath)
- Explain the step in the treatment (whether steroids are necessary or not)
- Discuss asthma action plan (carry blue inhaler everywhere, use up to 10 puffs every 30-60 seconds when breathless)
    - If no response, call an ambulance
- Explain how to use peak flow meter
- Advise on identifying triggers
- Support: Asthma UK and itchywheezysneezy.co.uk

Asthma Attack

- **Determine the Severity of Asthma**

Moderate	Severe	Life-Threatening
PEFR >50-75% best or predicted	PEFR 33-50% best or predicted	PEFR <33% best or predicted
Able to talk in sentences	Can't complete sentences in one breath or too breathless to feed/talk	SpO2 <92%
SpO_2 >92%	SpO_2 <92%	Altered consciousness or confusion
HR <140 (1-5 yrs) HR <125 (>5 yrs)	HR >140 (1-5 yrs) HR >125 (>5 yrs)	Exhaustion
RR <40 (1-5 yrs) RR <30 (>5 yrs)	RR > 40 (1-5 yrs) RR > 30 (>5 yrs)	Silent chest
	Accessory muscle use	Hypotension
		Cyanosis
		Poor respiratory effort

Life-threatening/ severe asthma	• **Admit to hospital**
	• Whilst awaiting admission give the following:
	• **Oxygen**
	  ○ Give **high-flow oxygen** to all patients with life-threatening asthma or if SpO2 <94%
	  ▪ Via tight-fitting facemask or venturi mask or nasal cannula
	  ▪ To achieve saturations **94-98%**
	• **SABA**
	  ○ **Salbutamol** (nebulised)
	  ▪ 5 mg if >5 yrs

	▪ 2.5 mg if 2-5 yrs ▪ Ideally should be oxygen-driven • Flow rate of at least 6L/min is usually required • **Ipratropium bromide** (nebulised) ○ Given in combination with SABA ○ 250mcg 1 month – 11 yrs ▪ Every 20-30 mins for first 2 hours ▪ Every 4-6 hours as required ○ 500mcg 12-17 yrs ▪ Every 4-6 hours as required • **Magnesium sulphate** (nebulised) ○ 150 mg ▪ Added to each nebulised salbutamol and ipratropium in the first hour in children with a short duration of acute severe asthma symptoms • **Corticosteroids** ○ Given to all patients with severe/ life threatening asthma ○ **Prednisolone** (steroid of choice) ▪ 1-2mg/kg/day oral OD • Maximum 40mg/day ▪ Can be given IM if oral not possible ▪ 3 days usually sufficient but may be extended depending on severity • Monitor PEFR and oxygen saturation to assess response to treatment • 2nd line treatments (if above fails): IV salbutamol/ IV aminophylline/ IV magnesium sulphate • **Discuss with senior clinician**, PICU or paediatrician
Moderate exacerbation requiring admission	• **Admit** to hospital (whilst awaiting admission give the following): ○ If moderate asthma and worsening symptoms despite initial bronchodilator treatment and/ or who have had a previous near-fatal asthma attack • Whilst awaiting admission give the following: • **Oxygen** ○ Give **high-flow oxygen** if SpO2 <94% ▪ Via tight-fitting facemask or venturi mask or nasal cannula ▪ To achieve saturations **94-98%** • **SABA** ○ Pressurised **metered-dose inhaler** with a large-volume **spacer** ▪ 1 puff every 30-60 seconds (up to 10 puffs) ▪ 5 tidal breaths should be taken per puff ▪ If response still poor, give further doses and switch to nebuliser if available • **Ipratropium bromide** ○ Given in combination with SABA ○ 250mcg 1 month – 11 yrs ▪ Every 20-30 mins for first 2 hours ▪ Every 4-6 hours as required ○ 500mcg 12-17 yrs ▪ Every 4-6 hours as required • **Corticosteroids** ○ Prednisolone ▪ 1-2mg/kg/day oral OD

	• Maximum 40mg/day • Monitor PEFR and oxygen saturation to assess response to treatment

Mild exacerbation or moderate exacerbation not requiring admission	• **Hospital admission not required**
	• **Oxygen**
	  ○ Give **high-flow oxygen** if SpO2 <94%
	  ▪ Via tight-fitting facemask or venturi mask or nasal cannula
	  ▪ To achieve saturations **94-98%**
	• **SABA**
	  ○ Pressurised **metered-dose inhaler** with a large-volume **spacer**
	  ▪ 1 puff every 30-60 seconds (up to 10 puffs)
	  ▪ 5 tidal breaths should be taken per puff
	• **Prednisolone**
	  ○ Consider prescribing a short course (3-5 days)
	• Once symptoms have subsided, advise patient to return to using their SABA as required up to 4 times per day (not exceeding 4-hourly)
	• The dose of ICS does not need to be altered and ICS should not be used as an alternative for oral prednisolone
	• Advise parents to monitor PEFR and to seek help if symptoms worsen/PEFR decreases
	• Consider initiating montelukast in children >2 yrs

Follow-up	• **Follow-up** within:
	  ○ **48 hours of presentation** if not admitted to hospital
	  ○ **2 working days** of discharge if admitted to hospital
	• Things to assess in review:
	  ○ Symptoms
	  ○ PEFR
	  ○ Inhaler technique
	  ○ Consider stepping-up treatment
	  ○ Possible non-compliance with current treatment
	  ○ Vaccinations
	  ○ Smoking (whether patient is a smoker or exposure to secondary smoke from household member)
	• Ensure that the person has received self-management education and a **personalised asthma action plan**
	• Consider referral to a respiratory physician if the person has experienced 2 asthma attacks within 12 month

Antibiotics are not routinely prescribed unless there is suspicion of bacterial infection

- Most asthma attacks are triggered by viral infection

Bronchiectasis

- All children with Bronchiectasis should be reviewed in secondary care
- Investigations in secondary care:
  - **Bronchiectasis Severity Index**
    - Should be calculated to gauge severity of disease
  - **Sweat chloride test** or genetic testing for CF

        - Should be offered to all children
    - **Screen for antibody deficiency**
        - IgG/ IgA/ IgM
        - Done for all patients with confirmed diagnosis
    - Test for primary ciliary dyskinesia in children
        - Only if no other cause for bronchiectasis is found and if there is a history of continuous rhinitis, neonatal respiratory distress, and/or dextrocardia
- Cause of bronchiectasis should be treated
    - For example treat cystic fibrosis (see separate section in guide)
- **Vaccination** against streptococcus pneumonia and seasonal influenza
    - Should be offered to all bronchiectasis patients

- **Non-cystic fibrosis bronchiectasis acute exacerbation**:
    - **Airway clearance techniques**
        - +/- nebulized saline for airway clearance

    - **Antibiotic treatment**
    - Can be started empirically but should be guided by sensitivities from sputum culture when they come back
    - Empirical oral antibiotics
        - For patients over 1 month old to 11 years:
            - 1st line
                - Amoxicillin
                - Clarithromycin
            - 2nd line
                - Co-amoxiclav
        - For patients 12 to 17 years
            - 1st line:
                - Doxycycline
            - 2nd line:
                - Co-amoxiclav
        - Ciprofloxacin can be started following specialist advice if co-amoxiclav cannot be used

    - Empirical IV antibiotics
        - If child is severely unwell or unable to take oral antibiotics
            - 1 month to 17 yrs
                - Co-amoxiclav
                - Piperacillin and tazobactam
            - 1yr to 17yrs
                - Ciprofloxacin (following specialist advice)

- Can be treated in primary care but refer to secondary care if:
    - 3 or more infective exacerbations in 1 year
    - They have had a severe infection
    - Symptoms not responding to repeat courses of antibiotics
- Refer to hospital if signs of more serious illness:
    - Cardiorespiratory failure
    - Sepsis

Admit for exacerbation if:

- Breathlessness with raised RR and increased work of breathing
- Circulatory or respiratory failure
- Cyanosis
- Temperature ≥ 38

        - Unable to take oral medications
        - No improvement with oral antibiotics, indicating step up to IV required

- British Lung Foundation patient information leaflet
    - Can be given to patient seeking more information of their condition

Bronchiolitis

- Immediate referral (call 999) if:
    - Apnoea
    - Child looks seriously unwell
    - Severe respiratory distress (e.g. grunting, marked recession, RR > 70/min)
    - Central cyanosis
    - Persistent oxygen saturation < 92% on air
- Consider referring if:
    - Respiratory rate >60/min
    - Difficulty with breastfeeding or inadequate oral fluid intake (50–75% of usual volume)
    - Clinical dehydration
- **Admit if:**
    - Apnoea – observed or reported
    - Persistent O2 saturations < 92% in RA
    - Inadequate fluid intake (50-70% of normal)
    - Features of severe respiratory distress e.g. grunting, chest recession, RR > 70
    - Lower threshold to admit for infants with risk factors for severe bronchiolitis

- Respiratory management
    - **Humidified oxygen**
        - If saturation is persistently **< 92%**
    - **CPAP**
        - If impending respiratory failure
    - **Upper airway suction**
        - Do not perform routinely
        - Perform if upper airway secretions are causing respiratory distress or feeding difficulties
    - **Fluids**
        - By nasogastric/orogastric tube if they cannot take enough fluid by mouth
        - Give IV fluids if cannot tolerate nasogastric or orogastric fluids or have impending respiratory failure
- Prevention
    - **Infection control measures** are required in the ward the patient is placed as RSV is highly infectious
    - **Palivizumab** (monoclonal antibody against RSV) reduces the number of hospital admissions in high-risk preterm infants

PACES TIPS

- Explain the diagnosis (common chest infection that affects about 1 in 3 children < 1 yr) and that it usually gets better by itself over 2 weeks
- Advise maintaining good hydration and using paracetamol if child over 3 months old and distressed
- Safety net about when to go to A&E/ call an ambulance (significant respiratory distress, apnoea)
- Refer to NHS webpage on bronchiolitis

Common Cold

- Reassure that the common cold is self-limiting

- Symptoms may peak after 2-3 days and they will typically resolve within 2 weeks
- Consider potential SARS-CoV-2 infection if they have any key symptoms (see COVID-19 guidance)
- Encourage **rest**, adequate **fluid** intake and a healthy diet
- Encourage the use of **paracetamol** or **ibuprofen** for symptomatic relief (antipyretic/ analgesic)
    - Not to be given simultaneously in children <5 yrs
    - Can alternate these agents if child appears to be distressed when given only one
    - Continue only as long as child appears distressed
- For symptomatic relief can try the following remedies:
    - Steam inhalation
    - Vapour rubs
    - Gargling salt water
    - Nasal saline drops
- If < 6 years over-the-counter cough and cold products should not be used; ingredients that should be avoided are:
    - Antitussives (dextromethorphan and pholcodine)
    - Expectorants (guaifenesin and ipecacuanha)
    - Topical and oral decongestants (ephedrine, oxymetazoline, phenylephrine, pseudoephedrine, and xylometazoline)
    - Antihistamines (brompheniramine, chlorphenamine, diphenhydramine, doxylamine, promethazine, and triprolidine)
- Honey and lemon with water can be used >1 yr for cough

Cough

As above

COVID-19

- **Notifiable disease**
- **SARS-CoV-2 test**
    - Patients with possible SARS-CoV-2 should be tested:
        - Individuals with new continuous cough/ temperature 37.8°C/ loss of, or change in, normal sense of smell (anosmia) or taste (ageusia)
- Patients with any of the above and are well enough to remain in the community should follow stay at home guidance and get tested
- Testing should also be considered in:
    - People with acute respiratory infection, clinical or radiological evidence of pneumonia, influenza-like illness, acute worsening of underlying respiratory illness, fever without another cause, onset of delirium in older people or immunocompromised person with possible atypical COVID-19 presentation
- Children are at lower risk of severe COVID, those most at risk are < 1 and 10-24 years of age
- **Vaccination** – children over 5 can be vaccinated, full course requires 2 doses at least 8 weeks apart
-
- **CT scan**
    - Has a high degree of accuracy in picking up COVID-19 (up to 85%)
    - Will show bilateral infiltrates in mid-zones which spare the apices and bases
- **Isolation**
    - Patient should be placed in respiratory isolation with staff entering having to wear the correct level of PPE
- **Oxygen**
    - Saturations need to be kept above 92%
- **CPAP** to be considered if
    - They are on 40% oxygen

- Respiratory rate is >30
- Increase PEEP up to 10cm H_2O

- **Dexamethasone (or hydrocortisone/prednisolone as alternatives)**
  - If supplemental oxygen required or if patient has a level of hypoxia requiring oxygen but is unable to have or tolerate it.
- **Remdesivir**
  - 5 day course in young people 12 years and over weighing 40kg or more in hospital and needing low-flow supplemental O2.
- **ITU**
  - If patient is on >60% oxygen
- Antibiotics
  - Can be useful as most people at post-mortem have been found to have bacterial infection in addition to COVID-19

- **Multisystem-inflammatory syndrome**
  - complication of COVID-19 seen in paediatric population,
  - requires admission, close monitoring + discussion with HDU/PICU

Cow's Milk Protein Allergy

- **IgE-mediated** (Onset within minutes (up to 2 hours) of ingestion)
  - Mild-moderate
    - **Allergy testing** at specialist allergy clinic
    - **Paediatric dietician referral**
    - Exclusively breast-feeding mother
      - **Exclusion** of all cow's milk protein from mother's diet
      - Mother to take calcium and vitamin D supplements
    - Formula fed or mixed feeding
      - Trial of **extensively hydrolysed formula**
  - Severe
    - As above and:
    - Consider elemental (amino acid) formula if extensively hydrolysed formula not effective
    - Refer to A&E if severe respiratory or CVS signs present – risk of anaphylaxis
- **Non-IgE mediated** (Onset 2-72 hours after ingestion)
  - Mild- moderate
    - Be wary of diagnosing infant with CMA as GI symptoms of vomiting and diarrhoea are very common
    - Exclusively breast-feeding mother
      - **Exclusion** of all cow's milk protein from mother's diet for 2-4 weeks, followed by home reintroduction of cow's milk to confirm diagnosis if there is clear symptom improvement.
      - Mother to take calcium and vitamin D supplements
    - Formula fed or mixed feeding
      - Trial of **extensively hydrolysed formula**
  - Severe
    - Classified as severe if above measures taken and symptoms persist and are severe – symptoms to look out for:
      - Skin: pruritis/ erythema/ atopic eczema
      - GI: GORD/ vomiting/ loose stools/ blood or mucus in stools/ abdominal pain or discomfort/ infantile colic/ food refusal or aversion/ constipation/ perianal redness/ pallor or tenderness/ faltering growth
      - Resp: cough/ chest tightness/ wheezing/ shortness of breath
    - Continue management as per mild/moderate non-IgE mediated CMA plus:
      - **Urgent referral to local paediatric allergy service**

        - **Urgent referral to dietician**
    - Advise cow's milk free diet until child 9-12 months old and for at least 6 months if non-IgE-mediated allergy confirmed. After which, commence milk ladder for home reintroduction of cow's milk to assess whether tolerance acquired.
- **Weaned infants/older children**:
    - Exclude cows' milk protein from their diet
    - Offer nutritional counselling with a **paediatric dietician**
    - Regularly monitor growth
    - Re-evaluate the child to assess for tolerance to cows' milk protein (every 6-12 months) - this involves re-introducing cows' milk protein into the diet
        - If tolerance is established, greater exposure of less processed milk is advised following a '**Milk Ladder**' (available from Allergy UK)

PACES TIPS

- Explain the diagnosis (allergic reaction to some of the proteins in milk)
- Explain that it is common (5-15% of infants)
- Treatment is simple: avoid cows' milk in maternal diet (breastfeeding) or switch to hypoallergenic formula
    - Consider calcium and vitamin D supplementation
    - NOTE: it takes 2-3 weeks to fully eliminate cows' milk from breastmilk
- Many children will grow out of it (review in 6-12 months and consider re-introducing cows' milk protein using a milk ladder)
- Advise regularly monitoring growth
- **Support**: British Dietetic Association (BDA) has produced a useful fact sheet

Croup (laryngotracheobronchitis)

- Consider admitting all children with moderate or severe illness:

Symptoms	Mild	Moderate	Severe
Seal-like barking cough	☑	☑	☑
Stridor		☑	☑
Sternal/intercostal recession at rest		☑	☑
Agitation/ lethargy			☑

- Admit children with impending respiratory failure:
    - History of severe obstruction, previous severe croup, known airway structural abnormality
    - Increasing upper airway obstruction
    - Sternal/intercostal recession
    - Asynchronous chest wall and abdominal movement
    - Fatigue
    - Pallor
    - Cyanosis
    - Decreased level of consciousness
    - Respiratory rate >70
- All severities of croup:
    - **Oral dexamethasone** (0.15 mg/kg)
        - If oral medication not possible:
            - Inhaled beclomethasone (2mg)
            - IM dexamethasone (0.6mg/kg)

- Mild croup
  - Hospital admission not required
  - **Safety net**:
    - Advise to take child to hospital if continuous stridor heard or skin between ribs pulling in with every breath
    - Advise to call an ambulance if child is:
      - Very pale, blue, or grey (includes blue lips) for more than a few seconds
      - Unusually sleepy or is not responding
      - Having a lot of trouble breathing
      - Upset (agitated or restless) while struggling to breathe and cannot be calmed down quickly
      - Unable to talk, are drooling, or having trouble swallowing
- Moderate croup
  - **Oxygen**
- Severe croup
  - Oxygen
  - **Nebulised adrenaline** (1 in 1000 (1mg/ml))
  - Intubation in minority of cases where respiratory failure occurs

PACES TIPS

- Explain diagnosis (common infection of the airways)
- Explain that it gets better over 48 hours and steroids have been given to help that
- If it gets worse, come back
- If the child becomes blue or very pale for more than a few seconds, unusually sleepy or unresponsive or serious breathing difficulties call an ambulance
- Paracetamol or ibuprofen if distressed
- Advise good fluid intake
- Advise regularly checking on the child at night (cough is worse)

Cystic Fibrosis

- Δ F508 mutation
  - This specific mutation can be treated with **lumacaftor/ivacaftor** (increase CFTR protein trafficking to cell membrane)
- Pulmonary complications management
  - Common complications:
    - Pneumonia
    - Nasal polyps
    - Sinusitis (prevalence increases with age)
  - General prophylactic management
    - airway clearance techniques
    - mucoactive agents
      - 1st line **rhDNase**
      - 2nd line **hypertonic sodium chloride** +/- **rhDNase**
      - 3rd line **mannitol dry powder for inhalation**
  - Staphylococcus aureus pneumonia
    - **Flucloxacillin** (as prophylaxis)
      - From diagnosis to 3rs age
      - Can be given up to 6 yrs age
  - Pseudomonas aeruginosa pneumonia
    - Acute infection
      - 1st line: treat as per local guidelines with **oral/ inhaled antibiotics**

            - Consider IV antibiotics if unwell
        - Chronic/ persistent infection
            - 1st line: nebulised/ inhaled **Colistimethate sodium**
                - Plus oral antibiotic/ 2 IV antibiotics of different classes if clinically unwell with a pulmonary disease exacerbation
            - 2nd line: **Tobramycin DPI**
    - Immunomodulatory agents for patients with deteriorating lung function
        - **Azithromycin**
        - **Oral corticosteroids**
- Gastrointestinal complications management
    - Common complications:
        - Underweight/ malnutrition
        - Intussusception
        - meconium ileus (affects 1 in 7 newborn babies)
        - fat-soluble vitamin deficiencies (including vitamins A, D, E and K)
    - **High calorie diet**
    - Pancreatic enzyme replacement therapy (e.g **Creon**)
        - Insufficiency of pancreatic enzymes can be tested with faecal elastase
    - **H2 receptor antagonist** or **PPI**
        - If malabsorption persistent despite optimal pancreatic enzyme replacement therapy
- Other complications
    - Other complications:
    - distal intestinal obstruction syndrome
        - First line: **diatrizoate meglumine** and **diatrizoate sodium solution** (Gastrografin) (orally or via an enteral tube)
    - Liver disease (the prevalence increases with age until early adulthood)
        - if abnormal LFTs then **ursodeoxycholic** acid first line (stop once LFTs recover)
        - if chronic and deteriorating refer to specialist
    - urinary stress incontinence
    - muscle pains and arthralgia
    - male infertility caused by obstructive azoospermia (almost all males with cystic fibrosis are infertile)
    - reduced female fertility
    - cystic-fibrosis-related diabetes (uncommon in children under 10 years, but the prevalence increases with age and it affects up to 1 in 2 adults)
    - reduced bone mineral density (including osteoporosis)
    - Genetic counselling for the parents, and child once of appropriate age

PACES TIPS

- Explain the diagnosis (lifelong condition characterised by recurrent respiratory infections and malabsorption)
- Explain that that management requires an MDT approach
- Explain that they will be referred to a specialist cystic fibrosis centre to discuss the ongoing management
- Offer to outline the aspects of management:
    - **Pulmonary** – physiotherapy, mucolytics
    - **Infection** – prophylactic antibiotics, monitoring
    - **Nutrition** – enzyme tablets, high-calorie diet, monitor growth
    - **Psychosocial** – provide support for child and carers
- Offer information on genetic counselling if considering having more children

Food Allergy

- Dietary treatment
  - **Exclusion of offending food(s)** from diet
  - Paediatric dietician referral
  - Dietary exclusion in mother should be considered if mother is breast feeding
- Drug treatment
  - Mild reactions (no cardiorespiratory symptoms) are treated with **non-sedating antihistamines (diphenhydramine)**
  - Severe reactions (with cardiovascular, laryngeal or bronchial involvement) require **IM adrenaline** (may be given by autoinjector (EpiPen)) and **salbutamol** if bronchospasm occurs
- Educating the child and family about how to manage an allergic attack (**allergy action plan**)
  - Provide written self-management plans and training
  - Provide **Epi-Pens** for home use, advise to keep 2 doses with them at all times. Doses of 1:1000 adrenaline:
    - >12 years 500mcg
    - 6-12 years 300mcg,
    - 6 months to 6 years 150 mcg,
    - child < 6 months 100-150mcg
- **Food challenge**
  - After 6-12 months of being symptoms-free consider a food challenge
  - If previous reaction was severe then consider doing this in hospital

PACES TIPS

- Explain the concept of allergy (the body's immune system reacts to substances that are not harmful to other people (e.g. milk))
- Mainstay of treatment is strict avoidance of the allergens
- Discuss an allergy action plan
- Explain that some children grow out of allergies
- Explain the use of non-sedating antihistamines and adrenaline
- Food allergy to cows' milk and egg often resolves in early childhood, so gradual reintroduction may be possible
- Food allergy to nuts and seafood usually persist through to adulthood

Foreign Body Inhalation

- **Conscious**
  - Encourage coughing
  - External maneuvers
    - Back blows (x 5)
    - Abdominal thrusts (Heimlich) (x 5)
      - NOTE: these should NOT be done on infants and very young children
      - Can be done in those >1 year of age
      - Chest thrusts for infants (x 5)
  - Removal of foreign body
    - **1st line**: Flexible bronchoscopy or rigid bronchoscopy
      - Rigid bronchoscopy is preferred in cases of stridor, asphyxia, radio-opaque object seen on CXR, a history of foreign body aspiration associated with unilateral decreased breath sounds, localising wheeze, obstructive hyper-inflation, or atelectasis

        - In all other cases, flexible bronchoscopy should be performed to confirm the diagnosis
        - This is usually done with **conscious sedation** or **general anaesthesia**
    - **2nd line**: surgery, thoracotomy
- **Unconscious**
    - Start CPR resuscitation in line with pediatric BLS guidelines
    - Secure the airway immediately (endotracheal intubation)
        - Unless the foreign body can be seen and removed from the upper airway
        - May need to do a cricothyroidotomy
    - Removal of foreign body (as above)

Lactose intolerance

- Hereditary:
    - Dietary modification by avoidance and trialing different foods to discover their lactose threshold
        - Should be done with a dietician
    - Can use lactase-treated dairy products or oral lactase supplementation
    - Supplementation of calcium and vitamin D is required
- Acquired:
    - Treat the underlying cause
    - Consult a dietician to do dietary modification
    - Can use lactase-treated dairy products or oral lactase supplementation
    - Supplementation of calcium and vitamin D is required

Laryngitis

- If there is airway compromise:
    - Secure airway – emergency tracheostomy may be required
    - If patient doesn't have diphtheria then can give:
        - Dexamethasone sodium phosphate: to reduce oedema
        - **Cefalozin** AND **cefalexin:** administered IV to start and then changed to oral antibiotics
    - If patient has diphtheria:
        - Patient needs to be isolated
        - Benzylpenicillin sodium IV/IM for 14d
        - Diphtheria antitoxin
- If there is no airway compromise:
    - Viral:
        - Analgesia as required: paracetamol
        - Vocal hygiene: voice rest for 3-7d, increase hydration, humidification, decreased caffeine intake
        - Mucolytic can be given to help lubricate the vocal folds
    - Bacterial:
        - Phenoxymethylpenicillin for 14d
        - Analgesia as required: paracetamol
        - Vocal hygiene: voice rest for 3-7d, increase hydration, humidification, decreased caffeine intake
        - Mucolytic can be given to help lubricate the vocal folds

Laryngomalacia

Mild disease	• Observation and reassurance as patient has no respiratory distress or failure to thrive, so can keep monitoring growth and reviewing
	• May need GORD therapy:
	  ○ 1st line: thickened feeds
	  ○ 2nd line: Famotidine OR omeprazole
	  ○ 3rd line: Nissen fundoplication
	• Patient should be fed upright

Moderate disease	• Observation as patient may have increased work of breathing and weight loss/inadequate gain
	• GORD therapy as above
	• May need surgical therapy:
	  ○ 1ry: endoscopic supraglottoplasty – relieves obstruction from supraglottis
	  ○ 2ry: Tracheostomy
	• May need BiPAP
	  ○ If patient has OSA, surgery isn't indicated or hasn't worked

Severe disease	• Surgical therapy:
	  ○ 1ry: endoscopic supraglottoplasty – relieves obstruction from supraglottis
	  ○ 2ry: Tracheostomy
	• BiPAP
	• GORD therapy

Most have **excellent prognosis** with the condition resolving by 2 years of age

Otitis Externa

- **Localised otitis externa:**
  - Analgesia and local heat application using warm flannel. Often sufficient as folliculitis tends to be mild and self-limiting
  - Oral antibiotics: rarely indicated
    - Furunculosis or cellulitis spreading beyond ear canal
    - Systemic infection, e.g. fever
    - Diabetes mellitus or immunocompromised
  - Referral for pus incision and drainage: rarely indicated
- **Acute otitis externa: <3 months**
  - Ibuprofen/paracetamol can be used for pain management. If severe pain and >12yo, then can use codeine with the paracetamol
  - Antibacterial ear drops: ciprofloxacin and dexamethasone otic (0.3%/0.1%) 2x day for 7-14 days
    - Ear needs to be cleaned of wax first and may need a wick to deliver the drops if the ear is too swollen
  - **Oral flucloxacillin OR clarithromycin (penicillin allergic):** rarely indicated
    - Cellulitis extending beyond external ear canal
    - Ear canal occluded by swelling and debris, inhibiting wick insertion
    - Diabetes or immunocompromised, or high risk of severe infection, e.g. Pseudomonas
- **Chronic otitis externa: >3 months**
  - Avoidance of triggers, e.g. swimming, scratching, aggressive cleaning
  - If **fungal** infection suspected:

        - **Mild-moderate:**
            - Clotrimazole 1% solution
            - Acetic acid 2% spray
            - Clioquinol and corticosteroid (e.g. Locorten-Vioform)
    - **Cause evident:**
        - Allergic dermatitis: topical corticosteroid
        - Seborrhoeic dermatitis: antifungal/corticosteroid combination
    - **No cause evident:** 7-day topical preparation containing only corticosteroid and no antibiotic. Consider co-prescribing acetic acid spray.
- If malignant otitis suspected, urgent admission required - systemic antibiotics ± debridement

Pneumonia

- **Immediately refer for hospital admission if:**
    - Persistent SpO2 < 92% on air
    - Grunting, marked chest recession, RR > 60/min
    - Cyanosis
    - Child looks seriously unwell, does not wake, or does not stay awake if roused or does not respond to normal social cues
    - Temperature > 38 degrees in a child < 3 months
    - **Consider admission if**: dehydration, decreased activity, nasal flaring, predisposing diseases (e.g. chronic lung disease)
    - Whilst awaiting hospital admission
        - Give **controlled supplemental oxygen** if SpO2 < 92%
- **If hospital admission is <u>not</u> needed:**
    - Most children can be managed <u>at home</u>
        - Bacterial and viral pneumonia are difficult to differentiate so all children should be given antibiotics.
    - **Amoxicillin** is first-line for 5 days for **low-moderate severity**
        - If penicillin allergic, give **clarithromycin**
        - **Macrolides** can be added at any stage if there is no response to first-line treatment
    - **Co-amoxiclav** for **high severity**
        - Add **clarithromycin** if atypical organism suspected
    - Paracetamol or ibuprofen can be used as antipyretics
    - Keep adequate hydration
    - Seek medical advice if RR increases, dehydration occurs or worsening of fever
- If admission required:
    - **PO** antibiotics if tolerated. Otherwise, **IV** and review after **48h** to consider switching to PO.

PACES TIPS

- Explain the diagnosis (chest infection)
- Explain whether admission is needed
- Explain treatment (antibiotics)
- Advise paracetamol used if distressed
- Advise adequate fluid intake
- Advise against parental smoking
- Check the child regularly during the day and night
- Seek medical advice if child deteriorates (increased respiratory distress, reduced responsiveness)

Scarlet Fever

- Notify the **Health Protection Unit (HPU)**
- **Antibiotics**
    - **Phenoxymethylpenicillin** (**penicillin V**) - QDS for 10 days
    - Azithromycin (if penicillin allergy)
    - Treatment for 10 days is needed to prevent complications such as acute glomerulonephritis and rheumatic fever
- Stay away from nursery/school for 24 hours after starting antibiotics
- Paracetamol or ibuprofen can be given for symptomatic relief
- Symptoms should settle down after around 1 week

Sinusitis

- Refer to hospital if there are symptoms and signs of:
    - Severe systemic infection
    - Intraorbital or periorbital problems (e.g. periorbital cellulitis, displaced eyeball, double vision)
    - Intracranial complications (e.g. features of meningitis)
- Symptoms lasting **< 10 days**
    - Do NOT offer an antibiotic
    - Advice
        - Acute sinusitis is usually caused by a virus and takes 2-3 weeks to resolve
        - Symptoms, such as fever, can be managed using **paracetamol or ibuprofen**
        - Some people may find some relief using **nasal saline or nasal decongestants**
            - Can be given **intranasal corticosteroid** for congestion
        - Medical advice should be sought if symptoms worsen rapidly, if they do not improve in 3 weeks or become systemically unwell
- Symptoms lasting **> 10 days** but <4wks
    - Commonly bacterial infection
    - Consider **high-dose nasal corticosteroid for 14 days** for adults and children > 12 years old (e.g. mometasone)
        - May improve symptoms but unlikely to affect duration of illness
        - Could cause systemic side-effects
    - Consider NO antibiotic prescription or back-up prescription
        - Antibiotics are unlikely to change the course of the illness
        - The back-up prescription should be used if symptoms get considerably worse or it has still not improved by 7 days
            - 1st line: **phenoxymethylpenicillin**
                - NOTE: clarithromycin if penicillin allergy
            - 2nd line: co-amoxiclav
    - Advise patients to seek medical advice if they develop complications or their symptoms don't improve/worsen

Sleep Disordered Breathing

- Children with adenotonsillar hypertrophy may need **adenotonsillectomy** which usually causes a dramatic improvement in symptoms
- Other children may benefit from CPAP or BiPAP to maintain their upper airway at night
- Can use montelukast +/- intranasal budesonide if surgery didn’t improve the obstruction

Sore Throat (Pharyngitis and Tonsillitis)

- **Hospital admission** if:
    - Difficulty breathing
    - Clinical dehydration
    - Peri-tonsillar abscess or cellulitis
    - Signs of marked systemic illness or sepsis

    - A suspected rare cause (e.g. Kawasaki disease, diphtheria)
- **Antibiotics**
    - Given if either
        - Group A Streptococcus has been confirmed: **Immediate** or **back-up**
            - **FeverPAIN score** (4 or 5) or **Centor score** (3 or 4)
            - Throat cultures
            - Rapid antigen testing
        - Person is experiencing severe symptoms, systemically very unwell, or high risk of complications: **immediate** prescription indicated
    - **Phenoxymethylpenicillin**
        - Given for 5 to 10 days
    - Clarithromycin
        - If penicillin allergy
    - Avoid amoxicillin because it may cause a widespread maculopapular rash if the tonsillitis is due to infectious mononucleosis
- Advice
    - Adequate fluid intake
    - Paracetamol or ibuprofen when necessary
    - Salt water gargling, lozenges or anaesthetic sprays (e.g. Difflam) may provide temporary relief of throat pain
    - Children can return to school after fever has resolved and they are no longer feeling unwell and/or after taking antibiotics for 24 hours
    - Patients with recurrent tonsillitis may require referral to ENT for **tonsillectomy**

PACES TIPS

- Explain that this is tonsillitis
- Explain that importance of taking antibiotics correctly for 10 days even if symptoms get better in that time
- Avoid school until 24 hours after starting antibiotics and the child is feeling well
- Advise on the use of paracetamol, lozenges, saltwater gargling and Difflam for symptomatic treatment

Urticaria

- **Avoid triggers**
    - Identify triggers and if possible, give clear instructions of avoidance strategies
- **Symptom diaries**
    - To determine frequency, duration and severity of urticarial episodes
- **Urticaria Activity Score (UAS7)**
    - Used to assess severity of urticaria
    - The parent/ person records the severity of itching and the number of weals daily for 7 days
    - A score of less than 7 in 1 week indicates control of disease, whereas a score > 28 per week indicates severe disease
- For people with mild urticaria with an identifiable and avoidable cause/ trigger:
    - Advise that urticaria is likely to be self-limiting
- For people with symptoms requiring treatment:
    - **Cetirizine** (or other non-sedating antihistamine e.g. fexofenadine or loratadine)
        - Usually given for up to 6 weeks
            - Can be given for up to 3-6 months if it is likely that symptoms will recur
    - **Prednisolone** (or other oral corticosteroid)
        - If symptoms severe
- Referral to the dermatologists or immunologists if:

    - Painful and persistent
    - Symptoms not well controlled with antihistamines
    - Acute severe urticaria due to food or latex allergy
- Provide additional information on urticaria:
    - The British Association of Dermatologists (BAD) information leaflet on Urticaria and Angioedema
    - NHS A-Z - Urticaria (hives)
    - Allergy UK website

Viral Episodic Wheeze/Viral-induced Wheeze

- **Important**: do not diagnose these patients with asthma as many preschool children will grow out of their illness by the age of 6 and a diagnosis of asthma can affect a person's future employment e.g. airline pilots, commercial drivers, armed forces, police will require normal pulmonary function tests
- Management settings most commonly home or hospital.
    - 1st line: **salbutamol**
        - **Burst Therapy** is often used for viral-induced wheeze
            - The child is given 10 puffs of salbutamol using a high-volume space. Give a puff every 30-60s
            - They are then assessed for a response to treatment
            - Repeat every 10-20 minutes
            - If they can last 4 hours without the symptoms reappearing, they can be discharged
            - They will be given a **salbutamol weaning regime** for the salbutamol inhaler with a spacer.
            - Use inhaler as required at home in further episodes of VIW
    - Escalate treatment as per 'Acute asthma' section
- If mild intermittent wheeze and respiratory symptoms that only occur with viral URTI, consider not giving maintenance treatment but planning a review in an agreed time interval.
- Encourage parents who are smokers to stop
- **Follow-up** required **within 48h of presentation** if not admitted to hospital, or **2 working days of discharge**.

PACES TIPS

- Explain the diagnosis (narrowing of the airways due to a viral chest infection causes difficulty breathing)
- Inhaled medication helps to open up the airways and make you breathe easier
- Explain that the child will be monitored for 4 hours to see whether they can be symptom-free for 4 hours after the episode
- Discharge with salbutamol and spacer
    - 10 puffs through spacer maximum of every 4 hours
    - If no response after 10 puffs, seek help
    - If symptomatic 48 hours after discharge, seek help

Whooping Cough

- Notify the **Health Protection Unit (HPU)**
- **Admit in isolation if:**
    - < 6 months old or acutely unwell
    - Significant breathing difficulties (e.g. apnoea, severe paroxysms, cyanosis)
    - Significant complications (e.g. seizures, pneumonia)
- **Pharmacological Treatment** - if admission is not needed, prescribe an antibiotic if the onset of the cough is **within 21 days**.
    - < 1 month old = **clarithromycin**

    - >1 months old and not pregnant = **azithromycin**
    - If pregnant = **erythromycin**
        - Recommended from 36 weeks gestation without vaccination to reduce the risk of transmission to the newborn
    - If macrolides contraindicated, give **co-trimoxazole**
        - Do **not** use in pregnant or infants <6 weeks of age
- **Advice**
    - Rest, adequate fluid intake and the use of paracetamol or ibuprofen for symptomatic relief
    - Inform the parents that, despite antibiotic treatment, the disease is likely to cause a protracted non-infectious cough that may take weeks to resolve
    - Advise that children should avoid nursery until 48 hours of appropriate antibiotic treatment has been completed or until 21 days after the onset of the cough if it was not treated
    - Once the acute illness has been dealt with, advice parents to complete any outstanding immunisations
    - Counsel that cough can persist for 3 or more months in some children

PACES TIPS

- Explain the diagnosis (cough that lasts for a reasonably long time)
- Explain that it isn't seen very often because of the immunisation programme (and discuss concerns about immunisation with the parent)
- Explain that having it once does not mean you can't have it again
- Explain that antibiotics can help treat the condition, but the cough often persists for a long time
- Exclude from school until 48 hours after starting antibiotics

Gastroenterology

Anal Fissure

- Ensure stools are soft and easy to pass
    - Increase dietary fibre (include foods containing whole grains, fruits and vegetables)
    - Increase fluid intake
    - Consider constipation treatment: lactulose, macrogol
    - Stool softeners
- Manage pain
    - Glyceryl trinitrate intra-anally
    - OR Topical diltiazem 2% - fewer headaches and SE than GTN with similar efficacy
    - Offer simple analgesia (paracetamol or ibuprofen)
    - Sitting in a shallow, warm bath can help relieve the pain
- Advise on the importance of anal hygiene
- Advise against stool withholding
- Advise the parents that if it has NOT healed after 2 weeks or the child remains in a great deal of pain, they should seek help
- Keep in mind the possibility of sexual abuse

Appendicitis

- Surgical emergency – admit and closely monitor
- The patient should be nil-by-mouth from the time of diagnosis
- IV fluids and analgesia should be started
    - Consider IV antibiotics (cefoxitin)
- Requires immediate hospital admission

- **Appendectomy** performed without delay - open/laparoscopic
    - With peritoneal lavage if perforation
- In Complicated Appendicitis e.g. with perforation, abscess, appendix mass present:
    - If there is generalised guarding consistent with perforation- fluid resuscitation and IV antibiotics are given prior to laparotomy.
- If symptoms PROGRESS- laparotomy is indicated
- Follow-up in clinic afterwards

Coeliac Disease

- All products containing gluten (wheat, rye and barley) are removed from the diet
- Consider referral to dietician if there are problems with adhering to the diet
- Calcium and Vit D supplements +/- Iron should be given
- Arrange annual review
    - Check height, weight and BMI
    - Review symptoms
    - Review adherence to diet - IgA-tTG titre every 3m until normalised and then yearly
    - Consider blood tests (coeliac serology, FBC, TFT, LFT, vitamin D, B12, folate, calcium, U&E)
    - If concerns, bone mineral density (DEXA scan) should be evaluated

PACES TIPS

- Explain the diagnosis (caused by an inability to digest gluten (present in barley, rye and wheat)
- Reassure that it is a common condition (1 in 100) and the treatment is fairly straight forward (gluten-free diet)
- Explain that they will be put in touch with a dietician
- Explain the importance of keeping to a strict gluten-free diet (complications include malnutrition and cancer)
- Explain that follow-up is usually necessary every 6-12 months
- Advise regular measurements of height and weight on centile charts
- Support: Coeliac UK

Constipation

- Exclude red flag symptoms
- Reassure that underlying causes of constipation have been excluded
- Laxatives - may have to be taken for several months
- Check for faecal impaction - if present, recommend **disimpaction regimen**
    - Osmotic laxative (Movicol: polyethlene glycol with electrolytes): escalating dose over 2 weeks
    - With dietary/lifestyle modification
    - If unresponsive attempt: add Senna → sodium citrate enema → phosphate enema → manual evacuation under anaesthetic (rarely done)
- Start **maintenance laxative treatment** if impaction is not present/has been treated
    - Osmotic laxative (Movicol: polyethlene glycol with electrolytes)
    - With dietary/lifestyle modification
    - Once normal bowel routine established, gradually reduce dose
- Advise behavioural interventions
    - Bowel habit diary: for monitoring
    - Scheduled toileting: after meals and before bedtime
    - Reward systems/star charts: given for attempting to poo, not actually pooing
    - Address any anxieties about going to the toilet, staying calm and reassuring
    - Posture: make sure both feet are flat on the floor

- Diet and lifestyle advice
  - Adequate fluid and fibre intake: more water, fruits, and vegetables
  - Exercise more
- Follow up to assess adherence and response to treatment
- Secondary behavioural problems are common
- Types of Laxative
  - **Bulk-forming**: fybogel, methylcellulose
  - **Osmotic**: lactulose, Movicol
  - **Stimulant**: Bisacodyl, senna, sodium picosulphate
  - **Stool-softener**: arachis oil, docusate sodium

PACES TIPS

- Explain that this is simple constipation and that it is very common
- Explain treatment (want to break the cycle of a hard stool being difficult to pass)
- Explain that Movicol takes time to work
  - Disimpaction: escalating dose for 2 weeks
  - Maintenance: can be used for a long time until bowel habits are re-established (no dangers)
- Advise encouraging the child to sit on the toilet after mealtimes (reflex)
- Advise behavioural intervention (star chart) to aid motivation

Crohn's Disease

- Assess impact of symptoms on daily functioning (anxiety, depression)
- Encourage stopping smoking (may reduce the risk of relapse)
- Assess risk of osteoporosis
- Consider enteral feeding for those with concern about growth

- Inducing remission:
  - Corticosteroid monotherapy (prednisolone, methylprednisolone or intravenous hydrocortisone): suitable for first presentation or first inflammatory exacerbation in a 12-month period
    - If not tolerated, budesonide or aminosalicylates (e.g. mesalazine) may be used
    - If concerns about growth in children/young people, consider enteral nutrition as an alternative
  - May add immunosuppressive drugs (azathioprine or methotrexate)
  - Or biologic therapies: infliximab and adalimumab
  - If disease is limited to the terminal ileum, consider resective surgery
- Maintaining remission:
  - Offer azathioprine or mercaptopurine as monotherapy if used with steroids to induce remission
    - Including after surgery
    - Consider methotrexate as remission regime if required on induction; do not tolerate 1st line or have contraindications to 1st line
- Using these medical therapies requires monitoring of certain biochemical measures (e.g. ferritin, B12, calcium and vitamin D)
- Educate about features of Crohn's flare up (e.g. unintended weight loss)
- Patients on immunosuppressive therapies should not have live vaccines. They are at increased risk of influenza and pneumococcal infection so should receive these vaccines.

	Mildly active	Moderately active	Severely active

Ileocaecal disease	Observation OR budesonide OR 5-ASA therapy Extraintestinal manifestations	1) Oral corticosteroids OR budesonide +/- 5-ASA therapy 2) Immunomodulator therapy + oral corticosteroid 3) Biological therapy +/- azathioprine + oral corticosteroid • Corticosteroid dependent relapse = Surgery • Management of extraintestinal manifestations • Antibiotics	1) Hospitalisation + Oral/IV corticosteroids +? surgery Immunomodulator therapy 2) Biological therapy or surgery • Management of extraintestinal manifestations • Gradual tapering of corticosteroids • Antibiotics
Colonic disease not fistulating	1) Oral corticosteroid + 5-ASA 2) Surgery • Topical rectal hydrocortisone • Management of extraintestinal manifestations • Antibiotics	1) Oral/IV corticosteroids + immunomodulator therapy + surgery • Topical rectal hydrocortisone • Management of extraintestinal manifestations • Antibiotics	1) Oral/IV corticosteroids + immunomodulator therapy + surgery • Topical rectal hydrocortisone • Management of extraintestinal manifestations • Antibiotics

PACES TIPS

- Explain the diagnosis (a disease with an unknown cause that causes inflammation of the digestive system leading to malabsorption and bloody diarrhoea)
- Explain that it is a life-long condition and there is always a risk of relapse
- Reassure that there are many medications that can be used to settle down the inflammation any time it flares up (and explain that they will be seen by a gastroenterologist)
- Explain complications (malabsorption and bowel cancer)
- There is no special diet but you may find that certain foods will make it worse
- Support: Crohn's and Colitis UK

Dehydration and Fluids

- The most accurate measure of dehydration is the degree of weight loss during the illness:
  - Clinical dehydration: ≥ 5%
  - Shock: > 10%
- If clinical dehydration is present, oral rehydration solution is the mainstay of therapy
  - 75 mL/kg every 4 hours
- **IV fluids** are only indicated for shock or deterioration or persistent vomiting
- There are broadly 3 contexts in which you give IV fluids:
- **1) Fluid Resuscitation**
  - In children in need of fluid resuscitation, use a **0.9% sodium chloride bolus of 20 mL/kg over < 10 minutes** (consider pre-existing conditions that may require a smaller dose such as kidney disease)
  - (If term neonates, then 10-20mL/kg)
  - Can repeat bolus if still shocked
  - If larger volumes need to be given, transfer child to HDU/PICU
  - **Important**: fluid resuscitation guidance is different in DKA because of risk of cerebral oedema

- **2) Correction of dehydration**
  - Percentage dehydration × weight (kg) × 10
  - Given over 48 hours
- **3) Routine Maintenance**
  - 100 ml/kg for 0-10 kg
  - 50 ml/kg for each kg from 10-20 kg
  - 20 ml/kg for each kg from 20 kg onwards
  - Given over 24 hours
  - NOTE: males rarely need more than 2500 mL and females 2000 mL per day
  - Measure electrolytes and glucose when starting IV fluids and at least every 24 hours thereafter
- Example: a 20kg child with 5% dehydration
  - Maintenance fluids: 1500 ml over 24 hours
  - Correction of dehydration: 1000 ml over 48 hours
  - Equating to 2000 ml per 24 hours; 83 ml/hour
- Neonatal Fluid Resuscitation
  - Maintenance Requirements
    - Day 1: 50-60 ml/kg/day
    - Day 2: 70-80 ml/kg/day
    - Day 3: 80-100 ml/kg/day
    - Day 4: 100-120 ml/kg/day
    - Day 5-28: 120-150 ml/kg/day
  - For term neonates use isotonic crystalloids with 5-10% dextrose
- Hypernatraemic Dehydration
  - **Suspect if** jittery movements, increased muscle tone, hyperreflexia, convulsions, drowsiness or coma
  - Oral rehydration solution should be used to rehydrate
  - If IV fluids are required, a rapid reduction in plasma sodium concentration and osmolality will lead to a shift of water into the cerebral cells and may result in **seizures** and **cerebral oedema**
  - So, the reduction in plasma sodium should be slow
  - The fluid deficit should be replaced over at least 48 hours and the plasma sodium should be measured regularly

Failure to thrive

- Monitor weight if concerns of faltering growth at appropriate intervals
  - Daily if < 1 month of age
  - Weekly 1-6 months
  - Fortnightly 6-12 months
  - Month from 1 year of age
- Mild: Feeding or providing eating behaviour recommendations
  - 2nd line: referral and review of eating behaviour recommendations
- Moderate: Feeding or providing eating behaviour recommendations and referral to specialist
  - 2nd line: further referrals (CAMHS, Child Protective Services) +/- hospitalisation
  - Consider dietetics input e.g. introducing calorie dense foods or oral food supplements
- Severe: Feeding or providing eating behaviour recommendations, referral and hospitalization

Gastroenteritis

- Consider hospital admission
- Give rehydration advice
- Give rehydration advice
  - If mild treat first with oral rehydration fluid

    - Trial can be done over a few hours in A&E with close input and output monitoring to aid decision around admission
- Maintenance fluid volumes given over 24 hours:
    - 0-10 kg = 100 ml/kg
    - 10-20 kg = 1000 ml + 50 ml/kg for each kg over 10
    - 20+ kg = 1500 ml + 20 ml/kg for each kg over 20
    - Males rarely need more than 2500 mL and females 2000 mL per day
    - Measure electrolytes and glucose when starting IV fluids and at least every 24 hours thereafter
- Antibiotics:
    - NOT routinely required to treat gastroenteritis (even if the cause is BACTERIAL)
    - Only indicated for:
        - Suspected OR confirmed SEPSIS
        - Extra-intestinal spread of bacterial infection
        - Salmonella gastroenteritis if aged < 6 months
        - Malnourished or immunocompromised children with Salmonella
        - Specific bacterial or protozoal infections e.g. C. difficile associated with pseudomembranous colitis, cholera, shigella, giardiasis)
- Nutrition:
    - Can continue breastfeeding whilst rehydrating with ORS
    - Nutritional intake needs to be INCREASED after diarrhoeal illness
    - Diarrhoea may lead to zinc deficiency and supplementation may be necessary
- Give advice on:
    - Preventing spread - washing hands, preparing + cooking food, contact with others
    - Follow up (and safety net!)
        - Diarrhoea: usually lasts for 5-7 days and stops within 2 weeks
        - Vomiting: usually lasts 1-2 days and stops within 3 days

	Treatment
No dehydration	<10kg receive 60-120mL >10kg receive 120-240mL of oral rehydration solution per episode of vomiting/diarrhoea Age-appropriate diet continued
Mild dehydration <5%	Rehydration with ORS at 50mL/kg over 4hrs <10kg receive 60-120mL >10kg receive 120-240mL of oral rehydration solution per episode of vomiting/diarrhoea Age-appropriate diet continued
Moderate dehydration 5-10%	Rehydration with ORS at 100mL/kg over 4hrs <10kg receive 60-120mL >10kg receive 120-240mL of oral rehydration solution per episode of vomiting/diarrhoea Age-appropriate diet continued
Severe dehydration >10%	Medical emergency Immediate IV resuscitation and hospital admission Saline/Ringer's lactate 20mL/kg IV over 1hr IV bolus may be given until haemodynamically stable Once child is well enough: <10kg receive 60-120mL >10kg receive 120-240mL of oral rehydration solution per episode of vomiting/diarrhoea Age-appropriate diet continued

Gastro-oesophageal Reflux

- Reassure
  - It is very common
  - Begins early (< 8 weeks) and may be frequent
  - It usually becomes less frequent with time
  - Treatment and investigation are not usually needed
- Review infant or child if:
  - Projectile regurgitation
  - Bile-stained vomit or haematemesis
  - New concerns (e.g. faltering growth, feeding difficulties)
  - Persistent, frequent regurgitation beyond the first year of life
- Same day referral if: haematemesis, melaena, signs of raised ICP (e.g. bulging fontanelle) or dysphagia present
- Initial Management
  - If breastfed:
    - Carry out a breastfeeding assessment
    - Trial smaller but more frequent feeds
    - If issue persists despite advice, consider trial of alginate therapy for 1-2 weeks (stop at intervals to check whether the infant has recovered)
  - If formula-fed:
    - Review feeding history
    - Reduce feed volumes if excessive for infant's weight (aim for 150-180 mL/kg/day)
    - FIRST: Offer a trial of smaller, more frequent feeds
    - SECOND: Offer a trial of thickened formula or anti-regurgitant formula
    - THIRD: Offer alginate therapy without feed thickeners if the above hasn't worked (stop at 2-week intervals to see if the infant has recovered)
    - Trials are recommended to last 1-2 weeks
  - Positional:
    - Advise about upright positioning after feeds and avoiding overfeeding
    - Prone and left-lateral positioning helps but should be used when awake
    - Do NOT use positional management in a sleeping infant (they should sleep on their back)
  - Pharmacological Management
    - Consider 2-4-week trial of PPI or histamine antagonist in children who have 1 or more of the following:
      - Unexplained feeding difficulties (refusing feeds, choking)
      - Distressed behaviour
      - Faltering growth
      - No resolution respite 1-2 week trial of alginate therapy
    - Consider specialist referral if still no resolution
- Last Resort Options
  - Enteral feeding (if failure to thrive)
  - Nissen fundoplication
    - The fundus of the stomach is wrapped around the intra-abdominal oesophagus
    - Abdominal or laparoscopic procedure
- If the child fails to respond to these measures, other diagnoses e.g. cow's milk protein allergy should be considered

PACES TIPS

- Explain the diagnosis (due to immaturity of the gullet leading to food coming back the wrong way)
- Reassure that this is common and usually gets better with time
- Breastfeeding: offer assessment → alginate therapy
- Formula: review feeding history → smaller, more frequent feeds → thickeners → alginate therapy
- Safety net: keep an eye on the vomitus (if it's blood-stained or green seek medical attention)

Hernia

Inguinal hernia:

- #1: surgical repair for inguinal hernia. Timing is based on whether hernia is reducible
- **If it is reducible**, then manual reduction is preferred, with elective surgery being scheduled for repair
- **If it is incarcerated**, emergency manual reduction of hernia contents is attempted under sedation (IV morphine), with repair after 48 hours to allow oedema to settle

Umbilical hernia:

- If small and asymptomatic: **Observation until 4-5 years of age**
  - If small, then elective repair at 4-5 years
- If large and symptomatic: **Elective repair at 2-3 years of age**
  - Large or symptomatic umbilical hernia (> 1.5cm)
  - Intermittent symptoms of incarceration or recurring pain
- If hernia incarcerates during observation period:
  - Then should be manually reduced with pressure and surgically repaired within 24 hours.
  - If it cannot be reduced, then emergency operation required

Hirschsprung Disease

- Initial management involves **bowel irrigation** (softens faeces and flushes it from the bowel)
- Surgical - usually involves an initial colostomy followed by anastomosing normally innervated bowel to the anus
- The procedure is called an **anorectal pull-through**
- Total colonic agangliosis would require initial ileostomy with later corrective surgery

Infant Colic

- **Reassure** the parents that colic is a common problem that should resolve by 6 months of age
- Avoid over- or under-feeding the infant and feed in semi-upright position to avoid aerophagia
- **Breastfeeding** should continue and mother may benefit from following a hypo-allergenic diet
- **Formula fed infants:**
  - Check bottle teat size is correct for infant
  - Hypo-allergenic formula may be beneficial but should have food challenges periodically to check if it has resolved naturally
  - Avoid Soy formula
- **Sources of Information/Support**: NHS Choices leaflet, health visitor (help with feeding techniques etc.)
- **Strategies to sooth a crying infant**:
  - Holding the baby through the crying episode
  - Gentle motion (such as pushing the pram or rocking the crib)
  - 'White noise' (for example from a vacuum cleaner or hairdryer)
  - Bathing the infant in a warm bath
  - Ensuring an optimal winding technique is used during and after feeds, if needed

- **Encourage parents to look after themselves**: get support from family and friends, meet other parents at a similar state (NCT), resting, putting the baby in a safe place to give yourself a time out
- Do not recommend things like Infacol and Colief because there is an insufficient evidence base

Intussusception

- ABCDE approach
- IV fluids and NG tube aspiration may be needed
- Unless there are signs of peritonitis, reduction of the intussusception by **rectal air insufflation** (with fluoroscopy guidance) is usually attempted by a radiologist
    - Success rate is 75%
    - Remaining 25% require an operation
- Clinically stable with no contraindications to contrast enema reduction
    - Fluid resuscitation
    - Contrast enema (air or contrast liquid e.g. Barium or Gastrografin)
    - Contraindications
        - Peritonitis
        - Perforation
        - Hypovolaemic shock
    - Broad-spectrum antibiotics
        - **Clindamycin + gentamicin** OR tazocin OR cefoxitin + vancomycin
    - **2nd line**: surgical reduction with broad-spectrum antibiotics
        - **Immediate laparotomy**
            - Indicated if:
                - peritonitis, perforation
            - Consider in:
                - prolonged history (> 24 hours), high likelihood of pathological lead point, failed enema
- If recurrent intussusception - consider investigating for a pathological lead point (e.g. Meckel's diverticulum)

PACES TIPS

- Explain that it is caused by telescoping of the bowel and typically occurs in young children
- If needing reduction, explain the procedure
- Explain that NG tube aspiration may be required
- Explain the supportive treatment (fluids and antibiotics)
- Explain about the possibility of needing an operation if rectal air insufflation is unsuccessful (75% success rate)
- 5% risk of recurrence (usually within a couple of days of treatment)

Irritable Bowel Syndrome

- Lifestyle and diet modifications including:
    - Ensuring sufficient intake of fluids
    - Eating regularly, limiting fresh fruit intake, and, reducing intake of ‘resistant starch’ and insoluble fibre (e.g. bran) can be recommended
    - If an increase in dietary fibre is required, soluble fibre such as oats, ispaghula husk, or sterculia can be recommended
    - Reducing stress
    - Identifying precipitating substances such as caffeine, lactose or fructose
    - Adding fibre and probiotics to their diet
    - Adhering to the FODMAP diet
- Medications:
    - Only in cases of severe symptoms that have not responded to non-drug approaches:

- Laxatives: treat abdominal pain if underlying cause is suspected constipation e.g. macrogol, lactulose
- Antimotility drugs: Loperamide hydrochloride may relieve diarrhoea
- Antispasmodic drugs: relieve pain

	With pain or bloating	Without pain or bloating
Diarrhoea predominant	Lifestyle and dietary modifications • Antidiarrhoeals + Antispasmodics OR • TCA CBT or hypnotherapy	Lifestyle and diet modifications Antidiarrhoeals
Constipation predominant	Lifestyle and diet modifications • Laxatives + Antispasmodics OR • SSRI + linaclotide CBT or hypnotherapy	Lifestyle and diet modifications Laxatives
Alternation diarrhoea and constipation	Lifestyle and diet modifications • Antispasmodics + laxatives + loperamide OR • TCA/SSRI CBT or hypnotherapy	Lifestyle and dietary modifications Laxatives Loperamide

Meckel's Diverticulum

- Asymptomatic
  - Incidental imaging finding - no treatment required
  - Detected during surgery for other reasons - prophylactic excision
- Symptomatic
  - Bleeding - excision of diverticulum with blood transfusion (if haemodynamically unstable)
  - Obstruction - excision of diverticulum and lysis of adhesions
  - Perforation/peritonitis - excision of diverticulum or small bowel segmental resection with perioperative antibiotics
  - Surgery usually laparoscopic

Malrotation

- If there are signs of vascular compromise, an **emergency laparotomy** is needed (this is a surgical emergency)
- **Ladd procedure** - detorting the bowel and surgically dividing the Ladd bands
  - This is either done laparoscopically (if elective or non-urgent) or during open laparotomy (emergency or urgent)
  - The bowel is placed in the non-rotated position with the duodenojejunal flexure on the right and the caecum and appendix on the left
  - Note: the appendix is usually removed to avoid diagnostic confusion in case the child presents again with an acute abdomen
- Antibiotics (**cefazolin**)

Mesenteric Adenitis

- Self-limiting condition, so supportive care:
  - Pain management and adequate hydration
- Pain can take 2-4 weeks to resolve

Peptic Ulcer Disease

- Acute:

- Active bleeding ulcer:
  - Endoscopy +/- blood transfusion
    - And PPI
  - Surgery or embolization
- Not bleeding, H.pylori negative:
  - Treat underlying cause + PPI
  - 2nd line: H2 antagonist
- Not bleeding, H.pylori positive:
  - H. pylori eradication triple therapy for 7d:
    - PPI BD + clarithromycin 500mg BD + amoxicillin 1g BD

- In children with suspected peptic ulceration, it should be treated with **proton-pump inhibitors** (e.g. lansoprazole 30 mg)
- If they fail to respond to treatment, an **upper GI endoscopy** should be performed
  - If this is normal, **functional dyspepsia** is diagnosed
  - Note: functional dyspepsia is probably a variant of IBS

Pyloric Stenosis

- IV fluid resuscitation
  - This is essential to correct the fluid and electrolyte disturbance before surgery
  - This should be provided at 1.5 x maintenance rate with 5% dextrose + 0.45% saline
  - Add potassium once urine output is adequate
- Definitive treatment is by performing a **Ramstedt pyloromyotomy**
  - This involves dividing the hypertrophied muscle down to but not including the mucosa
  - Can be open or laparoscopic

Recurrent Abdominal Pain

- Important to say that pain is real, not faked.
- Reassurance and continuation with physical activities
- Psych interventions may be helpful – CBT, family therapy

Small bowel atresia

- Initially: nil by mouth, NGT placed for suction, IV hydration, broad spectrum antibiotics given.
- Surgical approach depends on the atresia site, mainly end-to-end attachment to form an anastomosis.

Ulcerative Colitis

- Severity in children is assessed using the Paediatric Ulcerative Colitis Activity Index (PUCAI)
  - Severe > 65 points
  - Moderate - 35-64 points
  - Mild – 10-34 points
  - Remission – 0-9 points
- **Proctitis**
  - 1st line - Topical aminosalicylate for 4 weeks,
  - If no improvement add oral aminosalycylate
  -
- **Mild UC:**
  - 5-ASA
  - Can be used topically (suppository or enema) initially and PO if remission not achieved within 4 weeks
  - For extensive disease- topical and high-dose PO treatment is 1st line
  - Continue as maintenance if no relapse
  - Relapse = use oral prednisolone and taper
    - If they relapse with steroids, then it is called steroid dependent disease

- **Moderate UC:**
  - Oral prednisolone for 2-4wks and taper
  - If good response = treat with oral 5-ASA and continue for maintenance
  - If relapse frequent, then steroid dependent disease
  - If bad response to oral prednisolone, then IV can be given. Should be tapered off to oral and maintain remission.
- **Steroid dependent disease:**
  - #1: Thiopurine or infliximab
  - If successful continue with medication as maintenance
  - If inadequate:
    - Colectomy, adalimumab or vedolizmab
    - Colectomy is the final treatment option
- **Severe UC:**
  - Medical emergency
  - High dose IV Methylprednisolone
  - Oral 5-ASA should be stopped
  - Antibiotics can be used with bacteraemia
  - Parenteral nutrition needed until improvement or surgery
  - Surgical Treatment
    - Colectomy with an ileostomy or ileojejunal pouch

PACES TIPS

- Explain the diagnosis (condition with unknown cause that leads to inflammation of the bowel, which leads to symptoms)
- Explain that it isn't common but is a well-known disease (1 in 420
- Explain that there is no cure, and it is a condition that tends to come and go in flare-ups every so often
- Reassure that there are medications that can be used to reduce the likelihood of flare-ups and to treat flare-ups when they happen
- Explain the complications (growth issues, bowel cancer)
- Explain that they will be seen by a gastroenterologist
- Support: Crohn's and Colitis UK

Volvulus

- Whether or not vascular compromise is present, the Ladd procedure with open laparotomy is used as an emergency surgery.
- Supportive care: NGT (if obstruction is present), broad-spectrum antibiotics, IV fluids

Liver Disorders

Acute Liver Failure

- Early referral to a national paediatric liver centre
- Steps to stabilise the child:
  - Maintaining blood glucose (> 4 mmol/L) with **IV dextrose**
  - Preventing sepsis with **broad-spectrum antibiotics** and antifungals
  - Preventing haemorrhage with **IV vitamin K** and **H2 antagonists/PPIs**
  - Prevent cerebral oedema by **fluid restriction** and **mannitol diuresis**
- Management is dependent on the suspected cause of acute liver failure
- Features of POOR prognosis:

    - Shrinking liver
    - Rising bilirubin
    - Falling transaminases
    - Worsening coagulopathy
    - Coma
- Assessment for liver transplantation (PT is the best marker of liver failure)

Autoimmune Hepatitis

- Most children with autoimmune hepatitis will respond to **prednisolone** and **azathioprine**
- Sclerosing cholangitis is treated with **ursodeoxycholic acid**
- Liver transplants may be considered in severe cases

Biliary Atresia

- Surgical intervention is recommended immediately (ideally within the first 60 days of life)
- **Kasai hepatoportoenterostomy** - involves ligating the fibrous ducts above the join with the duodenum, dissecting proximally to the porta hepatis (from which bile usually flows from the liver) and joining a loop of jejunum directly to the porta hepatis of the liver, facilitating bile duct drainage.
    - With antibiotic cover for the first year of life
- **Liver transplantation** is considered if the Kasai procedure is unsuccessful or at presentation infants have end stage liver disease
- **Management of Complications**
    - Complications: growth failure, portal hypertension, cholangitis, ascites
    - Choleretics: **Ursodeoxycolic acid** promotes bile flow
    - Nutritional supplementation: During the first year of life, either breast milk or medium-chain triglyceride-enriched formula is given with monthly monitoring and nutritional status
    - Fat-soluble vitamins are given to all children with the condition - levels should be monitored and the dose adjusted accordingly
    - Prevent cholangitis: During the first year of life, prescribe **prophylactic antibiotics** (usually co-trimoxazole)

Cirrhosis and Portal Hypertension

- Treat the underlying cause
- Prevent superimposed hepatic insults: avoid hepatotoxic drugs (NSAIDs, high-dose paracetamol), immunize against hepatitis A and B for susceptible patients, manage metabolic risk factors, maintain adequate nutrition, and regular exercise
- Monitor complications e.g. abdominal USS for ascites
- To treat ascites: sodium and fluid restriction, diuretics
- Refractory ascites: albumin infusion, paracentesis
- Liver transplantation

Hepatic Encephalopathy

- Supportive (frequent monitoring of neurological and mental status)
- Identify and correct precipitating factors (e.g. GI bleeding, infections, electrolyte disturbances, drugs)
- Reducing nitrogenous load
    - Dietary protein restriction (be careful about worsening protein-caloric malnutrition)
    - Nitrogenous load from the gut can be reduced using non-absorbable disaccharides (e.g. **lactulose**) or antibiotics (e.g. **rifaximin**)

Hepatitis A

- Supportive for pain, nausea, or itch as required
- Avoid paracetamol

- Assess for co-infection with other hepatitis viruses – can complicate clinical course
- Close contacts should be vaccinated within 2 weeks of the onset of illness
- Unvaccinated patients with recent exposure to hepatitis A (<2 weeks) should have human normal intramuscular immunoglobulin (<12 months; history of chronic liver disease) or the hepatitis A vaccine (>12 months)
- **Notify the Health Protection Unit (HPU)**

Hepatitis B

- **Acute**
  - Supportive for pain, nausea, or itch as required
  - Anti-viral therapy (lamivudine, entecavir, tenofovir disoproxil)
  - with/without liver transplant
- **Chronic**
  - Supportive (usually asymptomatic)
  - Interferon or antiviral monotherapy (e.g. entecavir, tenofovir disoproxil, interferon alfa, peginterferon alfa, lamivudine) is recommended in some patients
- **Prevention**
  - ALL pregnant women should have antenatal screening for HBsAg
  - Babies of all HBsAg-positive mothers should receive hepatitis B vaccination
  - Hepatitis B immunoglobulin is also given if the mother was HBeAg-positive
  - Other members of the family should also be vaccinated
- **Notify the Health Protection Unit (HPU)**

Hepatitis C

- Treatment decisions are based on genotype of the HCV
- Antiviral monotherapies such as **glecaprevir/pibrentasvir**, **sofosbuvir/velpatasvir** are used for the majority of genotypes
- If treatment failure, a combination of therapies may be trialed, or the addition of oral ribavirin
- NOTE: treatment is NOT undertaken until > 3 years of age because vertically acquired infections may resolve spontaneously
- **Notify the Health Protection Unit (HPU)**

Non-Alcoholic Fatty Liver Disease

- Weight loss through:
  - Diet
  - Exercise
  - Medications (Orlistat)
  - Possibly bariatric surgery (Roux-en-Y gastric bypass)
- Treatment for insulin resistance and diabetes
- Statins
- Vitamin E (alpha tocopherol)
- Liver transplantation - considered in children with end-stage liver disease

Wilson's Disease

- Nazar score or Kings Wilson score used to assess severity
- Zinc - blocks intestinal copper resorption
- Oral chelation therapy – penicillamine or trientine
- Trientine - increases urinary copper excretion
- Pyridoxine (vitamin B6) - given to prevent peripheral neuropathy
- Dietary restriction of copper (reduce liver and shellfish intake)
- NOTE: neurological improvement may take up to 12 months
- Liver transplantation - considered in children with end-stage liver disease

Infection and Immunity

Bacterial Meningitis

- <3 months old:
  - Antibiotics: **IV ampicillin/amoxicillin + cefotaxime**
- >3 months old:
  - **IV ceftriaxone**
- Supportive therapy:
  - Analgesia and antipyretics
  - Oxygen: reservoir rebreathing mask, unless intubation required
  - Anticonvulsant therapy if needed
  - IV fluids: 0.9% NaCl + 5% dextrose
  - Vasopressors if hypotensive despite fluid resuscitation
- Presenting in primary care: single dose of **IM/IV benzylpenicillin**
  - Arrange emergency medical transfer to hospital by telephoning 999
  - Note: check for penicillin allergy (in which case you might consider moxifloxacin and vancomycin)
- Recent foreign travel: add **vancomycin**
- **Dexamethasone** may be given if >3 months old and presents with these in CSF analysis:
  - Frankly purulent CSF
  - CSF WBC > 1000/μL
  - Raised CSF WBC + protein concentration > 1 g/L
  - Bacteria on Gram stain
  - Note: steroids should not be used in meningococcal septicaemia
- Notify the Health Protection Unit
- Discharge and Follow-Up
  - All children should be reviewed by a paediatrician **4-6 weeks** after discharge
  - Offer formal audiological assessment
  - **Treating Contacts**: ciprofloxacin is preferred over rifampicin
    - This includes anyone who has had close contact with the patients in the 7 days before onset

PACES TIPS

- Explain the diagnosis (infection of the tissues surrounding the brain)
- Explain that it is a serious condition, but we have effective antibiotics that can treat the infection
- It will require hospital admission to administer the antibiotics and monitoring
- There can sometimes be long-term complications, the most common is hearing loss, and offer formal audiological assessment as follow up
- Follow-up with paediatricians in 4-6 weeks
- Offer ciprofloxacin prophylaxis for contacts
- Support: Meningitis Now

Chickenpox

- General advice:
  - Encourage adequate fluid intake
  - Dress appropriately to avoid overheating or shivering
  - Wear smooth, cotton fabrics
  - Keep nails short to minimize damage from scratching
  - Oral paracetamol and topical emollient (e.g. calamine lotion) to reduce itching

- Advise that the most infectious period is 1–2 days before the rash appears, but infectivity continues until all the lesions are dry and have crusted over (usually around 5 days after onset of the rash). Avoid contact with:
    - School
    - Immunocompromised
    - Pregnant women
    - Infants <4 weeks old
- Admit to hospital if there are serious complications:
    - Pneumonia
    - Encephalitis
    - Dehydration (reduced urine output, lethargy, cool peripheries)
    - Bacterial superinfection (sudden high-grade pyrexia with erythema and tenderness around the original chickenpox lesions)
    - Purpura fulminans
- Inform the person to seek urgent medical advice if their condition deteriorates or they develop complications
- **Mild-moderate disease:**
    - General advice (above)
- **Severe disease:**
    - Consider oral aciclovir 800 mg 5 times a day for 7 days if adolescent (aged 14 years or older) who presents within 24 hours of rash onset
- **Neonatal chickenpox:**
    - Seek immediate specialist advice
- **Immunocompromised children:**
    - IV aciclovir for 7 days if they present with 24 hours of the onset of the rash OR if the chickenpox is severe
    - PO valaciclovir may be substituted
- **Prevention in Immunocompromised children:**
    - **Human varicella zoster immunoglobulin** should be used in high-risk immunocompromised individuals with deficient T cell function following contact with chickenpox

Dengue

- Notifiable disease
- **WHO group A** (no warning signs)
    - Tolerating adequate fluid volume, passing urine every 6hrs
    - Sent home
    - Rest and take oral fluids (rehydration products)
    - Monitor for warning signs
    - Paracetamol and tepid sponging can be used to reduce fever
- **WHO group B** (developing warning signs)
    - Hospital admission
    - IV/oral fluids
    - Monitor for progression of warning signs
    - Discharge once patient is afebrile for >48hrs
- **WHO group C** (established warning signs)
    - Hospital admission to ICU
    - Consider blood transfusion
    - IV 0.9% NaCl: maintenance + 5% fluid deficit
        - 100ml/kg for first 10kg
        - 50ml/kg for second 10kg
        - 20ml/kg for >20kg
    - Monitoring for worsening signs
    - Investigation for other causes

- Discharge once patient is afebrile for >48hrs

EBV

- Arrange hospital admission if:
  - Stridor
  - Dehydration or difficulty swallowing fluids
  - Become systemically unwell
  - A suspected potentially serious complication, such as splenic rupture (sudden abdominal pain)
  - Haemolytic anaemia or thrombocytopenia
- Supportive care:
  - Paracetamol (10-15mg/kg every 4-6hrs) or ibuprofen (5-10mg/kg every 4-6hrs)
  - Good hydration
  - Rest, without physical activity and contact sports up to 8wks after
- Explain the expected course of the illness
  - Symptoms usually last for 2–4 weeks.
  - Tiredness is common
  - Exclusion from work or school is not necessary but tailor activities to what they find comfortable
  - Limit spread by avoiding kissing and sharing of eating utensils
  - Avoid heavy lifting and contact or collision sports for the first month of the illness
- **Oral prednisolone** may be given if upper airway obstruction or haemolytic anaemia is present
  - Patient should be admitted to hospital
- **IVIG** may be given in patients with active bleeding due to thrombocytopenia
- Warning: **ampicillin** and **amoxicillin** can cause a florid maculopapular rash in children infected with EBV so should be avoided
- Advise aspirin should not be given as risk of triggering Reye's syndrome

Encephalitis

- All suspected cases of encephalitis should be admitted and treated as an emergency (A to E approach)
- Empirical therapy:
  - Suspected viral encephalitis treated with **IV aciclovir** until cause is determined
  - Often empirical antibiotics are also given (vancomycin, cefotaxime) for suspected bacterial origin
- Supportive care should be done in ICU:
  - Endotracheal intubation and mechanical ventilation
  - IV fluids
  - Decrease intracranial pressure if elevated - with corticosteroids and mannitol
  - Deep venous thrombosis prophylaxis
- Specific viruses and the drugs used against them are:
  - HSV-1 and HSV-2: **high-dose IV aciclovir** for 2-3 weeks, as relapses may occur after shorter courses
  - Varicella-zoster virus (VZV): **aciclovir or ganciclovir.**
  - CMV: **ganciclovir plus foscarnet** for 2-3 weeks.
  - Epstein-Barr virus (EBV): **aciclovir** is first line in suspected viral encephalitis, but once the diagnosis of EBV encephalitis is confirmed, **cidofovir** is a possible alternative.
- Corticosteroids
  - Methylprednisolone for complications such as cerebral vasculitis
- Follow-up
  - Supportive, rehabilitation (cognitive and motor) and monitoring should continue for at least 1 year after discharge from hospital
  - Hearing evaluation should be performed at time or shortly after discharge from hospital

Fever

- Assess for risk of serious underlying cause
- Recommend **paracetamol** or **ibuprofen** for children with a temperature > 38 degrees who are distressed or unwell
    - Stop once patient is comfortable and not distressed
    - **Not** to be used **simultaneously**, use paracetamol and if ineffective consider switching to ibuprofen
    - Dosage guided by age
- Keep hydration levels up
- External cooling isn't routinely suggested, but can use warm sponging to reduce temperature rapidly

Traffic Light System – Feverish Child

	Green – low risk	Amber – intermediate risk	Red – high risk
Colour (of skin, lips or tongue)	• Normal colour	• Pallor reported by parent/carer	• Pale/mottled/ashen/ blue
Activity	• Responds normally to social cues • Content/smiles • Stays awake or awakens quickly • Strong normal cry/not crying	• Not responding normally to social cues • No smile • Wakes only with prolonged stimulation • Decreased activity	• No response to social cues • Appears ill to a healthcare professional • Does not wake or if roused does not stay awake • Weak, high-pitched or continuous cry
Respiratory		• Nasal flaring • Tachypnoea: – RR >50 breaths/ minute, age 6–12 months – RR >40 breaths/ minute, age >12 months • Oxygen saturation ≤95% in air • Crackles in the chest	• Grunting • Tachypnoea: RR >60 breaths/minute • Moderate or severe chest indrawing
Circulation and hydration	• Normal skin and eyes • Moist mucous membranes	• Tachycardia: – >160 beats/minute, age <12 months – >150 beats/minute, age 12–24 months – >140 beats/minute, age 2–5 years • CRT ≥3 seconds • Dry mucous membranes • Poor feeding in infants • Reduced urine output	• Reduced skin turgor
Other	• None of the amber or red symptoms or signs	• Age 3–6 months, temperature ≥39°C • Fever for ≥5 days • Rigors • Swelling of a limb or joint • Non-weight bearing limb/not using an extremity	• Age <3 months, temperature ≥38°C* • Non-blanching rash • Bulging fontanelle • Neck stiffness • Status epilepticus • Focal neurological signs • Focal seizures

- **Green**
  - Manage at home with appropriate care and advice
  - Safety net with:
    - Advice on warning symptoms and signs and when urgent medical review is needed.
    - Arrange a follow-up appointment in primary care
    - Liaise with other healthcare professionals, including out-of-hours providers, to ensure direct access for the child if further assessment is required
  - Use paracetamol or ibuprofen if child is uncomfortable or distressed, and on measures to prevent dehydration
  - Test urine for UTI
  - No routine bloods/CXR
- **Amber**
  - Provide parents with safety net or refer to paediatric specialist for further assessment
  - Consider arranging hospital admission if:
    - < 3 months with a suspected UTI and no alternative focus of infection, to obtain a reliable urine specimen and initiate treatment.
    - The fever has no obvious underlying cause, and the infant or child is unwell for longer than expected for a self-limiting illness.
    - There is significant parental/carer anxiety and/or difficulty coping due to the family/social situation.
  - If the child can be managed at home, safety net (as above)
  - Test for UTI
  - FBC
  - CXR if temp >39C and WBC >20x10^9/L
  - Consider LP if <1yo
- **Red**
  - Arrange immediate ambulance transfer to A&E if life-threatening features, or urgent face-to-face assessment within 2 hours
  - FBC, CRP, culture
  - Urine test
  - CXR, LP, serum electrolytes, blood gas
  - Empirical parenteral antibiotics if <1m or <3m and appears unwell, or if shocked, unrousable or signs of meningococcal disease

Hereditary Immunodeficiency

- Antimicrobial prophylaxis
  - For T-cell and neutrophil defects:
    - Co-trimoxazole to prevent PCP
    - Itraconazole or fluconazole to prevent other fungal infections
  - For **B-cell** defects:
    - Antibiotic prophylaxis (e.g. azithromycin) to prevent recurrent bacterial infections
- Antibiotic treatment
  - Prompt treatment of infections
  - Longer courses
  - Low threshold for IV therapy
- Screening for end-organ disease
  - E.g. CT scan in children with antibody deficiency to detect bronchiectasis
- Immunoglobulin replacement therapy
  - For children with antibody deficiency
- Bone marrow transplantation
  - E.g. for SCID, chronic granulomatous disease

- Gene therapy
- Specialist referral

- Genetic counselling for families if considering further children

HHV-6 and HHV-7 (Roseola Infantum)

- The condition will resolve over a few days/week
- Paracetamol (10-15mg/kg every 4-6hrs) or ibuprofen (5-10mg/kg every 4-6hrs) for symptomatic relief
- Advise to maintain adequate hydration
- Explain the risk of febrile seizures
- School exclusion is NOT needed

HIV

- Decision to start is based on a combination of clinical status, HIV viral load and CD4 count
- **Important**: infants should start ART shortly after diagnosis because they are at higher risk of disease progression
    - First line therapy:
        - 2 NRTI with an INSTI or NNRTI or PI
    - Counselling to help commit to long term ART
    - Prophylaxis for opportunistic infections e.g. PCP with co-trimoxazole
    - Other concomitant infections should be treated
- **Other aspects of management:**
    - Micronutrient supplementation
    - Immunisation (follow normal vaccination schedule but do NOT give BCG as it is a live vaccine)
        - Additional immunisation against influenzae, hepatitis A, B and VZV should be considered
    - MDT approach
        - Can be seen together in a family clinic with other members of the family who may be HIV-infected and an adult specialist can be involved
    - Regular follow-up with particular attention to weight and developmental progress
- PEP started within 72hrs of exposure and lasts 28d:
    - Tenofovir disoproxil + emtricitabine + raltegravir as 1st line (2NRTI and HIV integrase inhibitor)
- **Reducing Vertical Transmission**
    - Mothers with a high viral load are more likely to transmit HIV to their infant (C-section will be recommended)
    - Babies born to HIV-positive mothers receive **zidovudine for 6 weeks**
    - Avoidance of breastfeeding also reduces transmission

Human Parvovirus B19 (Erythema Infectiosum)

- Paracetamol (10-15mg/kg every 4-6hrs) or ibuprofen (5-10mg/kg every 4-6hrs) for symptomatic relief
- Encourage adequate fluid intake and rest
- Secondary arthritis may be treated with ibuprofen (4-10mg/kg every 6-8hrs)
- If infection persists >3wks:
    - Give **IVIG** for 5d
    - May need a **RBC transfusion** for anaemia

Impetigo

- Reassure that impetigo usually heals without any scarring (takes 2-3 weeks)

- Hygiene is important: wash areas with soapy water, wash hands after touching lesions, avoid scratching affected areas and keep nails short, avoid sharing towels/ bathwater etc.
- Children should avoid school until the lesions are DRY and scabbed over
- Antibiotic therapy:
    - Localized non-bullous impetigo:
        - Hydrogen peroxide 1% cream
        - If unsuitable, offer 5 days of topical fusidic acid 2% or mupirocin 2%
    - Widespread non-bullous impetigo:
        - Topical fusidic acid 2% or mupirocin 2%
        - Oral flucloxacillin (or clarithromycin if penicillin allergic)
    - Bullous impetigo or children who are systemically unwell or at high risk of complications:
        - Oral flucloxacillin (or clarithromycin if penicillin allergic)
    - Intranasal mupirocin topical 2% may be given as prevention for recurrences
- If MRSA is suspected, consult local microbiological guidelines
- Arrange follow up if no improvement after 7 days
    - Review diagnosis
    - Check compliance with treatment and hygiene measures
    - Take a swab
    - Consider PO antibiotics if fusidic acid was initially used

Kawasaki Disease

- **IVIG infusion** (single dose, may be repeated 36 hours after completion of the first dose)
- **High-dose aspirin** (reduce thrombosis risk) for 24-72hrs after the fever and then low-dose is given for 8 weeks
- 2nd line treatment options include **corticosteroids** and **infliximab** if resistant to IVIG
- 3rd line treatment options include cyclospirin or anakinra or plasma exchange
- Risk assessment for myocardial ischaemia and coronary artery aneurysms is carried out:
    - Low risk: no further medications after 8wks of aspirin
    - Moderate risk: **low dose aspirin** until aneurysm regression is demonstrated, with ECG and echo follow up annually
    - High risk: **low dose aspirin** long term, with ECG and echo follow up twice a year
        - Need long term **warfarin** (INR target: 2-3)
        - May need clopidogrel

Malaria

- If uncomplicated P. falciparum disease:
    - Artemisinin combination therapy (such as artemether with lumefantrine or artenimol with piperaquine phosphate)
    - Quinine is second line (usually given with an antibiotic)
- If severe P. falciparum disease:
    - **Parenteral artesunate** then after at least 24 hours treatment, switch to oral artemisinin combination therapy
    - Supportive care +/- intensive care
- If non-Falciparum malaria (Plasmodium vivax and less commonly by P. ovale, P. malariae, and P. knowlesi)
    - Artemisinin combination therapy (such as artemether with lumefantrine) or chloroquine
- Notify all cases to the local **Health Protection Team (HPT)**

Measles

- Advise that measles is a self-limiting disease, but it is likely to cause unpleasant symptoms e.g. rash, fever, cough and conjunctivitis
- Rest and drink plenty

- Stay away from school for at least or at least 4 days after the development of the rash
- Seek urgent medical advice if they develop complications such as:
    - Shortness of breath
    - Uncontrolled fever
    - Convulsions or altered consciousness
- Immediately notify the local **Health Protection Team (HPT)**
- **Paracetamol** (10-15mg/kg every 4-6hrs) or **ibuprofen** (5-10mg/kg every 4-6hrs) for symptomatic relief
- Respiratory support can be given if pneumonia or neurological support in case of encephalitis
- **Vitamin A** is given orally for 2d, especially in those hospitalised or <2 years old
- Encourage vaccinations once the acute episode has subsided
- Find out the immunization status of close contacts
- Children should be isolated in hospital
- In immunocompromised patients, ribavirin may be of use

Mumps

- Advise that it is a self-limiting condition
- Advise patient to rest and take in adequate fluids
- Paracetamol (10-15mg/kg every 4-6hrs) or ibuprofen (5-10mg/kg every 4-6hrs) for symptomatic relief
- Stay away from school for 5-7 days after the development of parotitis
- Advise patient/ parents to seek help if they experience symptoms suggestive of meningitis or epididymo-orchitis
- Find out the immunization status of close contacts and tell them to watch out for symptoms of mumps
- Notify the local Health Protection Unit (HPU)

Rubella

- Notify the local Health Protection Unit (HPU)
- Rest and take in adequate fluids
- Consider admitting if there is a serious complication such as haemorrhagic complications (caused by thrombocytopaenia) or encephalitis

Staphylococcal Scalded Skin Syndrome

- Hospital admission
- IV antibiotics (**flucloxacillin**)
- Analgesia - especially when changing dressings
- Emollient to alleviate pruritus and tenderness
- Monitoring hydration and fluid balance, give IV fluids
- Burns dressings to areas affected as required

Toxic Shock Syndrome

- **Intensive care** support is required to manage patients in shock
    - IV Fluid
    - Antibiotic therapy
    - Vasopressor support
- Areas of infection should be surgically **debrided**
    - Removal of infected tissue to prevent progression of disease, may need amputation also
- Start clindamycin and either meropenem or co-amoxiclav before culture reports return
- Antibiotics used often include:
    - Streptococcal: Clindamycin + benzylpenicillin OR vancomycin
    - Staphylococcal (MSSA): Clindamycin + oxacillin OR nafocillin OR vancomycin
    - Staphylococcal (MRSA): Clindamycin + vancomycin OR linezolid

Tuberculosis

- Notify the Health Protection Unit (HPU)
- Arrange hospital admission if the patient has suspected active TB and is unwell
- If hospital admission is not needed, arrange urgent referral to **specialist TB service** for confirmation of diagnosis and ongoing management
- Medication:
    - Rifampicin + Isoniazid - 6 months
    - Pyrazinamide + Ethambutol - first 2 months
    - **Pyridoxine hydrochloride (vitamin B6)** is given weekly to prevent peripheral neuropathy due to isoniazid
    - In tuberculous meningitis, **dexamethasone** is given initially to reduce the risk of long-term sequelae, rifampicin and isoniazid should be continued for 10 months after initial 2m
    - Latent TB Treatment
        - Isoniazid – 6 months OR
        - Rifampicin + Isoniazid – 3 months
        - To decrease risk of reactivation in later life
- Risk assessment for drug-resistant TB
- A multidisciplinary approach should be taken including a **key worker** who should monitor the patient's adherence to treatment (directly observed therapy), clinical response, any adverse effects and assess need for psychological support
- Do contact tracing
- TB Alert is a good website for further information

Typhoid

- Supportive care: IV fluids and antipyretics
- Suspected: Ceftriaxone and azithromycin
- Known:
    - Ciprofloxacin 7d treatment
    - If no response after 4/5d of treatment add **azithromycin**
    - If encephalopathic, add high-dose dexamethasone

Dermatology

Acne Vulgaris

Advice	• Avoid over-cleaning the skin (may cause dryness and irritation - twice daily washing with gentle soap is adequate). • If make-up, emollients and cleansers are used, non-comedogenic, non-oil based preparations are recommended with a pH close to the skin • Avoid persistent picking and scratching of acne lesions due to the risk of scarring • Treatments are effective but may take a while to work (up to **8 weeks**) and may initially irritate the skin • Insufficient evidence to support specific diets – advise to maintain balanced diet.

Mild to Moderate Acne	• Single topical treatment for a 12-week course:
	  ○ Adapalene + benzoyl peroxide
	  ○ Clindamycin (1%) + tretinoin
	  ○ Clindamycin (1%) + benzoyl peroxide
	  ○ Benzoyl peroxide monotherapy
	• Creams and lotions are preferable in patients with dry skin

	• Frequency of application can be increased gradually from 1/week if tolerated • Apply a thin layer to clean skin at nighttime • Washing affected areas with salicylic acid preparations

Moderate Acne not responding to topical treatments	• Consider adding oral antibiotics to the single topical treatments (as above) OR topical azelaic acid for a maximum of 3 months
	  ○ Lymecycline or Doxycycline
	• Topical retinoid or benzoyl peroxide co-prescribed with antibiotic (to reduce risk of resistance)
	• Change to an alternative antibiotic after 3 months if no improvement
	• Oral antiandrogens e.g. cyproterone +/- spironolactone if signs of hyperandrogenism
	• If not responding after 2 courses of antibiotics or if they are scarring, refer to dermatology for consideration of treatment with **isotretinoin** (Roaccutane)
	• **COCP** in combination with topical agents can be used as an alternative to systemic antibiotics in girls
	  ○ Note: progesterone only contraceptives or progestin implants with androgenic activity may worsen acne

Severe acne	• Refer to dermatologist • Oral **isotretinoin** • High-dose oral **antibiotics** for 6 months or longer • If acne flare occurs when initiating oral isotretinoin, considering adding a course of oral **corticosteroids**
Refer to a specialist	• Severe variant (e.g. acne conglobata or acne fulminans) • Severe acne with scarring or risk of scarring • Acne with persistent pigmentary changes • Multiple treatments have failed • Significant psychological distress • Diagnostic uncertainty
Follow-Up	Review each treatment step at **8-12 weeks** • If there is an adequate response, continue treatment for at least 12 weeks • If acne has cleared or almost cleared - consider maintenance therapy with combination of topical adapalene and topical benzoyl peroxide. If any contraindications or not tolerated, consider monotherapy with adapalene, azelaic acid or benzoyl peroxide. • If there is NO response, consider adherence to treatment, adverse effects, progression to more severe acne and discuss the next step in the management

Atopic Eczema

	Skin/physical severity	**Impact on quality of life and psychosocial wellbeing**	**Treatment**
Clear	Normal skin, no evidence of active atopic eczema	No impact on quality of life	None

Mild	Areas of dry skin, infrequent itching (with or without small areas of redness)	Little impact on everyday activities, sleep and psychosocial wellbeing	Emollient with frequent and liberal use + Mild topical corticosteroid (e.g. hydrocortisone 1%) with continued treatment until >48hrs after flare has been controlled Routine follow-up not normally needed
Moderate	Areas of dry skin, frequent itching, redness (with or without excoriation and localised skin thickening)	Moderate impact on everyday activities and psychosocial wellbeing, frequently disturbed sleep	Admit if eczema herpeticum. Emollient with frequent and liberal use + Moderate topical corticosteroid (betamethasone valerate 0.025% or clobetasone butyrate 0.05%) with continued treatment until >48hrs after flare has been controlled If severe itching or urticaria- consider 1-month trial of a non-sedating antihistamine (e.g. cetirizine, loratadine, fenoxfenadine) Consider maintenance regimen to control areas of skin prone to frequent flares 2nd line: topical calcineurin inhibitors e.g. tacrolimus Bandages
Severe	Widespread areas of dry skin, incessant itching, redness (with or without excoriation, extensive skin thickening, bleeding, oozing, cracking and alteration of pigmentation)	Severe limitation of everyday activities and psychosocial functioning, nightly loss of sleep	Emollient with frequent and liberal use + Potent topical corticosteroid (e.g. betamethasone valerate 0.1%) with continued treatment until >48hrs after flare has been controlled Prescribe a maintenance regimen of topical corticosteroids Occlusive dressings or dry bandages are used in acutely flared or lichenified skin. These may be impregnated with zinc paste +/- tar paste. Worn overnight or for 2-3 days at a time until skin has improved

			Wet stockinette wraps are also used with diluted topical steroids and emollients are mixed in If severe itching- consider 1 month trial of non-sedating antihistamine. If the itching is affecting sleep, consider a 7–14-day trial of a sedating antihistamine e.g. chlorphenamine If there is SEVERE, extensive eczema causing psychological distress, consider a course of oral corticosteroids 2nd line: topical calcineurin inhibitor Consider phototherapy if other options have failed Systemic therapy used if all above ineffective.

- Conservative measures
  - **Identify and education of triggers** (e.g. food allergens, contact allergens, inhalational allergens, irritants like soaps)
  - **Cut nails short** to avoid scratching especially in children
- Consider a diagnosis of food allergy
- **Emollients**
  - Use emollients in large amounts and often
  - **Examples**: **Examples**: E45, Cetraben, Diprobase, Aveeno
  - Emollients should be applied on the whole body
  - Emollients should be applied on the whole body
  - Emollients should be used as a soap substitute (also instead of shampoo or use unperfumed shampoos)
- **Topical Corticosteroids**
  - Use once or twice daily (duration can vary from 3-14 days depending on how long the skin takes to respond)
  - Only apply to areas of active eczema
  - Do not use potent corticosteroids in children < 12 months without specialist advice
  - For areas prone to flares, consider using topical corticosteroids for 2 consecutive days per week to prevent flares (review after 3-6 months)
  - If a topical corticosteroid is deemed ineffective, consider using a different type of steroid of a similar potency before increasing the potency
  - Mild Potency for Mild Eczema: hydrocortisone 1%
  - **Moderate Potency for Moderate Eczema**: betamethasone valerate 0.025% or clobetasone butyrate 0.05%
  - **Potent for Severe Eczema**: betamethasone valerate 0.1%, mometasone
  - If very severe and extensive: consider oral steroids
- **Topical Calcineurin Inhibitors**
  - Topical tacrolimus may be considered as 2nd line treatment of moderate to severe eczema in children > 2 years that has not been controlled with steroids
    - Alternative: pimecrolimus
  - This should only be applied to areas with active eczema
  - Do not use under occlusive bandages

- **Bandages**
  - Can be used with emollients for areas of chronic lichenified skin
  - Can be used for short-term flares (7-14 days)
  - Whole-body occlusive dressings may be used by specialists
- **Infected Eczema**
  - Swab the affected area
  - Advise about maintaining good hygiene when using emollients and other creams (e.g. using a spatula, not leaving it open)
  - **1st line: Flucloxacillin** (oral if extensive, topical if local)
    - Penicillin allergy: erythromycin (alternative: clarithromycin)
    - Use antibiotics for no longer than 2 weeks
  - Recurrent infections: antiseptics (e.g. chlorhexidine) can be used to decrease bacterial load (do not use in long-term)
  - Eczema Herpeticum
    - Oral aciclovir
    - If widespread, start aciclovir immediately and refer for same-day dermatological advice
    - If around the eyes, refer for same-day ophthalmological and dermatological specialist review
    - Provide parents and children advice on how to identify eczema herpeticum (rapidly worsening painful eczema, clustered blisters, punched-out erosions)
- **Indications for Referral**
  - Eczema herpeticum (immediate referral)
  - Urgent referral (2 weeks) if severe atopic eczema has not responded to optimum therapy within 1 week or treatment to bacterially infected eczema has failed
  - Refer if diagnosis is uncertain, atopic eczema on the face is not responding, contact allergic dermatitis is suspected, causing significant social and psychological problems or severe recurrent infections

PACES TIPS

- Explain the diagnosis (characterised by dry, itchy skin)
- Explain that it is very common, and many children grow out of it
- Explain the management (and use of steroids if necessary)
  - Patients often worry about use of steroids
  - Explain that these are topical not systemic
  - Only a short course required – it is better to use 1-2 weeks short course to clear up eczema than to let child suffer for months.
- Encourage frequent, liberal use of emollients (and as a soap substitute)
- Explain the association with other atopic conditions
- Advise avoidance of triggers (e.g. types of clothes, detergents, soaps, animals)
- Avoid scratching if possible (keep nails short, use anti-scratch mittens in infants)
- Safety net about signs of infection (oozing, red, fever)
- Information and Support
  - Itchywheezysneezy.co.uk - excellent website demonstrating how to apply emollients

Cellulitis

- Uncomplicated cellulitis can be managed at home with oral antibiotics
- Complicated cellulitis (e.g. cellulitis with systemic illness) may require admitting, resuscitation with oxygen and fluids and IV antibiotics.
  - Switch to oral when fever settles, cellulitis has regressed and CRP is reducing
- May need **surgery** for incision and drainage of abscess, debridement of necrotic tissue or treatment of compression syndromes

- Consider **MDT approach** with dermatologists, microbiology, pharmacists, surgeons (and ophthalmologists if orbital cellulitis).
- High-dose **flucloxacillin** for 7 days
- Or co-amoxiclav for 7 days if near the nose or eyes
    - Penicillin allergy: clarithromycin
- Arrange a review in 48 hours by phone or in person
- If severe infection, give co-amoxiclav, cefuroxime, clindamycin or ceftriaxone for 7 days
- If cellulitis occurring on top of **VZV**, prescribe **flucloxacillin + amoxicillin**
    - Penicillin allergy: ciprofloxacin + metronidazole/clarithromycin
- Rest the area – limb etc
- Advise using paracetamol or ibuprofen to relieve pain or discomfort
- Safety net: seek help if it gets worse or doesn't improve in 24-48 hours
- **Erysipelas** presents similarly but has a very clearly demarcated rash
    - Treated with **penicillin V**

Guttate Psoriasis

- Reassure that it is usually a self-limiting condition that typically resolves within 3–4 months, and reassure that it is not infectious
- 1st: Phototherapy: narrow band UVB 2-3 times/week (if widespread or unresponsive to topical treatment)
- Topical preparation offered:
    - Emollient to reduce scales and relieve itch (E45, Oilatum, Emulsiderm)
    - Potent topical corticosteroid with vitamin D preparation +/- salicylic acid if scales are problematic
- Refer to dermatology if lesions are extensive, severe or not responding to treatment, or there is diagnostic uncertainty.

Haemangioma

- Usually are asymptomatic and undergo involution
- Does not necessarily need treatment
- Needs to be looked after as they can bleed when scratched
- If there is functional impairment (near eyes, nose, mouth) or cosmetic disfigurement:
    - Beta-blocker: PO (propranolol) or topical (timolol)
    - Corticosteroid: PO or topical
    - Until theoretical involution or 12m
    - May need surgery
        - Cryotherapy
        - Electrotherapy
        - Vascular laser surgery
- If it is ulcerated:
    - Barrier protection and Burow's solution for gentle debridement
    - May need topical antibiotics (metronidazole)
    - Beta blocker may be used if haven't previously been treated with it

Hand, Foot and Mouth Disease

- Symptomatic treatment only (hydration and analgesia)
- Keep blisters clean and apply non-adherent dressings to erosions
- Reassurance there is no link to disease in cattle
- Do not necessarily need exclusion from school
- Will subside within days

Insect Bites and Stings

- If stinger is visible, remove by scraping sideways with a finger nail or credit card

- Clean the area with soap and water and advise on prevention
- Specific Bites
    - **Bedbugs** – advise contacting pest control
    - **Fleas** – often associated with contact with domesticated pets (animals should be tested and treated if necessary)
    - **Lice** – check head lice management
    - **Scabies** – check scabies management
    - **Lyme disease (Borrelia)** - doxycycline, amoxicillin and cefuroxime
- If transient localised reaction
    - Consider simple analgesia
    - If swollen, can reduce with ice pack application (15min on and off regimen)
    - Oral antihistamine or topical steroids (hydrocortisone 1%) may reduce itching
        - Can give oral steroids for patients with moderate-severe reactions, continuing for 3-5d
    - OTC agents can be used: crotamiton, topical antihistamines and topical anaesthesia
    - Secondary bacterial infection can be treated as cellulitis
- Animal and Human Bite
    - Check for risk of tetanus
        - If unknown: tetanus/diptheria/pertussis vaccine, tetanus immunoglobulin and another tetanus/diptheria vaccine >4wks after and 6-12m later
    - Check for rabies risk:
        - Non-immunised: Rabies vaccine + rabies immunoglobulin
        - Immunised: rabies vaccine
    - **Co-amoxiclav** for 7 days
        - Penicillin allergy: metronidazole + doxycycline (7 days)
    - Safety net about signs of infection

Milia

- Most cases eventually clear by themselves (within a few weeks in infants)
- May be removed if not cosmetically pleasing
    - Can do it using a fine needle
    - Cryotherapy can be used
    - Laser treatment
    - Dermabrasion
    - Chemical peeling

Molluscum Contagiosum

- Does not require treatment if immunocompetent (it is self-limiting), with spontaneous resolution usually occurs within 18 months
- Advise against squeezing mollusca to avoid the spread of infectious material and reducing risk of super-infections
- Avoid sharing towels, clothing and baths with uninfected people (e.g. siblings)
- If eczema or infection develops around the lesions, treat appropriately (e.g. emollients and steroids or antibiotics)
- Chemical or physical destruction may be done by a specialist and only if lesion has become symptomatic
- If anogenital lesions, can use:
    - Podophyllotoxin 0.5% (usually used to treat anogenital warts but effective)
        - Apply 2 x day for 3 consecutive days
        - Repeat after a week if needed
    - Imiquimod 5% cream
        - Apply 3 x week and wash off 6-10 hours later
- Do NOT need to be excluded from school
- Refer to Dermatologist if:

- Immunocompromised
- Lesions are extensive and painful (although inflamed lesions may indicate resolution)
- Diagnostic uncertainty

Mongolian Blue Spot

- Are harmless and usually disappear by 4yo
- Do NOT need treatment and are not a sign of an underlying condition
- Note: can be mistaken for bruises and thus child abuse/safeguarding issues
  - So should be recorded on baby's medical records from birth

Nappy Rash

- Advise the parents/carers about self-management strategies
  - Consider using a nappy with high absorbency and ensure that it fits properly
  - Leave nappy off as much as possible to help skin drying of the nappy area
  - Clean the skin and change the nappy every 3-4 hours or as soon as possible after wetting/soiling, to reduce skin exposure to urine and faeces
    - Use water, or fragrance-free or alcohol-free baby wipes
    - Dry gently after cleaning
    - Bath the child daily- avoid excessive bathing (>2x a day)
    - Do not use soap, bubble bath, lotions or talcum powder
- **If mild erythema and the child is asymptomatic**
  - Advise on the use of barrier preparation to protect the skin (available OTC) and apply thinly at each nappy change
  - Options: Zinc and Castor oil ointment BP, Metanium ointment, soft white paraffin BP ointment
- **If the rash appears inflamed and is causing discomfort**
  - If > 1 month = **hydrocortisone 1% cream** OD (max 7 days) + barrier cream
  - ADVISE: apply topical hydrocortisone first and wait a few minutes before applying barrier preparation
- **If the rash persists and candidal infection is suspected or confirmed on swab**
  - Advise against the use of barrier protection
  - Prescribe **topical imidazole cream** (e.g. clotrimazole, econazole, miconazole)
- **If the rash persists or bacterial infection is suspected or confirmed on swab**
  - Prescribe **oral flucloxacillin** for 7 days
  - If penicillin allergy: clarithromycin (7 days)
- Arrange to review the child
- **Summary**
  - Disposable nappies are better than towel nappies
  - Expose nappy area to air where possible
  - Apply barrier cream (e.g. Sudocrem)
  - Mild steroid cream (e.g. 1% hydrocortisone) in severe cases
  - Manage suspected candida nappy rash with topical imidazole (cease the use of barrier cream until candida has settled)

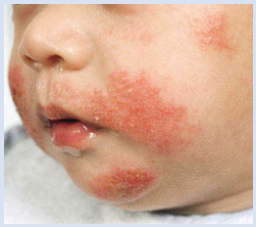
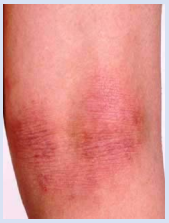
Necrotising Fasciitis

- Surgical emergency
- Surgical debridement of all infected and devitalised tissues, should go beyond visible areas of necrosis
- IV fluids
- Empirical IV antibiotics (vancomycin, linezolid, daptomycin, tedizolid phosphate, tazocin, meropenem, imipenem/cilastatin, ertapenem = 2 or 3 at the same time)
- +/- intravenous immunoglobulin (IVIG)

Paediatric Rashes

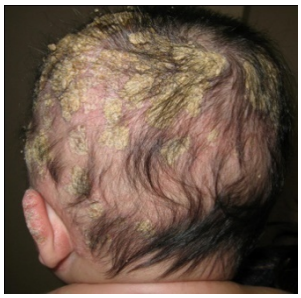
- Type of rash
  - Macular
  - Papular
  - Maculopapular
  - Plaques
  - Pustules
  - Patches
  - Nodules
  - Comedones
- Size
- Shape and symmetry
- Colour and pigmentation
- Surface features (smooth; rough)
- Distribution over the body (extensor surfaces; flexor surfaces)
- Epidermal changes (e.g.: lichenification, scaling)
- Nail/mucosal involvement

Atopic eczema

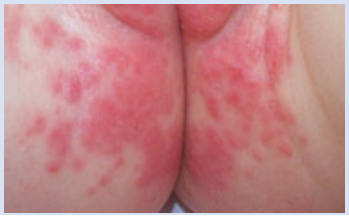
- Itchy rash typically in face, trunk and flexor surfaces (age-dependent)
- Common in first year of life
- Associated with asthma and hay fever
- Scratching causes excoriation, crusting, infection and eventually lichenification
- Management – avoid precipitants, emollients, topical corticosteroids, occlusive bandages, antihistamine, antibiotics, immunomodulators

Infantile seborrhoeic dermatitis



- 'Cradle-cap'
- Erythematous scaly eruption in first 2 months of life
- Progresses to thick yellow adherent layer
- Starts on scalp, spreads to the face, flexures and napkin area
- Not itchy
- Management –
  - Infants: baby shampoo/oil, barrier emollients, topical antifungal creams (clotrimazole, miconazole)
  - Children/adolescents: ketoconazole shampoo/creams, selenium sulphide shampoo, coal tar, salicylic acid ointment

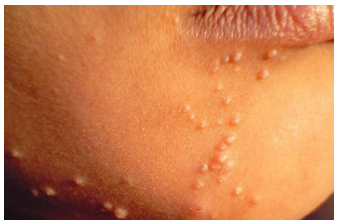
Candida infection



- Both causes and complicates napkin rashes
- Spares flexures
- Satellite pustules
- Management – ensure good hygiene, topical antifungals

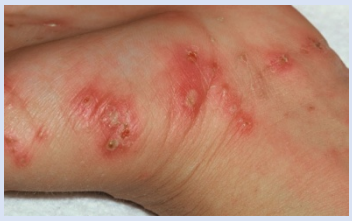
Molluscum contagiosum

- Caused by a poxvirus
- Pearly papules with central umbilication through which the infectious central core is shed
- Usually disappear spontaneously



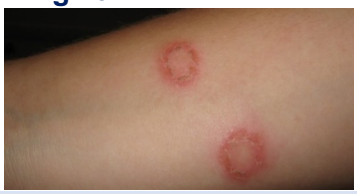
- Management (if needed) – cryotherapy, topical antibacterials to prevent/treat secondary bacterial infection

Scabies



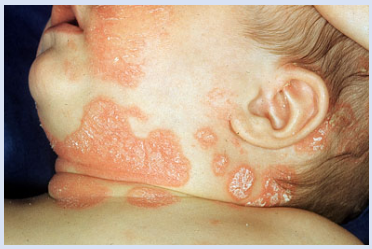
- Caused by *Sarcoptes scabiei*
- Severe itching worse at night and in warmth
- Ask about family's living situation
- Between fingers and toes, axillae, palms, soles and trunk in younger children
- Treatment – treat child and whole family, 5% permethrin cream or 0.5% malathion lotion to whole body below neck, washed off after 12 hours

Ringworm



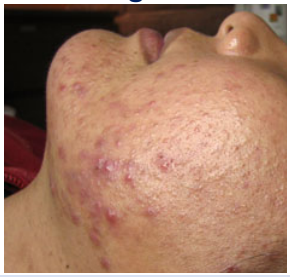
- Annular lesions with a crusted edge caused by dermatophyte fungi
- Kerion – severe inflammatory pustular ringworm
- Treatment – topical antifungals, systemic antifungal for severe infection, treat source (often animals)

Psoriasis



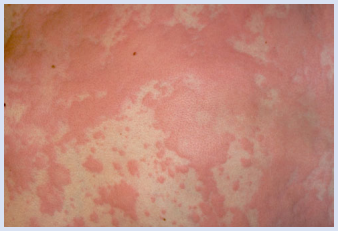
- Most commonly guttate psoriasis following strep/viral URTI
- Small erythematous patches with silvery scale on trunk and upper limbs
- Rare before 2 years, rarely chronic
- Management – emollients, coal tar, dithranol (for resistant cases), calcipotriol (over 6 years of age)
- Can be associated with arthritis

Acne vulgaris

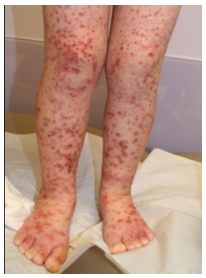
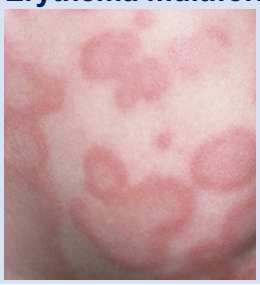
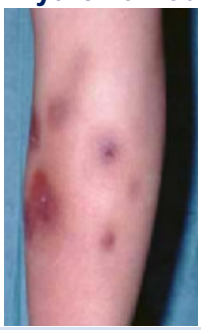


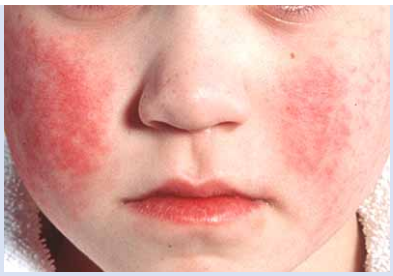
- Can occur 1 – 2 years before onset of puberty
- Due to obstruction of sebum flow in sebaceous follicle
- Open/closed comedones, papules, pustules, nodules, cysts on face, neck, back, shoulders
- Can produce scarring
- Treatment – topical – benzoyl peroxide, antibiotics, retinoids. Systemic – oral antibiotics (tetracyclines only licensed if over 12 years old), isotretinoin

Urticaria



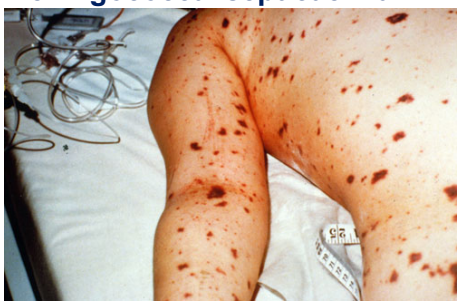
- Hives/weals
- Delayed hypersensitivity reaction due to bite e.g. from mite, flea, bedbug
- Identify underlying triggers – symptom diary may be useful
- Advise likely to be self-limiting
- If symptomatic:
    - Offer non-sedating antihistamines (e.g. cetirizine) for up to 6 weeks
    - These can be increased up to 4 x the standard dose
- If severe, offer PO corticosteroid course for 7 days (e.g. prednisolone 40mg)

	• If symptoms improve, consider giving treatment to take as required (if there were to be future episodes) or daily antihistamines for 3-6 months if symptoms are likely to be persistent • Itchy, can get secondary infection due to scratching
Henoch-Schönlein purpura 	• Boys > girls • Usually between 3 – 10 years of age • Often preceded by URTI (strep) • Rash – papular, symmetrically distributed over buttocks, extensor surfaces of arms and legs and ankles, with sparing of the trunk • Associated with arthralgia, periarticular oedema, abdominal pain and glomerulonephritis • Most cases will resolve spontaneously within 4 weeks • Joint pain can be managed with paracetamol or ibuprofen • If there is scrotal involvement or severe oedema/ abdominal pain, PO prednisolone may be given • IV corticosteroids are recommended in patients with nephrotic-range proteinuria and those with declining renal function • Renal transplant may be considered in end-stage renal disease
Erythema multiforme 	• Target lesions, can also be vesicular or bullous • Caused by herpes simplex, *Mycoplasma pneumonia* and other infections and drugs • Usually resolves spontaneously within a few weeks
Erythema nodosum 	• Tender discrete red nodules on the shins • Caused by Strep, primary TB, IBD, drugs • Treatment – treat underlying cause, compression, anti-inflammatories
Erythema infectiosum / fifth disease / slapped cheek syndrome	• Common infection caused by parvovirus B19 • Often asymptomatic • Rash – initially ‘slapped cheek’, progresses to maculopapular lace-like rash on trunk and limbs • Rash associated with fever, malaise, headache and myalgia



- Infects erythroblastoid red cell precursors in BM, so causes aplastic crisis in sickle cell (↑ RBC turnover), also in immunocompromised
- Maternal transmission can cause hydrops and foetal death due to severe anaemia
- Paracetamol or ibuprofen and encourage adequate fluid intake
- Secondary arthritis may be treated with ibuprofen

Meningococcal septicaemia



- Caused by *Neisseria meningitides* septicaemia
- Characteristic non-blanching purpuric lesions irregular in size and outline with a necrotic centre
- Called '*purpura fulminans'* if widespread
- Often non-specific initial presentation – fever, vomiting, poor feeding, irritability, lethargy, seizures, reduced consciousness, shock; later bulging fontanelle, neck stiffness and opisthotonus
- Typically headache, neck stiffness and photophobia
- Diagnosis – LP (turbid fluid, polmorphs, high protein, low glucose)
- Management – rapid initiation of antibiotics – 3rd generation cephalosporin e.g. ceftriaxone

Pediculosis (Head Lice)

- Wet combing with a fine-tooth comb to remove live lice every 3-4 days for 2 weeks is useful and safe
- **Dimeticone 4% lotion** or aqueous solution of malathion 0.5% is rubbed into the hair and scalp and left on overnight and the hair is shampooed the following morning
- Treatment should be repeated a week later
- School exclusion NOT advised

Periorbital Cellulitis

- Periorbital cellulitis should be treated promptly with **IV antibiotics** (e.g. high-dose ceftriaxone)
  - MRSA will require vancomycin
  - May give empirical antifungal therapy
- This is to prevent posterior spread of the infection which could cause orbital cellulitis
- Incision, drainage and culture of peri-ocular abscess may be required
- Consider ophthalmologist advice

Ringworm

- **Tinea Corporis, Tinea Cruris**
  - Mild infections are treated with **topical antifungals**
    - E.g. terbinafine cream, clotrimazole
  - If marked inflammation, consider **hydrocortisone 1% cream**
  - More severe infections will require **systemic antifungals**
    - **1st line**: oral terbinafine
    - **2nd line**: oral itraconazole
  - Topical aluminium acetate (in some)
- **Tinea Capitis**
  - Systemic antifungal therapy (e.g. **griseofulvin** or **terbinafine**)
  - **2nd line**: itraconazole or fluconazole
  - Adding topical antifungal shampoo is recommended in some patients (e.g. selenium sulfide or ketoconazole topical)

- NOTE: any animal source of the infection will also need treatment
- **Advice**
  - Wear loose-fitting cotton clothing
  - Wash affected areas of skin daily
  - Dry thoroughly after washing
  - Avoid scratching
  - Do not share towels
  - Wash clothes and bed linen frequently
  - No need for school exclusion

Scabies

- Prescribe a topical insecticide/scabicide (**permethrin 5% cream**)
  - The product should be applied to the **whole body** from the chin and ears downwards
  - Particular attention should be paid to areas in between the fingers and under the nails
  - It should be applied to cool, dry skin and allowed to dry before the patient dresses
  - Permethrin should be **washed off after 8-12 hours**
  - A second application is required, **10-14d** after the first application
  - **2nd line**: ivermectin 0.5% 200 mcg/kg (if permethrin is contraindicated/not tolerated)
- **Advice**
  - Members of the household and other close contacts should be treated
  - The bedding, clothing and towels of the patient (and any potentially infected contacts) should be decontaminated by washing at a high temperature and drying in a hot dryer
  - Patients whose symptoms persist 2-4 weeks after the last treatment application should be advised to retreat
  - Treat **post-scabietic itch** with **crotamiton 10% cream** (or topical hydrocortisone)
  - Night-time sedative antihistamine (e.g. chlorphenamine) may help reduce itching and improve sleep
- In babies, the face and scalp should be included but avoiding the eyes
- Alternative: benzyl benzoate emulsion can be applied below the neck and left on for 12 hours, but it smells bad and has irritant action
- **Special Cases**
  - If **crusted scabies**, seek specialist advice
  - Seek specialist advice if < 2 months old

Seborrhoeic Dermatitis

- Reassure the parents and it will spontaneously resolve over a few weeks/months (usually by 8 months)
- Scalp affected:
  - Infants (cradle cap):
    - Massaging olive/vegetable oil onto scalp to loosen scales and then brush gently with soft brush and wash off with shampoo
    - Thicker scales can be soaked overnight with olive/vegetable oil or petroleum jelly and then shampooed in the morning
    - Consider topical hydrocortisone lotion once/twice daily
  - Children:
    - Shampoo containing: pyrithione zinc, coal tar, salicylic acid, selenium sulfide, ciclopirox
    - Or antifungal shampoos: ketoconazole, miconazole
    - Use 2-3 times per day (depending on preparation) until symptoms disappear
- Non-scalp areas affected:
  - Infants: advise **bathing** the infant at least once per day using an emollient as a soap substitute
  - Topical corticosteroids/antifungals: desonide, hydrocortisone, ketoconazole
- Consider dermatology referral if it lasts > 4 weeks or is widespread

Viral Warts

- Watchful waiting is most common in children
- Daily administration of proprietary **salicylic acid** or **lactic acid paint** or **glutaraldehyde lotion** can be useful
- **Cryotherapy** with liquid nitrogen is effective but can be painful (should only be used in older children)

Kidneys and Urinary Tract Disorders

Glomerulonephritis

- **Acute Glomerulonephritis**
  - **Mild:**
  - Treat the underlying cause
  - Supportive treatment with close monitoring
  - May need antibiotics, if post-strep GN
    - Phenoxymethylpenicillin
  - **Moderate:**
  - ACE inhibitor or ARB
  - May need antibiotics, if post-strep GN
    - Phenoxymethylpenicillin
  - Furosemide
  - **Severe:**
  - Corticosteroids and immunosuppressants (e.g. Rituximab)
  - **With nephrotic syndrome**:
  - Prednisolone +/- immunosuppressant
  - **Prophylactic trimethoprim –** for early phases of treatment due to immunosuppression
- **Rapidly progressive:**
  - Manage existing cardiovascular risk factors:
    - Lifestyle
    - Statins
    - Blood pressure control
    - Aspirin
  - Anti-GBM:
    - Plasmapheresis + prednisolone + cyclophosphamide
    - **Prophylactic trimethoprim –** for early phases of treatment due to immunosuppression
  - Immune complex – not SLE:
    - Prednisolone
    - Phenoxymethylpenicillin
  - Immune complex – SLE:
    - Cyclophosphamide +/- prednisolone
    - **Prophylactic trimethoprim –** for early phases of treatment due to immunosuppression
  - Pauci-immune:
    - Methylprednisolone + cyclophosphamide
    - **Prophylactic trimethoprim –** for early phases of treatment due to immunosuppression

Acute Kidney Injury (AKI)

- Use **STOP AKI**
  - **Sepsis –** perform septic screen
  - **Toxins –** identify and stop nephrotoxic drugs (e.g. NSAIDS, aminoglycoside, iodine based contrast agents)
  - **Optimise** volume status and blood pressure –
    - Hypovolaemic – give bolus saline
    - Withhold duiretics
  - **Prevent harm**
    - Treat reversible causes e.g. urinary tract obstruction
    - Treat life threatening complications e.g. acidosis and hyperkalaemia
- **PRE-renal failure**
  - Due to hypovolaemia, decreased sodium excretion because the body is trying to retain it
  - Hypovolaemia should be urgently addressed with **fluid replacement** and circulatory support
  - **Dopamine/adrenaline** in severe hypotension
  - **Furosemide** if volume overloaded
- **RENAL failure**
  - Treat underlying cause
  - Monitoring water and electrolyte balance
  - A high-calorie, normal protein feed will decrease catabolism, uraemia and hyperkalaemia
  - **Furosemide** if volume overloaded
  - **IV fluid replacement** if prerenal failure co-existing
  - Consider renal replacement therapy

- **POST-renal failure**
  - Refer immediately to urology if any of the following are present:
    - Pyelonephritis
    - Obstructed solitary kidney
    - Bilateral upper urinary tract obstruction
    - Complications of AKI caused by urological obstruction
  - Requires assessment of the site of obstruction
  - Relief can be achieved by nephrostomy or bladder catheterisation
  - **Furosemide** if volume overloaded
  - Consider renal replacement therapy
- **Dialysis**
  - Indicated in AKI when there is:
    - Failure of conservative management
    - Hyperkalaemia
    - Severe hyponatraemia or hypernatraemia
    - Pulmonary oedema or severe hypertension due to volume overload
    - Severe metabolic acidosis
    - Multisystem failure

AKI in childhood generally has a good prognosis unless it is complicating a more serious condition (e.g. severe infection, following cardiac surgery)

Chronic Kidney Disease (CKD)

- Aims of treatment:
  - Treat reversible kidney dysfunction
  - Prevent/slow progression of disease

- Treat the complications

	1st line	2nd line	Additional treatments
Stage 1-2 without uraemia	ACE inhibitor/ARB	CCB	Statin Additional Antihypertensives
Stage 3-4 without uraemia	ACE inhibitor/ARB Statin +/- ezetimibe	CCB Statin +/- ezetimibe	Addition antihypertensives Education about RRT
Stage 5 with uraemia	Dialysis	Kidney transplant	Secondary hyperparathyroidism

- If anaemia presents:
  - Erythropoietin stimulating agent can be used
  - **Iron supplementation** should also be given
- If secondary hyperparathyroidism occurs:
  - Decreased activation of vitamin D leads to phosphate retention and hypocalcaemia, which, in turn, leads to secondary hyperparathyroidism and eventually **osteitis fibrosa cystica** and **osteomalacia**
  - Phosphate restriction (by reducing milk), using **calcium carbonate** as a phosphate binder and **activated vitamin D** supplements can help
- If metabolic acidosis occurs:
  - Many children will also have obligatory loss of salt and water
  - They need salt supplements and a lot of water
  - Treatment with bicarbonate supplements is needed to prevent acidosis
- Diet
  - Anorexia and vomiting are common
  - Calorie supplements or NG/gastrostomy feeding is often necessary to optimise growth
  - Protein intake should be sufficient to maintain growth and normal albumin (but preventing the accumulation of toxic metabolic by-products)
- Hormonal abnormalities
  - Growth hormone resistance, characterised by a high GH level but poor growth, is a feature of CKD
  - Recombinant human GH is effective in improving growth for up to 5 years of use
  - Many children with stage 4/5 CKD will have delayed puberty or subnormal pubertal growth spurt

Enuresis

- Most children are dry by day and night by the age of **5 years**
  - Children are dry by day only by the age of **4 years**
- Primary Bedwetting (without daytime symptoms)
  - Children < 5 years
    - Reassure the parents that many children aged < 5 yrs wet the bed and this usually resolves without intervention
    - Ensure easy access to the toilet at night (e.g. potty near the bed)
    - Encourage bladder emptying before bed
    - Consider a positive reward system
  - Children > 5 years
    - If bedwetting is infrequent (< 2 per week) reassure the parents and offer watch-and-see approach
      - Can use a star or reward chart
      - Don't punish or make the child feel embarrassed
    - If long-term treatment is required, offer:

- **1st line: enuresis alarm** with positive reward system
- 2nd line: desmopressin
  - Note: fluid should be restricted 1 hour before desmopressin until 8 hours after
  - May need to use anticholinergics if have nocturnally overactive bladder
- If rapid or short-term control is required (e.g. school trips), offer desmopressin
- If bedwetting recurs following treatment, restart previously successful treatments and offer combination treatment with desmopressin and an enuresis alarm
- Referral
  - If bedwetting has NOT responded to two courses of treatment, refer to secondary care, enuresis clinic or community paediatrician

- Primary Bedwetting (with daytime symptoms)
  - Refer all children to secondary care or an enuresis clinic
- Secondary Bedwetting (enuresis that occurs after the child has previously been dry at night for 6 months)
  - The following underlying causes can be managed in **primary care**
    - UTI
    - Constipation
  - The following underlying causes are likely to need specialist referral
    - Diabetes
    - Recurrent UTI
    - Psychological problems
    - Family problems
    - Developmental, attention or learning difficulties
    - Known or suspected physical or neurological problems
- Summary
  - Look for possible causes (e.g. constipation, diabetes)
  - **BED**
    - **B**ehavioral - Advise onreduced fluid intake before bed, diet and toileting behaviour & Reward systems (e.g. star charts)
    - **E**nuresis alarm
    - **D**esmopressin: may be used 1st line if > 7 years or if short-term control is needed (e.g. holiday)

Haemolytic Uraemic Syndrome (HUS)

- Consult nephrology and haematology specialists
- Children with the typical presentation should be admitted
- Supportive
  - Monitor urine output and fluid balance
  - **In diarrhoea HUS (D+ HUS) use of antibiotics can worsen disease**
  - Maintain adequate hydration status (avoid cardiopulmonary overload) – **IV isotonic crystalloids**
  - Monitor blood pressure (treat if elevated)
    - Treatment should be with CCBs (ACE inhibitors can reduce renal perfusion)
  - If anaemic, **red cell transfusion** is needed
  - Avoid antibiotics, anti-diarrhoeals, narcotic opioids and NSAIDs
  - 50% of patients will require **dialysis** in the acute phase
- If irreversible renal failure has occurred then **renal transplant** will be needed
- **Long-term follow-up** is necessary because there may be persistent proteinuria and the development of hypertension and progressive CKD
- **Atypical HUS** has no diarrhoeal prodrome, may be familial and frequently relapses
  - This has a high risk of hypertension and progressive CKD with a high mortality

- **Thrombotic thrombocytopenic purpura** will require plasmapheresis

Henoch-Schonlein Purpura (IgA vasculitis)

- Most cases will **resolve spontaneously** within 4 weeks
- Joint pain can be managed using paracetamol or ibuprofen
- If there is scrotal involvement or severe oedema or severe abdominal pain, **oral prednisolone** may be given
    - Rest, hydration and elevation of the affected area needed
- **IV corticosteroids** are recommended in patients with nephrotic-range proteinuria and those with declining renal function
- In rapidly progressive nephritis:
    - IV corticosteroids + oral prednisolone + cyclophosphamine
    - Renal transplant or dialysis may be considered
- Follow-up to check blood pressure and renal function

Nephrotic Syndrome

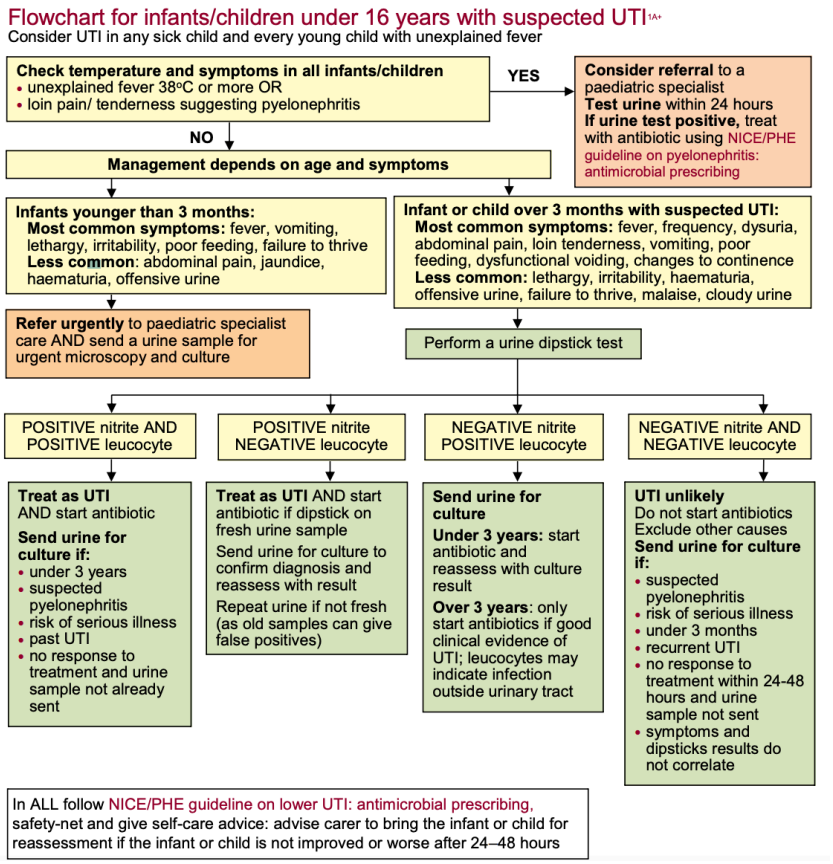
- Minimal change disease is main cause in children
- Initially give oral steroids (60 mg/m^2 per day of **prednisolone**)
    - After 4 weeks, the dose should be reduced or alternate days for 4 weeks
    - Then it should be weaned or stopped
- Fluid restricted and low-salt diet
- May need **albumin and furosemide** if very advanced MCD
- Children who don't respond after 4-6 weeks of corticosteroid therapy or have atypical features may have a more complex diagnosis and need a renal biopsy
    - Given ciclosporin or tacrolimus and methylprednisolone

Urinary Tract Calculi

- Conservative management with IV fluids, analgesia (morphine) and anti-emetics (ondansetron)
- **Bacterial Infection** - antibiotic treatment with co-trimoxazole or nitrofurantoin, or surgical decompression
- **Small stones** - medical expulsive therapy
    - May pass naturally
    - Tamsulosin for distal ureteric stones <10mm OR alfuzosin OR silodosin
- Surgical removal if: Larger stones and those that do not pass spontaneously OR renal colic with ongoing pain that is not tolerated
    - 1st line: ESWL or ureteroscopy
- High fluid intake is recommended in all affected children

Urinary Tract Infection

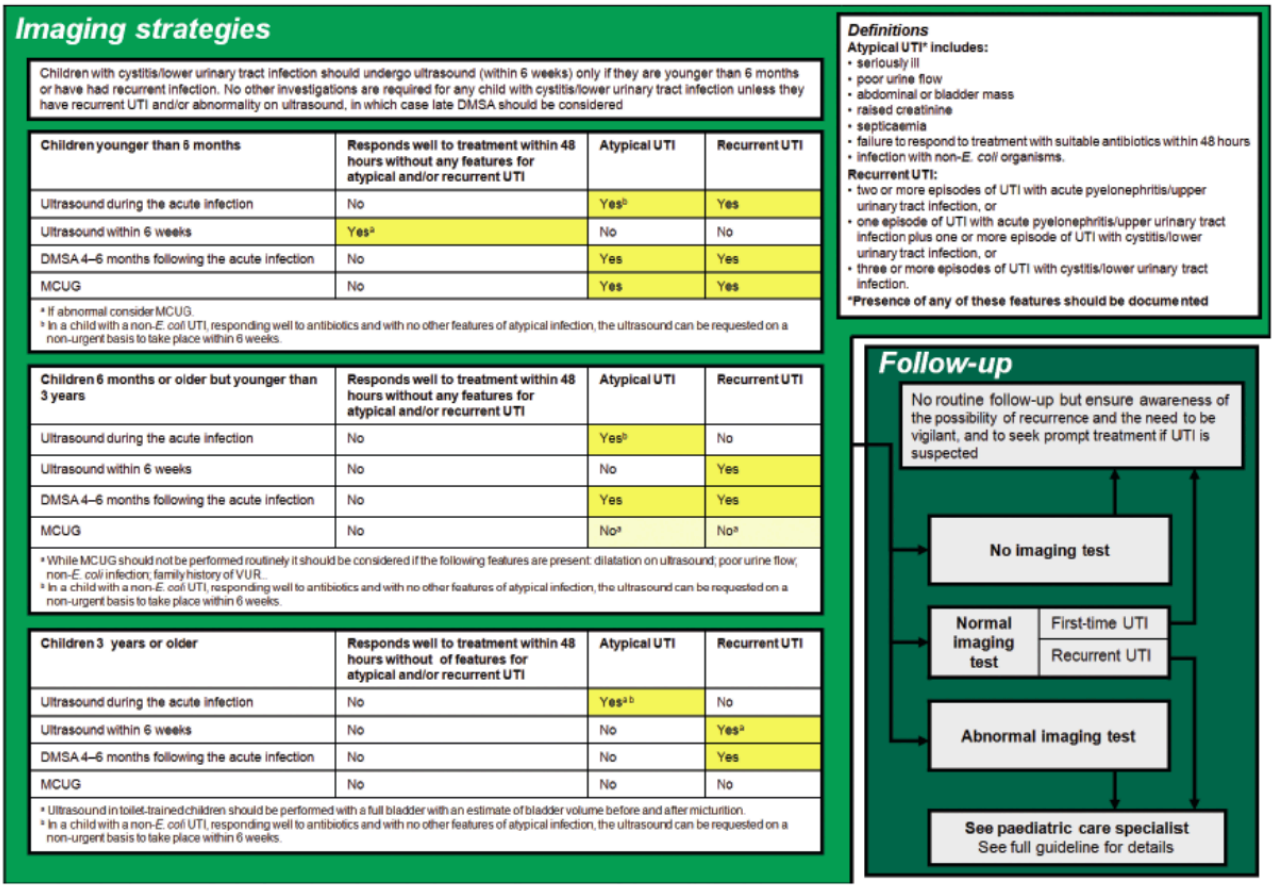
- **Initial investigation**



- **Management**

Age	Systemically stable
<3 months	All to be **admitted to hospital** after full sepsis screen, including urine MC&S. All to receive parenteral antibiotics, e.g. IV ampicillin and gentamicin or cefotaxime. Consider oral stepdown after clinical response seen + blood/CSF culture being negative
3 months – 15 years	For lower UTI, give oral antibiotics ○ Trimethoprim ○ Nitrofurantoin (if eGFR >/=45ml/min) For upper UTI or acute pyelonephritis: consider paediatric referral ○ Cephalexin ○ Co-amoxiclav (only if culture results confirm organism is susceptible)
Recurrent UTIs	Refer all children to paediatric specialist for further investigation. Will require follow up with ultrasound scans, Micturating cystourethrogram (MCUG) and DMSA scans to check for scarring and reflux

- **Further investigations**



Imaging strategies

Children with cystitis/lower urinary tract infection should undergo ultrasound (within 6 weeks) only if they are younger than 6 months or have had recurrent infection. No other investigations are required for any child with cystitis/lower urinary tract infection unless they have recurrent UTI and/or abnormality on ultrasound, in which case late DMSA should be considered

Children younger than 6 months	Responds well to treatment within 48 hours without any features for atypical and/or recurrent UTI	Atypical UTI	Recurrent UTI
Ultrasound during the acute infection	No	Yes[b]	Yes
Ultrasound within 6 weeks	Yes[a]	No	No
DMSA 4–6 months following the acute infection	No	Yes	Yes
MCUG	No	Yes	Yes

[a] If abnormal consider MCUG.
[b] In a child with a non-*E. coli* UTI, responding well to antibiotics and with no other features of atypical infection, the ultrasound can be requested on a non-urgent basis to take place within 6 weeks.

Children 6 months or older but younger than 3 years	Responds well to treatment within 48 hours without any features for atypical and/or recurrent UTI	Atypical UTI	Recurrent UTI
Ultrasound during the acute infection	No	Yes[b]	No
Ultrasound within 6 weeks	No	No	Yes
DMSA 4–6 months following the acute infection	No	Yes	Yes
MCUG	No	No[a]	No[a]

[a] While MCUG should not be performed routinely it should be considered if the following features are present: dilatation on ultrasound; poor urine flow; non-*E. coli* infection; family history of VUR.
[b] In a child with a non-*E. coli* UTI, responding well to antibiotics and with no other features of atypical infection, the ultrasound can be requested on a non-urgent basis to take place within 6 weeks.

Children 3 years or older	Responds well to treatment within 48 hours without of features for atypical and/or recurrent UTI	Atypical UTI	Recurrent UTI
Ultrasound during the acute infection	No	Yes[a,b]	No
Ultrasound within 6 weeks	No	No	Yes[a]
DMSA 4–6 months following the acute infection	No	No	Yes
MCUG	No	No	No

[a] Ultrasound in toilet-trained children should be performed with a full bladder with an estimate of bladder volume before and after micturition.
[b] In a child with a non-*E. coli* UTI, responding well to antibiotics and with no other features of atypical infection, the ultrasound can be requested on a non-urgent basis to take place within 6 weeks.

Definitions

Atypical UTI* includes:
- seriously ill
- poor urine flow
- abdominal or bladder mass
- raised creatinine
- septicaemia
- failure to respond to treatment with suitable antibiotics within 48 hours
- infection with non-*E. coli* organisms.

Recurrent UTI:
- two or more episodes of UTI with acute pyelonephritis/upper urinary tract infection, or
- one episode of UTI with acute pyelonephritis/upper urinary tract infection plus one or more episode of UTI with cystitis/lower urinary tract infection, or
- three or more episodes of UTI with cystitis/lower urinary tract infection.

***Presence of any of these features should be documented**

Follow-up

No routine follow-up but ensure awareness of the possibility of recurrence and the need to be vigilant, and to seek prompt treatment if UTI is suspected

No imaging test

Normal imaging test: First-time UTI / Recurrent UTI

Abnormal imaging test

See paediatric care specialist
See full guideline for details

Genitalia

Epididymo-Orchitis

- Consider admitting to hospital if:
  - Systematically unwell
  - Diabetes
  - Immunocompromised
- Same day or next day assessment by sexual health specialist
- Identify most likely cause
  - Sexually transmitted infection
    - Age <35 yrs
    - 1+ sexual partner in last 12 months
    - Urethral discharge
  - Gonorrhoeal
    - Previous gonorrhoeal infection
    - Purulent urethral discharge
    - Men who have sex with men
    - Black ethnicity
  - Enteric organisms associated with UTIs
    - Age >35 yrs
    - Low risk sexual history
    - History of penetrative anal sex
    - Recent catheterisation
  - Consider testing for HIV, hepatitis, syphilis, trichomoniasis and mumps

- **Symptomatic Relief**
  - Bed rest
  - Scrotal elevation
  - Simple elevation
  - If systemically unwell with a high-grade fever, **IV antibiotics and fluids** are required
- **Treatment**
  - Empirical antibiotics
    - **STI (Gonorrhoea or Chlamydia)** – without waiting for results:
      - ceftriaxone 1g IM single dose PLUS
      - doxycycline 100mg PO TDS for 14 days
    - **Non STI-chlamydia or non gonococcal organism** - doxycycline 100mg PO TDS for 14 days
    - **Enteric organisms** – quinolone (e.g. ofloxacin, levofloxacin)
  - **Mumps** – supportive
- **Prevention of complications**
  - Prompt treatment and supportive measures
  - Possible complications: abscess formation, infertility, chronic pain

Hydrocoele

- **< 2 years** (congenital hydrocoele) = most resolve spontaneously before the age of 2 so observation is appropriate unless there is bowel palpable in the groin and provided there is no evidence of underlying pathology
- **2-11 years** - hydrocele persists beyond 2 years
  - Open repair
  - Laparoscopic exploration
  - Bilateral repair
  - Abdominoscrotal hydrocoeles - require surgery through an abdominal incision
- **11-18 years** - commonly non-communicating hydrocoele
  - **Idiopathic hydrocoele** - observation is appropriate, however, surgery may be considered if it is large or uncomfortable
  - **Hydrocoele after varicocelectomy** - conservative management is the initial approach, surgery is considered in cases that do not resolve
  - **Filarial-related hydrocoele** (parasitic infection) - complete excision of the tunica vaginalis

Hypospadias

- Surgery is NOT mandatory
- May be performed on functional or cosmetic grounds (after 3 months)
- Ultimate functional aim of surgery is to allow boys to pass urine in a straight line whilst standing and to have a straight erection
- Prepuce may be preserved and reconstructed, although for more proximal hypospadias, it is sometimes required for the repair itself
- **IMPORTANT**: boys with hypospadias should NOT be circumcised before repair, because the skin is important for the repair

Paraphimosis

- With ischaemia or necrosis:
  - Emergency surgery
- Acute but without ischaemia or necrosis:
  - Manipulation with topical analgesia (with ice packs, compression, osmotic agents such as 50% dextrose). If this fails, refer urgently to urology.
  - Puncture technique - perforating the foreskin at multiple locations to allow exudation of oedematous fluid (if manipulation was unsuccessful)
  - Surgical reduction followed by circumcision
- Chronic without ischaemia or necrosis:

- Surgical reduction followed by circumcision

Testicular Torsion

- Presenting **within 4-6 hours of symptom-onset** has a greater likelihood of testicular viability
- **If suspected admit immediately to urology or paediatric surgery**
  - **IV fluids, NBM, antiemetics, analgesia**
- **Non-Neonates**
  - Immediate urological consultation for operative repair
  - With supportive care: morphine sulfate and ondansetron
  - Decision about orchidectomy vs orchidopexy is based on the extent of damage to testicular tissue
  - During surgery, the contralateral testicle is fixed to the posterior wall
- **Neonates**
  - Born with torsion - debate about whether surgical intervention is necessary (risk of anaesthesia)
  - Born with normal testes but develop torsion - urgent surgical exploration is necessary
  - In any case supportive care is necessary: morphine sulfate and ondansetron
- **Manual de-torsion** may be attempted if surgery is not available within 6 hours
- **Supportive Care**
  - Pain relief and sedation
  - Anti-emetics
  - If there no current scrotal swelling but there are histories of pain and swelling – refer to outpatient with urologist, urgency depends on frequency and duration of episodes

Undescended Testes / Cryptorchism

- **< 3 months**
  - If possibility of **disorder of sexual development** (e.g. ambiguous genitalia or hypospadias)
    - Urgently refer to a senior paediatrician within 24 hours as genetic or endocrine testing may be necessary
  - If undescended testes are **bilateral** at birth
    - Urgently refer to a senior paediatrician within 24 hours as genetic or endocrine testing may be necessary
  - If undescended testes are **bilateral** at 6-8 weeks
    - Urgent referral to paediatrician within 2 weeks.
  - If **unilateral** undescended testis
    - At birth - arrange review at **6-8 weeks**
    - At 6-8 weeks
      - If both testes are descended, no further action is necessary
      - If unilateral undescended testis, re-examine at **3 months**
    - At 3 months
      - If both testes are descended, no further action is needed
      - If both testes are in the scrotum, but one or both are retractile, advise the parents that **annual follow up** is needed throughout childhood as there is a risk of ascending testes
      - If the testis is still undescended, refer the child to a paediatric surgeon **before 6 months of age**
      - If uncertain between undescended or retractile- referral for clarification of diagnosis
- **Surgery**
  - Undescended palpable testis → **Orchidopexy** (placement of testis in the scrotum) is performed for the following reasons:
    - Cosmetic
    - Reduced risk of trauma and torsion

        - Fertility (particularly important if bilateral)
        - Malignancy (increased risk in an undescended testis)
        - (Ideally, surgery should be performed <1 year of age)
    - Undescended non-palpable testis → Laparoscopic inguinal surgical exploration with subsequent orchidopexy/orchidectomy
        - Orchidolysis- by 12 months
        - Orchidopexy- by 18 months
- In 10% of impalpable testis, they have regressed in development and are **absent**
- **Summary**
    - If undescended by 3 months, refer to paediatric surgery (before 6 months)
    - Orchidopexy should be considered from 3 months

Malignant Disease

Acute Lymphoblastic Leukaemia (ALL)

- Factors contributing to prognosis:

Prognostic factor	High-risk features
Age	<1 year or >10 years
Gender	Male, non-caucasian
Tumour load (measured by WBC)	>50x10^9/L
Cytogenetic / molecular genetic abnormalities in tumour cells	t(9;22), t(8;14) MLL rearrangement, t(4;11), hypodiploidy, presence of T or B cell markers
Speed of response to initial chemotherapy	Persistence of leukaemic blasts in bone marrow
Minimal residual disease assessment (submicroscopic levels of leukaemia detected by PCR)	High

- NOTE: these factors are considered when deciding on the treatment intensity
- **Supportive therapy**
    - Sufficient **fluid** intake to guarantee urine output of 100 mL/hour
    - **Allopurinol** or **rasburicase** to **prevent tumour lysis syndrome**
    - Bleeding patients or low platelet count may require transfusions
    - Prophylactic antibiotics, antifungals, and antivirals
    - Prophylactic use of haematopoietic growth factors e.g. CSF (filgrastim) in those at risk of febrile neutropenia
    - Norethisterone can be given to female patients to suppress periods during therapy and periods of thrombocytopenia
- Before starting treatment, anaemia may need to be corrected using blood transfusions
- **Newly Diagnosed: NO CNS Disease**
    - Induction chemotherapy
        - Standard induction includes prednisolone, vincristine, anthracyclines (e.g. doxorubicin, daunorubicin) and/or L-asparaginase)
        - Dexrazone (prevent cardiotoxicity from doxorubicin)
        - Rituximab (if CD20+ ALL)
        - Tyrosine kinase inhibitors (e.g. imatinib) - for Philadelphia chromosome-positive patients
- **Central Nervous System Involvement**
    - Cytotoxic drugs penetrate poorly into the CNS
    - Standard induction therapy with intensified intrathecal chemotherapy is, therefore, required to prevent CNS relapse
    - Currently recommended regimens consist of frequent **intrathecal methotrexate** alone or with **cytarabine** and **hydrocortisone** ('triple'), and consolidation therapy containing systemic treatment with high-dose cytarabine (HDAC) or high-dose methotrexate (HDM) to ensure good blood-brain penetration

- The **second phase** of treatment after **induction** of remission consists of **consolidation and maintenance therapy**
    - **Remission** occurs when leukaemic blasts are eradicated and normal marrow function is restored
    - Current induction regimens achieve remission rates of 95%
    - Continuing chemotherapy of moderate-high intensity is usually continued for a relatively long time (up to 3 years)
- **Relapse, refractory, or residual disease**
    - High-dose chemotherapy, with or without total body irradiation followed by bone marrow transplantation, is used as an alternative to conventional chemotherapy after a relapse

Brain Tumours

- SURGERY - aimed at treating hydrocephalus, providing tissue diagnosis and attempting maximum resection
- Radiotherapy and chemotherapy - vary depending on tumour type

Hodgkin's Lymphoma

- Combination chemotherapy (**ABVD**: Adriamycin (Doxorubicin), bleomycin, vinblastine and dacarbazine) with/without radiotherapy
- **Favourable disease**: two cycles of **ABVD** followed by low dose radiation
- **Unfavourable disease:**
    - four cycles of **ABVD** followed by medium radiation OR
    - **BEACOPP** (bleomycin, etoposide, doxorubicin, cyclophosphamide, vincristine, procarbazine, prednisolone), followed by two cycles of ABVD and radiotherapy
- **Primary refractory or relapse disease:**
    - High-dose chemotherapy and autologous stem cell transplantation (ASCT)
    - **Brentuximab vedotin** (anti CD30) can be prescribe if ASCT fails or is ASCT is unsuitable
    - **Nivolumab** and **Pembrolizumab** (both block PD-1) are last line
- PET scanning is used to monitor treatment response
- 80% cure rate

Neuroblastoma

- Low risk disease (localised primaries without metastatic disease, in some infants may resolve spontaneously)
    - Observation (serial ultrasounds every 3-6 weeks) +/- surgery
    - Chemotherapy if progresses post-surgery
- Intermediate risk (Metastatic disease)
    - Chemotherapy AND surgery
        - Carboplatin, etoposide, cyclophosphamide, and doxorubicin for 4-8 cycles
    - Radiotherapy is unsuccessful
- High risk (Aggressive and metastatic disease)
    - Radiotherapy
        - High dose carboplatin, etoposide, cyclophosphamide, and doxorubicin for 5-6 cycles
    - Surgery
    - Autologous bone marrow transplant
    - Radiotherapy
    - Immunotherapy with Dinutuximab
    - Isotretinoin
- Cure rates for children with metastatic disease is around 40%

Retinoblastoma

- Average age of diagnosis: 18 months
- In propriety, goals of treatment: Save life, save eye, save vision
- Frequent eye examinations under anaesthesia to assess the response to treatment
- **Gross vitreous seeding present (tumor cells floating within the vitreous cavity)**
  - **1st LINE:** Enucleation (surgical removal of the eye without resection of the lids or extraocular muscles
  - **Infiltration of the iris, ciliary body or sclera**: Adjuvant chemotherapy: carboplatin, etoposide, and vincristine
- **Minimal or no vitreous seeding present**
  - **1st LINE:** systemic chemotherapy (carboplatin, vincristine, etoposide)
  - **PLUS:** focal therapy (cryotherapy or laser therapy)
- **Family history of retinoblastoma/detected at birth**
  - Usually treated by laser alone
  - Followed up with an examination under anaesthesia every month for at least 1 year
- **Vitreous seeding after chemotherapy and/or focal therapy**
  - **1st LINE:** external beam radiotherapy
- Most patients are cured (90%)
- However, many will be **visually impaired**
- Significant risk of second malignancy (especially sarcoma) among survivors of hereditary retinoblastoma

Wilm's Tumour (Nephroblastoma)

- Surgery (nephrectomy) and chemotherapy (may be post-operative or pre-operative)
- Subsequent management is dependent on histological findings
- Radiotherapy in more advanced disease
- 5% have bilateral disease
- More than 80% of patients are cured

Haematological Disorders

Beta Thalassemia Major

- It is fatal without regular **blood transfusions**
- The transfusions aim to maintain the Hb concentration > 100 g/L to reduce growth failure and prevent bone deformation
- Repeated blood transfusion can cause iron overload
- This can lead to cardiac failure, liver cirrhosis, diabetes, infertility and growth failure
- To prevent this, all patients are treated with **iron chelation**
  - Chelators include SC desferrioxamine or oral deferasirox
- Good compliance with transfusion and chelation is associated with a high probability of surviving beyond 40 years
- **Bone marrow transplantation** is the only cure for beta-thalassemia major
  - However, this is reserved for children with an HLA-identical sibling
- Splenectomy may be required

Trait (heterozygous for beta thalassaemia)

- Genetic counselling and iron advice
- **Prenatal diagnosis** via chorionic villus sampling

Bruising

- If there is active bleeding, admit to hospital
- Consider **non-accidental injury** – red flags:

- Bruises are on a child who is not yet independently mobile (crawling, cruising, or walking).
- Bruises have indicative features - unusually large, multiple sites or in clusters, similar shape and size, patterned in the shape of a hand print, ligature, stick, tooth, grip, or implement (such as a belt).
- Bruises are found in indicative places - any non-bony part of the body or face (including the eyes, ears, cheeks, back, abdomen, buttocks, arms, and genitalia).
- Explanation for the bruising is implausible, inadequate, or inconsistent
- Delay in presentation.
- If suspicions of NAI, screen for other injuries and perform skeletal survey to investigate. Inform safeguarding team.

- If no suspicion of NAI:
  - Consider leukaemia if unexplained petechiae, hepatosplenomegaly, high WBC on FBC
  - Urgent referral for neuroblastoma if periorbital bruising, palpable abdominal mass
  - Further investigations to detect underlying cause

Typical bleeding patterns

	Platelet disorders	Coagulation factor disorders
Site	Skin, mucus membranes (epistaxis, gum, vaginal, GI)	Soft tissues, joints, muscles
Petechiae	Yes	No
Ecchymoses ("bruises")	Small, superficial	Large, deep
Haemarthrosis/muscle bleeding	No	Yes
Bleeding after cuts & scratches	Yes	No
Bleeding after surgery or trauma	Immediate	Delayed (1-2 days)
Severity	Mild	Severe

Disseminated Intravascular Coagulation (DIC)

- Treat underlying cause (usually **sepsis**)
- Supportive care
- Replacement therapy - replacement of platelets (platelet transfusion), coagulation factors (FFP) and cryoprecipitate transfusions
- Restoration of physiological coagulation pathways (e.g. heparin – however use is controversial)
- Antithrombin – minimal data on effectiveness and safety – should not be used
- Protein C concentrates may be used, particularly in purpura fulminans due to meningococcal septicaemia or congenital protein deficiency (in neonates)
- Chronic DIC may require heparin and tranexamic acid

G6PD Deficiency

- Parents should be advised on the signs of **acute haemolysis** (jaundice, pallor, dark urine)
- Parents should also be given a list of drugs, chemicals, and food to avoid
- **Acute Haemolysis**
  - Supportive care + folic acid
  - Blood transfusion and renal support may be given in cases of severe anaemia with renal impairment
- **Neonates with prolonged hyperbilirubinaemia**
  - Follow treatment graphs for phototherapy and exchange transfusion

Haemophilia A and B

- Recombinant factor VIII concentrate for haemophilia A
  - 10-15% of patients will develop antibodies to factor VIII treatment
- Recombinant factor IX concentrate for haemophilia B
- Acute bleeds are treated with factor concentrates and anti-fibrinolytics (e.g. aminocaproic acid, tranexamic acid)
- NOTE: these should be given by prompt IV infusion whenever there is any bleeding
- Analgesia and physiotherapy may be required for deep bleeds into muscles and joints
- Orthopaedic and pain team review may also be necessary
- In patients with haemophilia, the following should be AVOIDED:
  - IM injections
  - Aspirin
  - NSAIDs
- **Complications of Haemophilia Treatment**

Inhibitors, i.e. antibodies to FVIII or FIX

- Develop in 5–20%
- Reduce or completely inhibit the effect of treatment
- Require the use of very high doses of factor VIII or bypassing agents (e.g. FVIIa) for treating bleeding
- May be amenable to immune tolerance induction

Transfusion-transmitted infections

- Hepatitis A, B and C
- HIV
- ?Prions

Vascular access

- Peripheral veins – may be difficult to cannulate
- Central venous access devices may become infected or thrombosed.

- Replacement therapy should be given at HOME to avoid delay in treatment
- **Prophylactic factor 8** is given to all children with severe haemophilia A to further reduce the risk of chronic joint damage
- **Desmopressin (DDAVP)** may be useful in mild haemophilia A as it stimulates the endogenous release of factor 8 and vWF

Hereditary Spherocytosis

- **Neonates**
  - Supportive +/- red blood cell transfusion
  - Folic acid supplementation
  - Consider phototherapy or exchange transfusion if the baby also has jaundice
- **Infants, Children and Adults**
  - Supportive care +/- red blood cell transfusion
  - Folic acid supplementation (2-5 mg oral OD)
  - Splenectomy may be considered with a pre-operative vaccination regimen for encapsulated bacteria (*H. influenzae*, meningitis C and *S. pneumoniae*)
  - Cholecystectomy may be performed because gallstones are common in HS
  - Pneumococcal prophylaxis (oral penicillin)
- Aplastic crisis is caused by parvovirus B19 and requires blood transfusions

Immune Thrombocytopaenic Purpura (ITP)

- In 80% of children, the disease is acute, benign and self-limiting
- It will resolve spontaneously within **6-8 weeks**

- Most children can be managed at home
- Treatment is indicated if there is evidence of major bleeding (e.g. intracranial or gastrointestinal) or persistent minor bleeding that affects daily life (e.g. excessive epistaxis)
- **Life- or Organ-threatening bleeding**
    - IVIG + corticosteroid + platelet transfusion
    - Antifibrinolytics (Aminocaproic and tranexamic acid) may be used
- **Newly Diagnosed Child**
    - **Asymptomatic or Minor Bleeding**
        - Observation (most will achieve a normal platelet count eventually)
        - Most manifestations are limited to the skin
    - **Major Bleeding**
        - Corticosteroids
        - IVIG OR anti-D immunoglobulin
- **Child with Chronic Disease**
    - Mycophenolate mofetil
    - Rituximab
    - Eltrombopag (thrombopoietin receptor agonist)
    - 2nd line: splenectomy (if persistent)

Iron Deficiency Anaemia

- Dietary advice (increase intake of iron-rich food e.g. dark green vegetables, iron-fortified bread, meat, apricots, prunes and raisins) and consider dietician referral
- Explore underlying cause
- Supplementation with oral iron
    - **Oral ferrous sulphate 200 mg tablets** (2/3 per day)
        - Should be continued for 3 months after iron deficiency is corrected to allow stores to be replenished
        - If not tolerated, consider oral ferrous fumarate or ferrous gluconate
- Monitor to ensure there is an adequate response to treatment
- If failure to respond to treatment, consider other causes
- **Advice**
    - They may experience adverse effects (e.g. constipation, diarrhoea, faecal impaction, GI irritation, nausea)
    - Discomfort could be minimised by taking the iron supplement with food or reducing dose frequency
    - Explain the monitoring requirements
- **Monitoring**
    - Recheck haemoglobin levels (FBC) after **2-4 weeks** of iron supplement treatment
        - Hb should rise by 2 g/100 mL over 3-4 weeks
    - If the level has risen sufficiently, check again at **2-4 months** to ensure that Hb level has normalised
    - If it has NOT risen sufficiently, address compliance issues
    - Once haemoglobin and red cell indices are normal:
        - Continue iron treatment for **3 months** to replenish iron stores
        - Monitor FBC every 3 months for 1 year
        - Recheck after another year
    - Consider **prophylactic dose** in people who are at particular risk of iron deficiency anaemia
        - Recurring anaemia
        - Iron-poor diet (e.g. vegans)
        - Malabsorption
        - Menorrhagia
        - Gastrectomy

Sickle Cell Disease

- **Prophylaxis**
  - Immunisation against encapsulated organisms (e.g. *S. pneumoniae* and *H. influenzae* type B)
  - Daily oral penicillin
  - Daily oral folic acid
  - Vaso-occlusive crises should be minimised by avoiding exposure to cold, dehydration, excessive exercise, undue stress or hypoxia
- **Treatment of Acute Crises**
  - Oral and IV analgesia (avoid morphine < 12 years)
  - Good hydration (oral or IV)
  - Infection should be treated with antibiotics
  - Oxygen (if reduced saturation)
  - **Exchange transfusion** is indicated for acute chest syndrome, priapism and stroke
- **Treatment of Chronic Problems**
  - Children who have recurrent hospital admission (>3 in 12 months) for acute chest syndrome or vaso-occlusive crises could benefit from **hydroxycarbamide** (stimulated HbF production)
    - Monitor for white blood cell suppression (side-effect of hydroxycarbamide)
  - Splenectomy with immunisation against encapsulated organisms
  - Bone marrow transplant may be considered in severe cases
- **Prognosis**
  - Can cause premature death due to complications
  - 50% of patients with the most severe form of sickle cell disease will die < 40 years

Von Willebrand Disease

- Depends on type and severity
- Type 1 vWD can be treated with **DDAVP**
  - NOTE: it should be used with caution in children < 1 year old, because it can cause **hyponatraemia** and may precipitate seizures
- More severe types of vWD have to be treated with **plasma-derived factor 8 concentrate**
- Things to AVOID in vWD:
  - IM injections
  - Aspirin
  - NSAIDs

Musculoskeletal Disorders

Developmental Dysplasia of the Hip

- Seek specialist orthopaedic opinion
- First line (<6 months old): Observation - Progress is monitored by repeat ultrasound or X-ray
- Second line: The infant may be placed in a **splint** or **Pavlik harness** to keep the hip flexed and abducted - follow-up with x-ray at 6 months of age.
- Third line: Surgery if conservative measures fail (reduction with spica casting)
- Indications for **ultrasound scan** at 6 weeks to check for DDH:
  - Breech presentation at 36/40 (regardless of presentation at delivery)
  - Breech delivery (including <36/40)
  - Family history of DDH
- From 6 months onwards, hip X-ray is better than ultrasound
- **Summary**
  - Most unstable hips will resolve spontaneously by 3-6 weeks
  - Pavlik harness in children younger than 4-5 months
  - Older children may require surgery

Fractures

- Initial pain management and immobilisation
  - Oral ibuprofen and/or paracetamol for mild to moderate pain
  - IV opioids for severe pain
- Acute stage assessment and diagnostic imaging
- Management in the emergency department
  - Distal radius fractures
    - Manipulation
    - Consider
      - a below-elbow plaster cast
      - K-wire fixation if the fracture is completely displaced (off-ended).
  - Femoral shaft fractures
    - Admit all children and consider according to age and weight:
      - Prematurity and birth injuries: simple padded splint
      - 0 to 6 months: Pavlik's harness or Gallows traction
      - 3 to 18 months: Gallows traction
      - 1 to 6 years: straight leg skin traction with possible conversion to hip spica cast to enable early discharge
      - 4 to 12 years: elastic intramedullary nail
      - 11 years to skeletal maturity (weight more than 50 kg): elastic intramedullary nails supplemented by endcaps, lateral- entry- antegrade rigid intramedullary nail, or submuscular plating.
- Ongoing orthopaedic management
- Consider non-accidental injury

Juvenile Idiopathic Arthritis (JIA)

- Patients should be managed by a **specialist paediatric rheumatology multidisciplinary team**
- Physical and occupational therapy is encouraged
- Inactivity leads to deconditioning, disability and decreased bone mass so patients are advised to participate in activities such as swimming or cycling
- **Pharmacological management:**
  - Simple analgesia e.g. Paracetamol
  - **NSAIDs** are useful for controlling pain and stiffness
  - Consider weak opioids e.g. codeine
- Intra-articular, oral or IV **corticosteroids** are useful adjunctive agents (whilst waiting for second-line agents to have an effect) – avoided if possible due to risk of growth suppression and osteoporosis
- **DMARDs** - used when the disease fails to respond to conventional treatments
  - 1st line: oral or SC methotrexate
  - 2nd line: sulfasalazine
- Other treatments: Inflammatory cytokine blockade e.g. TNF-alpha inhibitors, interleukin receptor antagonists, anti-emetics
- **PROGNOSIS**
  - Most children can expect good disease control and quality of life
  - Complications (with poor disease control):
    - Joint damage
    - Anterior uveitis
    - Osteoporosis
    - Growth failure

Osgood-Schlatter Disease

- Advise about **pain relief**
    - Analgesia - paracetamol or NSAIDs
    - Intermittent application of ice packs over the tibial tuberosity (10-15 mins up to 3 times per day, including after exercise)
    - Protective knee pads (may relieve pain when kneeling)
- Reassure the patient and parents that this will resolve over time but may persist until the end of a growth spurt
- **Reassure** that usually stopping all sporting activity is not necessary
    - Reduce sporting activity (intensity, frequency or duration)
    - Change the type of exercise to limit the amount of running and jumping requiring powerful quadriceps contraction if they cannot tolerate normal activity
    - As symptoms decrease, they can gradually increase their exercise levels
    - Introduce low-impact quadriceps exercises (e.g. isometric quadriceps contractions, straight leg raises, cycling or swimming)
- **Reassure** that usually stopping all sporting activity is not necessary
- If symptoms do not improve or worsen OR symptoms persist into adulthood despite the above management, refer for specialist assessment by orthopaedic surgeon.
    - **ADVICE**
        - **Victorian Paediatric Orthopaedic Network** fact sheet on Osgood-Schlatter disease has an explanation of the condition as well as instruction on some useful stretches
        - Proper stretching before and after exercise may reduce symptoms

Osteochondritis Dissecans

- Pain relief (paracetamol or ibuprofen)
- Rest and quadriceps exercises
- Sometimes surgical intervention is needed (to remove intra-articular loose bodies)

Osteomyelitis

- **Acute Osteomyelitis**
    - **High-dose IV empirical antibiotics** (usually for 2-4 weeks)
    - Once the patient has demonstrated clinical recovery and acute-phase reactants have returned to normal, patients can be switched to **oral antibiotics**
    - **IMPORTANT**: take blood cultures before starting antibiotics
    - The regimen should be altered once results of MC&S arrive
    - NOTE: in children who respond well, early transition to oral antibiotics (after 3 days to 1 week) may be considered
        - 6-week course of oral antibiotics
    - Affected limbs should be immobilised, analgesia should be given, and associated comorbidities should be addressed
    - **Surgical debridement** may be necessary if there is dead bone or a biofilm
- **Chronic Osteomyelitis**
    - Clinical assessment, disease staging (Cierny-Mader classification) and optimisation of comorbidities
    - Surgical debridement
    - IV antibiotics
    - Functional rehabilitation

Perthes Disease

- **Non-surgical treatment** – benign self-limiting condition
- Supportive care for acute pain: simple analgesia, ice packs, protective pad over the tibial tubercle
- Activity continuation

- Physical therapy: stretching of the quadriceps and hamstring muscles, strengthening of the quadriceps, encourage hip abduction
- Education about exacerbations and management
- Surgical treatment is reserved for patients who fail to respond to conservative measures (only if >6yrs)

Reactive Arthritis

- No treatment is required as it is **self-resolving**
- Symptomatic relief:
    - NSAIDs for pain-relief
    - Steroids (severe)
    - DMARDs (on-going)

Rickets (Vitamin D Deficiency)

- If calcium deficient rickets with vitamin D deficiency
    - **Daily calcium AND**
    - **Ergocalciferol** (vit D2) **/ colecalciferol** (vit D3)
- If pseudo-vitamin D deficiency (defect in 1-alpha hydroxylase)
    - Calcitriol / alfacalcidol
- Phosphate salts are used in hypophosphataemic rickets
- Dietary: oily fish, egg yolk

Septic Arthritis

- Prolonged course of **antibiotics** (initially IV for 2 weeks, followed by 4 weeks of oral antibiotics)
    - Neonate to <3 months:
        - IV cefotaxime
    - 3 months to </=5 years:
        - IV ceftriaxone
        - If penicillin allergic, give clindamycin
    - >/=6 years
        - IV flucloxacillin
        - If penicillin allergic, give clindamycin
    - Oral stepdown:
        - Co-amoxiclav
        - Flucloxacillin
- **Joint aspiration -** affected joints should be aspirated to dryness as often as required (through closed needle aspiration or arthroscopically)
- Washing out of the joint or surgical drainage may be required

Slipped Capital Femoral Epiphysis (SUFE)

- Ensure patient remains non-weight-bearing, analgesia, **immediate orthopaedic referral**
- Surgical repair
- In situ screw fixation across the growth plate

Viva Tips

- What are the X-ray findings?
    - Trethowan's sign: line of Klein does not intersect superior femoral epiphyses/asymmetry between line of Klein's on either side

Transient Synovitis (AKA irritable hip)

- Need to RULE OUT septic arthritis: consider joint aspiration and blood cultures if likely
- Bed rest
- Pain relief can be achieved with paracetamol or NSAIDs
- Usually resolves after a few days

Neurological Disorders

Attention Deficit Hyperactivity Disorder (ADHD)

- **MDT**: paediatrician, psychiatrist, ADHD nurses, mental health and learning disability trusts, CAMHS, parent groups, social care, school/college
- **ADHD criteria**: Diagnosis should only be made by specialist psychiatrist, paediatrician or other qualified professional with training and expertise in ADHD diagnosis.
    - Meet criteria for DSM5 or ICD10 (hyperkinetic disorder)
    - Cause at least moderate psychological, social or educational impairment
    - Be pervasive, occurring in 2 or more settings including social, familial or educational and/or occupational settings
- In children who have behavioural/attention problems that are adversely impacting on their development or family life:
    - Consider period of watchful waiting for up to 10 weeks
    - Offer referral to **group-based ADHD-focused support** for parents
    - Refer to specialist if problems are severe
- **Children < 5 Years**
    - **1st line**: Offer an **ADHD-focused group parent-training programme** to parents and carers
        - 10-16 meetings in a group of 10-12 participants
    - If this fails, seek advice from a specialist ADHD service
    - Do NOT offer medication unless under the instruction of a specialist ADHD service
- **Children > 5 Years**
    - Recommend **ADHD-focused group parent-training programme**:
        - Education about ADHD
        - Advice on parenting strategies
        - Liaison with school (with consent)
        - Both parents and carers if feasible
    - Offer individualised parent-training programmes if there are difficulties attending group sessions or the needs are too complex
    - Offer **medication** if ADHD symptoms persist and cause significant impairment despite environmental modification
        - 1st line: M**ethylphenidate** for 6 week trial
        - If unsuccessful, consider switching to **lisdexamphetamine**
        - If responding to lisdexamphetamine but not tolerating side-effects, consider switching to **dexamphetamine**
        - Offer **atomoxetine** or **guanfacine** if methylphenidate or lisdexamphetamine cannot be tolerated or symptoms have not responded to 6-week trials of both
        - Establish baseline physical state (height and weight) and do baseline ECG before starting medication
        - Yearly off-medication trials are recommended
    - Consider **CBT** if significant impairment in:
        - Social skills, problem solving, self-control, active listening and dealing with expressing feelings
    - Other medications: clonidine for sleep disturbance, rages or tics, antipsychotics for aggression and irritability
- **Monitoring Medication**
    - Consider using symptom rating scales (e.g. Conner's)
    - Measure height every 6 months
    - Measure weight every 3 months
    - NOTE: if height/weight is significantly affected by the treatment, consider a planned break (treatment holiday) over school holidays
    - Monitor HR and BP every 6 months
    - Monitor for development of tics after taking stimulant medication
    - Monitor for sexual dysfunction, seizures, sleep disturbance and worsening behaviour

- **Dietary Advice**
  - Stress importance of balance diet and regular exercise
  - Explore foods that seem to influence behaviour (recommend keeping a food diary)
  - Consider referral to dietician if a relationship with certain foods is observed in the diary
  - No dietary interventions are particularly evidence-based
- **Summary**
  - After presentation, a **10-week watch and wait** period should commence to see whether symptoms resolve
  - If they persist, refer to secondary care (developmental paediatrician or CAMHS)
  - **1st line: parent education and training programmes**
  - If this fails, pharmacotherapy should be considered (in children > 5 years):
    - 1st line: **methylphenidate**
    - 2nd line: lisdexamphetamine
    - Dexamphetamine can be used if side-effects of lisdexamphetamine cannot be tolerated
    - **WARNING**: all drugs are cardiotoxic, so baseline ECG should be conducted

PACES TIPS

- Explain the diagnosis
- Explain that the manifestation will change as the child gets older (e.g. hyperactivity tends to become less of a problem, and inattention becomes more pronounced as the tasks they face become more complex)
  - Some may grow out of it
- Explain the management
- Watch and wait for 10 weeks
- Group parent training programme - will teach various parenting techniques to deal with ADHD and meet other parents in similar situations
- If medication needed:
  - Explain that it is a 6-week trial
  - Side-effects: loss of appetite, mood changes, palpitations, tics
  - If medication is continued, requires 6 monthly height and 3 monthly weight monitoring

Autism Spectrum Disorders (ASD)

MDT approach involving Paediatrician/adolescent psychiatrist, psychologist, occupational therapist

- **Psychosocial Interventions**
  - Aim to increase attention, engagement and reciprocal communication
  - Adjust to the child's developmental level
  - Aim to increase carers' and teachers' understanding of patient's patterns of communication and interaction
  - Include techniques to expand the child's communication, interactive play and social routines
  - Include techniques of therapist modelling and video-interaction feedback
  - Consider CBT if patient has anxiety and has the verbal and cognitive ability to engage in therapy.
- **Speech and Language Therapy**
  - Social skills training
- **Pharmacological**
  - Do not use antipsychotics, antidepressants, anticonvulsants, or exclusion diets to manage core features of autism
  - Consider antipsychotic medication if behavioural issues are making psychosocial interventions ineffective
    - Review at 3-4 weeks
    - Stop at 6 weeks if no clinical indication

    - Treat any comorbidities, e.g. ADHD according. See 'ADHD' section above
- **Families and Carers**
    - Offer personal, social and emotional support
    - Offer practical support in the caring role (respite breaks and emergency plans)
    - Plan for the future (e.g. transition to adult care)
    - Offer carer's needs assessment
- **Educational**
    - Assess for learning disability
    - If needing extra support, discuss **EHC plan** (legal document that describes a child's special education, health and care needs)

PACES TIPS

- Explain that autism is a spectrum, so it is difficult to predict the extent of the impact on the child's life
- Explain that it is characterised by difficulties in social interaction, language impairment and ritualistic behavioural tendencies
- Explain that management involves:
    - Psychological interventions to reduce ritualistic behaviours
    - Speech and language therapy (with a focus on social skills)
    - Educational assessment and plan
- Explain that the carer's needs will also be attended to and link them to support websites:
    - National Autistic Society

Becker muscular dystrophy

- Similar to Duchene muscular dystrophy but slower progression, therefore same management
    - Loss of independent ambulation in late 20s
    - Life expectancy middle to old age

Breath Holding Attacks

- Attacks resolve spontaneously
- Children tend to grow out of these by 4-5 years old
- Behaviour modification therapy with distraction
- Consider Iron deficiency anaemia as cause and investigate accordingly with bloods

Cerebral Palsy

- **Risk Factors**
    - **Antenatal**: Chorioamnionitis, maternal respiratory or GU infection
    - **Perinatal**: Preterm birth, LBW, neonatal encephalopathy, neonatal sepsis, maternal infection (e.g. respiratory or genito-urinary)
    - **Postnatal**: Meningitis, head trauma prior to 3 years
- **MRI may assist to assess the cause**
    - MRI cannot establish timing of injury
    - **WARNING**: general anaesthesia or sedation is usually needed for a young child
- **Signs of Cerebral Palsy**
    - For children at risk: provide clinical and developmental follow-up programme by an MDT for children up to 2 years
    - Possible early motor features of CP
        - Unusual fidgety movements or abnormality of movement (including asymmetry or paucity of movement)
        - Abnormalities of tone (includes hypotonia, spasticity or dystonia (fluctuating tone))
        - Abnormal motor developing (including late head control, rolling and crawling)
        - Feeding difficulties

    - Delayed motor milestones (correct for gestational age)
        - Not sitting by 8 months
        - Not walking by 18 months
        - Hand preference before 1 year
    - Refer all children with persistent toe walking
- **RED FLAGS for other neurological disorders**
    - Absence of risk factors
    - Family history of progressive neurological disorder
    - Loss of already attained cognitive or developmental abilities
    - Development of unexpected focal neurological signs
    - MRI findings suggestive of progressive neurological disorder
    - MRI findings not in keeping with CP
- **Multi-Disciplinary Team (MDT)**
    - **Main Members**: paediatrician, nurse, physiotherapist, occupational therapist, speech and language therapist, dietetics, psychology
    - **Supplementary Members**: orthopaedics, orthotics, visual and hearing
- **Eating, Drinking and Swallowing**
    - Should be assessed by a speech and language therapist with training in assessing dysphagia
    - Specialist MDT may consider video fluoroscopy
    - Create individualised plan for managing eating, drinking and swallowing (e.g. including postural management, modifying textures, feeding techniques and equipment)
- **Speech Language and Communication**
    - **Note**: communication difficulty does not necessarily correlate with learning difficulty
    - Interventions for speech intelligibility include posture, breath control, voice production and rate of speech
    - Consider augmentative and alternative communication systems if they need support understanding and producing speech (e.g. pictures, symbols and speech generating devices)
- **Other Measures**
    - **Optimise nutritional status**
    - **Managing saliva control**
        - Consider anticholinergics (e.g. glycopyrronium bromide, transdermal hyoscine hydrobromide)
        - If anticholinergic drugs contraindicated, not tolerated or ineffective, refer to specialist service to consider other treatments
        - Specialists may consider botulinum toxin A injection into salivary glands
    - **Low bone mineral density**
        - Non-ambulant children with CP are at risk of low-impact fractures
        - Assess dietary intake of calcium and vitamin D
        - Consider an active movement/weight bearing programme or dietetic interventions
    - **Pain, discomfort and distress**
        - Consider ‘stepped approach’ trial of simple analgesia if no identifiable cause
        - Consider referral to specialist pain MDT if simple analgesia is unsuccessful
    - **Sleep disturbance**
        - Optimise sleep hygiene
        - Consider a trial of melatonin
    - **Mental health problems**
        - Refer for specialist psychological assessment
    - **Visual impairment**

        - Refer all children with a hearing impairment for an initial baseline ophthalmological and orthoptic assessment
        - 1 in 2 children will have a visual impairment (e.g. issue controlling eye movement, squint, refractive errors)
    - **Hearing impairment** – affects 1 in 10 children
    - **Learning disability and behavioural difficulties**
    - **Gastro-oesophageal reflux –** refer to specialist
    - **Chronic constipation (3 in 5)** - laxatives
    - **Epilepsy (1 in 3)** – anticonvulsants
- Other options for CP:
    - Dorsal rhizotomy (some of the nerve roots of the spinal cord are cut to reduce spasticity)
    - Intrathecal baclofen
    - Deep brain stimulation

- **Summary**
    - **Physiotherapy** – encourage movement, improve strength and stop muscles from losing range of motion
    - **Speech therapy** – improve language abilities
    - **Occupation therapy** – identify everyday tasks that may be difficult and help make these tasks more accessible
    - **Medication**
        - Stiffness – baclofen, diazepam
        - Sleeping – melatonin
        - Constipation – laxatives
        - Drooling – anticholinergic

PACES TIPS

- Explain the diagnosis (damage to the brain that would have occurred early in development)
- The damage to the brain doesn't get worse, but the way it manifests will change as the child gets older
- Refer to paediatrician specialising in developmental disorders
- Long-term management will include physiotherapy, speech and language therapy and special educational needs
- Medications can also be given to help with symptoms

Developmental delay

- MDT approach: SALT, OT, PT, Family counselling, behavioural intervention and educational assistance.
- Manage associated conditions.

Duchenne Muscular Dystrophy

- **Physiotherapy** helps prevent contractures
- **Exercise** and **psychological support** are necessary
- Tendoachilles lengthening and **scoliosis surgery** may be required
- **Glucocorticoids** (e.g. prednisolone) may help delay wheelchair dependence
- **Ataluren** is a drug that restores dystrophin synthesis and has conditional licensing for patients 5 years and over
- **Dietician** for gastric feeding indicated in some patients. Vitamin D and calcium supplementation may be necessary to prevent and treat bone fragility.
- Weakness of intercostal muscles may lead to nocturnal hypoxia
    - This presents with daytime headache, irritability and loss of appetite

- **Overnight CPAP** may be indicated for respiratory support
- If the left ventricular ejection fraction drops, cardioprotective drugs (e.g. carvedilol) and left ventricular assist devices may be considered

Epilepsy

- Urgently refer all patients suspected of having a first epileptic seizure to a neurologist (first fit clinic)
- **Advice**
    - Advise parents and carers how to recognise a seizure
    - Advise parents to record any future episode of possible seizures (e.g. by video)
    - Advise that the patient avoid dangerous activities until the diagnosis is confirmed (e.g. swimming, bathing)
    - Advise the parent to seek help if another seizure occurs before the referral
- **Epilepsy specialist nurse** may assist families by providing education and continuing lifestyle advice
- Decisions on treating epilepsy is dependent on the risk of recurrence, how dangerous or impairing the seizures are and how upsetting further seizures would be to the patient's life
- Treatment is NOT usually given for **childhood rolandic epilepsy**
- Treatment of childhood absence epilepsy is aimed at maximising their educational potential and supporting social development
- **Antiepileptic Drug (AED) Therapy**
    - Not all children with epileptic seizures require AED
    - Decisions to treat should be based on seizure type, epilepsy type, frequency and social/educational consequences against the possibility of unwanted effects of antiepileptic drugs
    - Choose an appropriate AED for the seizure and epilepsy (e.g. carbamazapine can make absence and myoclonic seizures worse)
    - Monotherapy should be used, at the minimum dosage required to prevent seizures, to reduce the risk of adverse effects
    - **All AEDs** have potential adverse effects
    - AED levels are not checked regularly but may be measured to check adherence
    - Children with **prolonged epileptic seizures** (convulsive seizures with loss of consciousness > 5 mins) are given **rescue therapy** to keep with them
        - This is usually **buccal midazolam**
    - AED therapy may be **discontinued** after 2 years free of seizures
- **Choice of Antiepileptic Drug**
    - **Generalised**
        - **Tonic-Clonic**
            - **1st line: Sodium valproate** for boys and girls who are not of childbearing potential. Otherwise, offer **lamotrigine or levetiracetam**
                - Alternatives: carbamazepine, oxcarbazepine
                - NOTE: these can exacerbate myoclonic (lamotrigine) and absence (carbamazepine and oxcabazepine) seizures
            - Adjunctive treatment: clobazam, lamotrigine, levetiracetam, valproate, topiramate
        - **Absence**
            - **1st line: ethosuximide**
                - 2nd line: valproate (or lamotrigine in females of child bearing age)
            - Adjunctive treatment: consider a combination of 2 of these 3 - ethosuximide, lamotrigine, valproate
        - **Myoclonic**
            - **1st line: valproate or levetiracetam (if female of child bearing age)**
                - Alternatives: topiramate
            - Adjunctive treatment: levetiracetam, valproate, topiramate

- **Focal**
  - **1st line: levetiracetam, lamotrigine** (preferred for girls of childbearing potential)
    - Alternatives: oxcarbazepine, valproate
  - Adjunctive therapy: carbamazepine, clobazam, gabapentin, lamotrigine, oxcarbazine, **valproate, topiramate**

- **Side-Effects of Antiepileptic Drugs**

Drug	Side-effects
Valproate	Weight gain, hair loss, rare idiosyncratic liver failure
Carbamazepine / oxcarbazepine	Rash, neutropenia, hyponatraemia, ataxia, liver enzyme induction, interferes with other medications
Vigabatrin	Visual field restriction, sedation
Lamotrigine	Rash
Ethosuximide	Nausea and vomiting
Topiramate	Drowsiness, withdrawal, weight loss
Gabapentin	Insomnia
Levetiracatem	Sedation (rare)
Benzodiazepines	Sedation, tolerance, increased secretions

- **Other treatment options in children with intractable epilepsies**
  - Ketogenic diets (low carb, fat based)
  - Vagal nerve stimulation
  - Surgery (only in children with epilepsy that has a well localised structural cause)

PACES TIPS

- It is a tendency to have unprovoked seizures
- Aim to promote independence and confidence
- The school should be made aware of the condition
- Situations where having a seizure could lead to injury or death should be avoided (e.g. deep baths, swimming unsupervised)
- Driving is only allowed after 1 year free of seizures

Extradural Haemorrhage

- Correct hypovolaemia
- Urgent evacuation of haematoma
- Arrest bleeding

Febrile Convulsion

- **6 months to 6 years of age.**
- **Management DURING a seizure**
  - **Protect**: cushion their head, do not restrain or put anything in their mouth, remove harmful objects nearby
  - **Airway**: once seizure stops, check airway and put them in the recovery position
  - Time duration of seizure if possible

If the seizure lasts **> 5 mins,** call ambulance OR **give rescue medication (buccal midazolam** or **rectal diazepam)**
        - Doses can be repeated once after 10 mins if the seizure hasn't stopped
        - Call ambulance if 10 minutes after the first dose:
            - Seizure ongoing
            - Twitching ongoing
            - Another seizure has started before child has regained consciousness
        - Recommended dose of midazolam:
            - 6 months - 11 months = 2.5 mg
            - 1-4 years = 5 mg
            - 5-9 years = 7.5 mg
        - Recommended dose of rectal diazepam:
            - 6 month - 1 year = 5 mg
            - 2-11 years = 5-10 mg
    - Measure **blood glucose** if the child cannot be roused or is convulsing
- **Management after a Seizure**
    - Identify and manage the cause of the fever
        - Urgently admit any child with suspected meningococcal disease
        - Use the NICE traffic light system to assess the likelihood of serious illness in a child with a fever
    - Arrange **immediate hospital assessment by a paediatrician** if:
        - First febrile seizure or if second seizure in a child who has not been assessed before
        - < 18 months old
        - Diagnostic uncertainty about the cause of the seizure
        - Complex febrile seizure: focal features, seizure lasting >15 minutes, recurrence within 24h or within same febrile illness, incomplete recovery within 1h
        - Focal neurological deficit
        - Decreased level of consciousness prior to seizure
        - Seizure recurred in the same febrile illness (or within 24 hours)
        - Child recently taken antibiotics as can mask signs of CNS infection
        - Parents are anxious and/or feel that they cannot cope
    - If the child has no apparent focus of infection, consider **urgent** hospital assessment for a period of observation
    - **Referral** to paediatrician or paediatric neurologist if neurodevelopmental delay and/or signs of neurocutaneous syndrome or metabolic disorder.
    - **All other children can be managed AT HOME**
        - Inform parents about febrile convulsions
            - They are not the same as epilepsy
            - The risk of epilepsy in the future is only slightly higher than the general population
            - Short-lasting seizures are not harmful to the child
            - 1/3 children will have another febrile convulsion
        - Advise parents about what to do when a seizure occurs
            - Protect them from injury
            - Do not restrain or put anything in their mouth
            - Check the airway and place in the recovery position when the seizure stops (explain that the child might be drowsy for up to an hour)
            - Seek medical advice if the seizure lasts < 5 mins, call an ambulance if it lasts > 5 mins
        - Advise parents about managing fever
            - **Reducing fever does not prevent recurrence**

        - Explain when and how to use paracetamol or ibuprofen
        - Advise about maintaining adequate fluid intake
        - Advise on when to seek prolonged symptoms
    - Advise parents to carry on with routine immunisations, even if febrile seizure followed an immunisation
    - Do NOT prescribe drugs to manage or prevent future seizures
        - UNLESS on the advise of a specialist
    - Consider primary care follow-up

Headaches

- All children under four presenting with headache should referred urgently for neurological assessment
- Children under 12 years old should be referred for same day assessment if they present with **red flag symptoms**:
    - Waking at night or present on waking in the morning
    - Features of meningism
    - Vomiting or ataxia
    - Aggravated by coughing, sneezing, or bending down
    - Progressively worsens
    - Change in conscious level or pervasive lethargy
    - Within 5 days of head injury
    - Squint or failure of upward gaze

- Please see sections below for further information on migraine and tension type headache below

Hydrocephalus

- Treatment is needed for symptomatic relief of raised ICP and to minimise the risk of neurological damage
- Insertion of a **ventriculoperitoneal shunt** (VP shunt)
    - Shunts can malfunction due to blockage or infection → often require replacement
- Sometimes, endoscopic treatment to create a ventriculostomy is performed
- Over-drainage can cause low pressure headache

Migraine

- Assess the severity and frequency of attacks, and the impact on the patient's life:
    - Quality of attacks - intensity and site of pain, associated symptoms
    - Timing and frequency - when they start, reason for consultation, how often they occur, temporal pattern, how long they last, time off school
    - Possible causes - suspected triggers or emotional problems (e.g. bullying)
    - Other factors - general health in between attacks
- Consider using a **headache diary** for a minimum of 8 weeks to identify triggers
- **Acute Management (in 12-17 year olds)**
    - Step 1: Simple analgesia (paracetamol or ibuprofen)
        - Only consider aspirin if > 16 (risk of Reye's syndrome)
    - Step 2: **Nasal sumatriptan**
        - NOTE: oral triptans are NOT licensed in people < 18 years
    - Step 3: Combination therapy with nasal triptan and NSAID/paracetamol
        - Consider adding anti-emetic e.g. metoclopramide or prochlorperazine
    - Arrange follow-up within 1 month, but ask them to return sooner if symptoms get worse
- **Prophylactic Treatment**
    - Offer topiramate or propranolol – specialist referral required
        - NOTE: topiramate has a risk of foetal malformations

Myotonic muscular dystrophy

- Multi-system disorder requiring MDT management
- Management issues
  - Muscle involvement:
    - **Physiotherapy** (Strength and flexibility training),
    - **Occupational therapy** (Specially designed utensils for hand weakness, wrist braces),
    - Orthopaedic (Ankle–foot arthroses for foot-drop)
    - Monitor for deformities.
  - Muscle pain: NSAIDs, Gabapentin etc
  - Myotonia: **Mexiletine** with careful supervision (used be treated with quinine or procainamide in the past)
  - Difficulties swallowing and dysarthria due to muscle weakness: SALT
  - Cardiac disturbances: Refer to cardiologists
  - Respiratory function and sleep:
    - Noninvasive positive airway pressure ventilation (NIPPV) may be useful in correcting apnoea
    - Infants with congenital muscular dystrophy require continuous ventilatory support
  - Cataracts: Surgery
  - Genetic counselling: For antenatal diagnosis.
  - Psychological support: For parent and child

Neurocutaneous syndrome

- **Neurofibromatosis**
  - Medical: Regular follow-up for monitoring BP, ophthalmology assessment, testing of 8th nerve and skeletal complications.
  - Selumetinib for treatment of symptomatic and inoperable plexiform neurofibromas associated with type 1 NF over 3 years old
  - Surgical: Laser removal of nodules, orthopaedic or neurosurgical intervention.
- **Tuberous sclerosis** – treat according to presentation
  - Skin lesions – laser therapy
  - Cardiovascular – anti-arrhythmics
  - Epilepsy – anti-epileptics
  - Renal - antihypertensives

Status Epilepticus

- **Step 1**: (0 min)
  - Secure airway
  - Check ABC, high flow $Oxygen_2$ if available
  - Check blood glucose
  - Confirm clinically that it is an epileptic seizure
- **Step 2**: (5 min)
  - If IV access, **IV lorazepam**
  - If NO immediate IV access:
    - Buccal midazolam
    - Rectal diazepam
- **Step 3**: (15 min)
  - if no response, give a second dose of IV lorazepam
  - Call for senior help
  - Start to prepare phenytoin for step 4
  - Re-confirm it is an epileptic seizure
- **Step 4**: (25 min)
  - Seek senior anaesthetist / inform ICU

    - Phenytoin 20 mg/kg by intravenous infusion over 20 mins
        - or (if on regular phenytoin): Phenobarbital 20 mg/kg intravenously over 5 mins
    - Consider rectal paraldehyde 0.8 ml/kg
- **Step 4**: (45 min)
    - Rapid sequence induction of anaesthesia using thiopental sodium
- Consider dexamethasone if vasculitis/cerebral oedema is possible
- NOTE: treat reversible causes if identified (e.g. thiamine if malnourished or glucose if hypoglycaemic)

Subarachnoid Haemorrhage

- Neurosurgical or interventional radiology for surgical clipping and coil embolisation

Subdural Haematoma

- Consider NAI due to shaking
- Treatment dependent on size and clinical signs
    - Small – conservative
    - GCS <9 with large haematoma or midline shift – surgical

Tension Headache

- **Reassure** that this is not a concerning cause of headaches
- Offer simple **analgesia** (paracetamol, ibuprofen, aspirin) for acute treatment
    - Do NOT offer aspirin to <16-year-olds due to risk of Reye's syndrome
    - Do NOT offer opioids
- Consider course of up to 10 sessions **acupuncture** over 5-8 weeks for prophylactic treatment of chronic tension type headache in over 12-year-olds.

Tic disorder

- Consider **referral** to local pathways if:
    - Tic associated anxiety or OCF, refer to mental health services
    - Tic disorder associated with autism or ADHD, refer to neurodevelopmental team
    - Tic disorder severe, refer for neurological assessment
- Do not refer children with simple motor tics that are not troublesome for the child
- 1st line: CBT with habit reversal technique
- 2nd line: (more severe cases) alpha-2 adrenergic agonists e.g. clonidine, risperidone

West Syndrome (Infantile Spasms)

- Urgent referral to tertiary paediatric neurology service
- Treatment is mainly with high dose prednisolone and **vigabatrin**
- Infantile spasms have a POOR prognosis with loss of skills, learning disabilities and continuing epilepsy

Endocrinological Disorders

Congenital Adrenal Hyperplasia

- Affected females sometimes need **corrective surgery** for external genitalia (they have a uterus and ovaries so they are reared as girls)
- Definitive surgical correction is usually delayed until puberty
- **Acute (salt losing crisis)**
    - IV saline (0.9% sodium chloride), IV hydrocortisone 200mg, IV dextrose
- **Long Term**
    - Life-long glucocorticoids (hydrocortisone) to suppress ACTH levels (and hence testosterone)
    - Mineralocorticoids (fludrocortisone) if there is salt loss
    - Monitoring growth, skeletal maturity, plasma androgens and 17α-hydroxyprogesterone levels

- Additional hormone replacement at times of illness or surgery

Congenital Hypothyroidism

- Thyroxine treatment should be started within 2-3 weeks of age to reduce the risk of impaired neurodevelopment
- Treatment is **life-long** with oral replacement of thyroxine titrating dose to maintain normal growth, TSH and T4 levels.
- With adequate and early intervention, intelligence and development should be normal

Delayed Puberty

- **Boys**
  - **1st line**: observation - most do NOT need treatment
  - **2nd line**: short course of oxandrolone or testosterone (3-6 months)
    - This can help increase growth velocity
- **Girls**
  - **1st line**: observation - most do NOT need treatment
  - **2nd line**: short course of oestrogen (3-6 months)
- Organic or permanent causes can be treated by inducing puberty using either testosterone or oestrogen
- Persistent hypogonadism would require testosterone and ovarian supplementation

Diabetic Ketoacidosis (DKA)

- **Diagnosis (must meet all criteria):**
  - Plasma glucose >11 mmol/litre
  - Ketosis (plasma ketone >3 mmol/litre or ketonuria >++)
  - Acidosis (pH <7.3 or HCO3 <15 mmol/litre)

- **Initial**
  - When DKA is diagnosed, record their:
    - Level of consciousness
    - Vital signs (HR, BP, Temp, RR, Kussmaul breathing)
    - History of nausea or vomiting
    - Clinical evidence of dehydration
    - Body weight
  - When DKA is diagnosed, measure their:
    - pH and pCO2 – Venous blood gas
    - U&E
    - Plasma bicarbonate
  - Children should be cared for with one-to-one nursing either in an **HDU** or a **general paediatric ward** if:
    - < 2 years old
    - Severe DKA
    - NB: consider **PICU** transfer if one-one nursing not available in the above settings
- **Fluid Therapy**
  - If clinically dehydrated
    - Initial fluid bolus at 10ml/kg of 0.9% NaCl over 30 minutes
    - Consider further fluid bolus if needed to improve tissue perfusion after clinical reassessment
  - Calculate total fluid requirement by adding the estimated fluid deficit to the maintenance requirement
    - Fluid Deficit
      - 5% fluid deficit in mild DKA (pH 7.2-7.29)
      - 7% fluid deficit in moderate DKA (pH 7.1-7.19

        - 10% fluid deficit in severe DKA (pH < 7.1)
        - Fluid bolus at 10 ml/kg.
            - Shocked patients: fluid bolus volume does NOT need to be subtracted from estimated fluid deficit.
            - Non-shocked: subtract from total fluid deficit.
        - **IMPORTANT**: fluid deficit should be replaced over **48 hours**
    - Maintenance Requirement
        - 100ml/kg/day for first 10kg
        - 50ml/kg/day for next 10kg
        - 20ml/kg/day for each additional kilogram above 20kg
- **Which Fluids?**
    - 0.9% saline without added glucose should be used for rehydration and maintenance until plasma glucose is < 14 mmol/L
    - Change to 0.9% saline + 5% glucose after plasma glucose drops below 14 mmol/L
    - **IMPORTANT**: Ensure all fluids (except boluses) administered to children with DKA contain **40 mmol/L potassium chloride** (unless anuric or potassium >5.5 mmol/L
- Once blood glucose <14 mmol/L, add 5% glucose to the fluid.
- Only consider **stopping** IV fluids if ketosis is resolving, the child is alert, and can take oral fluids without nausea or vomiting

- **Insulin therapy**
    - **Start IV insulin infusion 1-2 hours after beginning IV fluid therapy in children with DKA**
        - Use a soluble insulin infusion at a dose **0.05-0.1 units/kg/hour**
        - Do NOT give bolus doses of insulin
        - If the child is using an insulin pump, disconnect it before starting IV insulin
        - **Continue any long-acting insulin** that a child is already on
    - If the blood ketone level is NOT falling after 6-8 hours, think about increasing the insulin dosage to 0.1 units/kg/hour or more AND seek **senior help**
    - Do NOT change from IV insulin to SC insulin until ketosis is resolving (<1 mmol/L), the child is alert, and can take oral fluids without nausea or vomiting
    - Start **SC insulin** in the child at least 30 mins BEFORE stopping IV insulin
    - If using an **insulin pump**, start the pump at least 60 mins BEFORE stopping the IV insulin
        - NOTE: remember to change the insulin cartridge and infusion set, and insert the cannula into a new SC site
- Consider inserting **urinary catheter** if it is difficult to monitor urine output
- Consider inserting an **NG tube** if a child with DKA has a reduced level of consciousness and is vomiting (due to risk of aspiration)
- Consider the use of inotropes in a patient with DKA who is in hypovolaemic shock
- Consider **sepsis** in a patient with DKA who has any of:
    - Fever or hypothermia
    - Hypotension
    - Refractory acidosis
    - Lactic acidosis
- **Monitoring During Therapy**
    - Monitor and record at least HOURLY
        - Capillary blood glucose
        - Vital signs (HR, BP, Temp, RR)
        - Fluid balance with fluid input and output charts
        - Level of consciousness (using modified GCS)
    - **NOTE**: level of consciousness and heart rate (to detect bradycardia) should be recorded every 30 mins in:

        - Children < 2 years
        - Children with severe DKA
        - This is because they have an **increased risk of cerebral oedema**
    - Monitor children receiving IV therapy for DKA using a **continuous ECG** to detect **HYPOKALAEMIA** (ST depression, prominent U waves, flattened P waves)
    - At 2 hours after starting treatment, and then at least every 4 hours afterwards, measure and record:
        - Glucose (laboratory measurement)
        - Blood pH and pCO2
        - U&E
        - Ketones (Beta-hydroxybutyrate)
    - The patient should be reviewed at least every 4 hours looking at:
        - Clinical status (including vital signs and neurological status)
        - Results of blood investigations
        - ECG trace
        - Cumulative fluid balance record
- **Complications**
    - **Cerebral Oedema**
        - Suspect cerebral oedema if:
            - Headache
            - Agitation or irritability
            - Unexpected fall in heart rate
            - Increased blood pressure
        - If cerebral oedema is suspected, treat with **mannitol** or **hypertonic sodium chloride**
        - Immediately treat if any of these serious signs of cerebral oedema are present:
            - Deterioration in level of consciousness
            - Abnormalities of breathing pattern
            - Oculomotor palsies
            - Pupillary inequality or dilatation
    - **Hypokalaemia** (< 3 mmol/L)
        - Consider temporarily stopping the insulin infusion
        - Discuss management with paediatric critical care specialist (central venous catheter is needed for IV administration of potassium solutions > 40 mmol/L)
    - Venous thromboembolism - there is an increased risk of VTE in children with DKA, especially if they have a central venous catheter

PACES TIPS

- Explain DKA (complication of diabetes where the blood sugars get very high)
- Explain the features of DKA (drowsiness, abdominal pain, nausea)
- Explain that DKA is important because it can lead to severe dehydration
- Explain the steps in the acute management of DKA (giving fluids and insulin to get the blood glucose back to a healthy range)
- Discuss factors that led to this episode
- Advice on how to manage intercurrent illness (e.g. viral infections leading to increased insulin demand)
- Arrange to see diabetes specialist to discuss treatment
- Support: Diabetes UK

Diabetes Mellitus (Type 1)

- **Insulin Therapy for T1DM**
    - **Three Types of Insulin Therapy**

        - **Multiple Daily Injection Basal-Bolus**: injections of short-acting insulin or rapid-acting insulin analogue before meals, with 1 or more separate daily injections of intermediate acting insulin or long-acting insulin analogue
        - **Continuous Subcutaneous Insulin Infusion** (insulin pump therapy): programmable pump and insulin storage device that gives regular or continuous amounts of insulin (usually rapid-acting insulin or short-acting insulin) by a subcutaneous cannula
        - **One, Two or Three Insulin Injections Per Day**: injections of short-acting insulin or rapid-acting insulin analogue mixed with intermediate-acting insulin
    - Offer **multiple daily injection basal-bolus insulin** regimens from diagnosis
    - If this is inappropriate, consider **continuous subcutaneous insulin infusion** (CSII or pump therapy)
- **Dietary Management of T1DM**
    - Offer level 3 carbohydrate counting education from diagnosis and to family members
- **Blood Glucose and HbA1c Targets and Monitoring**
    - Routinely perform at least 5 capillary glucose tests per day
        - Fasting plasma glucose and at other times in the day: **4-7 mmol/L**
        - After meals: **5-9 mmol/L**
        - If driving: **> 5 mmol/L**
    - Offer ongoing real-time **continuous glucose monitoring** with alarms for children with:
        - Frequent severe hypoglycaemia
        - Impairment awareness of hypoglycaemia with adverse consequences (e.g. seizures, anxiety)
        - Inability to recognise or communicate symptoms of hypoglycaemia (e.g. cognitive disability)
    - HbA1c target **< 48 mmol/L** (6.5%)
- **Blood Ketone Monitoring**
    - Offer blood ketone testing strips and a meter and advise testing for ketonaemia if they are ill or hyperglycaemic
- **Psychological and Social Issues**
    - Offer ongoing access to mental health services
- **Lifestyle**
    - Encourage healthy, balanced diet
    - Encourage regular exercise
- **Complications**
    - Diabetic retinopathy, nephropathy, and hypertension – monitor **annually from 12 years**
    - Thyroid disease at diagnosis and annually until transfer to adult services
- **DKA**
    - Explain the symptoms of DKA: nausea/vomiting, abdominal pain, hyperventilation, dehydration, reduced consciousness

PACES TIPS

- Explain diagnosis (a condition where the body is unable to control the sugar levels in the blood)
- Explain that it is reasonably common, and it is well understood
- Explain that the management is quite intensive and involves regular self-monitoring of glucose levels (using skin prick) and taking insulin injections
- Stress the importance of good blood glucose control
- Explain how to identify DKA
    - Damage to kidneys and blood vessels
    - Explain that they will be seen in a diabetes clinic to discuss ongoing management
- Encourage healthy, balanced diet and regular exercise

Hyperthyroidism

- **1st line:** Medical - Carbimazole or propylthiouracil
- **Important**: both thionamides are associated with a risk of **neutropaenia**
  - Families should be safe-netted about seeking urgent medical attention and a blood count if a **sore throat or fever** occur whilst on treatment
- Adjunct: Beta-blockers may be considered for symptomatic relief of anxiety, tremor and tachycardia
- Medical treatment is usually given for around 2 years
- **2nd line**: Radioiodine treatment, Surgery (partial thyroidectomy)
- NOTE: neonatal hyperthyroidism may occur due to the transplacental transfer of TSIs

Hypocalcaemia

- **Management of Acute Symptomatic Hypocalcaemia**
  - IV calcium gluconate
- **Management of Chronic Hypocalcaemia**
  - Oral calcium
  - High dose vitamin D analogues
  - **Important**: avoid hypercalciuria because it can lead to nephrocalcinosis so urinary excretion should be monitored

Hypoglycaemia

- Advise always carrying an immediate source of fast-acting glucose and blood glucose monitoring equipment (include parents and school nurses)
- **Mild-to-Moderate Hypoglycaemia**
  - Give **fast-acting glucose** by mouth (usually liquid carbohydrate (e.g. Lucozade))
  - May need to be given in small amounts if vomiting
  - Recheck blood glucose within 15 mins and repeat fast-acting glucose if hypoglycaemia persists
  - As symptoms improve, give **oral complex long-acting carbohydrate** to maintain blood glucose levels
- **SEVERE Hypoglycaemia**
  - Treat in hospital
    - Give **IV 10% glucose** (maximum dose of 500 mg/kg of bodyweight (5 ml/kg))
  - If NOT in hospital: unresponsive or PO route cannot be used
    - **IM glucagon** or **concentrated oral glucose** solution (e.g. glucogel)
      - IM glucagon: 500 µg for < 8 years; 1 mg for > 8 years
    - Seek medical help if blood glucose remains low after 10 mins
    - Once symptoms improve, give oral complex long-acting carbohydrate
- NOTE: alcohol is a risk factor for hypoglycaemia (they should eat carbohydrates before and after drinking)

Obesity

- Managed in primary care, only refer for specialist paediatric assessment if there are any complications or an endogenous cause is suspected
- Treatment is considered if child's BMI is above 98th decile
- Weight maintenance is the main goal, with BMI reduction achieved as height increases
- Lifestyle modification
  - Healthier diet – regular meals, decreased portions, eating together as a family, nutrient-rich foods etc.
  - Increase physical activity – aim for fun activities, family participation is encourages, structured physical activity

    - Limiting television and other small screen recreational activities to less than 2 hours per day
    - Counselling
- Pharmacotherapy is indicated in a small subgroup of children, over the age of 12 with extreme obesity
    - Orlistat – lipase inhibitor
- Bariatric surgery is generally not considered

Precocious Puberty

- **Gonadotrophin-Dependent Precocious Puberty**
    - 90% in females has NO identifiable cause
    - Manage associated brain neoplasms (e.g. optic nerve gliomas)
    - **GnRH agonist** (e.g. leuprolide) can suppress puberty via negative feedback
    - **GH therapy** (as GnRH agonists can stunt growth)
    - Cryproterone (anti-androgen) is used by specialists
- **Gonadotrophin-Independent Precocious Puberty**
    - **McCune Albright or Testotoxicosis**: ketoconazole or cyproterone, GnRH agonist, aromatase inhibitors
    - **Congenital Adrenal Hyperplasia**: adjustment of hydrocortisone therapy, GnRH agonist
    - **Tumours**: specialist referral

Severe Hypercalcaemia

- Rehydration
- Diuretics
- Bisphosphonates

Paediatric Emergencies

ABCDE Approach

	Signs and Symptoms	Action
Airway	Secretions, foreign body Stridor See-sawing	Open airway – jaw thrust and position: • Infant – neutral position • Children – 'sniffing' position • NB. C-spine control Remove obstruction if safe
Breathing	Respiratory rate Symmetry Wheeze Work of breathing	Auscultate and monitor Oxygen Support breathing
Circulation	Pulse rate and volume Blood pressure Capillary refill time	Fluid/blood Chest compressions Defibrillation Look at the colour and temperature of peripheries Measure capillary refill time Auscultate the heart Insert 1 or 2 large bore cannulas Reassess every 5 mins Consider fluid bolus if hypotensive
Disability	Consciousness Pupils Posture	AVPU/GCS Collateral history re. seizures, trauma, poison, sepsis, diabetes
Exposure	Fully expose the child to enable a secondary assessment, analgesia	

Don't Ever Forget Glucose

Anaphylaxis

- Treat as **MEDICAL EMERGENCY**
- Assess (**ABC Approach**)
    - Airway - look for and relieve obstruction, intubate if necessary
    - Breathing - check whether it is normal
    - If **unresponsive** and **not breathing normally**:
        - Start CPR immediately
        - Ensure help is on the way because advanced life support is essential
    - If CPR is NOT required:
        - Examine chest for signs of airway obstruction
        - Check pulse and blood pressure for circulatory collapse
        - Check skin and inside the mouth for urticaria and angio-oedema
- Place in a comfortable position
    - Sitting up if airway and breathing difficulty
    - Lying flat with/without leg elevation if low blood pressure/feeling faint
    - Recovery position if breathing but unconscious
- **Give IM adrenaline 1: 1000** (as per age-related guidelines)
    - Given in the anterolateral aspect of thigh
    - Assess response after **5 mins**
    - **Repeat** IM injection at 5 min intervals until there has been an adequate response
    - Do NOT give IV adrenaline in primary care (however it may be given in cases of cardiopulmonary arrest)
- Remove trigger if possible e.g. stinger after a bee sting
- **Give high flow oxygen**
- **Give IV fluids**
- **Give IV chlorphenamine 10 mg + IV hydrocortisone 200 mg**

PACES TIPS

- Explain that this is a severe allergic reaction
- Explain that the priority right now is to treat this reaction and make sure the child is stable
- Explain that they will be referred to an allergy clinic where further tests may be required to establish the exact allergens
- Explain that future management of allergy will be discussed (e.g. carrying an EpiPen)
    - Check the airway
    - Lie patient flat
    - Raise legs
    - Administer adrenaline into the thigh or arm (repeat after 5 mins if no response)
    - Call an ambulance

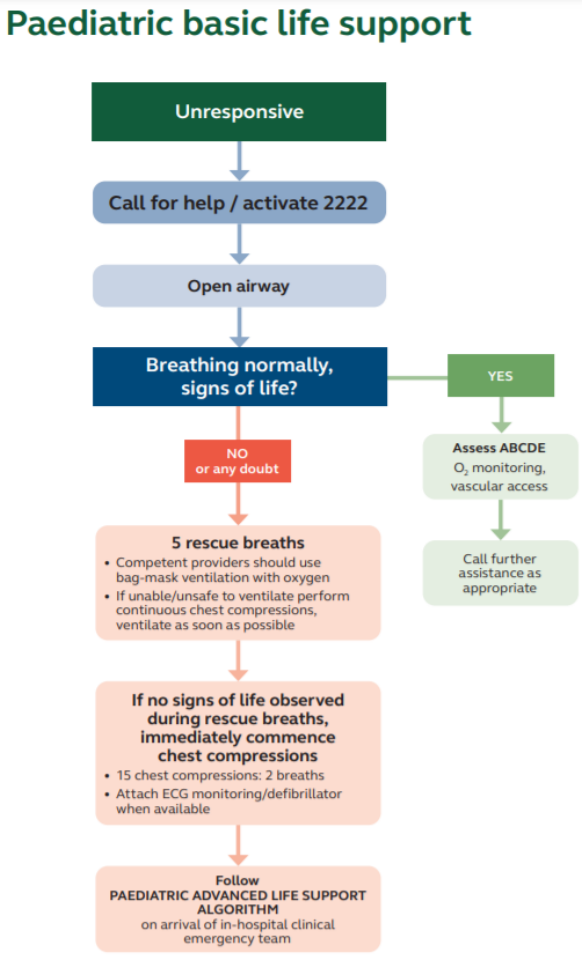
Cyanosis / blue baby

- In neonates it is commonly due congenital heart disease
- Acute cyanosis
    - ABCDE approach
        - Oxygen
        - Oxygen saturation should be maintained >90%
        - Ventilation e.g. nasal CPAP should be considered
        - Fluids if hypotensive and shock
        - Antibiotics if evidence of sepsis or pneumonia
    - Start prostaglandin infusion (5 ng/kg per min) to maintain ductus arteriosus patent.
    - If suspected CHD, refer to tertiary care centre immediately
        - Treatment balloon atrial septostomy.

Neonatal Resuscitation Guidelines

- **At birth, delayed cord clamping** if possible
- **Dry the baby**, remove any wet towels and covers and start the clock or note the time
- **Within 30 seconds**: assess tone, breathing and heart rate
- **Within 60 seconds**: if gasping or not breathing – open the airway and give 5 inflation breaths
    - Consider SpO2 and ECG monitoring
- **Re-assess**: if no increase in heart rate, look for chest movement
- **If chest NOT moving**:
    - Check mask, head and jaw position
    - Consider 2-person airway control
    - Consider suction, laryngeal mask/tracheal tube
    - Repeat inflation breaths and look for a response
    - Consider increasing inflation pressure
- **If NO increase in heart rate**: look for chest movement
- **When chest is moving**: if heart rate is not detectable or slow (< 60/min) ventilate for 30 seconds
- **Reassess heart rate**: if still < 60 bpm
    - Start chest compressions with ventilation breaths (**3:1**)
    - Increase oxygen to 100%
    - Consider intubation if not already done or laryngeal mask if not possible
- **Reassess heart rate every 30 seconds**: if heart rate is not detectable or slow (< 60/min):
    - Vascular access and drugs (e.g. atropine)
    - Consider other factors, e.g. pneumothorax, hypovolaemia, congenital abnormality

Paediatric Basic Life Support



- Approach with care

- Check responsiveness
- Shout for help
- Open airway
- Check breathing for 10s: Look, listen and feel
- Give 5 rescue breaths
- Check for signs of circulation 10s
    - Femoral, brachial and radial pulses are appropriate in children
- Chest compressions: 15 chest compressions: 2 rescue breaths (15:2)
    - rate 120 compressions per minute and 30 breaths per minute

Sepsis

- Assess **HIGH RISK** of severe illness or death from sepsis (under 5 years):
    - Behaviour:
        - No response to social cues
        - Appears ill
        - Does not wake, or if roused does not stay awake
        - Weak, high-pitched and continuous cry
    - Heart Rate:
        - Tachycardia (different at different ages)
        - < 60 bpm at any age
    - Respiratory Rate
        - Tachypnoea (different at different ages)
        - Grunting
        - Apnoea
        - SpO2 < 90% on air
    - Mottled or ashen appearance
    - Cyanosis of the skin, lips or tongue
    - Non-blanching rash
    - Aged < 3 months with temperature > 38 degrees
    - Temperature < 36 degrees
- **Transfer IMMEDIATELY** to an acute hospital setting if there are signs of severe illness or if immunity is impaired
- If in the community and **meningococcal disease** is suspected, give **IM benzylpenicillin**
- **Identify the source of infection**
    - **Investigations include**: FBC, blood culture, CRP, urinalysis, LP, CXR
    - Contraindications for LP: signs of raised ICP, focal neurological signs, shock, purpura
    - Perform LP in the following children with suspected sepsis:
        - < 1 month
        - 1-3 months who appear unwell
        - 1-3 months with WCC < 5 or > 15 x 10^9/L
- **Children with MODERATE to HIGH Risk**
    - Carry out VBG for:
        - Blood gas (including **glucose** and **lactate**)
        - Blood culture
        - FBC
        - CRP
        - Urea and electrolytes
        - Creatinine
    - Review venous lactate within 1 hour
    - **Lactate > 2 mmol/L or evidence of AKI**
        - Treat as **HIGH RISK**
    - **Lactate < 2 mmol/L**
        - Repeat structured assessment at least hourly

        - Ensure review by senior clinician within 3 hours of meeting 2 or more of the moderate to high-risk criteria
        - Once the cause is identified, manage it
- **Children with HIGH Risk**
    - Arrange immediate review by senior clinician
    - Carry out VBG for:
        - Blood gas (including **glucose** and **lactate**)
        - Blood culture
        - FBC
        - CRP
        - Urea and electrolytes
        - Creatinine
        - Clotting screen
    - Give **broad spectrum antibiotics** at the MAXIMUM dose without delay
    - Monitor children continuously
    - Monitor mental state of the child using **GCS** or **AVPU**
    - **Lactate > 4 mmol/L**
        - Give IV fluid bolus without delay
        - Refer to critical care for review of central access and initiation of inotropes or vasopressors
    - **Lactate 2-4 mmol/L**
        - Give IV fluid bolus without delay
    - **Lactate < 2 mmol/L**
        - Consider IV fluids
    - **Antibiotics**
        - Follow local guidelines for other infections
        - If meningococcal sepsis (fever and purpuric rash)
            - IM benzylpenicillin (in the community)
            - IV ceftriaxone (in hospital)
        - Age up to 17 years old: IV ceftriaxone 80mg/kg OD (max 4g).
            - Neonates <72h old: IV Benzylpenicillin and gentamicin
            - Children <3 months, give additional antibiotic to cover listeria, e.g. ampicillin or amoxicillin
    - **IV fluids**
- **PAEDIATRIC SEPSIS 6**
    - **Give high flow oxygen**
    - **Obtain IV/IO access and take bloods**
        - Blood gas and lactate (FBC, U&E, CRP)
        - Blood glucose (treat hypoglycaemia)
        - Blood cultures
    - **Give IV/IO antibiotics**
    - **Consider fluid resuscitation**
        - Aim to restore normal physiological parameters (urine output > 0.5 ml/kg/hr)
        - Give 10-20 ml/kg isotonic fluid over 5-10 mins
        - Repeat as necessary, monitor urine output
    - **Involve senior clinicians early**
    - **Consider inotropic support early**
        - If normal physiological parameters are not restored after > 40 ml/kg fluids, consider ICU admission

PACES TIPS

- Explain that the child has an infection that may have crossed into the blood
- It is important to monitor closely, identify the source of the infection and treat with antibiotics

Ophthalmological Disease

Conjunctivitis

- **Viral** (non-herpetic) conjunctivitis self-limiting and it resolves within 2 weeks but symptom relief:
  - Clean with saline / boiled and cooled water
  - Cool compresses around they eye area
  - Artificial tears or lubricating drops
- THEREFORE, avoid antibiotic prescription
- Inform that it can be contagious for 24 hours – wash hands with soap, avoid contact with others
- **Bacterial** – self-limiting and resolves 5-7 days without treatment
  - Treat with topical antibiotics if severe / symptoms haven't resolved within 3 days
  - Staphylococcal or streptococcal infection (Discharge or redness) → Topical antibiotic eye ointment e.g. chloramphenicol or neomycin
  - Gonococcal infection (purulent discharge) → IV 3rd generation cephalosporin
  - Chlamydia trachomatis (purulent discharge, eyelid swelling) → oral erythromycin for 2 weeks
- If associated with contact lens use check for corneal involvement with florescin
  - Urgent Ophthalmology referral if suspicion of corneal involvement
- No recommended school exclusion

Hypermetropia

- Convex (plus) lenses
- Mild – may not need spectacle correction

Myopia

- Concave (minus) lenses

Retinopathy of prematurity

- Screening for babies born <32 weeks AND/OR <1500g
- Prevention by using reduced concentrations of oxygen when ventilating
- Laser therapy reduces visual impairment
- Intravitreal anti VEGF (anti-vascular endothelial growth factor) therapy is being investigated

Strabismus

- Referral to specialist service (Paediatric or orthoptist with ophthalmology) if red flags:
  - Limited abduction
  - Double vision
  - Headaches
  - Nystagmus
- Correction of refractive error – corrective glasses
- Occlusion or penalisation therapy to treat amblyopia
  - Occlusion of normal eye with a patch for a number of hours per day depending on age and severity
  - Penalization – vision in the normal eye is deliberately blurred by using atropine drops and is used when problematic compliance to occlusion
- Eye exercises
- Extraocular muscle surgery
- Botulinum toxin – injection into an extraocular muscle causes paralysis for up to 3 months and corrects squints

Other Topics

Gillick Competence

- At **16 years** or older, a young person can be treated as an adult and be presumed to have capacity to decide
- Under the age of 16 years, children may have capacity to decide, depending on their ability to understand what is involved
- Where a competent child refuses treatment, a person with **parental responsibility** or **the court** may authorise investigation or treatment which is in the child's best interests
- **Family Law Reform Act (1969)**
    - Those **over 16** can consent to treatment but CANNOT REFUSE TREATMENT under 18 years old, unless there is one consenting parent, even if the other disagrees

MMR Contraindications and Side-Effects

- **Contraindications**
    - Severe immunosuppression
    - Allergy to neomycin
    - Children who have received another live vaccine by injection within 4 weeks
    - Pregnancy should be avoided for at least 1 month following vaccination
    - Immunoglobulin therapy within the past 3 months (there may be no immune response if these antibodies are present)
- **Adverse Effects**
    - Malaise, fever and rash may occur after the first dose of MMR. This typically occurs after 5-10 days and lasts around 2-3 days.
    - Anaphylaxis is very rare

Non-Accidental Injury

- **Variety of Presentations**
    - Bruising
    - Broken bones
    - Drowsiness (subdural haematoma)
    - Neglect (e.g. unkempt)
    - Failure to thrive
- **Is the child in DANGER?**
    - Could the siblings or parents be in danger?
    - **MAKE SURE THE CHILD IS IN A SAFE PLACE**
- **Who to get involved?**
    - Senior colleagues
    - Named doctor for child protection
    - Contact social services and make a formal referral
    - Consider contacting the police (**Child Abuse Investigation Team (CAIT)**)
    - Consider contacting **Multi-Agency Safeguarding Hub (MASH)**
        - This includes a variety of people that help manage different aspects of a child's life
- **Investigations**
    - Skeletal survey
    - CT +/- MRI head scan
    - Bloods and bone profile
        - Rule out leukaemia, ITP etc.
    - Ophthalmology referral (fundoscopy for retinal haemorrhages)
- **GENERAL RULE**: if you are suspecting NAI, it is always safe to admit the child

PACES TIPS

- We have to talk about what to do next from a medical and non-medical standpoint
- Whenever we have a case where we don't know why an injury has occurred, we have to involve some other people
- This includes social services and the child safeguarding team (and maybe the police)
- This is a routine requirement for all children in these situations, and our aim is to keep your child safe
- Sometimes when children have similar injuries, they do not happen by accident and they are caused by someone else

School Exclusion

- **No Exclusion**
  - Conjunctivitis
  - Slapped cheek syndrome (fifth disease)
  - Roseola infantum
  - Infectious mononucleosis
  - Head lice
  - Threadworms
- **Exclusion for 24 hours after Antibiotics**
  - Scarlet fever
- **Exclusion for 48 hours after Antibiotics**
  - Whooping cough
  - NOTE: if no antibiotics are given, exclude for 21 days from onset of symptoms
- **Exclusion for 4 days from onset of rash**
  - Measles
  - Rubella
- **Exclusion until all lesions crusted over**
  - Chickenpox
  - Impetigo
- **Exclusion for 5 days from onset of swollen glands**
  - Mumps
- **Until symptoms have settled for 48 hours**
  - Diarrhoea and vomiting
- **Until treated**
  - Scabies
- **Until recovered**
  - Influenza

Somatisation / Chronic Pain / Unexplained symptoms

- **Initial treatment** – Primary care management with regularly scheduled visits
  - Schedule regular outpatient visits
  - Acknowledge somatic symptoms
  - Communicate with specialists who are treating the patient –patients with somatic symptom disorder consult one doctor after another ("doctor shopping").
  - Evaluate for and treat diagnosable general medical diseases.
  - Limit diagnostic testing and referrals to specialists.
  - Reassure patients that grave medical diseases have been ruled out.
  - Explain that the body can generate symptoms in the absence of disease, that psychological and social issues (e.g. stress) can affect the body.
  - Assess for comorbid psychiatric disorders
  - Stop unnecessary medications.
- **Treatment resistant patients** – continue to meet regularly with the patient and also:
  - Discuss the case with a psychiatrist

- Meet jointly with the patient and family members
- Administer relaxation training
- Provide formal psychoeducation
- Prescribe antidepressants for patients with prominent comorbid symptoms of anxiety disorders, depressive disorders, or obsessive-compulsive disorder

Paediatric Vital Signs

Age (years)	Respiratory rate (breaths/min)	Heart rate (beats/min)	Systolic BP (mmHg)
<1	30 – 40	110 – 160	70 – 90
2-5	20 – 30	95 – 140	80 – 100
5-12	15 – 20	80 – 120	90 – 110
>12	12 – 16	60 - 100	100 - 120

Paediatric Hydration Assessment and Fluid Balance

	Clinical features	Management
Not clinically dehydrated (<5%)	None of the below (may have dry mucous membranes)	Continue milk feeds and encourage clear fluids (not carbonated, juice or flat cola)
Clinically dehydrated (5%)	Symptoms: decreased urine, unwell, altered consciousness Signs: dry mucous membranes, sunken eyes, tachypnoea, tachycardia, decreased skin turgor	Continue milk feeds plus oral rehydration solution: **50ml/kg over 4 hours, plus maintenance,** may try via NG if cannot feed If deteriorating or vomiting → IV fluid replacement
Clinical shock (10%)	Symptoms: decreased consciousness, pale/mottled skin, cold extremities	IV rehydration: **10ml/kg bolus of 0.9% saline**. If still shocked, then PICU If shock resolves, then: IV 100ml/kg 0.9% saline over 4hrs plus maintenance

	Signs: tachycardia, tachypnoea, weak pulses, prolonged capillary refill, hypotension	NB. Give 10ml/kg bolus of 0.9% saline for DKA and cerebral trauma because worried about central pontine myelinosis and cerebral oedema.

Maintenance Fluid

Body Weight	Fluid Requirement over 24 hours	Volume/kg/hour
First 10kg	100 ml/kg	4ml
Second 10kg	50 ml/kg	2ml
Each kg thereafter	20 ml/kg	1ml

UK Paediatric Vaccination Schedule (from January 2020 onwards)

Age	Vaccines
8 weeks	DTaP/IPV/Hib/HepB - Diptheria, tetanus, pertussis, polio, *H. influenzae* type B and Hepatitis B (6 in 1) Men B Rotavirus
12 weeks	DTaP/IPV/Hib/HepB - Diptheria, tetanus, pertussis, polio, *H. influenzae* type B and Hepatitis B (6 in 1) PCV – Pneumococcal conjugate vaccine Rotavirus
16 weeks	DTaP/IPV/Hib - Diptheria, tetanus, pertussis, polio, *H. Influenza* type B and Hepatitis B(6 in 1) Men B
1 year	Hib/MenC PCV – Pneumococcal conjugate vaccine MMR –measles, mumps, rubella Men B booster
Annually from 2 years old	Nasal spray influenza vaccine (other groups include) • **All primary school children** • **Aged 2-17 with long-term health conditions**
3 years 4 months old	DTaP/IPV - Diptheria, tetanus, pertussis, polio (4 in 1 pre-school booster) MMR (2nd dose) – check first dose given
12 – 13 years (boys and girls, school year 8)	HPV (Gardasil) – 2 doses 6-24 months apart

14 years (school year 9/10)	Td/IPV – tetanus, diphtheria, polio (chec MMR status) (3 in 1 teenage booster) Men ACWY

Also, for at risk groups, BCG at birth AND HBV for babies born to Hep B infected mothers, 1 month, 2 months and 12 months

Contraindications to vaccination

- Acute febrile illness
- Egg allergy – influenza, yellow fever and tick-borne encephalitis (NB: MMR is usually safe but can be given in hospital if egg allergic)
- Previous anaphylaxis to vaccine containing or constituent antigens/components
- Immunocompromised depends on cause.
    - Short term – delay vaccines.
    - Care with live vaccines

Psychiatry

Updated and Edited by: Dr. Weijian Tan and Dr. Sophia Terry

Introduction to Psychiatry

Psychiatric illness is incredibly common, affecting 1 in 4 of us during our lifetime. As well as by psychiatrists, mental health problems are commonly managed by GPs in the community, but everyone in the medical profession requires a basic understanding of recognising and managing psychiatric illness. Appropriate diagnosis and management can improve a patient's quality of life immeasurably and the boundary between physical and mental health can often be blurred.

The psychiatric PACES are designed to examine your ability to assess a patient presenting with mental health problems and formulate an appropriate management plan. A lot of it is about risk management and recognising when referral to a specialist is needed. Try not to approach psychiatry differently to the rest of medicine. You still have to ask a structured history, perform investigations, create lists of differentials and treat appropriately. Each patient will be unique and you will need to take into account their individual social circumstances. When managing risk in psychiatry, it can be classified as:

- Risk to self
- Risk to others
- Risk from others

When discussing your management plan ensure that you have considered all of the above areas of risk and how you would mitigate them.

It is likely that you will have one station based in the community and one based in hospital. It is important to think about how you would manage the cases differently and the kinds of resources available to you. An excellent NICE guide to the management of common mental health problems is available online, detailing a step-based care approach depending on the severity of the problem. Remember there are liaison psychiatry teams in hospital who may be available to offer advice and lend a hand!

Mental State Examination (MSE)

The MSE is supposed to be an objective assessment of the **current** episode of illness. Sometimes when it has not been possible to take a history from the patient (perhaps because they are floridly psychotic or catatonically depressed), the candidate has been asked to present a full MSE instead. It is essential that you can perform this fluently and understand the range of terminology used. As with most things in medicine, it is vital that you have a solid system in place that you can rely upon under the pressure of the exam. *A Guide to Psychiatric Examination* by Aquilina & Warner covers this well.

Presentation of the MSE is important for PACES:

- Practice presenting. Watch the examples of psychiatric patients on Speaking Clinically and try to present their MSE to a friend in less than a minute. Alternatively, practice amongst yourselves by presenting the mental state examination of each other.
- Terminology is very important in psychiatric presentations, but make sure you know what the words mean!
- It may ask you on the door to '*take a focused history and perform a mental state examination'* - some examiners may ask you to present fully, others just to summarise.
- Present positives and relevant negatives as per any other medical examination
- Never use the term *'normal'*

When the patient has symptoms of psychiatric illness remember to **describe** the abnormality: *"Mr X showed no evidence of formal thought disorder, however there was some delusional thought content, primarily grandiose in nature. For example, he believes he is the Mayor of London and owns Hyde Park."*

The Mental State Examination Framework

1. **Appearance and behaviour -** this sets the scene for the listener (imagine you are presenting over the phone)
    a. Age, gender, ethnicity and occupation – e.g. *"Mrs X is a middle-aged Caucasian female who reported to be the lead singer of the Spice Girls"*
    b. Dress and self-care – dressing provocatively could be a sign of sexual disinhibition, whereas a disheveled appearance may be consistent with depression or schizophrenia.
    c. Manner - hostile/helpful, aggressive/amiable? Were they appropriately behaved with you during the consultation?
    d. Posture and movement - were they tense, relaxed or overactive, or were there any side effects of antipsychotic use evident, e.g. tardive dyskinesia
    e. Rapport - easy or difficult to establish
2. **Speech -** describe in terms of rate, rhythm, tone and volume. Comment on whether there was any pressure or poverty of speech and whether they were coherent or incoherent. Think of speech as a train and thoughts as passengers – normal speech and thought would be a train travelling at normal speed, reasonably full of passengers and it takes a logical route from station A to station B.
    NB: Formal thought disorder should be presented here, not in the Thought section, as it presents as abnormal speech patterns e.g. word salad
3. **Mood**
    a. Subjective – quote the patient directly e.g. "10/10" or "never felt better"
    b. Objective – what you think their mood is e.g. "depressed," "elated," "euthymic"
    c. Affect is how the patient is presenting during the consultation. It is "incongruent" if the person's report doesn't match their presentation (i.e. they laugh while saying they have suicidal thoughts). If the affect varies appropriately, you can describe it as "reactive"

d. Risk assessment! See (8) but this is a common place to ask about risk to self, risk to others and risk from others

4. **Thought**
    a. Content - thought insertion, thought withdrawal or thought broadcasting
    b. Preoccupations (recurrent thoughts which the person is able to put aside), worries and overvalued ideas, obsessions, thoughts of harm
    c. Delusions – grandiose, persecutory, hypochondriacal, nihilistic, of guilt, of reference, of infidelity, amorous, of control
    d. Form - pressure or poverty of thought, thought blocking, loosening of associations, knight's move, neologisms, perseveration, circumstantial or flight of ideas.
5. **Perception -** hallucinations, illusions, depersonalisation or derealisation.
6. **Cognition**
    a. Orientation - to time, place and person.
    b. Attention and concentration - subjective report, serial 7s, WORLD backwards
    c. Memory - subjective report and:
        i. Immediate memory
        ii. Recent memory
        iii. Remote memory
    d. Grasp – e.g. current monarch/prime minister.
7. **Insight**
    a. Does the patient consider themselves unwell in psychological terms?
    b. Does the patient feel in need of treatment?
8. **Risk**
    a. To themselves (neglect, DSH, suicide) and to others (remember to ask if there are any children in their care, as well as if they have thoughts of harming others)
    b. From others (do they feel safe?)

Assessing Cognition

1. Abbreviated Mental Test Score (out of 10 - brief screening test)

1. Age	☐	6. Date of birth	☐
2. Time (to nearest hour)	☐	7. Dates of WW1	☐
INSERT: Address for recall		8. Name of monarch	☐
3. Year	☐	9. Count backwards 20-1	☐
4. Location	☐	10. Address recall	☐
5. Identify 2 people	☐		

2. Mini Mental State Examination (out of 30)
A template will be provided in the exam, but make it obvious you've done it before!

3. Addenbrookes Cognitive Examination (ACE-R) (extensive- out of 100)
You will not be asked to perform this in the exam, but you should mention it when asked about further tests of cognition. It has a better diagnostic value than the MMSE and can detect subtler deficits at an earlier stage. It takes about 10-15 minutes.
Find online at: *www.stvincents.ie/dynamic/File/Addenbrookes_guide.pdf*

Frontal lobe testing
For personality and behavioural changes in context of cognitive deficit. It is unlikely you will be asked to do this, but again it is useful to be aware of how you would do it.

- Verbal Fluency: Recall as many words beginning with F, A or S (>10)
- Cognitive Estimates: Educated guesses (*how many camels in Holland?)*
- Abstract Thinking: Proverb interpretation (*let the cat out of the bag)*

Depression screening
Don’t forget that depression is a significant cause of apparent cognitive impairment, especially in older adults (e.g. pseudodementia).

Psychiatry Management Guide

Affective Disorders

Depression
Mania and Bipolar Affective Disorders
Self-Harm and Suicide
Schizophrenia

Substance Misuse Psychiatry

Alcohol Misuse
Acute Alcohol Withdrawal
Opiate Misuse
Benzodiazepine Misuse

Organic Psychiatry

Delirium
Normal Pressure Hydrocephalus

Old Age Psychiatry

Depression in the Elderly
Psychosis in the Elderly
Dementia
Pharmacology for Non-Alzheimer's
Vascular Dementia
Lewy Body Dementia

Anxiety, Obsessions and Reactions to Stress

Anxiety Disorders (includes general and specific)
Generalised Anxiety Disorder (GAD)
Panic Disorder
Obsessive Compulsive Disorder
Acute Stress Reaction
Post-Traumatic Stress Disorder (PTSD)
Adjustment Disorder
Medically Unexplained Symptoms
Chronic Fatigue Syndrome
Conversion (Dissociative) Disorders

Eating Disorders

Anorexia Nervosa
Bulimia Nervosa

Psychosexual Disorders

Low Libido
Hypersexuality
Erectile Dysfunction
Disorders of Gender Identity

Problems following childbirth

Postnatal Depression
Puerperal Psychosis
Bipolar Disorder in Pregnancy
Learning Disability

Child and Adolescent Psychiatry

Autism Spectrum Disorder
Asperger's Syndrome
Depression in Children
Anxiety Disorders (including separation anxiety and school refusal)
Encopresis
Conduct Disorder
Tic Disorders
Personality Disorders
Emotionally Unstable Personality Disorder
Chronic Insomnia
Attention Deficit Hyperactivity Disorder

Psychiatry and the Law

Other topics

Psychopharmacology – Antipsychotics
SSRI Side-Effects and Interactions

SSRIs in Pregnancy
Switching Anti-Depressants
Lithium Side-Effects and Monitoring
Benzodiazepines
MMSE Interpretation
Montreal Cognitive Assessment (MoCA)
Depression and Anxiety Questionnaires
Alcohol Questionnaires

Electroconvulsive Therapy (ECT)
Insomnia

Applied Relaxation Therapy
Mentalisation-Based Therapy
Transference-Focused Therapy

Affective Disorders

Depression

- Assess severity of depression, considering the number of symptoms, degree of functional impairment and/or disability and duration of the episode
- Explore possibility of previous episodes of depression and mood elevation (BPAD), comorbid physical illnesses, responses to previous treatments, and the quality of their interpersonal relationships
- Always assess **suicide risk** - "have you had thoughts of harming yourself or ending your life?" - if significant risk to self, refer to specialist MH services urgently
- **Stepped Care Model** - always choose the least intrusive and most effective intervention
    - **Step 1**: all known and suspected presentations of depression
    - **Assessment,** support, psychoeducation, active monitoring and referral for further assessment and interventions
- **Step 2:** persistent subthreshold depressive symptoms, mild-to-moderate depression
    - **Low-intensity psychological interventions**, psychological interventions, medication, referral for further assessment and interventions
- **Step 3**: Persistent subthreshold depressive symptoms or mild-to-moderate depression with inadequate response to initial interventions, moderate-to-severe depression
    - **Medication**, **high-intensity psychological interventions**, combined treatments, collaborative care and referral for further assessment and interventions
- **Step 4**: Severe and complex depression, risk to life, severe self-neglect
    - **Medication**, **high-intensity psychological interventions**, ECT, crisis service, combined treatments, multi-professional and inpatient care
- Explain that symptoms may get worse soon after starting treatment (give clear advice on how to seek help, e.g. local crisis lines, Samaritans, A&E)
- **Mild To Moderate Depression**
    - Sleep hygiene advice
    - Arrange further assessment within 2 weeks
    - **Low-Intensity Psychosocial Intervention**
        - **Individual-guided self-help based on the principles of CBT**
            - Provision of written materials, supported by a trained practitioner who reviews progress and outcome
            - Consists of 6-8 sessions (face-to-face or telephone) usually taking place over 9-12 weeks including follow-up
        - **Computerised CBT**
            - Include an explanation of the CBT model
            - Encourage tasks between sessions, use thought-challenging and active monitoring of behaviour and thought patterns
            - Supported by a trained practitioner who reviews progress and outcomes
            - Typically takes place over 9-12 weeks including follow up
        - **Structured group physical activity programme**
            - Delivered in groups with support from a trained practitioner
            - Usually 3 sessions per week (45-60 mins) over 10-14 weeks
    - **Group CBT**
        - Considered if low-intensity psychological intervention is declined
        - Based on a structured model such as 'Coping with Depression'
        - Should be delivered by 2 trained practitioners
        - Consists of 10-12 meetings of 8-10 participants
        - Normally lasts 12-16 weeks including follow up
    - **Do not routinely consider medication unless**:
        - Past history of moderate or severe depression
        - Symptoms have been present for a long time (> 2 years)
        - Symptoms persist after other interventions

        - NOTE: Do not advise St. John's wort but warn patients about uncertainty in dosing and drug interactions, including oral contraceptives, anticonvulsants and anticoagulants
- **Moderate to Severe Depression**
    - Provide a combination of:
        - Antidepressant medication
        - High-intensity psychological intervention (CBT or interpersonal therapy (IPT))
    - **Antidepressant Medication**
        - **1st line**: SSRI (e.g. sertraline)
        - **Risks**
            - Bleeding (especially in elderly, gastric ulcers, hyponatraemia)
                - NSAIDs should be given with PPI
            - **Drug Interaction**: fluoxetine, fluvoxamine, paroxetine
            - **Discontinuation Symptoms**: paroxetine
            - **Death from Overdose**: venlafaxine
            - **Overdose**: TCAs (except lofepramine)
            - **Stopping due to side effects**: venlafaxine, duloxetine, TCAs
            - **Blood Pressure Monitoring Needed**: venlafaxine
            - **Worsening Hypertension**: venlafaxine, duloxetine
            - **Postural Hypotension and Arrhythmia**: TCA
        - After starting antidepressant medication, review **after 2 weeks** (if low suicide risk), then every 2-4 weeks thereafter for 3 months
        - Patients <30 years old or at increased risk of suicide should be followed-up **after 1 week**
        - Review response to treatment after 3-4 weeks
    - **High-Intensity Psychological Interventions**
        - **Individual CBT**
            - 16-20 sessions over 3-4 months
            - Consider 2 sessions per week in the first 2-3 weeks
            - Consider follow-up sessions over the following 3-6 months
        - **Interpersonal Therapy**
            - 16-20 sessions over 3-4 months
            - Consider 2 sessions per week in the first 2-3 weeks

  More about antidepressants:
        - **Be especially cautious when switching the following antidepressants**:
            - From fluoxetine **to** other antidepressants (as fluoxetine has a long half-life)
            - From fluoxetine or paroxetine **to** a TCA (both drugs inhibit TCA metabolism so a lower starting dose may be needed)
            - To a new serotoninergic antidepressant or MAOI (because of risk of serotonin syndrome)
            - From non-reversible MAOI: a 2-week washout period is required (other antidepressants should not be prescribed during this period)
- **Complex and Severe Depression**
    - Use **crisis resolution** and **home treatment teams** to manage crises
    - Develop a **crisis plan** that identifies potential triggers and strategies to manage triggers (share with the GP and any other people involved in the patient's care)
    - Consider inpatient treatment if significant risk of suicide, self-harm or neglect
    - Consider **ECT** for acute treatment of severe depression that is life-threatening and when a rapid response is required, or when other treatments have failed
- **Summary**
    - **Mild depression or subthreshold depressive symptoms:**
        - Consider a period of active monitoring

        - Provide information about depression
        - Arrange **follow-up within 2 weeks**
    - **Persistent subthreshold depressive symptoms or mild to moderate depression**:
        - Consider psychological intervention (patients can self-refer through **IAPT**)
        - Avoid routine use of antidepressants (but consider if they have a history of moderate to severe depression, subthreshold depressive symptoms lasting a long time (usually >2 years) or mild depression that is complicating care of chronic physical health problems
    - **Moderate or Severe Depression**
        - Offer an antidepressant and a high-intensity psychological intervention
    - **First Episode of Depression**
        - Consider an SSRI (e.g. citalopram, sertraline)
    - **Recurrent Episode of Depression**
        - Consider an antidepressant that the patient has previously had a good response to
        - Avoid antidepressants that have previously failed
    - **If co-existing chronic physical health problem**
        - **Sertraline** is preferred (lower risk of drug interactions)
- If they develop **psychosis**: you add the antipsychotic earlier on (whenever the psychosis comes on)
- **Stopping antidepressants:** dose should be tapered down over a period of 4 weeks

PACES TIPS

- Explain the diagnosis of depression (persistently low mood that impacts on day-to-day functioning)
- Explain that it is very common (each year 1 in 4 people suffer a mental health problem)
- Address social needs
- Explain the role of psychological therapy (CBT – talking therapy based on the principle that thoughts, mood and behaviour are intertwined)
- Explain the role of medication (takes a number of weeks to work, follow-up in 1 or 2 weeks, warn about side-effects)
- Advise about the **crisis resolution** and **home treatment team**
- **Support**: mind.co.uk, Samaritans

Mania and Bipolar Affective Disorders

- **Mood Stabilisers**
    - Even out the extreme highs of mania and profound lows of depression
    - More effective against mania
    - Three main drugs:
        - Lithium
        - Sodium valproate
        - Carbamazepine
    - Mechanism of action is uncertain (possibly to do with sodium channels or GABA)
    - **Lithium**
        - Therapeutic range: 0.6-1.0 mmol/L
        - Becomes toxic from 1.2 mmol/L
        - Measure BMI, check FBC. U&Es and TFTs before starting
        - Plasma lithium levels should be checked 1 week after starting or changing dose and monitored weekly until a steady therapeutic level is achieved (aiming for 0.6-0.8 mmol/L)
        - It should be monitored every 3 months from then on
        - **U&Es** and **TFTs** should be monitored every 6 months (can cause renal impairment and hypothyroidism)

        - **Lithium Toxicity**
            - Level >1.2 mmol/L
            - Life-threatening
            - Presentation:
                - GI disturbance
                - Polyuria/polydipsia
                - Sluggishness
                - Giddiness
                - Ataxia
                - Gross tremor
                - Fits
                - Renal failure
            - Triggers:
                - Salt balance changes (e.g. dehydration, D&V)
                - Drugs interfering with lithium excretion (e.g. diuretics)
                - Accidental or deliberate overdose
            - **Management**
                - Check lithium level
                - Stop lithium dose
                    - **Warning**: stopping lithium abruptly could precipitate symptoms of mania/depression
                - Transfer for medical care (rehydration, osmotic diuresis)
                - If overdose is severe, the patient may need **gastric lavage** or **dialysis**
    - **Valproate**
        - Anticonvulsant
        - Treats acute mania
        - Prophylaxis in BPAD
        - Given as sodium valproate because of reduced side effects
        - Plasma levels do not need monitoring
        - No widely accepted therapeutic range
        - Dose-related toxicity is not usually an issue
        - Check BMI, FBC and LFTs before starting
    - **Carbamazepine**
        - Anticonvulsant
        - Can cause toxicity at high doses
        - Induces liver enzymes
        - Close monitoring of carbamazepine levels is essential
        - Check for drug interactions before prescribing
    - **Pregnancy**
        - Mood stabilisers are **teratogenic**
        - Risk of harm to fetus should be weighed against harm of manic relapse
        - Lithium - **Ebstein's anomaly**
        - Valproate and carbamazepine - **spina bifida**
        - Women of childbearing age should be given contraceptive advice and prescribed a **folate supplement** if using valproate
        - Closely monitor the fetus if mood stabilisers are used in pregnancy
    - **Other drugs**
        - **Antipsychotics** (e.g. olanzapine)
            - Usually atypical (e.g. olanzapine, risperidone, quetiapine) because of fewer side-effects
            - Before starting, check BMI, pulse, BP, fasting blood glucose or HbA1c, lipid profile
        - **Anticonvulsants**

        - Lamotrigine is 2nd line for prophylaxis in BPAD type II
        - Check FBC, U&Es and LFTs before starting
- **Acute Treatment of Mania or Hypomania**
    - Stop all medications that may induce symptoms (e.g. anti-depressants, recreational drugs, steroids and dopamine agonists)
    - Monitor food and fluid intake to prevent dehydration
    - If not currently on treatment
        - Give an **antipsychotic and a short course of benzodiazepines**
    - If already on treatment
        - Optimise the medication
        - Check compliance
        - Adjust doses
        - Consider adding another medication (e.g. antipsychotic added to mood stabiliser)
        - Short-term benzodiazepines may help
    - **ECT** may be used if patients are unresponsive to medication
- **Long-Term Treatment**
    - Mood stabilisers are the mainstay
    - Other medications may be added when new symptoms arise or when facing stress that could precipitate relapse (e.g. antipsychotics or benzodiazepines)
    - **Depression in BPAD**
        - Difficult because antidepressants can cause a **switch to mania**
        - To reduce this risk, antidepressants should only be given with a mood stabiliser or antipsychotic
            - **1st line**: fluoxetine + olanzapine/quetiapine
            - **2nd line**: lamotrigine
        - Monitor closely for signs of mania and immediately stop antidepressants if signs are present
        - Medication can be cautiously withdrawn if the patient is symptom-free for a sustained period
- **Psychological Treatment**
    - **CBT**
        - Identify relapse indicators
        - Relapse prevention strategies:
            - Developing routine
            - Ensuring good quality sleep
            - Promoting a healthy lifestyle
            - Avoiding excessive stimulation/stress
            - Addressing substance misuse
            - Ensuring drug compliance
        - Helps patients to test out their excessively positive thoughts to gain a sense of perspective
    - **Psychodynamic Psychotherapy**
        - Useful if mood stabilised
- **Social Interventions**
    - Family support and therapy
    - Aiding return to education or work
- **Summary**
    - Psychological interventions designed for BPAD may be helpful
    - **Lithium** is the mood stabiliser of choice
        - Alternative: sodium valproate
    - During an acute manic episode, may need to stop antidepressant
    - Consider antipsychotic therapy (e.g. olanzapine)

- **Management of Depression**: talking therapies, fluoxetine (given with olanzapine or quetiapine)
- Address comorbidities: diabetes mellitus, cardiovascular disease and COPD
- **Primary Care Referral**
  - Symptoms of hypomania → routine referral to CMHT
  - Symptoms of mania or severe depression → urgent referral to CMHT

PACES TIPS
- **Consider admission and section if at risk**
- Explain the diagnosis (condition where patients tend to experience the extremes of emotion for variable lengths of time)
- Explain the importance of controlling it (both extremes can lead to making certain decisions and taking risks that you would otherwise regret)
- Explain that there are medications available (helps balance the chemicals in the brain)
- Advise about crisis resolution team and Samaritans

Self-Harm and Suicide

- **Physical Treatment**
  - Examine any physical injuries
  - Overdoses
    - Naloxone (for opioid overdoses)
    - Activated charcoal (decreases intestinal absorption of some substances (e.g. antidepressants))
      - Must be used <1 hour of ingestion
    - Antidotes (e.g. N-acetylcysteine for paracetamol overdose)
  - Lacerations
    - Superficial cuts: sutures or Steristrips
    - Plastic surgery for deep cuts
    - Adequate analgesia should be given
- **Risk Assessment**
  - Thoughts about hurting themselves again
  - Thoughts of hurting others
  - Concerns about being hurt by others
  - Specific features of increased risk:
    - Careful planning
    - Final acts in anticipation of death (e.g. writing wills)
    - Isolation at the time of the act
    - Precautions taken to prevent discovery (e.g. locking doors)
    - Writing a suicide note
    - Definite intent to die
    - Believing the method to be lethal (even if it wasn't)
    - Violent method (e.g. shooting, hanging, jumping in front of a train)
    - Ongoing wish to die/regret that the attempt failed
  - If the patient is insistent on leaving you need to **assess their capacity**
- **Immediate Interventions**
  - If at high risk of suicide and lacking capacity, they need to be **admitted to a psychiatric ward** for their own safety
  - Patients at lower risk may be managed at home (depending on home circumstance e.g. if they have a supportive family)
  - A **crisis plan** should be made to deal with future suicidal ideation or thoughts of self-harm
    - Who they will tell
    - How they will get help (e.g. coming straight to hospital)
- **Follow-up Interventions**

    - Follow-up **within 1 week** of the self-harm or discharge from the inpatient ward
    - This could be:
        - Community mental health team
        - Outpatient clinic
        - GP
        - Counsellor
    - Underlying disorders (e.g. **depression**) should be treated
        - SSRIs are safest for depression, but prescriptions should be short and reviewed regularly to prevent stockpiling for overdose
    - Psychological therapies
        - CBT-based therapies (e.g. CBT, dialectical behaviour therapy)
        - Mentalisation-based treatment
        - Transference-focused psychotherapy
    - **Important**: 30% of suicides occur within 3 months of discharge from psychiatric wards
    - Harm minimisation techniques (agreed with MDT) may be used if stopping self-harm is unrealistic in the short-term, e.g. using ice cubes, rubber bands
- **Coping Strategies**
    - Distraction techniques
    - Mood-raising activities (e.g. exercise, writing)
    - **Strategies to Decrease or Avoid Self-Harming**
        - Put tablets and sharp objects away
        - Avoid triggers (e.g. photos online)
        - Stay in public places or with supportive people when tempted to self-harm
        - Call a friend or support line
        - Avoid drugs and alcohol
        - Squeeze ice cubes
        - Snap a rubber band around their wrist
        - Bite into something strongly flavoured (e.g. lemon)
- Offer emotional support to relatives/carers if possible

Schizophrenia

- **Biopsychosocial Model**
    - Biological therapies (mainly antipsychotics)
    - Psychological therapies
    - Social interventions
- **Early Intervention in Psychosis (EIP) Service**
    - Psychosis is toxic: the longer a patient is psychotic, the more it will affect their cognitive abilities, insight and social situation
    - The sooner effective treatment can be started the better the prognosis
    - The service aims to engage patients with very early symptoms, from adulthood till ~35 years
    - Patients are offered antipsychotics and psychosocial interventions with the aim of keeping the **duration of untreated psychosis (DUP)** under 3 months
    - The service can be used in children >14 years old
        - CAMHS can manage psychosis in children up to 17 years old
- **Note**: if urgent intervention is necessary, use the **crisis resolution team** and **home treatment team**

Psychological Management of Schizophrenia

- **Antipsychotics**
- Dopamine antagonists (block D2 receptors)
- **Extrapyramidal side-effects (EPSEs)** can occur at higher concentrations of ALL antipsychotics (but less common with atypicals)
- **Typical Antipsychotics**
    - Older drugs

    - Examples:
        - Chlorpromazine
        - Haloperidol
        - Flupentixol decanoate
    - Cause EPSEs at normal doses
    - Effective, cheap and provide depot options
- **Atypical Antipsychotics**
    - In addition to dopamine receptors, these also block **serotonin 5-HT2 receptors**
    - Examples:
        - Olanzapine
        - Risperidone (available as depot)
        - Quetiapine
        - Aripiprazole
        - Clozapine
        - Amisulpride
    - Consider starting an atypical antipsychotic when:
        - Choosing 1st line treatment in newly diagnosed schizophrenia
        - There are unacceptable side-effects from typical antipsychotics
        - Relapse occurs on a typical antipsychotic
    - Avoid using more than 1 antipsychotic
- **Side-Effects of Antipsychotics**
    - **Extrapyramidal Side-Effects**
        - Dystonia
        - Akathisia
        - Parkinsonism
        - Tardive dyskinesia
- **Hyperprolactinaemia**
    - Galactorrhoea, amenorrhoea, gynaecomastia and hypogonadism
    - Sexual dysfunction
    - Increased risk of osteoporosis
- Weight gain (especially olanzapine and clozapine)
- Sedation
- Increased risk of diabetes (olanzapine)
- Dyslipidaemia
- Anticholinergic side-effects (dry mouth, blurred vision, constipation, urinary retention, tachycardia)
- Arrhythmias
- Seizures (reduces seizure threshold)
- Neuroleptic malignant syndrome

Psychological Management of Schizophrenia

- **CBT**
    - CBT has not been shown alone to improve outcomes, but combined with other therapies can be helpful in treating schizophrenia
    - CBT has been shown to help positive symptoms
    - Social skill training better in helping negative symptoms
- **Family Therapy**
    - Can reduce relapse rates
    - Effects of high expressed emotion can be ameliorated through communication skills, education about schizophrenia, problem-solving and helping patients expand their social network
    - Can offer respite for the families
- **Duration**
    - CBT: at least 16 sessions

    - Family therapy: at least 10 sessions
- **Concordance Therapy**
    - Collaborative approach where the patient is encouraged to consider the pros and cons of the management

Social Management of Schizophrenia

- May include admission to hospital for observation, treatment or refuge
- **Psychoeducation** is vital to reduce relapse
- Needs to address
    - Education, training and employment
    - Skills (e.g. budgeting, cooking)
    - Housing (e.g. supported accommodation, independent flats)
    - Accessing social activities
    - Developing personal skills (e.g. creative writing)

Other Management

- Consider offering art therapy (particularly for alleviation of negative symptoms)
- **Physical Health**
    - Offer combined healthy eating and physical activity programme
    - Offer interventions for metabolic complications of antipsychotics (e.g. weight gain, high cholesterol)
    - Help with smoking cessation (consider nicotine replacement therapy or bupropion or varenicline)
        - Bupropion and varenicline have an increased risk of adverse neuropsychiatric symptoms so should be monitored closely for the first 2-3 weeks
    - Regularly monitor weight and other cardiovascular/metabolic parameters
- **Support for Carers**
    - Offer support for carers (including education and support programmes)
    - Inform them of their right to a formal **carer's assessment** (available for free through social services)
    - Consider peer support (support from someone who has recovered from psychosis)
- **Monitoring**
    - **Baseline Measurements** before starting an antipsychotic:
        - Weight
        - Waist circumference
        - Pulse and BP
        - Fasting BM, HbA1c, lipid profile, prolactin
        - Assessment of any movement disorders
        - Assessment of nutritional status, diet and physical activity
        - ECG (if cardiovascular risk factors present or recommended by the chosen medication)
        - **Children** should also have height measured every 6 months
    - **Monitoring**
        - Response to treatment and side-effects
        - Emergence of movement disorders
        - Waist circumference
        - Adherence
        - Overall physical health
        - **Weight**
            - Weekly for 6 weeks
            - At 12 weeks
            - At 1 years
            - Annually thereafter
        - **Pulse and blood pressure**

- At 12 weeks
- 1 year
- Annually

Treatment Resistance in Schizophrenia

- **1st line: Clozapine**
- **Treatment Resistance**: *failure to respond to **two or more** antipsychotics, at least one of which is atypical, each given at a therapeutic dose for at least 6 weeks*
- **NB**: there is a small but significant risk of **agranulocytosis** (0.7%)
- Requires weekly blood tests to detect early signs of neutropaenia
- If there is a lack of response to clozapine, consider augmentation with another antipsychotic

Summary of Schizophrenia Management

- **1st line: atypical antipsychotic (e.g. quetiapine)**
- CBT should be offered to all patients
- Close attention should be paid to cardiovascular risk factor modification due to the high rates of cardiovascular disease in schizophrenic patients (due to medication and high smoking rates)

Substance Misuse Psychiatry

Alcohol Misuse

- **Investigations**:
  - **Bloods**: FBC, LFT, B12, folate, U&E, clotting screen, glucose
  - Blood alcohol level or breathalyser
  - Urine drug screen
  - Rating scale (e.g. AUDIT, CIWA-Ar, APQ)
  - Severity of Alcohol Dependence Questionnaire (SADQ)
- **Needs of Family/Carers**
  - Offer a carer's assessment if necessary
  - Consider offering guided self-help for families and provide resources about support groups
  - Consider offering **family meetings**, usually at least 5 weekly meetings
- **Assessment**
  - Use formal assessment tool to assess severity and nature of misuse:
    - **AUDIT** – alcohol use disorders identification test (>15 requires comprehensive assessment)
    - **SADQ** – severity of dependence
    - **CIWA-Ar** – clinical institute withdrawal assessment of alcohol scale (for severity of withdrawal)
    - **APQ** – alcohol problems questionnaire (assess the nature and extent of the problems arising from alcohol misuse)
- **Establishing Goals**
  - **Abstinence** is the best treatment goal (but some may want a more moderate goal)
  - If comorbid mental health issues don't improve within 3-4 weeks of abstinence, consider referring for specific treatment
- **Principles of Interventions**
  - Carry out a **motivational interview** (explore problems related to drinking, encourage belief in ability to change)
  - Offer interventions to promote abstinence as part of intensive structured community-based intervention for people with moderate to severe alcohol dependence who have limited social support, complex physical/psychiatric comorbidities or who have not responded to initial community-based interventions
  - If homeless, offer residential rehabilitation services for maximum of 3 months

    - Routinely monitor outcomes
    - Provide information about **Alcoholics Anonymous**, **SMART Recovery** and **Change, Grow, Live (CGL)**
    - **Care Coordination**: routine coordination by any staff involved in care
    - **Case Management**: used to increase engagement in people at risk of dropping out of treatment (involves devising individualised care plan)
- **Interventions for Harmful Drinkers and Mild Alcohol Dependence**
    - Offer **psychological intervention** (e.g. CBT, behavioural therapy, social network and environment-based) focused on alcohol-related cognitions
        - Weekly 1 hour sessions for 12 weeks
    - Offer **behavioural couples therapy** (if a regular partner is present)
    - If no response to above or if pharmacological treatment requested, offer the following alongside psychological therapy:
        - **Acamprosate** (anti-craving)
        - **Naltrexone**
- **Assisted Withdrawal**
    - Give **Pabrinex** if they are at risk of Wernicke's encephalopathy
    - **Expectations**: withdrawal symptoms are worst within the first 48 hours, take about 3-7 days after the last drink to completely resolve
    - **If >15 units/day or >20 on AUDIT, consider offering:**
        - Community-based assisted withdrawal (best option)
            - This can be done through organisations like **CGL (Change, Grow, Live)**
            - Usually 2-4 meetings in the first week
            - If complex, may need up to 4-7 days per week over a 3-week period
        - Management in specialist alcohol services if there are safety concerns
    - **Consider** inpatient **assisted withdrawal if one or more of the following:**
        - 30+ units/day
        - 30+ on SADQ
        - History of epilepsy, delirium tremens or withdrawal-related seizures
        - Need concurrent withdrawal of alcohol and benzodiazepines
        - Significant psychiatric comorbidity or significant learning disability
        - Lower threshold for inpatient treatment in vulnerable groups (e.g. homeless, older people)
        - Children (10-17)
            - Should also receive family therapy for about 3 months
    - **Drug Regimens**
        - Fixed-dose or symptom-triggered regimen
        - Preferred medication: **chlordiazepoxide** or **diazepam**
            - If liver impairment, consider **lorazepam** (limited hepatic metabolism)
        - Titrate initial dose based on severity of alcohol dependence/daily alcohol consumption
        - Gradually reduce the dose over **7-10 days**
            - This will be longer if concurrent benzodiazepine withdrawal treatment required (up to 3 weeks)
        - Give no more than 2 days medication at a time (installment dispensing)
    - **After Successful Withdrawal**
        - Consider **acamprosate** or **naltrexone** with **individualised psychological intervention**
            - Consider **disulfiram** if above options are unsuccessful/unacceptable
            - Usually prescribed for up to 6 months
            - Carry out thorough medical assessment to establish baseline before starting medication (including U&Es and LFTs)

PACES TIPS

- Establish risks (driving, suicide, dependents)
- Assess social issues and advise accordingly (SAFEGUARDING)
- Establish goals (elimination or moderation)
- Explain that symptoms of withdrawal (worst in the first 48 hours and should pass after 3-7 days)
- Advise against stopping drinking abruptly
- Explain referral to drugs and alcohol service and the process of assisted withdrawal (benzodiazepines, psychological treatment and relapse prevention

Acute Alcohol Withdrawal

- Offer pharmacotherapy to treat the symptoms of withdrawal as follows:
  - Consider offering a **benzodiazepine (e.g. lorazepam)** or **carbamazepine**
  - Alternative: **clomethiazole**
- Offer advice on local support services (alcoholics anonymous, SMART recovery)
- **Delirium Tremens**
  - **1st line: oral lorazepam**
    - If symptoms persist: offer IV lorazepam or haloperidol
    - Alternative: chlordiazepoxide
  - **IV thiamine**
- **Alcohol Withdrawal Seizures**
  - Consider fast-acting benzodiazepine (e.g. lorazepam) to reduce the likelihood of future seizures

Opiate Misuse

- **Investigations**
  - Physical examination (establish baseline physical state)
  - Urine drugs screen
  - U&Es (features of malnutrition)
  - FBC (anaemia due to malnutrition or signs of infection)
  - LFTs (may impact medication dosing)
  - Blood borne infections (RPR, hepatitis serology, HIV test)
- **Harm Reduction**
  - Pragmatic approach involving assessing and minimising risk rather than insisting on abstinence
  - Information should be provided on improving safety of drug use
  - Examples:
    - Needle exchanges for IV drug users
    - Vaccination and testing for blood-borne viruses for sex-workers and IVDU
- **General Recommendations**
  - Counsel on aspects of a healthy lifestyle (e.g. sleep hygiene, diet)
  - Provide information about self-help groups (e.g. 12-step groups)
  - Offer assessment for family members and carers
- Do not routinely offer opioid withdrawal treatment if:
  - Concurrent medical problem requiring urgent treatment
  - In police custody
  - Presenting in acute or emergency settings
  - Be careful with pregnant women
- **Medication for Detoxification**
  - Appoint a **key worker** (supports the patient as they go through detoxification)
  - **1st line: methadone** (liquid) or **buprenorphine** (sublingual) - decision is largely based on patient preference

    - Consider **lofexidine** (alpha-2 agonist) if above options are unacceptable, mild dependence or keen to detoxify over a short period of time
    - Decisions about the dosing regimen should be based on severity of dependence, stability of the patient and the setting of detoxification
    - **Duration**
        - Inpatient: up to **4 weeks**
            - Residential detoxification tends to be limited to patients with significant comorbid physical and mental health problems or require concurrent detox of other substances
        - Community: up to **12 weeks**
    - **Withdrawal Symptoms**: clonidine and lofexidine can help the symptoms
    - Detox can be helped with medications to help manage symptoms (e.g. anti-diarrhoeals, anti-emetics, pain killers)
- **Ultra-rapid, Rapid and Accelerated Detoxification**
    - Withdrawal is actively precipitated by using high doses of opioid antagonists (e.g. **naltrexone** or **naloxone**)
    - **Ultra-Rapid**: 24 hours under general anaesthesia or heavy sedation
        - This should not be offered
    - **Rapid Detoxification**: 1-5 days with moderate sedation
        - Can be considered if patient specifically requests it
    - **Accelerated Detoxification**: no sedation
- **Stage 2: Stabilisation and Maintenance**
    - Promote abstinence from illicit drugs, prevent relapse, reduce HIV and hepatitis C risk, reduce mortality, and decrease criminality
    - Can be accomplished without the use of opioid agonists, but substantial evidence indicates that medication-assisted treatment is essential for a majority of patients with opioid use disorder
    - Long-acting opioid agonists (i.e., methadone, buprenorphine) and opioid antagonists (i.e., injectable extended-release naltrexone)
- **Follow-Up**
    - Refer to **Drugs and Alcohol Service**
    - For at least 6 months
    - Offer talking therapy (**CBT)** to prevent relapse and address underlying mental health issues
    - Appoint a **key worker**
    - Consider **contingency management** after completed detoxification
        - Offer incentives for every drug-negative test
        - Screening could be frequent at first (3/week) and then reduced
        - Urinalysis is the preferred method of screening

PACES TIPS

- Explain that it would be worth getting tests done for blood-borne diseases and offer vaccinations
- Explain the features of withdrawal (restlessness, anxiety, sweating, yawning, diarrhoea, abdominal cramps, nausea and vomiting, palpitations)
    - Manage expectations and explain timescale (begin within 24 hours, peaks after 2-3 days and should be significantly better by 1 week)
- Explain detoxification regime (giving a substitute that should lessen the symptoms of withdrawal)
- Explain that symptomatic treatments will be given to reduce nausea, diarrhoea and autonomic symptoms
- Explain the role of psychological therapies in preventing relapse
- Explain the role of the key worker
- Support: **Narcotic Anonymous**, **SMART Recovery**

Benzodiazepine Misuse

- **Uses of Benzodiazepines**: sedation, hypnotic, anxiolytic, anticonvulsant, muscle relaxant
- They should only be used for a short time (2-4 weeks)
- **Risks of Using Benzodiazepines**
  - **Short-Term**: drowsiness, reduced concentration
  - **Long-Term**: cognitive impairment, worsening anxiety and depression, sleep disruption
- **Clinical Features of Benzodiazepine Withdrawal**
  - Insomnia
  - Irritability
  - Anxiety
  - Tremor
  - Loss of appetite
  - Tinnitus
  - Excessive sweating
  - Seizures
  - Perception disturbance
- Address underlying issues that need benzodiazepines
  - Anxiety
  - Sleep
  - Depression
- **How to Withdraw**
  - Withdraw in steps of about 1/8 of the daily dose every fortnight (but in reality, the dose is reduced according to the severity of the withdrawal symptoms)
  - Consider switching patients to equivalent dose of **diazepam**
    - Oxazepam may be considered instead in patients with liver failure
  - **Duration**: may take 3 months to a year or more
  - **Warning**: do not drive if feeling drowsy
- **Psychological Therapy**
  - Offer CBT (help address underlying mental health issues and provide advice about sleep hygiene etc.)

PACES TIPS

- Explain the harmful effects of benzodiazepines (long-term worsening of psychiatric symptoms)
- Explain that benzodiazepines can be reduced very gradually, considering the symptoms the patient is experiencing
- Explain the role of CBT
- Advise against driving if feeling drowsy

Organic Psychiatry

Delirium

- **Treat the cause**
  - Manage aggravating factors (e.g. pain, dehydration, constipation)
  - Stop unnecessary medications
- **Behavioural Management**
  - Frequent reorientation (e.g. clocks, calendars, verbal reminders)
  - Good lighting (gloomy conditions increase risk of hallucinations/illusions)

    - Address sensory problems (e.g. hearing aids, glasses)
    - Avoid over- or under-stimulation (side room if the main ward is disruptive)
    - Minimise change
        - Don't keep moving the patient
        - One staff member to engage with the patient each shift
        - Establish a routine (regular toileting and sleep hygiene)
    - Remove things that can be thrown or tripped over
    - Silence unnecessary noises (e.g. bleeping alarms)
    - Allow safe or supervised wandering
- **Medication**
    - Small night-time dose of benzodiazepines could promote sleep
    - If short-term sedation is needed, low-dose typical antipsychotics (e.g. **haloperidol**) or benzodiazepines can be used
- **Consider Referral**
    - Geriatrics
    - Psychiatry
- **Preventing Delirium**
    - Good sleep hygiene without medication
    - Minimal moves around hospital
    - Encouraging mobility
    - Proactive management (minimise dehydration, pain, constipation, urinary retention and sensory problems)
- **Prognosis**
    - Associated with:
        - Increased mortality
        - Longer admissions
        - Higher readmissions rates
        - Subsequent nursing home placement
    - May take days to weeks to resolve
    - Some patients do not return to pre-morbid levels

Normal Pressure Hydrocephalus

- A **ventriculo-peritoneal shunt** is first line, to allow CSF drainage into the peritoneal cavity

Old Age Psychiatry

Depression in the Elderly

- Problem-solving, increasing socialisation and day-time activities
- Psychological therapies (e.g. CBT, psychodynamic therapy, group therapy, family therapy, couple therapy)
- Antidepressants: SSRIs are first line (e.g. citalopram)
- ECT is sometimes used in psychotic or life-threatening depression
- Consider social workers, community nurses and carers
- Recommend Age UK

Psychosis in the Elderly

- Reduction of sensory impairment
- Exclusion of organic cause or LBD
- Low-dose antipsychotics

Dementia

- Management focuses on quality of life and preservation of independence and dignity
- Provide a single named **care coordinator**

- **Adaptations for Patients**
  - Always carry ID, address and contact number in case they get lost
  - Dossett boxes/blister packs to aid medication compliance
  - Reality orientation (visible clocks, calendars)
  - Environmental modifications (e.g. patterned carpets can predispose to hallucinations, bad lighting can also increase confusion)
  - Assistive technology (e.g. door mat buzzers)
  - Do a home safety assessment and ensure that adaptations are made to home (fires, floods, falls)
- **Social Support**
  - Personal care, meal preparation and medication prompting
  - Day centres provide enjoyable daytime activities and social contact
  - Day hospitals enable daily psychiatric care for more complex patients
- **Support Carers**
  - Emotional support
  - Offer **carer's assessment**
  - Educate about dementia
  - Train to manage common problems
  - Provide respite care
- **Optimise Physical Health**
  - Treat sensory impairment (hearing aids, glasses)
  - Exclude superimposed delirium
  - Treat underlying risk factors
  - Review all medication
- **Psychological Therapies**
  - Offer a range of activities
  - Offer **group cognitive stimulation** (memory training and re-learning)
  - Consider **group reminiscence therapy**
  - Consider cognitive rehabilitation or occupational therapy
  - Behavioural approaches
    - Identify and modify underlying triggers for difficult/risky behaviours (e.g. wandering may be due to disorientation, boredom or anxiety)
  - Validation Therapy
    - Reassure and validate the emotion behind what is said
  - Multisensory Therapy
    - As dementia advances and speech is lost, it may be easier to respond to touch, music etc.
- **Psychotropic Medications**
  - Start doses low and increase slowly with any medication used
  - Older people are very sensitive to drug side-effects
  - Treat comorbid psychiatric illness (e.g. depression)
  - **Acetylcholinesterase inhibitors**
    - Options: donepezil, rivastigmine, galantamine
    - Used in **mild-to-moderate Alzheimer's disease**
    - Can cause symptomatic relief
    - Has no effect on the progression of dementia
  - **Memantine** (NMDA antagonist)
    - Used in severe Alzheimer's disease
    - Or if there is intolerance/contraindication for acetylcholinesterase inhibitors
  - Behavioral disturbance may require sedatives as a last-resort (e.g. trazodone, sodium valproate, haloperidol)
- **Using MMSE in Alzheimer's Disease**
  - Mild AD: 21-26
  - Moderate AD: 10-20

- Severe AD: < 10

Pharmacology for Non-Alzheimer's

- Offer **donepezil** or **rivastigmine** for dementia with Lewy bodies
- Consider galantamine if the above are not tolerated
- Only consider acetylcholinesterase inhibitors in people with vascular dementia if there is suspected comorbid Alzheimer's, Parkinson's dementia or dementia with Lewy bodies
- Do not offer to patients with frontotemporal dementia
- **Important**: antipsychotic can be used acutely in agitated patients who are at risk of harming themselves
  - **Warning**: antipsychotics can worsen Lewy body dementia

Vascular Dementia

- Characterised by 'step-wise' progression and multi-faceted impairment of cognitive function
- Key is to prevent further cerebrovascular disease by optimal control of major risk factors in people with a history of stroke or TIA
- Risk Factors: Age, Male, HTN, Hypercholesterolaemia, obesity

Lewy Body Dementia

- Characterised by fluctuating cognition, visual hallucinations, REM sleep behaviour disorder
- Adaptations for patient (with an occupational therapist)
  - Reality orientation, environmental modifications
- Social support/support carers
- Optimising physical health (review medications)
- Psychological therapies (e.g. reminiscence therapy)
- Acetylcholinesterase inhibitors may provide symptomatic relief
- Clonazepam used for REM seep disturbance
- Parkinson's medications could relieve the tremors, but they could worsen the psychosis
- Antipsychotics are **dangerous** and should not be used (they cause severe reactions – confusion, Parkinsonism, death)

Anxiety, Obsessions and Reactions to Stress

Anxiety Disorders (includes general anxiety disorders and specific anxiety disorders)

- Advice and reassurance (may be enough for mild problems)
- Basic counselling (to address worries)
- Problem-solving (help deal with stressors)
- Self-help material
  - CBT-based books
  - Encourage reliance on supportive contacts (e.g. friends, family)
- Relaxation techniques and breathing exercises
- **Cognitive Behavioural Therapy (CBT)**
  - Aims to reduce patient's expectation of threat, and the behaviours that maintain threat-related beliefs
  - Often begins with teaching techniques for managing arousal (relaxation and controlled breathing)
  - Explore the actual likelihood and impact of the anticipated catastrophe
  - Test the feared situation and their belief in a catastrophic outcome using behavioural experiments
  - This gradually increases the patient's confidence in their capacity to cope with the feared situation

    - **GAD**
        - Main feature is continuous worry with no discernable trigger
        - Therapy involves testing predictions of worry with behavioural experiments and looking at errors in thinking
    - **Panic Disorder**
        - Panic may be triggered by misinterpretation of physical anxiety symptoms as signs of major catastrophe
        - Safety behaviours may be adopted which reinforce beliefs (e.g. avoiding situations)
        - CBT educates the patient on the true meaning of the symptoms (i.e. panic not perish)
        - Helps them test whether their behaviours keep them safe and whether their beliefs are true or misinterpretations
- **Exposure Therapy**
    - Used as part of the CBT approach when there are strong elements of avoidance and escape
    - In the absence of actual harm, the body can only remain extremely anxious for a short time (usually < 45 mins) before **habituation** occurs and anxiety levels drop
    - Habituation is characterised by a decrease in anxiety until fear dies out (**extinction**)
    - Exposure is usually through a gradual (or graded) approach called **desensitisation**
    - The patient identifies a goal (e.g. being able to hold a slug) and constructs a hierarchy of feared situations
    - The patient tackles it from least frightening to most frightening
    - The aim is to stay in the situation until the anxiety has subsided to induce learning and challenge existing thoughts
    - **Agoraphobia** can be treated using this strategy

Generalised Anxiety Disorder (GAD)

- **Step 1**: CBT over 4-12 weeks
    - Can have applied relaxation training, meditation training, sleep hygiene education, exercise and self-help information provided
- **Step 2: Drug Treatment**
    - **Drug Treatment**
        - 1st line: **sertraline**
        - 2nd line: other SSRI or SNRI
        - 3rd line: pregabalin
        - **Warning**: do not routinely use benzodiazepines except for short-term management during a crisis
        - **Follow Up**: usual follow up used for SSRIs (see depression)
- **Step 3: Specialist Assessment**
    - Offer specialist assessment of needs and risks
    - Review needs of family/carers
- **Other pharmacological options**
    - **TCAs**
        - E.g. clomipramine, imipramine
        - May be useful if not responding or not tolerating SSRIs
    - **Buspirone**
        - Serotonin partial agonist
        - Has a delayed action and dysphoric effects
    - **Beta-Blockers**
        - E.g. propranolol
        - Sometimes used to treat adrenergic symptoms (e.g. tremor, palpitations)
        - **Important**: consider contraindications e.g. Asthma
- **Summary of GAD Management**

- **Step 1**: low-intensity psychological interventions (individual non-facilitated self-help or individual guided self-help or psychoeducational groups)
- **Step 2**: drug treatment (sertraline)
- **Step 3**: highly specialist input (e.g. multi-agency teams)
- **Drug Treatment**
  - 1st line: **Sertraline**
  - Weekly follow-up is recommended in patients < 30 years (because of increased risk of suicidal thinking and self-harm)

- **Propranolol**: helps deal with anxiety that has a lot of physical symptoms (e.g. shakiness, sweating, flushing) such as social anxiety
- Never give a benzodiazepine to anyone with anxiety because of high risk of dependence (it may be given for specific phobia in the short term (e.g. dental phobia))

Panic Disorder

- **Step 1**: recognition and diagnosis
- **Step 2**: treatment in primary care (self-help)
- **Step 3**: review and consideration of alternative treatments
- **Step 4**: review and referral to specialist mental health services
- **Step 5**: care in specialist mental health services
- **Treatment in Primary Care**
  - 1st line: **CBT + SSRI**
  - If no response after 12 weeks: consider **imipramine** or **clomipramine**

Obsessive Compulsive Disorder

- **1st Line**: **Low-Intensity Psychological Therapies**
  - Brief individual **CBT** (including **ERP**) using structured self-help materials
  - Brief individual CBT (including ERP) by telephone
  - Group CBT (including ERP)
  - This should be done for up to 10 hours
  - **CBT: Exposure and Response Prevention**
    - Compulsions are analogous to escape in phobias
    - CBT aims to prevent compulsive behaviour, allowing the tolerated anxiety to habituate
    - E.g. someone with obsessions about contamination is supported to touch something dirty and instead of immediately washing their hands, they are encouraged to experience anxiety and discuss it with the therapist
    - A hierarchy of feared situations is used
    - Effective in well-motivated patients
  - If unacceptable or ineffective or moderate-to-severe functional impairment, consider SSRI
- **2nd line: SSRI**
  - Possible agents: **fluoxetine**, fluvoxamine, paroxetine, sertraline and citalopram
  - Continue SSRI treatment for at least 12 months after remission of symptoms
- **3rd line: Clomipramine** or **alternative SSRI**
  - Considered if first SSRI is ineffective after 12 weeks
  - Consider alternative SSRI or **clomipramine**
- **Prognosis**
  - OCD has a chronic course with symptoms worsening at times of stress
  - Often disabling
  - Comorbid depression is common

- **Summary**
  - **1st line**: CBT with ERP
  - **2nd line**: SSRI (continue for 12 months after remission)
  - **3rd line** (after 12 weeks): clomipramine or alternative SSRI

PACES TIPS

This is exactly the same as in PTSD, but you will also give **trauma-focused CBT or EMDR therapy**

Acute Stress Reaction

- Exclude injury
- Support and reassurance
- Benzodiazepines may alleviate short-term distress (does not prevent later PTSD)

Post-Traumatic Stress Disorder (PTSD)

- **Watchful Waiting**
  - May be considered if subthreshold symptoms of PTSD within 1 month of a traumatic event
  - Arrange follow-up within 1 month
- **Trauma-Focused CBT**
  - Offered to all patients with PTSD symptoms lasting > 1 month
  - **How it Works**
    - A traumatic event can shatter previous belief systems (e.g. the world is an unsafe place, I am vulnerable)
    - These thoughts can be examined and tested
    - Exposure therapy is important (support the patient to work through their memories)
    - **Warning**: talking about the experience can make the patient feel re-traumatised
    - Usually **8-12** regular session
    - Can be **computerised** if the patients would prefer not to do it face-to-face
  - Trauma-Focused CBT includes:
    - Cognitive processing therapy
    - Cognitive therapy for PTSD
    - Narrative exposure therapy
    - Prolonged exposure therapy
- **Eye Movement Desensitisation and Reprocessing (EMDR)**
  - Offer to adults with a diagnosis of PTSD or clinical important symptoms who have presented > 3 months after non-combat related trauma
    - Can be considered earlier than this
  - **How it Works**
    - Original trauma is deliberately re-experienced in as much detail as possible (e.g. making the patient narrate every step of it)
    - Whilst doing this, they fix their eyes on the therapist's finger as it quickly passes from side to side in front of them
    - Eye movements can be replaced by any alternating left-right stimulus (e.g. tapping hands)
    - This aids memory processing
- **Group Therapy**
  - Involves meeting and speaking with other people who have had similar experiences
- **Pharmacological Treatment**
  - Consider **SSRI** (e.g. paroxetine and sertraline (licensed)) or **venlafaxine** for adults with PTSD

    - Consider antipsychotics (e.g. risperidone) in addition to psychological therapies if they have failed to respond to other drug treatment or have disabling symptoms/behaviours (e.g. hyperarousal)
- **Prognosis**
    - Most patients recover
    - Some suffer for many years
    - Chronicity can lead to personality change
- **Summary**
    - Debriefing is not recommended
    - Watchful waiting may be used for mild symptoms lasting < 4 weeks
    - **Trauma-focused CBT** or **EMDR** may be used in more severe cases
    - Drug treatment is not routinely recommended, but if it is used, **paroxetine** and **mirtazapine** are recommended
    - Note: mirtazapine is a NaSSA (alpha-2 antagonist, serotonin antagonist and histamine antagonist)

PACES TIPS
- Explain the diagnosis (a condition that occurs after trauma and is characterised by flashbacks, hyperarousal and avoidance)
- Be wary of the impact it is having on the patient's life
- Offer trauma-focused CBT (explain that this can be done by computer or face-to-face and consists of 8-12 sessions)
    - Involves exploring how the trauma has affected belief systems and outlook
- Consider pharmacological management (e.g. sertraline, mirtazapine)
- Consider group therapy
- Offer follow-up

Adjustment Disorder

- Support, reassurance and problem-solving are often all that are needed

Medically Unexplained Symptoms

- **Therapeutic Assessment**
    - Full history and physical examination
- **Explain and Reassure**
    - Many patients will benefit from being reassured that their symptoms are not serious, are common and familiar
    - **Reattribution Model**
        - Ensure they feel understood
        - Broaden the agenda from a physical and psychological cause
        - Make a link between symptoms and psychological factors
    - **Avoidance of over-investigation, unnecessary specialist referrals or physical medications**
        - These reinforce physical illness beliefs
        - May increase anxiety
        - Ensure reasonable investigation
    - **Emotional Support**
        - Encourage patients to discuss emotional difficulties
        - Support them in dealing with stress
    - **Encourage Normal Function**
        - Patients may avoid normal activities because they think it will exacerbate problems
    - **Antidepressants**
        - May be useful even without depression (e.g. tension headache, IBS)
    - **Treat Comorbid Illness**

        - Particularly anxiety or depression
    - **CBT**
    - **Graded Exercise**
        - Helpful in CFS and fibromyalgia

Chronic Fatigue Syndrome

- Strong evidence for **graded exercise** (scheduled and gradually increasing activity)
- Patients need realistic goals and should not do more activity than planned
- **CBT** improves fatigue and physical functioning

Conversion (Dissociative) Disorders

- Psychotherapy and CBT

Eating Disorders

Anorexia Nervosa

- **Psycho-education**
    - Advice on nutrition and health
- **Treat comorbid psychiatric illness**
    - Depression, OCD and substance misuse are common
- **Nutritional management and weight restoration**
    - Realistic weekly weight gain target (usually 0.5-1 kg/week)
    - Set eating plan
- **Psychotherapies**
    - **Overview of 1st Line Options**
        - CBT-ED
        - Maudsley Anorexia Nervosa Treatment in Adults (MANTRA)
        - Specialist Supportive Clinical Management (SSCM)
    - **CBT-ED**
        - Usually up to 40 sessions over 40 weeks
        - Encourages healthy eating
        - Addresses nutrition, cognitive restructuring and self-esteem
    - **Specialist Supportive Clinical Management (SSCM)**
        - Offer 20 or more weekly sessions
        - Explore the main problems that cause anorexia
        - Educate about nutrition and how eating habits cause symptoms
        - Also explore other aspects of management (e.g. improving relationships, getting back to work)
    - **Maudsley Anorexia Nervosa Treatment for Adults (MANTRA)**
        - Offer 20 sessions with a practitioner
        - Helps the patient understand the cause of their anorexia (focuses on what is important to the patient) and encourages the person to develop a 'non-anorexic identity'
    - If any of the above options are unacceptable, offer a different one of the three
        - or consider **Eating Disorder-Focused Focal Psychodynamic Therapy (FPT)**
        - **2nd line**: CBT-ED, AFP-AN (adolescent-focused psychotherapy)
- Other aspects of treatment
    - **Motivational Interviewing**
        - Tries to engage ambivalent patents who lack insight into their disorders (or think that their illness is a good thing)
    - **Interpersonal Therapy**
        - Aims at improving social functioning and interpersonal skills
        - Better for patients with later onset or longer duration of illness
- **Children with Anorexia Nervosa**

    - **1st line: Family Therapy**
        - Some sessions should be for the whole family and others should be separate
        - Usually, 18-20 sessions over 1 year
        - Review 4 weeks after treatment, then every 3 months
    - **2nd line:** if Family Therapy unacceptable, consider Individual CBT-ED or AFP-AN
- **Medical Treatment**
    - Particularly important if there are physical complications, rapid weight loss or BMI < 13.5
- **Inpatient Treatment**
    - May be necessary if:
        - BMI < 13 or extremely rapid weight loss
        - Serious physical complications
        - High suicide risk
    - Mental Health Act may be needed to enable compulsory feeding
- Warning: Refeeding Syndrome
    - Caused by an intracellular shift of ions due to switching to carbohydrate metabolism
    - **Biochemical Features**: low phosphate, low magnesium, low potassium, low thiamine, salt and water retention
    - **Clinical Features**: fatigue, weakness, confusion, high blood pressure, seizures, arrhythmia, heart failure
- **Referral Pathways**
    - **Severe** → Urgent referral to CEDS (community eating disorder service)
        - **Features**: BMI < 15, rapid weight loss, evidence of system failure
    - **Moderate** → Routine referral to CEDS
        - **Features**: BMI 15-17, no evidence of system failure
    - **Mild** → Monitor/advice/support for 8 weeks, recommend support from **BEAT**, routine referral to CEDS if failure to respond
        - **Features**: BMI > 17, no additional co-morbidity
- **Summary**
    - **Adults** – consider one of:
        - Individual eating disorder focused CBT (CBT-ED)
        - Maudsley Anorexia Nervosa Treatment for Adults (MANTRA)
        - Specialist Supportive Clinical Management (SSCM)
    - **Children**
        - **1st line**: Anorexia Focused Family Therapy
        - **2nd line**: CBT
    - Note: up to 10% will die because of anorexia nervosa

PACES TIPS

- Explain the diagnosis (characterised by a morbid fear of fatness, reduced calorie intake and endocrine problems, based on numbers (BMI) not opinions)
- Explain the risks of anorexia (osteoporosis, infertility, cardiac problems (e.g. arrhythmia))
- Explain the psychological therapy (CBT-ED, SSCM, MANTRA, Family Therapy (children))
    - Involves exploring the thought processes that drive these behaviours
    - Set an eating plan and feasible weight gain targets
- Explain medical therapy if depressed (e.g. fluoxetine)
- **Support**: Beat (Eating Disorder Charity)

Bulimia Nervosa

- **Treat medical complications, often need dental care**
- Consider **Bulimia Nervosa-Focused Guided Self-Help Programme** for adults
- **Children**: offer **family therapy** (FT-BN)
- **CBT-ED with nutrition and meal support**
- **SSRIs (Fluoxetine) or SNRI**

    - Reduce bingeing and purging by enhancing impulse control
    - Should not be offered as sole treatment for bulimia
- **Treat comorbid psychiatric illness**
    - Depression, self-harm and substance misuse are common
- **Referral Pathways**
    - **Severe** → Urgent referral to Community Eating Disorder Service
        - **Features**: daily purging with significant electrolyte imbalance, comorbidity
    - **Moderate** → Monitor/advice/support for 8 weeks, recommend self-help, consider SSRI, routine referral to CEDS if failure to respond
        - **Features**: frequent binging and purging (>2/week), no significant electrolyte abnormality, some medical consequences (e.g. chest pain)
    - **Mild** → Recommend self-help, recommend **BEAT**, monitor/advice/support for 3 months, routine referral to CEDS if no improvement/deterioration
- **Summary**
    - Referral for specialist care is appropriate in all case
    - **BN-focused guided self-help** for adults
    - If unacceptable, contraindicated or ineffective after 4 weeks, consider **ED-focused CBT (CBT-ED)**
    - Children should be offered **BN-focused family therapy (FT-BN)**
    - Consider a trial of **high-dose fluoxetine**

Binge Eating Disorder

- Offer **BED focused guided self-help** programmes for adults
- If unacceptable or ineffective after 4 weeks, consider **group CBT-ED**
- If unacceptable or ineffective, consider individual CBT-ED

Psychosexual Disorders

Low Libido

- Establish there are no physical health problems
- Treatment is mainly psychological
- Communication is encouraged
- **Sensate Focus Therapy**
    - Intercourse is banned
    - Non-genital caressing (focus on pleasure and relaxation)
    - Genital touching to achieve arousal and subsequent orgasm
    - In time, intercourse occurs naturally
- **Timetabling Sex**
    - Helps partners with different libidos reach a compromise

Hypersexuality

- CBT-based treatments
- Can also use SSRI's, GnRH therapies and anti-androgens

Erectile Dysfunction

- **Modifiable Risk Factors**
    - Stop smoking, exercise, reduce weight and alcohol, stress management
    - Treat diabetes, hypertension etc.
    - Review medication (e.g. mirtazapine is associated with placebo-level sexual dysfunction whereas SSRIs have a much higher rate)
- **Psychological Approaches**
- **Physical Treatments**
    - **1st line:** Phosphodiesterase-5 inhibitors (e.g. sildenafil (Viagra))

- Intracavernosal prostaglandin self-injections before intercourse
- Vacuum pumps
  - Plastic dome and pump placed over the penis creating a vacuum to produce an erection
  - This is maintained by slipping a tight ring around the base of the penis
- Topical Therapies - alprostadil
- Surgery – penile prosthesis

Disorders of Gender Identity

- Hormone therapy
- Gender reassignment surgery
- Note: patient must demonstrate the ability to live successfully in their desired gender before surgery can be considered

Problems following Childbirth

Postnatal Depression

- Same as depression but take care with drugs used in breastfeeding mothers
  - Antidepressants can be secreted in breast milk
  - Recommended SSRIs are **sertraline** and **paroxetine**
  - Low-dose amitriptyline is probably safe
  - Lithium should be avoided if possible
  - Sodium Valproate definitely avoided
  - Seek specialist advice
- **Hospital admission** should be considered if depression is severe with suicidal or infanticidal ideation
  - **Mother and Baby Unit (MBU)** is the optimal setting under these circumstances
  - Separation should be avoided if possible
- Most women respond well to treatment within a month
- Use of CBT/IPT has been proven to reduce postnatal depression
- Early and effective treatment of PND is important because it can affect the baby's attachment and have lasting effects on development and personality

PACES TIPS

- Consider admission to mother and baby unit if severe
- Involve the home treatment team and health visitor
- Explain that diagnosis (likely to be due to hormonal changes)
  - Occurs in 1 in 10 women
- Address any concerns (e.g. being a bad mother) and provide support at home if needed
- Explain psychological treatment (CBT)
- Explain medical treatment (sertraline is safe to use when breastfeeding)
- Explain prognosis (most will recover within a month)
- Explain that the postnatal community mental health team will be involved

Puerperal Psychosis

- Depending on the presentation, antipsychotics, antidepressants, or lithium may be needed
- Benzodiazepines may be needed for agitation
- In severe cases, **ECT** may be lifesaving (women tend to respond well)
- **Admission** is usually required, preferably to a mother and baby unit
- Most patients recover within 6-12 weeks
- 1st year after pregnancy
  - Risk to the baby can be through neglect or violence
  - Watch out for depressive delusions (e.g. the baby is evil, possessed or abnormal)

PACES TIPS

- **Admit**
- Explain the diagnosis (may be linked to hormonal changes, causing chemical imbalances in the brain)
- Explain the treatment (antipsychotics)
- Explain that admission to mother and baby unit is necessary to keep the mother and baby safe
- Recovery usually takes 6-12 weeks
- 30% risk of recurrence

Bipolar Disorder in Pregnancy

- Do not offer lithium or sodium valproate to women who are planning a pregnancy or pregnant, unless antipsychotic medication has not been effective
- If a woman taking lithium becomes pregnant, consider stopping the drug gradually over 4 weeks
    - Consider switching to an **antipsychotic**
    - Antipsychotics are safe in pregnancy and breastfeeding (except clozapine)
- **Risks**
    - Risk of foetal heart malformations (Ebstein's anomaly) but the magnitude of the risk of uncertain
    - Lithium may be highly expressed in breast milk
- **Monitoring** (more frequent)
    - Every 4 weeks
    - Weekly from the 36th week
- Ensure that the woman gives birth in a hospital
- **Important**: antipsychotic use can make it difficult to get pregnant because of hyperprolactinaemia

Learning Disability

- **Prevention**
    - Parental Education (e.g. risks of alcohol during pregnancy)
    - Improved antenatal/perinatal care
    - Genetic counselling
    - Early detection and treatment of reversible causes (e.g. excluding phenylalanine in babies with PKU)
- **Treat physical comorbidity**
    - Annual physical health checks should be offered
- **Treat psychiatric comorbidity**
    - Mental health problems can be difficult to diagnose because of cognitive, language and communication difficulties
    - Patients may be particularly sensitive to medications so slower dose titration and careful monitoring maybe required
- **Educational Support**
    - Statement of Special Educational Needs allow appropriate support
    - This may be in mainstream or specialised schools
    - The aim is to maximise the child's potential
- **Psychological Therapy**
    - May include counselling, group therapy and modified CBT
    - Behavioural therapy - helps improve unhelpful behaviour patterns
    - **ABC approach**
        - Antecedents
        - Behaviour
        - Consequences

    - Management involves:
        - Avoiding antecedents
        - Reinforcing positive behaviours
        - Preventing reinforcement of negative behaviours (e.g. using distraction techniques)
        - Helping people understand the consequences of their actions
- **Other support**
    - Support network is needed to provide specific help with daily living, housing, employment and finances
    - Assess carers' needs
- **Prognosis**
    - Lifelong condition
    - Life expectancy is reduced because of comorbid physical illness and unmet health needs
    - **Important**: people with learning disabilities are very vulnerable to neglect, abuse and exploitation
        - This may be compounded by communication difficulties
        - Behavioural change may be their way of communicating distress

Child and Adolescent Psychiatry

Autism Spectrum Disorder

Early education and behavioural interventions are beneficial

- **Applied behavioural analysis (ABA)**
    - A behavioural programme for treating young children (age 2 to 3 years at the start of intervention) with ASD. ABA may be used if it is considered that the child would benefit from a heavily structured environment with the use of a reward system to lessen the impact of either repetitive behaviours or overactivity.
- **Early Start Denver Model (ESDM)**
    - ESDM intervention is based on developmental and applied behavioural analytical principles and delivered by trained therapists and parents.
    - Aimed for children with autism between the ages of 12-48 months
- **More Than Words (Hanen programme)**
    - Designed to help parents of all children <6 years of age who are experiencing difficulties in social interaction and communication. Parents learn a number of strategies that help to improve their child's communication and interaction.
- Involving parents in the therapy plan and ensuring that they gain an understanding of the disorder and what works best for each child is vital
- Discuss need for education, health and care (EHC) plan assessment with nursery/school/GP/community paeditrician

Asperger's Syndrome

- Advice
- Support (involve nursery/school/GP/community paeditrician) – discuss EHC plan assessment
- Routine
- Social skills training

Depression in Children

- **1st line: CBT** or other psychological therapies
- Antidepressants are only used in severe cases
    - **Fluoxetine** is the safest option in children
- Good prognosis

Anxiety Disorders (including separation anxiety and school refusal)

- **Psychological therapies** are the mainstay of treatment e.g. Counselling and CBT

Encopresis

- Laxatives (if constipated)
- Reassure, address stress and review toilet training
- Pelvic floor exercises
- Star charts

Conduct Disorder

- **Family education**
  - Make the family understand CD and how they may accidentally reinforce the behaviours
- **Psychological therapy**
  - Talk about feelings and thoughts and how these affect behaviour and wellbeing to a therapist
- **Parent management training**
  - Teaches parents to reward good behaviour and deal constructively with negative behaviours
- **Family therapy**
  - Family meets with a skilled therapist to discuss current problems
  - They are helped to cooperate in problem solving
- Educational support
- Anger management for child
- Treat comorbid problems (e.g. ADHD)

Tic Disorders

- Reassurance, education and stress management
- Behavioural therapy – **habit reversal therapy, exposure and response prevention**
- Clonidine (alpha-2 agonist)
- Atypical antipsychotics

Personality Disorders

- They are treatable
- Encourage the individual to take responsibility for their actions
- Boundaries are essential
- **Psychotherapy**
  - Most approaches are related to **CBT** (focusing on the interaction between thoughts, moods and behaviours right now) and **psychoanalysis** (explores how the past relates to interpersonal difficulties)
  - Therapies:
    - **Dialectical behaviour therapy (DBT)**
      - Type of CBT that has been adapted for people who experience emotions very intensely
      - Used to treat emotionally unstable (borderline) personality disorder
      - Focuses on changing unhelpful behaviours AND accepting who you are at the same time
    - **Cognitive analytical therapy (CAT)**
    - **CBT**
    - **Mentalisation**
      - Integrative form of psychotherapy that brings together aspects of psychodynamic, CBT and systemic approaches
    - **Therapeutic communities**

        - Group-based approach to long-term mental illness
        - Housing placements where the residents make their own rules
    - **Psychodynamic and psychoanalytical psychotherapy**
- **Medication**
    - **Antipsychotics** - may reduce impulsivity and aggression (e.g. risperidone)
    - **Antidepressants** - may reduce impulsivity and anxiety
    - **Mood stabilisers** - may be used for labile affect (effects aren't evidence-based)
- **Treat Comorbid Problems**
    - Substance misuse, affective and anxiety disorders require management
- **Prognosis**
    - Personality disorders disrupt relationships, education and employment
    - Although they are persistent, they may change in severity over time

- **NB –** ICD-11 no longer categorises PDs based on their subtype, but **instead classes them by severity.** Current guidelines are being reviewed but remains relevant for management.

Emotionally Unstable Personality Disorder

- Formulate long-term and short-term goals, and a **crisis plan**
- **1st line: Dialectical Behavioural Therapy (DBT)**
- Focuses on the factors contributing to emotional instability
    - Being emotionally vulnerable and sensitive to stress
    - Growing up in an environment where your emotions were dismissed by those around you
- These factors lead to a vicious cycle where you experience intense and upsetting emotions, which make you feel guilty and worthless and leads to actions that can make you feel upset again
- DBT aims to introduce two important concepts:
    - **Validation**: accepting that your emotions are acceptable
    - **Dialectics**: showing you that things in life are rarely black or white, and helping you be open to ideas and opinions that contradict your own
- **Mentalisation-Based Therapy**
    - Mentalisation is the ability to think about thinking (examining your own thoughts and assessing them based on reality)
    - Mentalisation teaches you how to take a step back and scrutinise your thoughts and impulses
    - It also teaches you how to recognise other peoples' thought patterns and accept that your interpretation may not be correct
    - Usually lasts around 18 months
    - Some places recommend staying as an inpatient
- **Therapeutic Communities**
    - Involves teaching social skills to groups of people with complex psychological conditions
    - Includes tasks that improve your social skills and self-confidence (e.g. household chores, meal preparation)
- **Arts Therapies**
    - Useful for people who struggle to express their feelings verbally
    - Other options: CBT, cognitive analytical therapy (CAT)
- **SSRIs** may be useful to reduce impulsive behaviour
- Check for features of insomnia
- **Treating a Crisis**
- Provide contact numbers for:
    - Community mental health nurse
    - Out-of-hours social worker

    - Local crisis resolution team
- Sedative antihistamines (e.g. promethazine) may be used during a crisis
- Do not use antipsychotics for medium-/long-term management of EUPD

PACES TIPS
- Explain the diagnosis (explain that it is characterised by an increased sensitivity to emotions and is likely to be linked to stressful life circumstances and experiences)
- Explain that personality disorders are often undiagnosed (~10% may have a personality disorder, ~2% have EUPD)
- Explain dialectical behavioural therapy (helps you understand your thought processes and teaches you to not view things as black and white, teaches skills to cope with difficult emotions)
- Explain the use of therapeutic communities (meet other people with similar issues and support each other in recovering)
- **Crisis management**: provide numbers for crisis resolution team, community mental health nurse, out-of-hours social worker, Samaritans
- **Support**: mind.co.uk

Chronic Insomnia

- Defined as difficulty getting to sleep or maintaining sleep on **3 or more nights of the week for 3 months**
- May be investigated using a sleep diary and actigraphy
- Identify potential causes (e.g. depression and anxiety)
- Advice on sleep hygiene and not to drive when tired
- CBT-I for insomnia
- Consider hypnotics if major day time impairment
    - Short-acting benzodiazepines (e.g. lorazepam) or Z-drugs can be used
    - Use lowest possible dose for the shortest possible time
    - Review in 2 weeks and consider CBT

Psychiatry and the Law

- **Section 2**
    - Admission for assessment (and treatment if assessment finds this appropriate)
    - Usually used for first admission
    - **28 days**
    - Cannot be renewed
    - Made by an **AMHP** or **nearest relative (NR)** on behalf of TWO doctors, one or whom should be section 12 approved (usually SpR or consultant) and one of whom should know the patient in professional capacity (e.g. GP)
        - There must be no more than 5 days between the two medical examinations
        - The patient must have been seen within 14 days of the date of the application
        - The AMHP should interview the patient to confirm that detention is necessary
    - **Discharge Routes**
        - One application (by the nearest relative) can be made to the **Mental Health Review Tribunal** within the first 14 days of detention
        - Responsible clinician can discharge at any time
- **Section 3**
    - Admission for treatment with diagnosis stated
    - **6 months**
    - Can be renewed:
        - 1st renewal: 6 months
        - 2nd renewal onwards: 12 months

    - Made by an **AMHP** or **nearest relative (NR)** on behalf of **two** doctors, one or whom should be section 12 approved (usually SpR or consultant) and one of whom should know the patient in professional capacity (e.g. GP)
        - Nearest relative should be consulted by AMHP before submitting section (unless in urgent circumstances)
    - Patient can be forcibly medicated
    - **Consent to Treatment** provisions apply after 3 months of detention (if not consenting, will need a **Second Opinion Appointed Doctor (SOAD) Assessment**)
    - **Discharge Routes**
        - Patient can apply to the Mental Health Review Tribunal at any time (MHRT aims to hold a hearing within 5 weeks)
        - Leave can be granted under **Section 17**
        - Nearest relative can apply for discharge to the hospital (i.e. not the MHRT) but it can be barred by the responsible clinician
- **Section 4**
    - Admission for emergency treatment
    - **72 hours**
    - Preferred over section 2 if the admission is more immediate
    - Only need one doctor
    - Can be converted into a section 2
    - Usually done by an **AMHP** (rarely by a nearest relative) on behalf of **one doctor** (doesn't need to be section 12 approved)
- **Section 5(2)**
    - Detention of an inpatient
    - **72 hours**
    - Can be done by **one doctor in charge of the case (or a nominee)**
- **Section 5(4)**
    - Detention of an inpatient that is enforced by a nurse
    - **6 hours** (until a doctor or clinician with authority arrives)
    - Can be done by a **registered mental health nurse**
- **Section 17**
    - Allows leave for a specified period of time from a current section
    - Certain conditions will have to be met (e.g. returning at a certain time, staying with a particular person)
- **Section 35**
    - Applies if the patient is accused of committing a crime
    - Magistrates Court can remand you in hospital if one doctor has evidence that you may have a mental health disorder
    - **28 days**
    - Can be extended for further periods of 28 days up to a maximum of 12 weeks
- **Section 37**
    - Admission for medical treatment in a patient who has committed a crime
    - **6 months**
    - Can be extended for another 6 months, and then 1 year at a time thereafter
- **Section 41**
    - Restriction order
    - Made by the Crown Court
    - Restrictions affect leave of absence, discharge and transfer between hospitals
    - No appeal within the first 6 months
- **Section 47**
    - Used to transfer a serving prisoner to hospital
    - Can add a **Section 49** which adds the restrictions of section 41
- **Section 48**
    - Used for the transfer of an unsentenced prisoner to hospital for detention

- **Section 135**
  - The magistrate issues a warrant for a police officer (with a doctor and AMHP) to enter any premises to take the patient to a place of safety
  - **24 hours** (can be extended to 36)
- **Section 136**
  - Police can take the patient from a public place to a place of safety to be examined by a doctor and interviewed by an AMHP
  - **24 hours** (can be extended to 36)
- **Section 26 and 29**
  - 26 – who the patient's nearest relative is
  - 29 – the patient's rights to change the nearest relative
- **Community Treatment Order (CTO)**
  - Allows being discharged from a previous section but on the agreement that certain conditions are met such as:
    - Living in a certain place
    - Going somewhere for medical treatment
- **Approved Mental Health Professional (AMHP)**
  - Mental health professionals who have been approved by a local social services authority to carry out certain duties under the Mental Health Act
  - Responsible for coordinating the assessment of a patient and admission to hospital if the patient is sectioned
- **Independent Mental Health Advocate (IMHA)**
  - Advocate trained to help the patient find out their rights under the MHA and provide support whilst detained
  - Patients have a right to an IMHA if:
    - Under a section except 4, 5, 135 and 136
    - Under MHA guardianship, conditional discharge and CTO
    - Discussing treatments such as ECT
- **Guardianship**
  - A 'guardian' is appointed to help the patient live as independently as possible in the community, instead of being sectioned and kept in hospital
- **Deprivation of Liberty Safeguards (DoLS)**
  - Used if a person is deprived of their liberty within a care home or hospital
  - This is needed if restraint and restrictions used to safeguard a person under the MCA will deprive a person of their liberty

Other Topics

Psychopharmacology – Antipsychotics

- **Clozapine**
  - Used in treatment-resistant schizophrenia
  - **Mechanism**: blocks D1 and D4 receptors
  - **Contraindications**: previous or current neutropaenia, previous myocarditis, active or progressive liver disease
  - **Side-Effects**: sedation, weight gain, reduced seizure threshold, myocarditis, metabolic syndrome, hypersalivation, GI (swallowing problems, constipation)
    - NOTE: smoking cessation can lead to a decrease in CYP450 activity resulting in raised clozapine levels
  - Register patient with **Clozaril patient monitoring service**, Dezapine monitoring system or Zaponex treatment access system
  - Ensure **normal leucocyte count** and **ECG** before starting treatment
  - **FBC Monitoring**:
    - Weekly for 18 weeks
    - Fortnightly for 1 year

        - Monthly thereafter

Side-Effects

- Agranulocytosis, neutropaenia
- Reduced seizure threshold
- Constipation
- Myocarditis (baseline ECG should be taken before starting treatment)
- Hypersalivation

SSRI Side-Effects and Interactions

- **Choice**
    - Citalopram and fluoxetine are currently the preferred SSRIs
    - Sertraline is useful post-MI
    - Fluoxetine is the drug of choice in children
- **Side-Effects**
    - GI upset
    - GI bleeding (if NSAIDs are being used, it should be given with a PPI)
    - Increased anxiety and agitation soon after starting
    - Fluoxetine and paroxetine have higher propensity for drug interactions
- **QT Interval**
    - Citalopram and Escitalopram are associated with a dose-dependent increase in QTc and should not be used in those with pre-existing QT prolongation or in combination with other medicines that prolong the QT interval
    - Maximum daily dose of citalopram: 40 mg for adults; 20 mg for > 65 years, 20 mg for hepatic impairment
- **Interactions**
    - NSAIDs and aspirin: if used, give with a PPI
    - Warfarin/heparin: avoid SSRIs and consider mirtazapine
    - Triptans: avoid SSRIs
    - MAOI: risk of serotonin syndrome when given at the same time as SSRIs

SSRIs in Pregnancy

- Weigh up benefits and risks when deciding whether to use SSRIs
- **1st trimester**: increased risk of congenital heart defects
- **3rd trimester**: increased risk of persistent pulmonary hypertension of the newborn
- SSRIs that are generally considered safe are sertraline, citalopram and fluoxetine
- **Paroxetine** has an increased risk of congenital malformations, particularly in the 1st trimester

Switching Anti-Depressants

- Switching **from** citalopram, escitalopram, sertraline or paroxetine **to** another SSRI
    - First should be withdrawn before the alternative is started
- Switching **from** fluoxetine **to** another SSRI
    - Withdraw then leave a gap of 4-7 days (fluoxetine has a long half-life) before starting a low-dose of the new SSRI
- Switching **from** SSRI **to** TCA
    - Cross-tapering is recommended
    - **Exception**: fluoxetine should be withdrawn before TCAs are started
- Switching **from** citalopram, escitalopram, sertraline or paroxetine **to** venlafaxine
    - Cross-taper cautiously (start venlafaxine 37.5 mg OD and increase very slowly)
- Switching **from** fluoxetine **to** venlafaxine
    - Withdraw then start venlafaxine at 37.5 mg OD and increase very slowly
- **Take home message**: fluoxetine takes longer to switch because it has a long half-life

Lithium Side-Effects and Monitoring

- **Side-Effects**
  - Nausea/vomiting and diarrhoea
  - Fine tremor
  - Nephrotoxicity: polyuria (secondary to nephrogenic DI)
  - Thyroid enlargement (and hypothyroidism)
  - ECG: T wave flattening/inversion
  - Weight gain
  - Idiopathic intracranial hypertension
- **Monitoring**
  - After starting, lithium levels should be performed **weekly** and after each dose change until concentrations are stable
  - Once established, lithium blood levels should be routinely checked **every 3 months** (levels should be taken 12 hours post-dose)
  - Thyroid and renal function should be checked **every 6 months**
  - Patients should be given an information booklet, alert card and record book

Benzodiazepines

- Enhances the effect of GABA (increases the frequency of opening of the chloride ion channel)
- Used as a sedative, hypnotic, anxiolytic, anticonvulsant and muscle relaxant
- Should not be used for longer than **2-4 weeks**
- **Features of Withdrawal**
  - Insomnia
  - Irritability
  - Anxiety
  - Tremor
  - Loss of appetite
  - Tinnitus
  - Perspiration
  - Perceptual disturbance
  - Seizures
- Note: barbiturates work by increasing the duration of chloride channel opening

MMSE Interpretation

- Any score $\geq$ 24/30 is considered **normal**
- **Cognitive Impairment**
  - **Mild**: 18-23
    - May require some supervision, support or assistance
  - **Moderate**: 10-17
    - Clear impairment, may require 24-hour supervision
  - **Severe**: 0-9
    - Marked impairment, likely to require 24-hour supervision and assistance with ADLs
- The raw score may need to be corrected based on educational attainment and age
- **Note:** patients with depression may often answer with 'I don't know' whereas patients with dementia will attempt to answer all questions

Montreal Cognitive Assessment (MoCA)

- **Domains tested**: visuospatial and executive functioning, animal naming, attention, language, abstraction, delayed recall (short-term memory), orientation, education level (1 point added if < 12 years of formal education)
- Maximum: 30 points
- Normal: $\geq$ 26 points

- Does not differentiate between mild, moderate and severe cognitive impairment
- If a patient score ≤ 25, consider referral for further cognitive assessment

Depression and Anxiety Questionnaires

- **PHQ-9**
  - Ask the patient '*over the last 2 weeks, how often have you been bothered by any of the following problems?*'
  - 9 items which are scored 0-3
  - Includes items about thoughts of self-harm
  - **Interpretation**
    - None: 0-4
    - Mild: 5-9
    - Moderate: 10-14
    - Moderately Severe: 15-19
    - Severe: 20-27
- **Hospital Anxiety and Depression Scale (HAD)**
  - Consists of 14 questions: 7 anxiety + 7 depression
  - Focuses on the last week
  - Each item scored from 0-3
  - Produces a score out of 21 for both anxiety and depression
  - **Interpretation**
    - Normal: 0-7
    - Borderline: 8-10
    - Anxiety/Depression: 11-14
- **GAD-7**
  - Asks about 7 symptoms and their frequency (each is worth a maximum of 3 points)
  - Focuses on the last 2 weeks
  - **Interpretation**
    - Mild: 5-9
    - Moderate: 10-14
    - Severe: 15+
    - Maximum = 21

Alcohol Questionnaires

- **CAGE** – screening tool
- **Alcohol Use Disorders Identification Test (AUDIT)** – screening tool
- **Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar)** – determines the severity of withdrawal (useful for determining the next stage in treatment)

Electroconvulsive Therapy (ECT)

- **Indications**
  - Catatonia
  - Prolonged or severe manic episode
  - Severe depression that is life-threatening
  - NOTE: it is effective in pregnant women
- **Short-Term Side-Effects**
  - Headache
  - Nausea
  - Short-term memory impairment
  - Memory loss of events prior to ECT
  - Cardiac arrhythmia
- **Long-Term Side-Effects**

- Impaired memory

Insomnia

- **Definition**: difficulty initiating or maintaining sleep, or early morning awakening that leads to dissatisfaction with sleep quantity or quality.
  - **Chronic Insomnia**: diagnosed if a person has trouble falling asleep or staying asleep at least 3 nights per week for 3 months
- **Investigation**: usually based on history, may use sleep diary, rarely use polysomnography
- **Management**
  - Identify potential causes (e.g. mental or physical health issues or poor sleep hygiene)
  - Advise against driving when sleepy
  - Advise good sleep hygiene (no screens before bed, limited caffeine intake, fixed bed times)
  - Only consider hypnotics if impairment is severe
    - Recommended hypnotics include short-acting benzodiazepines (e.g. temazepam) or non-benzodiazepines (e.g. zopiclone)
    - Use lowest effective dose for shortest duration
    - Review after 2 weeks and consider referral for CBT
    - **Side-Effects of Sleeping Pills**: daytime sedation, poor motor coordination, cognitive impairment, addiction

Applied Relaxation Therapy

- Used for people with anxiety disorders
- Based on the premise that these patients have lost the ability to relax
- Consists of a series of exercises that teach the patient how to:
  - Spot the signs and feelings of tension
  - Relax your muscles and relieve tension
  - Use these techniques in stressful situations to prevent you feeling tense and panicky
- Consists of 12-15 weekly sessions

Mentalisation-Based Therapy

- Form of therapy that focuses on the patient's ability to attend to mental states in themselves and in others
- This helps them understand their actions and the actions of others
- This leads to more successful social interactions and relationships
- Mainly used for **emotionally unstable personality disorder** and **self-harm**

Transference-Focused Therapy

- Based on a theoretical process by which emotions are transferred from one person to another
- It is presumed that your feelings about certain important people are transferred onto the therapist
- You then feel about and react to the therapist as you would to these important people
- The therapist can observe how you interact and help you build healthier relationships
- This is mainly used for **emotionally unstable personality disorder**