The Locum Essentials Guide
Icons used in this guide

At the end of each section in the Handbook you will find a summary box, which include the key take home messages, some ideas to help you apply your learning and some useful websites.

- This icon occurs where we list **Take home messages**
- This icon occurs where we list possible ideas for **CPD actions**
- This icon occurs where we list **Useful websites**
- This icon shows where you can add your own **Notes**

We make every effort to ensure the information in these pages is accurate and correct at the date of publication, but it is of necessity of a brief and general nature, and this should not replace your own good clinical judgement, or be regarded as a substitute for taking professional advice in appropriate circumstances. In particular check drug doses, side-effects and interactions with the British National Formulary, and NHS pension and taxation information with the NHS and HMRC respectively. We are not finance, pension nor tax advisers, and it is important that you act only upon the advice of a financial advisor who understands your specific situation regarding these matters. Save insofar as any such liability cannot be excluded at law, we do not accept any liability for loss of any type caused by reliance on the information in these pages.

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GP Update Limited.

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Why this guide?

We know many of you are locums or are entertaining the idea of becoming locums, perhaps after a salaried career or a baby, or even after training. This can be a scary move, and finding all the information you need in one place is difficult.

The aim of this guide is to help you to safely navigate the choppy waters and multiple administrative pitfalls of being a GP locum.

Having no fixed surgery means that, for most of you, your bag and your smartphone are your surgery. To help a little, we also wanted to provide you with an easily accessible set of up-to-date, clinical articles on major emergencies.

Who are we?

MyLocumManager is an online accounting toolkit that simplifies all the admin that comes with locum work, such as invoicing, pension forms and tax. Our website enables you to access the services of our specialist medical accountants. Our online resources also provide support with everything from terms and conditions of locum work, to CV templates.

Red Whale is one of the leading providers of primary care medical education in the UK. Our courses are evidence-based, very relevant to general practice, and full of action points that you can take away and implement immediately. We are also the only primary care education provider that is completely free from pharmaceutical sponsorship.

In creating this guide, we drew from the learning and experiences of our team members. We hope you will find it useful. You are welcome to print it, share it and photocopy it for non-commercial use. If you have any suggestions, questions or comments, please do drop us a line at mail@red-whale.co.uk.

If you wish to find out more about the products and courses we offer, please click on our logos below.
## Contents

### Administrative Essentials

- 2 Getting started as a locum GP
- 4 Managing the financial side of things

### Surgery Essentials

- 9 Sepsis
- 13 Feverish illness in children: NICE guidance
- 18 Drugs for the GP bag
- 22 Acute severe asthma
- 24 Anaphylaxis
- 29 Oxygen use in a medical emergency
Administrative Essentials

2 Getting started as a locum GP
2 Essential paperwork
2 Preparing your doctor's bag
2 Key points for finding locum work
3 Locum pay structure
3 Your work day

4 Managing the financial side of things
4 Invoicing
4 NHS pension
5 Tax
6 Expenses
Getting started as a locum GP

Working as a locum GP is a wonderful way of combining clinical practice with flexibility and variety. Starting out can be a daunting process. Here are the key essentials of working as a locum GP.

**Essential paperwork**

In order to work for a practice or agency, you will require the following paperwork:

- Up-to-date Curriculum Vitae (you can use our free CV template to help you with this).
- Certificate of Completion of Training (CCT).
- GMC certificate of full registration.
- Performers list inclusion letter.
- Certificate of medical indemnity for locum work.
- Valid DBS check (this can usually be obtained via your LMC from the Disclosure & Barring Service).
- Proof of immunisations.
- Two references.
- Copy of passport (this is proof of eligibility to work in the UK).

**Preparing your doctor’s bag**

When preparing your doctor’s bag, it is worth thinking about what you need for a typical surgery and home visits. Ensure your bag is lockable.

**Equipment**

Useful items include:

- Stethoscope.
- Auroscope.
- Ophthalmoscope.
- BP machine.
- Tendon hammer.
- Gloves.
- Tongue depressors.
- Tape measure.
- Phlebotomy equipment (venflon, plaster, cotton, etc.)
- Thermometer.
- Pulse oximeter.
- Urine dipstick.
- Urine pots.
- Glucometer.
- Peak flow meter.
- Lubricant jelly.
- Pregnancy test kits.
- Alcohol hand gel.
- Small sharps bin.

**Drugs**

Appropriate medications to carry around in a doctor’s bag may vary, depending on:

- Your area (distance to nearest hospital and extent of local paramedic cover).
- The medical conditions you are likely to face.
- The availability of a local 24-hour pharmacy.

You must ensure you are confident in knowing how and when to administer emergency drugs, especially when working alone, on a home visit, in a remote location.

Please see the article Drugs for the GP bag later in this guide for a list of medications to consider carrying in your doctor’s bag. You must take relevant precautions to safeguard controlled drugs. You must also ensure you have systems in place to replace used and expired drugs, as well as maintain and calibrate your clinical equipment.

**Key points for finding locum work**

- Most locums tend to work as freelance GPs who book work directly with practices. You can also supplement this with agency work.
- Contact practices directly with a cover letter and your CV. You can find a list of your local GP practices here.
- Contact training practices on your VTS as a starting point for locum work.
- Contact your local CCG and join its locum forum.
- Join the locum lists on your Local Medical Committee.
• Ensure you and the practice are aware of what work will be undertaken. For example, agree on how many patients will be seen and what additional duties will be required. It is important to have work terms and conditions in place. You can use a terms and conditions template as a guide to creating your own.

Locum pay structure

You can book locum work at an hourly rate, sessional rate or on-call. Your pension contribution is usually added on top of this rate.

Hourly rate
This fee is agreed for a specific duration of work. For example, £80/hour for 3 hours of work, from 09:00–12:00. Any additional work on top of these hours (visits, signing prescriptions, seeing extra patients) is charged on top.

Sessional rate
This fee is agreed for a set amount of work. For example, £250 for a morning session, from 09:00–13:00. The session may comprise a 15-patient surgery, 2 home visits, plus ‘admin’ time to sign prescriptions or do telephone triage.

On call/duty doctor
This is usually paid as a half-day or full-day rate, depending on the amount of time a practice requires you for. It will involve a mixture of telephone triage, seeing patients, signing prescriptions, and dealing with blood results, admin and home visits. You normally charge a set fee for this which is negotiated with the practice.

• Tip 1: It is worth asking for catch-up slots during your clinic, especially when you first start out as a locum.
• Tip 2: It is important that you and the practice agree beforehand what work will be undertaken. MyLocumManager.com has a terms and conditions template that you can use as a guide.

Your work day

Navigating your way through a surgery requires preparation. Here are some simple tips to help you sail through:
• Arrive 15 minutes early.
• Introduce yourself to key staff so you can approach them for advice if needed.
• Ask for the practice locum pack (this should contain information such as computer login and referral pathways).

To ensure you are well prepared for your session, here is a useful checklist:
• What is the extension number for reception?
• Where is the panic button?
• How do I call patients in?
• How do I request blood tests and where are these done (on site or local hospital)?
• How do I order X-rays and ultrasounds?
• How do I refer for physiotherapy and counselling?
• Where are MED3, MATB1 and maternity exemption forms kept?
• How do I create referrals?

At the end of the session, consider any tasks that may need handing over or follow up.
Managing the financial side of things

We’ve put together some guidance to help you keep on top of issues such as invoicing, tax, pensions and expenses.

**Invoicing**

After you have completed your sessions, you need to generate an invoice for work done. If you are contributing to your NHS pension, you need to send a pension form A with each invoice. The HMRC requires that each invoice has a unique reference number. The invoice needs to specify the work undertaken, and the employer’s contribution to your pension must be added. MyLocumManager.com generates your invoices and pension forms automatically from the data in your job diary, making it simple to manage the paperwork that comes with locum work.

**NHS pension**

Your NHS pension contribution is made up of 2 parts:

*Employee contribution:* This is your contribution to the pension scheme. It is calculated by estimating your annual income and using the tiered contribution to calculate what percentage you need to pay (see contributions table below).

*Employer contribution:* This is the practice’s contribution to your pension scheme (it is also referred to as employer superannuation). In England and Wales, this is 14.3% of 90% of your invoice amount. In Scotland and Northern Ireland, the contribution is 14.9% and 16.3% respectively; however, this is paid by the Primary Care Organisation, not the practice.

As a locum in England and Wales, you are responsible for collecting the employer contributions and forwarding these to your pensions office, along with your own contributions.

Your employer contribution amount will be added to your invoice to create a total amount due. Each invoice must be accompanied by a completed GP Form A.

**How to contribute to your NHS pension**

There are three steps to undertake to contribute to your NHS pension.

**STEP 1: Calculating your (employee) contribution**

The scheme is based on your anticipated annual GP earnings (inclusive of other pensioned NHS work such as salaried/partnership work), and has a tiered contribution structure. The percentage contribution you need to pay will depend on what level of income you earn, as summarised below.

<p>| Tiered contribution rates 2015/2016 to 2018/2019 for Scheme Members (England and Wales) |</p>
<table>
<thead>
<tr>
<th>Full time pensionable pay</th>
<th>Contribution rate (before tax relief) 1 April 2015 to 31 March 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to £15,431.99</td>
<td>5%</td>
</tr>
<tr>
<td>£15,432.00 to £21,477.99</td>
<td>5.6%</td>
</tr>
<tr>
<td>£21,478.00 to £26,823.99</td>
<td>7.1%</td>
</tr>
<tr>
<td>£26,824.00 to £47,845.99</td>
<td>9.3%</td>
</tr>
<tr>
<td>£47,846.00 to £70,630.99</td>
<td>12.5%</td>
</tr>
<tr>
<td>£70,631.00 to £111,376.99</td>
<td>13.5%</td>
</tr>
<tr>
<td>£111,377.00 and over</td>
<td>14.5%</td>
</tr>
</tbody>
</table>

<p>| Tiered contribution rates 2015/2016 to 2018/2019 for Scheme Members (Scotland) |</p>
<table>
<thead>
<tr>
<th>Full time pensionable pay</th>
<th>Contribution rate (before tax relief) 1 April 2015 to 31 March 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to £15,828</td>
<td>5.2%</td>
</tr>
<tr>
<td>£15,829 to £21,601</td>
<td>5.8%</td>
</tr>
<tr>
<td>£21,602 to £27,089</td>
<td>7.3%</td>
</tr>
<tr>
<td>£27,090 to £49,967</td>
<td>9.5%</td>
</tr>
<tr>
<td>£49,968 to £71,337</td>
<td>12.7%</td>
</tr>
<tr>
<td>£71,338 to £111,376</td>
<td>13.7%</td>
</tr>
<tr>
<td>£111,377 and over</td>
<td>14.7%</td>
</tr>
</tbody>
</table>
Tiered contribution rates 2015/2016 to 2018/2019 for Scheme Members (Northern Ireland)

<table>
<thead>
<tr>
<th>Full time pensionable pay</th>
<th>Contribution rate (before tax relief)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 April 2015 to 31 March 2019</td>
<td></td>
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<td>14.5%</td>
</tr>
</tbody>
</table>

N.B. – although the contribution rates are not set to change until 2019, the bands may be adjusted according to inflation.

In England and Wales, the GP practice is responsible for paying your employer contributions (you will often need to negotiate this payment with them before starting). In Scotland and Northern Ireland, it is paid by the Primary Care Organisation.

STEP 2: Completing Pension Forms A and B

**GP Form A**

This form certifies the work you have done at a given practice.

You should complete and submit a Pension Form A with every invoice to the practice.

This form is signed by the practice and returned to you.

Every month, you will send all your Form As with a Form B and a cheque of your contributions to Primary Care Support England (PCSE).

**GP Form B**

Pension Form B only needs to be completed once a month.

This form will take you through a series of calculations, considering the tiered pension rate you have set, and give you a final figure of your contribution to the NHS pension scheme. This can be a time-consuming process to do manually. Alternatively, you can use bespoke software such as MyLocumManager to calculate and prepare your pension forms.

**GP SOLO Form**

This form is completed for out-of-hours work in England, Wales and Northern Ireland. Scotland uses a Form B for out-of-hours work.

In England and Wales, the GP SOLO Form is also used for long-term (>6 months) locum work.

Normally, the out-of-hours provider will complete the form and send it to the pensions office, along with both the employer contribution and your employee pension contribution, which they deduct from your pay.

STEP 3: Sending your pension forms

Every month, you send all Forms A and a Form B to Primary Care Support England (PCSE).

You must send your pension forms and cheque within 10 weeks of the date worked, or before the 7th of the next month. More details on how to make your pension payments can be found on the Primary Care Support England website.

**Exceptions to the NHS pension scheme**

You cannot claim an NHS pension for:

- Work done as a limited company.
- Work paid over 10 weeks ago.
- Agency work (as you are not paid directly by the practice).
- Private work.
Tax

Working as a locum means you are now responsible for your tax payments. It is imperative you keep your finances organised so that your tax liability can be accurately calculated.

Keep a record of all invoices, pension contributions and expenses. You can do this manually, which can be time consuming and difficult to track, or you can use an online accounting software such as MyLocumManager. You can use our locum expenses proforma to see what expenses can be claimed.

According to HMRC requirements, “A taxpayer must keep records relevant to tax liability for a period of 5 years”. MyLocumManager keeps your financial information securely to help you meet HMRC requirements. This is also important should you be part of a tax investigation in the future.

Key points for your tax responsibilities are outlined below.

Get an accountant

Although you may be able to do the accounting paperwork yourself, the benefit of having a knowledgeable accountant who has up-to-date and in-depth knowledge of the tax system is invaluable if you have a significant volume of work, and will far outweigh the cost of them submitting your tax return. You can find specialist medical accountants through MyLocumManager or via personal referrals.

Decide whether you want to work as a sole trader or a limited company

As a rule of thumb, if you are keen to maintain your NHS pension then you should register as a sole trader. GPs who set up limited companies are effectively setting up a business which is separate from them and their personal finances. Any profit the company makes is owned by the company after it pays corporation tax. Operating in this way has some advantages and disadvantages.

Some of the pros to being a limited company

• The main advantage of this method is reduced tax liability. If you are a sole trader, your business profits and other personal income are taxed via the annual self-assessment process. You cannot defer profits to future years. For the 2016–17 tax year, the personal allowance is £11,000. You pay no income tax on this amount. You pay income tax at 20, 40 or 45%, depending on your annual profits. In addition, you must pay National Insurance Contributions (NICs) on your profits. Class 2 NICs are £2.80 per week (2016/17 tax year), and HMRC will calculate your Class 4 NICs on your annual profits. As a limited company, the company pays corporation tax on its taxable profits. The corporation tax rate is currently 20% (2016/17 tax year). Unlike sole traders, a limited company can retain profits and distribute them as dividends in future tax years if necessary. It is important to note that new tax legislation affecting limited companies is being implemented, which could make it less favourable to set up as a limited company; ask your accountant if this could affect you.

Some of the cons to being a limited company

• Working as a limited company involves more paperwork and is associated with larger accountancy fees. It is therefore important to consult an accountant to ascertain if this is the best option for you.

• You cannot claim NHS pension when working as a limited company. You therefore need to consider the benefits of your tax savings versus any loss of NHS pension.

Expenses

The HMRC website details what expenses can be claimed if you are self-employed.

As a self-employed business, you will have various running costs. You can deduct some of these costs to work out your taxable profit if they are allowable expenses.

For example, if you earn £50,000 and you claim £10,000 in allowable expenses, you only pay tax on the remaining £40,000 – which is known as your taxable profit.

However, you need to follow different rules if you are working as a limited company. You can deduct any business costs from your limited company’s profits before tax. You must report any item you make personal use of as a company benefit.

Costs you can claim as allowable expenses include:

• Office costs, e.g. stationery or phone bills.

• Financial costs, e.g. insurance or bank charges.

• Costs of your business premises, e.g. heating, lighting, business rates.

• Advertising or marketing costs, e.g. website costs.
• Travel costs, e.g. fuel, parking, train or bus fares.
• Staff costs, e.g. salaries or subcontractor costs.

A full list can be downloaded here.

The HMRC stipulates that if you use something for both business and personal reasons, you can only claim allowable expenses for the business costs. For example, if your mobile phone bills for the year total £300, of which £230 is personal calls and £70 business calls, you can claim for £70 of business expenses.

**If you work from home**

You may be able to claim a proportion of your costs for things such as:

• Heating.
• Electricity.
• Council Tax.
• Mortgage interest or rent.
• Internet and telephone use.

If you would like further guidance about all aspects of working as a locum GP, you can download the MyLocumManager Survival Guide for free. Like us on Facebook to stay up to date with locum news and offers.
9 Sepsis

9 NICE guidance on sepsis

13 Feverish illness in children: NICE guidance

13 NICE on feverish illness in children aged 0–5y
13 Table 1: NICE traffic light system for ‘risk stratifying’ children with fever
14 Table 2: Symptoms and signs suggestive of specific serious febrile illnesses
16 FAQs from NICE guidance on fever

18 Drugs for the GP bag

22 Acute severe asthma

24 Anaphylaxis

24 Emergency management of anaphylaxis
25 How common is anaphylaxis?
25 Recognising anaphylaxis
25 What triggers anaphylaxis?
25 Death from anaphylaxis
25 Assessing someone with suspected anaphylaxis
26 Important drug-related notes from the algorithm
26 What is the relationship between asthma and anaphylaxis?
26 Who should have an autoinjector? Who should be referred to an allergy specialist?
27 How many autoinjectors should patient have?
27 Should GPs carry autoinjectors in their emergency bag?
27 Is there a test to confirm a patient has had an anaphylactic reaction?
27 Should antihistamines be used to treat anaphylaxis?
27 Do patients need to be admitted?

29 Oxygen use in a medical emergency

29 How to remember this?
29 Why might too much oxygen be a bad thing?
29 Oxygen in COPD
30 So what does this mean in practice?
Sepsis

“I think Lisa’s got that septicaemia thing that was on the news.”

Twenty month old Lisa was happily driving Thomas the Tank Engine along my couch while making ‘choo-choo’ sounds. I have to confess, at that stage septicaemia wasn’t top of my differential list!

“I don’t know doctor, maybe I’m making a fuss, but I just don’t feel right.”

John was 55 and had only 2 entries in his notes during the past 8 years. Probably not a fussler then!

He didn’t really have many symptoms – a bit achy, a bit of a cough, but he had a temperature of 39ºC, a marked tachycardia and his blood pressure was 80/40. He was indeed ‘not right’– it turned out that he had strep pneumonia and septicaemia.

Two consecutive patients: if only it was that easy to separate the sick from the healthy each time!

Sepsis statistics

• Each year in the UK, there are 100 000 admissions to hospital and 37 000 deaths from sepsis (J of Antimicrobial Chemo 2011;66(Supp ii):11).
• In the UK, more people die of sepsis each year than of breast, bowel and prostate cancer combined.

NICE guidance on sepsis published in July 2016 highlights the challenges of spotting sepsis: signs and symptoms can be very non-specific, so a high index of suspicion is needed. If clinicians do not ask themselves ‘Could this be sepsis?’, the opportunity to intervene and avoid death may be missed.

In hospitals, there are now clear protocols for recognising and managing sepsis. In primary care, our job is in some ways much harder, because people present at an earlier stage in most illnesses, when the signs are subtler.

NICE did not recommend the use of early warning sepsis scores in primary care (although such tools are available, e.g. from The UK Sepsis Trust). It did recommend clear assessment of risk factors for sepsis and documenting key observations – not just the obvious ones such as pulse and blood pressure, but also skin changes, urine output and, perhaps most challenging, assessing mental state to look for subtle changes in behaviour or function.

NICE guidance on sepsis

The key messages from the NICE guidance on sepsis are (NG 51, 2016):

• Be very mindful of sepsis and consider it in anyone presenting with symptoms or signs of possible infection.
• Many factors increase the risk of sepsis – these include young or old age, pregnancy and skin wounds, including from surgery. Extra caution should be used in these people.
• Careful history and examination, with close attention to vital signs, mental state, skin colour and urine output is needed. Remember that people with sepsis may not have a fever!
• Stratify risk (based on the observations outlined later) into moderate-high risk or high risk of severe illness/death from sepsis.
• Many observations may be normal even in the presence of sepsis – for example, people may not have a fever. Take any single abnormal observation seriously.
• If any single high risk criteria is present, admit urgently (usually by 999 ambulance).
• If a single moderate–high risk criteria is present, it may be possible to manage the person in primary care, but only if a definitive diagnosis can be made. Very careful safety netting is required. In those with impaired immunity from drugs (including oral steroids) or disease (including diabetes), urgent admission may be indicated.

I have summarised the guidance, including the risk factors, features used to stratify risk (with the cut offs for each age group) and management, overleaf.
NICE guidelines on sepsis (NICE NG51, 2016)

- Always ask yourself "Could this be sepsis?" in people presenting with signs and symptoms of infection.
- If yes, use the risk factors below, and your clinical judgement, to decide if sepsis is a real possibility (if you are doing telephone triage this may only be symptoms such as 'feeling more breathless' or the carer reporting someone is more confused).
- If sepsis is a real possibility, assess the patient (see ‘assessment’ section below). Using the information gathered during assessment, stratify the risk of severe illness/death using the charts overleaf, and manage accordingly.

Remember, people may have non-specific, non-localised presentations (e.g. just feeling very unwell, subtle changes in behaviour) and **may not have a fever**. In those who can’t give a good history (age, communication problems, memory issues), take extra care.

### Risk factors for sepsis

<table>
<thead>
<tr>
<th>General risk factors for sepsis</th>
<th>Pregnancy and 6w post-partum</th>
<th>Neonates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>Pregnant women, and those who have given birth in the past 6w, are at high risk of sepsis. This includes after miscarriage and termination of pregnancy.</td>
<td>Maternal factors</td>
</tr>
<tr>
<td>- Under 1.</td>
<td>- Invasive grp B infection in previous baby.</td>
<td></td>
</tr>
<tr>
<td>- Over 75y.</td>
<td>- Maternal grp B strep colonisation, bacteriuria or infection in this pregnancy.</td>
<td></td>
</tr>
<tr>
<td>- Frail people of any age.</td>
<td>- Maternal intrapartum fever (&gt;38°C).</td>
<td></td>
</tr>
<tr>
<td><strong>Impaired immune system</strong></td>
<td>- Maternal parenteral antibiotics given for suspected invasive bacterial infection (e.g. sepsis) during labour/24h after birth (not prophylactic antibiotics).</td>
<td></td>
</tr>
<tr>
<td>- Diseases that impair immune system, including diabetes, asplenic patients, sickle cell disease.</td>
<td>Infant factors</td>
<td></td>
</tr>
<tr>
<td>- Drugs that impair the immune system: long-term oral steroids, other immunosuppressant drugs (e.g. for rheumatoid arthritis) and cancer chemotherapy.</td>
<td>- Premature rupture of membrane.</td>
<td></td>
</tr>
<tr>
<td><strong>Skin breaches</strong></td>
<td>- If preterm birth, suspected/confirmed rupture of membranes more than 18h.</td>
<td></td>
</tr>
<tr>
<td>- Surgery/invasive procedure in last 6w.</td>
<td>- Confirmed/suspected chorioamnionitis.</td>
<td></td>
</tr>
<tr>
<td>- Indwelling lines/catheters.</td>
<td>In a multiple pregnancy, suspected infection in another baby.</td>
<td></td>
</tr>
<tr>
<td>- Wounds (burns, cuts, skin infections).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Intravenous drug misusers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Assessment

- Use the tables opposite to stratify risk of sepsis and appropriate action to take.

**Measure the following:**
- Temperature.
- Pulse.
- Respiratory rate and oxygen sats.
- BP if ≥12y, capillary refill time if <12y.
- Skin colour (pallor, cyanosis, mottling).

**Ask about:**
- Mental state (behaviour, functioning).
- Recent fevers or rigors.
- Frequency of urination in past 18h.

**Examine patient:**
- Look for possible source of infection (including any skin wounds or rash).
- Don’t forget to check the urine!

### Warnings and cautions with vital signs

**Temperature**
- Temperature may be normal, low or high.
- The very young, the old, the frail and those having cancer treatment may not mount a fever response.

**Heart rate**
- Very fit people: remember ‘normal’ may be lower than the figures quoted in the very fit.
- Pregnancy: baseline pulse is 10–15bpm higher.
- Older people: pulse rate may not rise in response to infection, but may develop a new arrhythmia.

**BP**
- When interpreting BP, be aware of what is ‘normal for them’.
- In children and young people, a normal BP does not exclude sepsis.

**Mental state**
- Look for changes from normal cognitive state/functioning. Changes may be subtle: ask family members.
- In children, and in adults with dementia, changes in cognitive state may present as irritability or changes in behaviours (and in dementia, functional ability).

**Oxygen**
- Peripheral oxygen saturations may be difficult to measure in sepsis because of peripheral shut down.

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**Once you have decided someone needs admission (see overleaf): refer immediately (usually 999)**

**Oxygen**
- Adults: give oxygen if needed to achieve sats of 94–98% (88–92% if risk of hypercapnic respiratory failure (e.g. COPD)).
- Children: give oxygen to children if saturations ≤90%.

**Antibiotics**
- If meningococcal sepsis is suspected (fever and purpuric rash), give parenteral antibiotics (usually benzylpenicillin in the community, but do not let this delay transfer to hospital.
- For all types of sepsis, if transfer to hospital will take >1h, GPs/ambulance services should have mechanisms in place to give antibiotics in the community.
**Stratifying risk of severe illness/death if sepsis suspected**

From 12 years of age (including adults)

<table>
<thead>
<tr>
<th>MODERATE-HIGH risk of severe illness/death</th>
<th>HIGH risk of severe illness/death</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of new change in behaviour/mental state</td>
<td>Mental state Objective evidence of new altered mental state</td>
</tr>
<tr>
<td>Acute deterioration in functional ability</td>
<td>Skin Mottled/ashen skin or cyanosis (skin/lips/tongue) Non-blanching rash</td>
</tr>
<tr>
<td>Signs of potential infection (redness, swelling or discharge at surgical site or breakdown of wound)</td>
<td>Urine output Not passed urine for 18h</td>
</tr>
<tr>
<td>Not passed urine for 12–18h</td>
<td></td>
</tr>
<tr>
<td>Impaired immunity (illness/drugs incl. oral steroids)</td>
<td>Medical history</td>
</tr>
<tr>
<td>Trauma, surgery or invasive procedure in past 6w</td>
<td></td>
</tr>
<tr>
<td>Temp</td>
<td>Respiration</td>
</tr>
<tr>
<td>&lt;36°C</td>
<td>RR 21–24</td>
</tr>
<tr>
<td>If ANY moderate-high risk criteria:</td>
<td></td>
</tr>
<tr>
<td>Can definitive diagnosis be made &amp; treated?</td>
<td></td>
</tr>
<tr>
<td>If yes: treat if safe to do so: safety-net clearly.</td>
<td></td>
</tr>
<tr>
<td>If no: admit urgently (999).</td>
<td></td>
</tr>
<tr>
<td>If ANY high risk criteria:</td>
<td>admit urgently (999)</td>
</tr>
</tbody>
</table>

**CHILDREN 0–11y**

<table>
<thead>
<tr>
<th>MODERATE-HIGH risk of severe illness/death</th>
<th>HIGH risk of severe illness/death</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not responding normally to social cues</td>
<td>Mental state Appears ill to a healthcare professional</td>
</tr>
<tr>
<td>Decreased activity</td>
<td>Does not wake or if roused does not stay awake</td>
</tr>
<tr>
<td>Parental/carer concern child is behaving differently</td>
<td>And if 0-5y: Weak high-pitched/continuous cry</td>
</tr>
<tr>
<td>And if 0-5y: No smile</td>
<td>No response to social cues</td>
</tr>
<tr>
<td>Wakes only with prolonged stimulation</td>
<td></td>
</tr>
<tr>
<td>Leg pain</td>
<td>Skin Mottled or ashen skin</td>
</tr>
<tr>
<td>Cold hands or feet</td>
<td>Cyanosis of skin, lips or tongue</td>
</tr>
<tr>
<td>And if 0-5y: Pale or flushed</td>
<td>Non-blanching rash</td>
</tr>
<tr>
<td>Reduced urine output</td>
<td></td>
</tr>
<tr>
<td>Temp</td>
<td>Cap refill</td>
</tr>
<tr>
<td>No criteria except &gt;39°C if 3–6m</td>
<td>Capillary refill time</td>
</tr>
<tr>
<td>90–92%</td>
<td>90–92%</td>
</tr>
<tr>
<td>90–92%</td>
<td>90–92%</td>
</tr>
<tr>
<td>Capillary refill time</td>
<td>90–92%</td>
</tr>
<tr>
<td>≥3sec</td>
<td>90–92%</td>
</tr>
<tr>
<td>If ANY moderate-high risk criteria:</td>
<td></td>
</tr>
<tr>
<td>If IMPAIRED IMMUNITY – admit urgently (999).</td>
<td></td>
</tr>
<tr>
<td>If NORMAL IMMUNITY –</td>
<td></td>
</tr>
<tr>
<td>Can a definitive diagnosis be made &amp; treated?</td>
<td></td>
</tr>
<tr>
<td>If yes: treat if safe to do so: safety-net clearly.</td>
<td></td>
</tr>
<tr>
<td>If no: admit urgently (999).</td>
<td></td>
</tr>
<tr>
<td>If ANY high risk criteria:</td>
<td>admit urgently (999)</td>
</tr>
</tbody>
</table>

**LOW RISK (but take any single abnormal sign seriously)**

<table>
<thead>
<tr>
<th>RR</th>
<th>Pulse (Note: if under 12y, pulse &lt;60 is a high risk criteria)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1y</td>
<td>&lt;24</td>
</tr>
<tr>
<td>1–2y</td>
<td>&lt;22</td>
</tr>
<tr>
<td>3–4y</td>
<td>&lt;21</td>
</tr>
<tr>
<td>5y</td>
<td>&lt;105</td>
</tr>
<tr>
<td>6–7y</td>
<td>&lt;100</td>
</tr>
<tr>
<td>8–11y</td>
<td>&lt;91</td>
</tr>
</tbody>
</table>
These guidelines are not without their challenges:

- The criteria for children are based on age, but do bear in mind that children vary hugely in size!
- Can I remember that for an 8 year old a respiratory rate of 22 is normal, 22–24 is moderate–high risk, and 27 and more is high risk? No! But I can remember the upper limits of normal (in the table) which may be most useful when screening people for sepsis!

But, as NICE reminds us: if we don’t ask ourselves ‘Could this be sepsis?’ in those presenting with signs and symptoms indicating possible infection, we may well miss it – the symptoms can be subtle, and fever may be absent!

### Sepsis
- The NICE guidance on sepsis reminds us of the challenges in spotting the diagnosis.
- Always think ‘Could this be sepsis?’ in those who present with features that could be an infection.
- Look for risk factors for sepsis (which include extremities of age, frailty, pregnancy and skin wounds, including from surgery) and use your clinical judgement, based on whatever information you have, to decide if sepsis is a real possibility. (If you are doing telephone triage, this may only be symptoms such as ‘feeling more breathless’ or the carer reporting someone is more confused.)
- If sepsis is a real possibility, take a careful history and examination, paying close attention to vital signs, mental state, skin colour and urine output.
- Remember, people may have non-specific, non-localised presentations (e.g. just feeling very unwell, subtle changes in behaviour) and **may not have a fever**. In those who can’t give a good history (age, communication problems, memory issues), take extra care.
- After thorough assessment, stratify risk based on these factors into **moderate–high risk** or **high risk of severe illness/death** from sepsis.
- If any single high risk criteria is present, admit urgently.
- If a single moderate–high risk criteria is present, it may be possible to manage the person in primary care, but only if a definitive diagnosis can be made. Very careful safety netting is required.
- In those with impaired immunity, urgent admission may be indicated, even in the absence of high risk features.

### How often do you document the vital signs suggested by NICE?
- Do you have a sats monitor? Does it work on small children?
- Can you remember the cut offs for each age for vital signs? Would it help to photocopy this article and pin it on the wall in your consulting room?

### My notes
Feverish illness in children: NICE guidance

This is an update on NICE guidance initially published in 2007 (NICE 2013 CG160). When this guideline was first published, it received a lot of criticism around “teaching grandmothers to suck eggs!”.

However, infections remain the leading cause of death in children under 5 years old, and the UK performs relatively poorly compared with other European countries, where childhood mortality rates are 30–40% lower. In addition, until extension of GP training is approved, a substantial proportion of new GPs enter general practice without any formal postgraduate paediatric training.

For this reason, while this guideline may seem basic to some, I think it imparts valuable information, particularly around recording objective measures such as pulse, respiratory rate and capillary refill, which in these days of more fragmented care can be used by a different clinician at reassessment. It should be used in conjunction with NICE guidance on Sepsis.

Febrile illness statistics:

• 20–40% of parents report febrile illness in their children to a doctor each year (is that all – some days it feels like they all do?!).
• Fever is the commonest reason for paediatric GP consultations.
• Infections remain the leading cause of death for children under 5y.
• An otherwise normal child will have an average 8 infective episodes before they are 18m old.
• Serious causes of febrile illness are rare, so we need to be vigilant to spot them among the self-limiting viral illnesses.
• Of children aged 0–5y who have a fever, 1% per year will have a ‘serious cause’ for it.

Children this guideline does not cover

Certain groups of children are not covered by this guideline because they are higher risk, and we should have a lower threshold for seeking specialist advice about these children:

• Children with co-morbidity for fever, e.g. cystic fibrosis, cerebral shunts, immunosuppression, sickle cell disease.
• Children with tropical diseases.
• Children with recurring fever.

The updated guidance does not contain many changes. NICE has added recommended cut-off values for vital signs which were absent in the previous guideline, and put more emphasis on the importance of heart rate. It has also updated the ‘traffic light system’, making more specific recommendations as to how it should be used (NICE 2013 CG160).

NICE on feverish illness in children aged 0–5y

**How should we measure fever?**

- For infants <4w old, use an electronic thermometer in the axilla.
- For children aged 4w–5y, use an electronic thermometer or chemical dot thermometer in the axilla, or an infra-red tympanic thermometer.
- Do not use oral or rectal route, or forehead thermometers, to measure temperature.
- If parents report that their child has had a fever, take this seriously, even if it has not been measured.

**Perform a clinical assessment of the child**

The first question we are answering is whether this child is sick or well.

- Identify if the child has any immediately life-threatening features.
- Take and document observations, including pulse rate, respiratory rate, oxygen saturations and capillary refill time. These are an essential part of using the traffic light system shown in the table on the next page.
- Look for signs of dehydration.
- Look for other signs of a sick child, including poor response to social cues, a drowsy unresponsive child, or weak, high-pitched or continuous crying.

Table 1 can be used to risk stratify these children.
Table 1: NICE traffic light system for ‘risk stratifying’ children with fever

This table is meant for use with children aged 0–5y presenting with fever. Remember that for children with learning disabilities, we should take account of these in interpreting the traffic light table (NOTE: this should be used alongside the NICE guidance on Sepsis.)

<table>
<thead>
<tr>
<th>Clinical features</th>
<th>Green (low risk)</th>
<th>Amber (intermediate risk)</th>
<th>Red (high risk) = REFER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Normal colour</td>
<td>Pallor reported by parent</td>
<td>Pale/mottled/ashen/blue</td>
</tr>
<tr>
<td>Activity</td>
<td>Responds normally</td>
<td>Not responding normally</td>
<td>No response to social cue</td>
</tr>
<tr>
<td></td>
<td>Content/smiles</td>
<td>No smile</td>
<td>Appears ill to health professional</td>
</tr>
<tr>
<td></td>
<td>Stays awake or wakens quickly</td>
<td>Wakes only after prolonged stimulation</td>
<td>Does not wake</td>
</tr>
<tr>
<td></td>
<td>Strong normal cry or not crying</td>
<td>Decreased activity</td>
<td>Weak, high-pitched or continuous cry</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Nasal flaring</td>
<td>Tachypnoea:</td>
<td>Grunting</td>
</tr>
<tr>
<td></td>
<td>Tachypnoea:</td>
<td>Age 6–12m: &gt;50 breaths/min</td>
<td>Tachypnoea &gt;60 breaths/min</td>
</tr>
<tr>
<td></td>
<td>Age &gt;12m: &gt;40 breaths/min</td>
<td>Oxygen sats ≤95% in air</td>
<td>Moderate or severe chest indrawing</td>
</tr>
<tr>
<td></td>
<td>Crackles in chest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circulation and hydration</td>
<td>Normal skin and eyes</td>
<td>Tachycardia:</td>
<td>Reduced skin turgor</td>
</tr>
<tr>
<td></td>
<td>Moist mucus membranes</td>
<td>Age &lt;12m: &gt;160bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age 12–24m: &gt;150 bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age 2–5y: &gt;140 bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capillary refill time ≥3sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry mucus membranes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor feeding in infants</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduced urine output</td>
<td></td>
</tr>
<tr>
<td>Other features</td>
<td>None of the red or amber symptoms or signs</td>
<td>Age 3–6m: T ≥39°C</td>
<td>Age &lt;3m: T ≥38°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fever ≥5d</td>
<td>Non-blanching rash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rigors</td>
<td>Bulging fontanelle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Swelling of a limb or joint</td>
<td>Neck stiffness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-weight bearing limb</td>
<td>Status epilepticus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Focal neurological signs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Focal seizures</td>
</tr>
</tbody>
</table>

Having done this, look for the cause of the fever.

- Look for specific symptoms and signs suggesting a serious cause for fever (see Table 2).
- Remember to check the urine if no clear focus for fever can be found, especially in children <1y who may present non-specifically.
- Clearly, there will also be lots of children with viral infections, tonsillitis, otitis media and gastroenteritis in the cohort – NICE does not specifically refer to these.

Table 2: Symptoms and signs suggestive of specific serious febrile illnesses

<table>
<thead>
<tr>
<th>Diagnosis to consider</th>
<th>Symptoms or signs in conjunction with fever</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meningococcal disease</td>
<td>Non-blanching rash, particularly with 1 or more of:</td>
</tr>
<tr>
<td></td>
<td>• An ill-looking child</td>
</tr>
<tr>
<td></td>
<td>• Lesions &gt;2mm in diameter (purpura)</td>
</tr>
<tr>
<td></td>
<td>• Capillary refill time ≥3sec</td>
</tr>
<tr>
<td></td>
<td>• Neck stiffness</td>
</tr>
</tbody>
</table>
### Diagnosis to consider | Symptoms or signs in conjunction with fever
--- | ---
Bacterial meningitis | Neck stiffness  
 | Bulging fontanelle  
 | Decreased level of consciousness  
 | Convulsive status epilepticus  
Herpes simplex encephalitis | Focal neurological signs  
 | Focal seizures  
 | Decreased level of consciousness  
Pneumonia | Tachypnoea  
 | Crackles in chest  
 | Nasal flaring  
 | Chest indrawing  
 | Cyanosis  
 | Oxygen saturations ≤95% in air  
Urinary tract infection | Vomiting  
 | Poor feeding  
 | Lethargy  
 | Irritability  
 | Abdominal pain or tenderness  
 | Urinary frequency or dysuria  
Septic arthritis | Swelling of a limb or joint  
 | Not using an extremity  
 | Not weight-bearing  
Kawasaki disease | Fever for more than 5d AND at least 4 of the following:  
 | • Bilateral conjunctival injection  
 | • Change in mucous membranes (injected pharynx, dry cracked lips, strawberry tongue)  
 | • Change in the extremities (oedema/erythema/desquamation)  
 | • Polymorphous rash  
 | • Cervical lymphadenopathy  

**Management by a ‘non-paediatric practitioner’**

Separate recommendations are made for face-to-face assessment and remote assessment, i.e. telephone triage.

**If assessing remotely:**
- If symptoms suggest an immediately life-threatening illness, refer straight away for emergency medical treatment, usually by a 999 ambulance.
- Children with red features but not felt to be immediately life threatening should be seen face to face within 2h.
- Children with amber features should be seen face to face, but the urgency is left to the clinician’s discretion.
- Children with all green features can be cared for at home with appropriate advice and safety netting.

**If assessing face to face:**
- Refer children with an immediately life-threatening illness for emergency treatment, usually by a 999 ambulance.
- If you suspect meningococcal disease, give IM benzylpenicillin.
- Children with red features should be referred urgently to the care of a paediatric specialist.
- Children with amber features:
  - If a diagnosis can be reached, treat or refer as appropriate – *this is where our clinical acumen comes in!*
  - If a diagnosis cannot be reached, either safety net and reassess at a specific time and place, OR refer for paediatric assessment.
- Children with only green features can be cared for at home with appropriate advice and safety netting.
• **DO NOT** prescribe antibiotics for children with fever and no apparent source.
• **DO test urine if appropriate** (any child <3m with a fever and children >3m with features of a UTI as listed above or no clear focus).
• Children with clinical symptoms and signs of pneumonia who do not require admission should **not routinely** have a chest X-ray.

**Advising parents about anti-pyretics:**
- Should only be used to ease a child’s distress, not to treat a number on a thermometer.
- Do not prevent febrile convulsions and should not be used specifically for this purpose.
- Do not recommend tepid sponging (risk of peripheral shut down causing core temperature to rise).
- Consider using paracetamol **or** ibuprofen in children with fever who appear distressed.
- Do not give both agents simultaneously; only consider alternating agents if distress persists or recurs before the next dose is due (we discuss why in the FAQs).

**Specific safety netting advice**
We need to be a bit more specific than ‘come back if you are concerned…’

Parents who are caring for their child at home should seek further medical advice if:
- The child has a fit.
- The child develops a non-blanching rash.
- The child is less well than when they previously sought advice.
- The fever lasts longer than 5d.
- The parent is concerned that they are unable to look after their child.

**FAQs from NICE guidance on fever**

**Why is heart rate now included in the traffic light table?**
Three prospective observational studies have been published since the 2007 NICE guideline which specifically looked at the relationship between heart rate and the risk of serious illness. They found that:
- The risk of serious bacterial infection increased with higher heart rate centiles.

The studies used cut-offs for tachycardia in line with those used in Advanced Paediatric Life Support (APLS).
Taking account of this evidence, NICE has now included these cut-offs in its traffic light system.

**Doesn't fever increase heart rate?**
Yes but… NICE reviewed the three available studies that have specifically addressed this question. The studies were based in A&E and primary care populations. They showed similar results:
- For every 1°C increase in temperature, heart rate increases by about 10bpm.

However, the one study that looked at correcting heart rate for temperature (Arch Dis Child 2011;96:6) had less diagnostic predictive power than either temperature or heart rate alone, so in practice we should take the heart rate at face value.

**Why not paracetamol and ibuprofen together?**
NICE concluded that neither paracetamol nor ibuprofen were better than the other, and that combined therapy should not be routinely used because there was:
- Increased risk of adverse reactions, particularly if the child is dehydrated.
- Increased risk of confusion and overdosing.
- No evidence of clinically significant benefit in terms of child distress.

It also acknowledges the increased NHS costs of dual prescribing of paracetamol and ibuprofen for febrile illness, and recommends that if a prescription is to be issued, it should be for one agent or the other.

However, in the 2013 guidance, NICE does acknowledge the findings of the PITCH study, a small UK-based RCT of children with fever randomised to paracetamol, ibuprofen or both (BMJ 2008;337:a1302). This study showed:
- Ibuprofen or combined therapy were equally good at reducing fever after the first dose, and better than paracetamol alone.
- Ibuprofen or combined therapy were better at keeping temperature down in the first 4h than paracetamol alone.
• Combined therapy was better than ibuprofen or paracetamol alone at keeping fever away in the first 24h.
• There was no difference in adverse reactions between the three groups.
• Importantly though, there were no differences in discomfort scores in the first 48h.
So, ibuprofen or combined therapy may be a bit more effective at bringing and keeping fever down, but no different at relieving discomfort.
Cochrane is in the process of completing a formal meta-analysis to answer this question.

We can share this with parents and allow them to choose their preferred agent, reserving combined therapy only for those children where either agent alone does not relieve distress.

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Feverish illness in children: NICE guidance

• Assessing fever: in children <4w old, use an axillary digital thermometer; in older children, axillary digital or chemical dot thermometers or infra-red tympanic monitors are acceptable.
• Take seriously parental reports of fever.
• Measure and record temperature, heart rate, respiratory rate and capillary refill time.
• Recognise that children with tachycardia are of at least intermediate risk:
  ○ <12m: >160bpm.
  ○ 12–24m: >150bpm.
  ○ 2–5y: >140bpm.
• Look for a source of the fever, and treat or refer as appropriate.
• Remember to have a low threshold for checking urine.
• Risk-stratify children as per the traffic light table.
• If seeing face to face, refer children with red features for urgent paediatric assessment.
• If assessing remotely, ensure children with red but not life-threatening features are seen for face-to-face assessment within 2h.
• Do not prescribe antibiotics for children with fever without a source.
• Advising parents on antipyretic interventions:
  ○ Remind parents that antipyretics do not prevent febrile convulsions and should only be used to relieve distress.
  ○ Recommend paracetamol or ibuprofen.
  ○ Only consider alternating these agents if distress persists or recurs before the next dose is due.
  ○ A small well-designed study showed that ibuprofen (or a combination of ibuprofen and paracetamol) is more effective than paracetamol alone at getting and keeping fever down. However, there was no difference in discomfort between groups.

Print out a colour copy of the NICE traffic light system for your GP ST room, duty doctor or nurse triage room; in fact, go the whole hog – how about one for each consulting room!

Audit 20 febrile illness consultations – how many included documented pulse, respiratory rate, CRT and temperature? Discuss these guidelines at your PHCT meeting and re-audit 1m later.

My notes
## Emergency drugs – page 1 of 4

For the IN-HOURS GP emergency bag (not for OOH services). The DTB suggest the following as a starting point. Which of these you choose to carry depends on the environment you work in, the drugs available to local paramedics and the proximity of your nearest hospital (DTB 2015;54(5):56 & BNF).

### ADULTS

#### DILUENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water for injection</td>
<td>Most of the drugs listed below come as solutions. Where they don’t, we have given you the diluent specified in the SPC.</td>
</tr>
<tr>
<td>Sodium chloride 0.9% for injection</td>
<td></td>
</tr>
</tbody>
</table>

#### ACUTE CORONARY SYNDROME

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin 300mg tablets</td>
<td>Give 300mg orally as a single dose, unless known allergy.</td>
</tr>
<tr>
<td>GTN 400mcg sublingual spray</td>
<td>1–2 puffs every 3–5 min. Maximum 3 doses in 15 min. If this fails to relieve pain consider giving an opioid analgesia (with cover for nausea and vomiting) (doses for these below).</td>
</tr>
</tbody>
</table>

#### ANAPHYLAXIS

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenaline 1 in 1000 (1mg/ml) as ampoule or pre-filled 500mcg pen (e.g. Mini-Jet NOT Epipen)</td>
<td>Give 0.5mg/500mcg intramuscularly. Do NOT give adrenaline intravenously in anaphylaxis.</td>
</tr>
<tr>
<td>Chlorphenamine 10mg/ml for injection (= chlorpheniramine)</td>
<td>Give 10mg intramuscularly or slowly intravenously over 1 min. Can be given after initial resuscitation. Use SODIUM CHLORIDE 0.9% for injection as diluent.</td>
</tr>
<tr>
<td>Hydrocortisone 100mg for injection (Efcorisol is pre-mixed*)</td>
<td>Give 200mg (2 ampoules) intramuscularly or slowly intravenously. Can be given after initial resuscitation.</td>
</tr>
</tbody>
</table>

#### ASTHMA

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salbutamol pMDI inhaler with large volume spacer</td>
<td>Give 4 puffs followed by a further 2 puffs every 2 min up to a maximum of 10 puffs. Can be repeated 10–20 min later if needed. Remember it is 5 gentle tidal breaths/puff. Shake inhaler before each puff.</td>
</tr>
<tr>
<td>Salbutamol nebulés</td>
<td>Alternative to inhaler. Dose 2.5–5mg. Ideally drive nebuliser with oxygen. <strong>If severe/life threatening asthma:</strong> consider continuous nebulised salbutamol.</td>
</tr>
<tr>
<td>Ipratropium nebulés</td>
<td>Use combined with nebulised salbutamol if poor response to initial dose of nebulised salbutamol or if life-threatening asthma. Dose 500mcg (0.5mg).</td>
</tr>
<tr>
<td>Oxygen</td>
<td>High flow via close fitting face mask/nasal cannula. Give if saturations &lt;94%. Increase flow to keep sats 94–98%.</td>
</tr>
<tr>
<td>Prednisolone 5mg tablets or intravenous hydrocortisone</td>
<td>Give 40–50mg prednisolone orally or hydrocortisone 100mg iv (Efcorisol is pre-mixed*).</td>
</tr>
</tbody>
</table>

#### HYPOGLYCAEMIA

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick acting carbohydrate (e.g. Glucogel, dextrogel)</td>
<td>Give one tube. After any treatment for hypoglycaemia, if admission is not indicated, give oral carbohydrate (e.g. toast +/- jam) when patient recovers and make sure they are left in the care of a responsible adult who can look out for relapse.</td>
</tr>
<tr>
<td>Glucagon for injection</td>
<td>Give 1 mg by intramuscular or subcutaneous injection. Use if impaired consciousness or unable to take oral glucose.</td>
</tr>
<tr>
<td>Glucose 20% 50ml for injection</td>
<td>If no response to glucagon after 10 min give 50ml of 20% glucose into a large bore vein – very irritant.</td>
</tr>
</tbody>
</table>

#### HYPO-ADRENALISM

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocortisone 100mg for injection (Efcorisol is pre-mixed*)</td>
<td>Presents with vomiting, hypotension and shock in someone who has abruptly stopped oral steroids (especially if unwell with intercurrent illness). Give 100mg intramuscularly or slowly intravenously.</td>
</tr>
</tbody>
</table>

#### PULMONARY OEDEMA

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furosemide 10mg/ml</td>
<td>Give 40mg intravenously over 10 min. Relieve cardiac pain if present (sublingual nitrates, opioids). Alternative: oral furosemide 40mg.</td>
</tr>
</tbody>
</table>

**NOTE:** there are 2 forms of hydrocortisone for injection: both can be used for all the indications listed here. Doses are identical and price differences negligible. Solu-cortef (hydrocortisone sodium succinate) comes as a powder to be mixed with water before use, whereas Efcorisol (hydrocortisone sodium phosphate) comes in solution ready to use. It would seem sensible to carry the pre-mixed Efcorisol in an emergency bag. (Note that iv administration can cause paraesthesia and pain, often perianally.)
Emergency drugs – page 2 of 4

For the IN-HOURS GP emergency bag (not for OOH services). The DTB suggest the following as a starting point. Which of these you choose to carry depends on the environment you work in, the drugs available to local paramedics and the proximity of your nearest hospital (DTB 2015;54(5):56 & BNF).

MENINGITIS

Benzylpenicillin
600mg for injection
Give by intravenous or slow intramuscular injection. If given intramuscularly, give as proximally as possible to an area that is still warm (suggests better perfusion) (e.g. deltoid). For suspected bacterial meningitis or meningococcal sepsis WITH RASH. (NICE do not recommend giving if meningitis without rash unless delay in getting to hospital (NICE 2012, CG102)).

Use WATER FOR INJECTION as diluent – at least 4ml for 600mg and at least 8ml for 1200mg (risk of sodium overload in renal/half failure if diluted with 0.9% sodium chloride).

Cefotaxime
1g for injection
Give 1g intravenously over 3–5min. Use if definite penicillin ANAPHYLAXIS (not just a rash).

Use WATER FOR INJECTION as diluent.

NAUSEA AND VOMITING

Cyclizine
50mg/ml for injection
Give 50mg by intravenous or intramuscular injection. Not recommended in those with acute coronary syndrome (causes peripheral vasocostriction). Not recommended in heart failure.

Metoclopramide
5mg/ml for injection
Give 10mg intramuscularly or by slow intravenous injection (over 3min). Can cause oculogyric crisis especially in young and elderly. Reverse with procyclidine (see below).

Prochlorperazine
12.5mg/ml for injection
Give 12.5mg by deep intramuscular injection. Can cause oculogyric crisis especially in young and elderly. Reverse with procyclidine (see below).

Procyclidine 5mg/ml injection
(NB not an antiemetic: use for oculogyric crisis caused by anti-emetics)
To reverse oculogyric crisis triggered by metoclopramide or prochlorperazine (sustained maximum, usually upward, deviation of eyes). Give 5–10mg intravenously or intramuscularly. Usually takes 5–10min to work, but may take as long as 30min.

OPIOID OVERDOSE

Naloxone
400mcg/ml for injection
Give 400–2000mcg intravenously, repeating every 2–3min to a maximum of 10mg. Most only need 400–800mcg (1–2 ampoules). Best given intravenously. May be given subcutaneously or intramuscularly but slower response times.

PAIN

Paracetamol, ibuprofen, codeine
For mild to moderate pain.

Diclofenac
(injection/suppository)
Give 75mg intramuscularly or 100mg suppository.

Diamorphine
2.5–10mg for injection
Always give with an anti-emetic. Controlled drug regulations apply.

Use WATER FOR INJECTION as diluent.

Acute coronary syndrome: 5mg by slow intravenous injection. Further 2.5–5mg if needed.

Acute pulmonary oedema: 2.5–5mg by slow intravenous injection.

Acute pain: 5mg by intramuscular or subcutaneous injection, increased to up to 10mg in heavier patients. Half to a quarter dose if given intravenously for pain.

PALLIATIVE CARE

Hyoscine butylbromide
20mg/ml
Give 20mg subcutaneously. For bowel colic and excessive respiratory secretions.

Use SODIUM CHLORIDE 0.9% for injection as diluent.

Do NOT confuse with HYOSCINE HYDROBROMIDE: same indications, very different doses.

Midazolam 2mg/ml
Give 2.5–5mg subcutaneously for restlessness or mild agitation. For seizures, see below.

Dexamethasone 2mg tablets
Spinal cord compression: give 16mg stat and admit. Early use may save cord function.

Superior vena cava obstruction: 8–12mg daily.

SEIZURES

Midazolam oromucosal solution
5mg/ml
Give 10mg for buccal absorption.

Diazepam rectal solution
10mg in 2.5mls
An alternative to buccal midazolam.

Give 10–20mg rectally (10 mg in elderly) repeated once after 10–15min if needed.

Add other adult drugs you like to carry here:
Emergency drugs – page 3 of 4

For the IN-HOURS GP emergency bag (not for OOH services). The DTB suggest the following as a starting point. Which of these you choose to carry depends on the environment you work in, the drugs available to local paramedics and the proximity of your nearest hospital (DTB 2015;54(5):56 & BNF).

CHILDREN

ANAPHYLAXIS

Adrenaline 1 in 1000 (1mg/ml)

Give intramuscularly. Monitor the patient as soon as possible to see response to adrenaline (BP, pulse, O₂ saturations, ECG). Do NOT give adrenaline intravenously in anaphylaxis.

IMPORTANT: if any asthma-like symptoms present, treat as per acute asthma as well.

Chlorphenamine 10mg/ml for injection (= chlorpheniramine)

Give intramuscularly or if giving intravenously give slowly over 1min. Can be given after initial resuscitation.

Use SODIUM CHLORIDE 0.9% for injection as diluent.

Hydrocortisone 100mg for injection (Efcortesol is pre-mixed*)

Give intramuscularly or slowly intravenously. Can be given after initial resuscitation.

**ADULTS**

<table>
<thead>
<tr>
<th>Adrenaline 1:1000 (1mg/ml)</th>
<th>Chlorphenamine</th>
<th>Hydrocortisone</th>
</tr>
</thead>
<tbody>
<tr>
<td>150mcg (0.15ml)</td>
<td>250mcg/kg (max 2.5mg)</td>
<td>25mg</td>
</tr>
<tr>
<td>150mcg (0.15ml)</td>
<td>2.5mg</td>
<td>50mg</td>
</tr>
<tr>
<td>300mcg (0.3ml)</td>
<td>5mg</td>
<td>100mg</td>
</tr>
<tr>
<td>500mcg (0.5ml)</td>
<td>10mg</td>
<td>200mg</td>
</tr>
</tbody>
</table>

<6m  6m – 6y  6–12y  12y and over

<table>
<thead>
<tr>
<th>Adrenaline 1:1000 (1mg/ml)</th>
<th>Chlorphenamine</th>
<th>Hydrocortisone</th>
</tr>
</thead>
<tbody>
<tr>
<td>150mcg (0.15ml)</td>
<td>250mcg/kg</td>
<td>25mg</td>
</tr>
<tr>
<td>150mcg (0.15ml)</td>
<td>(max 2.5mg)</td>
<td>50mg</td>
</tr>
<tr>
<td>300mcg (0.3ml)</td>
<td>5mg</td>
<td>100mg</td>
</tr>
<tr>
<td>500mcg (0.5ml)</td>
<td>10mg</td>
<td>200mg</td>
</tr>
</tbody>
</table>

ASTHMA

Salbutamol pMDI inhaler + large volume spacer (+ mask if <3y)

Give 2–10 puffs, one puff at a time. Remember it is 5 gentle tidal breaths/puff. Shake inhaler before each puff.

Prednisolone soluble tablets or use intravenous hydrocortisone

Doses below.

Severe/life-threatening asthma

Oxygen

High flow via close fitting face mask/nasal cannula. Give if saturations <94%. Increase flow to keep sats 94–98%.

Salbutamol nebulised via oxygen

Nebulise children through oxygen (risk of hypoxia if given without oxygen). Dose below.

Ipratropium nebulisers

Use combined with nebulised salbutamol if poor response to initial dose of nebulised salbutamol or if life-threatening asthma.

**ADULTS**

<table>
<thead>
<tr>
<th>Salbutamol nebulised via oxygen</th>
<th>Nebulised ipratropium</th>
<th>Oral prednisolone</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5mg</td>
<td>250mcg</td>
<td>20mg</td>
</tr>
<tr>
<td>5mg</td>
<td>250mcg</td>
<td>30-40mg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydrocortisone 100mg for injection (Efcortesol is pre-mixed*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50mg</td>
</tr>
<tr>
<td>100mg</td>
</tr>
</tbody>
</table>

<2–5y  Over 5y

<table>
<thead>
<tr>
<th>Salbutamol nebulised via oxygen</th>
<th>Nebulised ipratropium</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5mg</td>
<td>250mcg</td>
</tr>
<tr>
<td>5mg</td>
<td>250mcg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydrocortisone 100mg for injection (Efcortesol is pre-mixed*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50mg</td>
</tr>
<tr>
<td>100mg</td>
</tr>
</tbody>
</table>

CROUP

Prednisolone soluble tablets

Give 1–2mg/kg. Single stat dose.

(Alternative: dexamethasone oral solution (150mcg/kg as a single dose) but less portable!)

HYPOGLYCAEMIA

Quick acting carbohydrate (e.g. Glucogel, dextrogel)

Give one tube. After any treatment for hypoglycaemia, if admission is not indicated, give oral carbohydrate (e.g. toast +/- jam) when patient recovers and make sure they are left in the care of a responsible adult who can look out for relapse.

Glucagon for injection

Give by intramuscular or subcutaneous injection. Use if impaired consciousness or unable to take oral glucose.

**ADULTS**

<table>
<thead>
<tr>
<th>Age &lt;8y or &lt;25kg</th>
<th>Age ≥8y or ≥25kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5mg/500mcg</td>
<td>1mg (adult dose)</td>
</tr>
</tbody>
</table>

*NOTE: there are 2 forms of hydrocortisone for injection: both can be used for all the indications listed here. Doses are identical and price differences negligible. Solu-cortef (hydrocortisone sodium succinate) comes as a powder to be mixed with water before use, whereas Efcortesol (hydrocortisone sodium phosphate) comes in solution ready to use. It would seem sensible to carry the pre-mixed Efcortesol in an emergency bag. (Note that iv administration can cause paraesthesia and pain, often perianally.)

Red Whale
### Meningitis

**Benzylpenicillin**  
600mg for injection  
Give by intravenous or slow intramuscular injection. If given intramuscularly, give as proximally as possible to an area that is still warm (suggests better perfusion) (e.g. deltoid). For suspected bacterial meningitis or meningococcal sepsis WITH RASH. *(NICE do not recommend giving if meningitis without rash unless delay in getting to hospital (NICE 2012, CG102)).*

**Use WATER FOR INJECTION as diluent** – at least 4ml for 600mg and at least 8ml for 1200mg (risk of sodium overload in renal/heart failure if diluted with 0.9% sodium chloride).

<table>
<thead>
<tr>
<th>Age &lt;1y</th>
<th>Age 1–9y</th>
<th>Age ≥10y</th>
</tr>
</thead>
<tbody>
<tr>
<td>300mg</td>
<td>600mg (1 ampoule)</td>
<td>1200mg (2 ampoules) (adult dose)</td>
</tr>
</tbody>
</table>

**Cefotaxime**  
1g for injection  
Give intravenously over 3–5min. Use if definite penicillin ANAPHYLAXIS (not just a rash).  
**Use WATER FOR INJECTION as diluent.**

<table>
<thead>
<tr>
<th>Age &lt;12y</th>
<th>Age ≥12y</th>
</tr>
</thead>
<tbody>
<tr>
<td>50mg/kg</td>
<td>1g (adult dose)</td>
</tr>
</tbody>
</table>

### DEHYDRATION in Diarrhoea and Vomiting

**Oral rehydration salts**  
Age 1m – 1y: 1–1.5 × usual feed volume (hard to assess if breast-fed!) after each loose stool.  
Age 1–12y: 200ml after each loose stool.

### Opioid Poisoning

**Naloxone**  
400mcg/ml for injection  
Best given intravenously. May be given subcutaneously or intramuscularly but slower response times. *(Doses from BNFc, for poisoning.)*

<table>
<thead>
<tr>
<th>Age 1m – 12y</th>
<th>Age 12–18y</th>
</tr>
</thead>
<tbody>
<tr>
<td>100mcg/kg (maximum 2mg). If no response repeat at 1 min intervals to a total maximum dose of 2mg.</td>
<td>Give 400mcg. If no response after 1min give 800mcg and if no response after a further minute give a further 800mcg. If still no response give 2mg (4mg may be required in a seriously poisoned patient).</td>
</tr>
</tbody>
</table>

### Pain

**Paracetamol (oral, rectal)**  
Up to 3m doses are given every **8h**.  
After 3m doses can be given 4–6-hourly for all other ages, but no more than 4 doses in 24h.

<table>
<thead>
<tr>
<th>1–3m</th>
<th>3m – 1y</th>
<th>1–5y</th>
<th>5–12y</th>
<th>12–18y</th>
</tr>
</thead>
<tbody>
<tr>
<td>30–60mg every <strong>8h</strong> (maximum 60mg/kg/d)</td>
<td>60–125mg</td>
<td>125–250mg</td>
<td>250–500mg</td>
<td>500mg</td>
</tr>
<tr>
<td>3× a day</td>
<td>4× a day</td>
<td>4× a day</td>
<td>4× a day</td>
<td>4× a day</td>
</tr>
</tbody>
</table>

**Ibuprofen liquid**

<table>
<thead>
<tr>
<th>3–6m</th>
<th>6–12m</th>
<th>1–4y</th>
<th>4–7y</th>
<th>7–10y</th>
<th>10–12y</th>
<th>12–18y</th>
</tr>
</thead>
<tbody>
<tr>
<td>50mg</td>
<td>50mg</td>
<td>100mg</td>
<td>150mg</td>
<td>200mg</td>
<td>300mg</td>
<td>300–400mg</td>
</tr>
<tr>
<td>3× a day</td>
<td>3× a day</td>
<td>3× a day</td>
<td>3× a day</td>
<td>3× a day</td>
<td>3–4× a day</td>
<td>3–4× a day</td>
</tr>
</tbody>
</table>

### Seizures

**Buccal midazolam**  
Preferred first line. Dose may be repeated once after 10min if needed.

<table>
<thead>
<tr>
<th>1–3m</th>
<th>3–12m</th>
<th>1–5y</th>
<th>5–10y</th>
<th>10–18y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3mg/kg (max 2.5mg)</td>
<td>2.5mg</td>
<td>5mg</td>
<td>7.5mg</td>
<td>10mg</td>
</tr>
</tbody>
</table>

**Rectal diazepam**  
An alternative to buccal midazolam. Doses may be repeated once after 10min if necessary.

<table>
<thead>
<tr>
<th>1m – 2y</th>
<th>2–12y</th>
<th>12–18y</th>
</tr>
</thead>
<tbody>
<tr>
<td>5mg</td>
<td>5–10mg</td>
<td>10–20mg</td>
</tr>
</tbody>
</table>
# Acute severe asthma

I have presented this in the form of a protocol. Feel free to photocopy and use in your own practice.

**Mill Stream Surgery ACUTE ASTHMA PROTOCOL for ADULTS (2016)**

*Based on the SIGN/BTS Guidelines (SIGN 2016, 153)*

**Assess severity**

**TREAT EVERY ATTENDANCE WITH AN ASTHMA EXACERBATION AS SEVERE ASTHMA UNLESS PROVEN OTHERWISE.**

Don’t rely on a single sign. Look at the whole picture!

Use percentage predicted of **best** PEFR if available. If not available, use percentage predicted of **predicted** PEFR.

<table>
<thead>
<tr>
<th>MODERATE ASTHMA</th>
<th>ACUTE SEVERE ASTHMA</th>
<th>LIFE-THREATENING ASTHMA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peak flow 50–75% best/predicted</strong></td>
<td><strong>Peak flow 33–50% best/predicted</strong></td>
<td>Any one of the following:</td>
</tr>
<tr>
<td>Sats ≥92%</td>
<td>Sats ≥92%</td>
<td>PEFR &lt;33% best/predicted</td>
</tr>
<tr>
<td>Speech normal</td>
<td>Can’t finish sentence in 1 breath</td>
<td>0₂ sats &lt;92% or cyanosis</td>
</tr>
<tr>
<td>RR&lt;25</td>
<td>RR ≥25/min</td>
<td>Feeble respiratory effort/silent chest</td>
</tr>
<tr>
<td>P&lt;110/min</td>
<td>P ≥110/min</td>
<td>Hypotension or arrhythmia</td>
</tr>
<tr>
<td>No features of severe asthma</td>
<td></td>
<td>Exhaustion/ altered consciousness</td>
</tr>
</tbody>
</table>

**ADMIT IF ANY FEATURES OF SEVERE ASTHMA REMAIN AFTER INITIAL TREATMENT**

NB: people with severe asthma and ≥1 adverse psychosocial factors are at risk of death

Any one of the following:

- PEFR <33% best/predicted
- 0₂ sats <92% or cyanosis
- Feeble respiratory effort/silent chest
- Hypotension or arrhythmia
- Exhaustion/ altered consciousness

**ADMIT IMMEDIATELY**

**Management**

**OXYGEN** to keep 0₂ sats at 94–98%.

**SALBUTAMOL** nebulised or via spacer

Via spacer: 4 puffs via spacer, then 2 puffs every 2min. Max. 10 puffs.

Nebulised: 5mg nebulised via oxygen

In **LIFE THREATENING ASTHMA:**

Use oxygen driven nebulised **SALBUTAMOL WITH IPRATROPIUM.**

Salbutamol: 5mg

Ipratropium: 0.5mg

**Oral PREDNISOLONE** 40–50mg for at least 5d or until recovery.

**ANTIBIOTICS:** only if evidence of infection.

Oxygen not needed.

**SALBUTAMOL:** 4 puffs via spacer, then 2 puffs every 2min. After each puff, take 5 normal (tidal) breaths via spacer. Max. 10 puffs.

**Oral PREDNISOLONE** 40–50mg for at least 5d or until recovery.

**ANTIBIOTICS:** only if evidence of infection.

**Admission?**

Have a lower threshold for admission if:

- Afternoon/evening attack.
- Recent nocturnal symptoms or recent hospital admission.
- Patient unable to assess own symptoms/condition, or concern over social situation.

If admitting: stay until ambulance arrives. Ensure written handover. Repeat nebulisers via oxygen in ambulance.

**MODERATE ASTHMA: Most can go home if improving. Review drugs: is it time to step up? Admit if history of near-fatal asthma.**

**ACUTE SEVERE ASTHMA: Consider admission depending on response to treatment. Admit if features of severe asthma persist after initial treatment.**

**LIFE-THREATENING ASTHMA:**

Arrange immediate admission.

**After an admission**

SIGN/BTS say primary care should be notified within 24h of discharge from A&E or hospital().

**Primary care follow-up within 2 working days of discharge. At review:**

- Check symptoms and peak flow, inhaler technique and understanding of inhalers.
- Step up regular therapy if needed.
- Ensure patient has a written PAAP AND KNOWS HOW TO USE IT.
- Address potentially preventable contributors to admission.
SURGERY ESSENTIALS – ACUTE SEVERE ASTHMA

Mill Stream Surgery ACUTE ASTHMA PROTOCOL for CHILDREN (2016)
Based on the SIGN/BTS Guidelines (SIGN 2016, 153)

Assess severity

If signs and symptoms are scattered across severity criteria, treat according to the most severe symptom.

WARNING: some children with severe asthma do not look distressed, and some clinical signs may be normal

<table>
<thead>
<tr>
<th>MODERATE ASTHMA</th>
<th>ACUTE SEVERE ASTHMA</th>
<th>LIFE-THREATENING ASTHMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>O₂ sats ≥92%</td>
<td>O₂ sats &lt;92%</td>
<td>O₂ sats &lt;92% plus any of:</td>
</tr>
<tr>
<td>Talking normally</td>
<td>Can’t finish sentence in 1 breath or too breathless to talk or feed</td>
<td></td>
</tr>
<tr>
<td>Peak flow ≥50% best/predicted</td>
<td>Using accessory muscles (feel and look)</td>
<td></td>
</tr>
<tr>
<td>Peak flow 33–50% best/predicted</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2–5y | >5y | 2–5y | >5y |
RR ≤40 | RR ≤30 | RR >40 | RR >30 |
P ≤140 | P ≤125 | P >140 | P >125 |

Management

Always nebulise children with oxygen (risk of hypoxia otherwise).

No nebuliser machine? Plug tube from nebuliser ‘pot’ into oxygen cylinder and turn up the flow (usually to above 6L/min)!

Oxygen not needed.

**SALBUTAMOL via SPACER**

2–5y: use spacer & face mask
>5y: use spacer & mouthpiece

1 puff every 30–60sec. After each puff, take 5 normal (tidal) breaths via spacer. Max. 10 puffs.

Consider oral PREDNISOLONE:

Aged 2–5y: 20mg for 3d
Aged >5y: 30–40mg for 3d

**ANTIBIOTICS:** only if evidence of infection.

**OXYGEN** to keep O₂ sats at 94–98%.

**SALBUTAMOL via spacer/nebuliser**

Via spacer: 1 puff every 30–60sec. After each puff, take 5 normal (tidal) breaths via spacer. Max. 10 puffs.

**Nebulised salbutamol:**

Aged 2–5y: 2.5mg salbutamol
Aged >5y: 5mg salbutamol

**Give oral PREDNISOLONE:**

Aged 2–5y: 20mg for 3d
Aged >5y: 30–40mg for 3d

**ANTIBIOTICS:** only if evidence of infection.

**OXYGEN** to keep O₂ sats at 94–98%.

**SALBUTAMOL AND IPRATROPIUM**

Nebulise together every 20min:

Aged 2–5y: 2.5mg salbutamol
Aged >5y: 5mg salbutamol

Ipratropium 0.25mg for all ages

**Give oral PREDNISOLONE:**

Aged 2–5y: 20mg for 3d
Aged >5y: 30–40mg for 3d

**or iv HYDROCORTISONE if vomiting**

Aged 2–5y: 50mg iv
Aged >5y: 100mg iv

**ANTIBIOTICS:** only if evidence of infection.

Admission?

**MODERATE ASTHMA and ACUTE SEVERE ASTHMA:**

Assess response to treatment after 15min:

If poor response, ADMIT: stay with patient until ambulance arrives. Ensure written handover. Repeat nebulisers via oxygen in ambulance.

If good response to treatment, may go home.

Continue salbutamol as needed, but not more than every 4h (if needed more often than this, seek help). Arrange review within 48h.

Have a lower threshold for admission if:

- Late afternoon/evening attack.
- Recent hospital admission or previous admission with severe attack.
- Concern over social situation/ability to cope.

**LIFE-THREATENING ASTHMA:**

Arrange immediate admission.

Stay with patient until ambulance arrives. Ensure written handover. Repeat nebulisers via oxygen in ambulance.

After an admission

Follow up in primary care within 2 working days of discharge. Follow up in paediatric clinic within 1–2m.

Refer to paediatric respiratory specialist if life-threatening features. Consider referral if 2 attacks within 12m.

At review:

- Check symptoms, peak flow, inhaler technique and understanding of inhalers.
- Ensure patient/parent has a written PAAP, AND KNOWS HOW TO USE IT.
- Address potentially preventable contributors to admission.
Anaphylaxis

Here is our practice anaphylaxis protocol. Feel free to photocopy it for your emergency bag. It is based on the Resuscitation Council Guidelines (www.resus.org.uk/pages/reaction.pdf). The issues from this article and the NICE 2011 guidelines are then discussed (CG134, 2011).

Emergency management of anaphylaxis

Possible anaphylactic reaction?

Assess
Airway, Breathing, Circulation, Disability, Exposure

Diagnosis – look for:
- Acute onset of illness AND
- Life threatening Airway/Breathing/Circulation problems AND
- (usually) skin changes

Call for help
- Dial 999, summon other clinicians
- Lay patient down with legs up (what is the evidence for this?)

Administer adrenaline
- Give 1 in 1000 adrenaline intramuscularly
- Inject intramuscularly into mid 1/3rd of anterolateral thigh
- Doses: Adult (>12y): 500mcg = 0.5mls
  Child 6–12y: 300mcg = 0.3mls
  Child <6y: 150mcg = 0.15mls
- Repeat after 5 mins if no better

When skills and equipment available:
- Establish airway
- High flow O₂
- Fluid challenge : iv crystalloid: adult 0.5–1l, child 20mls/kg
- Chlorpheniramine (chlorphenamine) (see below for doses)
- Hydrocortisone (see below for doses)
- Monitor: O₂ sats
  ECG
  BP

Doses for chlorphenamine and hydrocortisone

Both can be delayed until arrival at hospital (Adrenaline doses in box above)

<table>
<thead>
<tr>
<th></th>
<th>Chlorphenamine</th>
<th>Hydrocortisone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult (&gt;12y)</td>
<td>10mg</td>
<td>200mg</td>
</tr>
<tr>
<td>Child 6–12y</td>
<td>5mg</td>
<td>100mg</td>
</tr>
<tr>
<td>Child 6m–6y</td>
<td>2.5mg</td>
<td>50mg</td>
</tr>
<tr>
<td>Child &lt;6m</td>
<td>0.25mg/kg</td>
<td>25mg</td>
</tr>
</tbody>
</table>
How common is anaphylaxis?

- True anaphylaxis is rare: primary care data suggests lifetime prevalence is 1 in 1333.
- Prevalence does seem to be genuinely increasing.
- Rare though it is, anaphylaxis causes considerable anxiety in those affected.

Recognising anaphylaxis

Actually, this is harder than it seems. Studies suggest many people with genuine anaphylaxis may not be recognised, while those with panic attacks or vasovagal fants are misdiagnosed as having anaphylaxis. Look for the following, as these criteria support the diagnosis of anaphylaxis:

- **Sudden onset and rapid progression of symptoms**

  **AND**

- **Life-threatening Airway and/or Breathing and/or Circulatory problems**

  **AND**

- **Skin and/or mucosal changes (flushing, urticaria, angioedema)** (although these may be subtle or absent in up to 20%).

Also note:

- A trigger may or may not be identified.
- Gl symptoms (vomiting, abdominal pain, faecal incontinence) may also occur.
- Skin or mucosal changes alone (e.g. lip swelling without airway/breathing/circulatory problems) are not sufficient to diagnose anaphylaxis.

What triggers anaphylaxis?

- The commonest triggers are foods, drugs and venoms (e.g. wasp stings), although it is important to note that in many cases no trigger is identified.
- Nuts are the most common food triggers.
- Antibiotics, NSAIDs, aspirin and muscle relaxants (for all you budding anaesthetists!) are the commonest drug triggers.
- Food reactions are more common in children, while drug reactions are more common in adults.

Death from anaphylaxis

This is, of course, what everyone fears, but what are the statistics?

- At least 20 people die each year in the UK from anaphylaxis, but this may be a significant underestimate. However, mortality from anaphylaxis is around 1%, so most survive an episode of anaphylaxis.
- Death is more likely in those with poorly controlled asthma, or in asthmatics who fail to use adrenaline early when developing anaphylaxis.
- Case studies suggest shock and collapse occur within 10–15min for stings, whereas for foods it often occurs after 30–35min. After intravenous administration of drugs, death may occur much more quickly (within 5min).
- Deaths never occur more than 6h after contact with a trigger.

Assessing someone with suspected anaphylaxis

The ABCDE approach is now taught as a tool to assess seriously ill/injured patients in a variety of settings, including anaphylaxis. If you want detailed information on this, please refer to Appendix 1 (pages 39 & 44) of the Resuscitation Council’s Guidance on anaphylaxis.
Here is a brief overview of the features to look for in anaphylaxis:

<table>
<thead>
<tr>
<th>Airway</th>
<th>Swelling of throat/tongue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Difficulty breathing</td>
</tr>
<tr>
<td></td>
<td>Difficulty swallowing</td>
</tr>
<tr>
<td></td>
<td>Feels throat closing up</td>
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<tr>
<td></td>
<td>Hoarse voice</td>
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<tr>
<td></td>
<td>Stridor</td>
</tr>
<tr>
<td>Breathing</td>
<td>Tachypnoea</td>
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<tr>
<td></td>
<td>Wheeze</td>
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<tr>
<td></td>
<td>Fatigue</td>
</tr>
<tr>
<td></td>
<td>Hypoxic confusion</td>
</tr>
<tr>
<td></td>
<td>Cyanosis</td>
</tr>
<tr>
<td></td>
<td>Respiratory arrest</td>
</tr>
<tr>
<td>Circulation</td>
<td>Pale, clammy</td>
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<tr>
<td></td>
<td>Tachycardia</td>
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<tr>
<td></td>
<td>Hypotension</td>
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<tr>
<td></td>
<td>Reduced consciousness</td>
</tr>
<tr>
<td></td>
<td>Cardiac arrest</td>
</tr>
<tr>
<td>Disability (neurological status)</td>
<td>Confusion or agitation</td>
</tr>
<tr>
<td></td>
<td>Reduced consciousness</td>
</tr>
<tr>
<td>Exposure (assess skin and mucosa)</td>
<td>Redness</td>
</tr>
<tr>
<td></td>
<td>Urticaria</td>
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<tr>
<td></td>
<td>Angioedema (swelling of deeper tissues)</td>
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</tbody>
</table>

Important drug-related notes from the algorithm

- **Adrenaline should be given early: do not delay.**
- **Adrenaline should be given intramuscularly** unless you are experienced in administering it intravenously. Why? The intramuscular route is safer, easier and allows a greater margin for error. The following are recommended to ensure intramuscular delivery:
  - Use a blue needle in all except very small infants (use orange instead).
  - Inject at 90° to the skin. Stretch, don’t pinch, the skin.
- **Adrenaline will work less well (and may be ineffective) in those on beta-blockers**, BUT **do not** give higher doses of adrenaline to those on beta-blockers who develop anaphylaxis. The decision to start a beta-blocker in those at risk of allergy should be carefully weighed up. Glucagon (to treat anaphylaxis in those on beta-blockers) should be reserved for ITU use only.
- **Antihistamines and steroids should only be given after initial resuscitation.** Evidence for use of H1 antihistamines in anaphylaxis is weak, and they are unlikely to be lifesaving if used alone. However, they may reduce bronchoconstriction and vasodilatation.

What is the relationship between asthma and anaphylaxis?

In those with asthma, anaphylaxis can present with a spectrum of typical anaphylaxis symptoms, to a mixture of anaphylaxis and asthma, through to pure asthma without anaphylaxis symptoms.

- **If pure asthma symptoms are present, manage according to the BTS guidelines for life-threatening asthma; otherwise, manage as for anaphylaxis.**

Who should have an autoinjector? Who should be referred to an allergy specialist?

All patients with anaphylaxis should be referred to a specialist allergy clinic (for a list of NHS allergy clinics nationwide see www.bsaci.org). The allergy specialist will decide who would benefit from an autoinjector, but, basically, patients with idiopathic anaphylaxis or with a known trigger that is difficult to avoid (venoms, some foods) should have an autoinjector; patients with reactions to drugs should not.
Patients using an autoinjection should be told to call an ambulance if the autoinjector is ever used, even if symptoms are improving (Drug Safety Update 2014;7(10):A2).

**How many autoinjectors should patient have?**

'It is important that the device is available at all times and paradoxically a carefree attitude may develop if multiple devices are prescribed.' Resuscitation Council, March 2008.

The MHRA recommends people are prescribed and carry with them 2 autoinjectors at all times. The second should be administered 5–15min after the first, *if the person is not starting to recover* (Drug Safety Update 2014;7(10):A2).

**A few notes about autoinjectors...**

- Autoinjectors are available in two strengths: 0.15mg/150mcg and 0.3mg/300mcg. The 0.3mg strength should be used for those aged 6y and over. Note that the adrenaline strength in the 0.15mg devices is 1 in 2000. This is because the device injects the same fluid volume as the 0.3mg device, but uses half strength adrenaline to deliver the correct dose.

- The different devices available are operated differently, so make sure the patient knows how to use one, and then always prescribe the same one!

- Note that the adrenaline doses suggested for administration by health professionals are higher than those in an autoinjector.

**Should GPs carry autoinjectors in their emergency bag?**

GPs should NOT carry autoinjectors in their emergency bags because we should use higher doses of adrenaline (500mcg not the 300mcg in autoinjectors). That means carrying an ampoule of 1 in 1000 (1mg/ml adrenaline) or using a prefilled device like a Minijet. However, the prefilled devices are suitable for ADULTS only, so it may be easier to carry an ampoule and draw up the dose required for the age of the patient affected.

**Is there a test to confirm a patient has had an anaphylactic reaction?**

Mast cell tryptase can be measured after the patient has been stabilised if a suspected anaphylactic reaction has taken place. Plasma levels peak at 0.5–1.5h and drop rapidly thereafter, returning to normal within 6–8h. Three timed samples are needed. The first should be sent as soon as the patient is stable, the second 1–2h after onset and the third 24h after onset. **Never delay resuscitation in order to obtain the blood sample!!**

**Should antihistamines be used to treat anaphylaxis?**

This remains an area of clinical uncertainty. This BMJ article (BMJ 2009;339:b2489) points out that there have been no RCTs which assess whether using antihistamines is beneficial. International guidelines differ, with the USA and UK guidance recommending antihistamines as a second line treatment after adrenaline and resuscitation. Australian guidelines recommend that antihistamines should not be used.

The authors remind us that there is no evidence to suggest that antihistamines in conventional dosage are able to counteract the massive histamine release in anaphylaxis. They have a negligible effect on blood pressure, bronchospasm and gastrointestinal side-effects, but may relieve minor skin irritation. Injectable first generation antihistamines can provoke arrhythmias such as long QT syndrome and torsades de pointe in susceptible individuals. Newer antihistamines are only available orally. All can give cholinergic side-effects.

The authors conclude that we should keep it simple – the first priority should be administration of adrenaline. In the absence of evidence of benefits, antihistamines should be reserved to treat cutaneous symptoms, if used at all.

**Do patients need to be admitted?**

Yes, because following an anaphylactic reaction, patients need to be observed for at least 6h. Those with a slower onset of action may need 24h observation. All patients must be warned that there is a theoretical biphasic nature to anaphylaxis, and to look out for recurrence of symptoms.

It is recommended that patients take antihistamines and oral steroids for 3d to reduce urticaria and the risk of relapse. Steroid doses are not specified, but consensus seems to be for between 30 and 60mg of prednisolone daily.
After an episode of anaphylaxis, patient/family education is crucial. They must:

- Know what they are allergic to.
- Know what that allergen may be found in and how to avoid it.
- Know how to recognise symptoms early.
- Know how to summon help.
- Know how to use an autoinjector and to carry it at all times.
- Consider using a MedicAlert bracelet.

**Anaphylaxis**

- Anaphylaxis is rare but a source of significant anxiety to patients and their families.
- Consider the diagnosis if:
  - Sudden onset and rapid progression of symptoms
  - AND life-threatening Airway and/or Breathing and/or Circulatory problems
  - AND Skin and/or mucosal changes (flushing, urticaria, angioedema).
- Foods, drugs and venom are the commonest causes.
- Deaths are rare, but are more likely in those with poorly controlled asthma or those with asthma who fail to use adrenaline early on.
- Assess patients with suspected anaphylaxis using the ABCDE system.
- Get help early.
- Administer adrenaline early.
- There is no evidence of a beneficial role for antihistamines.
- Patients should be prescribed 2 autoinjectors to carry at all times. An ambulance should be called if the device is EVER used.

When did you last run a scenario in your surgery so you could practise your resuscitation skills? This is a great way to test out whether you really do know where the emergency drugs are kept, how exactly you turn on the oxygen cylinder, etc.

Do you carry ampoules of adrenaline or an EpiPen in your emergency kit?
Do you have any patients with anaphylaxis on a beta-blocker? (Search for those with an adrenaline autoinjector and a beta-blocker.) Could the beta-blocker be changed to something else?

**For professionals:**

For a list of NHS allergy clinics nationwide see [www.bsaci.org](http://www.bsaci.org)

**For patients and professionals:**

Anaphylaxis Campaign is the charity for people with anaphylaxis. Its website contains advice for children, teenagers and adults. There’s a section for health professionals, including a brief video on using autoinjectors: [www.anaphylaxis.org.uk](http://www.anaphylaxis.org.uk)

**For schools and school nurses:**

[www.anaphylaxis.org.uk/schools/schools-help/](http://www.anaphylaxis.org.uk/schools/schools-help/) is also by Anaphylaxis Campaign, and is dedicated to managing anaphylaxis risk in schools. It has information for parents, pupils and staff.

[www.medicalconditionatschool.org.uk](http://www.medicalconditionatschool.org.uk) is written by leading charities as a resource for school nurses (it covers asthma, epilepsy, cystic fibrosis and diabetes, as well as anaphylaxis).

**My notes**
Oxygen use in a medical emergency

The BTS produced guidance on the use of oxygen in emergency situations in 2008. However, it doesn’t seem to have percolated down to primary care. Because it challenges many assumptions, we have summarised it here. Take note if you carry an oxygen cylinder in your emergency bag!

- In many situations, O2 should only be given if the patient is hypoxic. (This guidance assumes you have a pulse oximeter to assess hypoxia!)
- Normal oxygen sats should be in the range 94–98%, although in elderly people, even when well, they may be lower than this.

<table>
<thead>
<tr>
<th>Life-threatening situations</th>
<th>Most other conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>In primary care, the main scenarios are:</td>
<td>I’ve listed the commonest seen in primary care:</td>
</tr>
<tr>
<td>Resuscitation/arrest</td>
<td>Acute asthma</td>
</tr>
<tr>
<td>Shock</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>Sepsis</td>
<td>Lung cancer</td>
</tr>
<tr>
<td>Also applies to:</td>
<td>Acute heart failure</td>
</tr>
<tr>
<td>Major trauma</td>
<td>MI and ACS</td>
</tr>
<tr>
<td>Near drowning</td>
<td>Stroke (O2 may be harmful if not hypoxic)</td>
</tr>
<tr>
<td>Pulmonary haemorrhage</td>
<td>Sickle cell crisis</td>
</tr>
<tr>
<td>Major head injury</td>
<td>Pregnancy/obstetric crises</td>
</tr>
<tr>
<td>Carbon monoxide poisoning</td>
<td>Most poisonings (but in carbon monoxide poisoning, give high-flow O2)</td>
</tr>
<tr>
<td>Give high-flow oxygen to all</td>
<td>Give O2 only if hypoxic. Moderate-flow only</td>
</tr>
<tr>
<td>15l/min via face mask with reservoir</td>
<td>5–10l/min via simple face mask</td>
</tr>
<tr>
<td>Aim for target O2 sats of 94–98%</td>
<td>Aim for target sats of 94–98%</td>
</tr>
</tbody>
</table>

How to remember this?

I think this can be simplified to:

- **Life-threatening situations** (left hand column): arrest/shock/sepsis: high-flow O2.
- **Everyone else:** moderate flows of oxygen ONLY if hypoxic.

Why might too much oxygen be a bad thing?

Too much oxygen is associated with a number of problems:

- Coronary vasoconstriction.
- Reduced cardiac output.
- Release of chemically reactive oxygen molecules that can actually damage tissues.
- Small areas of lung collapse (absorption atelectasis).

None of these things are desirable in an acutely unwell patient!

Oxygen in COPD

We have always been cautious about oxygen use in COPD because of concerns that hyperoxia may depress ventilatory drive and/or worsen ventilation perfusion mismatch. This was thought to be mainly with longer-term use, and high-dose oxygen in acute severe disease was, at one stage, encouraged. However, evidence is emerging that even in emergency pre-hospital settings (e.g. primary care while waiting for an ambulance), high-flow oxygen may be harmful.

The study was done in Australia, using people with presumed acute exacerbations of COPD being transported to hospital by paramedics. Here I’ll discuss the results of the 200 people with confirmed COPD, not those who later turned out not to have COPD. Patients were randomised either to titrated oxygen (to achieve oxygen sats of 88–92%) or high-flow oxygen (the control arm). Arterial blood gases were taken on arrival at hospital (BMJ 2010;341:c5462).

- Mortality was significantly lower in the group which received titrated oxygen.
- Mortality rates were 9% (11 people) in those on high-flow oxygen (control group) and 2% (2 deaths) in the titrated group. That’s a 7% reduction in mortality and is statistically significant.
• Those titrated according to oxygen sats were also significantly less likely to have respiratory acidosis and hypercapnia.
• The BTS recommends aiming for sats of 88–92% unless seriously ill, using oxygen at 28% (4l/min) via a Venturi mask (the one with coloured ends controlling flow). If sats persist below 88% on this, change to a simple mask at 5l/min.
• In reality, I suspect most GPs don’t carry Venturi masks, so use 4l/min to start, and titrate flow to achieve sats of 88–92%.

So what does this mean in practice?

• You need a pulse oximeter (we tie ours to the oxygen cylinder – but make sure you don’t send it back to BOC when the cylinder is empty as they are costly to replace!).
• Make sure you have both simple masks and reservoir masks.
• Stop and think before giving high-flow oxygen to all.
• But continue to use high-flow oxygen in life-threatening situations.
• Use oxygen judiciously in COPD: even in acute severe exacerbations, high-flow oxygen may be harmful.

<table>
<thead>
<tr>
<th>Oxygen in emergencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guidance from the British Thoracic Society changes the way we think about O₂.</td>
</tr>
<tr>
<td>Use high-flow oxygen in life-threatening emergencies.</td>
</tr>
<tr>
<td>Use low-flow and titrate according to sats in those with respiratory conditions including COPD.</td>
</tr>
<tr>
<td>In most other situations, including cardiovascular emergencies, give oxygen only if the patient is hypoxic.</td>
</tr>
</tbody>
</table>

Do you have a pulse oximeter? Do all the clinical staff know how to use it and what target sats you are aiming for in an emergency?

My notes
We are pleased to announce that we are working in association with MyLocumManager, an online accounting toolkit that takes care of all your Locum admin. Whether you work as a sole trader or limited company it will save you time, stress and money.

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