MBChB Year 2 Clinical contact in GP – Body defence

Context for the session

The Intended Learning Outcomes are:

- Describe how common infections present
- Gather a focused history in a patient with symptoms of an infection
- Define infection "red flags" including the presentation of sepsis
- Identify the key elements of the systems review
- Demonstrate an approach the clinical examination (WIPER)
- Assess and document vital signs including pulse, respiratory rate oxygen saturations, temperature and blood pressure (including calculating the NEWS2 score)
- Describe how to use an otoscope to look in the ears and throat

Students will have covered the following in the two-week body defence block:

In **Case-Based Learning** they have will considered and compared the cases of an 18-year-old woman who develops a severe allergic reaction and an older man with tongue swelling. Students will consider the role of immunoglobulins, mast cells and histamines; types of hypersensitivity reactions and angioedema; and how adrenaline, chlorphenamine, and steroids work.

In **lectures, workshops and practical** they will learn about:

- Inflammation, healing and repair
- Types of immunity (antibodies and T-cells)
- Virology
- Microbiology – types of bacteria, bacterial structure, normal human flora vs pathogens and host-microbe interactions.
- Immune system histology
- When things go wrong: Allergies and hypersensitivity, immunodeficiency and autoimmunity
- Antimicrobials and resistance
- Viral pandemics (focus on influenza) and impact on health economics, global and public health

In their **Effective Consulting** lab session, they will learn how to:

- Compare the difference between a differential diagnosis and a problem list
- Describe common cognitive biases that can result in diagnostic error
- Discuss strategies to keep a consultation on track (*Communication challenge;* the talkative patient)

Specifics for Body Defence in GP clinical contact

Session structure and format

Please refer to the:

- GP Clinical contact handbook, for generic information and advice on how to structure and deliver each session.

- accompanying “session plan”, as a guide on how to use your time with your group

Specifically for this session, start by:

- Briefly meet each student 1:1, to identify any individual issues that you need to be aware of
- Getting the group to introduce themselves – do not assume they know each other (but we try to avoid “orphan” students)
- Establishing group rules and agree how to work together as a group, e.g. punctuality, keeping each other confidence’s, etc.

During the session:

- Use the below information on history and examination, given to students for this session, to support interactions with patients and small group discussion.
- Demonstrate/observe history taking, summarising, and clinical skills including those relevant to someone with an infection: measuring pulse, BP, temperature; and using a pulse oximeter and otoscope.

(Expert) patients

Ideal patients for the block are some who has had:

- previous serious or recurrent infection(s)
- an allergic (including anaphylactic) reaction

Scene setting

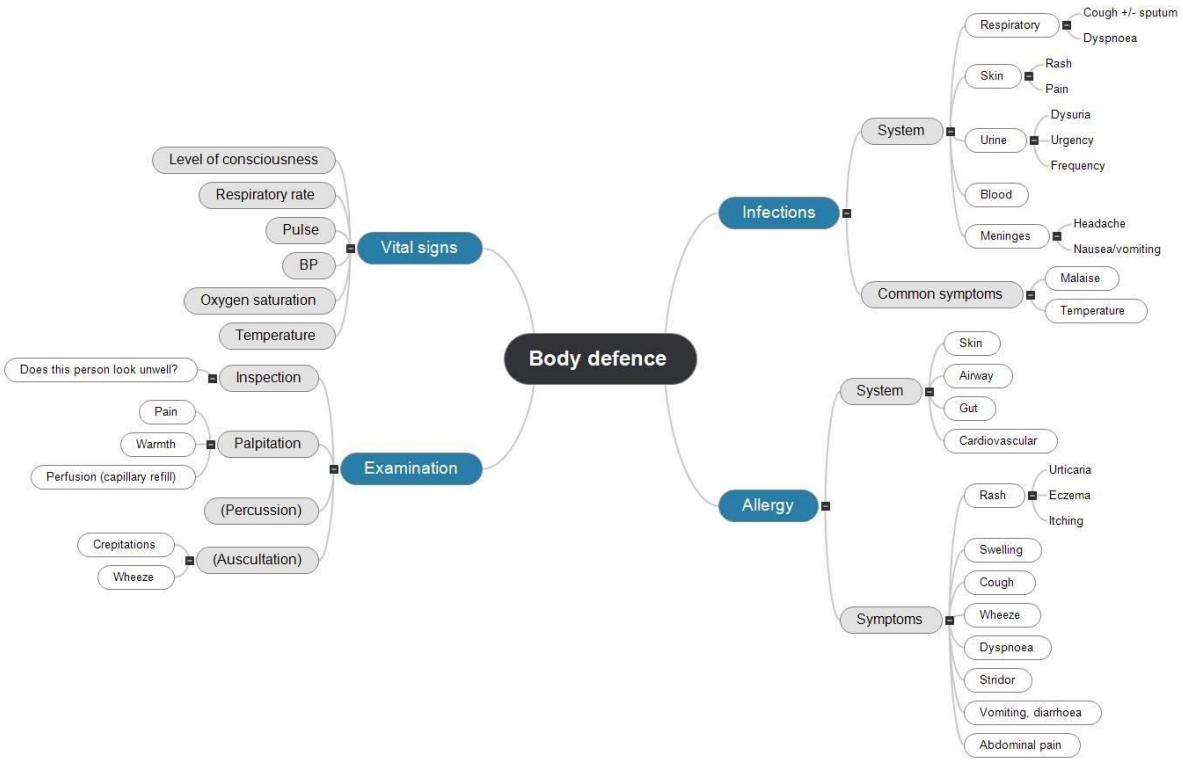
You are not expected to give a tutorial on immunity and infection. The students have had teaching on this, so start by getting them to tell you what they have learnt. Brainstorm their thoughts on a flipchart or whiteboard (see figure) and/or use these prompts:

- What common skin infections or allergies do you see in your clinical practice?
- How do patients with infections or allergies present?
- What is the difference between an allergic reaction, infection and sepsis? (See below definitions)
- If you are asked to assess someone presenting with an infection/allergy, how do you prepare? What do you look at in the notes before you speak to them?
- When someone presents with a possible infection or allergy, what do you want to find out about? How do you go about differentiating them?
- What are the most important things you want to cover in the medical history and why? What are “red flags” in a patient presenting with an infection/allergy? i.e. how do you know when they are seriously unwell and need hospital admission?

Definitions

- Allergy: an immune-mediated hypersensitivity reaction to food.
- Anaphylaxis: a serious systemic hypersensitivity reaction that is usually rapid in onset and may cause death. Severe anaphylaxis is characterized by potentially life-threatening compromise in airway, breathing and/or the circulation.
- Infection: the state produced by the establishment of one or more pathogenic agents (such as a bacteria, protozoans, or viruses) in or on the body of a suitable host.
- Sepsis: a life-threatening organ dysfunction due to a dysregulated host response to infection.

Figure: Example infection/allergy systems, symptoms and signs “brainstorm”



Student information

History

Screen for situations that make a serious infection more likely:

- age (the very young and older patients)
- immunocompromise including malnutrition
- medication (some suppress the immune system)
- recreational drug use (can elevate temperature) and IV drug use (increased risk of infection

Ask about possible sources of infection:

- contacts with known infections or animals/insects
- breach in skin e.g. bite/scratch
- recent foreign travel

Check vaccination history (if appropriate)

Systems review (see appendix 1):

- While the source of infection may appear clear, a review of systems can help make sure you have not overlooked something and identify the source when it is not so obvious.
- It reminds you to ask about aspects the patient may not have told you such as joint pain and swelling.
- Bear in mind that a child or older person may present with fever and vomiting and have a urinary tract infection that has made them systemically unwell but no or few urinary symptoms. A urinalysis is often useful in the patient with an unexplained fever.

Red flags: Systemic features of serious infection include:

- feverish/rigors
- altered mental state
- breathlessness
- feeling faint or collapse
- severe headache
- not passing urine
- a feeling of "impending doom".
- mottled skin or non-blanching rash

Examination

General appearance and level of consciousness, AVPU:

- Alert
- responsive to Verbal commands • responsive to Pain
- Unresponsive.

Vital signs

If you think that a person has an infection or presents with an allergy it is important to assess their vital signs. You can do a rapid assessment of:

- A (Is patient maintaining their Airway — voice and breath sounds)
- B (Breathing —Respiratory Rate, Chest wall movement, percussion & auscultation, oxygen saturation 97-100%)
- C (Circulation—skin colour/sweating, capillary refill time <2 seconds, pulse 60-100 bpm, blood pressure systolic 100-140 mmHg)
- D (Disability—AVPU, pupillary light reflexes, limb movements, blood glucose)
- E (Exposure—temperature and expose skin).

You will cover fever and sepsis in Year 4. In Year 2 we would like you to know how to measure:

- Radial pulse: felt at the base of the thumb just lateral to the flexor carpi radialis tendon. Most adults have a resting heart rate of 60-100 beats per minute.
- Respiratory rate: count the number of breaths for 15 seconds and x 4, normal respiration in an adult is 12-20 breaths per minute with the expiration slightly longer than inspiration.
- Temperature
- Transcutaneous monitoring of Oxygen Saturation: a non-invasive way of measuring oxygen saturation in arterial blood, which usually gives pulse rate as well. The probe is usually placed on the fingertip, although toes may be used, and ear probes are available. Use the corrected size probe – smaller probes are available for children. Leave it on at least 30 seconds.
- Blood pressure (including manual BP)

More on transcutaneous monitoring measurement of Oxygen Saturation:

- Measurement is prone to error, so you still need to put the SpO2 in context and use your clinical judgement.
- Causes for error include: cold peripheries, nail varnish, anaemia, irregular heart beat or tremor, carbon monoxide poisoning (falsely high readings), dirty equipment.
- It works by spectrophotometry. It compares the difference in absorption of red and infrared light by the blood. Two light-emitting diodes on one side of the probe are measured by a light detector on the other side. Oxyhaemaglobin absorbs more infrared light compared to deoxyhaemoglobin.

Never assume! A GP was called informed by a community nurse that despite the patient being distressed and breathless, their oxygen saturation probe was recording pulse 72 and oxygen saturation 98%. When the GP visited, they found the probe was switched off – the patient had been reading the sticky label that came attached to the new device! Their oxygen saturation was actually dangerously low …

Examining the ear (from Macleod)

Explain to the patient what you are going to do/doing!

Inspection: Pinna skin, shape, size, position, scars from previous surgery/trauma, deformity.

Palpation:

- Gently pull on the pinna and push on the tragus to check for pain.
- Gently palpate over the mastoid bone behind the ear to assess for pain or swelling.

Otoscopy

- Use the largest otoscope speculum that will comfortably fit the meatus.
- Hold the otoscope in your right hand for examining the right ear (left hand to examine left ear).
- Rest the ulnar border of your hand against the patient's cheek to enable better control and to avoid trauma if the patient moves
- Gently pull the pinna upwards and backwards to straighten the cartilaginous external auditory canal. Use the left hand to retract the right pinna.
- Inspect the external auditory canal through the speculum, noting wax, foreign bodies or discharge. You should identify the tympanic membrane and the light reflex anteroinferiorly.

Summarising

A mnemonic particularly useful in the acute medical setting:

- S = Situation (a concise statement of the problem)
- B = Background (pertinent and brief information related to the situation)
- A = Assessment (analysis and considerations of options — what you found/think)
- R = Recommendation (action requested/recommended — what you want)

Appendix 1 The systems review or systematic enquiry

The systems review is a screen for symptoms in the other body systems that patients may not have raised and may or may not be relevant.

Students often ask when they need to do a systems review.

The answer is that there are no hard and fast rules in real life clinical practice and it depends on what is relevant (this is the art of medicine). However, as a student it is worth being able to do full systems review slickly, and efficiently. **Practise often and it should be part of your clerking consultations on the wards.**

However, when you are asked to do a "focussed history" in an OSCE, or you are in Primary care where consultations tend to be short and more focussed on the presenting problem, or you are seeing a patient who is not presenting with a new symptom for the first time it may not be necessary to run through a review of all the systems. Instead, you should focus on relevant symptoms that will help make a diagnosis more or less likely. For instance, if a patient presents with abdominal pain you will want to ask about gastrointestinal symptoms, genitourinary symptoms and systemic features such as temperature, fatigue and weight loss. Neurological symptoms may be less relevant. However, if a patient mentions feeling dizzy, a review of other neurological symptoms becomes more important.

There are several different versions which can be confusing. There is a quick reference guide on the next page but please encourage students to look at their core reading textbook:

Dover, A.R. *et Al*. (eds) 2024 *MacLeod's clinical examination.* 15th Edition. London: Elsevier.

1. Chapter 2: General aspects of taking a history. The history of the presenting symptoms **Box 2.3**
2. Chapter 2: General aspects of taking a history. Systematic Enquiry. **Box 2.10**

Students also often use the following (so that you are aware of this)
Systemic Enquiry - OSCE Guide | Systems Review (SR) | Geeky Medics

A brief overview (not exhaustive)

Systemic: Fever, weight loss, pain.

Cardiovascular & Respiratory: Chest pain, breathlessness (including PND & orthopnoea) palpitations, ankle swelling, cough, wheeze, exercise tolerance normally and any recent change.

Gastrointestinal: Appetite, weight, abdominal pain, swallowing, nausea, bowel habit, jaundice, stool appearance/blood.

Genitourinary: Urinary symptoms (hesitancy, terminal dribbling, dysuria, haematuria, nocturia, incontinence, discharge), menstrual history, pregnancy.

Neurological: Memory, vision, hearing, headaches, fits, faints, funny turns, mood changes, unsteadiness, weakness.

Musculoskeletal: Injuries, joint pain/swelling, muscle pain.

Dermatological: Rash, skin lesions, ulcers

Appendix 2 NEWS2

NEWS2 stands for "National Early Warning Score (version 2)". It was developed by the Royal College of Physicians and assigns a score according to five parameters:

1. Respiratory rate
2. Oxygen saturations
3. Temperature
4. Systolic blood pressure
5. Pulse rate
6. Level of consciousness

A score (0-3) is allocated to each physiological parameter, the magnitude of the score reflecting how extreme the parameter varies from what's normal. This score is then aggregated, and uplifted (+2 points) for people requiring oxygen. (See overleaf)

NHS England mandated the use of NEWS2 in acute and ambulance trusts in 2018; but stopped short of recommending its use in primary care because of the lack of validation in this setting.

A high NEWS does not provide a diagnosis; but can help in standardised way to identify a sick patient or someone who is deteriorating and requires urgent clinical review. The RCP recommends that sepsis should be considered in any patient with a NEWS2 score of 5 or more.

National Early Warning Score (NEWS) 2 | RCP London

National Early Warning Score (NEWS2)

Physiological parameter	Score 3	2	1	0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO_2 Scale 1(%)	≤91	92–93	94–95	≥96			
SpO_2 Scale 2(%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

Reproduced from: Royal College of Physicians. *National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS.*

You can also look at National Early Warning Score (NEWS) 2 (mdcalc.com)