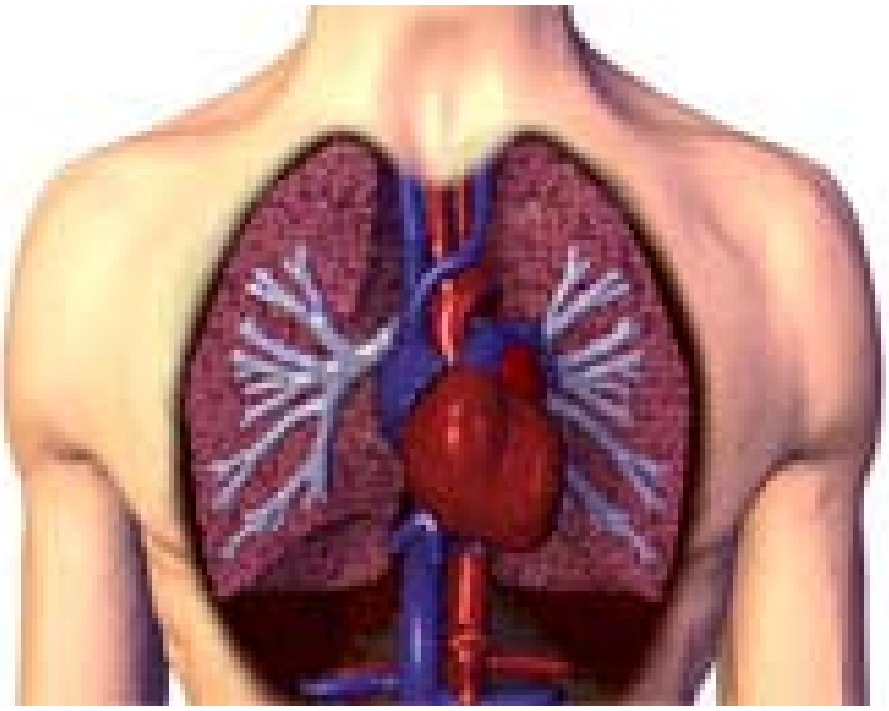
CARDIO-RESPIRATORY/HAEMATOLOGY (CR3) HANDBOOK

Year 3

2017 – 18



Module Lead

Prof Raj K Rajakulasingam

The London Chest Hospital c. 1855

The London Chest Hospital was founded in 1848 at a meeting held at the London Tavern in the City of London by a group of 19 philanthropic bankers, and City merchants, 13 of whom were Quakers. Tuberculosis, also known as Consumption or Phthisis, was the major endemic killing disease at that time, accounting for 20% of all deaths; double that of any other disorder. Whilst it affected all classes, it was much more common among the poor. The founders wanted to offer treatment to the people of the City and East London similar to that offered by the Brompton Hospital (founded in 1841) to patients in West London.

A public dispensary treating outpatients was opened in Liverpool Street on 13 June 1848. It attracted so many patients that the numbers treated had to be limited so as to keep the charity solvent and able to raise the money needed to build the new hospital. A site was obtained on Crown land in Bethnal Green, adjoining the 217 acre site, destined to become Victoria Park. Prince Albert laid the foundation stone of the Hospital in 1851, the year of the Great Exhibition in Hyde Park, and royal connections helped to raise £30,000 to build an 80-bed hospital which opened in 1855. In April 2015 the London Chest Hospital closed moving its services to St Bartholomew's Hospital in the City of London, itself the oldest hospital in the country.

The information in this handbook was correct as of August 2017

In the unlikely event of substantial amendments to the material, the SMD will attempt to inform students of the changes which will also be posted on blackboard. It is therefore advisable for students to check QMPlus on a regular basis.

The College cannot accept responsibility for the accuracy or reliability of information given in third party publications or websites referred to in this Handbook.

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INTRODUCTION

Welcome to the CR3 module. This handbook should be used in conjunction with the CR3 Log Book and the Clinical Skills handbook which, together, describe details of the generic and module specific objectives to be achieved by Year 3 students. Every student in Year 3 is expected to complete the CR3 module.

In addition, you are strongly advised to refer back to your CR1 and CR2 materials thereby ensuring a good basic scientific foundation to your clinical knowledge.

Cardio-respiratory/haematology diseases are extremely common; students need to have a good grasp of this subject before qualifying.

The programme consists of an Introductory Week of module specific lectures and a further nine weeks of clinical attachment. In addition to the lectures, you will have PBL tutorials and bedside teaching which will cover your learning objectives. Private study and spending time on the wards talking to patients and medical staff is also an extremely important part of your learning. Sessions in General Practice will offer further opportunities to meet patients in their home and community surroundings.

The module concentrates on cardio-respiratory medicine and haematology but students are also expected to develop their generic clinical and communication skills during the attachment. It is essential you undertake examination of all the systems whenever possible and to participate in on-call activities with your team. Attendance at lectures during the Introductory Week and all PBL sessions is compulsory. You should make use of the lectures and module outcomes to achieve the objectives for this module.

Learning medicine in modern hospitals may be challenging at times. There are so many targets hospitals need to achieve which often results in a high turnover of patients on the wards. Most doctors now work shifts and may not be on the wards every day to teach. In some places it may not be possible to offer formal teaching on a daily basis. In this environment, it is important to adapt to make the most of any learning experiences available. You will need to learn to make use of your time seeing patients or achieving other objectives. One way of learning cardio-respiratory and haematological disease is by considering how patients present to doctors with symptoms and then consider the individual diseases that might underlie each presentation.

The Log Book is designed to help you and your clinical teachers to make sure you cover the required learning objectives for this module.

Good Luck and we hope you enjoy your time with us,

Professor Raj K Rajakulasingam
Consultant Physician in Respiratory Medicine / Allergy and Honorary Clinical Professor
Module Lead for CR3

Dr Elspeth Alstead
Clinical Senior Lecturer and Consultant Gastroenterologist
Head of Year 3

THE INTRODUCTORY WEEK AND CLINICAL PLACEMENTS

Rotation 1

Introductory Week: 25/09/2017 – 29/09/2017

Placement: 02/10/2017 – 01/12/2017

Rotation 2

Introductory Week: 11/12/2017 – 15/12/2017

Placement: 15/01/2018 – 16/03/2018

Rotation 3

Introductory Week: 09/04/2018 – 13/04/2018

Placement: 16/04/2018 – 22/06/2018

CCS2 – 14/05/2018 – 18/05/2018

CR3: THE INTRODUCTORY WEEK LECTURES

The following subjects will be covered during the introductory week. For full details – including any changes which may occur during your placement, please see the CR3 Introductory Week Timetable on blackboard.

All lectures take place in the Costelo Lecture Theatre at **HOMERTON UNIVERSITY HOSPITAL. Attendance is required**.

Pathology

P1 Chest pain and Atheroma
P2 Cardio-vascular Pathology (non CHD)
P3 Pulmonary Pathology
P4 Respiratory Infections
P5 Lipids in Heart Disease
P6 Antibiotics in cardio-respiratory infections

Respiratory

R1 Interpretation of Lung Function
R2 Airways Disease (Asthma)
R3 Airways Disease (COPD)
R4 Sleep Disorders / Respiratory Failure
R5 Respiratory Emergencies (PNX/PE)
R6 Pleural Diseases (Effusion & Mesothelioma)
R7 Pneumonia
R8 Tuberculosis and Sarcoidosis
R9 Lung Cancer
R10 Oxygen Therapy
R11 How to look at a CXR?

Cardiology

C1 Interpretation of ECG
C2 Acute Coronary Syndrome and MI
C3 Stable Angina
C4 Hypertension
C5 Heart Failure
C6 Cardiac Arrhythmias
C7 Valvular Heart Disease and Endocarditis
C8 Commonly used Cardiac Medications

Haematology

H1 Blood Transfusion Reactions
H2 Venous Thromboembolism Prevention
H3 Sickle cell disease & haemoglobinopathies
H4 Malaria
H5 Anaemia

CR3 SPECIFIC OBJECTIVES – An Overview

In addition to the broad learning objectives given in the main Year 3 Handbook, students are expected to achieve the following objectives;

1. The development of core clinical and communication skills as per the Clinical Methods Handbook and the Communication Skills hand book

2. Core knowledge/skills in the cardio-respiratory system

3. Competency in relevant practical skills

4. Satisfactory completion of all CR3 PBLs

5. Attendance at the CR3 introductory week lectures

6. Satisfactory completion of Year 3 SSCs

7. Attendance at the half day hospice visit is compulsory

CR3 SPECIFIC COMMUNICATION AND CLINICAL SKILLS
(PLEASE ALSO REFER TO THE CLINICAL METHODS HANDBOOK)

GENERAL OUTCOMES

History

Be able to carry out a full history from a patient presenting with cardio-respiratory symptoms e.g., chest pain, difficulty in breathing, cough and sputum and, haemoptysis (symptoms alone or in combination) and be able to explore the differential diagnoses.

Be competent in taking histories from those conditions with given priority codes **1** and **2**

Examination

In addition to generic examination, be able to perform a complete examination of the cardiac and respiratory systems in normal and disease states and correctly interpret the signs

Summary, Problem List and Differential Diagnoses

Be able to write a good summary of the case in less than 10 lines and list problems identified by systems.

For those problems where it is appropriate give a differential diagnosis of possible causes of that problem particularly for conditions with priority codes **1 and 2**.

Management plan:

Be able to lay out immediate and subsequent management plans including preventive measures for common conditions (emergency and priority code **1** conditions)

Know the relevant investigations for those common conditions with priority code **1**.

Know the medications used in priority code **1** conditions as per the learning outcomes for those conditions.

Be able to understand and interpret the investigations including CXR, ECG, lung function and relevant blood tests for priority code **1** conditions listed in the CR3 Hand Book and Log Book.

History Taking (To be used with clinical methods handbook)

You should begin with open questions to establish the nature of the presenting problem(s). Only then is it appropriate to introduce more closed enquiries.

History taking involves knowing what to ask and how to ask

Open ended questions are better than closed questions in establishing the framework of the history.

PC: Define the problem that is troubling the pt and why they have been admitted/come to see the doctor (usually in one line) and mention how long ago it started.

Relevant PMH: Describe if the pt has a long standing disease which is likely to be connected to the PC. It is quite possible that any new symptom(s) could relate to this. Give details of the condition (s) here.

HPC: To evaluate the PC further, you need to ask question aimed at working out the cause and effects of the symptom(s).

- Find out more about the symptom(s) – describe all symptoms chronologically, giving their relationship with each other.
- Find out about other symptoms in the affected system
- Ask questions about possible causes – including risk factors
- Find out about the effects of the symptoms on the pt's life

Review of systems: It is possible to miss some important symptoms because you forget to ask or the pt has neglected to mention them. This acts as a fail-safe mechanism to make sure that you do not miss anything important.

PMH: give other past medical problems which were not linked to the PC. You should try and verify the diagnosis with the pt.

Drug history: (may be part of risk factors too)

give details, particularly about those drug which may have caused the pt's all or some symptoms. (Comment on new drugs/recent changes. This is not for recreational drugs which come in the SH).

Allergies: if any known with details (usually drug allergies only, other allergic conditions would come under PMH)

FH: (may be part of risk factors too)

This may give a clue to the cause of the pt's problems.

SH: (may be part of risk factors too)

- Marital status and children
- Occupation (+ previous occupation)
- Where the pt lives/who with

How the pt's condition restricts him/her and what help they have in coping with the restrictions – Mobility (Independent, stick, frame, wheelchair) and ability to perform activities of daily living (ADLs) (Washing and dressing, cooking, cleaning, shopping). Alcohol (Units/week = Alcohol% X volume)

Smoking - Age started, age stopped, average number per day. E.g; Smoked from 16 – 40, average 20/day). (Pack years = number of 20 cigarette packets/day X years smoked)

Illicit/recreational drugs

Foreign travel/immigration

Pets/birds

Remember; your chance of working out the diagnosis depends on your knowledge of possible causes and your ability of to ask relevant questions to establish which conditions are likely.

Example of history taking in a pt with chest pain.

PC: chest pain – 6 hours

Relevant PMH: give relevant details – IHD, Hypertension, similar problems (with details) before

History of presenting complaint (HPC):

1) Characteristics of symptoms- for example in the case of pain the following information if required

-site

-onset

-duration

-character

-radiation

-alleviating

-intensity

-exacerbating/relieving factors

-past experiences with symptoms

2) Context- what were the circumstances of the onset of symptoms (physical, social and psychological)

3) Response to symptoms- what the patient has done about the symptoms

4) Consequences- what do the symptoms interfere with (physical, social and psychological)

5) Associated symptoms with the relevant system

6) Patient's understanding/what they have been told - patient's ideas and feeling about causes/implications and treatment

7) Concerns and worries

8) What relatives have been told

9) Relevant risk factors towards the likely diagnosis (smoking, FH etc)

Review of Systems (ROS):

Brief structured review of body systems which were not discussed in the HPC

Past medical history (PMH):

-medical

-surgical

-obstetrics

-allergies

-medication

Family history (FH):

- current health of parents, siblings, children
- history of significant illnesses
- deaths- dates and age at death
- In this context specifically FH of IHD, DM, HTN, Hypercholesterolaemia

Social history (SH):

Home environment- living arrangements, who is resident, what is nature of those relationships

Support/secondary gains- how family or friends have responded to the illness

Sexual function- any difficulties

Important losses- death, separation, divorce

Work history/job satisfaction

Other areas- finance, interests

Nutrition - diet e.g.; dietary beliefs and meal patterns

Tobacco, alcohol, drug use

Treatment history (TH) – give details

Example of history and examination format in a pt with a respiratory problem

Date:

Patient: Mr XZ

Clinical student: N.S

Age: 53

Occupation: Tailor's cutter

Marital status: Married, two children

Admitted to L… Ward on 21.11.2011 under care of Dr X.

PC: cough with sputum for three years

Relevant PMH: 4 years old- TB knee requiring surgery, and possible lung disease as a result of being 'run over by a horse and cart'

Childhood- measles, no whooping cough, pneumonia or childhood infections.

HPC: Patient reported a cough 'all my life.'

3 years ago- he first noted production of sputum and a worsening of his cough, with wheezing at night and a shortness of breath.

The cough occurred at any time, especially worse at night when lying. It prevented him from sleeping. It was worse in the cold and especially when damp. Improved in the summer but was present all year. Aggravated by heat (car heater) or smoke (in the pub) often making the cough so bad he got a sore throat. His sputum was thickish, green, sticky and often smelly. Occasional haemoptysis-only specks in the sputum. Production- half a cup full per day. Patient would feel the phlegm build up on his chest during the day making his cough/sputum worse, until he 'got it of his chest.' Worse at night. After eating the cough would sometimes be so bad that he would vomit his stomach contents and sputum, thus clearing his chest. No nausea/sweats with it.

He had noticed shortness of breath on exertion eg climbing hills and one flight of stairs. Found he couldn't keep up with friends. He could walk and talk simultaneously. The shortness of breath on exertion varied depending on the other symptoms especially the cough. When the cough was bad, so was the breathing. He did not require extra pillows at night and was not woken by shortness of breath.

Over the past three years he has had several admissions for his chest condition and has been in regular attendance in M.O.Ps since January 2007. His condition is considerably relieved by antibiotics but soon returns when the course ends.

Smoking: Ex-smoker. Gave up 5 years ago. Used to smoke thirty per day for 30 yrs.

Other risk factors for the likely diagnosis: give them here (this may include FH, drug history etc)

System Enquiry

ROS: Appetite good. Weight loss. Weighed 11 stone 3 years ago, current weight is 9 stone. Stated height is 5' 8''.

GIS: Occasional heartburn especially after pastry/bread. Lasts for some hours. Not particularly bothersome or serious.

No dysphagia

No abdominal pain

Bowels regular. No diarrhoea/constipation

No blood in stools

CVS: No chest pain/ankle oedema/palpitations/pain in the calves on climbing stairs.

GUS: No dysuria/pain on micturition. D/N- 4/0

No hesitancy/terminal dribbling

Good flow

Sexual function normal

NS: No headaches/fits/black outs/faints

No dizziness/vertigo

No numbness/paraesthesia

No dysarthria/dysphasia/dysphagia

No visual problem

Poor hearing

Locomotor system: No joint pain or swelling, no muscle pain or weakness.

Other PMH:

8years ago- initially presented with swollen ankles, treated with 'water tablets,' was told that this trouble was associated with high blood pressure

3 years ago- while in Mile End hospital for lung problems investigations revealed enlarged kidneys and proteinuria; (diagnosed as membranous glomerulonephritis). Placed on special low salt diet and blood pressure tablets. Blood pressure said to satisfactory since then

No rheumatic fever, diabetes, jaundice

FH: Father died aged 71 from lung cancer

Mother is 81, alive and well

Two brothers - well

One twin sister - well

One sister- TB

Wife and two children aged 16 and 18-well

SH: Lives in own house with wife and children. No lifts, one flight of stairs. Drives to work. Made redundant after 36 years as a cutter of cloth in a factory, using large cloth cutting machines in dusty conditions. Unemployed for 5 years. Subsequently eight months ago found an ideal job as a tailor's cutter with a small firm. Now cuts single pieces of cloth by hand. He says the job is well paid but is worried about losing the job due to his condition and hospitalisations. He is the only cutter and the firm needs him.

Alcohol: Ten pints per week

Allergies: None known

TH: on admission:

Antibiotics: See HPC

Antihypertensives: Nifedipine- 20 mg b.d. Hydralazine 50mg b.d

Lung problems: Salbutamol MDI: 2 puffs qds, Ipratropium bromide 2 puffs qds

O/E: (positive features have been highlighted by underlining)

General: Temperature 36.5 degrees. A well looking man, rather thin and with some evidence of weight loss, alert and orientated in time and space, but rather anxious about his prolonged stay in hospital.

No pallor/cyanosis/jaundice/dehydration/tremor

No skin rashes

No lymphadenopathy or oedema

No clubbing or koilonychia

Normal hair, thyroid, conjunctiva and tongue/fauces clear

CVS: Radial pulses- 80/mm regular and equal

BP- 140/75

Femoral, posterior tibial and dorsalis pedis pulses palpable and equal (if relevant)

JVP- not raised

AB normal character- 5th LICS, in MCL

No precordial thrills or parasternal heave

HS: no murmur, I and II heard and normal

RS: Chest symmetrical and normal shape

Resp rate 18/min and regular

Trachea central

Movements equal

Expansion 3cm

Percussion: dull over left mid zone anteriorly

Auscultation: Breath sounds vesicular

Expiratory wheeze especially middle lobe and bases

TVF/VR normal

Coarse crackles throughout especially bases

No pleural rub

Sputum pot – green sputum. No blood

GIS: Slightly obese. No visible peristalsis/scars
No dilated vessels/pulsation: not distended
Not tender
LSKK: not palpable, no masses, no ascites
Gut sounds normal
Hernial orifices normal
Genitalia: normal
PR exam: moderate prostatic enlargement
Stools: not examined

Nervous system: Not examined formally on this case

Summary: Please write a summary of both history and examination with a likely diagnosis.

Problem lists: Please list the problems (current and chronic) you have identified in your pt.

Examination of the systems – OSCE format (to be used with clinical skills handbook)

Respiratory Examination

(A**) GENERAL**

1) Approaches patient politely and introduce yourself. Exposes the patient adequately after obtaining their permission. Patient at 45 degrees. Washes hands and stand at the end of the bed.

2) Clinical clues around the bed - inhalers, oxygen mask, sputum pots.

3) General inspection: well vs unwell, pallor, clubbing, peripheral cyanosis, tar stain, carbon dioxide retention flap, peripheral oedema and use of accessory muscles and intercostal recession

4) Pulse:
- Rate, rhythm,
- Bounding pulse in CO_2 retention
- Tachycardia in severe asthma or infection

5) Resp rate:
- Normal < 15/min, increased in fever, severe lung disease

6) Blood Pressure (not necessarily required for RS examination)

7) Eyes:
- Pale conjunctiva = anaemia
- Ipsilateral pupil contraction and ptosis = Horner's syndrome

8) Mouth: under tongue for central cyanosis (hypoxaemia)

9) Lymph node examination:
- Enlarged in respiratory infection, sarcoidosis, HIV, malignancy, TB
- Mainly anterior triangle and supra-clavicular, then submental-submandibular-preauricular-postauricular-occipital-posterior chain

10) JVP: as per cardiac examination (but do not spend a lot of time here!)
- Increased in RVF secondary to Cor-pulmonale

(B) **RS PER-SE (do anterior first and then posterior)**

Anterior Chest

11) Chest inspection: scars, anatomical abnormalities, movement with breathing

12) Trachea location: Pt sitting up, 3 finger technique
- Warns patient of discomfort
- Pushed away in pneumothorax and effusion
- Pulled towards in collapse and fibrosis

13) Palpation of apex beat of heart: learn from CVS. Displaced in lower mediastinal shift, often difficult to palpate if lungs are hyper-expanded, e.g. COPD

14) Chest expansion: must do upper, middle and lower zones (applies to both anterior and posterior): <5 cm may be abnormal.

15) Tactile vocal fremitus: says 99. Assesses upper, middle and lower zones

16) Percussion on chest wall. Assess upper, middle and lower zones. Compare zones each side and comment on altered resonance. Please note percussion over the cardiac area may be dull in normal and increased resonance indicates air trapping/hyper-expanded lungs (i.e; emphysema)

17) Auscultation: must do all 3 zones
- Comment about breath sound (vesicular or bronchial), air entry and added sounds (wheeze, crackles and rub)
- Vocal resonance – says 99 (it may not be necessary to do both VR and VF)

Posterior chest

18) Asks patient to sit forward and repeat chest expansion, TVF, percussion, auscultation and inspection on posterior chest wall. Make sure that you have sufficient space behind the pt. When they first sit forward is a good time to palpate for lymphadenopathy as this should be done from behind.

19) Helps/offers help to re-dress patient. Thanks patient and washes hands.

Interpretation of chest signs

The following table may be useful to work out the likely clinical diagnosis

	Pneumothorax	**Effusion**	**Collapse**	**Consolidation**	**Fibrosis**
Chest expansion	Decreased	Decreased	Decreased	Decreased	Decreased
Trachea/Apex	N/Pushed away	N/Pushed away	Pulled towards	Not shifted	N/Pulled towards
Percussion	Hyper-resonant	Stony dull	Dull	Dull	Dull
VF/VR	Decreased	Decreased	Decreased	Increased	Increased/Normal
Breath Sounds	Absent/Decreased	Absent/decreased, BB may be heard.	Absent/Decreased	BB,Whispering pectoriloquy	BB/ Normal
Added Sounds	Click, none else	None usually	None	Crackles	Crackles

Cardiovascular Examination

(A) **GENERAL**

1) Approaches patient politely and introduce yourself. Exposes the patient adequately after obtaining their permission. Patient at 45 degrees. Washes hands

2) Clinical clues around the bed - oxygen, GTN spray

3) General Inspection:
- Well vs unwell
- Perfusion, koilonychia (Iron deficiency anaemia), xanthomata (increased lipid), signs of infective endocarditis (Osler nodes, Janeway lesions, splinter haemorrhages)
- Nicotine stain
- Peripheral oedema

4) Pulse:
- Rate, rhythm, regularity, volume, symmetry
- Collapsing pulse – check for shoulder problem first, elevate arm and palpate pulse
- Radial-radial and radial-femoral delay
- Character – use Carotid (inform patient first before you touch the neck)

Carotid pulse:
- Comment on character
- Slow rising in aortic stenosis
- Collapsing in aortic regurgitation
- Hyperdynamic circulation in PDA

5) Blood pressure – **Ask** for this (this is given once asked for)

6) Eyes:
- Sclera for jaundice- prosthetic heart valve induced haemolysis
- Xanthelasma- hyperlipidaemia
- Conjunctiva- pallor
- Malar flush- mitral valve disease and decreased cardiac output

7) Mouth:
- Under tongue for central cyanosis
- Angular stomatitis- anaemia
- Mucosal petechiae- infective endocarditis

8) JVP: position 45 degrees, head being rested, neck turned to opposite side
- Increased in right ventricular failure, tricuspid stenosis/regurgitation, pericardial effusion
- Normal is <3cm
- You will be asked; what are you looking for – you need to know about differentiating arterial vs venous pulsations;
- Venous - Double wave form, non-palpable, hepato-jugular reflex, fills from above

(B) **CVS PER-SE**

9) **Inspect** precordium- pacemaker, visible pulsations, scars etc

10) Palpate apex beat: (lowest and outermost point of definite cardiac pulsation). You need to demonstrate how to locate the apex beat.

- Normally in fifth ICS MCL
- Displaced in RVH, volume overload and also due to lung disease.

11) Palpate for heaves and thrills (all 4 areas) with ulnar border of hand:

- Heaves- left of sternum: RV enlargement or severe LA enlargement
- Thrills- palpable murmurs

12) Auscultate all 4 areas: Must time auscultation with pulse.

Comment on S1, S2 and any added sounds and murmurs. Listen for carotid bruits.

Sounds:

- Aortic- 2nd right ICS
- Pulmonary- 2nd left ICS
- Tricuspid- 4th left ICS
- Mitral- 5th left ICS, mid clavicular line (or where you palpated the apex beat, if different)

Murmurs: must mention type, duration, intensity, whether accentuated in inspiration/expiration

- Aortic stenosis - ESM, best heard with patient forward and in expiration
- Mitral regurgitation - PSM, radiates to left axilla, turns patient onto left
- Mitral stenosis - MDM
- Aortic regurgitation - EDM

Note that right sided murmurs are louder on **inspiration** while left sided murmurs are louder on **expiration**

Added sounds:

- S3- early diastole- abnormal LV filling
- S4- as atria contract- non compliant ventricles or atrial hypertrophy

13) Percuss and auscultate lung bases (cardiac failure and pleural effusion-crackles)

14) Peripheral pulse assessment – you need to mention this (not to be done as a routine)

- Dorsalis pedis- proximal to first metatarsal space
- Posterior tibial- behind the medial malleolus
- Popliteal- knee must be flexed and relaxed. Both hands in popliteal fossa
- Femoral- midway between ASIS and pubic symphysis

19) Helps/offers help to re-dress patient. Thanks patient and washes hands.

Abdominal Examination

(A) GENERAL

1) Approaches patient politely and introduce yourself. Exposes the patient adequately after obtaining their permission. Lies patient flat (you may need to adjust the height of the bed). Washes hands

2) General inspection: may be done whilst pt sitting up
- Well vs unwell
- Hands- tremor, clubbing, palmar erythema, dupuytren's contracture, asterixis, nicotine stain

3) Pulse- rate, rhythm, volume, symmetry (make it brief, more important in CVS)

4) Blood pressure – not required to measure (you may need to ask for this)

5) Face:
- Sclera for jaundice
- Conjunctiva for pallor
- Central cyanosis (under the tongue)
- Dentition
- Angular stomatitis
- Glossitis
- Consider assessing for nystagmus if considering decompensated liver disease

6) Inspect and examine the chest for supra-clavicular, cervical and axillary nodes, spider naevi, gynaecomastia and obesity

(B) ABDOMEN PER-SE

7) Inspect abdomen- scars, deformities, obvious masses, ask patient to cough- look at hernial orifices (may not be necessary, mention that you may wish to do this)

8) Palpation of abdomen:

- Ask about pain. Start away from pain
- Tell the pt to relax as best he/she can, to breathe quietly and that you will be as gentle as possible
- It is helpful to have a logical sequence to follow
    - Start in LIF and work anti-clockwise to end in the supra-pubic region (do both soft and deep palpation)
    - At all costs avoid sudden poking with the fingertips.
- **Soft palpation and deep palpation**- palpate at patient's level with elbow at 180 degrees. Comment on masses, tenderness, rebound tenderness and guarding

Lump Right hypochondrium Liver Hepatic flexure	**Lump in Epigastrium** Stomach Large colon	**Lump in Left hypochondrium** Spleen Splenic flexure
Right lumbar Ascending colon	**Umbilical** Small intestine	**Left lumbar** Descending colon
Right iliac fossa Ovaries, appendix	**Suprapubic** Bladder	**Left iliac fossa** Ovaries sigmoid colon

9) Palpate liver from **right** iliac fossa:
- Examine using side of hand and ask patient to breath in; feel for liver by allowing the edge of the liver to hit the edge of the index finger (coordinate with pt's breathing)
- Percuss down from 2nd ICS to allow you to define upper border of the liver (Liver may be pushed down rather being enlarged)

10) Palpate spleen from right iliac fossa to left hypochondrium:
- Press in with fingertips and ask patient to breath in- feel for spleen to hit hand
- If unpalpable, turn patient to right and press under ribs to feel for spleen
- If unpalpable still, pull ribs towards left to bring spleen closer

11) Ballot for kidneys:
- Left hand under patient, right hand on top, flick left wrist and feel for kidney
- Do on both sides

12) Feel for aorta, para-aortic nodes and vessels

13) If a swelling is palpable, spend bit more time to elicit its features.

14) Shifting dullness:
- Percuss from midline to patient's left hand side until dull sound is percussed. Roll patient to their right. Wait a few seconds and percuss dull area again to see if there is a change in percussion note.

13) Auscultate for bowel sounds

14) Offer to examine hernial orifices (may not need to do this)

15) Completion: (just mention this and you may not need to do these)
- Urine dipstick
- Genital exam
- PR exam

16) Helps/offers help to re-dress patient. Thanks patient and washes hands

Cranial Nerve Examination

1) Approaches patient politely and introduce yourself. Exposes the patient adequately after obtaining their permission. Washes hands

CN 1- Olfactory Nerve:

- Ask patient about loss of smell
- Check that the nasal passages are clear
- Test if they can identify scent (each nostril separately)
- Do formal testing if provided with the required material – Ask the pt, with eyes closed, to sniff and identify in turn the test materials.
- Causes of anosmia: URTI, meningioma in olfactory groove, cribriform plate fracture

CN 2- Optic Nerve:

- Visual fields (a) - confrontational testing - Test upper and lower fields bilaterally. Waggle finger at periphery one side at a time and both together. (b) Red pin test
- Visual acuity – use Snellen's chart at 6m
- Pupillary reflexes - Examine the pupils for size and symmetry (in dim light)
    - Light reflex – direct and consensual (shine light from the side)
    - Accomodation reflex - ask pt to look into the distance and then at an object held close to the face.
- Colour vision – Ishihara plates
- Fundoscopy:
    - Darken room
    - Examine right eye. Hold ophthalmoscope with right hand and examine right eye. Examine both sides. Check that focussing wheel is at zero
    - Alter focussing wheel with index finger and other hand on forehead
    - Assess red reflex from 30cm
    - Move towards eye at 15 degrees laterally
    - Turn focussing wheel to bring retina in focus
    - Examine optic disc, retinal vessels, retinal background and macula

CN 3- Oculomotor Nerve, CN 4- Trochlear Nerve, CN 6- Abducens Nerve:

(CN3 - all other muscles, CN 4- superior oblique muscle, CN 6- lateral rectus) – remember $LR_6(SO_4)^3$

- Ocular movement – With both eyes open, pt's head in neutral position (if necessary hold head with one hand). Ask patient to follow finger whilst fixing the gaze on the examiner's finger. Move finger up and down, then to the right and up and down, and then to the left and up and down.
- Ask pt to report diplopia
- Check for nystagmus
- Test for convergence

Third nerve palsy – ptosis, weakness of superior, medial and inferior eye movements, dilated pupil and absent direct reflex.

Fourth nerve palsy – Diplopia looking down and reading (isolated lesions are uncommon)

Sixth nerve palsy – Diplopia towards the paretic lateral rectus muscle.

CN 5- Trigeminal Nerve:

- Motor function – Inspect muscles of mastication for wasting. Ask the pt to clench his/her teeth. Muscles of mastication - temporal, pterygoids- masseters (jaw deviates towards the paralysed side)
- Jaw jerk - normal response is slight/absent. If UMNL- exaggerated response
- Sensory examination
    - Face (ophthalmic, maxillary and mandibular divisions).
    - Cornel reflex (offer to do this) – use a wisp of cotton into fine hair and lightly touch the lateral edge of the cornea at its conjunctival margin.

CN 7- Facial Nerve:

- Motor - Test muscles of facial expression – ask pt to shut his eyes as tightly as he can, ask pt to whistle, ask him to smile, ask him to inflate his mouth with air.
- Sensory – check Taste in anterior two-thirds of the tongue
- Lesions above the facial nucleus cause UMN palsy – lower part of the face is affected.
- Lesions at or below the level of facial nucleus cause LMN palsy – upper and lower parts of the face are equally affected.

CN 8- Vestibulocochlear Nerve:

- Simple conversational voice should be heard at 3.6 m.
- Test the hearing by whispering a number into each ear at a time and ask the patient to repeat it
- Tuning fork test (256 or 512 Hz)
- Rinne's test- compares bone conduction vs air conduction with the base of the fork on the mastoid process. In normal and sensorineural deafness air conduction is better than bone conduction (Rinne's test positive). Conductive deafness will show opposite response (Rinne's test negative) – be aware of false negative response.
- Weber's test – base of the fork is placed anywhere on the midline of the skull. It is perceived in the deaf ear in conductive deafness and is referred to better ear in sensorineural deafness.

CN 9- Glossopharyngeal Nerve, CN 10- Vagus Nerve:

- Gag reflex (offer to do this)- sensory component via CN 9, motor component via CN 10
- Taste – posterior one-third of the tongue (CN9)
- Tickle back of the pharynx – look for palatal reflex.
- Ask the pt whether he notices regurgitation of fluids through his nose when he tries to swallow.
- Ask the pt to say Ah – Observe uvula to see whether both sides arch equally upwards. In paralysis, affected side will remain flat and uvula being pulled to the opposite side. Uvula remains motionless in bilateral paralysis.
- Check voice – hoarse and deep in bilateral lesions

CN 11- Accessory Nerve: purely a motor nerve.

- Shrug shoulders whilst attempting to push them down
- Turn their head against resistance – weakness of rotation of the chin towards the opposite side.

CN 12- Hypoglossal Nerve:

- Ask the pt put out his tongue as far as possible.
- Tongue is pushed to the paralysed side in unilateral paralysis.
- Ask the pt to move his tongue from side to side
- Tongue deviates towards affected side
- Look for wasting and fasciculation.

Peripheral Nerve Examination

Upper Limb Exam:

1) Approaches patient politely and introduce yourself. Exposes the patient adequately after obtaining their permission. Washes hands

2) Inspects the upper limbs for muscle wasting, tremor, fasciculation and deformities

3) Whilst standing ask patient to hold out both hands facing downwards, arms extended, eyes closed. Assess for drift. Downward drift - UMNL. Upwards drift- cerebellar. Other- proprioception.

4) Test tone in wrist, elbow and shoulder by moving them passively.
- Supinator catch- Increased tone elicited by rapid rotation of the forearm
- Cogwheel rigidity- Parkinson's disease

5) Test power:
- Deltoid (C5, C6)- Chicken wings. Do not let me push down
- Lat dorsi and Pec major (C6, C7, C8)- Chicken wings. Do not let me push up
- Biceps (C5, C6)- Elbow flexion. Bend elbows to 90 degrees (do not let me straighten the arm)
- Triceps (C7) - Elbow extension. Bend elbows slightly, do not let me bend the arm at the elbow.
- Wrist flexion (C6, C7, C8)
- Wrist extension (C7, C8)
- Finger flexion (C7, C8)- Squeeze my fingers
- Finger extension (C7, C8)- Straighten fingers, do not let me push them down
- Dorsal interossei (C8, T1)- Spread fingers apart and do not let me push them together
- Palmar interossei (C8, T1)- Hold fingers, do not let me pull them apart
- Abductor pollicis brevis – (the last muscle supplied by the median nerve): lay hands flat on table/lap with palms up, now point your thumb towards the ceiling, stop me from pushing the thumb back down (should demonstrate that pressure is applied at the region of the base of the thumb rather than the tip).

Power score:

5-normal

4-decreased against resistance

3-movement against gravity but not resistance

2-cannot move against gravity

1-flicker of contraction

0-paralysis

6) Test reflexes:
- Biceps (C5, C6)
- Triceps (C7, C8)
- Supinator (C5, C6)

7) Test co-ordination: Finger to nose test, test for dysdiadochokinesia

8) Test sensation (not to use a needle please):
- Superficial- assess dermatome with cotton wool. Patient has eyes closed. Detect touch?
- Deep- sharp vs blunt. Do test on sternum first to demonstrate sensation

  C5- Outer aspect of upper arm

  C6- Later aspect of forearm and thumb

  C7- Middle finger

  C8- Little finger

  T1- medial aspect of forearm

9) Test proprioception:
- Ask patient to close eyes. Hold thumb by lateral aspects. Move it up and down and ask patient if it is moving up or down

(10) Offer to test for other dorsal column function: position, vibration, light touch and two point discrimination.

(11) Test vibration sense at DIP joint

(12) Helps/offers help to re-dress patient. Thanks patient and washes hands

Lower Limb Exam:

1) Approaches patient politely and introduce yourself. Exposes the patient adequately after obtaining their permission. Washes hands

2) Inspects the lower limb for muscle wasting, tremor, fasciculation and deformities

3) Test for tone in knee and ankle:
- Increased tone-UMNL
- Decreased tone- LMNL

4) Test for Power:
- Ilio-psoas (L1, L2)- hip flexion. Lift leg, stop me pushing it down.
- Gluteus maximus (L5, S1, S2)- hip extension. Stop me from lifting leg of bed
- Hamstring (L5, S1, S2)- knee flexion. Bend knee, do not let me straighten it
- Quadriceps (L2, L3, L4)-knee extension. Bend knee, prevent me from bending further
- Tibialis anterior (L4, L5)- ankle dorsiflexion. Resist plantar flexion
- Gastrocnemius and Soleus (S1, S2)- ankle plantar flexion and resist dorsiflexion.

5) Test reflexes:
- Knee jerk (L3, L4)
- Ankle jerk (S1, S2)
- Babinski

6) Test co-ordination: heel to shin test

7) Test sensation:
- Superficial- assess dermatome with cotton wool. Patient has eyes closed. Detect touch?
- Deep- sharp vs blunt. Do test on sternum first to demonstrate sensation

L2-upper thigh

L3-anterior knee

L4-inner calf

L5-outer calf

S1-lateral foot

8) Test proprioception:
- Ask patient to close eyes. Hold big toe by lateral aspects. Move it up and down and ask patient if it is moving up or down

9) Offer to test for dorsal column function: (as per the upper limb)

10) Test vibration sense at DIP joint of big toe

11) Perform Romberg's test:
- Ask patient to stand with feet together and close eyes. If unsteadiness is increased- positive Romberg's sign (decreased proprioception)

12)+ Assess GAIT

13) Helps/offers help to re-dress patient. Thanks patient and washes hands

EXAMPLES OF CR3 CLINICAL PROBLEMS

(1) PRESENTING SYMPTOMS OF EXACERBATION OF ASTHMA

Overall aim: To understand the presentation and management of bronchial asthma.

Consider the following differential diagnoses

* COPD
* Respiratory infections – acute and chronic
* Lung cancer
* Pulmonary embolism
* Anaemia

Objectives:

The Disease

With respect to asthma, the student should be able to:

* Describe the pathology
* Relate pathology to symptoms and signs
* Describe the typical presentation of the disease and some of its variants
* Know the major differential diagnoses
* Describe the tests which can help to establish the diagnosis

The Treatment

* Understand the principles of treatment of acute and chronic asthma
* Understand the implications of treatment versus no treatment
* Learn about the published guidelines (local and national)
* How to plan and implement treatment – patient education about asthma, importance of prevention, monitoring of the disease
* Understand the principles of discharge planning and follow up
* Multi-professional team approach - understand the role of other members in the disease management – asthma nurse specialists, community matrons and primary care personal, and community pharmacists

(2) PRESENTING SYMPTOM OF CHEST PAIN

Objective: to be able to distinguish the following causes of chest pain:

* Angina/ACS/MI
* Pleuritic pain
* Muscular pain
* Pericarditis
* Oesophageal spasm
* GI reflux
* Referred pain
* Dissection of aortic aneurysm
* psychogenic

In order to do this you must be able to:

1. Take an efficient history from the patient with chest pain
2. Elicit the relevant physical signs using basic physical examination techniques.
3. Recognise signs of cardiac and lung disease
4. Perform and interpret the following tests:

    * ECG
    * CXR
    * Cardiac enzymes, D.Dimer, FBC, CRP, ESR, auto-immune profile

5. Know how to use the following tests to discriminate between alternative causes of chest pain:

* Exercise test
* CT chest/CTPA
* Echocardiogram
* Endoscopy

Management:

1. Of the symptoms, medications and consequences of ACS, pericarditis, causes of pleurisy, oesophageal spasm, GI reflux.
2. Similarly you must understand and be able to manage the following problems in the same way:

* Breathlessness
* Cough and sputum
* Wheeze
* Haemoptysis
* Weight loss and loss of appetite
* Swollen legs
* Peripheral oedema

CR3 SPECIFIC INVESTIGATIONS (ALSO SEE CR3 LEARNING OBJECTIVES)

SEE ALSO THE CLINICAL METHODS HANDBOOK AND THE CR3 LOG BOOK

Interpretation of Chest X-Rays

Attend radiology meeting to improve your skills on CXR

Orientate CXR

Distinguish between PA and AP

Describe the adequacy of films, including rotation and penetration

Learn to describe how a normal CXR looks like; cardiac borders, vascular border, lung marking, chest wall and diaphragm.

Learn how to distinguish consolidation, collapse, effusion, fibrosis, parenchyma/pleural opacities and hilar abnormalities.

Arterial Blood Gas Sampling, Analysis and Interpretation

Learn how to do sampling with the help of a junior doctor

Learn how to analyse the sample in an ABG machine

Learn about oxygen-Hb dissociation curve

Learn about partial pressures and normal values.

Learn about the mechanisms of low and high PaO_2 and $PaCO_2$

Learn to distinguish between respiratory and metabolic acidosis and alkalosis

Performing and Interpretation of Lung Function

Refer to practical skills guide

Learn about how to do PEFR and define the units of peak flow.

Teach a patient how to perform PEFR and recording them.

Describe the clinical use of PEFR in the diagnosis and management of acute and chronic asthma

Learn about spirometry, how to perform and their units.

Learn how to differentiate obstructive versus restrictive picture using spirometry

Learn about the use of spirometry in the diagnosis of COPD

Visit the local lung function lab and learn about how lung volumes and gas transfer are performed.

Learn about lung volumes and gas transfer

Learn about causes of abnormal gas transfer values.

Learn about the usefulness of CT chest

Learn about ECG

Learn about how to perform a 12 lead ECG

Learn about the basics about cardiac electrophysiology.

Learn about how to interpret ECG changes of cardiac ischaemia and MI.

Learn about various cardiac rhythm problems and conduction problems.

BP Measurement

For details, please refer to the Clinical Skills Handbook

Cardiac Exercise Test

Learn about indication and interpretation of results.

Holter Recording

Learn about usefulness of cardiac monitoring

Learn about usefulness of ECHO, Coronary Angiogram, Myocardial Perfusion Scan.

Cardiac Enzymes Tests:
Learn about the methodology and principles of Troponin and CK measurement
Learn about usefulness of these tests in diagnosing ACS/MI.

Haematological tests

Learn about how FBC and differential counts are performed

Learn about the interpretation altered WCC, platelets and other differential counts.

CR3 SPECIFIC PRACTICAL SKILLS

SEE ALSO THE CLINICAL METHODS HANDBOOK AND THE CR3 LOG BOOK

Generic Skills

Although you are placed in a cardio-respiratory firm, it is important to undertake tasks to achieve the generic practical skills detailed in the Clinical Methods Handbook.

Learning about Inhaler Devices and Techniques

Inhalers are essential part of respiratory care. You are therefore expected learn about the use of MDI with and without spacers, some dry powder devices; turbohaler, accuhaler, ellipta etc.

Teach patients about how to use these devices

Learn about how to set up a nebuliser with and without oxygen.

Learning About Setting Up of Oxygen Therapy

Learn about the rationale for oxygen therapy in general and patients with airways diseases; asthma and COPD

Learn about controlled oxygen therapy

Learn about local oxygen guidelines and the use of different devices used for oxygen delivery; nasal canuale, face mask etc.

Understand the Health and Safety requirements for use of oxygen therapy in the home.

PRIORITIES FOR CR3 INDEX CONDITIONS (also available in COMPAS - http://compas.smd.qmul.ac.uk)

By the time you reach the Foundation Year, you will be expected to know about these conditions. The codes give you an idea of their importance.

Learn the index conditions under the headings of basic sciences (anatomy, physiology), signs and symptoms, investigations, differential diagnoses, treatment (immediate and long term), prescribing and pathology.

As part of the spiral curriculum, Year 1 and Year 2 objectives are also incorporated and you are expected to learn them as well.

In general, you should be able to relate findings from examination of the cardio-respiratory system to pathology

- *** Emergency, life threatening or serious condition. Essential to be able to recognise and know how to treat.**
- **1 Have good knowledge of these conditions; be able to recognise them and be familiar with their treatment.**
- **2 Have some knowledge of these conditions and their treatment.**
- **3 Be aware of the existence of these conditions and know where to seek more information about them.**

Cardio-vascular diseases

System	Index Condition	Priority
CV1	Interpretation of ECG & basic anatomy of the heart	**1**
CV2	Hypertension	**1**
CV3	Angina	**1**
CV4	Acute Coronary Syndrome & Myocardial infarction	**1***
CV5	Arrhythmias and Conduction Defects	**1***
CV6	Cardiac Failure / Pulmonary Oedema	**1**
CV7	Acute Circulatory Failure / Shock	**1***
CV8	Cardio-respiratory Arrest	**1***
CV9	*Vascular Disease in other sites including CVA*	**1 & 2**
CV10	Infective Endocarditis	**2***
CV11	Valvular Heart Disease	**1**
CV12	Lipid disorders & Atherosclerosis	**1**
CV13	*Acute and Chronic Limb Ischaemia/Peripheral Vascular Disease*	**2***
CV14	*Limb Ulceration and Gangrene*	**2**
CV15	*Arterial Aneurysms*	**2***
CV16	Pericardial Disease	**3***
CV17	Myocardial Disease/Cardiomyopathy	**2-3**
CV18	Congenital Cardiovascular Disease	**3**
CV19	Rheumatic Fever and Rheumatic Heart Disease	**2**
CV20	*Varicose Veins*	**2**
CV21	*Vasculitis*	**2**

NB: Those index conditions in *italics* (9, 13, 14, 15 & 20) are covered in modules 3A and 3B.

Respiratory diseases

System	Index Condition	Priority
RS1	Lung function & pulmonary anatomy/physiology	**1**
Rs2	Asthma	**1***
RS3	Chronic Obstructive Pulmonary Disease (COPD)	**1***
RS4	Respiratory Failure	**1***
RS5	Pneumonia	**1***
RS6	Pulmonary Embolism	**1***
RS7	Deep Vein Thrombosis	**1**
RS8	Oxygen Therapy	**1***
RS9	Carcinoma of the Bronchus	**2**
RS10	Pulmonary Tuberculosis	**1**
RS11	Pleural Effusion and Pleural Disease	**1**
RS12	Pneumothorax	**1***
RS13	Chest Trauma / Haemothorax	**3***
RS14	Bronchiectasis and Cystic Fibrosis	**2**
RS15	Sarcoidosis	**2**
RS16	Interstitial Lung Disease	**3**
RS17	Obstructive Sleep Apnoea	**2**
RS18	Pulmonary Hypertension	**3**
RS19	Occupational Lung Disease	**3**

Haematological diseases

System	Index Condition	Priority
Haem1	Anaemia (General)	**1**
Haem2	Microcytic Anaemia (Iron Deficiency)	**1**
Haem3	Macrocytic Anaemia (B12 and Folate Deficiency) and Macrocytosis	**1**
Haem4	Normocytic Anaemia	**2**
Haem 5	Haemolytic Anaemia	**2**
Haem6	Tropical Haematological Disorders	**2**
Haem7	Haemoglobinopathies (Sickle Cell Thalassaemia)	**2***
Haem 8	Polycythaemia	**3**
Haem9	Benign White Cell (Leucocyte)	**2**
Haem10	Leukaemias (myeloproliferative Disorders and Myelodysplasia)	**3**
Haem11	Platelet Disorders	**2**
Haem12	Haemostasis	**2***
Haem13	Venous Thromboembolism	**1**
Haem14	Blood Transfusion (as applied to Clinical Medicine)	**1***
Haem15	Myeloma	**3**

Haem16	Lymphoma	**3**

CR3 LEARNING OUTCOMES: CARDIO-VASCULAR SYSTEM
(incorporating the objectives from years 1 and 2)

CV1: Interpretation of ECG and basic anatomy of the heart (Priority 1)

Linked year 1 / 2 sessions: CR2 lecture (data handling and ECG analysis, applied anatomy of the heart)

Linked Year 3 Objectives: CR3 lectures (C1 – C7)

General

Understand the basics of cardiac electrophysiology (including origin of each wave form)

Know the basic anatomy of the heart

Understand the ECG changes of cardiac ischaemia and MI

Learn about the ECG changes due to common electrolyte disturbances

Learn ECG changes in cardiac arrhythmias (as outlined below)

Learn ECG changes in cardiac conduction defects

Understand the ECG changes in common cardio-respiratory conditions as per the learning outcomes for the individual condition.

CV2: Hypertension (Priority 1)

Linked Year 1 / 2 sessions: CR2 lecture on hypertension

Linked Year 3 Objectives: CR3 lectures (C4)

CV3 (angina), CV4 (acute coronary syndrome / myocardial infarction), CV6 (cardiac failure), CV9 (vascular disease in other sites), CV12 (Lipid disorders), Met 3A (acute and chronic limb ischaemia), CV15 (arterial aneurysms), Neurol (CVA), retinopathy (Opthalmology) and Therapeutics lectures.

General

Learn the patho-physiology of atherosclerosis and other mechanisms of hypertension

Define hypertension (essential and secondary) and learn British Hypertension Society targets for blood pressure control

Describe symptoms and signs of hypertension

Learn the secondary causes of hypertension and give symptoms and signs that may be found in each condition

Learn about the associated cardiovascular risk factors that should be looked for in patients with hypertension

Describe the relevant investigations to look for causes and complications of hypertension.

Discuss the non-pharmacological management of cardiovascular risk factors

Advise patients with hypertension on the risks and benefits of drugs and non-therapeutic treatment options.

Learn those classes of drugs that can be used to control blood pressure and describe the mechanism of action, place in therapy and major side effects of each.

Acute management of a Hypertensive Emergency (priority 1*)

Learn the definition of accelerated hypertension

Learn about the pathology of target organ damage caused by accelerated hypertension

Discuss the principles of emergency blood pressure control in hypertension

CV3: Angina (Priority 1)

Linked Year 1 / 2 sessions: CR2 lecture (angina)

Linked Year 3 Objectives: CR3 lectures (P1, P2, C1, C2 and C3)

CV2 (hypertension), CV4 (acute coronary syndrome / myocardial infarction), CV6 (cardiac failure), CV9 (vascular disease in other sites), CV 12 (lipid disorders), Met3A (acute and chronic limb ischaemia), CV15 (arterial aneurysms), Met 3B (type I and type II diabetes mellitus) and Therapeutics lectures.

General

Learn the patho-physiology of atherosclerosis and explain how this leads to angina

Identify a patient with ischaemic heart disease

Describe symptoms and signs of angina

Learn about differential diagnosis for retrosternal chest pain

Learn about risk factors for development of atheroma and outline how each should be controlled in a patient with angina

Describe investigations that can be used to confirm the diagnosis of angina

Learn those classes of drugs used for angina and describe the mechanism(s) of action, place in therapy (i.e. whether they reduce the risk of a CV event or just control the symptoms) and major side effects of each

Explain to a patient how to take sublingual GTN spray in the event of chest pain

Learn about the indications for referral of a patient with angina to a specialist cardiology service

Prescribe for a patient with ischaemic heart disease with a view to improving prognosis

Evaluate the most appropriate treatment for patients with ischaemic heart disease

Advise patients with ischaemic heart disease on the risks and benefits of drugs and non-therapeutic treatment options.

Organise the long term care of a patient with ischaemic heart disease

Acute Management

Define unstable angina and the risk of progression of this to myocardial infarction

Describe symptoms and signs of unstable angina

Learn the investigations that should be performed in a patient with unstable angina and describe the expected findings

Describe the management of unstable angina

Give mechanism(s) of action and major side effects of drugs used in unstable angina

Learn the indications for urgent coronary intervention.

Coronary Intervention

Describe the processes of coronary angiography, angioplasty and stenting to a patient

Learn the complications of these procedures and discuss their prevention and management

Discuss indications for coronary artery bypass surgery

Describe some details about the process of putting a patient onto cardiopulmonary bypass

Learn the common complications of cardiopulmonary bypass and explain why these occur

Describe the process of coronary artery bypass and the risk of complications to a patient

CV4: Acute Coronary Syndrome & Myocardial infarction (Priority 1*)

Linked Year 1 / 2 sessions: CR2 lecture (myocardial infarction, applied anatomy of the heart)

Linked Year 3 Objectives: CR3 lectures (P1, P2, C1, C2 and C3)

CV2 (hypertension), CV3 (angina), CV6 (cardiac failure), CV9 (vascular disease in other sites), CV 12 (lipid disorders), Met 1 (acute and chronic limb ischaemia), CV15 (arterial aneurysms), Neurol (CVA), Met 3B (type I and type II diabetes mellitus) and Therapeutics lectures.

General

Learn the coronary circulation, particularly the vascular supply to various myocardial regions

Learn the basic anatomy of the heart

Explain how an ECG can be used to determine the site of myocardial infarction and to find out which vessel is occluded

Identify a patient with ischaemic heart disease

Learn the ECG changes (including evolutional changes) in Acute Coronary Syndrome

Describe changes in cardiac enzymes including troponin and creatinine kinase that occur from hours to weeks following an MI

Learn the common complications of myocardial infarction

Explain how and why complications may differ between anterior and inferior myocardial infarction

Describe symptoms, signs and management of complications of MI including (a) arrhythmias and (b) cardiac failure

Learn the drugs which are proven to improve prognosis/survival following MI and give evidence supporting their use including numbers need to be treated (NNT) values.

Organise the long term care of a patient with ischaemic heart disease

Advise patients with ischaemic heart disease on non-therapeutic methods of improving their condition

Prescribe for a patient with ischaemic heart disease with a view to improving prognosis

Evaluate the most appropriate treatment for patients with ischaemic heart disease

Advise patients with ischaemic heart disease on the risks and benefits of drugs and non-therapeutic treatment options.

Describe the role of cardiac rehabilitation in recovery from ACS

Acute Management

Describe the pathogenesis of acute MI

Describe symptoms and signs of an acute MI.

Describe the emergency investigations to confirm the diagnosis of MI.

Describe the criteria for the diagnosis of myocardial infarction

Describe the immediate management of a patient with myocardial infarction

Describe the mechanism of action, role in therapy and major side effects of aspirin, other anti-platelet therapies, diamorphine and oxygen in acute MI

Learn the role of primary coronary intervention (PCI) as an emergency therapy

Learn the role of thrombolysis in myocardial infarction

Describe mechanism of actions, indications and contraindications and major side effects of thrombolytic agents

Learn about the indications, pros and cons on the use of Primary Coronary Intervention (PCI) versus thrombolysis

Define “arrival-to-ECG” and “door-to-needle” times for suspected myocardial infarction and explain why these are important

Give indications for urgent cardiology referral in myocardial infarction

CV5: Arrhythmias and Conduction Defects (Priority 1*)

Linked Year 1 / 2 sessions:

Linked Year 3 Objectives: CR3 lecture (C3, C8 & C9)

CV3 (angina), CV4 (acute coronary syndrome / myocardial infarction), CV6 (cardiac failure), CV8 (cardio-respiratory arrest), CV11 (valvular heart disease), Neurology (blackouts, seizures and epilepsy) and Therapeutics lectures

General

Learn about cardiac cycle and cardiac electrophysiology and learn how this relates to the ECG waveform.

Identify common arrhythmias on an ECG

Using history (symptoms), signs and ECG findings be able to diagnose and distinguish between the following: cardiac arrest; atrial flutter and atrial fibrillation (AF); respiratory arrest; ventricular tachycardia ± pulse; Peri-arrest; ventricular fibrillation; supraventricular tachycardia; 1st, 2nd & 3rd degree heart block

Describe the symptoms by a patient experiencing cardiac arrhythmias

Learn how to distinguish between neurological and cardiological causes of collapse.

Learn cardiological causes of collapse.

Learn the causes of each type of pathological tachycardia and bradycardia

Describe how abnormalities of cardiac electrophysiology lead to the arrhythmias listed above

Learn about the ECG changes in common electrolyte disturbances, particularly potassium abnormalities.

Management

Describe the relevant investigations that should be performed in patients with suspected arrhythmias including 24 hour cardiac monitoring and investigation of underlying causes

Describe the mechanism and speed of onset of action, place in therapy and major side effects of adenosine, digoxin, amiodarone, verapamil, beta blockers, lignocaine, flecainide, magnesium and atropine.

Learn the role of anticoagulation in cardiac arrhythmias, particularly in atrial fibrillation

Discuss indications for “electrical treatment” of arrhythmias (cardioversion, pacemaker and ablation) and describe how each procedure is done

Describe methods that can be used to reduce recurrence of arrhythmias including treatment of underlying cause, drug treatment and radiofrequency ablation

Summarise the management of arrhythmias listed including termination of arrhythmias, control of heart rate and prevention of recurrence

Know how to manage a patient with a cardiac arrest in line with the current UK Resuscitation Council Guidelines

CV6: Cardiac Failure / Pulmonary Oedema (Priority 1)

Linked Year 1 / 2 sessions: CR2 lecture (heart failure)

Linked Year 3 Objectives: CR3 lectures (C2, C5, C8, R11)

CV2 (hypertension), CV3 (angina), CV4 (acute coronary syndrome / myocardial infarction), CV11 (valvular heart disease), Therapeutics lectures

General

Learn about the physiological mechanisms of cardiac contractility and learn about cardiac output and starling's law.

Explain how preload, after-load and cardiac contractility determine cardiac output.

Describe symptoms and signs of left, right and biventricular cardiac failure

Learn the causes of left, right and biventricular cardiac failure and the underlying pathogenesis.

Learn about the differential diagnosis for breathlessness (cardiac, respiratory and haematological)

Describe investigations that can be used to confirm the diagnosis of cardiac failure

Learn about the drugs which alter (a) preload, (b) after-load and (c) cardiac contractility and explain how each of these can be used to treat cardiac failure

Learn about drugs which (a) improve symptoms (b) prolong survival in heart failure and give evidence for the latter

Discuss the role of non-pharmacological treatments in heart failure including exercise and diet, revascularisation and cardiac transplantation

Be aware of new advancements in the treatment of heart failure

Compare the prognosis of congestive cardiac failure (CCF) to other common conditions.

Discuss the role of the primary care team in the management of chronic cardiac failure and in the avoidance of re-admissions

Describe the emergency management of a patient presenting with cardiac failure, particularly pulmonary oedema.

Describe the macroscopic and histological changes in the lungs and liver in heart failure

Be able to distinguish between the following terms and conditions: Left Ventricular Failure; Right Ventricular Failure; Congestive Cardiac Failure / Bi-ventricular Failure; Diastolic and Systolic Failure; Cardiogenic Shock; Low Output Failure; High Output Failure; Decompensated Failure

Learn about the CXR changes in pulmonary oedema

CV7: Acute Circulatory Failure/Shock (Priority 1*)

Linked Year 1 / 2 sessions: CR2 lecture (introduction to haemorrhage and shock)

Linked Year 3 Objectives: CR3 lectures (C2, C5, C6, R5, R7, R10, P4)

CV3 (acute coronary syndrome / myocardial infarction), CV5 (cardiac failure), CV15 (pericardial disease), RS5 (pulmonary embolus), septic patient, anaphylaxis (whole class lecture), and shock (ITU).

General

Learn about the mechanisms of shock

Describe how hypovolaemia, cardiac failure or obstruction (cardiac tamponade, pulmonary embolism), sepsis and anaphylaxis can result in shock

Describe how clinical examination can be used to distinguish between the causes of shock listed above

Describe how central venous pressure measurement can be used to give an indication of the cause of shock

Learn to distinguish between bronchial and "cardiac asthma"

Describe how a patient in shock should be monitored and managed

Explain the patho-physiological consequences/complications of shock

Outline measures that should be taken to prevent these complications

Cardiogenic Shock (Priority 1*)

Learn the causes of cardiogenic shock

Describe how preload, cardiac contractility and afterload could be optimised to improve cardiac function

Describe the mechanism of action, place in therapy and major side effects of adrenaline, noradrenaline, dopamine and dobutamine

Learn about the prognosis of cardiogenic shock.

CV8: Cardio-respiratory Arrest (Priority 1*)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lecture (C2, C6, R5, R10)

CV4 (acute coronary syndrome/myocardial infarction), CV5 (arrhythmias & conduction defects), CV7 (acute circulatory failure / shock), RS4 (respiratory failure), RS6 (Pulmonary embolism), RS12 (Pneumothorax), RS13 (chest trauma) and basic life support outcomes.

General

Learn how to recognise cardio-respiratory arrest

Learn UK resuscitation council (UK) guidelines in cardio-respiratory arrest.

Know how to perform basic life support including: (a) assessment and maintenance of the airway, (b) respiratory support and (c) cardiac massage

Explain the role and details about the cardiac arrest team and describe how to contact them

Recognise cardiac rhythm problems, particularly ventricular fibrillation (VF) and ventricular tachycardia (VT) on an ECG trace

Explain the importance of rapid defibrillation in a patient with VF or pulseless VT

Demonstrate the positioning of defibrillator gel pads and safe use of a defibrillator

Describe how you would administer defibrillation to a patient in ventricular fibrillation

Describe the mechanism of action and role of adrenaline, lignocaine, amiodarone and magnesium in the management of a cardiac arrest

Learn about the reversible causes of a cardio-respiratory arrest and explain how you would look for and correct these rapidly

Describe the prognosis of a patient in hospital who has a cardio-respiratory arrest and explain how underlying illnesses (acute and chronic) such as cancer influences this prognosis

Explain why the cardiac arrest team is not called for all patients that have cardio-respiratory arrest

Discuss how the decision not to call the arrest team is made and describe how the patient and their family should be involved in this process.

CV9: Vascular Disease in other sites including CVA (Priority 1 and 2) – mostly covered in Met 3A and 3B modules.

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lecture (P5), met3A lectures

CV2 (hypertension), CV3 (angina/), CV4 (acute coronary syndrome / myocardial infarction), CV12 (lipid disorders), CV15 (arterial aneurysms), Neurol (cerebro-vascular disease), Met 3B (type I and type II diabetes mellitus), Met3B (renal vascular diseases), Met 3A (acute abdomen/mesenteric ischaemia or infarction, limb ischaemia)

Carotid Stenosis (Priority 2)

Learn the patho-physiology of atherosclerosis

Describe symptoms and signs of carotid stenosis

Describe investigations that can be used to diagnose carotid stenosis

Discuss the main indications for end-arterectomy in patients with carotid stenosis

Cerebro-vascular accident (Priority 2*)

Identify a patient with cerebro-vascular accident

Describe the symptoms and signs associated with stroke and its complications

Know the general mechanisms, which cause cerebral vascular disease

Describe the role of aspirin, other anti-platelet drugs, thrombolysis and anticoagulation in the treatment of stroke

Demonstrate examination of the relevant neurological system following stroke

Know the medical management of transient ischaemic attack (TIA) and completed stroke

Know about the rehabilitation of patients with completed stroke

Demonstrate competency in use of an ophthalmoscope to recognise retinal vascular abnormalities

Outline the management options in primary care for a patient who has residual disability following stroke

Describe the importance of appropriate disease treatment and life style changes in stroke prevention

Mesenteric Ischaemia (part of module 3A)

Explain how blood supply to the bowel may be compromised and how might this present acutely/chronically

Learn the common symptoms and signs of mesenteric ischaemia

Learn the management of mesenteric ischaemia

Renal Vascular Disease (part of metabolism 3B)

Describe symptoms and signs of renal artery stenosis

Learn the different pathological types of renal artery stenosis and describe those people who might typically be affected by each

Describe investigations that can be used to confirm the diagnosis of renal artery stenosis

Outline the management of renal artery stenosis

Explain why ACE inhibitors are contra-indicated in patients with renal artery stenosis

Describe measures you would take to ensure ACE inhibitors are used safely in a patient with possible renal vascular disease

Other vascular diseases

Give an outline of a simple classification of vasculitis

Give an account of polyarteritis nodosa

CV10: Infective Endocarditis (Priority 2*)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lectures (P6, C7)

CV11 (Valvular heart disease), CV19 (Rheumatic heart disease), CSP lectures on bacterial infections, antibiotics and drug resistance, Therapeutics lectures, NICE guidelines on prophylaxis against infective endocarditis.

General

Describe the signs and symptoms of infective endocarditis

Give a differential diagnosis for an unexplained fever

Learn about the organisms that cause infective endocarditis and explain how cardiac infection with each may be acquired

Describe the pathogenesis of infective endocarditis and its complications

Explain how the diagnosis of infective endocarditis is made and describe the role of investigations including blood cultures and echocardiography in this process

Learn about the antibiotics effective against each organism that commonly causes infective endocarditis and describe the mechanism of action, place in therapy and major side effects of each

Learn NICE guidelines on antibiotic prophylaxis for endocarditis

Give indications for surgical treatment of infective endocarditis and discuss the timing of surgery in patients with this condition

Understand the importance of minimum inhibitory concentration (MIC) and antimicrobial synergy in management of IE

Be able to explain why liaison between the microbiologist/infectious disease physician, cardiologist, and cardiac surgeon is important

Be able to list host factors predisposing to the development of endocarditis

Be able to list the common bacterial causes of endocarditis in people with normal valves, abnormal native valves and prosthetic valves

Discuss the link between rheumatic fever and infective endocarditis

CV11: Valvular Heart Disease (Priority 1)

Linked Year 1 / 2 sessions: CR2 lecture (valvular heart disease)

Linked Year 3 Objectives: CR3 lecture (C7)

CV4 (acute coronary syndrome/myocardial infarction), CV10 (infective endocarditis), CV18 (congenital cardiovascular disease), CV19 (rheumatic fever and rheumatic heart disease).

General

Learn the anatomy of the heart and the structure of the semi-lunar and AV valves.

Explain the cardiac cycle particularly the valvular functions during this cycle

Explain how the first and second heart sounds are generated and relate these to the cardiac cycle and valve openings and closures

Learn the mechanisms of 3rd and 4th heart sounds and their clinical significance

Recognise the first and second heart sounds on cardiac auscultation and identify systolic and diastolic murmurs

Be able to describe the haemodynamic consequences of atrial and ventricular septal defects.

Systolic Murmurs

Describe symptoms and signs of aortic stenosis, aortic sclerosis, mitral regurgitation, tricuspid regurgitation and pulmonary stenosis

Distinguish between the causes of systolic murmurs using characteristics of the murmur (site, radiation, character, pitch) and associated clinical features, mainly to differentiate ejection systolic murmur of aortic stenosis, aortic sclerosis, mitral regurgitation, tricuspid regurgitation and pulmonary stenosis from that of pan systolic murmur.

Diastolic Murmurs

Describe symptoms and signs of aortic/pulmonary regurgitation and mitral stenosis

Distinguish between these causes of diastolic murmurs using characteristics of the murmur (site, radiation, character and pitch) and associated clinical features

Learn the causes of aortic regurgitation and mitral stenosis; describe the pathological effect that each type of valve lesion has on the heart and circulation

Learn about the ECG findings expected in patients with these cardiac valve defects

Discuss the management of a patient with a cardiac valve defect including a) treatment of underlying cause, b) prevention of complications, c) valve replacement surgery

Describe different types of prosthetic heart valve that may be used to replace defective valves and discuss the advantages and disadvantages of each

CV12: Lipid Disorders and atherosclerosis (Priority 1)

Linked Year 1 / 2 sessions: CR2 lecture (atherosclerosis)

Linked Year 3 Objectives: CR3 lectures (P5, C2, C3 and C4) & BNF cardio-vascular risk prediction charts.

General

Learn basic biochemistry about lipids, particularly chylomicrons, cholesterol, VLDL, HDL

Describe relationship between lipoprotein concentrations, atheroma and cardiovascular risk

Describe clinical features and investigations of hyperlipidaemia

Describe management of hyperlipidaemia including diet, exercise and drugs

Describe primary and secondary prevention of hyperlipidaemia and benefits

Learn about commonly prescribed drugs in hyperlipidaemia

Describe the role of screening for hyperlipidaemia

CV13: Acute and Chronic Limb Ischaemia/Peripheral vascular disease (Priority 2*) (as part of MET3A outcomes)

Linked Year 1 / 2 sessions:

Linked Year 3 Objectives: CR3 lectures (P5), Met 3A (limb ischaemia), CV2 (hypertension), CV3 (angina), CV4 (acute coronary syndrome/myocardial infarction), CV9 (vascular disease in other sites), CV12 (Lipid disorders), CV15 (arterial aneurysms), Neurol (cerebro-vascular disease), Met 3B (type I and type II diabetes mellitus)

General

Describe the symptoms and signs of chronic limb ischaemia

Learn about the differential diagnosis for calf pain

Describe the pathogenesis of peripheral vascular disease

Learn the risk factors for the development of peripheral vascular disease and describe how each of these can be looked for and controlled

Describe the investigations that should be performed to determine the presence and severity of peripheral vascular disease, including ABP Index (ABPI) and duplex Doppler

Counsel a patient on improving symptoms, slowing progression and preventing complications of peripheral vascular disease

Give indications for percutaneous transluminal angioplasty and arterial reconstruction surgery

Describe the percutaneous transluminal angioplasty and arterial reconstruction surgery to a patient, including risk of complications

Discuss indications for limb amputation

Describe types and process of limb amputation and list possible complications

Discuss rehabilitation for patients following limb amputation and list mobility aids available

Explain the options available for pain control and palliative support in a patient with intractable limb ischaemia.

Acute Limb Ischaemia

Describe the symptoms and signs of acute limb ischaemia

Discuss mechanisms which may lead to the development of acute limb ischaemia

Describe the nature and timing of pathological changes that will occur in an acutely ischaemic limb if the ischaemia is not relieved

Describe the emergency investigation of a patient with acute limb ischaemia

Recognise the urgency of management of the acutely ischaemic limb

Discuss the options available for emergency management of acute limb ischaemia including anticoagulation, thrombolysis, angioplasty and embolectomy

CV14: Limb Ulceration and Gangrene (Priority 2) (as part of Met3A outcomes)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: Met 3A (limb ischaemia, ulcer and gangrene), CV13 (acute and chronic limb ischaemia), CV20 (varicose veins), RS7 (deep venous thrombosis), Neurol (peripheral polyneuropathy), Met3B (type I and type II diabetes mellitus), Dermatology (dermatological malignancies/skin grafts and flaps)

General

Learn the causes of chronic leg ulcers and describe the different appearances

Leg Ulceration

Compare and contrast the presentation of venous and arterial leg ulcers

Describe the pathogenesis of ischaemic, venous and diabetic ulcers

Describe the features of decubitus ulcers (pressure sores)

Describe risk factors for decubitus ulcers

Describe measures for the primary and secondary prevention of leg ulcers

Learn the investigations that should be performed in patients with leg ulcers and explain how these will help with patient management

Discuss the treatment options for a patient with chronic leg ulcers including (a) management of underlying cause (b) dressings and bandaging and (c) skin grafting

Describe the role of the multidisciplinary team in the prevention and treatment of pressure sores

Gangrene

Explain how you would recognise gangrene clinically

Learn the types of gangrene e.g. wet, dry, gas and Fournier's scrotal gangrene and explain the pathogenesis and appearance of each

Describe the gangrene associated with chronic ischaemia

Describe the management of each type of gangrene

Describe how skin ulceration can be prevented

CV15: Arterial Aneurysms (Priority 2*) (as part of Met3A outcomes)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CV2 (hypertension), CV3 (angina), CV4 (acute coronary syndrome / myocardial infarction), CV7 (acute circulatory failure / shock), CV9 (vascular disease in other sites), CV12 (Lipid disorders), Met 3A (acute and chronic limb ischaemia), Neurol (cerebro vascular disease), Met 3B (type I and type II diabetes mellitus)

General

Describe how arterial aneurysms develop and give common anatomical sites at which they occur

Explain the difference between true and false aneurysms

Describe symptoms and signs of an aortic aneurysm

Describe the potential complications of aneurysms

Describe investigations that can be used to diagnose and monitor an aortic aneurysm

Know the indications for surgical intervention in aortic aneurysm disease

Explain the differences between an open and endovascular repair

Describe the potential complications of aortic aneurysm surgery including mortality figures for elective and emergency aneurysm surgery

Give a differential diagnosis for an epigastric mass

Learn the risk factors for arterial aneurysm and describe how these should be assessed and controlled

Describe complications of arterial surgery and understand their management.

Acute Management

Describe the symptoms and signs of a patient presenting with a leak or rupture of an aneurysm of (a) the abdominal aorta (b) the thoracic aorta

Describe the emergency management of a patient presenting with leaking or ruptured aortic aneurysm

CV16: Pericardial Disease (Priority 3*) (including acute pericarditis, pericardial effusion, constrictive pericarditis)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CV3 (Angina), CV4 (acute coronary syndrome / myocardial infarction).

General

Describe the characteristics of pain caused by pericardial inflammation

Describe the clinical signs and causes of pericarditis, pericardial effusion and constrictive pericarditis/cardiac tamponade.

Describe the ECG changes expected in a patient with acute pericarditis and explain how these differ from the changes of myocardial infarction

Understand the ECG and echocardiography findings in patients with pericardial effusion and constrictive pericarditis/cardiac tamponade

Describe the management of acute pericarditis

Outline the use of pericardiocentesis and surgery in the diagnosis and treatment of patients with pericardial effusion or constriction

CV17: Myocardial Disease/Cardiomyopathy (Priority 2-3)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lecture C5

CV6 (Cardiac failure), CV7 (acute circulatory failure/shock)

Myocarditis

Describe symptoms and signs of myocarditis

Learn the major causes of myocarditis

Explain how the diagnosis of myocarditis can be confirmed by investigation

Cardiomyopathy

Define cardiomyopathy and learn types of cardiomyopathy

Describe symptoms and signs of dilated, hypertrophic and restrictive cardiomyopathy and explain why these differ between types

Give causes of dilated, hypertrophic and restrictive cardiomyopathy

Discuss the advantages and disadvantages of screening in families with cardiomyopathy

Describe the management options for patients with dilated, hypertrophic and restrictive cardiomyopathies

Outline the main pathological features of cardiomyopathy

CV18: Congenital Cardiovascular Disease (Priority 3)

(Including atrial and ventricular septal defects, patent ductus arteriosus, Fallot's tetralogy, coarctation of the aorta)

Linked Year 1 / 2 sessions: CR2 lecture (heart development and congenital defects)

Linked Year 3 Objectives: CR3 lecture C7

General

Describe symptoms and signs of the cardiac malformations listed above.

Give a differential diagnosis for central cyanosis

Learn the factors that may cause congenital heart disease

Describe the pathology and cardiac consequences of these cardiac malformations

Define and explain the Eisenmenger reaction/syndrome and explain why this worsens the prognosis

Know the complications of congenital heart disease and explain how these may be prevented

Describe investigations that can be used to confirm the diagnosis of congenital heart disease

Discuss the role and timing of surgery in the management of congenital cardiac disease

Discuss particular difficulties that may be faced by adolescents and young adults with chronic cardiac disease

CV19: Rheumatic Fever and Rheumatic Heart Disease (Priority 2)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lecture (C7), CV6 (cardiac failure), CV10 (infective endocarditis), CV11 (Valvular heart disease)

General

Describe symptoms and signs of rheumatic fever

Describe how the Duckett Jones criteria are used to make the diagnosis of rheumatic fever

Explain how Group A streptococcal pharyngeal infection can lead to heart, skin, joint and CNS involvement and describe the pathological changes in these tissues

Describe investigations that can contribute to the diagnosis of rheumatic fever

Discuss the management of rheumatic fever including the choice of antibiotics for streptococcal infection

Describe the cardiac complications of rheumatic fever

Discuss the epidemiology of rheumatic fever in the UK and worldwide

CV20: Varicose Veins (as part of Met3A, Priority 2)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: Met 3A (varicose veins), CV14 (limb ulceration and gangrene), RS7 (deep venous thrombosis)

General

Describe the symptoms and signs associated with varicose veins and their complications

Demonstrate examination of varicose veins including distribution, communication with deep veins and complications

Discuss the pathophysiology of varicose veins

Give risk factors for the development of varicose veins

Outline the management options for a patient with varicose veins including indications for surgery

Describe the surgical options for treatment of varicose veins to a patient

CV21: Vasculitis (Priority 2)

Linked Year 3 Objectives: CR3 lecture P2.

Understand the classification of vasculitis

Understand the pathology of common vasculitis conditions

Give a differential diagnosis of conditions presenting like vasculitis

Understand the importance of anti-nuclear cytoplasmic antibody (ANCA)

Understand the signs and symptoms and pathology of Polyarteritis nodosa, Granulomatosis with polyangiitis (Wegener's granulomatosis) and ANCA related vasculitis.

CR3 LEARNING OUTCOMES: RESPIRATORY SYSTEM
(incorporating the objectives from yr 1 and 2)

RS1: Interpretation of Lung function and pulmonary anatomy/physiology (Priority 1)

Linked year 1 / 2 sessions: CR2 lectures (lung function testing, lung mechanics, ventilation & perfusion in the lung, blood gases, control of ventilation and plasma pH, obstructive and restrictive lung disease, anatomy of the sinuses and larynx, CXRs & lung anatomy)

Linked year3 objectives: CR3 lectures (R1, R2 & R3)

General

Learn the basic anatomy of the lungs

Describe the use of lung function in the diagnosis of respiratory diseases

Be able to interpret spirometry, lung volumes and gas transfer

Be able to differentiate obstructive and restrictive patterns

Learn about peak expiratory flow measurement and its usefulness

Describe the roles of peak flow and spirometry in the diagnosis and monitoring of respiratory diseases

Be able to explain to a patient how to perform spirometry and peak flow and, in the case of peak flow, record the results

Be able to interpret acid-base balance results

RS2: Asthma (Priority 1*)

Linked Year 1 / 2 sessions: CR2 lecture (asthma)

Linked Year 3 Objectives: CR3 lectures (R1, R2 & R3)

RS3 (chronic obstructive pulmonary disease), RS4 (Respiratory failure), RS19 (Occupational lung disease), also refer to ENT on rhinitis and dermatology on eczema.

General

Learn the basic anatomy of the larger and smaller airways

Describe the aetiology and pathophysiology of asthma

Give a differential diagnosis for wheeze

Describe investigations that can be used to confirm the diagnosis of asthma including the diagnosis of atopy

Describe the mechanism of action, place in therapy and major side effects of asthma treatments including short and long acting beta2 agonists, corticosteroids, leukotriene antagonists and anti-IgE

Explain the rationale behind the stepwise approach used in asthma management and demonstrate use of the British Thoracic Society (BTS) and Scottish Intercollegiate Network (SIGN) guidelines to choose treatments for asthma

Explain the role of specialist nurse practitioners and self-management plans in the management of asthma

Explain to a patient the difference between a reliever and preventer inhaler and the use of each in asthma management

Demonstrate the use of metered dose inhaler with and without a spacer to a patient

Be able to recognise differences and similarities in the management of asthma and COPD

Acute Asthma exacerbation

Learn potential precipitating factors for an asthma attack

Describe symptoms and signs of different severities of asthma exacerbations (as per the BTS guideline)

Describe the emergency management of asthma in a person presenting to Emergency Department and indications for admission

Discuss the role of intensive care in managing an acute asthma attack

Describe how a patient with acute asthma should be monitored following an admission to hospital

Describe measures that should be taken prior to hospital discharge to prevent asthma recurrence

Discuss the role of pharmacological and non-pharmacological interventions in preventing asthma exacerbations.

RS3: Chronic Obstructive Pulmonary Disease (Priority 1*)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lectures (R1, R2 & R3)

RS2 (asthma), RS4 (respiratory failure), RS18 (pulmonary hypertension), RS19 (Occupational lung disease) and CSP lectures on smoking.

General

Describe symptoms and signs in patients with COPD

Give a differential diagnosis for exertional breathlessness and cough

Describe the pathology and causes of COPD

Describe how a patient's 'pack years' are calculated

Describe the role of spirometry in diagnosing and measuring the severity of COPD

Describe the purpose and potential abnormal findings of other investigations including chest X-ray, full blood count and arterial blood gases in a patient with COPD

Explain the rationale behind the stepwise approach to COPD management and demonstrate use of the British Thoracic Society and NICE guidelines on COPD to choose treatments for COPD

Learn the drugs that can be used to aid smoking cessation and give evidence for their effectiveness and be aware of their contraindications

Give smoking cessation advice to a patient

Explain the mechanism of action and major side effects of bronchodilators, corticosteroids and theophylline in the management of COPD.

Describe the roles of specialist nursing, physiotherapy and pulmonary rehabilitation in the management of COPD

Learn the role of community services in the management of COPD

Learn the complications of COPD and describe their investigation and management

Understand the indications and rationale for long term oxygen therapy (LTOT).

Acute Exacerbation of COPD

Describe the clinical features (symptoms and signs) of an acute exacerbation of COPD

Give a differential diagnosis for increased breathlessness in a patient with COPD

Describe the investigation of a patient presenting with an acute exacerbation of COPD

Describe the emergency management of a patient with an acute exacerbation of COPD

List organisms that may cause pulmonary infection in patients with COPD

Discuss the role and choice of antibiotics for treatment of an acute exacerbation of COPD

Discuss the role of pharmacological and non-pharmacological interventions in preventing COPD exacerbations.

Learn the role of community services in the management of COPD exacerbation

RS4: Respiratory Failure (Priority 1*)

Linked Year 1 / 2 sessions: CR2 lecture (respiratory failure)

Linked Year 3 Objectives: CR3 lectures (R4 & R10)

RS2 (asthma), RS3 (Chronic obstructive pulmonary disease), RS5 (Pneumonia), RS6 (Pulmonary embolism) & RS16 (Interstitial lung disease)

General

Learn the oxygen dissociation curve and its importance in oxygen delivery

Describe the pathological consequences of hypoxia and hypercapnoea

Define type 1 and type 2 respiratory failures and interpretation of arterial blood gas results in these conditions and be able to differentiate these from other (metabolic) blood gas derangements

Explain the importance of correcting hypoxia in respiratory failure

Explain why oxygen replacement can cause deterioration as well as improvement in a patient with respiratory failure

Be aware of the treatment options for patients with ventilatory failure including: (a) non-invasive ventilation (NIV or BIPAP) & (b) continuous positive airways pressure (CPAP)

Discuss situations in which treatment may not be appropriate for ventilatory failure and describe palliative measures that could be used to relieve symptoms in these patients

Be able to interpret arterial blood gases and pH in order to assist making a diagnosis

Type 1 Respiratory Failure

Explain how matching of ventilation and perfusion is achieved in the normal lung

Describe the pathogenesis of type 1 respiratory failure

Learn the causes of type 1 respiratory failure

Describe symptoms and signs of type 1 respiratory failure

Type 2 Respiratory Failure

Describe the normal mechanical process of ventilation

Describe the normal process of control of breathing

Describe the pathogenesis of type 2 respiratory failure

Learn the causes of type 2 respiratory failure

Describe the symptoms and signs of type 2 respiratory failure

RS5: Respiratory tract infections & Pneumonia (Priority 1*)

Linked Year 1 / 2 sessions: CR2 lecture (upper respiratory tract infection, lower respiratory tract infection)

Linked Year 3 Objectives: CR3 lectures (P4, P6 & R7)

RS3 (chronic obstructive pulmonary disease), RS4 (respiratory failure), RS10 (pulmonary tuberculosis), RS11 (pleural effusion and pleural disease) & RS12 (pneumothorax).

General

Learn about common upper airway infections; pharyngitis, sinusitis, otitis media and~~,~~ influenza

Describe symptoms and signs of pneumonia

Describe the physiological processes important for normal lung defence from infection

Learn pulmonary, immunological or other conditions that predispose to pulmonary infection

Learn about the principal organisms that cause pneumonia in those patients who are (a) immuno-competent, (b) immuno-compromised and (c) in hospitals/institutions

Learn about the “atypical pathogens” and the clinical, pathological and microbiological features that differentiate them from ‘typical’ pathogens.

Describe the relevant investigations in a patient with pneumonia

Explain how organisms causing lower respiratory tract infections are differentiated and identified by microbiological investigations.

Name antibiotics likely to be effective against each of the major respiratory pathogens

Explain how the correct drug is chosen for lower respiratory tract infections

Describe routes of administration by which antibiotics can be given and state when each route should be used

Describe the major adverse consequences of antibiotics used in the treatment of LRTI (a) for the individual and (b) for society

Know the indications for vaccination against the following: (a) influenza and (b) pneumococcus

Recognise chest radiograph changes consistent with pneumonia (consolidation, lobar collapse and pleural effusion).

Identify and describe the histopathological changes in the lung in a patient with pneumonia

Emergency Management

Describe clinical features that differentiate mild, moderate and severe pneumonia; know about the use of CURB 65

Identify patients who are likely to have poor outcomes with community acquired pneumonia

Explain how and why management differs in those with mild, moderate and severe pneumonia

Give reasons for hospital admission with pneumonia

RS6: Pulmonary Embolism (PE) (Priority 1*)

(to be learnt together with DVT)

Linked Year 1 / 2 sessions; CR2 lectures (breathlessness, venous thromboembolism)

Linked Year 3 Objectives: CR3 Lectures (H2, R5, R6, R7 & R9)

CV7 (acute circulatory failure / shock), RS5 (pneumonia), RS7 (deep vein thrombosis), RS18 (pulmonary hypertension) and Haem 10 (venous thromboembolism).

General

Learn pathophysiology of venous thrombo-embolism.

Describe symptoms and signs of pulmonary embolism

Give a differential diagnosis for pleuritic chest pain

Explain how clinical history and examination can be used to distinguish between causes of pleuritic chest pain

Describe the role of D-Dimer, CXR, ECG, V/Q scanning, spiral CT scanning and pulmonary angiogram in the diagnosis of pulmonary embolus

Learn about the usefulness of Well's and other PE probability scoring systems

Describe the mechanism of action, place in therapy and major side effects of heparin and warfarin in the treatment of DVT and pulmonary embolus

Be aware of the new classes of anticoagulation treatments and the indications for choosing between them.

Learn about prevention of venous thrombo-embolism.

Acute Emergency

Describe the clinical features of massive pulmonary embolism

Describe the investigation of a patient with suspected massive pulmonary embolism

Outline the management of a patient with suspected massive PE

Be aware of the indications for thrombolysis in massive PE

Discuss the advantages and disadvantages of thrombolysis and surgery in a patient with a massive pulmonary embolus

RS7: Deep Vein Thrombosis (Priority 1)

Linked Year 1 / 2 sessions: CR2 lecture (Venous thromboembolism)

Linked Year 3 Objectives: CR3 lecture H2 (venous thromboembolism prevention); CV14 (limb ulceration and gangrene), CV20 (varicose veins), RS6 (pulmonary embolism), Haem10 (venous thromboembolism)

General

Describe the anatomy of the lower limb venous system

Describe symptoms and signs of deep venous thrombosis

Give a differential diagnosis for calf swelling/tenderness

Learn the risk factors for deep venous thrombosis and pulmonary embolism

Describe how investigations are used to confirm or refute the diagnosis of a deep vein thrombosis

Describe the mechanism of action, place in therapy and major side effects of heparin and warfarin in the treatment of DVT and pulmonary embolus

Counsel a patient regarding avoidance of drugs, foods and alcohol whilst taking warfarin

Describe the physiological and pathological processes that occur in the post-thrombotic limb and explain how these may lead to venous insufficiency and ulceration

Describe the management of a post-thrombotic limb and of venous ulceration

Learn about the indications for thrombo-prophylaxis for hospital in-patients and describe how this is done

Advise a patient on DVT/PE prophylaxis during travel e.g. long haul flight

Be aware of the new classes of anticoagulation treatments and the indications for choosing between them.

RS8: Oxygen Therapy (Priority 1*)

Linked Year 1 / 2 sessions: CR2 lecture (respiratory failure, blood gases, control of ventilation and plasma pH)

Linked Year 3 objectives: CR3 lecture (R10), Most of cardiac and respiratory emergencies.

General

Learn about oxygen transport and oxygen dissociation curve

Describe methods of oxygen delivery for pts both in hospital and in the community

Be aware of the concept of prescribing oxygen to achieve target saturations

Be able to identify conditions which should have oxygen prescribed to achieve saturations in each of the two common target saturation ranges.

Learn about conditions and situations where prescribing oxygen to target saturations does not apply and be able to explain why

Be able to prescribe oxygen on a standard drug chart.

Explain how you would determine what concentration of oxygen to administer to a patient with COPD

Describe different devices used to enrich the oxygen content of inspired air, including nasal prongs, venturi-masks and reservoir masks

RS9: Carcinoma of the Bronchus (Priority 2)

Linked Year 1 / 2 sessions: Cr2 lecture (lung cancer)

Linked Year 3 Objectives: CR3 lectures (P3, R9)

RS3 (chronic obstructive pulmonary disease), RS11 (pleural effusion and pleural disease), CSP lecture on smoking and health.

General

Learn about the risk factors for lung cancer and the usefulness of screening program.

Learn about and be able to apply the histological classification and staging of lung cancer

Explain why it is important to differentiate between small cell and non-small cell forms of lung cancer

Describe clinical (including metastatic) manifestations of lung cancer

Describe investigations used in the diagnosis of lung cancer

Learn about bronchoscopy in general and its usefulness in the diagnosis of lung cancer and other conditions.

Be able to break the news that the patient has lung cancer

Discuss the role of the multi-disciplinary team in the diagnosis, treatment and support of a patient diagnosed with lung cancer

Be aware of the potential paraneoplastic presentations of lung cancer and their pathogenesis, where known.

Understand the role of surgery, chemotherapy, radiotherapy and palliative care in the management of bronchial carcinoma.

Non-small Cell Lung Cancer

Describe specific clinical features and likelihood and common sites of metastasis of non-small cell cancer

Describe the clinical course and prognosis of patients with non-small cell lung cancer

Describe the management of non-small cell lung cancer based on the TNM classification

Understand adjuvant, neo-adjuvant and palliative treatments

Discuss the side effects and expected benefits of the treatments for non-small cell cancer

Small Cell Lung Cancer

Describe specific clinical features and likelihood and common sites of metastasis of small cell lung cancer

Describe the clinical course and prognosis of patients with small cell lung cancer

Describe the management of small cell lung cancer if (a) locally advanced and (b) metastatic

Discuss the side effects and expected benefits of the treatments for small cell cancer

Palliative

Explain how treatment may result in either improvement or deterioration in quality of life and discuss how treatment decisions are made

Learn symptoms experienced by patients dying of lung cancer and describe palliative measures which could be used to relieve each one

Describe the role of the palliative care home team in supporting patients dying at home and their families

Describe the role of primary care team in the palliative care of terminal respiratory disease

Explain the role of the hospice in providing care for patients with lung cancer

Explain the role of care of the dying pathways in the management of the dying patient

RS10: Pulmonary Tuberculosis (TB) (Priority 1)

Linked Year 1 / 2 sessions: CR2 lecture (Tuberculosis)

Linked Year 3 Objectives: CR3 lectures (P4, P6, R8); RS11 (Pleural effusion and pleural disease), Neurol (meningitis and brain abscess), CSP lectures on Infection

General

Define tuberculosis

Describe the epidemiology of tuberculosis; global, UK and risk factors

Be aware of the DOTS strategy

Review the symptoms of tuberculosis

(see lung cancer for differential diagnosis of haemoptysis)

Differentiate between primary and post-primary tuberculosis

List the investigations for active tuberculosis

Understand the standard treatment of tuberculosis

Explain why contact tracing is important

Understand the role of BCG vaccination.

RS11: Pleural Effusion and Pleural Disease (Priority 1)

Linked Year 1 / 2 sessions: CR2 lecture (CXRs and lung anatomy)

Linked Year 3 Objectives: CR3 lectures (R6, R9, R11)

RS5 (Pneumonia), RS9 (carcinoma of the bronchus), RS10 (pulmonary tuberculosis), RS12 (pneumothorax), RS13 (chest trauma, haemothorax).

General

Learn the physiological mechanisms of pleural effusion

Describe symptoms and signs of a pleural effusion

Differentiate clinical signs of a pleural effusion from those of pulmonary consolidation, collapse, pneumothorax and lung fibrosis

Describe how pleural aspiration is performed and list analyses that should be performed on fluid obtained

Describe how these tests distinguish between an exudate and a transudate and explain why this is important (learn Light's criteria)

List causes of an exudate and a transudate

Describe how investigations including chest X-ray, pleural aspiration, pleural biopsy, thoracic ultrasound and CT chest can help to differentiate between causes of effusion and the indications for each investigation.

Describe (in general) how pleural effusions are managed medically and surgically

Learn about chest drain insertion

Learn about VATS (video assisted thoracoscopic biopsy)

RS12: Pneumothorax (Priority 1*)

Linked Year 1 / 2 sessions: CR2 lecture (CXRs and lung anatomy)

Linked Year 3 Objectives: CR3 lectures (R5)

RS5 (pneumonia), RS6 (pulmonary embolism), RS13 (Chest trauma and haemothorax), BTS guidelines and CSP lecturer on smoking and health.

General

Describe symptoms and signs of pneumothorax

Learn the risk factors and describe the pathogenesis of pneumothorax

Describe investigations used to confirm the diagnosis of pneumothorax

Describe conservative, medical and surgical management of pneumothorax and when each should be considered

Describe how underwater chest drain is managed on a day to day basis on the ward.

Describe the criteria used in order to remove a chest drain in a patient

Explain the chances of pneumothorax recurrence and activities to avoid to a young patient with a simple pneumothorax

Describe the role of smoking cessation in those patients with pneumothorax.

Tension Pneumothorax

Describe the clinical features of tension pneumothorax

Explain why a tension pneumothorax is life threatening

Describe the emergency management of tension pneumothorax

RS13: Chest Trauma/Haemothorax (Priority 3*), learn together with RS11 and relevant objectives from module 3A

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lectures (R6, R11)

RS11 (pleural effusion and pleural disease), RS12(pneumothorax), Met 3A (chest trauma)

General

Learn pulmonary and pleural complications of blunt, sharp and explosion related chest trauma

Describe how chest trauma is assessed as part of the Advanced Trauma Life Support (ATLS) protocol

Describe the diagnosis and management of haemothorax

RS14: Bronchiectasis and Cystic Fibrosis (Priority 2)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lectures (P4, P6, R1, R2 & R3)

RS1 (lung function), RS3 (chronic obstructive pulmonary disease), RS5 (pneumonia), also refer to acute abdomen in children, malabsorption syndrome, single gene disorders, failure to thrive.

General

Give a differential diagnosis for cough with productive of sputum.

Describe the pathology of bronchiectasis.

Learn the common causes of bronchiectasis

Describe the symptoms and signs of bronchiectasis and cystic fibrosis

Describe the genetic mutation in cystic fibrosis and explain current theories as to how this leads to lung disease

Describe the pathological effect and clinical consequences of cystic fibrosis in non-pulmonary organs

Describe investigations that can be used to confirm diagnoses of bronchiectasis and cystic fibrosis

Learn the role of lung function and understand that bronchiectasis is one of the causes of COPD.

Learn about the organisms that exacerbate bronchiectasis and cystic fibrosis and explain how you would choose an antibiotic for patients with exacerbations

Discuss the significance of isolation of bacterial organisms like pseudomonas in sputum of those patients with bronchiectasis

Learn about the role of antibiotic prophylaxis in bronchiectasis

Describe the role of chest physiotherapy in the management of bronchiectasis

Describe nutritional problems and their management in cystic fibrosis.

Describe the potential impact of chronic disease, such as cystic fibrosis, on the lives of young people

RS15: Sarcoidosis (Priority 2)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lectures (P3, R8)

RS10 (pulmonary tuberculosis), RS16 (interstitial lung disease), Opthalmology (uveitis), Met 3B (hypercalcaemia and hypocalcaemia), Dermatology (cutaneous manifestations)

General

Describe symptoms and signs of sarcoidosis

Describe the pathological features of sarcoidosis

Describe how sarcoidosis affects (a) the lungs and (b) other tissues and organs

Describe those clinical conditions which closely resemble sarcoidosis.

Describe investigations that can be used to confirm the diagnosis of (a) pulmonary and (b) extra-pulmonary sarcoidosis

Describe the treatment options for patients with sarcoidosis and the indications for commencing treatment

Learn about the prognosis for patients with different presentations of sarcoidosis

RS16: Interstitial Pneumonias (Priority 3)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lectures

RS10 (pulmonary tuberculosis), RS15 (sarcoidosis), RS19 (occupational lung disease)

General

Describe the symptoms and signs of interstitial pneumonias

Give a differential diagnosis for finger clubbing

Describe those investigations which are used towards making the diagnosis

Understand the overall classification of interstitial pneumonias

Summarise the other causes of lung fibrosis including occupational dusts, sarcoidosis, extrinsic alveolitis, TB, connective tissue diseases, drugs

Describe which patients with interstitial pneumonias should be referred for specialist management

Describe the role of steroids and immune-modulating drugs in the therapy of interstitial pneumonias.

Describe the symptoms and signs characteristic of a restrictive lung defect including the changes in lung function.

Discuss the indications for single lung or heart-lung transplant.

RS17: Obstructive Sleep Apnoea (Priority 2), learn together with respiratory failure (RS4).

Linked Year 1 / 2 sessions: CR2 lecture (respiratory failure)

Linked Year 3 Objectives: CR3 lectures (R4)

RS4 (Respiratory failure), RS18 (pulmonary hypertension)

General

Describe clinical features of sleep apnoea in adults and children

Identify patients who may be suitable for referral to a sleep service

Discuss the difference between obstructive and central sleep apnoea

Learn the basic components of a sleep study and changes in sleep apnoea

Explain to a patient what they can expect when undergoing a sleep study

Describe the treatments available for obstructive sleep apnoea including conservative measures, Continuous Positive Airways Pressure (CPAP) therapy and surgery and when they are indicated

Discuss the complications of untreated sleep apnoea and describe the implications of driving with this condition.

Outline the causes of sleep apnoea in children and adults

RS18: Pulmonary Hypertension (Priority 3)

Linked Year 1 / 2 sessions: CR2 lecture (Venous thromboembolism)

Linked Year 3 Objectives: CR3 lectures (H2, R3, R5, R10, C1, C4, C7)

RS3 (chronic obstructive pulmonary disease), RS6 (pulmonary embolism), RS7 (Deep vein thrombosis), RS17 (obstructive sleep apnoea), Haem10 (Venous thromboembolism), CV18 (Congenital cardiovascular disease).

General

Describe differences, including pressure differences, between the systemic and pulmonary circulation and left and right sides of the heart

Learn about the common causes of pulmonary hypertension, particularly other systemic conditions

Outline investigations that can be used to confirm the diagnosis of pulmonary hypertension

Describe which patients with pulmonary hypertension should be referred for specialist management

Learn the outcomes of those patients having pulmonary hypertension secondary to underlying lung diseases.

RS19: Occupational Lung Disease (Priority 3)

Linked Year 1 / 2 sessions

Linked Year 3 Objectives: CR3 lectures (R2, R3, R6, R9)

RS2 (asthma); RS3 (COPD), RS9 (carcinoma of the bronchus), RS11 (Pleural effusion and pleural disease)

General

Give examples of occupational exposures that predispose to (a) asthma, (b) extrinsic allergic alveolitis, (c) lung fibrosis and (d) pulmonary malignancy

Describe measures that can be taken to prevent occupational lung disease

Asbestos related lung disease

Learn about those occupations that have a high chance of asbestos exposure

Describe the pulmonary consequences of asbestos exposure

Describe investigations that can be used to confirm the diagnosis of asbestos-related lung disease

Learn about those patient categories with asbestos-related lung disease who are entitled to compensation

Mesothelioma

Learn the clinical symptoms and signs of mesothelioma

Learn about how mesothelioma is diagnosed

Understand the role of the MDT in the diagnosis and management of mesothelioma

Understand the role of surgery, chemotherapy and radiotherapy in the management of mesothelioma

CR3 LEARNING OUTCOMES: HAEMATOLOGY (incorporating the objectives from yr 1 and 2)

Haem 1: Anaemia-General (Priority 1)

Linked Year 1 / 2 sessions: CR1 lecture (Structure and function of blood), CR1 microanatomy session dealing with basic anaemias and CR2 lectures (Anaemia 1 and Anaemia 2)

Linked Year 3 Objectives: Haem 2-4 (types of anaemia), CR3 lecture (H5)

General

1. Recall the process of erythropoiesis and the function of erythropoietin
2. Recall the structure and function of the red cell and haemoglobin
3. Recall the normal process of red cell breakdown with recycling of components
4. Recall the basic causes of anaemia and the morphological classification of anaemia i.e. microcytic, normocytic and macrocytic
5. Describe the symptoms and signs of anaemia and the compensatory physiological response to anaemia
6. Describe an approach to the investigation and management of a patient with anaemia

Haem 2: Microcytic Anaemia - Iron Deficiency (Priority 1)

Linked Year 1 / 2 sessions: See under anaemia (general)

Linked Year 3 Objectives: CV3 (angina), Met 3A (peptic ulcers), Met 3A (gastro-intestinal bleeding), Met 3A (malabsorption syndrome), Met 3A (colonic and rectal polyps and neoplasm), also other conditions resulting in loss of blood, CR3 lecture (H5)

General

1. Outline the nutritional and metabolic aspects of iron metabolism (including dietary iron, iron absorption, body iron distribution and transport)
2. Outline the common causes of iron deficiency anaemia
3. Identify questions which, on history-taking, help elucidate likely causes of iron deficiency anaemia
4. Describe the symptoms and signs of iron deficiency anaemia and diseases associated with this anaemia
5. Outline the investigation and management of a patient with iron deficiency anaemia
6. Differentiate, by laboratory tests, anaemia due to iron deficiency from other causes of microcytic anaemia

Haem 3: Macrocytic Anaemia - B12 & Folate Deficiency & Macrocytosis (Priority 1)

Linked Year 1 / 2 sessions: See under anaemia (general)

Linked Year 3 Objectives: CR3 lecture (H5)

Met 3A - Malabsorption syndrome, Met 3B - thyroid disease

General

1. Learn the common causes of macrocytic anaemia and macrocytosis without anaemia
2. Outline the nutritional and metabolic aspects of vitamin B12 and folate metabolism (including dietary aspects, absorption, body distribution and transport)
3. Understand the concept of megaloblastic anaemia and the effect of vitamin B12 and folate deficiency on inhibition of DNA synthesis
4. Outline the common causes of vitamin B12 and folate deficiency
5. Identify questions which, on history-taking, help elucidate likely causes of macrocytic anaemia
6. Describe the symptoms and signs and laboratory diagnosis of macrocytic anaemia
7. Outline the investigation and management of vitamin B12 and folate deficiency

Haem 4: Normocytic Anaemia (Priority 2)

Linked Year 1 / 2 sessions: See under anaemia (general)

Linked Year 3 Objectives: CR3 lecture (H5), Met 3B - Chronic renal failure, other chronic diseases.

General

1. Give a differential diagnosis for normocytic anaemia (anaemia of chronic disease)
2. Discuss investigation and management of normocytic anaemia
3. Understand the concept of the anaemia of chronic disorder/inflammation
4. Be able to discuss which chronic diseases can cause anaemia, the mechanism for the anaemia and the types of anaemia

Haem 5: Haemolytic Anaemia (Priority 2)

Linked Year 1 / 2 sessions: See under anaemia (general)

Linked Year 3 Objectives: CR3 lecture (H5), Haem 1-4, CV11 (valvular heart disease), Met 3A - jaundice

General

1. Recall normal red cell metabolism and red cell breakdown

2. Construct a simplified classification for the haemolytic anaemias
3. Describe additional clinical signs in a patient with haemolytic anaemia and explain how these may differ from those of anaemia due to other causes
4. Outline the laboratory diagnosis of a haemolytic process and understand the concept of extra-vascular and intravascular haemolysis
5. Describe the investigation and management of a patient with haemolytic anaemia
6. List common drugs which may induce haemolytic anaemia

Haem 6: Tropical Haematological Disorders - Malaria (Priority 2)

Linked Year 3 Objectives: CR3 lecture (H4)

General

1. Draw the life cycle of malarial species in man and the mosquito.
2. Know how to seek expert advice on the prevention and treatment of malaria.
3. Learn about the different species of Plasmodium that cause malaria in humans.
4. Understand the treatment of malaria
5. Know about the measures to be taken to prevent malaria

Haem 7: Haemoglobinopathies - Sickle Cell Disease / Thalassaemia (Priority 2*)

Linked Year 1 / 2 sessions: CR2 lecture (Haemoglobinopathies), CR3 lecture (H3)

Linked Year 3 Objectives: RS4 (respiratory failure), Met 3A and 3B - acute abdomen

General

1. Understand the genetics of sickle cell disease and thalassaemia; define sickle cell disease and sickle cell trait.
2. Understand how the genetic alterations affect the normal physiology of haemoglobin and the red cell and their clinical consequences.
4. Outline the laboratory diagnosis of sickle cell disease and thalassaemia
5. Outline the management of sickle cell disease and thalassaemia.

Sickle cell disease

1. Recognise the symptoms and signs of the different types of sickle cell crisis
2. Account for the vulnerability to infection that affects people with sickle cell disease

Haem 8: Polycythaemia (Priority 3)

Linked Year 1 / 2 sessions: CR1 lecture (Structure and function of blood)

Linked Year 3 Objectives: RS3 – chronic obstructive pulmonary disease, Met 3B – renal malignancy

General

1. Define polycythaemia
2. Learn the basic mechanisms leading to the development of erythrocytosis
3. Give a differential diagnosis for polycythaemia
4. Describe the management of polycythaemia
5. Be able to make a diagnosis of polycythaemia from history and investigations

Haem 9: Benign White Cell (Leucocyte) Disease (Priority 2)

Linked Year 1 / 2 sessions: CR1 and CR2 blood microanatomy sessions

Linked Year 3 Objectives: CSP - haematological malignancies (leukaemia, lymphoma and myeloma) and bone marrow failure

General

1. Recall the basic structure and function of the circulating leucocytes
2. Draw the proliferation and differentiation pathways of the different white cell lines
3. Learn the common causes of increases and reductions in numbers of the various leucocytes

Neutropenia

4. Define neutropenia and describe the causes and consequences of this condition
5. Describe the management of a patient with neutropenia on the ward

Haem 10: Leukaemias (Priority 3)

(Including Myeloproliferative Disorders and Myelodysplasia)

Linked Year 1 / 2 sessions: CR1 and CR2 blood microanatomy sessions

Linked Year 3 Objectives: Haem 9 (benign white cell (leucocyte) disorders/patterns) and CSP lecture on leukaemia.

1. Understand the nature of the malignant process and the concept of clonality; relate this to haematological malignancy – abnormal growth, differentiation, apoptosis
2. Be able to classify leukaemia into acute (AML and ALL) and chronic (CML and CLL) based on the clinical and laboratory findings
3. Compare and contrast the main differences between acute and chronic leukaemia
4. Explain the clinical features of leukaemia
5. Describe the diagnostic pathway required to confirm the diagnosis of leukaemia
6. Outline the basic principles of the management and treatment of leukaemia
7. Understand the concept of the myeloproliferative disorders
8. Understand the concept of myelodysplasia

General

Understand the role of the primary care team in the palliative care of terminal haematological disease.

Haem 11: Platelet Disorders (Priority 2)

Linked Year 1 / 2 sessions: CR1 lecture (Structure and function of blood), CR1 lecture (Basic physiology of haemostasis and thrombosis), CR1 blood microanatomy session, CR2 lecture (Pathophysiology of haemostasis)

Linked Year 3 Objectives: CV3 (angina), CV9 (vascular disease in other sites), CV13 (acute and chronic limb ischaemia), Neurol – cerebrovascular disease, Haem9 (haemostasis)

General

1. Recall normal platelet structure and function
2. Learn the common causes of thrombocytopenia (low platelet count)
3. Describe the symptoms and signs of a patient with thrombocytopenia
4. Outline the investigation and management of immune thrombocytopenia

5. Learn the differential diagnoses for thrombocytosis (raised platelet count)
6. Give examples of drugs that inhibit platelet function and learn about their indications.

Haem 12: Haemostasis (Priority 2*)

(Clinical aspects of inherited and acquired bleeding disorders)

Linked Year 1 / 2 sessions: CR1 lecture (Basic physiology of haemostasis and thrombosis), CR2 lecture (Pathophysiology of haemostasis)

Linked Year 3 Objectives: Haem 11 (platelet disorders), RS6 (pulmonary embolism), RS7 (deep vein thrombosis), Met 3A – cirrhosis and single gene disorders, CSP lectures on haemostasis.

General

1. Recall the key elements of the haemostatic mechanism
2. Understand how a balance is maintained between the opposing mechanisms of coagulation.
3. Describe the symptoms and signs associated with bleeding disorders
4. Understand the basic screening tests used to investigate a bleeding disorder
5. Learn about some bleeding disorders which are inherited and acquired
6. Be aware of the therapeutic approaches used to manage bleeding disorders.
7. Outline the action of antithrombotic drugs.

Haemophilia

1. Identify the various treatment options for patients with haemophilia and Von-Willebrand's disease, and be aware of their complications.
2. Learn about how haemophilia can be managed in the community with specialist help from a wide range of health care professionals.

Haem 13: Venous Thromboembolism (VTE) Prevention and Thromboprophylaxis (Priority 1), learn together with RS6 and 7.

Linked Year 1 / 2 sessions: CR2 lecture (Venous thromboembolism)

Linked Year 3 Objectives: CR3 lecture (H2, R5), RS6 (Pulmonary embolism), RS7 (Deep venous thrombosis).

General

1. Recall the pathological and physiological mechanisms leading to VTE.
2. Understand the significance of VTE (morbidity and mortality) in the whole hospital setting and to appreciate that much of this is preventable
3. Understand the process and justification for VTE risk assessment of hospitalised patients and alternative policy approaches to thrombo-prophylaxis
4. Describe methods and effectiveness of VTE prevention strategies along with their contraindications

Haem 14: Blood Transfusion - as applied to clinical medicine (Priority 1*)

Linked Year 1 / 2 sessions: CR2 lecture (Blood groups and blood transfusion)
Linked Year 3 Objectives: CR3 lecture H1 (Blood transfusion reactions)

CV7 (acute circulatory failure/shock), CV15 (arterial aneurysms), Met 3A - gastrointestinal bleeding, Met 3A -hepatitis, Met 3A - anaesthetic preparation of a patient for surgery.

General

1. Recognise the importance of the Blood Transfusion Service and identify the various blood components available for transfusion
2. Recall the indications for blood transfusion
3. Summarise the precautions and testing donated blood undergoes
4. Recall the ward procedures required for safe blood transfusion practice
5. Summarise the complications of blood transfusion
6. Develop a plan to investigate and manage a patient suspected of receiving an incompatible transfusion
7. Be able to identify the various blood components available for transfusion and their clinical indications.
8. Learn about the most important blood groups and their associated antibodies and antigens and their clinical importance.
9. Apply the necessary benefits, risks, adverse effects, interactions, monitoring when using the following medications: Whole Blood; Packed Red Cells; Platelet Concentrate; Fresh Frozen Plasma; Cryoprecipitate; Human Albumin solution; Clotting Factor Concentrates; Immunoglobulins

Haem 15: Myeloma (Priority 3)

Linked Year 1 / 2 sessions: None

Linked Year 3 Objectives: Haem 10 (leukaemias), Met3B (chronic renal failure), CSP lecture on myeloproliferative syndromes

1. Understand the structure and function of the immunoglobulins
2. Define the term paraproteinaemia
3. Understand the pathology and clinical manifestations of myeloma
4. Describe the biochemical and haematological abnormalities common in myeloma and their significance
5. Outline the diagnosis, investigation and management of myeloma
6. Distinguish myeloma from benign paraproteinaemia
7. Be aware of the complications of myeloma and their treatment
8. Discuss the management of myeloma

Haem 16: Lymphoma (Priority 3)

Linked Year 1 / 2 sessions: None

Linked Year 3 Objectives: Haem 10 (leukaemias), Met3A (malabsorption syndrome), CSP lecture on lymphoma.

1. Define the term lymphoma
2. Be able to recall a simplified classification of lymphoma
3. Outline the clinical manifestations and investigation of a patient with lymphoma
4. Understand the staging of lymphoma; list the criteria used for staging
5. Discuss the pathology of lymphoma including Hodgkin's and non-Hodgkin's lymphoma.
6. Understand the approach to the management and treatment of lymphoma

CR3 PBL SCENARIOS

Please note that scenarios 1 – 4 are linked to virtual patients on QMplus and you are advised to undertake each linked exercise before the actual PBL session with your tutor.

We suggest setting the learning objectives under the following;

(a) Terms, (b) Differential diagnoses and likely diagnosis, (c) Management (investigations and treatment) of the likely the condition with discussion on how you would exclude the other conditions and (d) Patho-physiology of the likely condition.

1. A patient with chest pain

Mr Aamir Khan is a 44-year-old Pakistani shopkeeper. He has been brought in by concerned relatives and after an initial assessment by the nurse, you are called into Emergency Department Resus to review him.

He complains of chest pain which started two hours ago shortly after breakfast. He thought it was indigestion but it has not resolved and is getting worse. The pain is in the centre of his chest, "like someone squeezing tight" and now has a severity of 9/10. He has vomited once.

On examination, Mr. Khan is alert and orientated, but looks sweaty and distressed. He has a BMI of 34 kg/m^2. The nurse puts him on a cardiac monitor and you note the following clinical observations:

Pulse rate – 98 beats/min, reg

BP - 156/100 mmHg (left arm)

Respiratory Rate – 22 breaths/min

Oxygen saturation - 92% on air

Cardiac auscultation revealed a 3rd heart sound.

Respiratory auscultation revealed fine crackles at both lung bases.

The rest of the physical examination is otherwise unremarkable.

Please set the learning objectives and use Virtual Patient Aamir Khan (in QMplus) for further developments in this clinical case.

2. A patient with breathlessness

Mrs.Comfort Oyinlola is a 51-year-old lady of African origin. She was brought in by an ambulance to the Emergency Department. She gave a history of becoming very short of breath whilst at work. She also has right sided chest pain, which is made worse when she breathes in.

Her mother died of TB 10 years ago and she has recently visited her cousin in Nigeria, who has sarcoidosis. Mrs.Oyinlola is known to have hypertension, for which she takes amlodipine.

Her physical observations are as follows:

Height: 168 cm	Pulse: 110 beats per minute
Weight: 80 kg	Blood pressure: 90/68 mmHg
BMI: 28.3 kg/m^2	Respiratory rate: 24 resps/min
Temperature: 37.6°C	Oxygen saturations: 85% (air)

There is evidence of central cyanosis, although chest examination reveals normal breath sounds bilaterally, with no added sounds. Her left leg is markedly swollen.

You are being called to see this patient in the ED.

Please set the learning objectives and also see Virtual Patient Comfort Oyinlola (in QMplus) for further developments in this clinical case.

3. A patient with wheeze

Ella Johnson is a 17-year-old Caucasian young lady. She is brought into the ED by her boyfriend. They had been out on a run earlier in the morning and stopped at a bakery to buy something to eat. Approximately five minutes later, Ella started to complain of chest tightness and breathlessness. She used her asthma inhaler but this did not help. This was approximately 15 minutes ago and her boyfriend says she is getting worse.

She says that this feels like her last asthma attack two years ago. Her chest feels tight, as does her throat and she feels like she cannot breathe. She had been mildly 'puffed out' during the run but this severe breathlessness is unusual and has not responded to her salbutamol inhaler. At present, she is extremely wheezy and also had also developed some rash on her trunk and face.

You note the following physical observations:

Height: 160 cm	Pulse: 120 beats per minute
Weight: 55 kg	Blood pressure: 85/50 mmHg
BMI: 21.5 kg/m^2	Respiratory rate: 28 breaths/min
Temperature: 37.1°C	Oxygen saturations: 92% (air)

Ella looks unwell. She cannot speak in full sentences and is audibly wheezing. Her voice is hoarse and she is holding her throat. Respiratory examination reveals diffuse wheeze bilaterally. She is also noted to have a generalised itchy rash and peri-orbital oedema. Peak flow measurement is 165L/min (best of 400).

You are being called to see this patient in the ED.

Please set the learning objectives and see Virtual Patient Ella Johnson (in QMplus) for further developments in this clinical case.

4. A patient with a cardiac murmur

You are in general practice. Grace Wang is a 72-year-old Chinese woman. She attends the practice with her daughter, who is a nurse. In the last two months, she has been finding it increasingly difficult to walk to her local parade of shops. Yesterday she 'collapsed' but recovered quickly and did not sustain any injuries.

Prior to this episode, Mrs Wang had been experiencing breathlessness on exertion. She occasionally experiences a tight feeling in her chest. Her symptoms are made worse on walking uphill and stairs and are relieved by resting for a few minutes.

On examination, Mrs Wang looks well. She is comfortable at rest and not in respiratory distress.

Physical observations:

Height: 152cm	Pulse: 92 beats per minute
Weight: 50 kg	Blood pressure: 118/96 (sitting) mmHg 120/98 (standing) mmHg
BMI: 21.6 kg/m^2	Respiratory rate: 16 resps/min

Temperature: 36.7°C	Oxygen saturations: 98% (air)

Cardiac examination reveals a slow rising carotid pulse and a quiet second heart sound. There is an ejection systolic murmur heard loudest in the aortic area and pitting ankle oedema.

Please set the learning objectives and also see Virtual Patient Grace Wang (in QMplus) for further developments in this clinical case.

5. A patient with tiredness

A 70-year-old woman presented to her GP with a 12 months history of increasing tiredness and shortness of breath on climbing a flight of stairs. On direct questioning she had no other complaints, was not taking any medication and had a normal mixed diet.

On examination the only signs elicited were pallor, atrophic glossitis and angular stomatitis.

Her GP arranged blood tests that included a blood count, blood film and investigations to confirm the reason for her symptoms (see below). When the patient was seen in the surgery two days later her GP arranged for an urgent hospital outpatient referral. In addition, he arranged for a stool sample to be tested.

Blood test results

	Patient's results	Normal values
Haemoglobin (Hb)	8.2 g/dL	11.5 – 15.5 (f)
Mean Corpuscular Volume (MCV)	67 fL	80 - 96
White Cell Count	7.8 $x10^9$/L	4.0 – 11.0
Platelet Count	453 $X10^9$/L	150 - 400
Reticulocytes	2.1%	0.5 – 2.5
Erythrocyte Sedimentation Rate (ESR)	13 mm in 1 hour	< 20
Blood film	microcytic	
Serum ferritin	5 µg/L	14 – 150 (f)
Serum vitamin B_{12}	240 ng/L	160 - 925
Serum folate	4.5 µg/L	3.0 – 15.0
Red cell folate	270 µg/L	160 - 640

Renal and liver function: Normal results

Please set the learning objectives.

6. A patient with shortness of breath

A 70-year-old retired man presents to his GP with a 6 months history of progressive shortness of breath on exertion. Prior to this he had been able to walk his dog for more than a mile but

now could only manage 100 to 200 yards before resting. He had also noticed a slight non-productive cough for the same period. In addition, he also mentioned about coughing some blood for about 2 weeks.

He had been a smoker of 20 cigarettes per day from the age of 18 until 2 years ago when he stopped after having suffered a myocardial infarction. There was no past history of asthma. Over the years he had suffered a few episodes of bronchitis when he had developed a cold in the winter months, but this had improved since he stopped smoking.

On examination he was not breathless at rest but had bilateral finger clubbing and there was no anaemia, cyanosis or lymphadenopathy. Examination of the chest revealed dullness, reduced vocal resonance and absent breath sounds over the lower one third of the right chest. There were no signs of heart failure. Abdominal and neurological examinations were normal.

His GP arranged a CXR and referred the patient as an urgent two week referral to the local clinic.

Please set the learning objectives

7. A patient with increased sputum production

A 55-year-old woman presented to her GP with a history of increasing cough, shortness of breath and sputum production for the last three years. On questioning it emerged that she was producing about half a cup of sputum per day, mainly in the morning. Over the last three months she had noticed that the sputum had been greenish in colour, occasionally streaked with blood, but without frank haemoptysis.

In her past medical history she suffered from whooping cough at age 3. She remembered developing colds in the winter that' went to her chest' and required several courses of antibiotics. She had smoked 25 cigarettes per day for the last 30 years. There was no past history of asthma.

On examination, her blood pressure was 150/80, pulse was 80/minute. There was no anaemia, jaundice or cyanosis. Auscultation of the chest revealed coarse crackles bilaterally at the bases with some scattered wheeze. There was no peripheral oedema. Heart sounds were normal.

Please set the learning objectives

8. A patient with swollen legs

A 78-year-old woman presents to her GP with a 4 week history of increased shortness of breath at rest and on further questioning she also mentioned about increased bilateral leg swelling. The GP has been seeing her regularly due to a previous myocardial infarction several years ago.

On examination, she has bilateral pitting oedema below the knees, pulse rate was 110/min, irregularly irregular, BP was 160/95, JVP was 6 cm above the sternal angle, apex was in the 6th ICS along the anterior axillary line and there were fine crackles in both lung bases. Auscultation reveals a 3/6 pan-systolic murmur at the lower left sterna edge and a third heart sound.

The GP arranges some investigations and refers her to be reviewed by a hospital specialist. Further medications are started and she is discharged back into the community being followed up by the community nurse specialist and her GP.

Please set the learning objectives

RECOMMENDED READING FOR CR3 MODULE

Remember to revise all that you have already learnt in CR1 & CR2 including the Clinical and Communication Skills handbook.

1. Kumar,P & Clark M. (Eds), *Clinical Medicine*; Elsevier Saunders.
2. *Macleod's Clinical Examination*: Churchill Livingstone
3. Ellis Stephen. Interpreting Chest X-rays. Scion publishing
4. Winter Robert & Dakin Jonathan., *Making sense of Lung function tests, A hands on guide*: Hodder Arnold.
5. Hampton John R., *ECG Made Easy*: Churchill Livingstone
6. Corne Jonathan., *CXR Made Easy*: Churchill Livngstone
7. Bourke, Stephen J., *Lecture Notes on Respiratory Medicine*: Wiley Blackwell.
8. Huon Gray, *Lecture Notes on Cardiology*: Wiley Blackwell.
9. *British National Formulary*
10. *Local hospital formulary*
11. *Secrets of Heart and Lung Sounds Workshop*, audio CD by Salvatore Mangione. A CD that contains all that you need to know about auscultation

Websites:

British Thoracic Society (www.brit.thoracic.org.uk).

Many guidelines can be downloaded

British Lung Foundation (www.lunguk.org)

Information about lung diseases is available.

Public Health Laboratory (www.phls.co.uk)

Information about infections including TB is available.

British Cardiovascular Society (www.bcs.com)

An excellent website including access to all important cardio-vascular societies worldwide.

ECG – (www.ecglibrary.com)

A good website giving all that you need to know about ECGs.

CXR – (http://www.meddean.luc.edu/lumen/MedEd/medicine/pulmonar/cxr/cxr.htm)

A website by Loyola University medical education network - all that you need to know about CXRs

CETL learning - http://www.cetl.org.uk/learning/index.php

CETL learning - http://www.cetl.org.uk/learning/tutorials.html.

A useful website to learn about clinical and communication skills.