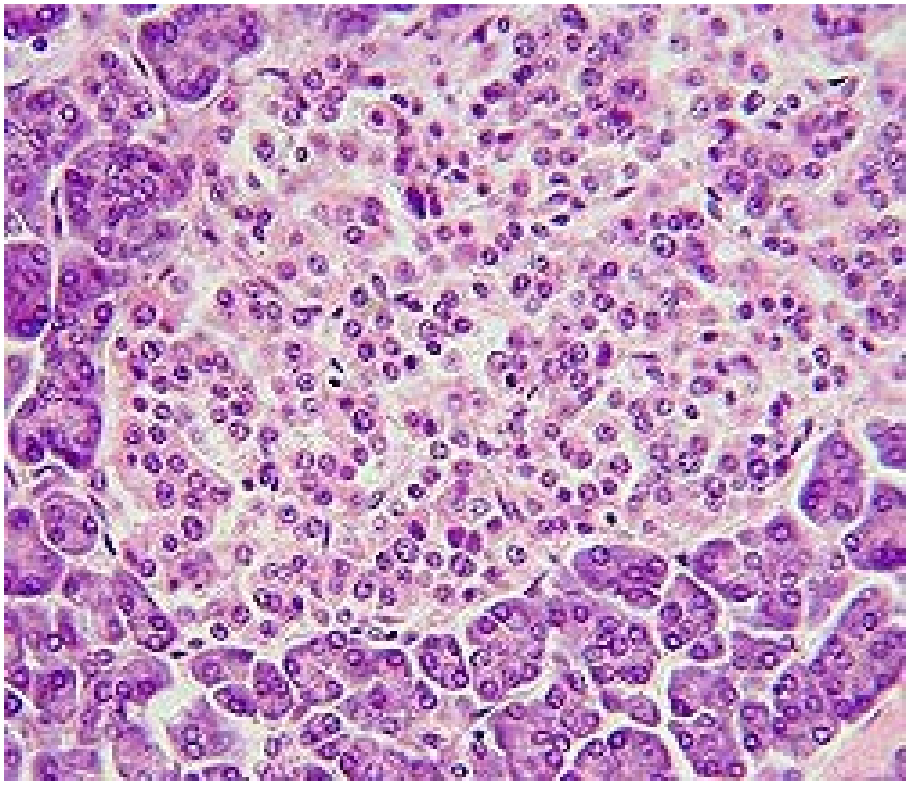
Barts and The London
Queen Mary's School of Medicine and Dentistry

RENAL AND ENDOCRINE (MET3B) and GP3 – Integrated Clinical Studies

YEAR 3: 2017 - 2018

STUDENT HANDBOOK



This handbook should be used together with the Academic Regulations and the Student Guide. It provides information specific to Barts and The London School of Medicine and Dentistry (SMD), while the Student Guide gives information common to all students of the College.

The Academic Regulations provide detailed information on all aspects of award requirements and governance.

NOTHING IN THIS HANDBOOK OVERRIDES THE ACADEMIC REGULATIONS WHICH ALWAYS TAKE PRECEDENCE.

The School's handbooks are available on QMPlus.

The Student Guide is available from the SMD Student Office; the Student Guide and Academic Regulations are also available on-line at:

www.arcs.qmul.ac.uk

The information in this handbook was correct at the time of printing. In the event of any substantial amendments to the information herein, the SMD will attempt to inform students of the changes.

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

CONTENTS PAGE

INTRODUCTION TO MET3B 4

GP PLACEMENT 5

INTRODUCTORY WEEK AND CLINICAL PLACEMENTS 8

MET 3B LEARNING RESOURCES 9

MET 3B INTRODUCTORY WEEK TIMETABLE 10

MET3B SPECIFIC LEARNING OBJECTIVES 11

MET3B SPECIFIC CLINICAL SKILLS 12

EXAMINATION OF THE ENDOCRINE SYSTEM 12
EXAMINATION OF THE RENAL PATIENT 13
EXAMINATION OF THE BREAST 14
EXAMINATION OF A LUMP 16

MET3B SPECIFIC INVESTIGATIONS 18

EXAMPLE 1: HAEMATURIA 19
EXAMPLE 2: ACUTE URINARY RETENTION 20

OPERATING THEATRES 21

PRIORITIES FOR MET3B INDEX CONDITIONS 21

MET3B LEARNING OUTCOMES: RENAL SYSTEM 22

MET3B LEARNING OUTCOMES: ENDOCRINE SYSTEM 25

MET3B PBL/CBL SCENARIOS 28

MET3B RECOMMENDED READING LIST 37

INTRODUCTION TO MET3B

Welcome to the MET3B module. This handbook should be used in conjunction with the MET3B Log Book and the Clinical Methods hand book which, together, describe details of the generic and module specific objectives to be achieved by Year 3 students.

In contrast to other modules in the third year, many Met 3b firms in hospitals are heavily involved in acute and general medicine, so you may get exposed to a wide variety of medicine, rather than just renal and endocrine diseases. **Therefore you should take the opportunity to build upon the basics of clinical skills, including history taking and examination, plus supplement your knowledge of renal and endocrine diseases**.

Every student in Year 3 is expected to complete the MET3B module. In addition, we strongly suggest you refer back to your MET1 and MET2 notes thereby ensuring a good basic science foundation to your clinical knowledge.

MET3B consists of an introductory week and a further nine weeks of clinical attachments. Some of the curriculum will be delivered in the form of lectures/case discussions, virtual patients, problem based learning (PBL), case-based learning (CBL) and tutorials. Sessions in General Practice will offer further opportunities to see patients in primary care, and meet patients in their home surroundings.

You will also be required to cover the MET3B learning objectives by private study and spending time on the wards talking to patients and medical staff. You should record the activities in the MET3B log book at regular intervals.

In the modern NHS it is important for medical students to adapt to make the most of any learning experiences available. Absence of formal teaching does not mean there are no learning opportunities. The successful student spends as much time on the ward as possible getting involved with all the activities of the team, examining and talking to patients and helping the junior staff; thinking of themselves as both an apprentice and a student.

We very much hope you enjoy your time on Met 3B.

Prof. Tahseen A. Chowdhury
Consultant in Diabetes
Lead for MET3B

Dr Jenny Blythe
General Practitioner
Clinical Teaching Fellow – Module Lead for GP3

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

GP PLACEMENT (GP3) - Integrated Clinical Studies

(Please note that your GP Tutors have also been sent the following information)

You will be spending one day per week at your designated GP Practice for the whole attachment (except for RLH/SBH students who will spend two days less). This longer attachment to the same GP practice comes in direct response to previous student feedback.

However, the GP3 block not only incorporates MB3 but relevant CR3 conditions with a focus of **integration of clinical knowledge across systems** that is more realistic as to how patients present in Primary Care.

This is a not only a great opportunity to develop an awareness how the conditions seen in a hospital setting both present and are managed in Primary Care, but start developing your skills in managing patients that may have several conditions simultaneously and how they impact upon each other.

The list below (although not exhaustive) reflects conditions that we commonly see and manage in Primary Care:

Cardiovascular	**Respiratory**	**Haematology**
Hypertension	Asthma	Anaemia (microcytic, macrocytic, normocytic, CKD)
Ischaemic Heart Disease inc. Lipid Management	COPD	Haemoglobinopathies
Heart Failure		
AF plus other arrhythmias		

Renal	**Endocrine**	**Infection**	**Urology**	**Breast**
CKD	Diabetes	Respiratory	OAB	Breast Lumps
AKI	Thyroid	Urinary	Prostate	
		Skin		

As well as the Learning Outcomes for the Met 3B block, please also be aware of the Compas General Outcomes for General Practice and Community Care.

General Outcomes for Community Care

- **Medical knowledge: CLINICAL FEATURES of DISEASE**
  - **Cancer**
    1. **Compare the presentation of malignancy in primary care and secondary care and palliative care in the community and hospice.**

- **Clinical skills: HISTORY**
  - **Taking a History**
    1. **Be able to take and record a patient's medical history, and recognize the role of taking a focussed history**
    2. **Be able to present a coherent summary of a patient's medical history**

- **Clinical skills: PHYSICAL EXAMINATION**
  - **Examining the Patient**
    1. **Attain competence in the general examination and key systems examinations, namely cardiovascular, respiratory, abdominal and basic neurological examinations**
    2. **Be introduced to ENT in primary care and begin to carry out ENT examinations**

- **Clinical skills: FORMULATING A TREATMENT PLAN**
  - **General Principles of Patient Management**
    1. **Learn to apply theoretical knowledge to clinical practice in cardio-respiratory, gastrointestinal, metabolic and some neurology areas**
    2. **Recognize the importance of a holistic approach, with particular reference to chronic disease management and palliative care**
    3. **Examine the interface between primary and secondary care and the integration of community and hospital services**
  - **Preventative care and Screening**
    1. **Begin to demonstrate skills in promoting behaviour and lifestyle change**

- **Professional issues: WORKING IN TEAMS**
  - **General Outcomes for Working in Teams**
    1. **Demonstrate effective communication skills (verbal, non verbal and written) with patients and with professionals within the primary care multidisciplinary team**

- **Professional issues: ETHICS and LAW**
  - **Good Medical Practice: Ethico-Legal Responsibilities of Patient Care**
    1. **Debate ethical issues pertinent to primary care**

Logbook Requirements

Students are required to complete the following activities and get them signed off in the logbook during their time on their primary care attachment:

- **Observed Short history taking** – 5 to be completed in the GP component
- **Observed Case Presentation** – 5 to be completed during whole attachment (across Hospital & GP)
- **Observed examinations** - Cardiovascular, Respiratory, Abdominal, Nervous & Other- 5 of each to be completed during whole attachment (across Hospital & GP).
- **Marked Written cases**- 5 to be completed during whole attachment (Hospital & GP)
- **PBL attendance and reflection** – cases 7&8 to be completed within the GP attachment. Logbook to be signed by the GP Tutor for these 2 cases.

- **Practical skills** – as outlined in the logbook
- **Common and Important conditions** – as outlined in learning outcomes-observe and read up
- **Observed procedures** – as outlined in Met 3B/GP3 logbook-observe and read up
- **Continuity Exercise** – Identify a patient with an acute exacerbation of a condition and follow them up on two further occasions during the placement in regards to ongoing management.
- **SSC3a** – optional for students to clerk a patient from the Primary Care setting.

Suggested Activities on Primary Care attachment

The **content of the teaching sessions** will vary from practice to practice, and with the availability of different types of patients. However we recommend you include a balance of the activities listed below.

- Directly observed consultations/clinical skills with a GP Tutor.
- Tutorial and case presentations and/or history taking with a GP Tutor.
- Visit a housebound patient and report back to the GP Tutor after to discuss the pre-arranged learning objectives.
- Nurse- led clinic – general clinics but looking at specific objectives, i.e. common presentations or complications, medication, etc. with suitable supervision/discussion opportunities
- Accompany patient to an outpatient appointment and explore their thoughts before, during and after the consultation (**note students to take ID and contact hospital prior to attending any OPA**)
- Undertaking Spirometry, ECG, medication reviews, annual review of chronic disease.
- Specialist Nurse-led clinics eg Diabetes, CKD, Hypertension, Heart Failure, BP clinics.
- District nurse home visits, other PAMS home visits eg physio, OT, social work.
- Attendance at Unplanned Admissions/ICM/Palliative Care meetings to discuss MDT management of patients and identify key roles of MDT in patient's care.
- Opportunity to get involved and present audits being undertaken within the practice.

Resources

You will find relevant resources, document and guidelines in the Year 3 GP area on QMPlus.

Finally, please do not be concerned that doing GP3 prior to your CR3 attachment will have a negative impact on the ICA as questions for the term's ICA are based on lecture weeks.

Please contact the Year 3 GP Module Lead and/or Administrator directly if you have any problems with the GP aspect of your attachment. Contact details are found in the Year 3 CBME area of QMPlus.

INTRODUCTORY WEEK AND CLINICAL PLACEMENTS

The introductory week has been designed with two key aims:

1. To ensure that when you start on your MET3B firm you have a basic understanding of the medical conditions you are likely to see on the firm.

2. To cover some of the key learning outcomes of the curriculum.

Consultants on your firms will expect you arrive on the wards with a basic understanding of these topics and hence lack of knowledge is likely to be reflected in poor firm grades.

Attendance for all of the sessions is compulsory and will be monitored. In addition you will be tested on these subjects in your end of firm and Part 3 exams.

ROTATION 1 Lecture week: Mon 25th Sept – Fri 29th Sept 2017
Placement: Mon 2nd Oct – Fri 8th Dec 2017

Note: Public Health takes place from Mon 30th Oct – Fri 3rd Nov 2017

ROTATION 2 Lecture week: Mon 8th Jan – Fri 12th Jan 2018
Placement: Mon 15th Jan – Fri 16th March 2018

ROTATION 3 Lecture week: Mon 9th April – Fri 13th April 2018
Placement: Mon 16th April – Fri 22nd June 2018

Note: CCS2 takes place from Mon 7th May – Fri 11th May 2018

MET 3B LEARNING RESOURCES

There are lots of learning resources for Met 3b for you to enhance your learning:

1. **Introductory Week.** This is done using a FLIPPED LEARNING approach, which requires:

    a. On line core lectures should be viewed **BEFORE** the case based sessions outlined below.

    b. There are five case based sessions of approximately 3 hours each (see timetable). In order for you to get the most out of these sessions, you **MUST READ OR WATCH THE RELEVANT PRE-SESSION MATERIAL BEFOREHAND**. All sessions will take place at the Royal London Hospital (venue TBC).

2. **Virtual cases** – there are 15 cases in renal medicine, diabetes and endocrinology in the virtual hospital. You should aim to do these during your Met 3b attachment.

    a. Asale Phiri – Acute kidney injury
    b. Enoch Thompson – Acute renal failure
    c. Imran Khan – Diabetic nephropathy
    d. Jane Adams – Chronic kidney disease
    e. Thandiwe Ozumba – Minimal change nephropathy
    f. Kwende Ngosa – Kidney Injury
    g. Farida Begum - Hypercalcaemia
    h. Helen Parry – Thyroid dysfunction
    i. Jagjit Singh – Type 2 diabetes
    j. John Simmons – Pituitary disease
    k. Mabel Boateng – Calcium physiology
    l. Michael Chan – Endocrine hypertension
    m. Sanjay Kumar – Diabetic ketoacidosis
    n. Clare Harvey (first clinical episode) – Adrenal disease
    o. Clare Harvey (second clinical episode) – Adrenal disease

3. **Problem Based Learning** / **Case Based Learning** (PBL/CBL) cases to be done during the attachment.

    We suggest that **two of these PBL/CBL scenarios (cases 7 and 8) should be done during your General Practice** placements.

    Hospital based PBL/CBLs:
    1. A woman in a coma
    2. A woman in shock
    3. A dizzy secretary
    4. A woman with headaches and sweating
    5. A man with constipation and depression
    6. A woman with irregular periods

    Primary Care based PBL/CBLs:
    7. A woman with blood in her urine
    8. A man attending for a routine diabetes check

MET 3B INTRODUCTORY WEEK TIMETABLE (subject to change – please check QMplus)

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	View lectures on diabetes	View lectures on renal medicine	View lectures on endocrinology and breast surgery	**10.00-11.15** Adrenal case studies (Prof M Druce) **11.30-13.00** Thyroid case studies (Prof M Druce)	View lectures on urology
PM	**1.45-2.00** Intro to GP 3 (Dr J Blythe) **2.00-5.00** Diabetes case based discussion (Prof TA Chowdhury)	**2.00-5.00** Renal medicine case based discussion (2 presenters out of Dr Raj Thuraisingham/ Dr Hamish Dobbie / Dr Ravi Rajkariar)	-	**1.30-3.15** Salt and water balance and Acid base balance (Prof W Drake) **3.30-4.30** Endocrine hypertension and calcium disorders (Prof TA Chowdhury)	**2-3.15** Breast surgery case based discussion (Ms Laila Parvanta) **3.30-5.00** Urology case based discussion (Mr Ahmed Almushatat)

MET3B SPECIFIC LEARNING OBJECTIVES

In addition to the learning objectives given in the main Year 3 Handbook, students are expected to achieve the following objectives whilst attending their MET3B placement;

- The development of core clinical and communication skills as per the Clinical and Communication skills hand book
- Core knowledge/skills in the metabolism system
- Competency in relevant practical skills
- Satisfactory completion of MET3B PBL/CBL sessions
- Attendance / reviewing of MET3B lectures and teaching sessions during the introductory week
- Attendance at all GP sessions
- Satisfactory completion of the Year 3 SSC
- Attendance at the half day hospice visit is compulsory

NOTE:
The majority of your knowledge should be gained from spending time on the wards; the set teaching is there to supplement this. Be aware that patients and their diseases do not behave as the textbooks imply - in neatly defined categories. Instead they may have many features and presentations that cross systems.

MET3B SPECIFIC CLINICAL SKILLS

Please read the following in conjunction with the Clinical Methods Handbook

EXAMINATION OF THE ENDOCRINE SYSTEM

General Clinical Observations - Head to Foot

By the end of Year 3 a student should be able to stand at the foot of the bed and begin to identify common signs of endocrine disease including:

1. Signs of complications of diabetes
2. Signs of thyroid disease
3. Signs of Cushing's syndrome
4. Signs of pituitary disease
5. Important observations – BP, HR, Temperature, Weight
6. Urinalysis

General Clinical Observations – Hands and Upper Limbs

By the end of Year 3 a student should be able to:

Inspect the hands of a patient and acknowledge the presence or absence of common pathologies associated with endocrine disease including:

1. Thyroid disease – acropachy, palmar erythema, tremor, tachycardia, irregular pulse, proximal myopathy, signs of carpal tunnel syndrome (hypothyroidism)
2. Diabetes – fungal nail infection
3. Adrenal disease – pigmentation of skin creases, thin skin, bruises, proximal myopathy
4. Pituitary disease – Acromegaly - signs of carpal tunnel syndrome, spade hands

Assessment of the Face, Neck and Chest

By the end of Year 3 a student should be able to:

1. Examine the face and neck of a patient with thyroid disease and acknowledge the presence or absence of common clinical signs – goitre (including type of goitre and distinguishing from other neck lumps), thyroid eye signs, signs of hypothyroidism, retrosternal goitre
2. Examine the face and neck of a patient with adrenal disease and acknowledge the presence or absence of common clinical signs – moon shaped face, hirsutism, acne, frontal balding, buccal pigmentation
3. Examine the face and neck of a patient with diabetes and acknowledge the presence or absence of common clinical signs – oral candidiasis, diabetic cataract and retinopathy, acanthosis nigricans, granuloma annulare
4. Examine the face and neck of a patient with pituitary disease and acknowledge the presence or absence of common clinical signs – bitemporal hemianopia, prominent supraorbital ridge, macroglossia, prognathism

Examination of the Abdomen

By the end of Year 3 a student should be able to:

1. Correctly position and expose a patient to examine their abdomen
2. Take into account the patient's underlying illness and degree of wellbeing or distress
3. Make a systematic examination of the abdomen using appropriate technique
4. Be able to define a mass within the abdomen
5. Look for signs of endocrine disease – purple striae, central obesity

Examination of the lower limbs

By the end of Year 3 a student should be able to:

1. Look for signs of proximal myopathy and pretibial myxoedema
2. Look for signs of diabetic foot disease, including ulceration, deformity and callus

3. Look for diabetic skin changes – dermopathy, necrobiosis lipoidica diabeticorum
4. Be able to tests for signs of peripheral neuropathy – loss of fine touch, vibration and ankle reflexes

EXAMINATION OF THE RENAL PATIENT

General Clinical Observations - Head to Foot

By the end of Year 3 a student should be able to stand at the foot of the bed and begin to identify common signs of renal disease including:

1. Signs of hypoalbuminaemia
2. Signs of uraemia
3. Fluid overload
4. Nephrotic / nephritic syndrome
5. Signs of renal replacement
6. Important observations – BP, HR, Temperature, Weight
7. Urinalysis

General Clinical Observations – Hands and Upper Limbs

By the end of Year 3 a student should be able to:

1. Inspect the hands of a patient and acknowledge the presence or absence of common pathologies associated with renal disease including:

    a. Vasculitic changes
    b. Hypoalbuminaemia
    c. Anaemia

2. Inspect the upper limbs of a patient with renal disease and acknowledge the presence or absence of common clinical signs - including those of renal replacement.

Assessment of the Face, Neck and Chest

By the end of Year 3 a student should be able to:

1. Examine the face of a patient with renal disease and acknowledge the presence or absence of common clinical signs.
2. Look for, and acknowledges the presence, of new / old venous access around the neck and clavicular areas

General Examination of the Abdomen

By the end of Year 3 a student should be able to:

1. Correctly position and expose a patient to examine their abdomen.
2. Take into account the patient's underlying illness and degree of wellbeing or distress.
3. Make a systematic examination of the abdomen using appropriate technique
4. Be able to define a mass within the abdomen.

Examination for Hepatomegaly and Splenomegaly

(See Clinical Methods handbook Abdominal Examination for full outcomes)

By the end of Year 3 a student should be able to examine a well patient for the presence of hepatosplenomegaly

Examination for Enlarged and Transplanted Kidneys

(See Clinical Methods handbook Abdominal Examination for full outcomes)

By the end of Year 3 a student should be able to:

1. Examine a well patient for the presence of enlarged kidneys by balloting

2. Examine a well renal patient for the presence of a pelvic (transplanted) kidney

Examination for Ascites
By the end of Year 3 a student should be able to demonstrate the presence of ascites on a patient using an appropriate technique.

Examination for Vascular Abnormalities
On a well patient, by the end of Year 3 a student should be able to:

1. Demonstrate how to examine for arterial bruits and thrills.
2. Be able to examine and define an abdominal aortic aneurysm.

Examination of the Male External Genitalia
On a manikin in the Skills Centre, by the end of Year 3, a student should be able to:

1. Competently demonstrate how to examine the male genitalia.
2. Demonstrate professionalism including:
    a. Requesting the presence of a chaperone
    b. Maintaining patient dignity and privacy
    c. Maintaining patient safety
3. Hygiene – including hand washing

Completion of the Renal Examination
By the end of Year 3 a student should be able to:

1. Competently complete the abdominal assessment of a renal patient, including assessment of:
    a. PR / DRE examination
    b. The external genitalia (see intimate examination)
    c. Urinalysis
    d. Routine and specific observations e.g. BP, Pulse, temperature, O_2 sats, weight and fluid balance assessment
2. Demonstrates their ability to act in a professional manner

EXAMINATION OF THE BREAST
Patients are usually nervous during this examination. This is partly because it is socially uncomfortable and partly because of fear of what the doctor might find. The patient may therefore need special care with regard to their dignity, and reassurance and explanation of findings.

1. Explain to the patient the need for the examination if you have not already done so.
2. Get verbal consent from the patient preferably in the presence of a chaperone (for male doctors).
3. Introduce and obtain consent for any others who may be present (medical students, clinical assistants etc)
4. Ensure privacy and freedom from interruptions as far as possible.
5. Allow the patient to undress to the waist in privacy and instruct her how to cover herself.

Observation
Position yourself in front of the patient and observe the breasts with the patient's arms by her sides and also with them elevated above her head and pressed against her hips. Look for:

<u>Symmetry:</u>
Contour
Colour and texture of overlying skin

Observe the nipples for:
Symmetry of position
Inversion of nipple
Discharge
Colour difference between sides
Obvious abnormalities (ulceration etc)

Talking to the patient while you examine her will allow her to understand what you are doing, will distract her and help her to relax.

Observation is of considerably less importance than palpation. It is likely to reveal <5% of lesions not also obvious by palpation.

Palpation

Position

An effective technique depends on compressing the breast against the chest wall. The patient should be lying flat. The lateral part of the breast she should turn slightly on the contralateral hip and raise the ipsilateral arm to her forehead (Fig 1). To flatten the medial part of the breast she should lie flat on her back and raise her ipsilateral arm to her shoulder (Fig 2).

Breast Boundaries

Imagine this as a rectangular rather than a circular area. It stretches from the midline to the mid-axillary line and from the clavicle to the bra line inferiorly.

Examination Pattern

Start in the axilla and move down the mid-axillary line to the bra line (Fig 1).
Move the fingers medially then continue palpating in a line up towards the clavicle. Continue up and down in a 'lawnmower pattern'. The rows should be overlapping. (This method is more thorough than a concentric or radial spoke pattern coming out from the nipple). The nipple is examined in the same way as the rest of the breast.

Fingers

Use the pads of three fingers to make small rotary movements. Use light pressure, then moderate then firmer pressure to feel all the layers of the breast.

Duration

Take at least three minutes to examine each breast of 'B' cup size, longer with larger sizes. Describe any lumps you feel in the following terms:

1. Number
2. Location, using quadrant or clock-face reference system
3. Size in cm
4. Shape
5. Consistency
6. Well circumscribed or not
7. Tenderness
8. Mobility
9. Attachment to skin or underlying muscle (see if mobility is reduced when patient presses hands on hips)

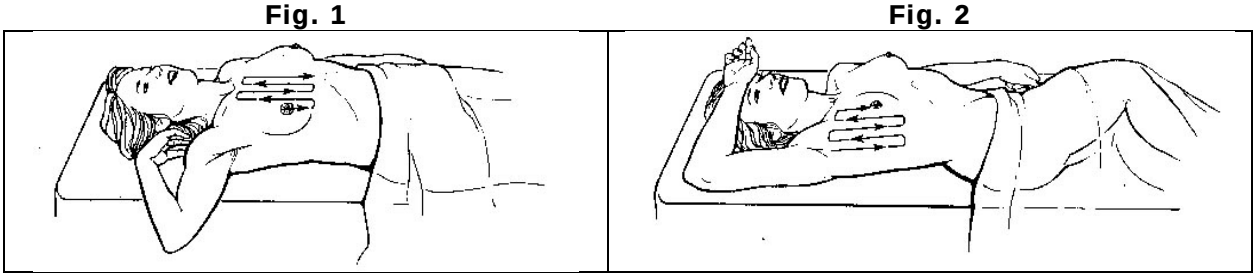
Examination of the Axillary Lymph Nodes

The axillary lymph nodes must be examined if breast pathology is suspected.

1. Ask the patient to relax their arm.
2. Support it gently at the elbow with one hand.

3. Use the other hand to feel for the central nodes against the chest wall at the apex of the axilla. If they are larger than 1cm they may be pathological and should be described in the same way as a breast lump.
4. If the central nodes are involved feel for the pectoral and subscapular nodes behind the pectoral and posterior axillary folds respectively. Also for the lateral nodes against the humerus.

Fig. 1 **Fig. 2**



Test Interpretation
Although malignant lumps are usually describes as hard, fixed and irregular and benign lumps as moveable, cystic, regular and soft, these features cannot be relied upon. **ALL** breast lumps found on examination should be investigated further. Expression of fluid in women complaining of nipple discharge is not a useful diagnostic sign of cancer.

EXAMINATION OF A LUMP

Preparation

Ask the patient to indicate the position of the lump(s) and any previous lumps
Explain the procedure to the patient
Ensure that exposure is adequate, including lymphatic drainage.
Ensure patients dignity is maintained throughout
Ask the patient if there is any tenderness
Ask about any recent change in the lump

Procedure
This is divided into five areas:

1. Look (Observation)
Location/position,
Contour (regular or irregular),
Pulsation (aneurism or high blood flow),
Colour of skin (red, pigmented, etc)
Abnormalities in skin (peau d'orange)
Abnormal vessels

2. Feel (Palpation)
Note that the order of these is arbitrary, they have been listed alphabetically.
Cough impulse
Consistency (Soft, firm, hard, rubbery; uniform, varied, lobulated)
Emptying
Fluctuation
Position (measured from a landmark)
Surface (smooth, rough, irregular)
Shape
Size (tape measure)
Tenderness
Temperature
Thrill or pulsation
3. Move (Plane of Attachment)

Skin Tethering (attempt to pick up a fold of skin over the swelling and compare with other side)
Deeper structures (attempt to move the swelling in different planes relative to surrounding tissues)
Muscles and tendons (palpate the swelling whilst asking the patient to use the relevant muscle)

4. Specific Tests
Transillumination (if you suspect the mass is filled with clear fluid, eg a hydrocoele)
Auscultation (for bruits or bowel sounds)

5. Regional Lymph Nodes
You must be aware of the main routes of lymphatic drainage and the relevant regional lymph nodes. There are specific ways of examining different groups of lymph nodes, these are covered well in Hutchison's Clinical Method.

MET3B SPECIFIC INVESTIGATIONS

The following are some of the commonly used investigations which students should become familiar with:

- Thyroid function tests
- Auto-antibody screen
- Endocrine investigations including stimulatory and suppressive dynamic tests
- Plasma glucose
- Haemoglobin A_{1c} (HbA_{1c})

Chest X-Ray

Become familiar with the changes associated with the following pathologies: LVF, lung tumours, pneumonias, retrosternal thyroid extension. Be aware of the purpose of a Chest X-Ray in relation to pre-operative anaesthetic assessment and the acutely ill surgical patient both pre- and post-operatively.

Plain Abdominal X-Ray

Develop an understanding of the findings seen in renal calculi.

ECG

Understand the basic principles and recognise the patterns seen in a normal ECG and with left ventricular hypertrophy and hyperkalaemia.

CT / MR Scanning

Students should be familiar with the diagnostic value of the following radiological investigations:

1. Intravenous urography (IVU)
2. Abdominal Ultrasound, CT and MRI scanning
3. Renal Angiography and whole body catheter venous sampling
4. MRI Scanning of the pituitary

EXAMPLE 1: HAEMATURIA

The presenting symptoms of haematuria are worked through as an example of depth of learning.

Objective: to be able to distinguish the following causes of haematuria:

- Renal calculi
- Renal parenchymal tumours
- Arteriovenous malformations
- Transitional cell carcinoma
- Prostatic malignancy
- Glomerulonephritis

To do this you must be able to:

1. Take an efficient history from the patient with haematuria
2. Elicit the relevant physical signs using basic physical examination techniques
3. Be able to recognise signs of generalised malignancy, systemic vasculitis
4. Perform and interpret the following tests:

    a. Urinalysis
    b. Urine microscopy and cytology
    c. blood chemistry and immunology

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

    a. Ultrasound
    b. renal biopsy
    c. CT

Management

1. Of renal tract malignancies, renal calculi and common glomerulonephritis
2. Of the consequences of untreated calculi, malignancy and glomerulonephritis
3. You must understand and be able to manage the following problems in the same way:

    a. Peripheral oedema
    b. Pyrexia of unknown origin
    c. Abdominal swelling
    d. Swollen legs
    e. Difficulty in micturition and retention

EXAMPLE 2: ACUTE URINARY RETENTION
Objective: To understand the presentation and management of acute urinary retention

Associated Problems (Differential Diagnosis)

- Benign prostatic hypertrophy
- Adenocarcinoma of the prostate
- Transitional cell carcinoma of the bladder
- Urethral stricture
- Urethral calculi

The Disease
With respect to acute urinary retention, the student will be able to:

1. Describe the pathology
2. Relate pathology to symptoms and signs
3. Describe the typical presentation of the disease and some of its variants
4. Know the major differential diagnoses
5. Describe the tests which can help to establish the diagnosis
6. Understand the possible complications

The Treatment

1. Understand the principles of aseptic technique
2. Be aware of the steps and able to perform urethral catheterisation

OPERATING THEATRES

Students should be familiar with Operating Theatres. They should understand the principles and practice of aseptic techniques and should learn, under supervision, how to scrub up and gown for theatre. They should witness and assist at both laparoscopic and open surgery and should understand the principles of the operative procedures for which their patients are submitted.

Please see the Clinical Methods Handbook or the MET3A Handbook for further information regarding Operating Theatres, scrubbing and gowning.

PRIORITIES FOR MET3B INDEX CONDITIONS

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.

*** 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.

RENAL SYSTEM	
Nephrotic Syndrome	1
Glomerulonephritis	2
Acute kidney injury - pre-renal, renal and post-renal	1
Chronic Kidney Disease	1
Renal Replacement Therapies / Renal Transplantation	1
Malignancies of the Renal Tract	1
Renal Stone Disease and Renal Tract Calcification	2
Bladder Dysfunction and Urinary Tract Infection	2

ENDOCRINE SYSTEM	
Diabetes Mellitus and Pre-diabetes	1
Insulin and Oral Hypoglycaemics	1
Diabetic Emergencies	*
Complications of Diabetes	1
Thyroid Lumps and thyroid dysfunction	1
Adrenal Disease – Cushing's	2
Adrenal Disease – Addison's	1
Acid base balance, Diabetes Insipidus and Hyponatraemia	2
Hyper- and hypocalcaemia	2
Pituitary Hypothalamic Axis	2
Endocrine Hypertension	2
Breast Disease	1

MET3B LEARNING OUTCOMES: RENAL SYSTEM

Nephrotic Syndrome and Glomerulonephritis

1. Know and understand the diagnostic criteria, clinical signs, investigations and differential diagnosis for nephrotic syndrome
2. Know and understand principles that govern the treatment of nephrotic syndrome
3. Know the different causes of oedema and explain the pathophysiology of each
4. Define the terms nephrotic syndrome and nephritic syndrome
5. Know and understand the diagnostic criteria for glomerulonephritis
6. Know the differential diagnosis for glomerulonephritis
7. Know the clinical signs of patients with glomerulonephritis
8. Know the appropriate investigations of patient with glomerulonephritis
9. Know and understand principles that govern the treatment of glomerulonephritis
10. Describe the pathogenic mechanisms underlying glomerular injury and the tissue reactions of the glomerulus to injury
11. Describe the clinical syndromes associated with glomerulonephritis
12. Outline the clinico-pathological features of the common types of glomerulonephritis

Self Directed Learning and Clinical Exposure: Nephrotic Syndrome and Glomerulonephritis

1. *Understand the mechanism of action of different diuretics and where they act in the renal tubule*
2. *Be aware of the factors that indicate poor prognosis with any glomerulonephritis*
3. *Know the association between systemic lupus erythematosus (SLE) and the kidney*
4. *Be aware of the concept of rapidly progressive glomerulonephritis and the relevant autoantibodies ie anti-GBM and ANCA and their association with pulmonary haemorrhage*
5. *Understand the importance of proteinuria, how it is measured and its clinical significance*

Acute Kidney Injury (AKI)

1. Define the term “Acute Kidney Injury”
2. Classify the causes of AKI (pre-renal, renal and post-renal), and list their causes
3. Outline the systemic effects and pathological changes in the kidney of AKI
4. Understand the cause and management of the diuretic phase during recovery from AKI
5. Understand the investigation of undifferentiated acute uraemia including the place of renal ultrasonography to exclude obstruction and renal biopsy if there is possibility of vasculitis, interstitial nephritis or crescentic glomerulonephritis
6. Understand prevention and management of life threatening complications of AKI especially: hyperkalaemia, pulmonary oedema and severe uraemia
7. Understand the methods of blood purification and fluid removal such as peritoneal and haemodialysis, continuous arteriovenous haemofiltration (CAVH) and CAVH / Dialysis

SDL&CE: Acute Kidney Injury

1. *Be able to carry out a fluid assessment of a patient ie, know if they are volume deplete or volume expanded*
2. *Understand the role of daily weight, lying and standing blood pressure and other clinical signs in the assessment of fluid balance*
3. *Know the difference between crystalloid, colloid and blood products and the appropriate use of these solutions in managing patients with acute renal failure*
4. *Understand how urinalysis and microscopy can help distinguish the various categories of acute renal failure*

Causes and Complications of Chronic Kidney Disease (CKD)

1. List the common causes of CKD
2. Understand the classification of CKD into the five stages
3. Describe the pathological changes of CKD in the kidney
4. Describe the effects and management of complications of CKD such as anaemia, secondary hyperparathyroidism, bone disease and impaired immunity
5. Understand the dietary management of CKD including the controversy relating to the possible benefits of protein restriction on rate of decline of renal function

6. Understand that fluid balance must be assessed clinically rather than by laboratory tests

SDL&CE: Chronic Kidney Disease
1. *Understand the concept of hyperfiltration injury*
2. *Understand the role of proteinuria in the monitoring of patients with CKD and its role in progression*
3. *Understand the importance of blood pressure control in attenuating the progression of CKD*
4. *Be aware of the use of drugs blocking the renal angiotensin system in the treatment of CKD*

Renal Replacement Therapies (Including Transplantation)
1. Understand the principles and practical aspects of haemodialysis and be aware of its limitations, advantages and disadvantages
2. Understand the principles and practical aspects of peritoneal dialysis and be aware of its limitations, advantages and disadvantages
3. Be aware of the prognosis, advantages and disadvantages of renal transplantation
4. Describe the basic principles of tissue typing and lymphocytotoxic cross matching
5. Describe the complications associated with anti-rejection therapy

SDL&CE: Renal Replacement Therapies including Transplantation
1. *Describe the MHC / HLA system and its role in the immune response*
2. *Describe the role of T-cells and B-cells in the immune response*
3. *Be aware of the mode of action of immunosuppressive drugs commonly used*

Organ Donation
1. Understand that transplantation can be a very effective treatment for organ failure
2. Understand why kidney transplantation is better than dialysis
3. Know that there is a shortage of donated organs
4. Know that that deceased may come from people whose death has been defined by brain stem or circulatory death.
5. Understand that there is a high refusal rate regarding potential donors and the possible reasons why
6. Describe strategies for increasing the availability of organs

Medical and Surgical aspects of Urological Cancer
1. Describe the clinical features of patients with renal tract tumours
2. Understand the significance of microscopic and macroscopic haematuria
3. Understand the pathogenesis of tumours of the renal tract and their risk factors
4. Be able to describe the investigations available to establish a diagnosis of renal tract malignancy including urine cytology, endoscopy and imaging
5. Understand the surgical approach to treating renal tract tumours
6. Be aware of the prognosis of patients with renal tract tumours
7. Understand the use and limitations of prostate specific antigen (PSA) in the diagnosis and monitoring of prostate cancer
8. Understand the use of chemotherapy, radiotherapy, hormone and immune therapy in the treatment of renal tract tumours

Urinary Tract Infection and Benign Prostatic Hypertrophy
1. Understand that urinary tract infections (UTI) are a common cause for prescribing antimicrobials
2. Know the common micro-organisms and predisposing factors for UTI
3. Understand that clinical significance and duration of treatment of UTI varies depending on the group of patients treated eg. children; pregnant women; non-pregnant sexually active women; young men; elderly and people with abnormal urinary tracts
4. Understand the risk of UTI in patients with congenital abnormalities of the renal tract
5. Understand principles of treatment and when prophylaxis may be indicated

6. Know the methods for investigating UTI infections in children; adult males and females; pregnancy
7. Outline the therapeutic options for UTI
8. Be able to describe common Lower Urinary Tract Symptoms (LUTS)
9. Understand the assessment of patients with LUTS
10. Know the medical and surgical treatment of patients with LUTS

Renal Stone Disease and Renal Tract Calcification

1. Describe the clinical features of patients with renal calculi
2. Discuss the aetiology and pathological consequences of calculi in the kidney and ureter
3. Understand the investigations required to diagnose the underlying predisposition to renal calculi
4. Understand the role of diet in treating patients with renal calculi
5. Describe the surgical and non-surgical approaches to treating renal calculi

SDL&CE: Renal Stone Disease and Renal Tract Calcification

1. Know the metabolic conditions that can result in renal tract calcification
2. Be aware of the various types of renal tubular acidosis and their biochemical basis

MET3B LEARNING OUTCOMES: ENDOCRINE SYSTEM

Breast Disease

1. Recognise normal and physiological findings
2. Recognise the features of benign breast disease eg. fibroadenoma, multi-duct nipple discharge, breast cysts, cyclical mastalgia
3. Take a history of breast symptoms
4. Take a history to assess the risk factor for breast disease
5. Be able to carry out an examination of the breasts including examination of the axillary lymph nodes and lymph node drainage sites
6. Appreciate the mammographic appearance of impalpable lesions
7. Assess potential sites of distant disease
8. Be able to discuss in professional and layman's terms, surgical approaches to breast disease in order to provide informed consent
9. Be able to propose a diagnosis from clinical findings and plan management
10. Recognise the role of ultrasound, mammography and cytology in management of breast disease

Breast Cancer

1. Evaluate the role of breast screening programmes
2. Know the risk factors, incidence, mortality, and prevention of common breast cancers
3. Know the common pathological types, prognostic factors, and receptors involved
4. Know the clinical presentation, diagnosis, and staging of breast cancer
5. Understand the treatment of early breast cancer to maximise cure
6. Recognise and justify the differing methods of surgical treatment of breast cancer
7. Understand the treatment of metastatic breast cancer to optimise palliation
8. Be aware of some new diagnostics, drugs, and recent clinical trials in breast cancer
9. Be aware of the role of rehabilitation and supportive care
10. Be able to evaluate the role of Nurse Counsellors, pain control and terminal care; and appreciate the role of a multi-disciplinary team approach to breast cancer

Diabetes – diagnosis, aetiology and presentation

1. Be able to classify the types of Diabetes Mellitus (DM) and list the causes of secondary DM
2. Be able to differentiate between Type 1 and Type 2 DM
3. Recognise the contribution of genetic and environmental factors in the aetiology of Type 1 and Type 2 DM
4. Know the diagnostic criteria for DM, impaired fasting glycaemia (IFG), impaired glucose tolerance (IGT) and pre-diabetes
5. Know the presentation and initial management of diabetes

SDL&CE: Diabetes – diagnosis, aetiology and presentation

1. *Understand the pathophysiology of obesity and insulin resistance*
2. *Understand the relationship between hepatic steatosis with obesity, insulin resistance and diabetes*
3. *Understand the following terms: insulin resistance; glucose tolerance; metabolic syndrome*

Insulins and Hypoglycaemic Agents

1. Be able to describe methods for assessing glycaemic control
2. Understand why good glycaemic control is important, and be aware that targets for glucose control may vary between individuals
3. Describe the principles of management of the newly diagnosed diabetic patient including the role of diet/lifestyle
4. Understand the indications and side effects of the various classes of oral hypoglycaemic agents / newer injectable agents
5. To be able to describe common insulin regimes and prescribe insulin safely

Diabetic Emergencies [Priority *]

1. Be able to distinguish between the following terms and conditions: hypoglycaemia; diabetic ketoacidosis; hyperglycaemia; hyperosmolar hyperglycaemic state
2. Know how to manage a hypoglycaemic patient
3. Know how to manage a patient with diabetic ketoacidosis
4. Know how to manage a patient in a hyperosmolar hyperglycaemic state
5. Understand the precipitating factors in hyperglycaemic states
6. Apply BRAINS&AIMS when choosing, giving and monitoring the following medication for Hypoglycaemia: 20% Glucose; Glucagon
7. Apply BRAINS&AIMS when choosing, giving and monitoring the following medication for Hyperglycaemia: Insulin; IV Fluids; IV Potassium; Low Molecular Weight Heparin (LMWH)

Complications of Diabetes

1. Describe the long term complications of diabetes – microvascular, macrovascular, other
2. Know the risk factors for development of complications
3. Be aware of the importance of education, preventative medicine and early recognition of complications
4. Know the importance of regular screening for complications of diabetes
5. Know the goals for treatment of hypertension, lipids and glycaemia to prevent complications
6. Be aware of the fungal infections that may present in patients who have diabetes
7. Be aware of the psycho-social impact of diabetes complications on the individual with diabetes and society in general

Thyroid Dysfunction

1. Describe the position and anatomical relationships of the thyroid gland
2. Define goitre, list the causes and briefly describe the pathology
3. Define the role of isotope scanning, ultrasound and fine needle cytology in the investigation of thyroid lesions
4. Distinguish thyroid enlargement from other lesions in the neck by examination
5. List the possible causes of thyroid enlargement in a euthyroid patient
6. Be able to describe the various benign and malignant tumours of the thyroid
7. Be aware of the surgical and non-surgical treatment options for thyroid tumours
8. Know the clinical features, investigations and management of patients with hypo- and hyperthyroidism

SDL&CE: Calcium disorders

1. *Be able to distinguish between the following terms and conditions: Hypercalcaemia; Primary hyperparathyroidism; Secondary hyperparathyroidism; Tertiary hyperparathyroidism;*
2. *Describe the clinical features of acute hypercalcaemia and its initial management*
3. *List the causes of hypercalcaemia and outline the diagnostic investigations*
4. *Apply BRAINS & AIMS when choosing, giving and monitoring the following medication for Hypercalcaemia: Saline; Furosemide; Bisphosphonates; Prednisolone*
5. *Describe the clinical features and initial management of hypocalcaemia*

Diabetes Insipidus and Hyponatraemia

1. Understand the causes of hypernatraemia and hyponatraemia
2. List the causes of thirst and polyuria
3. Describe the initial investigations which help to distinguish cranial and nephrogenic diabetes insipidus and psychogenic polydipsia
4. Understand the principles of treating hypernatraemia and hyponatraemia

Acid-Base Balance

1. Understand the basic physiological principles behind acid base balance.
2. Understand the relationship between respiratory and metabolic control of acidaemia
3. List causes of a normal and high anion gap.

4. Describe common causes of lactic acidosis.

Cushing's and Addison's Disease

1. Describe the clinical syndromes underlying causes and pathology associated with adrenocortical hypofunction
2. Distinguish between adrenal failure and pituitary-adrenal failure by means of clinical features assisted by laboratory investigations
3. Outline the maintenance treatment of adrenal insufficiency including precautions for inter-current illness
4. Describe the emergency management of acute adrenal insufficiency
5. Discuss the clinical features, causes and pathology of Cushing's Syndrome
6. Outline the laboratory and radiological investigations which help to distinguish pituitary, adrenal and ectopic causes of Cushing's Syndrome

Pituitary-Hypothalamic Axis

1. Be able to describe the structural and functional relationships between the hypothalamus and the pituitary gland
2. Be able to list the hormones secreted by both the anterior and posterior pituitary and in each case explain the role of the hypothalamus in regulating their secretion
3. Be able to briefly outline the actions of the hormones of the posterior and anterior pituitary
4. Describe the clinical features and management of syndromes of pituitary hormone excess (acromegaly, Cushings, hyperprolactinaemia)
5. Describe the clinical features and causes of hypopituitarism and outline the investigations/treatment required

Endocrine Hypertension

1. Describe the structure of the adrenal gland and relate the zones to production of hormones
2. Describe the blood supply to the adrenal gland and the functional relationship between the adrenal medulla and the nervous system
3. Know the strategy for investigation of endocrine hypertension
4. Outline the laboratory and radiological investigation of suspected Conn's syndrome and phaeochromocytoma
5. Describe the possible mechanisms of endocrine mediated hypertension with reference to phaeochromocytoma, Conn's Syndrome and renal artery stenosis
6. Describe the presenting clinical features of Conn's Syndrome and phaeochromocytoma

Polycystic Ovarian Syndrome (PCOS)

1. Define PCOS and describe it's clinical features
2. Be able to explain the underlying pathogenesis of PCOS, and it's relationship with insulin resistance
3. Explain investigation and differential diagnosis of PCOS
4. Describe management strategies for PCOS, including management of infertility, irregular menses and hirsutism

BRAINS & AIMS = Benefits, Risks, Adverse effects, Interactions, Necessary Prophylaxis Administering, Informing, Monitoring

MET3B PBL/CBL SCENARIOS

PLEASE NOTE: We would suggest that **two of these PBL/CBL scenarios (cases 7-8) should be done in General Practice**.

Hospital based PBL/CBLs:

1. A woman in a coma
2. A woman in shock
3. A dizzy secretary
4. A woman with headaches and sweating
5. A man with constipation and depression
6. A woman with irregular periods

Hospital or Primary Care based PBL/CBLs:

7. A woman with blood in her urine
8. A man attending for a routine diabetes check

HOSPITAL BASED PBL/CBL

1. A WOMAN IN A COMA

A 67-year-old widow who lives alone, was diagnosed with Type 2 diabetes three years previously, following referral from Moorfield's Eye Hospital, where she had attended for investigation of deteriorating visual acuity.

When first diagnosed she had been treated by diet alone in an attempt to lose weight. Since this was largely unsuccessful in the first year she had subsequently been treated with *metformin*. She also took *lisinopril* and *atorvastatin.*

At recent diabetes clinic review, her weight was 75 kg and height 1.60 m (body mass index 29.3 kg/m^2). Blood pressure was 146/84 mmHg, and she had reduced fine touch and vibration sense in the lower limbs. Glycated haemoglobin was 86 mmol/mol (28 – 42 mmol/mol), cholesterol 5.6 mmol/L, albumin creatinine ratio 8.6 mg/mmol (0 - 3.5).

On his recent weekly visit to his mother, the patient's son discovered her collapsed on the sofa, breathing but otherwise un-responsive, and dialled 999.

Examination:

Clinically severely dehydrated	
Glasgow Coma Score	8/15
Capillary glucose	54 mmol/L (4 – 7)
Pulse	120 irregular
Blood pressure	90/50 mmHg

Investigations:

Plasma glucose	52 mmol/L (4 - 6)
Serum sodium	150 mmol/L (135 - 145)
Potassium	4.8 mmol/L (3.5 - 5.5)
Bicarbonate	23 mmol/L (22 - 28)
Creatinine	208 umol/L (56-97)
Serum Osmolality	362 mOsm/kg (275 - 285)
pH	7.36 (7.35 – 7.45)
pO_2	12.0 kPa (on air) (9 – 13)
pCO_2	5.5 kPa (4 – 6)
Urinalysis	Glucose +++
	Blood Neg
	Protein +
	Ketones Neg

She was admitted to the Intensive Care Unit, and urgent treatment was instituted. She required a six day stay in ICU where she was stabilised metabolically, and was stepped down to the ward.

Once she was eating and drinking, capillary glucose levels were noted to be 13-24 mmol/L despite titration of oral hypoglycaemic medication to maximum doses.

HOSPITAL BASED PBL/CBL

2. A WOMAN IN SHOCK

A 72-year-old woman was admitted urgently via the emergency department. Her daughter stated that she was normally fit and well, had a past history of Type 2 diabetes (treated with tablets) and hypertension, but no known kidney problems. She has been unwell for 48 hours with fevers and abdominal pain. On the day of admission, she became confused and disorientated and her daughter phoned for an ambulance.

Examination:

Confused	
Glasgow Coma Score	9/15
Pulse	110 regular
Blood pressure	84/43 mmHg
Temperature	38.9 ^{0}C
Oxygen saturations	89% on room air
Chest	Clinically clear
Abdomen	Soft, no organomegaly
No focal neurology	

Investigations:

Haemoglobin	10.4 g/dl (11 - 13)
White cell count	23.5 (3.5 - 9.0)
Sodium	138 mmol/L (135 - 144)
Potassium	6.5 mmol/L (3.5 – 5.2)
Bicarbonate	16 mmol/L (24 - 28)
Urea	18.7 mmol/L (3.3 - 6.6)
Creatinine	427 umol/L (75 - 95)
Lactate	6.7 mmol/L (0.5 - 2.2)
pH	7.28 (7.35 – 7.45)
pO_2	8.9 kPa (On air) (9 - 13)
pCO_2	4.5 kPa (4 – 6)
Urinalysis	Blood ++
	Leucocytes +
	Nitrites +
	Protein ++
	Ketones Neg

CXR Normal ECG – enlarged T waves

She was admitted to the intensive care unit, and required emergency treatment with inotropes, fluids, haemofiltration and subsequently ventilatory support. Over the next 10 days on ICU she was weaned off ventilatory support, but did not pass urine. The nephrologist had a discussion with her and her daughter about the likelihood of her kidney function recovering. Consideration was given for long term renal replacement therapy.

HOSPITAL BASED PBL/CBL

3. A DIZZY SECRETARY

A 34-year-old secretary had noticed that she is getting progressively tired, with weight gain, constipation and feeling cold. She also had developed areas of depigmentation on her forearms. Blood tests revealed:

TSH	56.5 mIU/l (0.6-6.0)
Free T4	7.0 pmol/L (9-20)

She was prescribed medication by her GP and was assured that she would rapidly feel better. After two weeks, she noted that she was not feeling any better and indeed began to feel worse. She started feeling nauseated and felt dizzy as she got out of bed in the morning.

Despite this, she continued to work until, whilst travelling on the underground in the morning during her commute she collapsed. She was taken to her closest emergency department.

Examination:

Alert, but looks unwell	
Looks tanned	
JVP not visible	
Pulse	108 bpm
Lying BP	104/75 mmHg
Sitting BP	84/60 mmHg

Investigations:

Full blood count	Normal
Sodium	122 mmol/L (135-144)
Potassium	6.5 mmol/L (3.5 – 5.2)
Bicarbonate	16 mmol/L (24-28)

Appropriate endocrine tests were sent. She was treated with emergency intravenous treatment, stabilised and converted to standard oral treatment within three days.

On discharge, she was educated about dose adjustment in the event of illness and was issued with an emergency pack.

HOSPITAL BASED PBL/CBL

4. A WOMAN WITH HEADACHES AND SWEATING

A 48-year-old female accountant was referred to the endocrinology clinic with headaches, sweating and pains in her joints. She was a partner in a firm of accountants. Her two teenage children were doing well at school and the family had no financial or other domestic concerns.

During consultation, she described a number of other symptoms; she had noted her clothes and shoes felt some what tighter; she had noticed some problems with her eyesight, and had stumbled into door posts on more than one occasion. Her husband noticed that she had started to move her head from side-to-side when reading the newspaper, and also noted a change in her facial appearance. She complained of pins and needles in both hands, especially at night, and also noticed milk like secretions from her nipples on a few occasions. Her periods were regular but she was taking a combined oral contraceptive pill.

Examination:

Large jaw and hands	
Pulse	100 bpm
Blood pressure	160/95 mmHg
Visual fields	bi-temporal hemianopia with optic atrophy

Investigations:

Serum sodium	139 mmol/L	(135 - 145)
Potassium	4.8 mmol/L	(3.5 - 5.5)
Urea	4.5 mmol/L	(3.3 - 6.6)
Creatinine	86 umol/L	(75 - 95)
Free T4	14.5 pmol/L	(9 – 25)
TSH	0.3 mU/L	(0.4 – 4)
Prolactin	987 mU/L	(<400)
LH	4.5 IU/L	(1-20)
FSH	6.5 IU/L	(5 - 30 pre-menopausal 50 -100 post menopausal)
9am cortisol	364 nmol/L	(9am: 140 – 700)
Serum Insulin Like Growth factor-1	780 nmol/L	(94 – 252)

An appropriate confirmatory dynamic test was done, and she underwent a dedicated pituitary MRI scan, whereby the diagnosis was confirmed. She was treated with initially medical treatment, followed by surgical resection.

HOSPITAL OR PRIMARY CARE BASED PBL/CBL

5. A MAN WITH CONSTIPATION AND DEPRESSION

A 69-year-old man had noticed increasing symptoms of abdominal pain, constipation and headaches. He attended his GP surgery to complain about these symptoms but his wife also mentioned that she thought that he was depressed. His GP prescribed him some medication for his constipation and recommended paracetamol for his headaches. This helped for a short period.

A few weeks later whilst lifting some furniture he developed sudden and severe back pain in the lower lumbar region. The pain was so severe that he called an ambulance that took him to the Emergency Department.

He was examined, and investigations were organised, the results of which are shown below:

Calcium	2.90 mmol/L	(2.20 - 2.60)
Phosphate	0.62 mmol/L	(0.80 - 1.50)
Alkaline Phosphatase	290 U/L	(30 -130)
Albumin	39 g/L	(36 – 53)
Urea	7.8 mmol/L	(2.5 - 7.5)
Creatinine	80 umol/L	(55 – 106)
Parathyroid Hormone	15.2 pmol/L	(1.1 - 6.8)
Urinalysis	Blood ++	

Lumbar spine X-ray showed a wedge fracture of L5, and KUB showed a left renal calculus.

He was treated with intravenous fluids and analgesia. He went on to have a DEXA scan indicating significant loss of bone mineral density.

He underwent diagnostic radiological tests and was told by his endocrinologist that operative treatment was required to effect a cure.

HOSPITAL OR PRIMARY CARE BASED PBL/CBL

6. A WOMAN WITH IRREGULAR PERIODS

A 30-year-old canteen assistant went to see her GP because she and her partner had been trying for a baby for over two years without success. On closer questioning she reported irregular scanty periods for the last 18 months. She had a family history of Type 2 diabetes with her father and paternal uncles affected.

On examination she was noted to be obese with a BMI of 31.4 kg/m^2. She had facial acne, hirsutism and central obesity. Her blood pressure was 160/90 mmHg. Investigations were requested and the results are shown below.

Fasting glucose	6.4 mmol/L (4 – 6)
Androstenedione	11.2 nmol/L (<8)
SHBG (sex hormone binding globulin)	12 nmol/L (>30)
T4 and TSH normal	
Prolactin normal	

Whilst she was embarrassed by her facial hirsutism, she was most concerned about her infertility and wanted to seek treatment for this.

Her doctor stated that she was at risk of developing diabetes, and suggests that she sees a dietitian to makes appropriate lifestyle changes to lose weight. The doctor also suggested she commence *metformin*, and consider fertility treatment to aid her fertility.

HOSPITAL OR PRIMARY CARE BASED PBL/CBL

7. A WOMAN WITH BLOOD IN HER URINE

A 65-year-old woman with a long history of smoking, attended to see her GP complaining of frequency of micturition, dysuria and haematuria.

Urinalysis results:
Blood +++
Protein +
Glucose -
Ketones -
Nitrites ++
Leucocytes ++

Her GP started her on trimethoprim 200mg for three days. He also sent the urine sample to the lab for M,C+S. The report showed E. Coli was grown sensitive to trimethoprim, co-amoxiclav and nitrofurantoin. The GP contacted the patient to ask her to drop off a further sample to check the infection has gone. This sample again grew E. Coli. A course of co-amoxiclav is now given. Unfortunately her urine still grew E. Coli.

She was referred to the local urology services but whilst awaiting an appointment she developed severe left sided colicky loin pain and began to pass blood in her urine with clots. She attended the local emergency department. Following an initial assessment, she was admitted for investigations in order to determine the cause of her loin pain and haematuria.

Investigations requested by the admitting team include urine cytology, blood tests, imaging and a cystoscopy. These investigations revealed a transitional cell tumour of her left ureter. She was counselled about the various treatment options. Given the limited nature of the tumour and the lack of evidence of spread she was offered a left nephroureterectomy.

She had an uncomplicated recovery from her operation and was discharged from hospital seven days later and remained under follow up with her Consultant urologist.

HOSPITAL OR PRIMARY CARE BASED PBL/CBL

8. A MAN ATTENDING FOR A ROUTINE DIABETES CHECK

A 72-year-old man attended his GP for a routine diabetes check. He was diagnosed with Type 2 diabetes four years previously when he suffered with excessive thirst and was found to have an elevated glycated haemoglobin.

Since then he had sustained a myocardial infarct and suffers with pain in both calves if he walks for more than 100 metres.

He attended regular appointments at an ophthalmology clinic and had laser treatment to his retina. At review, it was noted that he had protein in his urine. His blood pressure in clinic was 152/93 mmHg. Body Mass Index was 27 kg/m^2

His list of medication included:

Aspirin 75mg daily
Atorvastatin 40mg daily
Ramipril 5mg daily
Bisoprolol 5mg daily
Metformin 1000mg twice daily
Gliclazide 160mg twice daily

Further investigations:

Serum creatinine	121 umol/L	(60-110)
Estimated GFR (eGFR)	47 mls/min	(using the MDRD formula)
Urine albumin:creatinine ratio (ACR)	94 mg/mmol/L	(<2.5)
Haemoglobin A_{1c}	67 mmol/mol	(26-42)
Total Cholesterol	5.6 mmol/L	(<4.0)

The GP tells the patient that he has diabetic nephropathy and that his management will consist of good blood pressure and glycaemic control.

MET3B RECOMMENDED READING LIST

Michael J. Glynn, William M. Drake (Eds)
Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice
24th Edition 2017
Saunders Elsevier

Simon Steddon, Neil Ashman, Alistair Chesser, John Cunningham (Eds)
Oxford Handbook of Nephrology and Hypertension
2nd Edition 2014
Oxford University Press

Parveen Kumar, Michael L. Clark
Kumar and Clark's Clinical Medicine
9th Edition 2016
Saunders Elsevier

Shern L. Chew, R.David.G. Leslie
Clinical Endocrinology and Diabetes: An Illustrated Colour Text
1st Edition 2005
Churchill Livingstone