Tutor guide

M3- first term 2024-2025

- Contents:

    1-Guide lines (why P.B.L. "Problem Based Learning") added to integrated system in October 6 university faculty of medicine (what the student & tutor will do this term) , (modules in this term & their general objectives)

    2-Schedule for lectures , practicals , cases (small group teaching) , skill lab , & exams

    3-Rubrics for grading assignments and presentations

    4-Portfolio template (to be completed by each student and tutors and department members put the marks and be submitted to tutors by end of each module)

    5-Cases (with objectives in tutor guide and without objectives in student guide)

- PBL Philosophy:

In a world where available information is growing exponentially, we believe that the most important thing a student needs to know is how to learn. So the main learning goals of the PBL are a framework for looking at concepts, skills, and abilities and help guide the creation of personalized student curriculum. PBL offers unique environments where students can flourish as individuals within a community of learners.

- PBL Process:

The core of the PBL process is the tutorials that will be held once weekly beside the practical sessions and the interactive lectures. In each tutorial there will be a case scenario that is delivered to the students, where they collaborate together through the seven jumps process to point out the possible problems present in the case and to find out the intended learning objectives need to be known through this case. In the second tutorial, they will discuss the objectives of the case after self study, and a new case will be delivered. In PBL process the role for lectures aim at clarification of complicated areas of information or to integrate different areas of information. Practical sessions and clinical skill lab are included as educational activities in BPL. They act as tools for the students to gain the needed psychomotor skills and to attain the professional attitude and behavior.

- Student role:

The student is the center of the learning process in PBL. Students will depend on themselves in finding out the learning objectives by brain storming in the case study session. Then they will go home and study and search in the texts for the information of the objectives they got. Then the following session they should try to present the information they gazered and summarized to their students in an easy palatable way. In PBL the students have to work hard, prepare themselves well for every tutorial group meeting, collaborate with their colleagues and practice team work. They also will have their reflection about the process, their colleagues and the tutor.

- Tutors role:

- The tutor will work as a facilitator more than traditional teacher who delivers all the information to the students. Tutors role is to stimulate and motivate the students to learn and to search for the information and knowledge. During the case they will guide the students and redirect them towards the intended learning objectives. The tutors share in the assessment process. Moreover, the tutor together with the students has the responsibility of setting the roles of the tutorial session.

- The tutor will receive guide information for the objectives in each case from the departments at least one week before the case is to be discussed, he should read them and then in the discussion of the case he should see if the students had fulfilled all the needed items so as to approve their work or they need to search more for certain items and get them so as to complete their work completely or they got more or un needed items they should discard them. By the end of the cases of the module students will have their hand out covering all items needed in the objectives they searched for
- All staff members should have their official mails done by the beginning of the academic year so as good communication may be applicable and to facilitate uploading of their lectures every Wednesday of each week
- Concerning the module (BOS 101) which is the beginning module for M1 the academic year 2022-2023.
- In each session one of the students will be the reader (the one who reads the case) and another one will be the writer (the one who writes the objectives on the board after brain storming of the students with the tutor and collect them after that)
- In session (1) (week 1)
    - One case will be red by the students
    - They make brain storming with each other and with the tutor to get the objectives the case is talking about. They will go home to search for them and make presentation about them the coming session.
    - Weeks for reading of the cases and discussion of the objectives are written above each case.
    - The presentation have certain rubrics the tutor try that the students stick more and more to them each presentation then at the last presentation of the module they will have certain mark among their portfolio total mark about:
        - The presentation they showed along the module and their share in the discussions and preparation of the work needed (see professional behavior sheet included) (the mark is given by the tutor)
    - After they finish the presentation in each session they will read the following case and brain storm to get the objectives that they will go home to prepare them as presentation in the coming case session and so on all the sessions
    - If the case is long its presentation by the students may take two weeks not one week to ensure that the students presented the objectives in the case in a good way
- - All students are to make their Emails in the first week try to login to thr LMS so as to be able to reach the following:
                                        - Lectures
                                        - Videos
                                        - Presentation
                                        - On line exams formative questions

- **- Scoring Rubric for Presentations:**

Category	Scoring Criteria	Total Points	Score
Organization (15 %)	Were the main ideas presented in a clear manner?	5	
	Information is presented in a logical sequence.	5	
	Presentation appropriately cites requisite number of references.	5	
Content (45 %)	- The Introduction is attention-getting, - It lays out the problem well, - It establishes a framework for the rest of the presentation.	5	
	Technical terms are well-defined in language that is appropriate for the target audience.	5	
	The Presentation contains accurate information.	10	
	The material included is relevant to the overall message/purpose.	10	
	Appropriate amount of material is prepared, and the points made reflect well their relative importance.	10	
	There is an obvious conclusion summarizing the presentation.	5	
Presentation (40 %)	Speaker maintains good eye contact with the audience and is appropriately animated (e.g., gestures, moving around, etc.).	5	
	Speaker uses a clear, audible voice.	5	
	Delivery is poised, controlled, and smooth.	5	
	Good language skills and pronunciation are used.	5	
	Visual aids are well prepared, informative, effective, and not distracting.	5	
	Length of presentation is within the assigned time limits.	5	
	Information was well communicated.	10	
Score %	**Total Points**	**100%**	

Steps to register on the Moodle
e-learning website for Faculty of Medicine

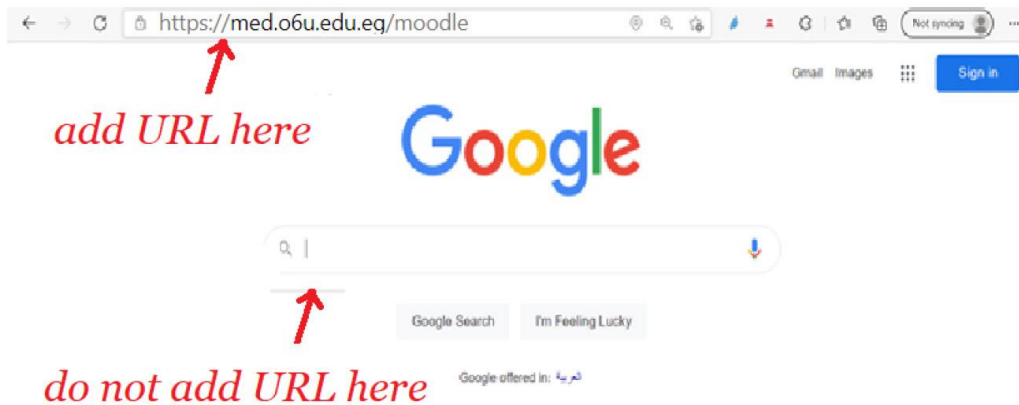1. Open any browser e.g. Chrome, Firefox, Edge, Safari …..
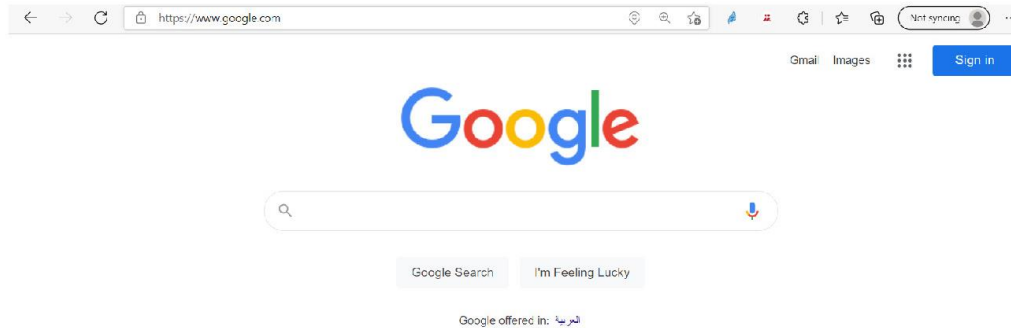
2. Then copy & paste this address in the URL box
   https://med.o6u.edu.eg/moodle

   N.B.
   - It is https & not http
   - There is no www in the address

3. Press "Enter" Key

4. Click on "log in" in the upper right corner of the screen.

5. Write your ID number twice: in the "Username" & in the "Password" ..... here is an example:

6. Then click on "Log in" below. You will be asked to change your Password:

The new password must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s), at least 1 upper case letter(s), at least 1 non-alphanumeric character(s) such as as *, -, or #

Very Important: DO NOT FORGET THE NEW PASSWORD

How to enroll yourself in a Module?

Some modules need an "enrolment key" to enter it for the first time. Ask you teacher for this key.

Enrolment options

Pediatrics-5

Teacher: Manar Aref
Teacher: Eman Sharaf

Self enrolment (Student)

Enrolment key

Enrol me

Professional Behavior of student in the case checklist

Students Name: ....
Date: .... **End of module (Summative):** ....
Module title: ....
Student's Signature :........................... **Tutor's Name:**...

Criteria	Scale: 1 and 2 is unsatisfactory, 3, 4 and 5 is satisfactory performance					Comments
Preparation: Is well prepared with relevant information, uses a variety of references and summarizes key points	1	2	3	4	5	
Critical thinking: Identifies problem, analyzes problem, suggests possible reasons for the problem, helps group to formulate learning objectives	1	2	3	4	5	
Participation: Participates actively, talks on turn and listens attentively to others	1	2	3	4	5	
Communication Skill & Group Skills: Respects tutor and colleagues, communicates well uses appropriate language, accepts feedback and responds appropriately. Contributes to group learning, shares information with others, demonstrates sensitivity to views and feeling of others, takes on assigned tasks willingly	1	2	3	4	5	
Presentation skills: Presents the information relevant to the learning objectivse of the case, explains clearly the reasoning process with regard to solving the problem	1	2	3	4	5	

SATISFACTORY   **UNSATISFACTORY**

-The students portfolio (October 6 university - faculty of medicine - 2024 - 2025):

Portfolio :
It is a collection of student work , reflections , and educational experience done and arranged by the student for documentation and assessment.

Purpose of portfolio :
It is formed to monitor the student progress ,, assess the student achievement , and determine the student grades.

Goals
-Show learning progress over time
-Provide greater motivation for students
-Increase self assessment skills
-Encourage reflective learning
-Increase tutor student collaboration

Module :
Student name :
ID:
Level:
Academic year :
First term / Second term :

Task	Monitored by	Signature	Mark
-CV of student	Tutor		20%
-Attendance			
-List of Cases taken or seen in the module			
-Objectives detected by brain storming			
-Presentation infront of colleagues against rubrics			
-your reflection concerning the sessions, cases , objectives , and presentation			

-Topics of Lectures taken in the module	-Department member		10%
-topics of practicals and laboratories taken in the module	-Department member		
-Skills achieved n this module			
-Number of formative exams done	-professor in the skill lab		
	-professor in the lecture		
-Your reflection concerning the lectures , practicals , skill labs , and formative exams	-Department member		
Task needed by department …………… or assignments or research work or video making	-Department member		Mark for all departments sharing in module 25%
Task needed by department …………… or assignments or research work or video making	-Department member		Mark for all departments sharing in module 25%
Task needed by department …………… or assignments or research work or video making	-Department member		Mark for all departments sharing in module 25%
Points of strength you had in this module (*what you need to do using what you knew or what could have been better in your work after your*	Tutor		10%

knowledge)			
Points of weakness in this module and your sight to correct them	**Tutor**		**5%**
Describe your study day *(what you tried to learn , how your learning influenced your practice , the most important thing you learnt in this module)*	**Tutor**		**10%**
Meeting with staff member *(what was the objective and what was the result)*	**Staff member**		**5%**
Have you visited Alex (the talking patient robot , and SECTRA table) *(If YES please say how was your journey and if NO please say why)*	**Tutor**		**3%**
Describe your group work with your colleagues *(Team Based Learning)*	**Tutor**		**10%**
Any activities you have done	**Tutor**		**2%**

THIRD YEAR	Mid module	Continuous assessment	End module	OSPE	OSCE
OPTHALMOLOGY 150	35 marks electronic	10 marks total 1.5 attendance small groups 1.5 attendance cases 4 presentation 3 portfolio	60 marks total 50 MCQ 10 SAQs electronic	45 marks total -slides electronic	OSCE
INTERNAL MEDICINE 150	35 marks electronic	10 marks total 1.5 attendance small groups 1.5 attendance cases 4 presentation 3 portfolio	60 marks total 50 MCQ 10 SAQs electronic	45 marks total -slides electronic and practical	
MST 25			25		
MRS 25			25		
MLG 100	22 marks electronic	8 marks total 1.5 attendance sections 1.5 attendance cases 3 presentation 2 portfolio	40 marks total 30 MCQ 10 SAQs electronic	30 marks total -slides electronic and practical	

Cases for the third year students modules

(Opthalmology, introduction to general medicine, medical statistics, medical research, forensic medicine)

DIABETES CASES SCENARIO
Cases for the module opthalmology, internal medicine, forensic, community

- Case 1: ophthalmology module

Diabetes mellitus

 (Red in week 1 and discussed in weeks 2,3,)
- A 25-year-old female patient presented to the ophthalmologist with blurred vision of three weeks duration.
- On careful questioning , the patient informed the ophthalmologist that before the start of her complaint she was waking up at night at least six times for urination, in addition she noticed that she lost weight of about ten kilograms during the past month in spite of her good appetite.
- The ophthalmologist ordered a blood sugar test and the result came of 400 mg/dl.
- She was referred to an internist who started insulin treatment for her.
- The patient asked the internist about how common diabetes in Egypt is, he replied that the prevalence of diabetes in Egypt is about 11% and that Egypt ranks as the seventh in the top ten countries with the highest prevalence of diabetes.

 - Objectives:
   - Define catract, causes, manifestation, & treatment (opthalmology)
   - Discuss diabetes as regards its causes, symptoms, signs, and treatment (internal medicine)
   - Discuss the prevalance of diabetes in egypt (community)

Tutor guide:

Guide information :
Discuss the prevalance of diabetes in egypt (community)
Prevalence of diabetes in egypt
Prevalence of eye complication among diabetes
Ways of control of diabetes
Nutrition tips for diabetes
In occurance of complication what are the tips needed for ensure the patient will be controlled
What are the kind of information given to patient whether curative or preventive
Giving information to patient and family
Ways to deliver this information counselling or in lecture or guidedbooklets

Define catract, causes, manifestation, & treatment (opthalmology)

Definition;
Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both.

Prevalence
Egypt is in the world's top 10 in terms of the highest number of people with diabetes (7.8 million) and highest projected number of people with diabetes in 2035 (13.1 million)
In Egypt 10.4% of adult population (10-79) have diabetes, but since Egypt has relatively large number of young population, this is corrected to 11.4% when used to compare with other countries.

Causes and classification
➢ Type 1 diabetes due to autoimmune β-cell destruction, usually leading to absolute insulin deficiency.
➢ Type 2 diabetes due to a progressive loss of β-cell insulin secretion frequently on the background of insulin resistance.
➢ Gestational diabetes mellitus (GDM) diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation.
➢ Specific types of diabetes due to other causes, e.g., monogenic diabetes syndromes.

Type 1 DM
➢ Type 1 diabetes accounts for <10% of all cases of DM
➢ Results from a cellular-mediated autoimmune destruction of the ☐ cells of the pancreas.
➢ The rate of destruction is rapid in some individuals (mainly infants and children) and slow in others (mainly adults, known as late-onset autoimmune diabetes LADA).
➢ This form of diabetes is characterized by severe insulin deficiency. Exogenous insulin is required to: 1) control blood glucose, 2) prevent diabetic ketoacidosis (DKA), 3) and preserve life.

Type 2 DM
➢ Type 2 DM Accounts for >90% of all cases of DM.
➢ Type 2 DM is initially characterized by insulin resistance followed by failure of ☐ cells to compensate for the increased insulin requirements.
➢ It is usually a disease of adults; however, type 2 DM is being increasingly diagnosed in children and adolescents accounting for up to 1/3 of new cases diagnosed over the age of 5.
➢ Type 2 diabetes is associated with obesity, family history of diabetes, hypertension and hyperlipidemia.

Gestational diabetes
➢ The term gestational diabetes mellitus describes women with abnormal glucose tolerance that appears or is first detected during pregnancy.
➢ Women with known diabetes before conception are not classified as having gestational diabetes,
➢ Gestational diabetes mellitus usually appears in the second or third trimester, when pregnancy-associated insulin antagonistic factors (many placentally derived) reach their peak.

Specific types of Diabetes

➤ Monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young [MODY]),

➤ Disease of the exocrine pancreas.

➤ Endocrinopathies.

➤ Drug or chemical induced (e.g., nicotinic acid, glucocorticoids, thyroid hormone, β-adrenergic agonists, thiazides, phenytoin, interferon)

Diagnosis Of Diabetes Mellitus

1) A1C ≥ 6.5%.

2) Classic symptoms of diabetes (polyuria, polydipsia, and unexplained weight loss) plus random plasma glucose concentration ≥ 200 mg/dL.

3) Fasting (≥8-hour) plasma glucose concentration ≥ 126 mg/dL.

4) 2-hour post load plasma glucose concentration ≥ 200 mg/dL during a 75-g oral glucose tolerance test.

Symptoms and signs of type 1 DM

➤ It has been clearly established that type 1 diabetes has a Long Preclinical Phase.

➤ In most cases, overt hyperglycemia (and ketosis if it is present) May Be Precipitated By An Unrelated Medical Illness Or Stress placed on an already-limited islet reserve, thus triggering the diagnosis.

➤ Typically, symptomatic hyperglycemia, manifested by Polyuria, Polydipsia, Weight Loss, And Fatigue, Occurs Abruptly in an otherwise healthy child or young adult.

➤ For a minority of patients, the initial presentation may be Diabetic Ketoacidosis.

➤ The disease has an Increased Incidence In The Winter months, classically attributed to respiratory viral infections.

➤ The Coincidence Of Type 1 Diabetes With Puberty has been attributed to insulin resistance associated with increases in sex and growth hormone secretion.

Symptoms and signs of type 2 DM

➤ The classic hyperglycemic symptoms of polyuria, polydipsia, and weight loss occur when the renal threshold for glucose reabsorption (~180 mg/dL) is exceeded and glycosuria with osmotic diuresis occurs.

➤ Therefore, patients may have plasma glucose concentration that is elevated but below this threshold, for years if not for decades, before specific symptoms appear.

➤ The initial presentation for some patients may be severe decompensated hyperglycemia, with profound dehydration, electrolyte imbalance, and plasma glucose levels of 400 mg/dL or higher hyperosmolar hyperglycemic sundrome(HHS).

➤ A key feature of type 2 diabetes is that the metabolic defects are not static but tend to worsen over time.

➤ A patient early in the course of type 2 diabetes may maintain acceptable glucose control with simple dietary modification and modest weight loss.

➤ For many patients, these measures alone fail over time, and combinations of oral medications and often insulin therapy become necessary to control blood glucose levels.

➤ For a minority of patients, the initial clinical presentation of diabetes may be the presence of diabetic microvascular complications (retinopathy, neuropathy, nephropathy),necessary to control blood glucose levels

Treatment of type 1 DM
- Treatment of type 1 DM requires lifelong insulin replacement.
- In type 1 diabetes, the primary focus is to replace the insulin secretion that has been lost. A healthy lifestyle is also required to facilitate insulin therapy and to optimize health
- In the short term, the goals of diabetes treatment are to optimize metabolic control and to improve the patient's sense of clinical well-being
- Long-term therapeutic goals focus on the prevention of complications, including cardiovascular disease, nephropathy, retinopathy, and neurologic disease

Treatment of type 2 DM
- Oral therapy should be initiated early in patients that failed glycemic control after a short-term trial of diet and exercise.
- Monotherapy with maximum doses of insulin secretagogues, metformin, or thiazol-idinediones yields comparable glucose-lowering effects.
- The glucose-lowering effects of insulin secretagogues are observed within days, but approximately 20% of patients do not respond to these agents. In contrast, the maximum effects of metformin or thiazolidinediones may not be observed for several weeks

Oral medications
Biguanides.
α–Glucosidase inhibitors.
Dipeptidyl peptidase IV inhibitors.
Insulin secretagogues— sulfonylureas.
Insulin secretagogues—nonsulfonylureas.
Thiazolidinediones.
Sodium-glucose cotransporter 2 (SGLT2) inhibitors
Parenteral
Insulin.
GLP-1 agonist.
Amylin agonist.

- Case 2: Nerve palsy

(Red in week 1 and discussed in weeks 2, 3,)

- A 30-year-old male patient presented to an ophthalmologist with double vision. The ophthalmologist examined him and found that he has sixth nerve palsy.
- Upon further questioning the ophthalmologist found out that the patient has been complaining from weight loss and increased appetite in addition to tingling sensation of both lower limbs for the past few months.
- The patient was sent to the lab for laboratory tests and the blood sugar came out of 450 mg/dl.
- The patient was referred to an internist who instructed the patient to start insulin therapy.
- The patient was reluctant to initiate insulin and he asked the internist about not starting insulin to control blood sugar.
- The internist informed the patient that not initiating insulin will result in diabetes complications and he informed the patient that incidence of diabetes among causes of blindness is about 50% and that the incidence of kidney failure after ten years of uncontrolled diabetes is 70%
- One week ago due to visual impairment his wife (who was a doctor) was to give him the insulin dose but one day unfortunately she gave him 60 units of the drug lantos (insulin) instead of 20 units and he died. Judicial authorities questioned her and corpse dissection his body to assure the cause of death and whether there is mal practice

- Objectives:

- Complication of diabetes (hypoglycemic coma) (internal medicine)
- Causes of blindness (opthalmology)

Cases for the Medicolegal module

An old man 60 years old found dead at his home. On his back, patches with purple discoloration were noticed. The medicolegal expert stated that death occurred since 2 hrs. There was a history of hypertension and cardiac disease.

1. How can you diagnose the time of death?

2. How could you differentiate traumatic and pathological cause of death?

Objectives

-The student should estimate the time of death

- The student should know the cause of death

Guide information

1)The time of death can be estimated from:

-Cooling (decrease by 1 – 1.5 ºC per hour→ so temperature here is 34 – 35 degree),
-Hypostasis: separate patches [patches coalesce together in about 3 hours].

-Rigor mortis: in the small muscles of the eye lids and face [R.M. starts after 2h in the muscles of the eyelids then in the muscles of the face, the neck and the trunk and downwards].

-Eye: intraocular pressure is nil.

2)The cause of death can be differentiated from:

*Traumatic: suspicious injuries as abrasions, bruises, cut wounds, … + autopsy may be suggestive [e.g., extradural or subdural or traumatic intracerebral hemorrhage…]

*Pathological: positive medical history + autopsy may be helpful e.g.,

- *Diagnosis of hypertension:* Hypertrophy of Lt. ventricle of the heart & atherosclerotic cerebral arteries: tortuous, thick, whitish and patent when cut.
- Pathological subarachnoid hemorrhage due to rupture of an aneurysm

Forensic cases
I- How to diagnose time of death

An old man 60 years old found dead at his home. On his back, patches with purple discoloration were noticed. The medicolegal expert stated that death occurred since 2 hrs. There was a history of hypertension and cardiac disease.

3. How can you diagnose the time of death?

4. How could you differentiate traumatic and pathological cause of death?

Objectives

-The student should estimate the time of death

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- *Diagnosis of hypertension:* Hypertrophy of Lt. ventricle of the heart & atherosclerotic cerebral arteries: tortuous, thick, whitish and patent when cut.
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II-Head injury

- **18 years old boy was admitted to the emergency room in a coma, after his head being hit while falling from running bus. On examination pulse was 65/ min. temp.36.5 c, blood pressure 90/55mmHg and the pupils were equal and reactive**

- How could you estimate the age of the victim?
- What is your provisional diagnosis and how can you prove it?

Objectives
- The student should estimate the age of the victim
- The student should manage the condition

Guide information
1-The age can be estimated from:

- The distal ends of metacarpal bones and phalanges unit with their shafts at 18 years.

- The head of femur units with shaft at 18 years.

- The lower ends of both tibia &fibula units with shafts at 18 years.

2-The diagnosis :

Concussion
It is a clinical state of transient loss of conscious due to temporary nerve cell dysfunction with no visible physical damage.
Cause: it is due to jarring of the brain inside the skull.
Clinical picture:
  o Mild confusion or dazing which are temporary.
  o Brief loss of conscious which won't last more than 15min (<6 hours) during which there will be manifestations of shock.
  o Post traumatic amnesia (events just before or after the injury may be lost).
Treatment:
The patient should be hospitalized and remains under observation for **48 hours**; give the patient fluids and glucose to treat hypotension and hypoglycemia.

III- wound injury

- **A 7 year old boy was kidnapped. A few days later the boy was found dead in a nearby garage with a cut wound in the neck. A 23-year-old neighbor was accused of committing the crime and a blood stain was found on his shirt.**

  - How could you estimate the age of both victim and the accused?

  - Describe the wound characteristics of the child injury.

    Objectives
  - The student should estimate the age of the victim.
  - The student should describe the wound.
  - **Guide information**

    1-The age can be estimated from:

  - The lower end of the radius, Ossific. Center reaches $\frac{2}{3}^{rd.}$ breadth at 7 years.

  - The proximal (medial) end of the clavicle unites with the shaft at 23 years.

  - The iliac crest unites with the iliac bone at 23 years.

  - Basiocciput – basisphenoid suture of the skull closes at 23 years.

2-Wound description:
  1. Edges are regular and cleanly cut,
  2. More long than deep.
  3. Hair edges are sharply cut.
  4. Bleeds profusely.
  5. Reflects sharp edge
  6. Direction of cut: deeper at the start.
  7. No abrasions or bruise at edges.
  8. Heal usually by primary intention.

Internal medicine module (MED)

Occupational Related Pulmonary Neoplasms
Red week 9   and discussed week 10 , 11

Case:
A 60 years old patient, nonsmoker presented to health care unit with weight loss, difficulty in breathing , cough for the past three months.
The shortness of breath is progressive and gets worse and the cough is not responding to cough medications.
In addition the patient gives history of occasional coughing of blood and recently he noticed a mass at the side of his neck.
The patient has been working for 40 years in a waterpipes factory which uses asbestos as one of the materials in the manufacturing of the water pipes.
Examination revealed underweight, mild fever , neck swelling at the cervical region (cervical lymph nodes) and chest auscultation showed markedly diminished breath sounds on the right side.
CT chest showed pleural effusion on the right side and hilar lymph nodes enlargement

Objectives
1) The student will understand the concept of occupational medicine and its importance in clinical practice.

2) The student will recognize the specific various occupations which pose a health hazard.

3) The student will recognize the various specific diseases resulting from exposure to specific environmental hazards.

4) The student will understand the occupational hazards on the lungs
5) The student will know the major risk factors related to pulmonary neoplasms
6) The student will know the basic classification of pulmonary neoplasms
7) The student will know the basic clinical features of pulmonary neoplasms

Tutor guide

❖ It is now recognized that a substantial burden of ill health and disability is due to work-associated physical, chemical, and biologic hazards. Psychosocial aspects of work also may be injurious to health.

❖ Environmental hazards may affect preferentially vulnerable populations— those with underlying disease, those at the extremes of life, those with atopy, and those with other serious health risks such as smoking or diabetes.

❖ Exposure dose of the environmental agents is the major determinant of the risk for development of disease

THE OCCUPATIONAL AND ENVIRONMENTAL HISTORY AND EXPOSURE ASSESSMENT

- Key to determining whether work and other environmental exposures may be causing or contributing to adverse health is the exposure history.

OCCUPATIONAL AND ENVIRONMENTAL HEALTH DISORDERS COMMON IN PRACTICE

COMMON OCCUPATIONAL AND ENVIRONMENTAL HEALTH CONDITIONS IN GENERAL PRACTICE		
CONDITION	EXPOSURE SETTINGS	COMMENT
Asthma	Virtually any indoor or outdoor workplace	New-onset, recrudescent, or exacerbated asthma
Interstitial, parenchymal, and inflammatory lung disorders	Dusts, metals, and organic materials	All parenchymal disorders have one or more environmental causes
Cancers of the respiratory tract	Asbestos, radon, silica, combustion fumes, tars, and some metals	Smokers are more likely to be affected
Sensorineural hearing loss	Noise, metals, and solvents	High-frequency loss, especially in younger workers
Musculoskeletal disorders of trunk and limbs	Heavy or repetitive activities or postures	Cold, vibration, and work stress contribute
Upper airway irritation	Dust and fumes	More common in smokers and atopic persons
Dermatitis, allergic or irritant	Repeated exposure to unprotected skin	Work and environmental exposures should be considered in every case

occupational health hazards

Asthma

- Atopic men and women with preexisting airways disease tolerate irritants in the workplace poorly and may experience exacerbations in temporal relation to one or more exposures.

- Virtually no profession or work is immune, and up to 20% of all adult-onset asthma may have a work component.

Chronic Interstitial, Parenchymal, and Inflammatory Lung Disorders

- Examples for the offending agents are silica, asbestos and beryllium.

Cancers of the Respiratory Tract

- Although most carcinomas of the lung and upper airway occur in smokers, occupational exposures to asbestos, silica, and the polyaromatic hydrocarbons in particulate air pollution, diesel exhaust, pitch, and asphalt contribute to the burden, as do radon and carcinogenic metals such as chromium and nickel found in most alloys.

Fatty Liver

- This disorder is common among individuals exposed regularly to organic solvents.

Sensorineural Hearing Loss

- Aside from aging, noise is the most important cause of high-frequency sensorineural hearing loss, recognizable as early as in adolescence.
- Hobbies such as shooting and loud music may combine with industrial and agricultural noise to accelerate hearing loss.

Musculoskeletal Disorders of the Upper Extremity and Trunk

- The most common cause of work disability, including permanent disability, is an injury to the back or upper extremity; Repetitive, heavy, awkward, and time-pressured activities are notorious contributors, as are cold and vibration.

Upper Airway Irritation

- Virtually any smoke, fume, dust, or chemical has potential to irritate the upper respiratory tract , causing acute or chronic symptoms indistinguishable from common allergic manifestations or upper respiratory infections.

Dermatitis

- Erythematous rashes are a common consequence of topical exposures to workplace, avocational, and household materials, including latex, plastics, and many foods.

Sick Building Syndrome and Nonspecific Building-Related Illness

- The effort to reduce the influx of "fresh" air into buildings to save heating and air-conditioning costs has resulted in upper airway and dermal irritation as well as vague central nervous system symptoms such as headache and fatigue, occurring shortly after beginning work and clearing minutes to hours after leaving the affected building.
- Many occupants are typically affected, especially those who spend the most time in one place. The cause is unknown, but recent evidence suggests that microbial materials may be the most common culprits.

COMMON HAZARDOUS EXPOSURES IN THE WORKPLACE AND AMBIENT ENVIRONMENT

COMMON HAZARDS IN THE WORKPLACE AND AMBIENT ENVIRONMENT		
HAZARD	HEALTH EFFECTS OF GREATEST CONCERN	COMMENTS
Metals	Neurotoxicity, cancer	Most can be measured in blood or urine to assess dose
Organic solvents	Respiratory and dermal irritation, neurotoxicity, hepatotoxicity	Benzene and a few others have unique effects
Herbicides and pesticides	Rare acute neurotoxicity, unknown long-term effects	Widespread hazards of high population concern
Electromagnetic radiation	Leukemia, glioblastoma	Ubiquitous exposures with unproven effects
Mold	Allergy	High population concern regarding putative chronic effects
Mineral dusts	Cancer	Old hazards still of high concern (e.g., asbestos, silica)

Common hazardous exposures

LUNG TUMORS

Introduction and classification

❖   Although lungs are frequently the site of metastases from cancers in extrathoracic organs, primary lung cancer is also a common disease.

❖   Ninety-five percent of primary lung tumors arise from the bronchial epithelium (bronchogenic carcinomas); the remaining 5% are a miscellaneous group that includes bronchial carcinoids, bronchial gland tumors (adenoid cystic and mucoepidermoid carcinomas), mesenchymal malignancies (e.g., fibrosarcomas, leiomyomas), lymphomas, and a few benign lesions.

❖   The most common benign lesions are spherical, small (3 to 4 cm), discrete hamartomas that often show up as "coin" lesions on chest radiographs. They consist mainly of mature cartilage but are often admixed with fat, fibrous tissue, and blood vessels in varying proportions.

Bronchogenic Carcinoma

HISTOLOGIC CLASSIFICATION OF BRONCHOGENIC CARCINOMA AND APPROXIMATE INCIDENCE

I	Non-Small Cell Lung Carcinoma (NSCLC) (70%-75%)
	1. Squamous cell (epidermoid) carcinoma (25%-30%) 2. Adenocarcinoma, including bronchioloalveolar carcinoma (30%-35%) 3. Large cell carcinoma (10%-15%)
II	Small Cell Lung Carcinoma (SCLC) (20%-25%)
III	Combined Patterns (5%-10%)
	Mixed squamous cell carcinoma and adenocarcinoma

| Mixed squamous cell carcinoma and SCLC |

❖   For therapeutic purposes, bronchogenic carcinomas are classified into two broad groups: small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC).

❖   The key reason for this distinction is that virtually all SCLCs have metastasized by the time of diagnosis and hence are not amenable to curative surgery. Therefore, they are best treated by chemotherapy, with or without radiation. In contrast, NSCLCs usually respond poorly to chemotherapy and are better treated by surgery.

Risk Factors

1.   *Tobacco*

It is estimated that cigarette smoking is responsible for approximately 85 to 90% of all cases of lung cancer, including 90% of cases in men and 80% in women.

Pipe and cigar smoking are also risk factors for lung cancer, but the risk is thought to be less than that associated with cigarette smoking, possibly because such tobacco products tend to be inhaled less deeply than cigarette smoke.

2.   *Environmental Tobacco Smoke*

Exposure to environmental tobacco smoke (i.e., passive smoking) by nonsmokers, especially in the workplace, increases the risk for development of lung cancer.

3.   *Other Exposure*

The International Agency for Research on Cancer classified the following as group 1 known carcinogens for lung cancer: radon, asbestos, arsenic, beryllium, ether, cadmium, chromium, nickel, vinyl chloride, and polycyclic aromatic hydrocarbons.

4.   *Preexisting Lung Disease*

Patients with COPD have an approximately four-fold increased risk for lung cancer.

5.   *Dietary Factors*

Increased consumption of fruits and green and yellow vegetables is associated with a reduced risk for lung cancer, whereas low serum concentrations of antioxidant vitamins such as vitamins A and E are associated with the development of lung cancer.

6.   *Gender and Racial Differences*

Women who smoke have a 1.2- to 1.7-fold higher risk ratio than men do, especially for adenocarcinoma and SCLC. Possible explanations for this difference in lung cancer risk include (1) effects of hormones such as estrogen on the development of lung cancer, (2)

gender differences in nicotine metabolism, and (3) gender variations in cytochrome P-450 enzymes involved in the bioactivation of toxic components in cigarette smoke condensate.

Clinical Manifestations

The diagnosis is usually made incidentally on a chest radiograph obtained for other reasons (e.g., a preoperative study).

The majority of patients have symptoms and signs that are:

(1) Caused by the pulmonary lesion itself—local tumor growth, invasion, or obstruction; (2) Intrathoracic—regional tumor spreading to lymph nodes and adjacent structures; (3) Extrathoracic—distant spread of disease; and (4) Paraneoplastic syndromes.

Pulmonary Lesion

a)   Symptoms resulting from the primary lung cancer depend on the location and size of the cancer. Such symptoms can be secondary to endobronchial or peripheral growth of the primary tumor.

b)   The most common are, cough , hemoptysis, Dyspnea . Wheezing is uncommon as an initial symptom in lung cancer and may signify major airway obstruction, which can cause a postobstructive pneumonia that may not initially be evident on chest radiographs and may be diagnosed only when the pneumonia fails to respond to standard therapy.

c)   Peripheral lung tumors may be asymptomatic but are more frequently associated with symptoms of cough and pain from involvement of the pleura or chest wall.

Intrathoracic Spread

a)   Dysphagia may occur secondary to esophageal compression.

b)   Hoarseness which is associated with recurrent laryngeal nerve paralysis.

c)   Phrenic nerve paralysis with hemidiaphragmatic elevation is associated with dyspnea and hiccups.

d)   Apical tumors, such as superior sulcus NSCLC (Pancoast's syndrome), may cause Horner's syndrome.

e)   Signs of SVC syndrome include facial swelling, plethora, upper extremity swelling, dilated neck veins, and a prominent venous pattern on the anterior surface of the chest.

Extrathoracic Spread

a)   Bone metastasis occurs in 30 to 40% of patients with lung cancer and commonly involves the vertebrae, ribs, and pelvic bones. Pain is the primary symptom.

b)   Liver metastases can produce right upper quadrant abdominal pain, as well as nonspecific symptoms of fatigue and weight loss.

c)   Brain metastasis which occurs in 25 to 50% of SCLC and 25% of adenocarcinomas of the lung, may cause no symptoms but is more commonly associated with nausea, vomiting, headaches, seizures, confusion, personality changes, and focal neurologic signs and symptoms.

Paraneoplastic Syndromes

a)   Endocrine syndromes include hypercalcemia , the syndrome of inappropriate antidiuretic hormone secretion , and ectopic adrenocorticotropic hormone secretion.
b)   Skeletal manifestations include digital clubbing and hypertrophic pulmonary osteoarthopathy.
c)   Hematologic/vascular syndromes include hypercoagulable states , migratory thrombophlebitis.

Diagnosis

❖   Once signs, symptoms, or screening studies suggest lung cancer, a tissue diagnosis must be established.

❖   Tumor tissue can be obtained by a (1) bronchial or transbronchial biopsy during fiberoptic bronchoscopy;(2) by node biopsy during mediastinoscopy;(3) from the operative specimen at the time of definitive surgical resection;(4) by percutaneous biopsy of an enlarged lymph node, soft tissue mass, lytic bone lesion, bone marrow, or pleural lesion; (5) by fine-needle aspiration of thoracic or extrathoracic tumor masses using CT guidance.

Staging Patients with Lung Cancer

Lung cancer staging consists of two parts: first, a determination of the location of tumor (anatomic staging) and, second, an assessment of a patient's ability to withstand various antitumor treatments (physiologic staging)

Lung Cancer Staging Procedures

- Complete history and physical examination
- Complete blood count with platelet determination
- Measurement of serum electrolytes, glucose, and calcium; renal and liver function tests

- Electrocardiogram
- Skin test for tuberculosis
- Chest x-ray
- CT scan of chest and abdomen
- CT or MRI scan of brain and radionuclide scan of bone if any finding suggests the presence of tumor metastasis in these organs
- Fiberoptic bronchoscopy with washings, brushings, and biopsy of suspicious lesions
- X-rays of suspicious bony lesions detected by scan or symptom
- Barium swallow radiographic examination if esophageal symptoms exist
- Pulmonary function studies and arterial blood gas measurements if signs or symptoms of respiratory insufficiency are present

Case 2 anaphylaxis
Red week 11 and discussed week 12

30 years old male developed sore throat and cough for which he sought medical advice.
He was given various medications among which broad spectrum penicillins.
Within an hour of receiving the treatment the patient started developing widespread itching, red rash over his trunk and face, lip and earlobe edema
Then he started to have difficulty in breathing and cough.
Examination revealed BP of 70/40 pulse of 130/min there was a red rash over the chest wall and legs, lips and ear lobes are swollen and edematous

Objectives
The student will
1) Understand the types of immune mediated reactions
2) The student will understand the nature of anaphylactic reaction
3) The student will know the causes of anaphylactic reactions
4) The student will know the clinical features of anaphylactic reaction

Tutor guide :

ANAPHYLAXIS

HYPERSENSITIVITY DISEASES ARE BEST CLASSIFIED ON THE BASIS OF THE IMMUNOLOGIC MECHANISM INITIATING THE DISEASE:

Type	Immune Mechanism	Prototype Disorder
I) Anaphylactic Type	Allergen cross-links IgE antibody → release of vasoactive amines and other mediators from	▪ Anaphylaxis, some forms of bronchial asthma.

	basophils and mast cells → recruitment of other inflammatory cells	
II) *Antibody to Fixed Tissue Antigen*	IgG or IgM binds to antigen on cell surface → phagocytosis of target cell or lysis of target cell by complement or antibody-dependent cell-mediated cytotoxicity	▪ Autoimmune hemolytic anemia, erythroblastosis fetalis, Goodpasture disease, pemphigus vulgaris.
III) *Immune Complex Disease*	Antigen-antibody complexes → activate complement → attract neutrophils → release of lysosomal enzymes, oxygen free radicals, etc.	▪ Arthus reaction, serum sickness, systemic lupus erythematosus, certain forms of acute glomerulonephritis.
IV) *Cell-Mediated (Delayed) Hypersensitivity)*	Sensitized T lymphocytes → release of cytokines and T cell-mediated cytotoxicity	▪ Tuberculosis, contact dermatitis, transplant rejection.

TYPE I

❖ Anaphylactic or immediate hypersensitivity reactions occur after binding of antigen to preformed IgE antibodies attached to the surface of the mast cell or basophil and result in the release of inflammatory mediators (see prior Mechanisms of Inflammation section) that produce the clinical manifestations. Examples of type I-mediated reactions include anaphylactic shock, allergic rhinitis, allergic asthma, and allergic drug reactions.

Type I
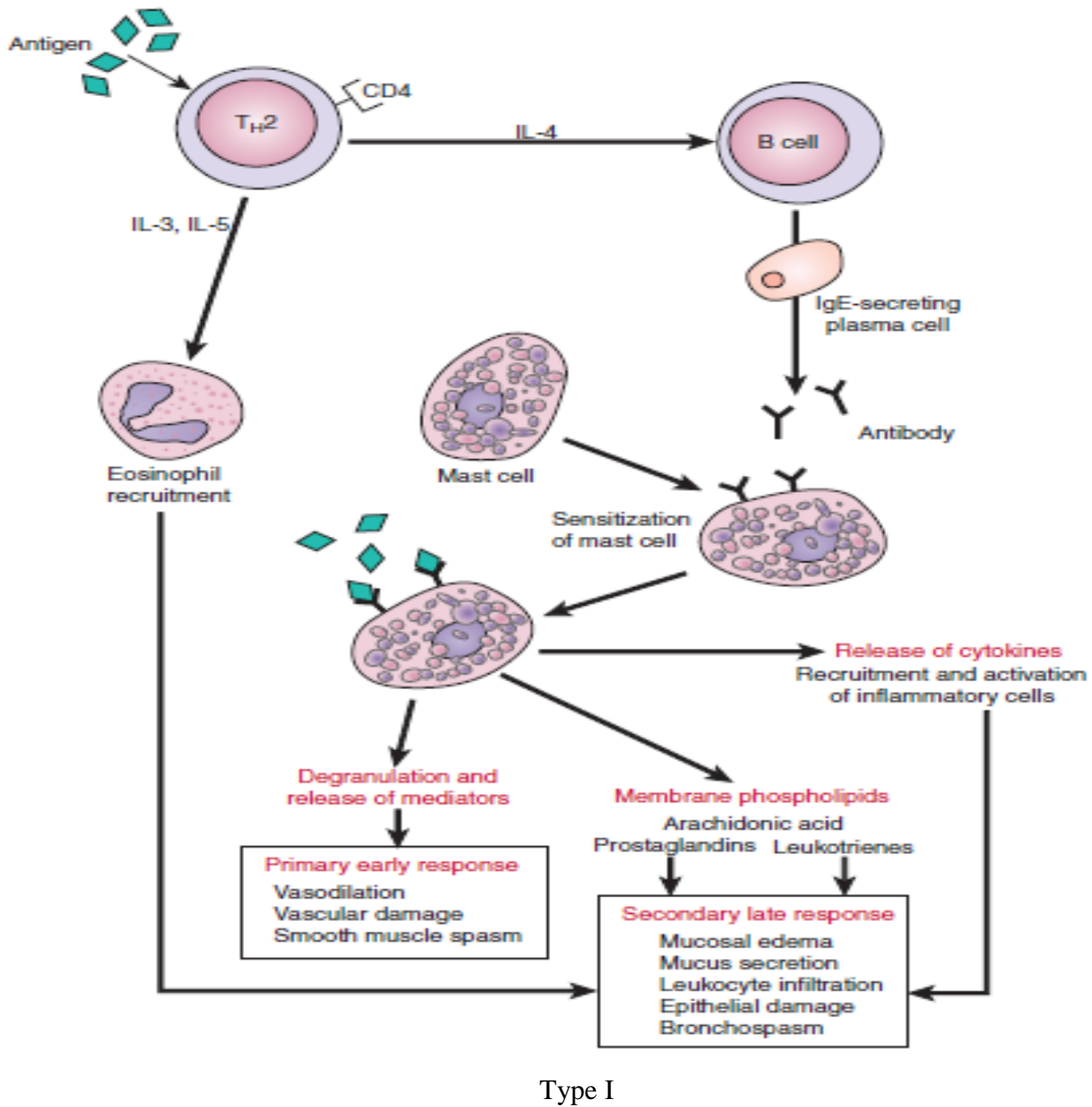
CAUSES OF SYSTEMIC ANAPHYLAXIS IgE-MEDIATED

- Insect sting
- Drugs
- Food

DRUGS FREQUENTLY IMPLICATED IN ALLERGIC DRUG REACTIONS

- Allopurinol
- Amiodarone
- Antiarrhythmic drugs (procainamide, quinidine)
- Antibiotics (β-lactams, sulfas, nitrofurans)
- Anticonvulsants (hydantoin, phenobarbital, carbamazepine)

- Antihypertensive agents (angiotensin-converting enzyme inhibitors)
- Antipsychotic tranquilizers
- Antisera (antitoxins, antivirals)
- Antituberculous drugs (isoniazid, rifampicin)
- Aspirin and nonsteroidal anti-inflammatory drugs

Diagnose Anaphylaxis

I. Acute onset of illness involving:

Skin or Mucosa
- Pruritus
- Flushing
- Hives
- Angioedema

and

Hypotension or End-Organ System Dysfunction
- Collapse
- Syncope
- Incontinence

or

Respiratory Compromise
- Dyspnea
- Wheeze-Bronchospasm
- ↓ Peak flow
- Stridor
- Hypoxemia

II. Rapid onset after exposure to a likely allergen of ≥ 2 of the following:

Skin or Mucosa
- Pruritus
- Flushing
- Hives
- Angioedema

Respiratory Compromise
- Dyspnea
- Wheeze-Bronchospasm
- ↓ Peak flow
- Stridor
- Hypoxemia

Hypotension or End-Organ System Dysfunction
- Collapse
- Syncope
- Incontinence

Gastrointestinal Symptoms
- Vomiting
- Crampy abdominal pain
- Diarrhea

III. Rapid onset after exposure to a known allergen:

Hypotension

Acute Treatment of Systemic Anaphylaxis

Hypotension
- Trendelenburg position
- Epinephrine (IM/IV)
- Volume expanders
- Oxygen

Epinephrine Resistance (β-blocker)
- Glucagon
- Vasopressin

Airway Constriction

Laryngeal Edema (LE)/ Bronchospasm (B)
- Epinephrine (IM) (LE, B) or
- Nebulized bronchodilator (B)
- Oxygen (LE, B)

↑ Airflow Blockage
- Intubation (LE, B)
- Tracheostomy (LE)

Urticaria
- H1R, H2R antihistamines

Possible Prevention of Late Reactions
- Glucocorticosteroids