



Course Orientation & General Notes

[**Color index:** **Important** | Notes: **F1**, **F2** | Extra] [EDITING FILE](#)

Objectives of the course:

- To know the basic ophthalmic anatomy and physiology.
- To recognize assessment and management of common ophthalmic diseases.
- To know how to handle common ophthalmic emergencies.
- To handle simple ophthalmic diagnostic instruments.
- To be aware of common ophthalmic operations.

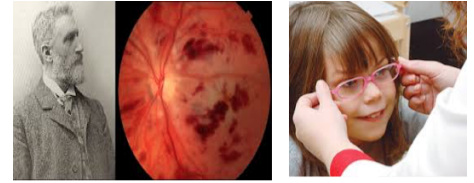
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Resources: Slides + Notes

Course Orientation: General Notes

● Difference between *optometrist* & *ophthalmologist*

- **Optometrist** (دكتور بصريات): is the one who measures the vision refraction.
Opto- = vision | **-metrist** = measurement
- **Ophthalmologist**: is the one who diagnoses and treat eye diseases.



● Eye is the window for body, examples:

- You can detect systemic diseases by simply examining the eye!
- **Diabetes mellitus**: sometimes first discovered with eye examination, examples:
 - Diabetic retinopathy with fundoscopic examination.
 - Multiple infections in the eyelids, also known as *stye*.
- **Jaundice**; looking at the color of the sclera. | - **Anemia**; pale conjunctiva
- **Brain Tumor**; manifests as optic disc edema. | - **Thyrotoxicosis**.

● What you need to learn in this course:

- Know the basic anatomy provided to you in lectures, you don't have to go into details!
- You have to have an idea about how to investigate, diagnose and treat **common** eye disorder.
- You'll not be asked about details, like: how to perform retinal detachment surgery or pars plana vitrectomy. You should only know the names for common ophthalmic operations! For example:
 - **Vitrectomy**: removal or cutting of vitreous. No one will ask you what is the treatment of vitreous hemorrhage (how to perform the procedure)
 - **Phacoemulsification**: cataract (phaco) surgery. suction of the nucleus **نفتح فتحة صغيرة و نعمل**
 - **Trabeculectomy**: glaucoma surgery.
 - **Oculoplasty types**: surgical repair of entropion and ectropion, nasolacrimal duct probing & syringing.
- Know how to handle **common** ophthalmic emergencies, like:
 - **Central retinal artery occlusion -CRO-** (جلطة في شريان العين): patient will have **sudden loss of vision**. If you don't manage the patient within **1 hour**, it will lead to permanent irreversible vision loss.
Pathophysiology: thrombus from any part of the body occluding retinal artery just like heart attacks (example: coronary artery occlusion due to hyperlipidemia)

Important question: how to manage central retinal artery occlusion?

Your main goal is to dislodge the thrombus from the artery, how?

- **Dilate the artery**: one way is by making the patient breathe into a plastic bag (اخذقيه) → ↑ CO₂ → vasodilation → dislodgement of thrombus.
 - **Decrease pressure in the eye**: by simply doing firm ocular massage. (apply pressure)
 - **Chemical injury**: "flash" or alkaline in the eye, how would you manage the patient? Wash the eye (irrigation with normal saline). **Question**: for: (a) 30 minutes (b) 1 hour (c) 10 minutes | **Answer**: a
- Know the most dangerous and important ophthalmic complications:
 - **Endophthalmitis**: infection inside the eye. Bear in mind that a lot of surgeries are performed daily.
 - **Conjunctivitis**: infection inside the eyelids. (not to be confused with endophthalmitis)

Side note: don't write loss of vision anywhere in the exam! you will get a ZERO! Most ophthalmic disorders end with loss of vision. You have to say what lead to vision loss (the reason)

- Exam questions are scenarios, example: patient did phaco surgery, he presented to the ER after surgery with pain, redness, and decrease vision what does he have?

- (A) Blebitis (area of filtration of glaucoma surgery) ✗
- (B) Infection ✓

(Exam tip: if you never heard of the term during the course do not choose it as an answer)

● **Lectures: total = 11**

1. Orientation, History Taking, Examination.

2. Basic Anatomy and Physiology of the Eye.

3. Lid, Lacrimal, and Orbit Disorders. SAQs

- Most pictures in the exam are of the retina, lids, orbit and lacrimal system. Examples:

- **Exophthalmos:** with thyrotoxicosis (most common cause of **unilateral** & **bilateral** exophthalmos)
- **Nasolacrimal duct obstruction:** babies are born with teary eyes because the lacrimal system is not developed. Normally tears go from the eye to the nose but in this case there is obstruction. The baby will have watering of the eye or *epiphora*.

Nasolacrimal duct obstruction in children 1st year? Massage then probing & syringing

4. Ocular emergencies and red eye. MCQs

- **Acute glaucoma:** high IOP

- **Endophthalmitis:** infection.

- **Trauma:** ruptured globe or open globe injury.

Immediate **management** = **surgical repair**, Immediate **action** = **eye shield** (not patch not Antibiotic)

- **Chemical injuries:** acid or alkali **What's worse? Alkali** injuries

- **Artery occlusion.**

- **Foreign body,** metallic or nonmetallic, common in construction workers who don't wear protective eye goggles.

- Red eye: **Painful:** Acute glaucoma, uveitis, corneal ulcer. | **Non-painful:** conjunctivitis (bacterial, fungal, viral)

5. Strabismus, Amblyopia and Leukocoria.

- **Strabismus,** also known as squint حول.

- **Types:** exotropia & esotropia
- Anyone with squint/ strabismus should undergo **Cycloplegic refraction.**
- **How does the Cycloplegic refraction work?** Applying cycloplegic drops → paralyzing the ciliary muscles → giving you the action of the nerve → you give them the full correction and patching the good eye.

- **Amblyopia,** also known as lazy eye كسل العين: one eye is strong (vision 6/6) and the other is weak -amblyopia- (vision 6/12), if is defined by a decrease in 2 or more lines from the other eye.

You have to know the THREE types:

Deprivation amblyopia	Strabismus amblyopia	Anisometropic amblyopia:
"طفل اتولد وانجرح في عينه، سكروله عين patching the eye of a baby who is just delivered in one week can get لأن amblyopia the brain is not receiving images from "the eye فيهملها"	"طفل تاني اتولد بحول squint، عين straight وعين برا أو جوه، بيتندي يركز بالعين الـ straight فتقوم العين التانيه بحصلها amblyopia"	Errors of refraction in one eye differ in the other eye. "العين اللي فيها higher refraction يحصلها amblyopia، خاصة إذا الطفل محدش عملو نظارة من مرحلة الولادة إلى 6 سنين، إذا ما سوا النظارة ولبسها و most likely فـ correct the vision he/she will develop poor vision in the "high refractive error eye"

- **Leukocoria:** when you shine light on the eye, the pupil normally looks black. If you examine the eye with an ophthalmoscope it will be red (red reflex), if it looks white we call it **leukocoria**. You'll learn all **5** causes of leukocoria in the lecture.

- The **most common** cause is **congenital cataract** which might lead to amblyopia.
- The **most dangerous & mortal** is **retinoblastoma:** malignant tumor in the eye (photoreceptors)
- **Premature with Leukocoria? retinopathy of prematurity**

"فلذلك تاخذو بالكو من الـ common محدش حيسألكو عن الـ PHPV فيه حاقه اسمها persistent hyperplastic primary vitreous هزي one of the causes و Coats' disease و vitreous hemorrhage من الـ causes إنما أنا يهمني الحاقات الـ dangerous retinoblastoma ونخاف منها لأنها might kill the baby أو يفقد النظر"

OSCE: when you examine the simulated patient (SP) -ophthalmoscopic examination- and you find out he/she has white pupil and the SP is 30 years old.

DO NOT say white pupil or leukocoria! It is only used with **pediatric patients**.

6. Acute Visual Loss. **FOUR + 1 MCQs**

“أربع حقات لازم تعرفونهم صم وتحفزوهم وحنزود عليهم وحده you should know it لأن ما فيه exam يخلى عنها very important حاقه اسمها "neovascular glaucoma

1. **Acute glaucoma (closed-angle glaucoma)**
 2. **Central retinal artery OR vein occlusion.**
 3. **Retinal detachment.**
 4. **Optic neuritis.**
- + **Neovascular glaucoma: very important topic.**

“topic بين الـ retina و الـ glaucoma فأنتم ما بتخدهوش في الـ details بالمحاضرات بس لازم تعرفوه، يعني ايه neovascular glaucoma يعني glaucoma سببها new vessels كيف؟ because or retinal ischemia مريض عنده diabetic retinopathy و retinal ischemia محدش عمله laser فـ it can present with acute glaucoma بـ what is called neovascular glaucoma

7. Chronic Visual Loss. **FOUR + 1 MCQs**

“أربع حقات لازم تعرفونهم، وحنزود عليها وحده مش حتلاقوها في المحاضرات، افكروا دايمًا أربعة ومعهم وحدة”

1. **Diabetic retinopathy.**
2. **Cataract: commonest.** 70% of surgical procedures done in the hospital are cataract surgeries. Glaucoma unit is mainly responsible for cataract surgery (anterior segment) + oculoplastic unit.
3. **Chronic glaucoma. (Open-angle glaucoma)**
4. **Age-related macular degeneration:**

“تآكل في مقولة العين تدريجيًا في السن الكبير، وهزا ما يحصل المرض إلا فوق الـ 65 سنة”

MCQs: Question 1: 40 years old patient and he has chronic visual loss, diagnosis?

لا يمكن الإجابة تكون age-related macular degeneration، يعني this is how you answer the exam يكون by exclusion من تشوفين الـ 40 سنة تشيلها من مخك. إذا قلت hypertensive patient الـ diabetic retinopathy يبقى فاضل حاقتين اللي هما: cataract chronic glaucoma & أجي أقولك أن الـ IOP is normal يبقى غالبًا أنها مهبش chronic glaucoma يبقى الـ diagnosis is cataract. السيناريو في الاختبار يجي زي كده بالزبط!

Question 2: 70 years old patient with chronic visual loss, diagnosis?

أول حاقه أفكر فيها age-related macular degeneration إنما ممكن تكون diabetic retinopathy بس احنا بنعمل exclusion.

Question 3: 70 years old diabetic patient complaints of gradual decrease in vision. On examination, there dot and blot hemorrhage in the retina, diagnosis?

يبقى diabetic retinopathy مع أنه 70 بس مش age-related macular degeneration

Question 4: 65 years old, complaining of gradual vision loss fundus examination is normal no afferent pupillary defect? CATARACT

“جاء سؤال للأولاد و لا عرفوا لما يقول الـ fundus طبييعي فيعني ما أقدر أقول glaucoma و لا age-related macular degeneration السيناريو ما قال انه مريض سكري عشان أقول diabetic retinopathy فالجواب هو الـ common و cataract!”

+ **Retinitis pigmentosa.**

“ده موجود بالسعودية كثير جدًا اللي هو العشى الليلي، many patients they are not seeing at night والمشكلة مش في انهم ما يشوفوا بالليل، المشكلة أنهم by age they lose vision completely ولكن gradually، ما تيجوا تقولوا ما نعرفهوش وما درسناهوش، you should know it”

Keywords

Diabetic retinopathy	Chronic glaucoma	Age-related macular degeneration
k/c of diabetes , Dot & blot hemorrhage.	High intraocular pressure.	More than 65 years.

MCQs

"نص الـ MCQs هو acute & chronic visual loss ما فيها كلام، مع شوية amblyopia على شوية squint على الـ optic neuritis يعني خلاص إذا عرفتموا هذه المحاضرة you'll know how to answer the exam كل lecture بييجي منها 1 question إنما كلهم بيجمعوا في الآخر على الـ "causes of acute & chronic visual loss"

"الكلمات مهمة، "if you don't know the term you'll not answer the question in the exam"

8. Refractive Errors. "محاضرة بسيطة وظريفة"

- **Myopia** قصر نظر light rays so they focus in front of the retina, treatment? Concave lens
- **Hyperopia** طول أو بعد نظر incoming light rays so they focus Behind the retina, treatment? Convex lens
- **Astigmatism**
- **Presbyopia:** 40 السن في السن، يعتبرون الكبير في السن، عدم القدرة على الرؤية في القريب للكبير في السن،

(سورة الأحقاف - آية 15) حَتَّىٰ إِذَا بَلَغَ أَشُدَّهُ وَبَلَغَ أَرْبَعِينَ سَنَةً قَالَ رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ

What happens at age 40:

1. Loss of elasticity of lens capsule (in other words increase density).
2. Loss of accommodation.
3. Increase the refractive index of the lens.

"يعني ايه elastic lens؟ الـ lens بتاعتنا ربي خلقها بتكبر وتصغر، لما أجي أبص بعيد الـ lens automatically بتبقى thin، لما أجي أبص قريب الـ lens بتبقى bulging، زي كأنها عملت نظارة، كآني لابسها. هذا في عمر أقل من أربعين سنة، بعد الأربعين سنة يحصل الـ **physiological presbyopia**"

You need to know the types of treatment: Lens, **lasik surgery when do we do it?** Age of 21

MCQs: Example in the exam: 7 years old patient has difficulty with reading.

One of the options is presbyopia ✗ (not the answer)

9. Ocular manifestations of systemic diseases. **MCQs & SAQs** "انتبهوا للصور"

- **Chronic uveitis.**

- **Tuberculosis (TB) of the eye:** infection in the eye → chronic uveitis.
- **Sarcoidosis:** infection in the eye → chronic uveitis.
- **Behcet's disease:** skin/genital/mouth ulcers + uveitis (inflammation of the uveal tissue) + sometimes loss of vision + sometimes they even get hypopyon of the eye.
- **Vogt-koyanagi-harada syndrome.**

- **Diabetes mellitus.**

- **Hypertension:** hypertensive retinopathy.

SAQs: *picture from the same lecture* child with deafness, has undergone cataract surgery in both eyes and "لابس نظارة بتاعت الـ presbyopia دي"

Q: What is the diagnosis? Ocular manifestation of Rubella syndrome

د. عصام: "لما جا مره بالـ batches اللي قبل ما عرفوا يجاوبوه! موجود في المحاضرة والصورة في المحاضرة، ويكتبوا شكوى، [هازا ما تدرّس في الـ curriculum] يا ابن الحلال، هازا في المحاضرة! لما بيحنا حاقه زي كده i never answer them، لأن أخليه يروح يشككي وحيسقطوه أساساً في الامتحان! طبعاً الـ exam will not come from lecture لكن if you take the lecture carefully أنا واسق أن كلكم حتجيبوا +A إزا حتى ما قريني "from the lecture"

10. Neuro-ophthalmology.

Very nice lecture. It will talk about cranial nerve palsy (especially **CN III, IV**) you have to know how it manifest!

11. Ocular Pharmacology and Toxicology. **MCQs 3 Qs** "بتهملوها، محدش بيقرأها وفي الغالب بتغلطوا فيها"

- Eye drops & systemic medications.

- Mostly treatment of -which is most prescribed:-

- **Glaucoma:** anti-glaucoma medication. Patient takes it for life.
- **Allergies** (temporary): antihistamine or steroids (only prescribed in serious situations and for a short period because of the serious side effects).

- Know the complications (side effects), especially **steroids: cataract & glaucoma**

- **Clinic** حتى لو الدكتور ما كان معاكم بالكلينيك يشرح أنتم شوفوا بنفسكم
 - You will have rotations in the clinic once or twice during the cycle.
 - Sometimes there will be no clinic and you will have to go the emergency. You'll be lucky because you'll get to see common ophthalmic disorders and procedures.
 - Most of the time it is busy. Try to ask. Try to engage yourself. خليك غلر (غلظ) شويه
 - You should look at the slit lamp. There is an extra tube whether the doctor asked you or not. You're the priority.
 - **In Clinics make sure you cover:** Tonometry, Visual field exam, Optical coherence tomography (OCT), Slit lamp, Direct & Indirect ophthalmoscope, 90 lens and Bi... something مو واضح بالركوردينق ولا هو موجود في قوقل

● Clinical skills sessions:

- Topics:

- External Ocular Examination, Ocular motility and Alignment.
- Visual acuity and Ophthalmoscopy.
- Visual field, Tonometry, **Pupil Examination.**
- They are tutorials (like PBL sessions) you have to prepare the topic & discuss it with the group.
- Attend & prepare well. That is all you need.
 - "المفروض تاخذوها كاملة، إنما للأسف بيتاخذ فيها 3 على الـ commitment يعني لو الدكتور بدأ الساعة تمنية ودخلتي تمنية وربع بتتقصي ثلاث درجات، حرام! عيب! فتكونو حريصين قداً قداً أنه قبل ما يجي تكونون أنتم موجودين كلكم، ثاني حاقه بقية النمر بقه على الـ discussion يعني بتعملي الـ test ويشوف how you are doing قاريه ولا مش قاريه ويديك بقية الدرجة. طبعاً صوابنا مش زي بعضها. تيجي أي small mistake وبعض الـ attending يشيل على طول ما تفرقش معاه وبعضهم they sympathise with you بتقولوله مسلاً تأخرت المواصلات... الكلام ده، فأنتم تكونوا حريصين في الـ teaching أنك تيجي على الـ time وتحضر الـ test قبل ما تيجوا"
- **Recommended source:** OphthoBook www.OphthoBook.com
- **Side note:** APD (afferent pupillary defect) → occurs with optic neuritis & multiple sclerosis.

● Mark distribution

	Assessment	Questions / stations / sessions	Marks
Same Day!	SAQs	20 (1.5 minute for every question)	40
	MCQs	30 (45 minutes)	30
لجنة واحدة	OSCE	2 a) Fixed: ophthalmoscope. b) Variable: hx or clinical sessions	20
	Clinical skills	2	10

- Do the evaluation before the exam (2 evaluation forms) so you can get your results early.
- Ophthalmoscopic examination. There is a mannequin in the exam center (at KKHU)
 - "بنسحبوا قبل الامتحان بأسبوعين، في نص يناير كده، فيه سلايدز وما بتتغيرش، أنا مديهالك؛
 - Artery occlusion, diabetic retinopathy, papilledema إشوفوها قبل الامتحان
 - فيه حاقه قديده عملناها السنة دي، صور مطبوعة "i'm testing how you're doing the exam طر we are not testing the diagnosis

OSCE: ophthalmoscope. You'll get two pictures: retina or squint. (esotropia) "فيه فرق بين اللي يحل أي كلام والعارف"

- **Pupil Examination:** start by saying i'll dim the light, watch red reflex direct, direct & indirect test or (consensual)... etc [You'll find it in OphthoBook]

SAQ: Chalazion, Entropion or Ectropion, Old trachoma scar "جاء للأولاد بس 2 جاوبوه" & treatment = lubricant, Foreign body.

● References

- Clinical Ophthalmology: A Systematic Approach by: Jack T. **Kanski** جميل جدا تشوفوا منه الصور تلقونه في المكتبة
- **SAQs:** google images is your best friend (look for **chalazion and stye**)
- **Required Text(s):** a. Lecture notes Ophthalmology (latest edition) By: Bruce James (published by Blackwell Science) b. Basic Ophthalmology (latest edition) By: Cynthia A. Bradford (latest edition) (published by American Academy of Ophthalmology) c. Practical Ophthalmology: A manual for Beginning Residents (latest edition) By: Fred M. Wilson (published by American Academy of Ophthalmology)
- Vaughan and Asbury's general Ophthalmology By: Paul Riordan-Eva (published by LANGE)

- **Retinitis pigmentosa**

Genetic disorder of the eyes that causes loss of vision. Symptoms include trouble seeing at night and decreased peripheral vision (side vision). Onset of symptoms is generally gradual. As peripheral vision worsens, people may experience "tunnel vision". Complete blindness is uncommon.

- **Keratoconus**

Painless disorder, usually sporadic but sometimes inherited, in which progressive central corneal thinning leads to an ectatic conical shape and marked myopia. With time, stromal corneal scarring occurs, which may further reduce vision. Onset is in youth, with atypical history of myopia which, with the development of irregular astigmatism, becomes uncorrectable by spectacle lenses.

- **Endophthalmitis**

Intraocular infection may occasionally occur within days following intraocular surgery. It causes a marked generalized increasing conjunctival inflammation. The eye is painful (unusual after routine intraocular surgery) and the vision reduced. A history of recent surgery is the clue treatment: **intravitreal antibiotic injection**.

- **Ocular TB**

The term "ocular TB" describes an infection by the *M. tuberculosis* species that can affect any part of the eye (intraocular, superficial, or surrounding the eye), with or without systemic involvement. "Secondary ocular TB" is defined as ocular involvement as a result of seeding by hematogenous spread from a distant site or direct invasion by contiguous spread from adjacent structures, like the sinus or cranial cavity.