

Competency-Based Medical Education for The Indian Medical Graduate: Implementation & Assessment in Ophthalmology

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Competency-based medical education (CBME) curriculum has been implemented by National Medical Council from 2019 for the Indian Medical Graduates (IMG). This competency-based curriculum focuses on skill acquisition with incorporation of soft skills related to attitude, communication and ethics. Widespread adoption of a competency-based approach would mean a paradigm shift in the current approach to medical education.

Abstract

The current article describes rationale of CBME along with an overview of the competencies mandated in ophthalmology with detailing of assessment module by means of logbook with incorporation of work place based assessment.

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Introduction

Rationale of CBME

Medical education focus is to train graduates to become effective health care providers. Erstwhile medical education was based on time bound, subject-centred curriculum with most assessments being summative, with inherent little opportunity for feedback. Both teaching-learning activities and assessment focused more on acquiring knowledge and not on skill acquisition, nor on patient doctor communication nor attitude. Competency-based Medical Education seeks to redress this with focus on basic clinical skills required to practice including soft skills related to communication, doctor-patient relationship, ethics, and professional conduct.

Competency is defined as "the ability to do something successfully and efficiently," and CBME is an approach to ensure that the Indian Medical Graduate (IMG) develops competencies required to fulfil patients' health requirements thereby preparing students for actual professional practice. Teaching-learning activities become more skill-based, involving more clinical, hands-on experience and assessment focuses on outcomes or competencies achieved. Time constraints are an issue, as continued training until desired competency is achieved, could be difficult to fit in during the prescribed course.

Work placed based assessment (WPBA) measures working of a health care professional while performing duties. Proposed by Norcini et al in 2007 it comprises of three essential components namely direct observation, conduction at work place and contextual with constructive, immediate feedback¹ Mini clinical examination (Mini CEX), Directly observed procedural skills (DOPS), Case based discussion (CBD) are few of the WPBA methods. Formative assessments largely work-based form the backbone of CBME and need to be performed frequently with qualitative feedback from teachers. Structured logbook required for this, is detailed in this article

Key aspects of CBME

• **Early Clinical exposure (ECE):** This aims to create an opportunity for correlation learning in Phase I with clinical

application. In ophthalmology it entails 4 weeks of clinical posting during 2nd year.

• **Integrated Teaching learning:** Both horizontal and vertical integration (inter and intra disciplines), bridge gaps between theory & practice. Ophthalmology can link with community medicine and ENT for horizontal integration. Vertical integration is feasible with pharmacology, microbiology and clinical specialities of medicine, paediatrics, gynaecology.

• **Self-directed learning:** An important teaching learning tool Self-Directed Learning (SDL) is the "process in which individuals take the initiative, with or without the help of others, in diagnosing learning needs, formulating learning goals, identifying human and material resources for learning, choosing/ implementing learning strategies, and evaluating learning outcomes".² The Graduate Medical Education 2019 document lists life-long learning as one of the roles of the Indian Medical Graduate (IMG) to continuously equip themselves with relevant knowledge and skills in the ever evolving world of medicine. To inculcate SDL, the logbook includes details of SDL activities undertaken by the student followed by subsequent reflections on the same.

• **Skill Certification:** CBME curriculum with focus on outcomes, emphasizes skill development. Acquisition of essential/ desirable and certifiable skills, during simulated or clinical posting has to be combined with documentation of process.

• **Electives:** This is to provide immersive learning experiences to explore career stream, discipline or research project related or unrelated streams of interest. As per CBME curriculum, 8 weeks of electives is reserved after 7th semester (post 3rd Prof exam Part I and prior to commencement of III rd MMBS Part II). Of these 8 weeks, 4 weeks is for clinical and 4 weeks for pre / para clinical, with choices given to student. Ophthalmology is part of Block II of electives envisaging supervised posting followed by formative assessment. At least 75% attendance is mandatory.

• **AETCOM (Attitude, Ethics and Communication):** This module is designed on the fundamental principle that a person's attitude influences behaviour and determines

doctor patient relationship. Emphasis on empathetic communication and guiding principles on professionalism and ethics are the basic tenets of this module.

(I) Competencies in Ophthalmology (CBME curriculum)

The competencies have been divided as per domain in table below and need to be taught using different teaching learning methods to accommodate the total hours.

A. SKILL BASED: certifiable competencies (OP* -ophthalmology)

S.no	Competency no	Competency
1 π	OP*1.3 π	Demonstrate the steps in performing the visual acuity assessment for distance vision, near vision, colour vision, the pin hole test and the menace and blink reflexes
2 π	OP2.2 π	Demonstrate the symptoms & clinical signs of common conditions of the lid and adnexa including Hordeolum externum / internum, blepharitis, pre-septal cellulitis, dacryocystitis, hemangioma, dermoid, ptosis, entropion, lid lag, lagophthalmos
3 π	OP2.3 π	Demonstrate under supervision clinical procedures performed in the lid including: bells phenomenon, assessment of entropion/ ectropion, perform the regurgitation test of lacrimal sac. Massage technique in cong. dacryocystitis, and trichiatric cilia removal by epilation
4 π	OP3.1 π	Elicit document and present an appropriate history in a patient presenting with a "red eye" including congestion, discharge, pain
5 π	OP3.2 π	Demonstrate document and present the correct method of examination of a "red eye" including vision assessment, corneal lustre, pupil abnormality, ciliary tenderness
6 π	OP3.8 π	Demonstrate correct technique of removal of foreign body from the eye in a simulated environment
7 π	OP3.9 π	Demonstrate the correct technique of instillation of eye drops in a simulated environment
8 π	OP4.8 π	Demonstrate technique of removal of foreign body in the cornea in a simulated environment
9 π	OP6.6 π	Identify and demonstrate the clinical features and distinguish and diagnose common clinical conditions affecting the anterior chamber
10 π	OP7.3 π	Demonstrate the correct technique of ocular examination in a patient with a cataract
11 π	OP8.3 π	Demonstrate the correct technique of a fundus examination and describe and distinguish the fundoscopic features in a normal condition and in conditions causing an abnormal retinal exam
12 π	OP9.1 π	Demonstrate the correct technique to examine extra ocular movements (Uniocular & Binocular)
13 π	PY10.20 (physiology) π	Demonstrate testing of visual acuity, colour and field of vision in volunteer/ simulated environment

B. Affective Competencies - it may or may not be certified

S.no	Competency no	Competency
1 π	OP4.10 π	Counsel patients and family about eye donation in a simulated Environment
2 π	OP6.10 π	Counsel patients with conditions of the iris and anterior chamber about their diagnosis, therapy and prognosis in an empathetic manner in a simulated environment
3 π	OP7.5 π	To participate in the team for cataract surgery
4 π	OP7.6 π	Administer informed consent and counsel patients for cataract surgery in a simulated environment

C. Knowledge Based Competencies

S.no	Competency	Competency
1	OP1.1	Describe the physiology of vision
2	OP1.2	Define, classify and describe types and methods of correcting refractive errors
3	OP1.4	Enumerate indications and describe principles of refractive surgery
4	OP1.5	Define, enumerate the types and the mechanism by which strabismus leads to amblyopia
5	OP2.1	Enumerate the causes, describe and discuss the aetiology, clinical presentations and diagnostic features of common conditions of lid & adnexa including Hordeolum externum/ internum, blepharitis, pre-septal cellulitis, dacryocystitis, hemangioma, dermoid, ptosis, entropion, lid lag, lagophthalmos
6	OP2.4	Describe aetiology, clinical presentation. Discuss complications and management of orbital cellulitis
7	OP2.5	Describe clinical features on ocular examination and management of a patient with cavernous sinus thrombosis
8	OP2.6	Enumerate causes and describe differentiating features, and clinical features and management of proptosis
9	OP2.7	Classify various types of orbital tumours. Differentiate symptoms and signs of presentation of various types of ocular tumours
10	OP2.8	List investigations helpful in diagnosis of orbital tumors. Enumerate indications for appropriate referral
11	OP3.3	Describe aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of various causes of conjunctivitis
12	OP3.4	Describe aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of trachoma.
13	OP3.5	Describe aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of vernal catarrh
14	OP3.6	Describe aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of pterygium
15	OP3.7	Describe aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of symblepharon
16	OP4.1	Enumerate, describe and discuss types and causes of corneal ulceration
17	OP4.2	Enumerate and discuss differential diagnosis of infective keratitis
18	OP4.3	Enumerate causes of corneal oedema
19	OP4.4	Enumerate causes and discuss management of dry eye
20	OP4.5	Enumerate causes of corneal blindness
21	OP4.6	Enumerate indications and types of keratoplasty
22	OP4.7	Enumerate indications and describe methods of tarsorrhaphy
23	OP4.9	Describe and discuss importance and protocols involved in eye donation and eye banking

24	OP5.1	Define, enumerate and describe aetiology, associated systemic conditions, clinical features complications indications for referral and management of episcleritis
25	OP5.2	Define, enumerate and describe aetiology, associated systemic conditions, clinical features, complications, indications for referral and management of scleritis
26	OP6.1	Describe clinical signs of intraocular inflammation and enumerate the features that distinguish granulomatous from non-granulomatous inflammation. Identify acute iridocyclitis from chronic condition
27	OP6.2	Identify and distinguish acute iridocyclitis from chronic iridocyclitis
28	OP6.3	Enumerate systemic conditions that can present as iridocyclitis and describe their ocular manifestations
29	OP6.4	Describe and distinguish hyphema and hypopyon
30	OP6.5	Describe and discuss angle of anterior chamber and its clinical correlates
31	OP6.7	Enumerate and discuss aetiology, clinical distinguishing features of various glaucoma's associated with shallow and deep anterior chamber. Choose appropriate investigations and treatment for patients with above conditions.
32	OP6.8	Enumerate and choose appropriate investigation for patients with conditions affecting Uvea
33	OP6.9	Choose correct local and systemic therapy for conditions of the anterior chamber and enumerate their indications, adverse events and interactions
34	OP7.1	Describe surgical anatomy and metabolism of the lens
35	OP7.2	Describe and discuss etio-pathogenesis, stages of maturation and complications of cataract
36	OP 7.4	Enumerate types of cataract surgery and describe steps intraoperative and postoperative complications of extracapsular cataract extraction surgery
37	OP8.1	Discuss aetiology, pathology, clinical features and management of vascular occlusions of retina
38	OP8.2	Enumerate indications for laser therapy in treatment of retinal diseases (including retinal detachment, retinal degenerations, diabetic retinopathy & hypertensive retinopathy)
39	OP8.4	Enumerate and discuss treatment modalities in management of diseases of the retina
40	OP8.5	Describe and discuss correlative anatomy, aetiology, clinical manifestations, diagnostic tests, imaging and management of diseases of the optic nerve and visual pathway
41	OP9.2	Classify, enumerate the types, methods of diagnosis and indications for referral in a patient with heterotropia / strabismus
42	OP9.3	Describe role of refractive error correction in a patient with headache and enumerate the indications for referral
43	OP9.4	Enumerate, describe and discuss causes of avoidable blindness and the National Programs for Control of Blindness (including vision 2020)
44	OP9.5	Describe evaluation and enumerate the steps involved in stabilisation, initial management and indication for referral in patient with ocular injury

S.no	Competency no.	Competency
1	AN30.5	Explain effect of pituitary tumours on visual pathway
2	AN31.3	Describe anatomical basis of Horner's syndrome
3	AN31.5	Explain anatomical basis of oculomotor, trochlear and abducens nerve palsies along with strabismus
4	AN41.1	Describe & demonstrate parts and layers of eyeball
5	AN41.2	Describe anatomical aspects of cataract, glaucoma & central retinal artery occlusion
6	AN41.3	Describe position, nerve supply and actions of intraocular muscles
7	PY10.17	Describe and discuss functional anatomy of eye, physiology of image formation, physiology of vision including colour vision, Refractive errors, colour blindness, Physiology of pupil and light reflex
8	PY10.18	Describe and discuss physiological basis of lesion in visual pathway
9	PY10.19	Describe and discuss auditory & visual evoke potentials
10	PA36.1	Describe etiology, genetics, pathogenesis, pathology, presentation, sequelae and complications of retinoblastoma
11	PH1.58	Describe drugs used in Ocular disorders
12	IM24.15	Describe and discuss etio-pathogenesis, clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of vision and visual loss in elderly

Knowledge Based Competencies: Integration with – Anatomy (AN), Physiology (PY), Pathology (PA), Pharmacology (PH), & General Medicine (IM)

Source: National Medical Commission UG-Curriculum-Vol-III.pdf - NMC 3

<https://www.nmc.org.in/wp-content/uploads/2020/01/UG-Curriculum-Vol-III.pdf> accessed on 18 /6/2022

(II) Ophthalmology Teaching/ Learning programme in concordance to CBME is summarized below:

Teaching learning methods would be chosen according to student patient ratio. Suggested are:

- **For Knowledge based competencies:**
Lecture, Small group Teaching (SGT), Structured case presentations like One minute Preceptor (OMP) ⁴
- **For Skill based competencies:**
DOAP (Directly observed assisted performance), Peyton 4 step approach⁵ Small group teaching (SGT), Skill lab, Simulated patient
- **For Affective domain:** Movies, Role play sessions, Shadowing, Theatre of oppressed, Brainstorming sessions

S.no	Competency no	Competency	Suggested method of T/L	Date Completed	Remarks by Faculty
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Teaching Sessions, Teaching/ Learning Methods & Duration (hours)

	Large Group Teaching	Small group teaching SGT/ Practical's /Tutorials	SDL	AETCOM	Total	Clinical/Field Posting
				Module 3.2 Need to be incorporated	100 hours	PHASE 2 - ECE during 2nd year 4 weeks duration
3rd Professional Part I	30 hours	60 hours	10 hours			PHASE 3 - during 3rd year 4 weeks duration
Total	30 hours	60 hours	10 hours		100 hours	Total : 8 weeks

(III) Assessment: Logbook

Name:
Batch:
Roll No.:
Year of Admission:
E-mail ID:
Mobile No.:
University Registration No.:

LOGBOOK CERTIFICATE
 This is to certify that the candidate Mr/ Ms....., Reg No., admitted in the year.....in the..... Medical College, Batch roll no..... and university registration no.....has satisfactorily completed / has not completed all assignments / requirements mentioned in this logbook for MBBS course in the subject of Ophthalmology during the period from to.....
 She / He is / is not eligible to appear for the summative (University) assessment as on the date given below.

Signature of Faculty Name and Designation Place: Date :	Signature and seal Head of Ophthalmology department Signature and seal Principal/
Dean of the College	

General Instructions

- The logbook is a record of academic & co-curricular activities of designated student during ophthalmology posting
- Logbook records various activities like overall participation & performance, attendance, completion of selected competencies. Reflections of student need to be documented
- The student is responsible for maintaining his/ her logbook and getting entries verified by concerned faculty regularly.
- Logbook must be verified by department & college, prior to submitting application of students for University examination.

S.no.	Contents	Page no.
I	Clinical case presentations	
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There are **4 weeks of clinical posting in Second Professional and 4 weeks in Third professional Part 1**

Rotation	Phase	Duration (weeks)	From	To	Faculty signature
1st	ECE (4th sem)	4			
2nd	III (3rd Prof Part I)	4			
Sent up					
Internal Assessment					

Glossary:
 Attempt at Competency
 F: First or only
 R: Repeat
 Re: Remedial

Rating
 B: Below expectation
 M: Meets expectation
 E: Exceeds expectation

Decision of faculty:
 C: Completed
 R: Repeat
 Re: Remedial

I. Clinical Case Presentations: Phase II: 2 Case presentations required

S.no.	Patient Name..... Age/ Sex
Diagnosis	
Student Presenter	
Date.....	
Diagnosis	
Teacher's Remarks	
Reflections by student	
Faculty signature	

II. Clinical Case Presentations Phase III: 2 Case presentations required

S.no.	Patient Name..... Age/ Sex
Diagnosis	
Student Presenter	
Date.....	
Diagnosis	
Teacher's Remarks	
Reflections by student	
Faculty signature	

Skill Based competencies; Assessment

Assessment methods again would be chosen according to student patient ratio.

Suggested are:

- For Knowledge based competencies:**
 Written (Long questions, short answer questions), Objective structured clinical examination (OSCE), Multiple choice questions (MCQ)
- For Skill based competencies:**
 DOPS (Direct observation of procedural skills), Mini CEX, Case based discussion, Critical incident technique, Bed side clinics, Viva, Multisource feedback
- For Affective domain:** Reflections, Portfolio, Brainstorming sessions

OP1.3 Demonstrate steps in performing visual acuity assessment for distance vision, near vision, colour vision, pin hole test , menace and blink reflexes

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP2.2 Demonstrate symptoms & clinical signs of common conditions of lid and adnexa including Hordeolum externum/ internum, blepharitis, preseptal cellulitis, dacryocystitis, hemangioma, dermoid, ptosis, entropion, lid lag, lagophthalmos

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP2.3 Demonstrate under supervision clinical procedures performed in lid including: bells phenomenon, assessment of entropion/ ectropion, perform the regurgitation test of lacrimal sac. Massage technique in cong. Dacryocystitis & trichiatric cilia removal by epilation

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP3.1 Elicit document and present an appropriate history in a patient presenting with a “red eye” including congestion, discharge, pain

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP3.2 Demonstrate document and present correct method of examination of a “red eye” including vision assessment, corneal lustre, pupil abnormality, ciliary tenderness

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP3.8 Demonstrate correct technique of removal of foreign body from eye in a simulated environment

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP3.9 Demonstrate the correct technique of instillation of eye drops in a simulated environment

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP4.8 Demonstrate technique of removal of foreign body in cornea in a simulated environment

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP3.9 Demonstrate the correct technique of instillation of eye drops in a simulated environment

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP4.8 Demonstrate technique of removal of foreign body in cornea in a simulated environment

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP6.6 Identify and demonstrate clinical features and distinguish, diagnose common clinical conditions affecting anterior chamber

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP7.3 Demonstrate correct technique of ocular examination in a patient with a cataract

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP8.3 Demonstrate correct technique of a fundus examination & describe and distinguish fundoscopic features in normal condition and in conditions causing an abnormal retinal exam

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

OP9.1 Demonstrate the correct technique to examine extra ocular movements (Unilateral & Binocular)

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

PY10.20 Demonstrate testing of visual acuity, colour and field of vision in volunteer/ simulated environment

Date completed	Attempt at competency	Rating (B/M/E)	Decision of Faculty (C/R/Re)	Faculty signature

I Self Directed Learning

Phase II - 3-4 such SDL can be incorporated ⁶

Self- directed learning

Topic:

Objectives:

Task:

Methodology:

Reflections: Self Directed Learning

s.no.	Competency no..... Competency detail:.....
Student Presenter.....Date.....	
What Happened?	
So what?	
What Next?	
Faculty signature	

Integrated Learning Sessions

Summary of Integrated Learning Sessions

S.no	Competency no.	Topic	Departments involved	Date

Marking scheme

The marking varies depending on different universities. For Delhi University it is as follows:

Internal / Formative assessment (FA): 35% marks to be obtained by student in theory and practical to qualify for sitting in university exam.

Summative assessment (Ophthalmology paper in 3rd Professional MMBS Part I):

Theory (60) and Practical (40). Of which 50% marks must be obtained by student in theory and practical separately for passing. Around 20% of FA is added to the summative assessment.

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