

Competency-based European training requirements for the specialty of ophthalmology. Recommendations from the UEMS section of ophthalmology and the European Board of Ophthalmology

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Abstract

Purpose: Ophthalmology encompasses comprehensive medical and surgical care for patients with diverse visual system disorders, significantly impacting eye health, vision, and quality of life. European ophthalmologists undergo specialized residency training to acquire necessary competencies, emphasizing theoretical knowledge, clinical and surgical skills, and professional behaviour. The European Union of Medical Specialists (UEMS) and the European Board of Ophthalmology (EBO) advocate for competency-based medical education (CBME), standardized training frameworks, and harmonized assessments across Europe.

Methods: In 2023, a survey among European ophthalmologists demonstrated broad consensus on establishing unified training requirements. Subsequently, a Core Working Group developed European Training Requirements (ETRs) for ophthalmology, detailing curricula, subspecialty rotations, and Entrustable Professional Activities (EPAs) across a structured four-year residency.

Results: These ETRs, formally approved by UEMS in October 2024, incorporate simulation-based training, workplace-based assessments (WPBA), and innovative evaluation methods such as electronic portfolios. Certification as a European Specialist in Ophthalmology involves passing rigorous summative assessments, including the European Board of Ophthalmology Diploma (EBOD) examination. Training institutions must offer substantial clinical exposure, robust infrastructure, and comprehensive educational resources.

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Faculty support, continuous quality assurance, regular audits, and clinical governance frameworks are essential.

Conclusion: The ETRs also highlight the importance of interprofessional collaboration and encourage subspecialty expansion in emerging areas like ophthalmic oncology and global ophthalmology. Designed as a dynamic, “living document,” the ETRs will evolve with scientific and technological advancements, supporting high-quality ophthalmic education and practice while respecting national diversity and sovereignty.

KEYWORDS

attitude, competency, curriculum, education, entrustable professional activity, knowledge, logbook, ophthalmology, professionalism, skills

1 | INTRODUCTION

Europe comprises 50 independent countries, each with distinct cultural, linguistic, and legislative frameworks regulating medical practice. The European Union of Medical Specialists (UEMS), established in 1958, is a non-governmental organization representing national associations of medical specialists at the European level. It advises the European Union (EU) Commission on medical issues in accordance with the United Nations (UN) Human Rights declarations and the World Medical Association WMA International Code of Medical Ethics (European Board of Ophthalmology, 2024c).

Operating through forty-three specialist sections, the UEMS promotes the free movement of medical specialists across Europe and establishes consensus-based frameworks for the highest standards of specialist training, thus enhancing healthcare quality for European citizens and beyond (European Board of Ophthalmology, 2024c). The UEMS Section of Ophthalmology specifically addresses the prevention, diagnosis, and management of visual system disorders, including surgical expertise involving the eye, adnexa, orbit, and related visual structures.

In 1992, the UEMS Section of Ophthalmology established the European Board of Ophthalmology (EBO), its permanent working group. The EBO conducts standardized examinations for European ophthalmology residents and specialists and advocates structured, competency-based medical education (CBME). These efforts aim to improve ophthalmology training across Europe, benefiting both healthcare providers and patients.

High-quality healthcare and patient safety hinge upon rigorous medical training, professional competencies, and continual professional development. European residents actively support harmonized training programmes to standardize ophthalmological education (Anaya-Alaminos et al., 2023).

Since 2023, the EBO and UEMS Section of Ophthalmology have collaboratively developed competency-based European Training Requirements (ETRs) for ophthalmologists. These ETRs ensure ophthalmology specialists across UEMS member states acquire the necessary knowledge, skills, and professional attitudes to deliver exemplary eye care while respecting regional diversity. Approved by the UEMS Council in October 2024, these ETRs reflect contemporary scientific

advancements, medical innovations, and educational best practices in ophthalmology (UEMS, 2024).

This paper details the origins of ETRs in ophthalmology and summarizes recommendations by the EBO and the UEMS Section of Ophthalmology for postgraduate medical education (PGME). The overarching goal is advancing standardized, high-quality ophthalmology training, ultimately benefiting practitioners and patients alike.

2 | THE GENESIS OF THE ETRs IN OPHTHALMOLOGY

In 2023, an online survey by the EBO was conducted to evaluate national practices and progress in CBME implementation across European ophthalmology training programmes. Distributed widely among representatives of the EBO, UEMS Section of Ophthalmology, former EBO examiners, members of the European Society of Ophthalmology (SOE), delegates of European subspecialty societies (including EGS, ESCRS, ESOPRS, Euretina, EPOS, ESA, and EUNOS), European University Professors of Ophthalmology (EUPO), and ophthalmologists from SOE's European Leadership Development Programme (EuLDP), the survey gathered responses from 230 participants across 28 countries. A significant majority (91%) acknowledged the necessity of creating a unified platform for fundamental training requirements to define the professional identity of European ophthalmologists (Dormegnny et al., 2024).

Subsequently, in January 2023, a Core Working Group (CWG) was established to oversee the development of ETRs in ophthalmology. This group included two members from the UEMS Section of Ophthalmology (DC, WA) and three from the EBO Executive Committee (HPF, RI, TB). The CWG guided the project through a series of structured meetings, beginning with a workshop by the UEMS ETR Committee Review in Brussels in January 2023. Initial online meetings involved survey respondents interested in contributing to the ETRs, providing an overview of CBME principles and project planning.

To address specific training needs, the CWG established 11 Subspecialty Working Groups (SWGs), each tasked with refining subspecialty curriculum sections aligned with the European Board of Ophthalmology Diploma (EBOD) framework (Supplementary Material S1). Starting in September 2023, 71

ophthalmologists collaboratively developed a detailed training document based on the UEMS template for PGME, incorporating trainee, trainer, and training institution perspectives. SWGs reviewed drafts prepared by the CWG, validated subspecialty curricula, and created one or two relevant entrustable professional activities (EPAs). Supporting this process, a microlearning package including a video, CBME workbook, and EPA template was distributed.

Further progress was discussed in two subsequent meetings: an onsite session in Copenhagen (March 2024), prior to the Ophthalmology Bureau meeting, and a hybrid session in Strasbourg (June 2024), preceding the EBO General Assembly and Ophthalmology Plenary Section. Throughout, three committees—the EBO Executive Committee, the UEMS Section of Ophthalmology Executive Committee, and the EBO Advisory Board—regularly reviewed and provided feedback on the project. The finalized ETRs document (European Board of Ophthalmology, 2024b) comprises four interconnected sections:

1. Training guidelines for trainees, trainers, and institutions.
2. Curricula for 11 ophthalmic subspecialties (Supplementary Material S2), detailing cognitive and procedural outcomes structured around specificity, measurability, attainability, relevance, and timeliness (SMART criteria).
3. Twenty-one EPAs (Supplementary Material S3) developed using standard entrustment scales and systematically integrated within a four-year residency structure.
4. A Surgical and Interventional Logbook (Supplementary Material S4).

After submission to the UEMS ETR Review Committee on July 17, 2024, the CWG received and addressed 19 comments by August 17. The revised document was resubmitted, formally presented, and unanimously approved by all 30 national representatives, originating from the leading national societies at the UEMS Advisory Board and Council meetings in Brussels on October 18–19, 2024. Responsibility for its dissemination lies with each national delegate within his or her respective society, and it is designed as a living document, continually evolving and regularly updated.

3 | RECOMMENDATIONS FROM THE UEMS SECTION OF OPHTHALMOLOGY AND THE EUROPEAN BOARD OF OPHTHALMOLOGY REGARDING THE ETR IN OPHTHALMOLOGY

3.1 | The specialist in ophthalmology

Ophthalmologists are medical doctors specializing in comprehensive medical and surgical care of the eyes and visual system, shaping their professional identity through specialized training after obtaining their medical degree. They diagnose, treat, and manage vision-related

disorders, perform surgical and laser procedures (provided their training meets necessary requirements), and prescribe corrective lenses such as spectacles and contact lenses. Additionally, ophthalmologists conduct scientific research into eye diseases and vision disorders. They identify systemic conditions affecting vision and collaborate with other healthcare professionals to ensure holistic patient care. While many ophthalmologists practise general ophthalmology, advancements in the field have driven increasing sub specialization. Professionals often pursue further training in specific areas such as cornea, glaucoma, neuro-ophthalmology, ophthalmic oncology, plastic surgery, refractive surgery, paediatric ophthalmology, retina, uveitis, low vision, or emergency eye care, enabling them to manage complex conditions or specific patient populations (American College of Surgeons, 2024; Churchill et al., 2024; Goldberg et al., 2006; Royal Australian and New Zealand College of Ophthalmologists, 2024).

3.2 | The scope of practice

Ophthalmologists care for patients of all ages experiencing emergent, acute, and chronic visual system disorders affecting eye health, vision, and quality of life. Conditions managed include congenital and acquired disorders, as well as ophthalmic manifestations of systemic diseases such as metabolic disorders, hypertension, rheumatic diseases, neurological conditions, medication toxicities, and cancers.

They receive referrals from primary care providers, specialists, and other eye care professionals, frequently collaborating within multidisciplinary teams comprising general practitioners, medical and surgical specialists, orthoptists, technicians, nurses, pharmacists, students, clinical research assistants, psychologists, administrative staff, social workers, and, in certain regions, optometrists or opticians.

Ophthalmologists practice across diverse environments, including outpatient clinics, inpatient units, surgical suites, and operating rooms, ranging from community-based practices to tertiary academic centres, often combining multiple settings. Telemedicine and tele-expertise increasingly facilitate patient assessments and professional consultations.

Specializing in preventive care, ophthalmologists perform assessments, diagnostics, and manage eye disorders using advanced examination techniques and specialized equipment. Treatment strategies encompass prescribing optical devices and medical therapies, and surgical interventions. Common procedures include intravitreal injections, laser therapies, and ophthalmic surgeries, with cataract surgery being the most frequently performed surgical procedure across all specialties.

Additionally, ophthalmologists provide critical follow-up care, screen for rehabilitation needs, and deliver continuous patient management. They educate patients and communities about preventing vision loss and blindness, emphasizing the treatability of many potentially blinding diseases, thus significantly enhancing patients' quality of life.

3.3 | Training requirements for trainees

3.3.1 | Eligibility for being a resident in ophthalmology

To be eligible for specialty training in ophthalmology, aspiring residents must meet several eligibility requirements (Table 1).

3.3.2 | Competencies required from trainees

Residents must actively participate in managing a diverse array of inpatients, daycare patients, and outpatients to build sufficient clinical experience. Performing a wide range of practical procedures is also essential to developing and reinforcing their competence in comprehensive ophthalmology. Effective linguistic skills are necessary for clear communication with patients and faculty, engagement with international specialized literature, and maintaining an up-to-date personal portfolio or logbook in compliance with national regulations and EU directives.

The ETRs in ophthalmology outline a structured curriculum for residency training, specifying high-level learning outcomes distributed across ophthalmology subspecialty rotations. Training follows a progressive structure, beginning with observation and gradually transitioning to independent practice as residents demonstrate increasing competence. This structured framework supports knowledge acquisition, clinical skill development, and professional identity formation, ultimately preparing residents for autonomous ophthalmological practice (Goldberg et al., 2006; Wentzell et al., 2020).

The UEMS advocates for CBME and assessment. CBME comprises five essential elements: (1) an outcome-based competency framework, (2) progressive sequencing of competencies, (3) diverse and individualized learning experiences, and (4) competency-driven teaching paired with programmatic assessment. Role modelling, coaching, and mentoring underpin CBME, ensuring meaningful formative assessments and clearly defined summative evaluations focused on essential professional tasks within ophthalmology. Competence-by-design promotes personalized learning and collaborative relationships between trainees and educators, facilitating effective navigation through the training process (Busari et al., 2024).

Competency encompasses three dimensions: theoretical knowledge relevant to ophthalmology, specialty-specific key skills—including an optimal number of necessary surgical and non-surgical procedures—and professional values, beliefs, behaviours, and attitudes shaping an ophthalmologist's professional identity.

Various competency-based curricula models exist globally. The CanMEDS framework, developed by the Royal College of Physicians and Surgeons of Canada, categorizes competencies within seven professional roles (Frank et al., 2015). The United States Accreditation Council for Graduate Medical Education (ACGME) offers a similar competency framework underpinning residency programme (Edgar et al., 2020), emphasizing professional activities residents should master (Borleffs & ten Cate, 2004). The UK's General Medical Council's "Outcomes for Graduates (Tomorrow's Doctors)" provides another model outlining core competencies and clinical milestones adaptable to local educational

TABLE 1 Eligibility criteria for being a resident in ophthalmology.

Requirements to be eligible resident of ophthalmology	Description
Educational qualifications	<ul style="list-style-type: none">• Medical degree recognized by the EU• At least 1 year of practical training (general surgery and medicine) as student, resident, or house officer, leading to full qualification as a physician
Specialty training	<ul style="list-style-type: none">• Ophthalmology training at accredited EU centres• Supervision by educator/tutor Minimum 4 years recommended• Training can be distributed across nationally recognized institutions as confirmed by National Board/EBO
Professional and ethical standards	<ul style="list-style-type: none">• Ethical and professional practice• Commitment to highquality patient care• Experience with disadvantaged, disabled, syndromic, and rare disease patients
Physical and psychological fitness	<ul style="list-style-type: none">• Required physical and mental fitness• Recommended probationary period• Entry exam and/or interview may be required to assess: teamwork, emergency response, investigation, and treatment planning
Communication skills	<ul style="list-style-type: none">• Proficient in the national language• Able to record and present patient data• Skilled in explaining procedures and obtaining informed consent
Regulatory compliance	<ul style="list-style-type: none">• Adherence to training programme rules• Some centres require a signed agreement between Resident and Residency Program Director (RPD) outlining mutual duties and obligations

Note: Residents in ophthalmology are MDs who have completed their general professional training as medical practitioners and are training in an accredited training programme to become recognized specialists in ophthalmology.

TABLE 2 The CanMEDs competency framework.

Roles	Description
Medical expert	This competency refers to applying theoretical knowledge and skills in clinical biomedical sciences relevant to ophthalmology and professionalism
Communicator	Ophthalmologists build relationships with patients, their families, and caregivers that facilitate collecting and sharing essential information for effective health care
Collaborator	Ophthalmologists work constructively with other healthcare professionals to provide safe, high-quality, patient-centred care
Leader	Ophthalmologists engage with others to contribute to a vision of a high-quality healthcare system and take responsibility for delivering excellent patient care through their activities as clinicians, investigators, administrators, scholars, and educators
Health advocate	Ophthalmologists contribute their expertise and influence as they work with communities or patient populations to improve eye health. They work with those they serve to determine and understand needs, speak on behalf of others when required, and support the mobilization of resources for meaningful change
Scholar	Ophthalmologists demonstrate a lifelong commitment to excellence in practice through continuous learning, by imparting experience and knowledge to others, appraising evidence, and contributing to scholarship
Professional	Ophthalmologists are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health

Note: The framework of competencies is categorized within seven roles.

cultures and seamlessly integrated into the continuum of medical education (Fürstenberg et al., 2017; General Medical Council, n.d.). For harmonization across Europe, the UEMS endorses an abbreviated CanMEDS framework of competencies (European Board of Ophthalmology, 2024c), (Table 2).

3.3.3 | Organization of training

A curriculum extends beyond a mere table of contents; it embodies a dynamic, nonlinear, and systematically planned educational journey. It involves contextual needs assessment, defining goals and objectives, selecting appropriate educational strategies, performance improvement assessments, and programme evaluation.

Residency programmes with mandatory surgical curricula must comprehensively address pre-, peri-, and post-operative competencies, including technical proficiency and foundational skills such as professionalism, teamwork, leadership, and effective communication (González-Andrades et al., 2023). Ophthalmic surgical training typically encompasses 1–2 years of foundational education, varying based on national medical programme structures. This foundational phase may consist of a sixth-year medical degree plus 1 year of general training or a 5-year degree followed by 2 years of general training. General training emphasizes routine healthcare tasks, emergency management, and foundational peri-operative and post-traumatic care principles.

Residency curricula should integrate structured simulation-based training, enabling residents to practice in supportive environments with tailored, constructive feedback, and personalized learning plans. This training ensures patient safety, upholds quality standards, and enhances both surgical and non-technical competencies, including communication, teamwork, professionalism, and advocacy for eye health. Ideally, residency

programmes should partner with or establish simulation centres offering comprehensive training involving virtual reality simulations, dry labs, and wet labs for a robust educational experience.

The emphasis should shift from fixed timeframes or procedure counts to training quality, prioritizing deliberate practice and meaningful feedback. Nevertheless, a minimum four-year residency programme is recommended, incorporating structured mandatory and optional subspecialty rotations.

EPAs bridge CBME and workplace practice. EPAs represent professional tasks entrusted to residents upon demonstrating sufficient competence, integrating multiple competencies simultaneously, and critically shaping professional identity (Table 3).

The ETRs in Ophthalmology Logbook employ the supervision levels scale from the UEMS General Surgery Specialty. These Grades of Competence define trainees' expected proficiency at various training levels, increasing sequentially in complexity across Knowledge, Clinical and Technical Skills, and Professional and Behavioural Skills, serving as assessment tools for certification and eligibility committees (The UEMS General Surgery Specialty, 2024).

3.3.4 | Assessment and evaluation

After completing a designated training period, residents typically become eligible for national board exams that assess their theoretical knowledge. To achieve recognition as a “European specialist in Ophthalmology” and qualify for positions in other countries, residents must satisfactorily complete summative assessments overseen by respective National Training Boards. Supranational exams, such as the EBOD, combine written and oral tests, standardizing ophthalmology training across the EU. These examinations evaluate core clinical conditions, relevant scientific knowledge, and clinical practice skills, including diagnosis,

TABLE 3 The practice entrustment level scale.

Levels of practice entrustment	Description of what the resident is trusted to do
1	To assist, observe, and progress from being a novice to a competent assistant, showing appropriate knowledge of a task and related problem-solving, and showing how to do it in a simulation-based learning environment. The resident does not enact the EPA in the clinical setting.
2	To perform the EPA with direct pro-active supervision, present in the room. The resident can do parts or the whole task, but may need close assistance and knows when to call for assistance or advice.
3	To carry out the EPA, striving to achieve the highest level of performance, including solving complications, but may need occasional help or advice. Indirect, reactive supervision without being in the room should be quickly available if needed.
4	To independently master the expertise of conducting the EPA (carry out a non-surgical or surgical procedure or manage a disease) unsupervised, anticipating complications, and knowing how to solve them.
5	To have developed proficiency and a high level of professionalism in performing the EPA, and is allowed to provide supervision to more junior residents. This level is closer to the “fellow degree” and will be elaborated on in a future document.

Note: EPAs can be time-framed, should be observable, and are suitable for focused entrustment decisions for unsupervised practice. Each level of supervision reflects different permissions to perform.

investigation, and treatment. If residents initially fail, retaking the summative assessment should be allowed.

CBME emphasizes workplace-based (WPBA) assessments (Ten Cate, 2014) to promote accountability, flexibility, and learner-centredness. Regular formative assessments during patient care, reinforced by constructive feedback from Rotation Directors of Programs (RDP) and Ophthalmology Educators (OE), facilitate continuous learning. Supervision must clearly identify residents' strengths and improvement areas, promptly addressing these through personalized improvement plans. Residents should receive consistent feedback from an assigned coach or mentor, typically overseen by subspecialty rotation heads or departmental mentors. Annual meetings between residents and the RPD ensure comprehensive performance reviews and guidance.

Formative assessment outcomes significantly influence summative entrustment decisions. Regular summative evaluations—conducted at rotation completion, annually, or at residency conclusion—determine readiness for independent practice at specific supervision levels. These assessments integrate formative feedback to guide ongoing development. A comprehensive evaluation incorporates diverse methods and multiple sources (triangulation) for robust decision-making (Van der Vleuten & Schuwirth, 2005). Mastery of all requirements warrants certification irrespective of training duration.

Residency programme evaluations extend beyond individual performance, incorporating feedback from residents, faculty, patient outcomes, and institutional or public health impacts, thus enhancing overall programme quality.

3.3.5 | Assessment methods

The UEMS advocates harmonized assessments of medical training through the development of competency-based European curricula for each specialist area (European Board of Ophthalmology, 2024c). Most European countries utilize National Boards to evaluate and certify ophthalmology specialists.

The EBO and the UEMS Section of Ophthalmology administer the EBOD Examination, an internationally recognized exam maintaining high standards. The EBOD aims not to replace national assessments but to offer a standardized European certification. Residents may undertake the EBOD in their final training year or post-completion. Applicants must have graduated from an EU medical university and successfully completed at least 4 years of formal residency training in ophthalmology. Additionally, they must be nationally certified ophthalmology specialists in at least one EU country. Originally held onsite with written and oral segments, recent iterations transitioned online due to the COVID-19 pandemic. Passing the EBOD alone does not establish complete clinical competence; rigorous evaluation within national residency programmes remains essential. Successful EBOD candidates receive the title “Fellow of the European Board of Ophthalmology” (FEBO), signifying competent clinicians capable of therapeutic decisions based on clinical evidence.

Considering ophthalmologists' free movement across Europe and specialized surgical training needs, residency programmes must specify clearly if they prepare residents for medical ophthalmology, surgical practice, or both.

Electronic portfolios (e-portfolios) and smartphone-accessible logbooks facilitate frequent documentation, supporting (WPBAs). WPBAs emphasize EPAs, guiding feedback and entrustment decisions, and integrating learning into clinical practice efficiently (Kavic, 2002; Marty et al., 2023). E-portfolios should centre around EPAs, recording performed surgeries, rotation details (dates, duration, and trainers involved), managed emergencies, examination achievements, completed audits, published articles, and presentations at various professional meetings. They should also document attended learning sessions, signed assessment forms from each training phase, and evidence of teaching involvement with medical students and junior trainees.

Regular review of e-portfolios by residents and their coaches ensures ongoing formative assessment and the development of individualized growth plans. This process allows residents to demonstrate adequate experience

managing diverse patient populations and pathologies. Summative evaluations of e-portfolios may be conducted by the Residency Programme Director (RPD) and involved faculty, verifying residents' comprehensive training progress.

3.3.6 | Assessment tools

Assessment tools must align specifically with the purpose of evaluation, effectively measuring various competency domains.

- *Knowledge improvement* is effectively evaluated using multiple-choice and short-answer questions, referencing accredited literature and clinical training.
- *Procedural knowledge* and its practical application can be assessed through short-answer questions, simulated clinical scenarios, and problem-solving exercises.
- *CBME and Workplace-Based Assessment (WPBA)* frequently employ direct or video observation of procedural skills (DOPS and VOPS). Residency programmes should leverage diverse data sources for equitable assessment. Tools such as Mini Clinical Examination (MiniCEX), Objective Structured Clinical Examinations (OSCE), Global Rating Scales (GRS), Objective Structured Assessment of Technical Skills (OSATS), Ophthalmology Surgical Competency Assessment Rubrics (OSCARs), simulation scenarios, and reflective portfolio writing are invaluable for comprehensive performance evaluation.
- *Professionalism* is best assessed using multi-source feedback (360-degree evaluations), ideally administered annually or more frequently as dictated by national guidelines. Reflective discussions between RPD and residents' mentors or coaches are essential for reviewing assessment outcomes, providing guidance, and integrating constructive feedback. Additional methods for evaluating professional behaviour include patient surveys, DOPS and VOPS, simulation-based education, and standardized patient interactions (European Board of Ophthalmology, 2024a; Peters et al., 2017; Ten Cate, 2013).

To qualify for employment in a country other than the one of their training or to be recognized as a "European Specialist in Ophthalmology," residents must successfully complete designated assessment methods. Following completion of a specified training period, residents typically become eligible for national board examinations that assess their knowledge, skills, and professionalism. Additionally, supranational examinations, such as the EBOD, offer standardized EU-wide assessment through written and oral evaluations. These examinations cover core clinical conditions and evaluate theoretical knowledge and clinical practice, including diagnosis, investigation, and treatment. Residents should have opportunities to retake summative assessments if initially unsuccessful. Completion of these evaluations under the supervision of National Training Boards is mandatory for recognition as a European specialist in Ophthalmology.

3.3.7 | Governance

Specialized ophthalmology training should be conducted at a European-accredited ophthalmology training centre under the guidance of a qualified educator or mentor, with a recommended minimum duration of 4 years. This training can take place across multiple institutions or sites within a complementary system, as long as these are officially recognized by the National Board of Ophthalmology and/or the EBO.

The RPD and the institution(s) hosting the training programme hold primary responsibility for the programme's governance. OEs are accountable to the RPD for delivering specialized training within their respective fields (subspecialties). Currently, governance of training competencies and content falls under the purview of national medical speciality boards.

The UEMS advocates for fostering a culture of continuous quality improvement through residency programmes outcome evaluation that involves all participants in the residency programme. Beyond assessing individual residents' performance, evaluation must also encompass the overall programme and its outcomes. To ensure a comprehensive and systematic approach and to support further enhancements informed by research, the use of a structured outcomes evaluation framework is recommended; examples include Kirkpatrick's model (Bisgaard et al., 2018) and Moore's framework (Moore Jr. et al., 2009).

3.4 | Training requirements for trainers

3.4.1 | Requested qualification and experience as a trainer

A commitment to continuous learning and teaching is essential for cultivating and enhancing competencies for optimal clinical practice (Academy of Medical Educators, 2021). Residency programmes must adhere to institutional standards, national regulations, EU directives, and recommendations from UEMS and EBO. The RPD and OEs hold defined roles to ensure effective training oversight. The RPD supervises the residency programme within the training institution(s). OEs, practising ophthalmologists across all subspecialties, deliver specialized training and report directly to the RPD, ensuring comprehensive educational experiences in their respective fields (Tables 4 and 5).

3.4.2 | Core competencies for trainers

When necessary and not addressed by the EU Directive on Professional Qualifications, OEs should pursue specialized qualifications. To achieve a professional standard of performance, the Academy of Medical Educators (AoME) has identified five key roles that clinician educators should role-model (Academy of Medical Educators, 2022):

1. Teaching and facilitating learning.
2. Assessing learning and providing feedback for improvement.

TABLE 4 Responsibilities of ophthalmic educators (OEs).

Responsibilities of the OEs	Description
Curriculum development and adaptation	Be acquainted with the overall ophthalmology curriculum as it relates to practice within their country and meets the needs of the individual resident
Clinical teaching and supervision	Be in sufficient numbers to ensure that all residents receive sufficient teaching and non-surgical and surgical training and close personal monitoring during residency
Accreditation and regulatory compliance	Be recognized for training stages by the National Authority, if such a system is in place
Learning environment and professional development	Create a supportive learning environment in which residents can develop into specialists in ophthalmology
Clinical supervision and oversight	Oversee the daily work of residents in the ward, clinic, operating theatre, emergency room, and during on-call commitments
Programme management and advocacy	Ensure an adequate balance between service commitment and training
Assessment and evaluation	Ensure that regular assessments and reports are completed and agreed upon by both OEs, residents, and the RPD
Communication and administration	Notify the RPD of any problems at an early stage if possible
Mentorship and individualized training	Identify the learning needs of the resident, provide constructive feedback, and create with the resident a tailored deliberate practice plan
Research and scholarship	Provide evidence of academic activities, namely clinical and/or basic research, publications in peer-reviewed journals, and participation in ophthalmology scientific meetings

- Advancing educational scholarship and adhering to evidence-based practices.
- Managing and leading within the educational domain.
- Designing and planning effective learning experiences.

Both clinical and non-clinical educators involved in training healthcare professionals should (a) uphold quality and safety in patient care, (b) embody professional identity and integrity, (c) commit to ongoing scholarship and self-reflection in medical education, (d) show respect and professionalism in interactions with others.

OEs should focus on faculty development aimed at meaningful contributions to entrustment decisions regarding residents' readiness for unsupervised practice. This includes:

- Observing skills in authentic workplace settings and conducting WPBAs.
- Mastering coaching and feedback delivery.
- Enhancing self-assessment and reflective practices.
- Cultivating peer guidance skills through a community of practice (Favreau et al., 2017).

OEs play a pivotal role in fostering the development of master adaptive learners—physicians who commit to lifelong learning and uphold their social accountability to the profession. Master adaptive learners evolve through four general phases of learning:

- Planning that incorporates the (a) identification of a learning gap, (b) selection of a learning opportunity, and (c) search for resources for learning, with prioritization as a crucial skill.
- Learning or internalizing new understandings that address the identified gap in knowledge, skill, or attitude, with critical appraisal of the learning sources gathered.

- Assessing or trying out what has been learnt until sufficient competence is reached with the newly learnt skills and knowledge and informed self-assessment.
- Adjusting through incorporating what was learnt into daily practice and considering its impact.

Critical thinking is a core component of this process. It involves the active and skilful application of conceptualizing, analysing, synthesizing, and evaluating information derived from observation, experience, reflection, reasoning, or communication to guide beliefs and actions. Reflection is a metacognitive process that occurs before, during, and after situations. It fosters a deeper understanding of both the self and the situation, using past encounters to inform future actions. Together, critical thinking and reflection are essential to learning, enabling learners to engage intentionally and evaluate the effectiveness of their learning (Cutrer et al., 2017).

3.4.3 | Quality management for trainers

Recognizing the critical role of OEs in fostering high-quality learning environments, it is essential to acknowledge and support their continuous development in ophthalmology and medical education (European Board of Ophthalmology, 2024c). OEs must actively practise clinically within UEMS-affiliated countries and engage in training at designated centres or networks. Initial appointments should last 5 years, with periodic performance assessments—such as staff appraisals—conducted in certain countries, potentially leading to five-year extensions based on mutual agreement. Effective training requires adequate secretarial and administrative support for OEs, who should exist in sufficient numbers to maintain an optimal OE-to-resident ratio of 1:1 to 1:2. OEs are responsible for mentoring residents and ensuring exposure to diverse perspectives within ophthalmology. To promote greater harmonization of ETRs, OEs are

TABLE 5 Responsibilities of the Residency Program Director (RPD).

Responsibilities of the RPD	Description
Qualifications and experience	Practicing ophthalmology for at least 1 year after qualification as a specialist
Institutional affiliation and commitment	Substantial working contract within the training institution
Teaching experience	Proven track record in teaching and training
Professional development	Evidence of continuing professional development in ophthalmology
Professional affiliation	Member of the National Ophthalmology Society
Administrative support and resource allocation	Full secretarial and administrative support with sufficient protected time
Recruitment and selection	Establish a transparent and fair selection and appointment process for candidates
Curriculum development and standards alignment	Know and adapt a national curriculum, learning objectives, and levels of competence
Programme oversight and faculty development	Supervise training within the department and facilitate faculty development
Programme structure and scheduling	Arrange a balanced residency programme with established rotations
Assessment and documentation	Ensure that residents' documentation and portfolios meet established standards
Clinical supervision	Oversee surgical procedures and clinical activities in the department
Research and academic development	Provide opportunities for research, audit, attending accredited courses, and scientific meetings
Assessment and reporting	Provide an annual and final report on each resident
Certification and credentialing	Provide valid documentation at the satisfactory completion of training

strongly encouraged to achieve European-level certifications, such as those provided by the EBO examinations.

3.5 | Requirements for training institutions

Ophthalmology training institutions must secure recognition from the National Authority or the National Board of their respective Member State to ensure compliance with national standards. Additionally, the EBO/UEMS has established a set of recommendations to guide and assess institutions seeking certification as EBO/UEMS-accredited training centres. These recommendations aim to maintain uniformity and excellence in ophthalmology training across Europe.

3.5.1 | Process for recognition as a training centre

Requirements on staff and clinical activities

Residency programmes should be hosted by institutions with sufficient patient volumes, both inpatient and

outpatient, offering a comprehensive range of clinical specialities. Essential requirements include qualified faculty, structured training programmes aligned with established guidelines, and an appropriate trainee-to-trainer ratio.

Ophthalmology training may occur within a single institution or across networks of collaborating centres, ensuring exposure to all clinical conditions and skills specified in the curriculum. Ideally, training institutions should be university departments, university-affiliated institutions, or facilities demonstrating equivalent educational or research commitments, providing comprehensive medical, surgical, and diagnostic services comparable to university hospitals.

Programmes must ensure residents encounter an extensive and diverse patient population, including adult and paediatric cases, covering a wide spectrum of ophthalmic conditions. This exposure fosters residents' diagnostic, therapeutic, and surgical skills and develops their clinical judgement. Experience with rare or complex ophthalmic cases is particularly critical for comprehensive training.

Regional variations exist, but an ideal training centre typically manages around 5000 patients annually across inpatient, outpatient, and day-case settings. Beyond numerical targets, residents should experience varied ophthalmic pathologies and clinical scenarios. Although educational models increasingly emphasize competency over quantity (Muttuvelu & Andersen, 2016), evidence suggests cataract surgery competency is typically achieved after approximately 80 procedures, with proficiency attained near 300 procedures (Balas et al., 2023; Chan et al., 2011; Parihar et al., 2024; Randleman et al., 2007).

In some regions, cataract surgery training is optional within residency programmes, leading to variable enforcement of minimum surgical requirements (Bourcier et al., 2024; Ní Dhubhghaill et al., 2023; Rossi et al., 2021). Nonetheless, programmes including surgical training—optional or mandatory—are encouraged to adopt evidence-based practices and recommendations.

For accurate documentation and progress tracking, the EBO and the UEMS Section of Ophthalmology recommend utilizing a logbook and will introduce an e-portfolio tailored specifically for ophthalmology residency training.

Within training networks, each participating institution must have national recognition for delivering designated curriculum components. The EBO/UEMS oversees residency programmes, offering guidance for their initiation or enhancement. While institutions need not be academic ophthalmology centres, they should maintain academic connections and actively contribute to research.

Requirements on equipment, accommodation

Training institutions must provide sufficient infrastructure for qualitative and quantitative clinical exposure, aligning with curriculum requirements. Facilities should support both theoretical and practical learning, including comprehensive digital and/or physical libraries with extensive ophthalmological and general medical resources to facilitate research and learning. Institutions are strongly encouraged to offer access to

simulation-based training facilities such as digital labs, dry labs, wet labs, or surgical simulators.

Residency-hosting institutions must ensure essential infrastructure, including financial and administrative support, for resident access to inpatient, outpatient, and operating room environments. Institutions should adhere to quality assurance and surveillance protocols to uphold training standards. Key resources include medical-technical equipment, library access, research support, and established quality management systems fostering continuous improvement.

Outpatient areas must be fully equipped with sufficient examination stations and advanced diagnostic tools. Integration with ophthalmic pathology, microbiology, and radiology services is crucial for comprehensive diagnostic support (ACGME, 2023).

Surgical facilities must offer adequate space and beds to optimize patient care, including conveniently located eye examination rooms equipped with slit lamps near inpatient areas. Dedicated surgical operating rooms must be accessible 24/7 and feature essential equipment, such as surgical microscopes, phacoemulsification devices, and vitrectomy systems. Additionally, laser treatment facilities for anterior and posterior segments are indispensable. Residents require adequately equipped workspaces with computing and IT resources to support study and research activities.

3.5.2 | Quality management within training institutions

Training institutions must implement internal systems encompassing medical audits, morbidity meetings, and critical incident reporting. Additionally, institutions should establish various hospital committees, such as infection control and pharmacological and therapeutic committees, to ensure quality and safety standards. National training schemes may include inspections by the National Authority. When requested, the EBO/UEMS education committee assists and evaluates institutions prior to inclusion in the EBO/UEMS training exchange programme.

Residency programmes should encourage accreditation, implement clinical governance, manage manpower planning, and regularly update their approaches. External audits, including trainee feedback, should ensure transparency and structured training oversight. Regular comprehensive evaluations of residency programmes should assess residents' development, faculty support strategies, assessments, recognition, and institutional quality improvement. National authorities, National Boards, faculty, and training institutions are responsible for quality assurance policies and evaluating faculty credentials, clinical practices, surgical outcomes, and scientific contributions, ideally within four-to-five-year cycles.

Recognizing geographical or organizational limitations, countries should establish national oversight boards to ensure curriculum completeness. Such boards facilitate resident participation in European programmes, provide travel grants, and encourage international exchanges.

National authorities must develop quality assurance programmes aligning with national rules, EU

legislation, and UEMS Ophthalmology Section recommendations. Recognized training centres must meet stringent national criteria for educational and care excellence, undergoing regular evaluations. Each UEMS member state's National Authority oversees ophthalmology specialist recognition and institutional accreditation in compliance with national and European laws.

Teaching hospitals, supported by medical faculties, professional societies, colleges, and national authorities, should foster robust learning environments. This involves providing advanced equipment, structured practice settings, adequate staffing, and continuous professional development opportunities in ophthalmology and medical education.

Faculty development programmes must introduce, support, and implement EPAs, aiding senior physicians as clinical lecturers. Institutions should influence leadership to prioritize education and annually appraise the educational contributions of OEs and Residency Programme Directors (RPDs). Clearly defined roles for RPDs and OEs should specify dedicated weekly time for resident support and faculty collaboration. Institutions must align employee structures and workloads with CBME principles.

Clinical governance, encompassing accountability and standard setting for service provision, is shared between RPDs and National authorities, incorporating manpower planning and periodic assessments. Healthcare planners should consider demographic shifts, evolving treatments, workload implications, and legislative influences on medical professional responsibilities and working hours.

Given ophthalmology's medico-surgical nature, exploring dual-accreditation pathways in medical and/or surgical education is beneficial. This distinction motivates residency programmes to maintain excellence by:

- Upholding high standards in medico-surgical training,
- Encouraging programmes to aspire towards medico-surgical accreditation through comprehensive surgical education, and
- Supporting excellence in standalone surgical residency programmes.

Providing surgical training opportunities elevates institutional prestige, enhances global standing, and develops ophthalmologists proficient in both medical and surgical domains. Institutions achieving medical accreditation demonstrate adherence to medical ophthalmology best practices. Those attaining medico-surgical accreditation must satisfy EBO's recommendations, including specific surgical requirements. Eligibility for medico-surgical accreditation also extends to standalone surgical programmes meeting established standards.

4 | CONCLUSION

Ophthalmology encompasses a broad spectrum, from fundamental eye care to advanced, technology-driven interventions. Its practice is inherently collaborative,

involving interprofessional and multidisciplinary healthcare teams dedicated to disease prevention, diagnosis, treatment, and enhancing patient and community quality of life. For residents, developing a robust professional identity that incorporates a holistic perspective and social accountability is essential. The creation of ETRs in Ophthalmology utilized the Nominal Group Technique to authentically integrate diversity and equity into the process. Upcoming initiatives will prioritize implementing these ETRs and validating ophthalmology-specific EPAs. Future subspecialty rotations will expand into global ophthalmology, ophthalmic oncology, ocular pathology, and low vision rehabilitation. This document is conceived as a dynamic “living document,” welcoming ongoing constructive feedback and updates. It will evolve with national healthcare demands, scientific advancements, and technological innovations while respecting the autonomy of EU member states.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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