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Leadership in ophthalmology training

Opportunities and risks of medical specialist education

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Abstract

Medical specialist training requires constant improvement and adaptation of the contents to the current situation. Nowadays, young physicians have the opportunity to select among the most renowned institutions and can choose the one most qualified for their training. Hospitals on the other hand still have the desire to recruit highly qualified physicians for their resident programs, which requires a good, well-rounded and reliable offer by the department under good leadership. Thus, among other issues a modern and multilingual homepage is already an important instrument for successfully addressing applicants and winning them over for the department. In addition to a well-planned and structured training plan (e.g., the “Homburg Curriculum”) and a so-called “resident guide”, many other additional offers are nowadays part of a successful training, such as structured internal and external specialist training courses, well thought out research concepts available to all interested parties, wet labs for practical exercises on pig’s eyes and as the latest most innovative addition, a virtual reality simulator. Due to a structured curriculum with regular continuous education during the daily early morning meetings and an exchange program with another university eye hospital, not only the residents can benefit but ultimately also the department itself. In addition, future specialists are involved in the respective organization (so-called “service teams”) from the very beginning. This conveys a great deal of knowledge and expertise but also organizational skills and thus improves the quality of training. In any case, standardized residency training with a view beyond the horizon, which is transparently organized and reliably carried out, improves the quality of training in order to become a certified ophthalmologist and increases the satisfaction of the residents. A department which is committed and can offer a wide range of services will benefit from motivated and satisfied employees in a good interpersonal climate, which in the end benefits not only the team but also the patients.

Keywords

Curriculum · Satisfaction · Ophthalmology · Resident · Exchange program

Far more than in the past, the so-called *Generation Z* of future ophthalmologists is self-confident and places high demands on working and training conditions. This development particularly affects newly qualified physicians, who attach great importance to choosing the optimal location for their medical specialist training. In response to this social change, employers/

educators must increasingly raise their profile in order to remain attractive.

The requirements for the profession of ophthalmologist are laid down by law in the medical specialist training regulations of the German Medical Association [18]. The basis for successful and satisfactory training begins with the opportunity for every resident to fulfill all requirements for

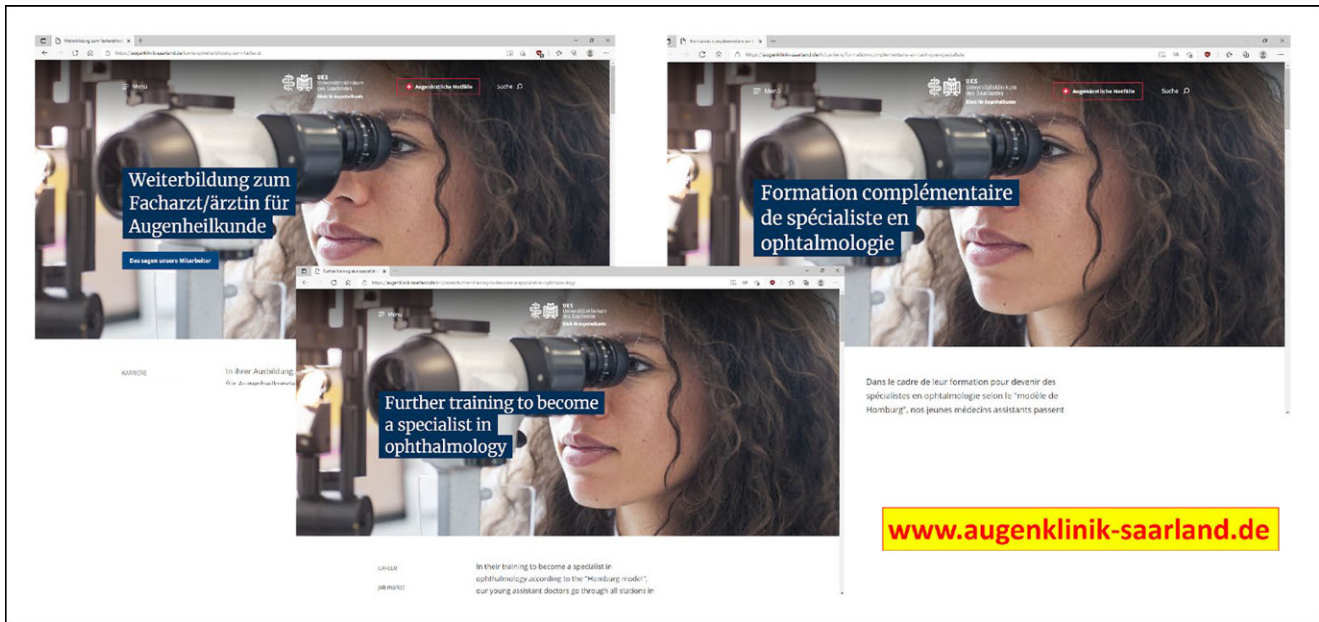


Fig. 1 ▲ Trilingual website of the Department of Ophthalmology at Saarland University Medical Center in Homburg

the German specialist examination. For this purpose, the “Homburg Curriculum” for the resident program [12] is based on the residency training regulations of the Saarland Medical Association in accordance with § 8 Para. 1 [27].

Today, quality of life outside work (so-called work–life balance) is just as important as the quality of training itself and represents an extremely important decision criterion for many young physicians [26]. In this respect, large cities are naturally far more popular than hospitals in more “remote” areas, which then have to offer “more” or “something different”. Additional criteria, such as a daycare center nearby or even in the hospital, and flexible working hours can also play an important role in the selection process if young physicians are already at a point where they need to reconcile work and family [13].

Other important aspects include the opportunities for academic and/or surgical development in the chosen hospital—even during the training period. Many residents start their residency already with the desire for surgical training [10]. The desire for academic development ranges from the opportunity to conduct clinical or experimental research to professional and financial support for the submission and publication of papers

as well as participation in congresses. With regard to surgical training, which for many reasons cannot be fully achieved during residency at most German ophthalmology training centers, numerous options are available in our modern age, from traditional surgical assistance to patient-free training in the wet lab or on the simulator. Cooperation and professional exchange with other centers of excellence can also improve the quality of training, which is an additional bonus for many prospective specialists.

This article presents the details of the “Homburg Curriculum” as a model for training to become a specialist in ophthalmology with the aim of improving the quality of and satisfaction with training, highlighting additional opportunities beyond the routine as well as new approaches to knowledge transfer.

On the road to employment

Homburg homepage: a mirror of the ophthalmology department

The first impression is often the deciding factor. An appealing and well-detailed website can give interested applicants the opportunity to get an early overview of the department. On our website, applicants will find the “Homburg Curriculum”

as well as all important documents and information for the resident training. Against the background of today’s international networking and approach (and the now international department team), the Department of Ophthalmology has created a modern trilingual website in German, English, and French (■ Fig. 1), which is regularly updated with, for example, dates of new specialist training courses, seminars, press reviews, etc. (link: <https://augenklinik-saarland.de/karriere/weiterbildung-zum-facharzt>). In the best case, the website is the “showpiece” that serves on the one hand as an initial basis for applicants to decide whether to join our team, while on the other hand, it gives the ophthalmology department the opportunity to attract the attention of the best potential candidates.

All applications are submitted to our secretary’s office and forwarded to the chairman of the department as well as the head and managing senior physician. After critical examination of the documents (including photo, license to practice medicine, *all* certificates), the selected applicants are invited to a hospitation day in our department and a personal interview.


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Direktor
Prof. Dr. med. Berthold Seitz



Homburg, 08.08.2023/azw

Your Hospitation Day
(PJ, Visiting physicians, residents, specialists, senior physicians)

Purpose: Insight into the processes of our department and its sections
Responsible: Resident physician's representative
Involved: Head physician's office, all medical staff, Experimental Ophthalmology

Dear Ms. Bosis,

we are very pleased to welcome you to your hospitation day in our Department of Ophthalmology at the UKS. To make your hospitation day a little easier, we have put together a brief „itinerary“ for you regarding today's events.


- **7:20 am:** Hand over of your personal information folder by Ms. Zäch-Welsch (senior physician's secretariat).
- **7:30 am:** Participation in the daily morning meeting, *lecture hall of the ophthalmology dept, ground floor – but virtually!*
- **Afterwards:** Guided tour of the building (alternately by resident physician's representative, assistant of the cornea bank and study doctor)

You will get to know the following sections:

- **08:30 till 10:00** Outpatient dept/ Emergency outpatient dept
- **10:00 till 11:00** Section KiOLoN („Vision school“)
- **11:00 till 11:30** LIONS Corneal bank
- **11:30 till 12:30** Surgery
- **12:30 till 13:00** Lunch
- **13:00 till 15:00** Outpatient dept/ Emergency outpatient dept
- **15:00 till 16:00** Ward
- **16:00 till 16:30** Break
- **17:00:** Senior physician meeting – short interview in presence with the applicant in the library.

We wish you a pleasant day. If you have any questions or problems, please contact Ms. Alfreda Zäch-Welsch, Ms. Lena Kunz or Ms. Vivian Boltz (management assistants).

With kind regards


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 Chairman of the Department

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Fig. 2 ▲ Example of a hospitation day at the Department of Ophthalmology at Saarland University Medical Center in Homburg. (With kind permission © Department of Ophthalmology at Saarland University Medical Center in Homburg)

Hospitation day (= work shadowing) and interview

All applicants take part in the daily morning meeting from 7:30 a.m. on the hospitation day and thus get to know the entire medical and management team. Afterwards, the applicants can accompany our physicians to the various sections and gain an insight into their daily work. All applicants are invited to communicate openly with all members of staff in the ophthalmology department in order to get a clear picture of the real conditions there.

The day is planned in such a way that each applicant passes through all sections of the department and, ideally, has contact with all specialists and senior physicians (■ Fig. 2). During the day, the applicants also have the opportunity to talk to the residents and find out firsthand how the in-house rotation works, how overtime is handled, and what additional training content is actually available. Of course, the applicants can also gather first impressions such as:

- What is the working atmosphere like in the department in general and among the physicians themselves?
- Is the department's motto *“One department—one team”* reflected in everyday clinical practice?
- Are the promises made on the website (*“Everyone feels welcome and comfortable in our department”*) also lived and practiced in the department?

In this regard, every department must be aware that the information on the website should match the department's everyday life in order to give the applicant an authentic, congruent picture [12].

At the end of the day, applicants and the entire medical team take part in our *“Current News Hour”*, the department's weekly internal training session. The interview and job application meeting then takes place as part of the senior physician meeting with the chairman of the department and in the presence of all senior physicians and the resident physicians' representative(s) as well as members of the staff council and the equal opportunities officer. It is important to us that the candidates as well as the senior physicians have sufficient time in this final joint meeting to ask questions and clarify whether they can imagine working together. We also highly value a fast and transparent communication. We therefore decide immediately whether to hire, reject, or *“keep in touch”* for a later date and inform the applicant of our decision *the next day*. We also expect applicants who decide to move to another training location to inform us honestly and promptly. This enables us to keep our lists as up to date as possible and give all candidates the same opportunity.

Resident training at the Department of Ophthalmology in Homburg

Rotation plan

The introduction of a rotation plan arose from the residents' desire to have the certainty that all areas of the department will be covered during the 5 years of training. Thanks to a fixed rotation plan (■ Fig. 3), there are no arguments or discussions about the *“more popular”* positions in the

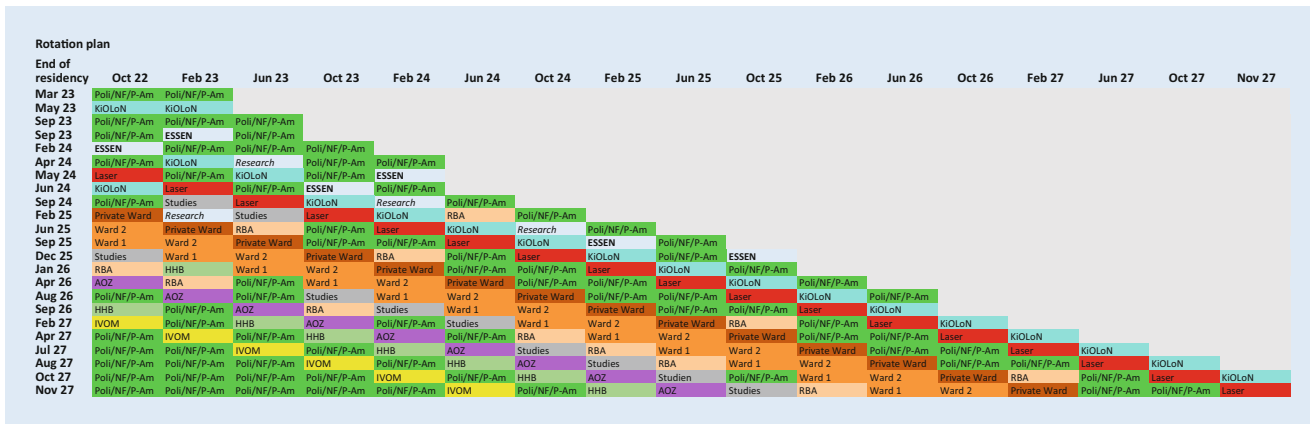


Fig. 3 ▲ Example of the training rotation plan at the Department of Ophthalmology in Homburg; planning up to 2027. The last two to three rotations correspond either to the function of a stand-in (assignment of the stand-in to the outpatient department/emergency outpatient department/private outpatient department) or—by arrangement—to deepening knowledge in one area, the research rotation, etc. *RBA* (retrobulbar anesthesia), *AOZ* (outpatient surgical center), *HHB* (corneal bank), *IVOM* (intravitreal drug administration), *KiOLoN* (pediatric ophthalmology, orthoptics, low vision, neuro-ophthalmology)

department, nor does a resident run the risk of having to “stay” permanently in only a few areas for organizational or staff policy reasons. It is ensured that at the end of the training period, all skills will have been learned practically—not just theoretically—in each subunit of the department. As part of the rotation plan, residents rotate through each of these individual units for 4 months (so-called *tertiar plan*):

- Retrobulbar anesthesia (RBA)
- Ward
- Outpatient department
- Corneal bank
- Laser/consultations
- Outpatient surgical center (AOZ)
- Pediatric ophthalmology, orthoptics, low vision, and neuro-ophthalmology (KiOLoN),
- Resident on private ward
- Private outpatient department
- Investigator at the *Integrative Clinical Study Center IKSZ*
- Intravitreal drug administration center
- Emergency outpatient department

Residents are assigned to the “ward” and “outpatient department” areas twice for 4 months each, as these areas are very extensive in terms of content. This results in a fixed allocation for each resident for 4 years, which also makes it easier to plan and participate in internal and external courses appropriate to the respective area.

Closing the gaps: stand-in, parental leave, and termination

After passing through all subunits, the resident acts as what is referred to as a stand-in in the remaining two to three rotations in their final year, a no less important task that also brings advantages.

This means that the stand-in can fill gaps due to illness or vacation or, for example, deepen their skills by repeating one of the previously completed areas. It is also possible to cover a shift during the day for a colleague on night duty. After the night shift, the resident goes home and the stand-in takes over without other physicians having to be taken out of their rotation. If the resident is not required as a stand-in, this leaves time for research, surgical assistance, or organizational matters and, in particular, for writing scientific manuscripts [12].

In the event of termination, pregnancy, or parental leave, a new applicant moves up and completes the rotation from the point at which a gap would have arisen. If an acute vacancy arises until a new resident is recruited, a stand-in can also bridge this for a short time. This means that all other residents remain in their rotation, and it is not necessary to reorganize everything. After returning from parental leave, individual plans must be made as to when the missing rotations can take place [12].

Starter package: “Homburg curriculum” and “resident guide”

At the start of their medical specialist training, all residents receive the *Homburg Residency Curriculum* in the form of a small booklet and the *Homburg Resident Guide* (■ Fig. 4). The most important part of the training curriculum by far is the LOGBOOK of the Saarland Medical Association [27]. All acquired skills and activities can and must be documented in this booklet in order to ensure successful registration for the specialist examination at the end. This constantly updated booklet is regularly reviewed and discussed with the chairman during the annual staff appraisals.

In the *Homburg Resident’s Guide*, new residents will find an abundance of important information and work instructions that they need to quickly familiarize themselves with the department at the beginning of their training. The resident’s guide also contains information on in-house and evidence-based guidelines for the diagnosis or treatment of various ophthalmological conditions and the associated standard operating procedures (SOPs) [12].

Feeling comfortable in the team: the role of the resident physicians’ representative

The social dimension in the workplace plays a decisive role both for the individual (self-confidence) and for group dynamics

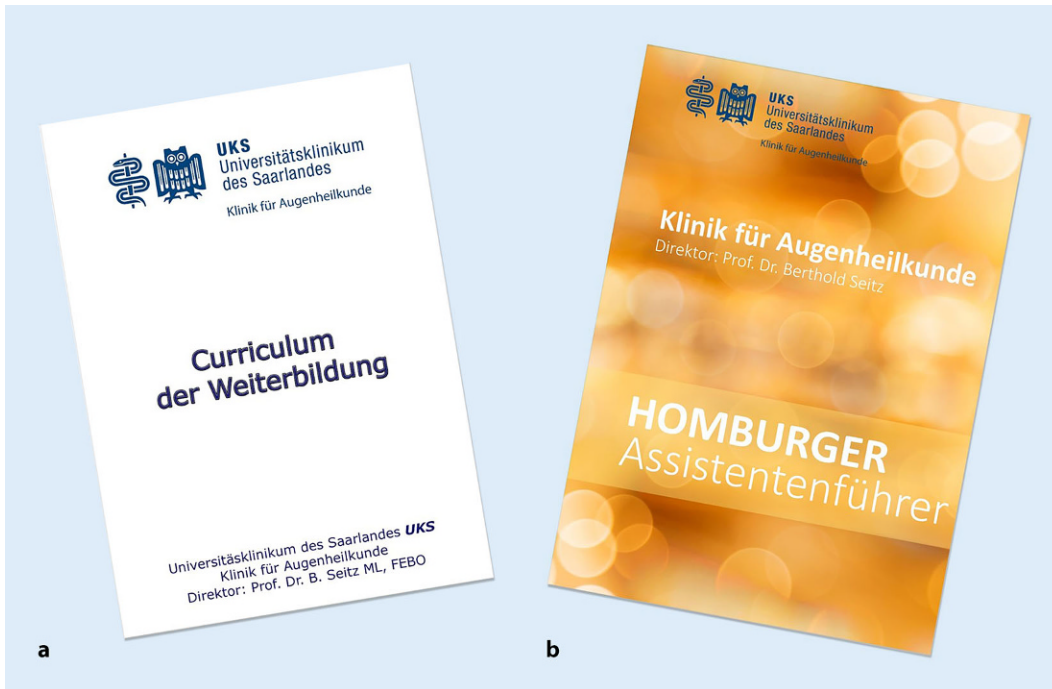


Fig. 4 ◀ The Homburg Residency Curriculum (a) is used for documentation during training, while the Homburg Resident Guide (b) contains the most important information and work instructions for new residents



Fig. 5 ▲ The Ophthalmology Department team at the Homburg corporate run in May 2023. a Before the start and b after a successful finish

(team-working), and thus for the overall efficiency of the department.

The integration of new residents into the department and the existing team is therefore a key factor in the recruitment and retention of residents. It is clear that all residents have their own personality and fit into the existing group in different ways. In Homburg, two resident physicians' representatives are democratically elected to represent the residents. In addition to their representative role towards their superiors and for the organization between the residents (vacation and shift planning), they also play an important role in the cohesion of the group. For ex-

ample, at least one activity is organized every month (going to a restaurant, bowling, escape room, soccer team, Homburg corporate run, etc.; ▶ Fig. 5a,b), to which all residents—and sometimes other department employees—are invited, which enables them to integrate quickly into the group and get to know the new residents, and strengthens cohesion within the group. In addition, a meeting is held every 2 months to discuss any tensions or important changes in the department. New residents are also assigned a mentor who supports them during their initial period and always serves as their first point of contact.

External and internal specialist training opportunities and congresses

Another bonus point for an attractive training position is the opportunity to take part in congresses, symposia, and specialist training courses. External specialist training that residents can attend include, for example, a basic or advanced sonography course (Vienna), the Schober course, a laser safety course, the FUN (functional diagnostics and neuro-ophthalmology) course (Tübingen), or the annual congresses of the German Ophthalmic Surgeons (*Deutsche Ophthalmochirurgie*, DOC)

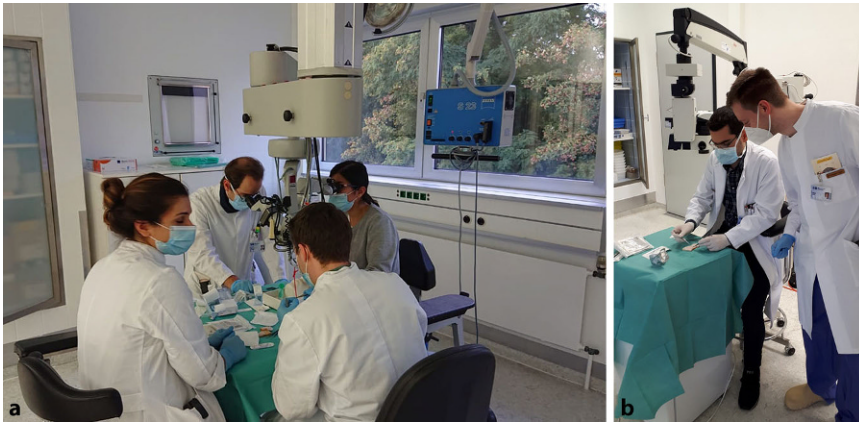


Fig. 6 ▲ a,b Example of one of the six wet labs at the Klaus Faber Center for Corneal Diseases including the LIONS Eye Bank Saar-Lor-Lux, Trier/Westpfalz

in Nuremberg or the German Society of Ophthalmology (*Deutsche Ophthalmologische Gesellschaft, DOG*) in Berlin. Residents are always encouraged to contribute to a congress. As an “incentive”, this is rewarded with financial support from the “Association for the Promotion of Ophthalmology” (*Förderverein für Augenheilkunde*) to attend a congress, both in Germany and abroad. Residents wishing to actively give a presentation (paper, lecture, poster), are released from clinical work to enable them to attend the congress (= no vacation days need to be taken!). *No resident travels to a congress to give an active presentation without previously rehearsing it with the chairman and team!*

In addition, the Department of Ophthalmology at Saarland University Medical Center in Homburg offers a range of high-quality internal specialist training courses, which are not only attended by residents on site, but are also aimed at external physicians in training as well as specialists. Some events, such as the Homburg Cornea Day (*Homburger Hornhaut-Tag, HHT*), the Homburg Retinological Curriculum (*Homburger Retinologische Curriculum, HRC*) with laser safety course and certificate issued by the laser safety officer and intravitreal drug administration certificate, the Homburg Cornea Curriculum (HCC) with keratoplasty and DMEK (Descemet membrane endothelial keratoplasty) wet lab, or Homburg Keratoconus Center symposia (HKCS) have now been taking place regularly for almost 10 years and further increase the attractiveness of

the location. The six wet labs—created from the conversion of the old operating rooms as part of the Klaus Faber Center for Corneal Diseases including the LIONS Eye Bank Saar-Lor-Lux, Trier/Westpfalz, in 2019—are available to the Homburg residents not only during the courses offered, but also outside of these (■ Fig. 6a,b).

Purely internal training courses for Homburg residents include the Journal Club every Thursday or “Updates from the Biology Laboratory” on the first Wednesday of the month—always in the early morning meeting. Every Tuesday, the “Doctoral Student Seminar” takes place early, or alternatively the “Famous People’s Birthdays.” Every Tuesday afternoon, the “Tuesday Advanced Training” (“Systematics & Current News Hour”) takes place. In these meetings, both residents and senior physicians give presentations on a wide variety of current topics, rare clinical pictures, or report news (“three bits”) from an external congress they have attended. Occasionally, qualified company representatives are also given a platform to report on scientific innovations as neutrally as possible. Every Friday in the early morning meeting, interesting fluorescein angiography and retinal findings of the week are presented and discussed together, thus practicing the residents’ skills in making accurate findings and diagnoses.

Support for research activities

The department offers a wide range of opportunities. Residents are welcome to get involved and are supported not only

by the chairman and the senior physicians themselves, but also by the Institute for Experimental Ophthalmology and the Dr. Rolf M. Schwiete Center for Limbal Stem Cell Research and Congenital Aniridia, located in the same building.

Every resident who has a previous achievement to show can apply for a 4-month *research rotation* in order to be able to complete their research project without constraints—always including a publication!—and to be able to “push” new topics. This allocation is optional and takes place specifically after evaluation of interested residents by the senior physicians (“give and take”). Residents who are interested in research activities and who are in their final year as a stand-in can use free time on a daily basis to carry out research. This allocation takes place every morning at the early morning meeting, when the current daily schedule is agreed by the team of doctors, nurses, medical assistants, and clerical staff.

Every resident in training, as well as all specialists/senior physicians and doctoral students, benefit from a functioning *Science Management* hub in Homburg. This includes the so-called *Integrative Clinical Study Center (Integrative Klinische Studienzentrum, IKSZ)* with three study nurses and an “investigator” as a regular 4-month training rotation. This means that multicenter studies can be carried out smoothly without “disrupting” the rotation of the other residents. On the other hand, all those interested in research (including doctoral students) are supported by an in-house (!) statistician in the planning, analysis, and presentation of their studies. In addition, a secretary who speaks perfect English helps with the linguistic presentation, formatting, and submission as well as revision of manuscripts. *No manuscript leaves the house without being corrected by the chairman in person!* To avoid accusations of autoplagiarism, doctoral theses are always published first and then this publication is cited in the monography, which increases the motivation of all those involved to successfully complete the respective project in a timely manner.

Involvement and self-determination of residents

The residents “regulate” and organize themselves, i.e., various tasks are distributed and taken on by the residents (so-called “service teams”, with each resident belonging to at least one of these teams):

- Schedules for night and weekend shifts.
- Vacations (all vacations of all physicians are fixed by October of the previous year at the latest—this is the only way to ensure planning security).
- External training courses.
- Expert opinions.
- Rotation scheduling—ideally independent of senior physician!

Open questions or concerns can be clarified together at the residents’ meeting, which takes place every 2 months. The resident physicians’ representative can take major concerns to one of the senior physician meetings (held every 2 weeks).

Exploring new paths

Setting priorities

Ophthalmology is a highly specialized field that has undergone enormous development and expansion of the possibilities of medical interventions in recent decades. Of course, this is only possible due to a high degree of medical and professional concentration in the various subspecializations of ophthalmology. Just as ophthalmology separated itself from general surgery at the beginning of the 19th century and emancipated itself as an independent discipline, it became apparent over the course of the 20th century that further subspecialization was essential in order to achieve maximum performance. As a result, several academic chairs in ophthalmology (C4) were established within one German medical faculty, such as in Essen, Tübingen, and Cologne. In the 21st century, for various reasons, we are seeing a renewed concentration on one chair (W3) per faculty, albeit with the possibility of distributing the specialist expertise to professorships (W2) designed for this purpose. This continues to enable the broader orientation

of university departments under the umbrella of a chair. Nevertheless, there are traditional focal points of the individual university departments, as well as those intended by the respective faculties, so that the training of future medical specialists can also be shaped by this. However, in order to guarantee a high level of quality in specialist training, it is extremely important, especially in the present day, to be able to present the entire spectrum of the subject with its various facets. The professional exchange can of course take place in a wide range of specialist training events, but the practical application of theory is essential for a better understanding, for the integration of what has been learned into daily processes, and ultimately for the improvement of patient medical services.

Cooperation with other centers of excellence

Many departments are emerging as centers of excellence and are focusing on in-depth, solid expertise in specific areas.

The invention and application of light coagulation by Prof. Gerd Meyer-Schwickerath initiated the focus on retinology at the Department of Ophthalmology at the University Medical Center Essen (UME) back in the 1960s. In the decades that followed, this tradition in retinology was supplemented by further specializations in the treatment of diseases of the anterior segment of the eye, the orbit, and strabology. During their time at the UME, ophthalmology residents undergo a structured rotation in all areas of the Ophthalmology Department. Nevertheless, retinology and in particular the treatment of intraocular tumors [1] remains one of the main focal points of the UME, so that supplementing the range of specialist training offered to residents with a rotation in a university hospital that has a different focus brings enormous advantages not only for the residents, but also for the quality of care within the departments.

With 678 transplants in 2022 [8, 9], the Department of Ophthalmology at Saarland University Medical Center (UKS) is one of the leading centers for corneal transplants in Germany and, with the opening of the new LIONS corneal bank as part of the Klaus Faber Center for Corneal Diseases in

2019 [14], has the best basis for bringing together clinical and research activities and driving innovation in this field. In addition to 327 DMEKs, Homburg performs by far the most penetrating keratoplasty procedures in Germany ($n = 339$, especially as *à chaud* procedures for infectious keratitis and for very thinned corneas, and excimer laser-assisted re-keratoplasty procedures). Another focus is, for example, the treatment of keratoconus, for which the Homburg Keratoconus Center (HKC) has been a specialized facility since 2010, in which more than 2800 patients have been included to date, who regularly come to our corneal consultation hours for check-ups [11, 22, 23].

However, in order to provide future specialists with comprehensive and in-depth knowledge in other areas, the UME and the UKS have established a cooperation. The exchange program between Essen and Homburg provides for residents to visit each other’s hospitals as part of a 3-month exchange, during which they can learn more about the expertise of the respective center.

Our first parallel 3-month exchange for residents was carried out between February and April 2022 (■ Fig. 7a–c). The purpose of this program is to train each other in the renowned specialty of the other hospital. Such a cooperation between hospitals offers physicians the opportunity to gain an insight into the skills and organizational structures of other departments and thus acquire in-depth knowledge in other specialist areas. After a successful first exchange, the second exchange between UKS and UME followed in November 2022 and the third in February 2023.

Once dates have been agreed upon, the secretaries’ offices or personnel managers for the ophthalmology departments coordinate all administrative details, e.g., data protection guidelines, so-called transfer agreement between the departments, and access to IT. Accommodation must be organized for the time on site (with support from the respective department), a rotation plan (■ Fig. 8) is drawn up, and the resident is assigned a mentor, much like new residents, who is the contact person for this time and can provide assistance.

The resident visiting Saarland University Hospital is assigned to the cornea and



Fig. 7 ◀ Resident exchanges: first exchange, February 1 to April 30, 2022: **a** Prof. Seitz (Homburg) and Ms. Kurdiani from Essen, **b** Prof. Eckstein (Essen) with Mr. Maamri from Homburg, **c** Prof. Bechrakis (Essen) with Mr. Maamri from Homburg

refractive consultation hours most of the time. This also includes shifts in the operating theater to watch corneal surgeries, for example DMEK and penetrating keratoplasty as well as implantation of intra-corneal ring segments. The resident also has access to the wet lab at the Department of Ophthalmology in Homburg to practice corneal surgery on pig eyes.

The resident visiting Essen University Hospital will spend the majority of the time in the retinology and tumor consultation hours. Here, they will examine patients with various retinal and ophthalmological clinical pictures, make diagnoses, and indicate treatment with the senior physicians and the head physician. In addition, they are sometimes assigned to the operating room to observe procedures for tumor diseases, e.g., suturing and removal of applicators (brachytherapy), transretinal endoresection, transscleral resection, and tantalum clip surgery in preparation for proton beam therapy.

The mutual exchange can be beneficial not just for the residents who take part in it, but also for both departments, which can exchange experience and clinical standards and thereby grow together. In this way, joint SOPs as well as treatment and training standards can be developed.

Integrating virtual simulators into the curriculum of ophthalmology residents [4]

The integration of simulators from Haag-Streit (Mannheim, Germany) into the curriculum for ophthalmology residents offers several advantages. Nowadays, there is a growing interest among medical students in technical devices and virtual simulations as a complementary learning method. In addition, the quality of teaching is of great relevance in view of the demographic development and the relative shortage of young physicians and specialists, as only renowned good teaching can arouse interest in ophthalmology among students and practical-year students [19, 20] and ensure the medical specialist training of our young physicians. That is why now is the right time to integrate such devices into the existing curriculum.

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Homburg, 31.01.2023/LD

Prof. N. Bechrakis
Prof. A. Eckstein
Dr. M. Fiorentzis
Cristina Rastoaca

Timetable for the rotation in the Department of Ophthalmology
Cristina Rastoaca
In the period from 01.02. – 30.04.2023

Daily: Early morning meeting 7.30 – 8.00 Uhr (via TEAMS)

Monday: LIONS Cornea bank, Surgery, Project work

Tuesday: Keratokonus consultation, PKP follow-up care with senior physician Dr. Flockerzi and project work.

Wednesday: Outpatient department – Cornea consultation

Thursday: Surgery as well as seeing Keratokonus patients in the HKC/Ms. Lang

Friday: Outpatient department and if possible refractive consultation with senior physician Dr. Daas

Working on a project during the rotation – this is coordinated with Ms. Rastoaca on site.

Max Bofferding will be her mentor during her time in Homburg.

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Fig. 8 ▲ Timetable for the rotation of Ms. Rastoaca from Essen at the Department of Ophthalmology in Homburg as an example of a resident exchange



Fig. 9 ▲ The slit lamp simulator for evaluating the anterior segment of the eye as an additional, novel learning tool for medical students and residents alike

The *Eyesi slit lamp* (Haag-Streit, Mannheim, Germany) is a clinical simulator of the anterior segment of the eye that enables medical students and residents to examine rare cases without the need for real patients (■ Fig. 9). Students are often reluctant to ask questions openly regarding pathologies and their treatment in front of patients. The simulator removes this inhibition threshold. The simulator offers the opportunity to practice and master the skills required for the slit lamp examination. In addition, the simulation device is supported by case series and offers the opportunity to get to know different clinical pictures, which is often not the case in everyday clinical practice, as the corresponding patients are not always available on site. Similarly, the *Eyesi Indirect and Direct* simulators (Haag-Streit, Mannheim, Germany) allow medical students and residents to practice the basic skills required for posterior segment funduscopy, followed by memory exercises and case series with pathology [2]. The simulator also records factors such as the duration of the examination and the area of the retina illuminated/viewed to provide appropriate feedback and assessment. Trainees also have access to additional theory on *VRmNet*, which is an online platform.

The *Eyesi Surgical Simulator* (Haag-Streit, Mannheim, Germany; ■ Fig. 10a–c) offers residents and trainee microsurgeons the opportunity to learn basic skills, in-

cluding how to deal with complications, without putting patients at risk. The device consists of a simulation microscope and foot pedals as well as a separate screen as an interface. One of two supplementary heads with three additional instruments is connected to the base unit to start one of the two available cataract and vitreoretinal simulators. Both simulation modules allow the trainee to learn basic skills such as anti-tremor training and the sequence of microsurgical steps. On completion of each task, *Eyesi* provides trainees with a detailed evaluation of their performance. Required minimum scores and repetition of tasks promote a reproducible level of performance. Once the various skill-based courses are completed, the trainee can test their skills, as all steps are combined into a complete surgical procedure. The simulator also challenges residents to perform well in a competitive environment with global scores and percentile ranks.

Haag-Streit Simulation in Mannheim, Germany is currently developing a *keratoplasty simulator* (DMEK [21] and penetrating keratoplasty) in collaboration with the Department of Ophthalmology at the Saarland University Medical Center. This will give ophthalmology residents an additional advantage on their way to corneal surgery in the future. The conditions in the pig's eye are only comparable to those in the human eye to a limited extent. This simulator will be similar to existing surgical simulators. Its aim is to simulate certain steps that are difficult to practice on pig eyes as realistically as possible, so that a wet lab can only be seen as a supplement.

In addition to the clinical and surgical simulators, the *VRmNet* online portal is an integral part of the Haag-Streit Simulation training program. The portal provides trainees with access to a large amount of theoretical material integrated into the various devices. This allows trainees to deepen their knowledge and skills at their own pace and track their progress. The *VRmNet* portal also allows teachers to track their students' progress and support them where necessary. The portal includes a range of assessment tools, including virtual exams, quizzes, and case-based assessments. Overall, the *VRmNet* online portal is an essential tool in the

Haag-Streit Simulation training program, providing students with the theoretical knowledge they need and allowing teachers to effectively support and assess their students.

The integration of simulators from Haag-Streit Simulation into the training curriculum for ophthalmology residents offers several advantages: *in the same way that pilots use flight simulators to safely practice flying, residents and future microsurgeons can use the Eyesi simulators to acquire both diagnostic and surgical skills without the need for patients to be present and without jeopardizing patient wellbeing.*

End of training: medical specialist

After successfully passing the specialist examination, doctors who are motivated and would like to continue working at the university hospital can also deepen their specialist knowledge in one of the various subspecialties. In Homburg, for example, there is the Center for Refractive Surgery or the Homburg Keratoconus Center. Surgery and research days can also be scheduled in coordination with the needs of the department.

In addition, the Ophthalmology Department in Homburg supports the European specialist examination (Fellow of the European Board of Ophthalmology, FEBO) from the fifth year of training—also in preparation for the specialist examination [6].

Discussion

In light of the ongoing shortage of specialists, it is more important than ever that ophthalmology also offers comprehensive training to become a specialist. According to a survey by Hos et al. [15], only just under 50% of all respondents felt that their training was good. In 58% of cases, residents judged that the requirements of the training curriculum were not met.

As Geerling et al. [10] have already emphasized, “young physicians interested in ophthalmology are the future of our discipline. Providing them with the best possible training, and not just limited to a few individual cases, is our honorable duty, or rather our joyful ambition.”

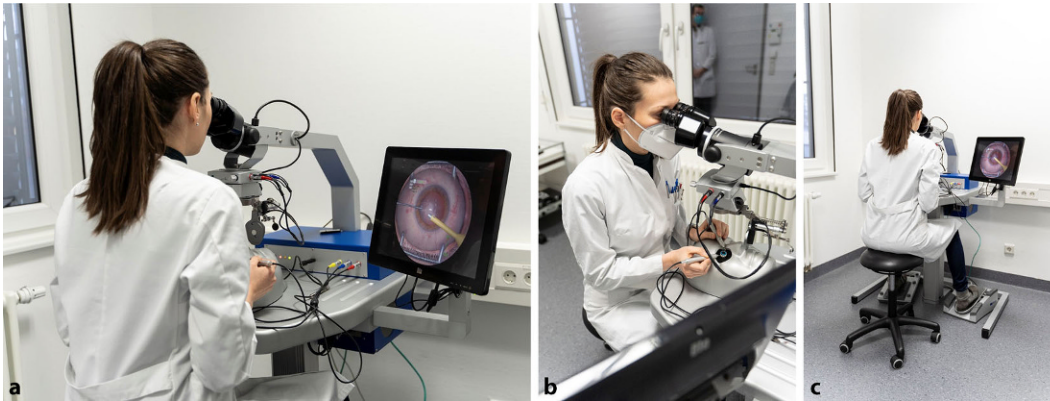


Fig. 10 ◀ a–c The Eyes Surgical Simulator is a clinical simulator to acquire surgical skills for both trainee microsurgers and residents

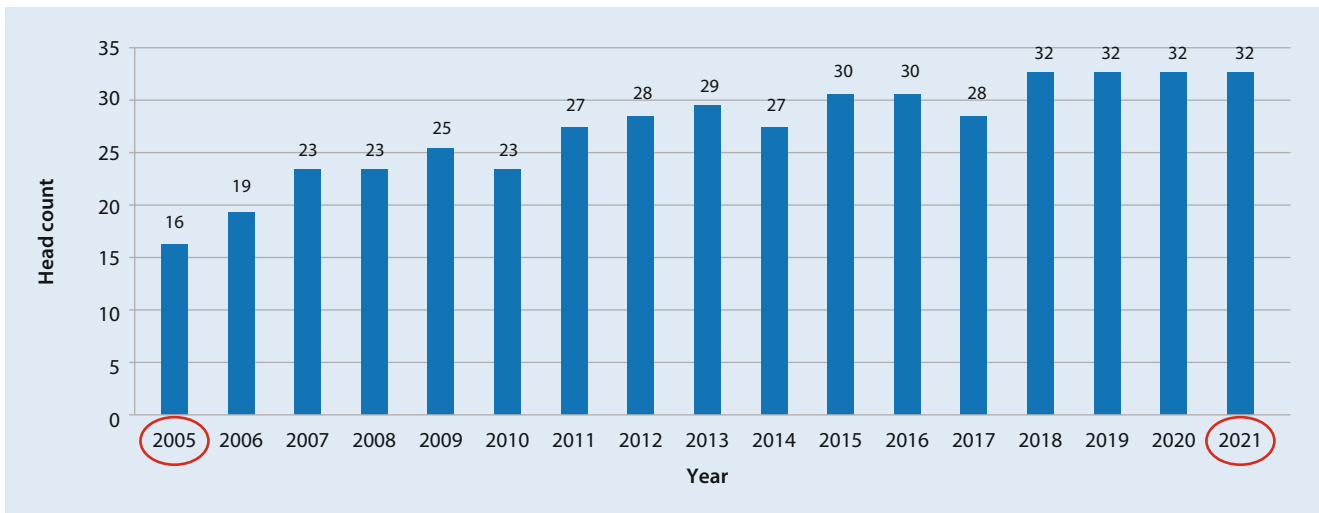


Fig. 11 ▲ Headcount of medical staff at the Ophthalmology Department in Homburg. The number of medical staff increased by 100% between 2005 and 2021

The Ophthalmology Department in Homburg has already restructured student teaching in the run-up to medical specialist training. The quality of the students' training also plays an equally important role, as described in an article by Prof. Käsmann-Kellner [16]. Since 2008, the "Eye Block at the UKS" has always taken place as a 1-week block course, which means that planning can be limited to 1 week, i.e., clinical operations are scaled back somewhat and teaching staff can plan better. Residents are better able to participate in teaching without it affecting their rotations. The students have a more intensive insight into the subject and can come into contact with the residents more easily. As with residency training, the department is also trying to break new ground here. For example, since COVID-19 times, lectures have been offered as online video lectures or hybrid

lectures. The department hopes that this will improve the connection between students and the ophthalmology department, with the aim of recruiting them for the practical year and thus ultimately attracting good new residents [5, 16].

» The use of the rotation plan provides residents with a fixed framework

On the part of the departmental management, the use of the rotation plan provides residents with a fixed framework, a clear structure, and thus the reassurance that they can definitely complete the various units and areas during the 5 years of their medical specialist training. The framework also makes it easier to plan specialist training courses in advance. On the other hand, the rotation plan provides the departmental management with an overview of when

the next resident position can be filled, and which physicians will be able to take their specialist examination in the near future.

A department that is well organized and works both transparently and reliably also ensures a more positive interpersonal climate and satisfied, motivated employees. Cohesion and a positive atmosphere in the team are important and promote good and smooth cooperation between residents. The role of the resident physicians' representative, who is loyal both to the residents as well as to the chairman and the hospital, also plays a very important role in this context. In the long term, a negative atmosphere will not go unnoticed by other employees. Since 2005, the number of medical staff has risen by 100%, which is without a doubt due not least to the structure and optimization of medical specialist training (■ Fig. 11).



Fig. 12 ▲ Overview of publications by the Department of Ophthalmology in Homburg since 2006

During the training period, new, innovative learning methods and internal specialist training offer future specialists a variety of opportunities to learn and deepen their skills. Through cooperation with other competence centers—such as the exchange between Essen and Homburg—the young physicians also benefit from specialist expertise in the competence areas. New approaches such as the use of simulators to recognize different clinical pictures without the need for “patient presence” provides residents with a safe environment at the beginning to familiarize themselves with the different and often very similar manifestations and symptoms of eye diseases. The use of such innovative learning methods can make the subject of ophthalmology more attractive, and a department can stand out as an innovative institution that moves with the times.

The more opportunities for knowledge transfer that are offered, the more in-depth the knowledge of the up-and-coming specialists will be. The more diverse range of training on offer makes a job more attractive for the new residents, and conversely, the department can ultimately benefit from specialists with a more solid level of knowledge.

The restructuring of specialist training is not only interesting at the Homburg department—a paper by Finis et al. reported in detail on the changes at the Ophthalmology Department of the Heinrich Heine

University in Düsseldorf [7]. The restructuring here was based on the introduction of an annual examination similar to the FEBO and numerous mini-exams as well as the switch to a curriculum with a team concept. One team each attended to patients with diseases of the anterior segment of the eye, posterior segment of the eye, or extraocular diseases, both as outpatients and inpatients. The first 3 years of training were the same for all residents. The final 2 years were distributed according to inclination and clinical capacity. This had the advantage that the individual wishes of the residents as well as those of the departmental management could be taken into account. However, an option as a stand-in was not possible in these circumstances. The disadvantage was that there were staff shortages as a result and residents often had to help out in the outpatient department instead of on scheduled operating days [7].

The introduction of stand-in rotations at the Homburg department means that up to three residents can be deployed as stand-ins per day. This means that no resident needs to be taken out of their current rotation in the event of (unexpected) absences. At least three stand-ins are required, as up to three (in exceptional cases four) residents may be on leave at the same time and the resident on night duty also has to be covered during the day.

Once the goal of excellent and comprehensive medical specialist training with research opportunities for all residents has been achieved, the next goal to strive for would be to achieve this in conjunction with a good work–life balance and good working conditions. Working at a large hospital does not only consist of clinical work with patients and night and weekend shifts—the job also includes organizational tasks such as planning and carrying out patient events, congresses, or ophthalmologic specialist training as well as supporting quality management and projects such as the introduction of electronic patient records [3, 17, 24, 25]. Furthermore, scientific work, including conducting studies and scientific writing, takes up a lot of time and previously had to be carried out mainly outside of clinical activities. The high density of residents in Homburg ($n = 22$; ■ Fig. 11) has for years allowed both the exchange with Essen and the establishment of a research rotation in which “high performers” can also work exclusively on scientific work during the day. Together with a functioning science management hub consisting of a secretary who speaks perfect English, an in-house (!) statistician, and three study nurses in an *Integrative Clinical Study Center (IKSZ)*—funded by the Dr. Rolf M. Schwiete Foundation—the scientific output shown in PubMed (■ Fig. 12) can be achieved as a team effort.

Practical conclusion

- Standardized residency training with a view beyond the horizon, which is organized transparently and carried out reliably, definitely improves the quality of training to become a certified ophthalmologist and increases the satisfaction of residents.
- Planning all vacations for all medical staff in October of the previous year at the latest is essential for planning security at all levels and in all areas!
- A department that is committed and can offer a wide range of services will benefit from motivated and satisfied employees in a good interpersonal climate, which ultimately benefits not only the team but also the patients.

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Ethics declarations

Conflict of interest. B. Seitz, C. Turner, L. Hamon, A. Sneyers, F. Alles, A. Maamri, S. Goebels-Kummerow, M. Fiorentzis and N.E. Bechrakis declare that there is no conflict of interest.

For this article no studies with human participants or animals were performed by any of the authors. All studies mentioned were conducted in accordance with the ethical standards indicated in each case. Written consent has been obtained from patients and/or their legal representatives for images or other information within the manuscript that can be used to identify patients.

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Führung in der augenärztlichen Ausbildung. Chancen und Risiken der Facharztweiterbildung

Die Facharztweiterbildung erfordert eine stetige Verbesserung und Anpassung der Inhalte an die aktuelle Situation. Junge Ärzte haben heute die Wahl, wo sie ihre Weiterbildung absolvieren, und suchen sich die für sie beste Stelle aus. Die Kliniken auf der anderen Seite haben nach wie vor den Wunsch, hoch qualifizierte Ärzte für die Facharztausbildung zu rekrutieren, was ein gutes, abgerundetes und verlässliches Angebot seitens der gut geführten Klinik erfordert. So ist unter anderem die moderne und mehrsprachige Homepage schon ein wichtiges Instrument, um Bewerber mit Erfolg anzusprechen und für die Klinik zu gewinnen. Neben einem gut geplanten und strukturierten Weiterbildungsplan (z. B. „Homburger Curriculum“) und einem sog. „Assistentenführer“ gehören heutzutage viele weitere zusätzliche Angebote zu einer gelingenden Weiterbildung, wie z. B. strukturierte interne und externe Fortbildungen, durchdachte Forschungskonzepte verfügbar für alle Interessierten, Wetlabs für praktische Übungen am Schweineauge und – als neueste, innovativste Ergänzung – ein Virtual-Reality-Simulator. Durch ein strukturiertes Curriculum mit regelmäßigen Fortbildungen in der täglichen Frühbesprechung und einem Austauschprogramm mit einer anderen Universitätsaugenklinik profitieren nicht nur die Assistenzärzte, sondern letztendlich auch die Klinik. Darüber hinaus werden die angehenden Fachärzte von Anfang an in die selbst betreffende Organisation (sog. „Service-Teams“) eingebunden. Damit wird ein großes Maß an Wissen und Fertigkeiten, aber auch Organisationsgeschick vermittelt und so die Qualität der Weiterbildung verbessert. Eine standardisierte Facharztweiterbildung mit Blick über den Tellerrand hinaus, die transparent organisiert ist und verlässlich durchgeführt wird, verbessert in jedem Fall die Qualität der Weiterbildung zum Augenarzt und erhöht die Zufriedenheit der Assistenzärzte. Eine Klinik, die sich engagiert und ein breit gefächertes Angebot bieten kann, wird in einem guten zwischenmenschlichen Klima von motivierten und zufriedenen Mitarbeitern profitieren, was am Ende nicht nur dem Team, sondern auch den Patienten zugutekommt.

Schlüsselwörter

Curriculum · Zufriedenheit · Augenheilkunde · Assistenzarzt · Austauschprogramm

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