

EMR installation report

Ophthalmology-driven EMR solution live in Vienna

Dr. Christoph Hackl, Consultant Ophthalmologist and Clinical Project Lead for the recent HEYEX EMR implementation in the Department of Ophthalmology at the Hanusch Hospital in Vienna (chaired by Prof. Oliver Findl), discusses lessons learned and steps ahead.

HEYEX EMR is a vendor-neutral electronic medical records (EMR) solution specifically developed for ophthalmology by Medisoft Limited, a Leeds-based software pioneer. Medisoft and its German parent company, Heidelberg Engineering, have recently completed a series of international HEYEX EMR installations exemplified by this Viennese eye department, the first Medisoft customer in Austria.

Dr. Hackl and his colleagues have now been using HEYEX EMR to manage their ophthalmic patient records for almost a year. The system gives them direct access to comprehensive documentation based on high-quality, structured patient data. Beyond the daily efficiencies of modern, paperless working, HEYEX EMR has allowed the team to gain new insights into treatment outcomes virtually at the push of a button.

Dr. Hackl, can you describe the general setup of your ophthalmology department and the general challenges you face?

The Eye Department of the Hanusch Hospital in Vienna is one of the largest in Austria. Last year we performed more than 10 000 ocular surgeries and more than 13 000 intravitreal injections. The Hanusch Hospital is owned by the ÖGK (Österreichische Gesundheitskasse), the largest Austrian public health insurance fund. The department also sees outpatients in four satellite locations across Vienna. In 2019, more than 76 000 outpatient contacts took place across our five sites. One of the main challenges in this setting is that many of our patients are seen in more than one location. For example, patients suffering from AMD or diabetic macular edema who are not in a treat and extend or *pro re nata* regimen are screened in one of the satellites. In case of recurrent macular edema or need for further intravitreal injections, they will be sent to the central Hanusch Hospital location for the next injection. Not only the patients travel from location to location but also the doctors. We were looking for continuous medical documentation for all patients who are seen at any of our five locations.



Prof. Oliver Findl (left), Chairman of the Department of Ophthalmology at Hanusch Hospital (Vienna, Austria), and Dr. Christoph Hackl, Consultant Ophthalmologist and Clinical Project Lead for the HEYEX EMR implementation.

“When a system like HEYEX EMR supports structured data, the possibilities to use the data are unlimited”

Dr. Christoph Hackl

How were you hoping HEYEX EMR might help with those challenges?

When the close collaboration with Hanusch Hospital and the satellite healthcare centers began in 2015, there was a need to exchange medical data within these five locations. At that time, our medical documentation for outpatients was still on paper. We already had different imaging platforms for our OCT, perimetry and biometry. There was a need to have a paperless medical record which could be seen in all five locations and met our main requirements: a continuous medical record, a patient summary for quick overview, as well as planning and documentation of intravitreal injections. We did a thorough market analysis and found HEYEX EMR to best meet our criteria.

Can you describe your role in the project and what your personal highlights have been?

My part in the project is as the interface between the clinical personnel, IT-staff and project management. I collected the requirements of the different stakeholders, communicating with doctors, nurses and other project team members. After that, I tried to help channel the decision processes and made training plans for the initial and testing phase. Most importantly, it was necessary to reassure colleagues during the roll-out phase. One of my personal highlights in the project was during the initial phase. This phase including the roll-

The screenshot displays the HEYEX EMR interface for patient Makula MUSTERMANN (Herr), born 30 Jul 1964 (54J), with patient ID 700100. The interface is organized into several panels:

- Wichtige Hinweise:** Overview of important notes, last updated 10-Jan-2020 15:29.
- Behandlungspfade:** Treatment paths including IVOM (last 03-Dec-2019) and Netzhaut (last 10-Dec-2019).
- Aktuelle Diagnosen:** Current diagnoses such as diabetisches Makulödem (29-Nov-2013).
- Geplante Prozeduren:** Planned procedures, currently none documented.
- Geplante Besuche:** Planned visits, next at Netzhaut - mit Arzt - Augenklinik (AUGHH) on 01-Jan-2020.
- Behandlungsplan:** Treatment plan for 10-Dec-2019 and 28-Oct-2019, detailing IVOM and RA Z.N. procedures.
- Augen-Przeduren (92):** List of eye procedures including IVOM Ozurdex, IVOM Triamcinolon, Pars plana Vitrektomie, and extrakapsuläre Kataraktextraktion.
- Augenanamnese:** Eye history including IVOM Ozurdex, IVOM Triamcinolon, and Pars plana Vitrektomie.
- Krankengeschichte:** Medical history, currently none documented.
- Aktuelle Medikamente:** Current medications, currently none documented.
- Diabetes:** Diabetes status, currently none documented.
- Visual Acuity Charts:** Two line graphs showing visual acuity (Rechts and Links) over time from 2018 to 2020. The right eye shows a range from 0.125 to 0.25, and the left eye from 0.125 to 0.25.
- Andere Messungen:** Other measurements, currently none recorded.
- Gesamanzahl IVOM:** Donut charts showing the total number of IVOM injections for the right eye (50) and left eye (42).
- Aktuelle Befunde:** Current findings for 10-Dec-2019, detailing findings for the right and left eyes, including clear cornea, deep anterior chamber, pseudophakia, and vitreoretinal findings.

HEYEX EMR interface in German, as used daily at Department of Ophthalmology of the Hanusch Hospital in Vienna, containing all relevant patient-information such as medical history, eye procedures, visual acuity, current medication.

out to all clinics, which lasted about five months. We started using HEYEX EMR in a relatively small casualty outpatient clinic in Hanusch Hospital to see how it worked in daily routine and to allow many of the doctors to become acquainted with the software. We planned more than six weeks for this initial phase. Then we introduced the system in one specialized clinic after the other until it was running in the entire outpatient clinic in Hanusch Hospital and the four satellite clinics – and it worked. We were able to handle the whole implementation without great problems and nearly everyone got used to the new digital documentation within quite a short time. It was a tough time, but I would never have thought that everything would run so smoothly.

Have you seen a learning process within the clinical and non-clinical team members?

The core project team includes around five to six people. For most of them this project has been a new situation. The scope of the project was larger than any other software project our department had done until then. It was a learning process for all of us. The only team member who had significant experience in his role was our project manager, who has been leading IT-projects in the Austrian healthcare system for several decades. We are very happy to have him because he kept his structured way of thinking even in complex situations.

As a clinician, what are the main benefits you expect to see from structured data?

One of the biggest opportunities brought by digitization and interconnectivity is the possibility to work with data once it has been entered in a system. EMR systems based on unstructured data allow you to copy blocks of text for medical reporting, so that the writing of letters is speeded up and easier for the users. However, when a system like HEYEX EMR supports structured data the possibilities to use the data are unlimited. There are simple things, like IOP-curves or VA-charts that can be viewed in real time. Diagnoses and activities can be recorded in a semiautomated manner and sent to the billing system. But there are also much more complex use cases, for example the link between treatment procedures and visual acuity progression or correlation between different cataract data (e.g. axial length, type of cataract, phaco power) and surgical outcomes. The better the quality the structured data entered, the more possibilities and granularity are available for reporting and auditing.

Can you describe how HEYEX EMR fits into your retina/injection pathway? How has it helped you to improve patient care?

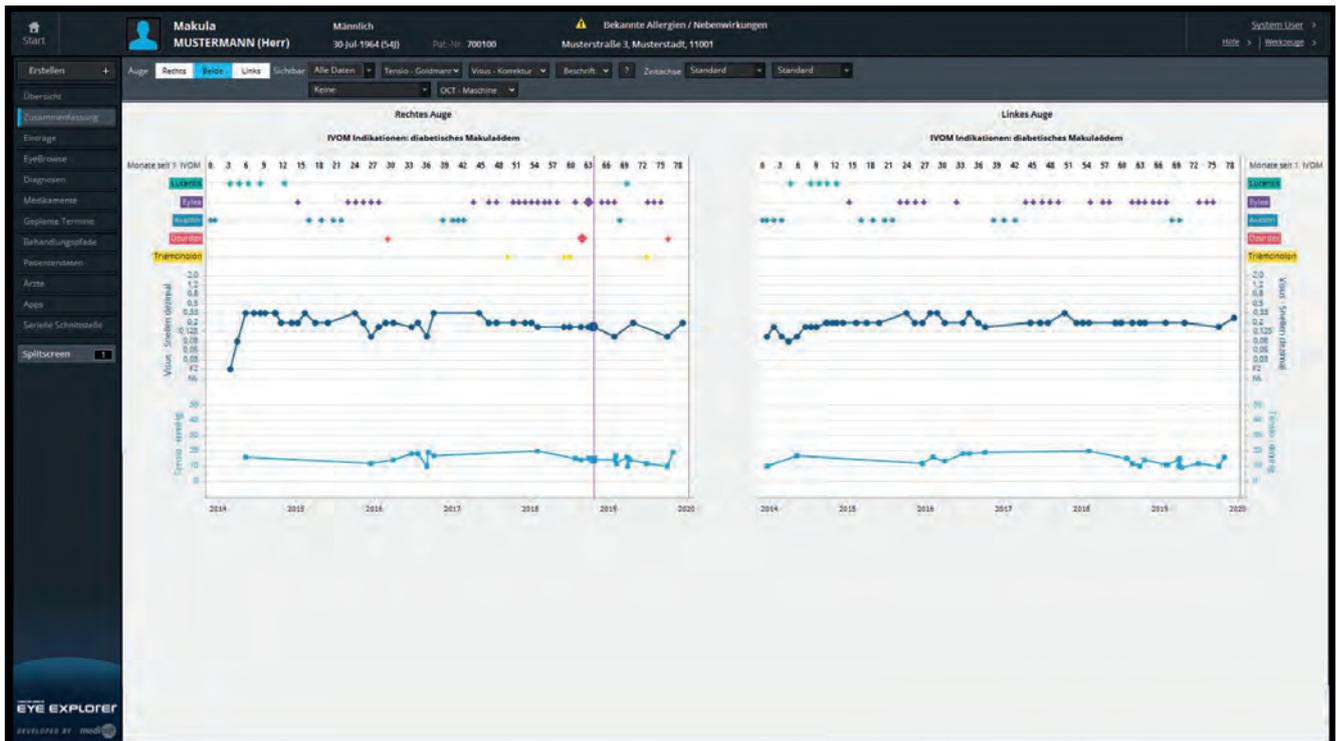
In our retina and injection clinic, we have the ubiquitous challenge of ensuring adequate care for the increasing number of patients who need regular injections, in addition to the other retina clinic patients. The number of injections we give has increased by more than 15% per year over recent years. We have always tried to improve our processes to provide the best care to our

patients. This has also contributed to an increase in patient visits.

In the months before we started using HEYEX EMR in the retina clinics, I was worried about how we would be able to manage the high patient numbers. After some smaller manageable problems during the starting phase, we are now documenting all our retina patients in HEYEX EMR and it was possible to keep up with increasing patient numbers. HEYEX EMR allows us to document more than 95% of our IVI-OP notes with fewer than 10 clicks per patient and provides a good solution for different treatment protocols (treat and extend or *pro re nata*). Now that nearly all of our retina patients have been seen at least once since we started using HEYEX EMR and have been entered into the system, we are now more efficient and have a better overview of what has happened and what needs to be done for the individual patient.

What have been the most important challenges during the implementation?

When we started thinking about going paperless, I underestimated the size of the project and how long we would have to plan to get started. One of the most important challenges was to ensure that the different clinics would still be able to work together. It is important to get input from staff working in different clinics to anticipate problems that may arise with new software. A department of this size has many legacy processes which have been the same for years or even decades. Going paperless provides the chance to improve processes; however, it may also risk blocking other processes that have



Graphic representation of a diabetic patient's course of injections combined with VA and IOP information, conveniently presented in HEYEX EMR.

become crucial for the clinic workflow. To get an overview of all these processes, collating them and reorganizing them was a challenging and important part of this project.

What makes the biggest difference for doctors, nurses and other users when using the system?

They had to stop writing on paper and start using their keyboard and mouse for the entire patient exam. Also, due to several process changes in the department, they had to adapt to a new workflow. One example is that we used to have different stacks for our paper files. Depending on the next step in the examination flow, the paper file was put on a different stack. There was one stack for patients that needed to receive eye drops from a nurse, another one for patients that needed to have an OCT, and another one for patients to be seen by the doctor. The paper file was transferred between different stacks during each appointment.

We implemented a clinic worklist that is visible to all participating staff. This worklist is part of HEYEX EMR and for all patients, all steps can be defined as they go through their appointment. For example, patient A is scheduled to go through the following steps: arrive – visual acuity exam – receive dilating eye drops – macular OCT – see the doctor –

discharged. All these steps have time stamps, so all staff can see the next step for patient A and how long they have been waiting. All these steps can be filtered by all staff involved so that each contributor can build their personal worklist.

There are many other processes within our clinic that have changed similarly, so there was a lot to learn for our staff. One further development we would welcome and have already communicated to Heidelberg Engineering and Medisoft, would be the ability to analyze the bottlenecks in the different clinics causing longer waiting times in the different clinics. Ideally, this would be visible live, allowing staff to resolve these bottlenecks for a more efficient workflow.

Do you think the implementation of HEYEX EMR has prepared the department for future challenges? Which other technology-related plans do you have?

The implementation of HEYEX EMR in Hanusch Hospital and in the four satellites has changed the way we work in our daily routine. Many things run more smoothly and some things are now more time-consuming than before. With HEYEX EMR we wanted to build a solid IT-basis for further IT-process optimisation within our clinic. As a next step we want to start the integration of more devices and third party

systems. At the moment, we have connected our autorefractors and phoropters to HEYEX EMR. The connection of our non-contact-tonometers is coming with the next update. Thinking about future device and system integration, there are three types of connections: devices sending just numeric data (e.g. autorefractors, non-contact-tonometers), devices sending images with or without numeric data (e.g. slitlamp-cameras, OCT) and third party software accessing further devices (e.g. Zeiss Forum, Haag-Streit EyeSuite). Connecting most of our devices and systems to HEYEX EMR will be the next step in our project and we are looking forward to making it happen.

In the medium term, we hope to be able to run virtual clinics in cooperation with referring ophthalmologists using an upload feature for clinical data and images - especially OCT - which would decrease the number of patients that visit our clinics. Also, adding artificial intelligence systems to aid diagnosis is a field of interest to us.

Last but not least, we are looking forward to using the HEYEX EMR audit functionality to be able to assess further the quality of our work and benchmark ourselves with others. Also, contributing to big data in Europe has much potential for the future, especially when using a software such as HEYEX EMR that uses primarily structured data.