Dear Colleagues,

Welcome to a very special edition of Cleveland Clinic Cole Eye Institute’s Ophthalmology Update. This issue delivers to you our perspective on the undeniable assimilation of electronic medical records (EMR) into the practice of ophthalmology.

In these pages, we provide you with a 360-degree view of what the integration of EMR means to our area of medicine. As a leading academic eye center, Cole Eye Institute is taking a national leadership role in adapting the technology advantages of EMR into improved clinical workflows, faster and easier documentation, and ultimately a better patient experience. Our practice has seen these benefits of this new system each and every day.

We’ve collected the perspectives of staff across our practice to bring you a closer look at the far-reaching implications of EMR. Some of those perspectives include:

- A view from our community practices, about connecting a smaller practice with a large one
- The perspective of a nurse who works in a high-volume practice, to teach about how the whole medical team works together to realize all the benefits that EMR has to offer, including how EMR helps optimize insurance reimbursements
- Details about the unique integration of imaging results into the EMR system
- A thought piece on how the vast amount of data now harvested as a result of EMR can be used to inform the future practice of ophthalmology

- How all this interconnectivity facilitates our work with other specialists treating our common patients for a variety of other conditions that may manifest themselves first in the ophthalmologist’s office

You will also find an update on the two-year results from the Comparison of AMD Treatments Trials (CATT). And you will find the other information that you have come to rely on from this publication, such as CME opportunities, our staff listing (including some new faces) and an overview of our staff’s recent publications. If you have additional thoughts on Ophthalmology Update, please do not hesitate to contact me at ophthalmologyupdate@ccf.org.

Sincerely,

Daniel F. Martin, MD
Chairman, Cole Eye Institute
Innovations

Defining what makes us different
Electronic Medical Records: The Future Is Now

Like it or not, electronic medical record (EMR) systems are slated to become commonplace in ophthalmology over the next few years, regardless of practice setting, geographic location and subspecialty focus. Our field in particular faces significant obstacles to widespread adoption, based on the unique features of its practice. For example, in just the management of age-related macular degeneration, monthly patient visits are commonplace and result in the accumulation of large amounts of diagnostic and procedural documentation over the lifetime of the patient. In addition, ophthalmologists are used to manual entry methods such as hand drawings of pathology, which is poorly emulated in current EMR systems.

These obstacles and others are the reasons why adoption of EMR systems has been poor. In 2006, the American Academy of Ophthalmology’s (AAOs) survey of its members found a 12 percent adoption rate of an EMR system, compared with a 17 percent adoption rate for physicians across all other medical specialties. A reason often given for not adopting EMR is the cost of implementing the system. Health Information Technology for Economic and Clinical Health’s $27 billion grant might help offset some of these costs, but there is no textbook or preferred practice pattern to go by on how to begin this process.

At Cleveland Clinic, we have successfully implemented an EMR system within our practice. This discussion will focus on the pearls of the process, such as identifying essential functions to look for in vendor products and tips on the implementation process.

Both Sides of the Coin – The Pros and Cons of Adoption

The addition of EMR has some significant advantages. The level of compliance with time stamps, procedure documentation and security measures increases greatly with EMR. Most EMR systems have predefined documentation for common ophthalmic procedures, and it’s important when evaluating the system to compare these to your local carrier or CMS guidelines to see if they match up. When under the scrutiny of an audit, the EMR system can be a lifesaver. Many EMR systems allow for the documentation of normal values for the specific eye fields, and components can be globally modified with a keystroke. For example, when an audit showed another practice lacked a particular exam component, we could implement a change in the EMR template within a day.

Having the records available anywhere and anytime really helps with patient care. According to the AAO, 45 percent of ophthalmologists work in multiple offices; when EMR is in place, patient care is informed and updated regardless of location. Consequently, medical record storage costs decline considerably with EMR. When integrating values such as intraocular pressure, corneal thickness and other quantitative measurements, the EMR permits trending of patients over time, allowing for a much more comprehensive evaluation of disease progression. (see article on page 12)

Finally, EMR allows for the determination of practice efficiencies and pitfalls. For example, we can allocate clinic resources such as space and tech coverage based on reports on previous technician and clinic performances. Our system has been able to drill down to determine how long technicians take to work up...
Choosing the right system is only half of the job, and the implementation can make or break your conversion.

But with as many advantages EMR offers, there is a balance of significant drawbacks. Whatever you think you will save by converting from paper charts (storage fees, personnel for records management) will be offset by information technology maintenance, high-speed Internet lines, and electronic backup and storage. Expect monthly or yearly software upgrades with the expected bugs, annoyances and potential downtime. Keystroke entry is virtually universal so you must be a proficient typist. The temporary decrease in efficiency and lost revenue on the initial implementation are sometimes too much for practices to bear.

Choosing the Right System for You

The first item to consider when choosing the proper system is to make sure that you are receiving a government-certified product (see cchit.org/find). Consider whether to partner up or go it alone. Local hospital systems may offer usage of their EMR for a nominal charge, but few have ophthalmic-ready systems. A better option might be to share the cost of the IT system or bargain collectively with another nearby practice when dealing with the EMR vendors.

When evaluating a system, determine the level of customization needed. Does the EMR mimic your workflow or practice pattern? Do the items within the EMR represent all the specialties within your practice? Some EMRs are specialty-specific even within ophthalmology. Finally, visit your colleagues who have successfully implemented a system to understand what their real experience has been. We visited many sites prior to finalizing our choice to seek out the features and functions that we wanted to implement within our own system.

Putting Your System to Work

Choosing the right system is only half of the job, and the implementation can make or break your conversion. Assembling a multidisciplinary team composed of a physician, technician, biller/coder and administrator is a good first step. Walking through the EMR workflow with this team can help in troubleshooting early problems. Consider choosing a lower-volume time of year to make the switch, to reduce the economic impact of the implementation process.

We chose to down-book by 25 percent for the two-week duration of the go-live in order to give our physicians adequate time to acquaint themselves with the system. By bringing the clinical volume back to normal levels quickly, we found that many physicians began to employ workflow efficiencies in order to keep pace.

When considering big-bang rollouts versus gradual implementations, we chose a more gradual approach that allowed us to troubleshoot the workflow, off-load patients to another provider and train technicians by rotating them through the clinic prior to their go-live. Scribes are an important consideration for any practice. Every study performed has shown that the utility of scribes decreases significantly as the practice becomes more familiar with the EMR system. Thus, we chose to hire additional technicians to serve as physician extenders within the clinic.

Conclusions

With all the pitfalls and efforts needed to navigate the process, why would practices choose to go forward? Having three years of experience using Cleveland Clinic’s EMR system has taught me how invaluable it can be. Patient calls can be answered quickly and efficiently. I’m communicating more than ever with referring and primary care physicians. I can perform chart reviews and clinical research studies within days and not weeks. Lastly, patients have now come to expect information on demand, which EMR systems allow. This ready access to their records has enabled patients to become better partners in their care.

Contact Dr. Rishi P. Singh at ophthalmologyupdate@ccf.org.
Imaging Solutions in the Age of EMR

Ophthalmology is becoming more and more of an image-driven subspecialty. Recent developments in diagnostic testing, such as optical coherence tomography (OCT), guide management decisions and enhance our diagnostic capabilities. This significant influx of testing can lead to information overload if the data is not presented to the clinician and handled in an appropriate way. In many practices, this may simply involve printing a report. However, the utility of printed reports is limited because paper limits the accessibility and functionality of the reports. In the age of EMR, an electronic image archiving and display system is the logical solution for most practices.

Three common ophthalmology imaging solution suites are Zeiss FORUM,® Merge Eye Care (OIS) and ANKA EyeRoute. These three packages provide digital alternatives for publishing reports from diagnostic devices. Each of these systems has advantages and disadvantages. Functionality also continues to evolve with the deployment of EMR. Many practices converted to electronic image display solutions long before converting to an EMR system. The integration between imaging solutions and EMR systems is an active area of development and progress.

The imaging system utilized at Cole Eye Institute is Zeiss FORUM. Nearly all our diagnostic reports are stored and displayed within this system. This includes OCT, photography, angiography and visual field testing. The comprehensive nature of this package provides the clinician with a practical interface that enhances workflow, facilitates optimal interpretation and allows integration of test results, such as visual field and OCT correlation.

In addition, we have elected to utilize this system throughout our satellite network. The servers that provide the data for the software system communicate with all the community locations. This system gives the clinician access to a test performed at one location even when the patient is seen at another.

Data integrity is also a critical component for any EMR and imaging solution. One important enhancement to the consistency of patient identification and labeling is the multidirectional communication among the EMR system, the diagnostic device and the imaging solution. In our current system, an order is placed within the EMR system and then is transferred to an electronic work-list. The diagnostic device is able to pull the order from the work-list with the patient’s identifying information already populated from the EMR system. Following the diagnostic procedure, the reports are then published to the image viewing software. This ensures a seamless transition from the EMR to the imaging solution, helping to eliminate transcription errors and variability in data entry.

When making the transition to a digital interface, access to previously collected data and test reports is an important consideration. A practice must consider the practical aspects of importing previous diagnostic studies and how far back to go when including such studies. If data is not included, an archiving solution needs to be in place to provide a backup if older data is needed.

The communication and interface for opening reports between the EMR system and imaging solution software also varies from system to system.
In some packages, there is no direct way to open diagnostic testing within the EMR system. Others use a link that opens the imaging solution program and the patient’s information with a single mouse click. Finally, some packages have the reports embedded within the EMR system itself. All these features can potentially impact workflow and should be considered when selecting an imaging solution.

A final consideration is how to display diagnostic reports. As our clinical practices have become more imaging-centric, the interface for the clinician as well as for the patient becomes important. Often, clinicians will review the testing with the patient directly. The ease and flexibility of the display system is vital, particularly when many patients may be dealing with visual impairment. Possible solutions include tablets, iPads, laptops, large-screen monitors and dual-monitor systems. The choice certainly comes down to practice style and personal preference. The type of imaging used and the patient population may impact which solution fits best for a given practice.

The options for the imaging solutions will continue to expand. These software packages enhance patient care and improve communication between offices and physicians. There is often a significant initial learning curve during which efficiency may initially suffer. However, the advantages of an electronic display system over paper records are significant. Careful preparation and research regarding the system that best fits your practice’s requirements can help dramatically ease the transition.

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Newly Developed System Is Bringing Far-Reaching and Unexpected Benefits

Better overall medical care, a new perspective on the whole patient and improved access for referring physicians are just three of the ways the new electronic medical record system has improved Cole Eye Institute, says Peter K. Kaiser, MD, a staff member of the vitreoretinal faculty of the Cole Eye Institute at Cleveland Clinic’s main campus.

It has also helped involve patients in their own care and has made billing more accurate and timely. Judging from the feedback from other institutions, it would be fair to say that Cleveland Clinic’s new system is raising the national standard of ophthalmic care.

It wasn’t always this way.

“In ophthalmology we’ve been reluctant to embrace EMR,” says Dr. Kaiser. “Our charts are visually based, and the traditional EMR system only allowed data. Ophthalmologists need to make drawings of the eye to create the visual history that is critical to the therapeutic plan. Until now, inserting drawings into an electronic record was all but impossible.”

Cole Eye Institute’s new EMR platform easily allows the incorporation of graphics (see related articles in this issue) and facilitates the move from paper charts to the computer. Designed within the institute by a group of staff, the platform sits on top of the common and widely used Epic EMR system.

“The standard Epic EMR is text-based and not graphical, so it wouldn’t have worked for us,” says Dr. Kaiser.

A Bright New Window on the Whole Patient

The new system allows an expanded level of interaction between ophthalmologists and other providers, which is core to the collaborative practice of medicine at Cleveland Clinic.

“It isn’t just the eyes that concern us, it’s the whole patient,” says Dr. Kaiser. “An ocular issue in a diabetic patient can now be shared in real time with that patient’s endocrinologist, internist, cardiologist and nephrology team. Having a single, all-inclusive medical record is much more than just a nicety; it opens important new channels to provide patients world-class care.”

The federally mandated medicine reconciliation is a perfect example. Reconciliation was very difficult to accomplish on paper but with the advent of EMR is now very easy. The electronic record maintains a real-time history of the patient’s medication orders and helps avoid omissions, duplications, dosing errors and drug interactions. Refills are sent electronically to the patient’s pharmacy, eliminating transcription errors.

Improving Information Flow at Satellite Locations

In the past, a Cleveland Clinic ophthalmologist seeing a patient at a community location did not have complete access to the thorough and descriptive imaging that was available at the main campus. EMR has changed that, and not just for remote locations. Now, any doctor who participates in Cleveland Clinic’s MyPractice online referral and patient monitoring system
can review all charts and images from any connected location. “The more information that’s available, the better the medical decisions,” says Dr. Kaiser. This is especially beneficial in emergency situations, which can happen at any time of the day or night.

Opening New Channels with Referring Doctors
Communication with referring doctors can now be maintained more easily, and can be updated far more quickly.

“We can now send referring doctors electronic images. If, for example, we have a patient with a macular hole, we can image the macula before and after surgery and update the referring doctor almost in real time electronically,” says Dr. Kaiser. “This improves our communication and creates opportunities to further improve patient care,” he adds. “The referring doctors can see exactly what we did and why since they can see patient records. This also can help ensure that patients return to their referring doctor for follow-up care.”

Better Care from the Patient’s View
Patients who use Cleveland Clinic’s web-based MyChart to track their medical care can now be kept more current, more easily. In the past, no patient had access to ophthalmology-related tests. The new EMR system allows ophthalmologists to make a variety of information available to MyChart. Test results and other relevant data can now be released electronically, allowing connected patients to access it at will.

“This gives patients a sense of involvement in the dynamics of their own care, which is very empowering. They can track their progress in therapy, and this tends to improve their outlook, which is therapeutic in itself,” he says.

Eliminating Billing and Insurance Errors
Financial efficiencies are built into the new system. “It’s a huge plus to be able to make sure that everything we order and interpret is billed appropriately,” says Dr. Kaiser. “With paper this was often complicated, and, quite frankly, sometimes we missed things for which we should have billed.”

The new system has automatic drop-down menus to remind the doctor to interpret tests. Once the interpretation is completed, the billing automatically goes out to the patient’s insurance provider. It’s an efficient system in which little falls through the cracks.

“For those of us who are very busy, it’s nice to have someone looking over our shoulder to make sure we’ve done everything that’s required,” he says.

Setting a New National Standard
The new EMR system is setting a new national standard. “Other eye institutes around the country have tried to use the stock Epic system with limited success; they’ve lost productivity and suffered decreased patient volumes without improving patient care,” says Dr. Kaiser. “We didn’t want to follow in their footsteps. Our system is light years ahead of where we started.”

As word of the new system gets out, many eye institutes using Epic have approached Cleveland Clinic’s Cole Eye Institute to learn more. Cleveland Clinic is sharing its knowledge, the better to improve patient care nationwide.

Dr. Peter K. Kaiser can be reached at ophthalmologyupdate@ccf.org.
Building the Toolbox – Essential Features and Functions in EMR Systems

Good features can significantly smooth the bumpy road to EMR adoption. Adding customized, intuitive functions within an EMR system can improve your workflow and practice efficiency. When Cleveland Clinic’s Cole Eye Institute first made the transition to EMR, our group spent several months evaluating several systems to find just the right tools.

By Rishi P. Singh, MD

Even if specific capabilities weren’t initially within the system, we worked with the vendor and our own IT people to create and implement those special features. These can be broken down into three distinct groups: improving the user experience of both providers and support staff; improving the billing capture and process; and integrating outcomes, administrative tasks and research activities.

Improving the User Experience

Ergonomics is a key element in facilitating user adoption and acceptance of any EMR system. By incorporating the largest monitors possible, we were able to distribute a significant amount of information across a larger space. We added personal computers to the hallways to mimic the normal workflow where a physician reviews the chart before entering the examination or procedure room. Placing printers in the hallway minimized the distance that physicians had to travel for printed prescriptions and patient instructions. All of these enhancements made it easier for physicians to adapt to the new EMR workflow.

Drawing is a mainstay of ophthalmology practices. We first created newer pictures to represent the portions of the eye that needed or required documentation. We were able to create numerous stencils for each of the drawing photos that allowed for both annotation of the image and insertion of text into the same exam field of the patient, eliminating duplication of work. The drawings could be placed within the chart, pulled forward to a new encounter for modification or even added to a letter to another provider.

We improved the letter-writing and documentation capabilities of our system by implementing letter templates with drop-down menus for quick annotation. By adding an autocorrect feature to our system (converting common abbreviations such as OD to right eye), we were able to better communicate to other physicians without ophthalmic backgrounds what transpired with the patients. Finally, by adding the capability to fax letters directly from the EMR, our physicians could maintain faster contact with referring providers and their staff.

Improving Billing Capture and Process

The number of procedures and diagnostics in ophthalmology has drastically increased over the past few years. Take for example the use of intravitreal injections for eye disease. In the past five years, the number of times that procedure is done has quadrupled. Increased volume has made it difficult to track procedures and submit charges in an efficient fashion.

We implemented a charge-on-completion system which has improved our billing compliance, led to significantly improved documentation of patient
testing and procedures, and increased our efficiency in billing and reimbursement for professional fees.

Here’s how it works: The physician places an order for the procedure or diagnostic test. The order then generates a form for the physician to fill out. After the physician electronically signs the form, the charge is submitted with the specific procedural or diagnostic code to our billing team for review. Once reviewed electronically, the biller can submit the charge to the local carrier for processing. This has streamlined our billing cycle from weeks to two days. It’s also decreased the potential for miscoding since it has completely eliminated manual entry. Finally, it allows for a transparent review of the indication and necessity of the procedure.

Integrating Outcomes, Administrative, and Research Activities with the EMR

Since 2005, all Cleveland Clinic institutes have participated in a patient outcomes reporting initiative. Until recently, the outcomes data has been compiled using manual entry and physician reporting, both ways by which reporting biases could be introduced. When we developed the entry system for our EMR, a conscious effort was made to use discrete documentation whenever possible. For example, few areas in the system have plain-text boxes for entry. Rather, buttons and checkboxes are used to document imaging, procedures and exam elements. This allows us to collect outcome metrics in an almost completely automated fashion.

In addition, by using the discrete elements within our system, we created additional data streams that determine a multitude of administrative and research functions. For example, we can now monitor our usage of supplies in real time to determine whether our pharmacy needs to be restocked. We can evaluate the wait times by ophthalmology specialist line in an effort to maintain the proper technician-to-physician ratios. Finally, our practice has been able to monitor the frequency of use of our lasers and diagnostic modalities so we can adjust schedule templates to maximize patient flow. Research has become easier, with only a few clicks necessary to analyze multiple patient charts rather than the arduous process of chart retrieval and review. (See article on page 15 for a nurse’s perspective.)

Overall, these features have allowed for the ongoing evaluation and management of the physician and patient experience and will lead to future enhancements of both functions.

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Patient History an Open Book - a Bonus of Record Systems

Community ophthalmologist Michael Millstein, MD, says Cleveland Clinic’s EMR system provides a complete picture of a patient’s medical history. “When we open an electronic chart, we finally can see the patient’s entire medical history. We don’t have to ask over and over what happened in the past. Everything is there in detail, and it’s all legible,” he says.

Because all Cleveland Clinic physicians share the same system, each patient has a single chart. When one of Dr. Millstein’s patients is seen by a colleague, he now has access to details about the patient encounter.

“It’s a great educational opportunity. I can read in depth what my colleague was thinking, what tests were done and why, and what the results were. It helps me to better learn about the disease process and enables me to take better care of the patient,” he says.

Improving Speed and Safety
When the EMR is opened to a patient’s chart, the first screen offers a menu of tabs for the typical workflow aspects of an ophthalmology patient visit, including medications, allergies and reasons for being seen. The information is filled in by typing or by choosing from drop-down menus of the most-utilized medications and most common allergies and complaints.

“I can review the medication list with a patient and not worry about whether they forgot to tell me about a medication or don’t know a dosage. This is because the list not only includes prescribed medications but an active list of recently filled medications from their pharmacies,” he says.

When he covers for a colleague, he no longer worries about misreading a medication order. Moreover, the system sends warnings about potential drug-drug interactions and allergies. “It definitely helps prevent mistakes,” he says.

Better Documentation
Sophisticated graphics software allows the ophthalmologists to document ocular diseases by selecting a preset stencil and drawing the pathology with a mouse or copying and pasting from a menu of images. For a patient with macular degeneration, for example, Dr. Millstein simply clicks on drusen and drops them on the image. All prior images are stored for comparison, allowing progress or lack of progress to be tracked over time.

For a physician who describes himself as “extremely detail-oriented,” the EMR facilitates thorough documentation that is guaranteed to be legible.

“I have horrible penmanship. So do my partners. At times it is difficult to decipher each other’s handwriting,” he says.

“The EMR lets me enter notes in a way that can be neatly reviewed and printed out. It takes a little longer initially, but it is legible. The next time I see the patient, I simply call up the last assessment and plan and make quick changes based on that day’s visit,” he says.

Dr. Millstein can send these notes electronically to the inbox of any other physician using the system, improving physician-to-physician communication. For those doctors outside of Cleveland Clinic’s system, letters and notes can be directly faxed from the EMR system.
Coding goes more quickly, because the most commonly used diagnoses can be selected from tabs on the screen. Patients can be rapidly provided with instructions.

to their office, and the system retains their mailing addresses, fax numbers and office locations. “We don’t have to engage our secretaries nearly as much for dictation or correspondence because of our system.”

Coding goes more quickly, because the most commonly used diagnoses can be selected from tabs on the screen. Patients can be rapidly provided with instructions: Dr. Millstein may type a very brief “smart phrase” consisting of only a few letters, and the system populates the discharge section with detailed instructions. One more click, and the information is printed. “It’s very useful. It helps me make sure a patient has critical instructions,” Dr. Millstein says.

Nearly Perfect
Cleveland Clinic continues to refine the EMR system developed at Cole Eye Institute. Software was recently added that allows the storage of images from diagnostic testing modalities such as optical coherence tomography, visual fields and ocular photographs and complex ocular measurements for cataract surgery. And while Dr. Millstein laughingly calls himself “a data-entry individual,” he says it’s all worth it.

“I find I access the system at home every day to communicate with staff or residents or check when a patient needs a new prescription. It’s an important part of a modern practice,” he says.

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EMR Facilitates Communication and Improves Treatment of Uveitis

By Sunil Srivastava, MD

Caring for patients with uveitis often requires a multidisciplinary team - an ophthalmologist, a rheumatologist and often other providers - to ensure a coordinated effort. At Cole Eye Institute, implementation of an EMR system has improved the care of these complex cases and opens the door for coordinated care and research activities.

Three ophthalmologists care for patients with uveitis, and the rheumatology section includes 12 adult providers and three pediatric providers. Additionally, the pulmonary, neurology and infectious disease services are often consulted to assist in the care of uveitis patients. Prior to EMR, communication among the services was adequate – emails, printed letters and phone calls were primarily used to discuss cases. However, the inability to read the other findings and plans limited each particular service’s ability to assess the patient. It was also apparent that providers may not have understood what was needed or what to look for in a specific patient. The review of laboratory tests and images was tedious and sometimes incomplete. Most important, tracking the success or failure of various immunosuppressants was difficult since endpoints were embedded within visits and not summarized.

With the implementation of a shared EMR chart between ophthalmology and non-ophthalmology providers, both communication and care for patients have improved considerably. Sharing of notes and letters between providers can be accomplished while evaluating a patient, often with one or two clicks. If the providers aren’t part of Cleveland Clinic’s system, the letters can be faxed directly to the providers’ offices, keeping them in the loop of ongoing findings and treatments. Often clinical care decisions can be made very quickly as providers receive messages, with instant transfer of information. Additionally, the ability to view each other’s clinical exams and notes without having to decipher handwriting has improved clinicians’ understanding of what the other team is looking for when making decisions for these patients. Finally, our clinicians can now track ophthalmic endpoints graphically over time as a method of determining response to treatments and procedures.

Improving our ability to track outcomes of patients is the next step of implementation. Shared patients with uveitis are now easily identified and screened for visual outcomes and for potential enrollment in clinical trials. A common outcome form is under development between services to serve as a shared measure of disease severity and to track successes or failures with particular drug regimens. Patient registries are also under development to allow tracking of particular subtypes (e.g., pediatric uveitis patients) to assess quality and successful visual and systemic outcomes. With imaging being linked to EMR, a large database of complex diseases with outcomes data is under construction, which will allow an improved understanding of this complex disease.

Overall, EMR in its current form has improved care for our patients with complex inflammatory disease. In the future, EMR will continue to facilitate improvements in our understanding of these diseases through research and clinical outcome measurements. ■

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Ophthalmic Nurse Uses EMR in Every Aspect of Her Work

Cole Eye Institute’s EMR system has not just improved the workflow of the ophthalmologists and optometrists on staff but also the daily work of nurses and technicians.

Tiffany Rodstrom, RN, a five-year veteran of Cole Eye Institute who works primarily with a retina specialist, says the system reduces problems with unclear plans from previous visits. “Prior to EMR, it was difficult to tell what tests the doctor wanted performed on the next visit; and EMR has helped tremendously in this regard because the future visit plans are concise and easy to understand.” It also improves communication between the providers and their secretaries, surgical schedulers, referring physicians and other departments.

Although some staff members were wary of the changes initially, she says most like it now. Rodstrom had previously been through another EMR implementation, and during this implementation process, she worked closely with the information technology team as the system was developed. “With my previous role as a certified ophthalmic technician and now as a nurse, I used my knowledge to help customize our EMR system and streamline our patient exams,” she says.

One of her favorite features is the ability to add ophthalmic drawings, previously done by hand, into the EMR. “We added stencils that annotate the drawing and put information into the exam (saving the physician steps). The drawings are improved, allowing for clearer communication about our findings,” she says.

She finds that the EMR particularly boosts efficiency in Cole Eye Institute’s busiest services. With some of the specialists seeing 70 or more patients a day, about half of whom need some form of diagnostic testing, moving them all through and documenting their exams, procedures and diagnostic interpretations is crucial. The “Study Review” module, a feature that tracks all procedures and diagnostic tests a patient has undergone, was made available in the EMR and is very helpful, she adds.

“We’ve added buttons for documentation of exams and procedures, vs. traditional manual entry, which increases our ability to document in a clear, compliant and concise fashion,” she says. “As part of this, we created 104 custom smart forms and 180 order sets to help us make our workflow efficient.”

Rodstrom says she uses the EMR in every aspect of her work: rooming of patients, phone encounters, patient care issues and documentation of instructions to patients. Although scribes are not part of Cole Eye Institute’s overall approach to EMR, Rodstrom occasionally fills that role as well in the course of her daily work. She adds that utilizing the system has made patient handoffs to other technicians or doctors much easier, thereby improving the overall patient experience.

Contact Tiffany Rodstrom, RN, at ophthalmologyupdate@ccf.org.
EMR Boosts Compliance and Captures Charges

For Nandini Surender, a reimbursement manager at Cleveland Clinic’s Cole Eye Institute, the transition to an EMR system has improved many aspects of her work. “It has greatly increased our surveillance of billing, compliance and documentation. With no bad handwriting to interpret or missing signatures, the billing staff feels that the process has become a lot more efficient and standardized,” she says.

And with customized snapshots that provide detailed history of a patient’s last surgical procedure or diagnostic test, her team can process all visits without any paper. “It’s all right in front of them,” she says. “They don’t have to search or wait for it.”

The EMR system has made capturing charges a much more streamlined process, Ms. Surender says. When all Cole Eye Institute billing was done via paper tickets, some diagnostic tests did not get billed if the ticket was misplaced. Her team spent many hours a day manually keying information into a separate billing system. Now, the system bill is created when the ordering physician signs off on the results (adding an extra level of assurance that all tests are accounted for prior to the bill being submitted). Similarly, for treatments, providers enter what they have done and link the treatment to a diagnosis. This process, a first anywhere in Cleveland Clinic, automatically drops all charges into a tank for her team to review before sending them out to insurance companies for reimbursement.

“We are no longer losing revenue when paper gets lost or waiting days to submit claims,” says Ms. Surender, who has worked on billing at Cole Eye Institute for about 10 years. “And we are easily capturing 15 percent more charges as a result of the new system,” she says. “I am very particular about compliance and this really helps improve our work,” she adds.

Ophthalmology is unique in the frequency of tests and treatments being performed during the same patient visit; almost 50 percent of patients will have a diagnostic test or procedure done during a visit. A major problem in eye care is that the employees who perform the billing function do not sit with the providers and do not always know what services were provided to the patient and whether those procedures were completed.

The EMR lets the billers visualize charts on a real-time basis and see everything that was done. They no longer have to chase the doctors around to fill in any blanks. All the components they need to submit proper billing are right there. And in the case of an audit or denied claim by an insurance company, the charts can be queried with the push of a button.

Another advantage EMR has provided Ms. Surender’s team relates to the increased presence of Cole Eye Institute in community facilities. It’s not uncommon for staff physicians to travel between two offices each week. Prior to EMR, patients who alternated the location they went to didn’t have a complete chart. In addition, her billing counterparts in the community couldn’t see what was being performed in other offices. Now, with EMR, seamless care can be provided everywhere, greatly enhancing the patient experience.

Nandini Surender can be reached at ophthalmologyupdate@ccf.org.
In 1993, at the age of 29, life brought Ms. Hardesty face to face with an almost universal fear: going blind. Previously enjoying good vision, Ms. Hardesty was shocked to learn that she had presumed ocular histoplasmosis and was bleeding internally in her right eye. She has endured multiple surgeries in order to stabilize her condition.

Her retina specialist now treats her with monthly ocular injections of Lucentis® and multiple topical drops. Keeping track of the details of all these conditions and all other medications and treatments Ms. Hardesty has for other conditions is simple with Cole Eye Institute’s EMR.

When considering the savings in both money and time that EMR systems provide to patients and health systems alike, Ms. Hardesty speaks without hesitation: “Golly, I can’t imagine what the savings will be. It’s great for patients who don’t have to keep repeating tests when they go from place to place, not to mention how much the hospitals probably save from maintaining all those records.”

She adds that long wait times are a thing of the past - in some cases, the doctor has been waiting to see her, rather than Ms. Hardesty having to endure sometimes hours-long waits to see a doctor due to nonemergency scheduling issues.

Karen Hardesty is a self-professed computer geek. That’s one part of the reason why she sees tremendous value in the migration to electronic medical record systems. The other reason is that she’s had to endure a long history of ophthalmic procedures over the past 20 years.

“We really don’t enjoy being tested,” she says from her perspective as a patient. “And the cost is a stress, too - especially for people who don’t have insurance, like I didn’t for some time during all this.”

She relates that one of her first doctors used his collection of colored pencils to draw her macula on her paper charts. No longer is this the case with EMR. Ms. Hardesty says that special functions of the EMR preclude the use of colored pencils - the only implements needed are a keyboard and a mouse.

And, she adds, wherever she goes, her records - in full - are present. Requesting records and giving patients access to their own records are also a snap. When Ms. Hardesty needed letters to her employer, they were given to her the same day since they could be generated within the EMR quicker than sending the request to a transcription service. Since Ms. Hardesty is so comfortable with computers, she is happy about the efficiencies the EMR brings. Cleveland Clinic’s MyChart online portal for patients allows access to test results and important reminders for complete patient care. She adds that long wait times are a thing of the past - in some cases, the doctor has been waiting to see her, rather than Ms. Hardesty having to endure sometimes hours-long waits to see a doctor due to nonemergency scheduling issues.

“Not only are all my records available when I see any specialist I may need to see, but I like to look at what they are looking at.”
Investigations
Striving for Answers
CATT Second-Year Results Show Lucentis and Avastin Produce Similar Results

In the ongoing Comparison of AMD Treatment Trials (CATT) drug-comparison study, Cleveland Clinic researchers found that bevacizumab (Avastin®) is equivalent to ranibizumab (Lucentis) in the treatment of wet age-related macular degeneration (AMD) through two years.

The study also showed that monthly dosing produced slightly more vision gain than as-needed dosing. But the final visual results were similar in all treatment groups, regardless of dosing frequency, with 60 percent or more of the patients achieving driving vision.

“Both drugs were highly effective regardless of the approach to dosing,” says Daniel F. Martin, MD, study chair for CATT and Chairman of Cole Eye Institute. “There was slightly less vision gain with as-needed treatment. However, patients seeking the small extra advantage of monthly treatment need to be mindful of the additional burden, risks and costs of monthly injections. Since as-needed dosing required 10 fewer eye injections over the course of two years and yielded similar visual results, many patients may choose this option.”

Ten years ago, 60 to 70 percent of patients with wet AMD were legally blind in two years. Due to the powerful therapeutic effects of the drugs studied in CATT, only 5 to 10 percent of patients are legally blinded from AMD today.

However, prior to the results of this trial, doctors did not know the optimal way to use these drugs or whether one drug was better than the other.

Over two years, the rates of death, myocardial infarction and stroke did not differ between drugs. In the first year of the study, there was a higher rate of nonspecific serious adverse events for bevacizumab-treated patients than for ranibizumab-treated patients, and this difference persisted in year two. However, the importance of this difference was unclear.

Serious adverse events occurred at a 40 percent rate for patients receiving bevacizumab and a 32 percent rate for patients receiving ranibizumab. Although bevacizumab had a higher rate of serious adverse events, they were distributed across many different conditions, most of which were not associated with bevacizumab when evaluated in cancer clinical trials.

In conjunction with the clinical findings from this study, the cost differences between treatments may have implications for both patients and physicians. One dose of ranibizumab costs approximately $2,000, while bevacizumab costs about $50 per dose. Both drugs are manufactured by Genentech.

“In 2010, ranibizumab accounted for nearly 10 percent of the entire Medicare Part B drug budget, its single largest expenditure,” write the study authors. “As the treatment of patients continues indefinitely, the cumulative financial burden to third-party payers and patients will only increase.”

Funded by the National Eye Institute, as part of the National Institutes of Health, CATT seeks to compare the relative safety and effectiveness of the two drugs in treating wet AMD. Ophthalmologists began using bevacizumab while awaiting FDA approval of ranibizumab because of the drugs’ structural similarities. Bevacizumab, approved by the FDA for treating colorectal cancer, has been widely prescribed off-label by ophthalmologists to treat AMD since 2005.

More information is available at clevelandclinic.org/CATT.
Clinical Trials
The following studies are either currently enrolling new patients or are pending approval by the Institutional Review Board and should be enrolling shortly.

**Retinal Diseases**

Investigator-Initiated Observational Study of Intravitreal Aflibercept Injection for Exudative Age-Related Macular Degeneration Previously Treated with Ranibizumab or Bevacizumab

**Objective:** Observational study to assess the efficacy of intravitreal aflibercept injection in subjects previously treated with Ranibizumab or Bevacizumab on central retinal thickness as measured by spectral domain optical coherence tomography (SDOCT).

**Contact:** Rishi P. Singh, MD, 216.445.9497, or Stephanie Bennett, 216.445.6497

Fluocinolone Acetonide Intravitreal Inserts for Vein Occlusion in Retina (FAVOR)

**Objective:** This study will assess the safety and efficacy of fluocinolone acetonide intravitreal inserts in subjects with macular edema secondary to RVO.

**Contact:** Peter K. Kaiser, MD, 216.444.6702, or Gail Kolin, RN, 216.445.4086

Home Vision Monitoring Using the Foresee Home Device Following Treatment of Neovascular Age-Related Macular Degeneration (CNV)

**Objective:** The purpose of the current study is to evaluate if, in post-treatment patients, parameters as measured with the Foresee Home Device are in agreement with clinical decisions and retinal characteristics as measured with optical coherence tomography (OCT).

**Contact:** Rishi P. Singh, MD, 216.445.9497, or Sonal Uppal, PhD, 216.444.7137

**Uveitis**

A Proof-of-Concept Study of Intravitreal LFG316 in Patients with Multifocal Choroiditis (MFC)

**Objective:** The study is designed to provide information on the safety, tolerability, pharmacokinetics, pharmacodynamics, and efficacy of successive intravenous (IV) doses of LFG316 in eligible patients with neovascular age-related macular degeneration (AMD).

**Contact:** Sunil Srivastava, MD, 216.636.2286, or Laura Holody, 216.445.3762

**Pediatric Eye Disease**

Bilateral Lateral Rectus Recession Versus Unilateral Recess-Resect for Intermittent Exotropia (IXT1)

**Objective:** The purpose of this study is to evaluate the effectiveness of bilateral lateral rectus muscle recession vs. unilateral lateral rectus recession with medial rectus resection procedures for the treatment of strabismus.

**Contact:** Elias Traboulsi, MD, 216.444.4363, or Sue Crowe, RN, 216.445.3840

Increasing Patching for Amblyopia in Children 3 to < 8 Years Old (ATS15)

**Objective:** This study is designed to evaluate the effectiveness of increasing prescribed patching treatment after visual acuity has stabilized with initial treatment and amblyopia is still present.

**Contact:** Elias Traboulsi, MD, 216.444.4363, or Sue Crowe, RN, 216.445.3840
**Genetics**

Molecular Genetics of Eye Diseases

**Objective:** The objective of this project is to study the molecular genetics of ophthalmic disorders through the compilation of a collection of DNA, plasma and eye tissue samples from patients and from families with a broad range of eye diseases and malformations.

**Contact:** Elias Traboulsi, MD, 216.444.4363, or Sonal Uppal, PhD, 216.444.7137

**Cornea/Refractive Surgery**

LASIK Flap Thickness and Visual Outcomes Using the WaveLight FS200 Femtosecond Laser

**Objective:** To evaluate the visual outcome, accuracy and predictability of LASIK flap thickness using the new WaveLight® FS200 femtosecond laser and compare these results to those obtained using the IntraLase™ FS60 femtosecond laser.

**Contact:** Ronald Krueger, MD, 216.444.8158, or Laura Holody, 216.445.2264

Long-Term Safety Follow-up for Subjects Previously Implanted With The AcrySof Cachet Phakic Lens in Clinical Studies C-02-23, C-02-40, C-03-21 and C-05-57

**Objective:** To estimate the annualized endothelial cell loss rate (for up to 10 years following date of implantation) of subjects previously implanted with the L-series AcrySof® Cachet™ Phakic Lens from clinical studies.

**Contact:** Ronald Krueger, MD, 216.444.8158, or Laura Holody, 216.445.2264

**Other Open Studies**

Safety Study of a Single IVT Injection of QPI-1007 in Chronic Optic Nerve Atrophy and Recent-Onset NAION Patients (NAION)

**Objective:** This is an open-label, dose escalation, safety, tolerability and pharmacokinetic study, where the active study drug (QPI-1007) will be given to all patients who participate. This study will determine whether QPI-1007 is safe when it is injected into the eye. The study will also reveal if there are any side effects of the drug and how long it takes for the body to clear the drug.

**Contact:** Rishi P. Singh, MD, 216.445.9497, or Laura Holody, 216.445.2264

The following studies have completed patient enrollment in the last year at Cole Eye Institute and are in follow-up:

- Comparing the Effectiveness of Treatment Strategies for Primary Open-Angle Glaucoma
- A Phase II Dose-Ranging Study of Pazopanib to Treat Neovascular Age-Related Macular Degeneration (GSK AMD)
- Infant Aphakia Treatment Study (IATS)
Cole Eye Institute Publications


Am. J. Pathol.

Anesthesiology


Arch. Ophthalmol.


Arthritis Care Res.(Hoboken)


*Br J Ophthalmol.*


*Br J Ophthalmol.*


*Exp Eye Res.*


Expert Opin Biol Ther.


Expert Opin Pharmacother.


Future Oncol.


Int Ophthalmol Clin.


Invest Ophthalmol Vis Sci.


J AAPOS


J Biol Chem.


J Cataract Refract Surg.


Mol. Vis.


Martin DF, Maguire MG, Fine SL. The authors reply [Ranibizumab and bevacizumab for AMD]. N Engl J Med. 2011 Dec 8;365(23):2237.

Nat.Med.

Neuron


Ocular Surgery News


Ophthalmic Genet.

Ophthalmic Surg.Lasers Imaging


Ophthalmology


Orbit

Plast Reconsr Surg

PLoS ONE


Retina


Retina Today

Ehlers JP. Intraoperative OCT and vitreoretinal surgery: This technology has the potential to improve clinical outcomes and enhance understanding of the pathophysiology of a wide variety of surgical vitreoretinal diseases. Retina Today. 2011 Sep;50:53.


Rev.Bras.Oftalmol.
da Silva RS, da Silva JAS, de Lima FB, Val-bon BF, Salomao MQ, Junior RA. Estudo das correlações entre a área do disco óptico e as características geométricas e biomecânicas da córnea [Study of correlation between optic disc size and corneal geometry and biomechanics] [Portuguese]. Rev Bras Oftalmol. 2011 Nov;70(6):349-357.


Saudi Journal of Ophthalmology

Semin.Oncol.
Clinical atlas of procedures in ophthalmic and ocular facial surgery


BOOK CHAPTERS

Age-related macular degeneration diagnosis and treatment


Clinical atlas of procedures in ophthalmic and oculofacial surgery


Gass’ atlas of macular diseases


Macular Surgery


Ophthalmic Surgery: Principles and Practice


Ophthalmology Review Manual


Pediatric Retina


Phacoemulsification


Studies on Retinal and Choroidal Disorders


Surgery of the Eyelids, Lacrimal System, and Orbit


Uveitis


Wills Eye Institute 5-Minute Ophthalmology Consult

Education
Helping Professionals Develop
Cole Eye Institute CME

Mark your calendars for continuing medical education symposia hosted by Cole Eye Institute. You’ll gain insights into state-of-the-art diagnostic, medical and surgical techniques, as well as the promise that research holds for patients with ophthalmic conditions.

Ophthalmic Ultrasonography: Practical Aspects
For ophthalmologists, optometrists, nurses, technicians, photographers and others
Friday-Saturday, March 15-16, 2013
Location: InterContinental Hotel and Conference Center, Cleveland, Ohio
Activity Directors:
Arun D. Singh, MD
Brandy Hayden

Uveitis Update
Saturday, April 20, 2013
Location: Cole Eye Institute
Cleveland, Ohio
Activity Directors:
Careen Lowder, MD, PhD
Sunil K. Srivastava, MD

Retina Summit
(date pending for May 2013)
Location: Cole Eye Institute
Cleveland, Ohio
Activity Directors:
Daniel F. Martin, MD
Sunil K. Srivastava, MD

International Society of Ocular Oncology (ISOO 2013) - NON-CME
Sunday - Thursday,
September 29 - October 3, 2013
Location: InterContinental Hotel and Conference Center, Cleveland, Ohio
Activity Director:
Arun D. Singh, MD

Most CME courses will be held at the Cole Eye Institute’s James P. Storer Conference Center. For details, exact location or to confirm dates for any of our 2013 CME courses, please contact Jane Sardelle at sardelj@ccf.org.
Training the Leaders of Tomorrow

Residency and fellowship training is considered a high priority at Cleveland Clinic Cole Eye Institute and is led by outstanding faculty in a state-of-the-art facility. Our programs are highly competitive and produce superbly trained clinical and academic ophthalmologists.

Residency Programs

Our residency training program’s mission is to prepare future leaders in patient care, teaching and vision research. The program meets all the requirements of the American Board of Ophthalmology and the Accreditation Council for Graduate Medical Education.

Four residents are matched annually in the three-year program. Residents rotate among the Institute’s nine departments and at MetroHealth Medical Center, Cleveland Clinic Lakeland and Cleveland Clinic Stephanie Tubbs Jones Health Center. Residents work under the direct supervision of the staff during each rotation through:

- Cornea, external disease, anterior segment
- Glaucoma
- Neuro-ophthalmology/oncology
- Ophthalmic pathology
- Ophthalmic plastic, reconstructive and orbital surgery
- Pediatric ophthalmology and adult strabismus
- Refractive surgery
- Retina, vitreous, low vision
- Uveitis, ocular inflammatory disease and immunology

This curriculum provides a balanced exposure to all subspecialty areas of ophthalmology, ensuring graduates the ability to perform general ophthalmology with skill, knowledge and confidence. Each resident works in a one-on-one relationship with a staff physician to provide the best opportunity to study disease processes and their medical and surgical management. This arrangement also provides excellent supervision and optimal continuity of patient care in the outpatient and hospital settings.

Residents are expected to participate in clinical and basic research activities utilizing the staff’s expertise. They complete independent clinical research projects that involve reviewing the literature, developing a hypothesis, and designing and executing the study. Activities are carefully supervised by an experienced clinical investigator. Residents are expected to submit and present their research at national meetings and to write several papers for publication based on their research activities. Each June, ophthalmology residents, fellows and staff participate in the Annual Research, Residents and Alumni Meeting, a scientific forum for the presentation of research projects.
Residency Graduates
June 2012
Baseer Ahmad, MD
Eric Ahn, MD
Theodore Pasquali, MD
Xiang Werdich, MD, PhD
Breno Lima, MD
(February 2012)
Aimee Chappelow, MD
(December 2011)
Residents, First Year
July 2012 – June 2013
Katie Hallahan, MD
Priyanka Kumar, MD
Tal Rubinstein, MD
Jack Shao, MD
Residents, Second Year
July 2012 – June 2013
Jedediah McClintic, MD
Stephen McNutt, MD
Karolinne Rocha, MD, PhD
Georgios Trichonas, MD
Residents, Third Year
July 2012 – June 2013
Elisabeth Aponte, MD
John Au, MD
Igor Estrovich, MD
Sumit Sharma, MD

Fellowship Program
We offer high-quality fellowship training opportunities in a variety of subspecialties to create the next generation of academic leaders in their fields. Training combines an excellent academic environment with close mentorship support.

Fellowships include:

- One-year glaucoma fellowship (one position)
- One-year pediatric ophthalmology fellowship (one position)
- Two-year oculoplastics fellowship (sponsored by ASOPRS) (one position)
- One-year ophthalmic oncology fellowship (one position)

Fellowship Graduates
June 2012
Cornea, External Disease and Refractive Surgery
Michael Savetsky, MD
Brent Timperley, MD
Glaucoma
Phyllis Eze, MD
Ophthalmic Oncology
no fellow
Pediatric Ophthalmology
Virginia Utz, MD
(August 2012)
Vitreoretinal Surgery
Dilsher Dhoot, MD
Alex Yuan, MD, PhD

Current Fellows
July 2012 to June 2013
Cornea, External Disease and Refractive Surgery
Patrick Chan, MD
Neema Nayeb-Hashemi, MD
Glaucoma
Elisa Bala, MD
Oculoplastics
Bryan Costin, MD
Pediatric Ophthalmology
Virginia Utz, MD
(August 2012)
Palak Wall, MD
Vitreoretinal Surgery
Robert “Jack” Courtney, MD
Miriam Engleander, MD
Matthew Ohr, MD
Omar Punjabi, MD

For more information about Cole Eye Institute fellowship programs, visit clevelandclinic.org/eyefellowships or contact Jane Sardelle at sardelj@ccf.org.
Distinguished Lecture Series

The Cleveland Clinic Cole Eye Institute is proud to present the 2012-2013 Distinguished Lecture Series, which provides a forum for renowned researchers in the visual sciences to present their latest research findings. This series of lectures will feature advances in many areas of ophthalmic research presented by noted basic and clinical scientists from throughout the world. Ample opportunity for questions and answers will be provided.

January 17, 2013
Discovery of New Glaucoma Pathogenic Pathways
Abbot Clark, PhD
Professor, Cell Biology & Anatomy
Director, North Texas Eye Research Institute
University of North Texas Health Science Center
Fort Worth, Texas

February 21, 2013
Mitochondrial Dysfunction: A Potential Mechanism for Age-Related Macular Degeneration
Deborah Ferrington, PhD
Associate Professor
Departments of Ophthalmology and Visual Neurosciences
University of Minnesota
Minneapolis, Minn.

March 14, 2013
The Role of the Choriocapillaris in Early AMD
Robert Mullins, PhD
Hansjoerg E.J.W. Kolder, MD, PhD
Associate Professor of Best Disease Research, Department of Ophthalmology & Visual Sciences
University of Iowa
Iowa City, Iowa

April 18, 2013
Genetic Control of Angiogenesis: Implications for ARMD
Robert D’Amato, MD, PhD
Judah Folkman Chair in Surgery
Professor of Ophthalmology
Harvard Medical School
Vascular Biology Program
Boston Children’s Hospital
Boston, Mass.

May 16, 2013
Global Blindness: Can We Control It?
Gullapalli Rao, MD
Chairman, LV Prasad Eye Institute
LV Prasad Marg Banjara Hills
Hyderabad, Andhra Pradesh
India

September 19, 2013
Responding to Clinical Need: Taking OCT Imaging Beyond Standard Clinical Applications
Cynthia A. Toth, MD
Professor of Ophthalmology and Biomedical Engineering
Duke University Eye Center
Durham, N.C.

October 17, 2013
The Hypoxic Response: Sought and Dreaded by the Retina
Christian Grimm, PhD
Professor for Experimental Ophthalmology
Department of Ophthalmology
University of Zurich
Schlieren, Zurich
Switzerland

November 21, 2013
Leukocytes Take Directives from the Extracellular Matrix in Ocular Infections and Inflammation
Shukti Chakravarti, PhD
Associate Professor
Departments of Medicine, Cell Biology and Ophthalmology
Johns Hopkins University
School of Medicine
Baltimore, Md.

Please join us for these insights into ophthalmic research and the promises they hold for patient care. No registration is required; call 216.444.5832 with any questions.

The Distinguished Lecture Series is held from 7 to 8 a.m. in the James P. Storer Conference Center on the first floor of Cole Eye Institute. Attendees should park in the East 102nd Street parking lot (facing the front of Cole Eye Institute) or the visitor’s parking garage at East 100th Street and Carnegie Avenue. We will validate your parking ticket.

Cleveland Clinic Executive Education
Learn from Top Healthcare Executives

The competencies needed to lead and manage differ from those needed to be an effective administrator, clinician or scientist. Take advantage of this opportunity to acquire skills and insights into the business of healthcare excellence from top executives at Cleveland Clinic.

Two-day and two-week programs are open to healthcare executives, including physicians, nurses and administrators. Visit clevelandclinic.org/ExecutiveEducation for details, including the opportunity to earn 72.5 CME credits.
Cole Eye Institute Overview

At Cleveland Clinic Cole Eye Institute, we have assembled a team of the world’s foremost clinicians and researchers who are committed not only to delivering the finest healthcare available, but also to improving tomorrow’s care through innovative basic, clinical and translational research.

We believe that research and patient care are interdependent. Therefore, we forge synergistic relationships through analytical and integrative processes, such as surgical outcomes analysis. We are pioneering treatment protocols for complex vision-threatening disorders through our clinical trials and aggressive research programs to shorten the gap between the laboratory discoveries of today and the patient care of tomorrow. Our goal: Answering tomorrow’s medical problems through today’s laboratory and research endeavors.

Clinical Expertise

As one of the country’s leading comprehensive eye institutes, Cole Eye Institute is able to enhance the lives of our patients and to serve our referring physicians by providing early, accurate diagnosis and excellent, efficient, state-of-the-art care.

Our ophthalmology program was ranked among the top 10 programs in the nation in the most recent annual U.S. News & World Report survey. We have one of the largest patient volumes in the United States, with more than 180,000 patient visits and more than 7,500 surgeries per year.

We offer primary, secondary and tertiary ophthalmologic services for all ages. Our internationally recognized staff of 45 ophthalmologists and researchers is composed almost entirely of subspecialists, and eight optometrists round out our comprehensive services.

Patient-Centered Facilities

Cleveland Clinic Cole Eye Institute offers state-of-the-art care at our main campus and in the community. The goal is to deliver maximum patient comfort and optimum service and quality. Our main campus building allows us to provide the full spectrum of clinical services at one location.

Exam lanes, a diagnostic services suite and operating rooms are all housed in one building, with features such as:

- Windows with special filters to minimize light on dilated or newly treated eyes.
- A comfortable waiting room with a special play area for children.
- Valet parking and an easy postoperative pickup area.
- Conveniently located food services.

For patients’ convenience, our regional eye care program provides both general ophthalmology and selected specialty services at a number of locations.

Fostering Innovation

Our institute is specially designed to enable clinicians to develop tomorrow’s advances. Our facility includes an Experimental Surgery Suite, one of the few in the country with full operating capacity.

Training future eye specialists is greatly enhanced in the Education Pavilion with the James P. Storer Conference Center (designed with televideo technology), as well as video rooms, resident carrels and ample conference space.
Cole Eye Institute Outcomes

Clinical outcomes allow us to understand and objectively measure the success of our surgical results. Cole Eye Institute recently released its 2011 Outcomes book. This is the sixth year we have shared our clinical outcomes with referring physicians, alumni and potential patients around the country.

Almost all the surgical procedures performed at Cole Eye Institute have been tracked and reported. Because Cole Eye Institute is a regional, national and international referral center, many of our patients are followed by their local ophthalmologists, and the data do not include patients who are not followed at Cole Eye Institute.

The scope of the Cole Eye Institute outcomes project is significant, our approach is innovative and, in spite of the complexity of cases and sometimes the absence of a defined benchmark, our outcomes are exceptional. Our physicians strive to push the boundaries of science and technology to provide excellence for our patients. We hope that by reviewing and analyzing information, we will continue to improve and offer patients superior clinical outcomes.

How We Measure Up

Our key evaluative measures continue to be visual acuity and the rate of surgical complications, and we continue to use ETDRS protocol refraction as the means of measuring visual acuity. The key measurement variables are mentioned under each section of the Outcomes book.

In addition to measuring clinical outcomes, world-class customer service is very important to us. Consequently, we have spent significant time understanding patient flow process and experience. We continue to seek best-practice measurement processes for both clinical and administrative areas. We strive to set the standard for excellence through innovation and consistent follow-up and measurement to evaluate our overall clinical proficiency.

The Outcomes book has data from across the full spectrum of ophthalmic surgery, including:

- Cataract surgery
- Cornea surgery
- Glaucoma surgery
- Oculoplastic surgery
- Oncologic eye procedures
- Refractive surgery
- Vitreoretinal surgery
- Strabismus surgery

Cleveland Clinic has created a series of Outcomes books for all its institutes. These contain a summary of our surgical and medical trends and approaches; data on patient volume and outcomes; and a review of new technologies and innovations.

To view all our Outcomes books or to download a copy of Cole Eye Institute’s 2011 Outcomes book, visit Cleveland Clinic’s Quality & Patient Safety Institute’s website at clevelandclinic.org/outcomes.
Unique Programs at Cole Eye Institute

The Center for Genetic Eye Diseases
The Center for Genetic Eye Diseases provides multidisciplinary clinical diagnostic and therapeutic services for patients with inherited eye conditions such as corneal and retinal dystrophies and microphthalmia. Patients with inherited disorders that involve the eye, such as neurofibromatosis, albinism, neurodegenerative disorders and Marfan syndrome, are referred to the center by physicians from around the country.

A regular specialty clinic is dedicated to patients with retinal dystrophies and their families.

National Eye Donor Program
The Foundation Fighting Blindness Center, a central collection agency for eyes donated by individuals across the United States for blindness research, shares tissue samples with researchers worldwide.

Formally known as the Retinal Degeneration Pathophysiology Facility, the collection center accepts eye donations after death from any person of any age who had normal vision or any degree of vision loss resulting from a retinal degenerative disease.

Cole Eye Institute staff members prepare a detailed medical report about each donated eye to help researchers track the effects of eye disease in different types of people and environments.

For more information or to refer a patient, please call 216.444.2020 or 800.223.2273, ext. 42020, or visit clevelandclinic.org/OUspecial.
Fatema Ghasia, MD
Pediatric ophthalmology specialist Fatema Ghasia, MD, joined Cleveland Clinic Cole Eye Institute this summer after completing a fellowship in Pediatric Ophthalmology and Strabismus at Duke University. She also completed an ophthalmology residency and two fellowships at Washington University School of Medicine.

Her specialty interests are within pediatric ophthalmology. Her awards and honors include the Rosenbaum Resident Research Award and several academic achievement awards. Dr. Ghasia has published a significant body of work on vision in children with cerebral palsy and other neurobehavioral disorders. She also has been awarded a Knights Templar research grant and a Fight For Sight grant to conduct oculomotor studies that involve eye movement recordings in patients with strabismus and nystagmus and eye motility deficits in patients with neurologic disorders.

Dr. Ghasia graduated from the Medical College at Maharaja Sayajirao University of Baroda, India.

Dr. Ghasia practices at Cole Eye Institute’s main campus location. She can be reached at 216.444.0999 or ghasiaf@ccf.org.

Alex Yuan, MD, PhD
Retina specialist and surgeon Alex Yuan, MD, PhD, joined Cleveland Clinic Cole Eye Institute this summer after completing a fellowship in Vitreoretinal Surgery at Cleveland Clinic. He also completed both a residency and a research fellowship at the Jules Stein Eye Institute at UCLA.

His specialty interests are regenerative and stem cell therapy, cell-based therapy, and gene and drug delivery. His awards and honors include the Cole Eye Fellow Teaching Award, the Cole Eye Fellow Research Award, the Heed Fellowship Award and the UCLA Excellence in Research Award, among others. Dr. Yuan is widely published on topics related to retinal diseases and their treatments, as well as research related to stem cell microvesicles.

Dr. Yuan graduated from Washington University School of Medicine with an MD and PhD in neuroscience.

Dr. Yuan practices at Cole Eye Institute’s main campus location. He can be reached at 216.444.0079 or yuana@ccf.org.
Cole Eye Institute Staff List

Cole Eye Institute Leadership

**Chairman, Cole Eye Institute**
Daniel F. Martin, MD 216.444.0430

**Institute Vice Chairman**
Andrew P. Schachat, MD 216.444.7963

**Institute Quality Review Officer**
Elias I. Traboulsi, MD 216.444.2030

**Institute Vice Chairman for Education**

Comprehensive Ophthalmology

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Richard E. Gans, MD, FACS 216.444.0848
Philip N. Goldberg, MD 216.831.0120
Michael Gressel, MD 440.988.4040
Mohinder Gupta, MD 419.289.6466
Martin A. Markowitz, MD 440.461.4733
Shari Martyn, MD 216.831.0120
Peter McGannon, MD 216.529.5320
Michael E. Millstein, MD 216.831.0120
Wynne Morley, MD 440.366.9444
Sheldon M. Oberfeld, MD 440.461.4733
Allen S. Roth, MD 216.831.0120
Scott A. Wagenberg, MD 440.461.4733
Steven E. Wilson, MD 216.444.5887

Cornea and External Disease

William J. Dupps Jr., MD, PhD 216.444.2020
Jeffrey M. Goshe, MD 216.444.0845
Roger H.S. Langston, MD 216.444.5898
Martin A. Markowitz, MD 440.461.4733
Peter McGannon, MD 440.529.5320
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Wynne Morley, MD 440.366.9444
Sheldon M. Oberfeld, MD 440.461.4733
Allen S. Roth, MD 216.831.0120
Scott A. Wagenberg, MD 440.461.4733
Steven E. Wilson, MD 216.444.5887

Glaucoma

Jonathan A. Eisengart, MD 216.445.9429
Edward J. Rockwood, MD 216.444.1995
Shalini Sood-Mendiratta, MD 216.445.5277

Keratorefractive Surgery

William J. Dupps Jr., MD, PhD 216.444.2020
Ronald R. Krueger, MD, MSE 216.444.8158
Michael E. Millstein, MD 216.831.0120
Allen S. Roth, MD 216.831.0120
Steven E. Wilson, MD 216.444.5887
### Neuro-Ophthalmology

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<td>216.444.2855</td>
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<td>Lisa D. Lystad, MD</td>
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### Oculoplastics and Orbital Surgery

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<tr>
<td>Mark Levine, MD</td>
<td>440.988.4040</td>
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### Ophthalmic Anesthesia

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### Ophthalmic Oncology

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### Ophthalmic Research

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### Pediatric Ophthalmology and Adult Strabismus

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### Retina

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### Uveitis

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Cole Eye Institute Resources

24/7 Referrals

Referring Physician Hotline
855.REFER.123 (855.733.3712)

Hospital Transfers
800.553.5056

On the Web at clevelandclinic.org/refer123

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About Cleveland Clinic

Cleveland Clinic is an integrated healthcare delivery system with local, national and international reach. At Cleveland Clinic, 2,800 physicians represent 120 medical specialties and subspecialties. We are a main campus, 18 family health centers, eight community hospitals, Cleveland Clinic Florida, the Cleveland Clinic Lou Ruvo Center for Brain Health in Las Vegas, Cleveland Clinic Canada, Sheikh Khalifa Medical City and Cleveland Clinic Abu Dhabi.

In 2012, Cleveland Clinic was ranked one of America’s top 4 hospitals in U.S. News & World Report’s annual “America’s Best Hospitals” survey. The survey ranks Cleveland Clinic among the nation’s top 10 hospitals in 14 specialty areas, and as the top hospital in three of those areas.

Resources for Physicians

Referring Physician Center and Hotline

Cleveland Clinic’s Referring Physician Center has established a 24/7 hotline — 855.REFER.123 (855.733.3712) — to streamline access to our array of medical services. Contact the Referring Physician Hotline for information on our clinical specialties and services, to schedule and confirm patient appointments, for assistance in resolving service-related issues, and to connect with Cleveland Clinic specialists.

Physician Directory

View all Cleveland Clinic staff online at clevelandclinic.org/staff.

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DrConnect is a secure online service providing real-time information about the treatment your patient receives at Cleveland Clinic. Establish a DrConnect account at clevelandclinic.org/drconnect.

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Cleveland Clinic’s critical care transport teams and fleet of vehicles are available to serve patients across the globe.

• To arrange for a critical care transfer, call 216.448.7000 or 866.547.1467 (see clevelandclinic.org/criticalcaretransport).

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