

The Evolving Glaucoma Workflow of the Academic Hospital in Milan

Matteo Sacchi, MD



Seeing beyond

The Evolving Glaucoma Workflow of the Academic Hospital in Milan

As both a physician practicing at the San Giuseppe Hospital in Milan and the head of the Glaucoma Center, I have certainly seen an evolution in the way we practice as well as the way we treat and manage glaucoma. Much of this evolution was created out of necessity because our hospital was located in the COVID epicenter of the world during the pandemic. However, as time progressed and as the pandemic continued to shift course, it became evident that many of the changes we implemented to our processes and procedures—including the way we use diagnostics and leverage data—will continue to be an integral part of our workflow into the future.

Our hospital is located in the center of Milan and is considered an academic hospital and referral center. We take care of patients coming from our local area as well as all over the country. I treat and manage glaucoma patients with all stages of the disease, from early to advanced.

The need for adaptation

Like everything and everyone else, our hospital needed to adapt to a rapidly changing environment during the COVID epidemic. These adaptations

required changes to our workflows, processes, procedures, and in the diagnostic tools we used on a daily basis to continue delivering the best possible quality of care.

During that time, our routine clinical activities significantly decreased, and we stopped performing all elective surgeries. We continued to take care of those patients with very severe glaucoma and performed only emergency surgeries in that early time period in the pandemic. Once we were able to increase the number of patient encounters, there were some changes we needed to adopt. For example, we decreased the number of visitors allowed into the hospital and implemented social distancing measures between patients in the waiting area. We used personal protective devices like masks, gloves, goggles; many of these changes are still in place today.

We are still using masks, protective barriers, and slit lamp shields for example, and we only allow patients into the hospital without family members. We still continue with some very simple measures, like increasing the flow of fresh air into the room by leaving doors open and opening the windows more frequently. In addition, as we are more aware of the risk of infection and the risk of contagion, we disinfect not just the tools that our patients interface with but all surfaces and objects.

The Evolving Glaucoma Workflow of the Academic Hospital in Milan

Leveraging our diagnostic tools

Part of our adaptations involved leveraging tools, technology, and platforms in an innovative way in order to provide continuity of care. Optical Coherence Tomography (OCT) with the ZEISS CIRRUS® became our diagnostic tool of choice, as it was easy, fast to clean between patients, and highly informative about the structural progression of glaucoma. Today it remains the gold standard in terms of structural progression of glaucoma because it gives us such a clear picture of the retina and optic nerve.

We found that OCT examination on the ZEISS CIRRUS provided us with time-savings, because it helped decrease the amount of time patients were spending in the clinic and was easier to properly disinfect between patients. Additionally, there are some types of patients that are ideal to follow with OCT; for example, patients with ocular hypertension, glaucoma suspects, or those glaucoma patients who are stable and well-controlled. In a perfect world, the OCT should be used right away if a practitioner suspects a glaucoma diagnosis. The relevance of OCT is most evident in the very early stages of disease.

In our hospital, we use both strategies: the retinal nerve fiber layer thickness and the ganglion cell layer thickness. The ganglion cell analysis software helps

physicians in cases of malformative and myopic optic nerves where it is very likely to have an artifact when examining the retinal nerve fiber layer. We also use OCT for studying the bleb after glaucoma surgery as well as the angle depth. Additionally, if we use the AngioPlex® software, we can study the perfusion of the optic nerve and the macular area to compare the structural analysis with the perfusion analysis thus trying to establish and oversee a very complete picture of our patient.

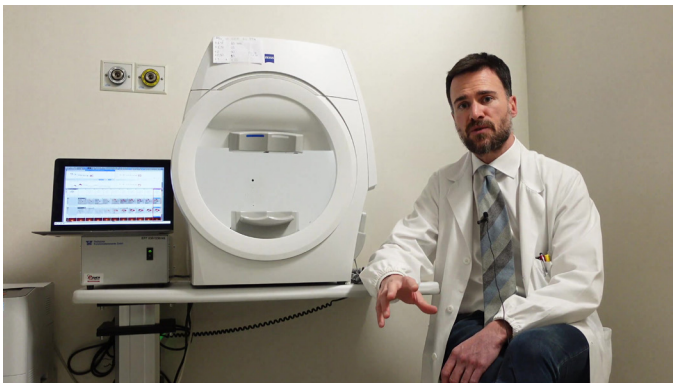


In terms of the functional progression of glaucoma, we rely heavily on the ZEISS Humphrey®Field Analyzer to screen, diagnose, and monitor glaucoma by leveraging different testing strategies and tools, including SITA™ Faster, and the 24-2C testing strategies.

For most patients, I suggest the SITA Faster program because it saves time and it reduces, generally speaking, the risk of contamination. The SITA Faster

The Evolving Glaucoma Workflow of the Academic Hospital in Milan

also reduces test time by up to 50%, which is helpful for our dry eye patients, who typically blink less during exams and can experience discomfort. We also choose this test for patients taking antidepressants or who have Sjögren's syndrome, because both conditions affect the ocular surface. In addition, we rely on the SITA 24-2C test, which adds 10 additional data points to examine visual field analysis in areas along physiologically relevant nerve fiber bundles known to be susceptible to glaucomatous defects at the center of the visual field. This is rapidly becoming our program of choice for routine glaucoma cases.



Together, OCT analysis and visual field analysis help us to track glaucoma progression from both a structural and functional perspective. These machines also give us the flexibility to change the testing baseline in case of an important change to the patient or after a major surgery. Used in tandem with Glaucoma Workplace, we are able to

more efficiently and confidently analyze data from the exam and to track the progression of patients remotely. During the pandemic, this saved us valuable time and, as analysis could be done without the patient being present, helped us decrease the risk of contagion as well.

Our glaucoma workflow of today

Many of the changes we made to the way we use and leverage our diagnostic tools and technology—like the Glaucoma Workplace—are still in place today and have helped us to evolve our workflow. Today, we have three stations in our glaucoma workflow for maximum efficiency and patient care.

The heart of our glaucoma clinic and our decision-making lies in the intraocular pressure measurement station. Here, we perform diurnal intraocular pressure and assess the entire pressure profile of our patients; sometimes this entails also measuring intraocular pressure in a supine position, which is useful for detecting progression in certain patients.

The second important assessment we perform is structural and functional analysis. We use visual field and OCT examinations to assess the function of the optic nerve and structural anomalies respectively. In

The Evolving Glaucoma Workflow of the Academic Hospital in Milan

In the past, our workflow involved obtaining fundus photography as an integral part of glaucoma management, but we have shifted away from this, as it can be a challenge to analyze changes within the optic nerve photographs. Along with supporting data from OCT measurements, the visual field examination is the most important test we use and the tool we utilize most to make diagnoses and track progression. The third station is the dry eye lab, where we perform every kind of measurement that relates to the ocular surface, which is a key component of glaucoma surgery success.

Glaucoma-related ocular surface disease (G-OSD) is a significant, yet often underdiagnosed, ocular comorbidity affecting 40% to 59% of glaucoma patients worldwide. It can have a big impact on glaucoma therapy as well as the outcome of surgery. Both dry eye disease and glaucoma are associated with aging, so it's no surprise that we often see both together. Treating both of them together gives our patients optimal comfort and better results after surgery.

How treatment is determined for glaucoma patients

We decide to initiate treatment by following treatment guidelines on intraocular pressure that is above normal limits—and in cases of confirmed glaucoma—due to visual field loss. We usually start treatment with topical medication, though in some cases, we start with laser treatment. We use laser trabeculoplasty in cases of open angle glaucoma, in patients with early glaucoma, or in patients with ocular hypertension.

We also consider surgery in cases of uncontrolled intraocular pressure despite maximum therapy in cases of patients with low tolerance to the therapy and in patients who are progressing despite medication. In these cases, we use traditional glaucoma surgical procedures but are also increasingly leveraging minimally invasive glaucoma surgery (MIGS) procedures because they offer time savings, the recovery is faster, and complication rates are significantly lower.

The Evolving Glaucoma Workflow of the Academic Hospital in Milan

My field of interest is pediatric glaucoma, so we have a large population of children with congenital or other forms of glaucoma. After a confirmed diagnosis, the first step is to put this very little patient under topical therapy, but the mainstay of pediatric glaucoma treatment is surgery. For the most part, children with glaucoma are managed in the operating room for the best possible outcomes. We even check the intraocular pressure under anesthesia to get the most accurate results and provide the highest level of comfort.

The importance of longitudinal data in understanding progression

Glaucoma is a chronic and progressive disease, and therefore, it is essential to have access to longitudinal data. Tools like ZEISS FORUM Glaucoma Workplace have made this much easier for us, as it gathers information from our visual field and OCT examinations and seamlessly integrates data between these devices. Being able to see the connection between the visual field and OCT results is very important from a clinical point of view.

We leverage two key types of reports provided by Glaucoma Workplace; both are very simple to understand because the interface is very intuitive.



The first is trend analysis, it is very powerful. With every examination being counted, you can quickly see and evaluate the regression line, which is also very easy for the patient to see and understand. If the regression line is flat, the disease is stable, or in the case of progressive disease, the regression line begins to go down. The trend analysis is something we use frequently because the physician can easily obtain an overview of progression over the course of follow-up, which greatly assists in the decision-making process.

The second type of report is for the event analysis, which establishes a baseline from the first two examinations. The patient's last examination is then

The Evolving Glaucoma Workflow of the Academic Hospital in Milan

always compared to this baseline, which allows event analysis to play an important role in detecting early and localized defects as well as early progression. We have found trend analysis to be important in having a general overview of the patient.

In glaucoma it is important to have a clear understanding of baseline intraocular pressure before treatment. This is something that can be hard to obtain, especially in patients that might be referred to you. However, since you cannot truly evaluate the efficacy of your treatment without a baseline, it is critical.

Glaucoma Workplace also serves as an important tool for patient education. Having access to all the patient's data from previous examinations in one platform allows us to show patients how their follow-up and treatment are going. For example, the patient can understand that a line is flat, which means things are going well or are stable. Alternatively, patients can see that if the line is going down, there is the presence of disease, or they are progressing. This allows us to educate patients on the importance of treatment, surgery, and follow-up in a way they can see and understand.

It is critical that physicians understand this data-driven approach and have access to event analysis, trend analysis, retinal thickness, nerve and ganglion cell complex analysis, and visual fields. When used together, we can earlier and better diagnose our patients and, in turn, treat them properly. We are fortunate to have very powerful tools today that provide an understanding of how our patients are responding to treatment through their follow-ups. These tools help us to make more confident diagnosis and decisions driven by data.

Having the ability to detect glaucoma and progression earlier allows us the ability to treat patients earlier. With surgical procedures like MIGS becoming increasingly prevalent, it is an exciting time to be managing glaucoma, not just from a physician standpoint, but from a patient outcome perspective as well.

The Evolving Glaucoma Workflow of the Academic Hospital in Milan

References

1. Nijm LM, De Benito-Llopis L, Rossi GC, Vajaranant TS, Coroneo MT. Understanding the Dual Dilemma of Dry Eye and Glaucoma: An International Review. *Asia Pac J Ophthalmol (Phila)*. 2020 Dec;9(6):481-490.

en-INT_31_160_04021 Printed in Germany. CZ-IV/2022 International Edition: Only for use in selected countries.
Not all products, services or offers are approved or offered in every market and approved labeling and instructions may vary from one country to another.
The statements of the author of this publication reflect only his personal opinion and experience and do not necessarily reflect the opinion of any institution with whom he is affiliated.
The author alone is responsible for the content of this white paper and any potential resulting infringements. Carl Zeiss Meditec AG does not accept any responsibility or liability of its content.
Published by Carl Zeiss Meditec AG 2022 www.zeiss.com/med All rights reserved.