

# What is the Most Efficient Way to Perform Intravitreal Injections?

A time-motion study found that using separate facilities for evaluation and injections is a more cost-effective system.

BY PAUL E. TORNAMBE, MD

*Adversity reveals genius, prosperity conceals it.*  
Horace

As reimbursement for intravitreal injections continues to decline, only the very efficient will survive. It is time to reevaluate our practices in terms of injection efficiency if we are to do well. Patients requiring intravitreal injections account for a significant proportion of the daily retina practice. It has been our routine to give the injection on the day of the visit. Is it more efficient, however, to administer an injection at a separate time or in a separate injection clinic?

My dear late friend, W.S. (Sandy) Grizzard, MD, advocated administering intravitreal injections at a separate time and in a separate injection clinic. The advantages, he argued, are that patients can drive themselves to the injection visit because they are not dilated, and that staff members are more efficient because they are focused on a single task. Additionally, an injection clinic is likely to have all the drugs and supplies available. Dr. Grizzard observed that noninjection days ran more smoothly, with patients evaluated on time. He said that his patients were content with a 2-day approach if it translated to overall less time in-office.

A time-motion study is the only way to scientifically determine which treatment regimen is most efficient.



Figure. Examination room with 1 PC running the EHR program (Retina Record/File Maker Pro XII), Carl Zeiss Meditec Cirrus OCT Remote Viewing Station, Topcon Remote Viewing Station, and Optos Remote Viewing Station, with 3 screens.

I recently evaluated the records of 100 consecutive established patient office visits. I excluded new patient consults and cases requiring laser or pneumatic procedures to focus exclusively on follow-up visits. Using the electronic health record (EHR) that I created, The Retina Record, which has time gates, I was able to calculate each visit's examination room occupancy time, how much of that time was devoted to the clinical examination, and, if an injection was needed, the extra time the room was occupied for the injection. The devil is in the details.

TABLE. EXAMINATION ROOM TIME FOR SAME-DAY VS DIFFERENT-DAY INTRAVITREAL INJECTIONS<sup>a</sup>

Examination time for injection patients	Examination room waiting time for injection patients	Total chair time for injection patients	Examination time for non-injection patients	Injection-only visit time
F minutes	1F to 2F minutes	2F to 3F minutes	F minutes	0.5F to 0.7F minutes
n = 42			n = 56	n = 2

<sup>a</sup>Total n = 100

## THE EXAMINATION

The examination consisted of an interval history; slit-lamp and dilated fundus examinations; a review of the fundus photos and optical coherence tomography (OCT) scans taken that day and compared with prior visits; a review of the occasional fluorescein angiogram and prior angiograms to check for growth of the neovascular process or polypoidal disease; a discussion of the patient's condition; and my recommendations. During the prior visit I ordered tests I felt would be necessary for the present examination, which usually include standard 30° color, red-free, autofluorescence photos, and/or a widefield Optos and an OCT scan. Retina specialists are not eligible for reimbursement for both digital photography and OCT (although the reasons are not clear to me), but I routinely perform both of these studies because they eloquently document the status of the retina and, ultimately, save time. I bill for the study that has the greatest input into that visit's clinical decision-making, which is usually the OCT.

Sometimes the OCT will show no fluid but may display a new hemorrhage. In such cases, I bill for the photos and not the OCT. Each examination room is equipped to review all the patient's images simultaneously on 2 or 3 screens (Figure). These provide all the information I need for clinical decision-making and make the examination more efficient, as I am able to focus on the problem area. I am also able to make patients feel that they are part of the decision-making process when I discuss the images as I review them. This, in my opinion, helps patients better understand my interpretation of the data and why they may or may not need another injection.

## THE DATA

The usual (mode) face-to-face examination visit time is about F minutes (Note: I have used the letter "F" because it is problematic to cite an exact time figure, as payers tend to equate time with reimbursement amount). In my clinic, examination times used to take twice as long until I incorporated new technology. If an office's staff is efficient in performing the busy-work, and there is technology that allows the clinician to focus his or her expertise, high quality work and patient satisfaction can be achieved in less time. The

EHR quickly reacquaints me with the patient's history, and dropdown menus minimize time-consuming typing. The imaging technology permits a shorter physical examination time, which allows longer patient face-to-face discussion time. All the patient's questions and concerns are addressed, and most patients are very satisfied with the care and time I provide, particularly when they take home the letter documenting what transpired during the visit. Widefield Optos retinal scans not only shorten the time I spend with the indirect ophthalmoscope and fundus lens, but, most important, these images assure me I have not overlooked subtle pathology posterior to the equator.

Although the advanced imaging that retina specialists have available saves time while improving quality, it is also very expensive, and payers often do not accurately calculate the cost of technology. All a doctor has to "sell" is his or her time and experience. Payers, particularly Medicare, are asking for cost-effective care, yet they punish for efficiency, paying less if a surgical procedure is performed in less time than they feel is reasonable, or paying half if the fellow eye is treated during the same visit. They should pay for the quality of care, not the time of care. Most people would likely pay more for a root canal done in 15 minutes instead of an hour.

## INJECTION TECHNIQUE

I give my injection patients the choice of topical versus subconjunctival anesthesia; the vast majority prefer subconjunctival anesthesia. Subconjunctival anesthesia requires more examination room time (which is uncompensated care time), and, unlike a topical anesthetic, it is given only after it is determined that an injection is needed. It takes several minutes for the anesthetic to work (much less than F minutes), and so I usually travel to another room to examine another patient while I wait for the anesthetic to have an effect. The examination with the other established patient, as noted, usually also takes about F minutes, so the injection is not given to the first patient at the most efficient time point. If the total visit time for the noninjection patient is F minutes, my total visit room time for the injection patient is 2 or 3 times longer (2F or 3F minutes).

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During the study, 2 patients came in for only an injection (1 patient returned because we ran out of drug on the previous visit day, the other refused bilateral same-day injections). I knew they needed the injection, so a subconjunctival lidocaine injection was given as soon as I entered the room. By the time I took an interval history, confirmed there was no change in visual acuity since the prior visit, and reviewed their chart to be sure we were injecting the correct drug into the correct eye of the correct patient, it was injection time. The chair time for the injection-only patients was 0.5F and 0.7F minutes. The injection-only visits saved considerable examination room time compared with examine-wait-inject visits. Thus, if I perform only follow-up visits and no injections, I can examine 1 to 2 more patients in the same time it takes to examine and treat 1 patient (Table).

## CONCLUSION

Dr. Grizzard was correct: A separate injection day is more efficient and permits more patients to be examined. In the time an injection patient occupies an examination room, 2 or 3 noninjection patients could occupy the same room. Injection patients treated on a different day have the clinical disadvantage of not being checked for peripheral tears and hemorrhage following the injection because the eye is not dilated prior to the injection. Fortunately, in experienced hands, retinal tears do not occur frequently. So long as the patient has at least light-perception vision at the time of discharge, the chance for a central retinal artery occlusion from elevated injection pressure is about zero.

A separate-day injection method is not for every patient. Patients who travel long distances should not be treated in 2 visits. Patients who live nearby may or may not like the 2-visit schedule, although some may be happier if the 2 office visits combined take less time out of their day than a single long visit. Family members who must drive the patient to the office for both visits will be inconvenienced.

As clinicians, we must always be patient-focused and never compromise the quality of the care we provide. Unfortunately, because of continued government-mandated decreases in reimbursement and bundling of services, we may no longer be able to afford to put patient convenience ahead of efficiency and, ultimately, our own survival. As a nun who ran a Catholic hospital once said, "We can't do good if we don't do well!" ■

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