Patients with open-angle glaucoma (OAG) would benefit from the safest, most effective approach to preserve their visual function while maximizing their quality of life. Certainly we owe it to our patients to find the best approach to manage glaucoma using evidence-based medicine. The Collaborative Initial Glaucoma Treatment Study (CIGTS) is a randomized clinical trial that tests whether filtration surgery or medical therapy is the best initial step to treat newly diagnosed OAG. Before this study, there were claims that immediate surgery was superior to medical therapy for patients with newly diagnosed OAG (see the study by Musch et al for a list of references). These studies indicated that a surgery-first approach to glaucoma was associated with lower intraocular pressure (IOP), more favorable visual field outcomes, and lower costs than a medicine-first approach. Furthermore, other studies indicated that long-term medical therapy disrupted the integrity of the ocular surface, potentially jeopardizing the success of filtration surgery should it be required if medical therapy failed. Subsequent advances in medical therapy on the one hand and the widespread use of antimetabolites during glaucoma filtration surgery on the other only added complexity to the “incise” vs “instill” debate.

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The CIGTS is well positioned to refine glaucoma management strategies, since collectively the Ocular Hypertension Treatment Study, the Collaborative Normal-Tension Glaucoma Study, and the Early Manifest Glaucoma Trial indicate that lowering of IOP (using various combinations of medicine, laser, and surgery) slows both the development of glaucoma and disease progression. We must now ask whether the results of the CIGTS shed light on the best way to lower IOP for patients with newly diagnosed OAG.

There are several excellent design features of the CIGTS and a few weaknesses. First, the CIGTS used the patient rather than the eye as the unit of analysis. After all, it is the patient who gets glaucoma, and potentially treating each eye of a patient with a different IOP-lowering strategy could have confounding crossover effects on vision and quality of life. Second, the CIGTS was truly collaborative in that the investigators actively involved participating community ophthalmologists in the treatment of enrolled patients. In fact, 27% of the initial surgical procedures and 36% of the initial medical treatments were administered by community ophthalmologists. The investigators should be commended for this decision because it is in keeping with the real-world setting, where patients visit a tertiary center for a second opinion but may ultimately receive agreed-on treatments locally. Third, the investigators used a standardized approach to determine when patients in either study arm required more intensive treatment based on the achievement of a target IOP goal derived from baseline IOP and visual field data. Using a target IOP approach to OAG management did not favor one form of IOP lowering over another throughout the study. However, attaining a target IOP appropriately was not a study outcome, as visual acuity and visual field stability are the more clinically relevant outcomes. Fourth, as new medicines emerged, there was flexibility for their inclusion in the study. Initial surgery could be performed with or without fluorouracil, but mitomycin C generally was not used. Although today mitomycin C is typically used in eyes undergoing primary trabeculectomy after medical therapy fails, there was limited experience with this approach at the time of the study. Initial surgery could be performed with or without fluorouracil, but mitomycin C generally was not used. Although today mitomycin C is typically used in eyes undergoing primary trabeculectomy after medical therapy fails, there was limited experience with this approach at the time of the study. Therefore, the decision to avoid widespread use of adjunctive mitomycin C in filtration surgery on newly diagnosed OAG eyes was reasonable. Finally, people of African ancestry were well represented in this study (38% were of African ancestry). There is fairly strong consensus that people of African descent are more likely to have OAG.

One weakness of the study was the lack of an objective assessment of lens opacity, such as the Lens Opacities Classification System III, since it could be anticipated that cataract formation or progression could affect the major study outcomes. The confounding effect of lens opacity on visual acuity, visual fields, and quality-of-life measures was not clearly delineated. Second, it seems that the CIGTS investigators did not seize the opportunity to assess the costs of the
interventions used in their study. Perhaps this will be the subject of a future study.

Similar to Migdal and Hitchings before them, the CIGTS investigators found that initial trabeculectomy produced consistently lower IOP than initial medication therapy, even with a uniform approach for assigning a target IOP applied to all patients enrolled in the trial. Consistent with the results reported by Jay and Allan, the visual acuity scores (measured using a modified Early Treatment of Diabetic Retinopathy Study protocol) were similar between both groups in the CIGTS. Perhaps the most remarkable result of the CIGTS was that the visual field scores (generated on the basis of a weighted summary of defects on the total deviation plot of the Humphrey visual field) were similar in the initial medical and initial surgical therapy groups after 4 years of follow-up (follow-up included 90% of patients in both arms of the study). The visual field data in the CIGTS are intriguing because Jay and Allan reported considerably less visual field progression in the initial surgery group than in the initial medicine group using a much smaller sample size and a similar follow-up period. Furthermore, in the study by Jay and Allan, visual field tests were performed using kinetic perimetry, whereas standard automated perimetry was used in the CIGTS. Perhaps the method used to lower IOP is less important than adhering to a target IOP strategy in managing newly diagnosed OAG. Certainly the medical regimen of the 1990s was superior to that of the 1980s, when publications popularizing the surgery-first approach to glaucoma management appeared. In the CIGTS, the IOP achieved in the initial medicine group was modestly lower (17-18 mm Hg) than that achieved by Migdal and Hitchings in their initial medication group (19.2 mm Hg). It is important to emphasize that only interim results on the first eye to meet study criteria have been reported by the CIGTS investigators so far.

We learned some interesting facts about filtration surgery in the CIGTS. There have been concerns that filtration surgery and medical therapy contribute to lens opacities. Furthermore, one cannot discount whether the glaucomatous process itself may lead to cataract. Although the CIGTS did not measure lens opacity objectively, it was well designed to isolate the effect of trabeculectomy on the subsequent development of cataract requiring extraction. Twenty percent of those in the initial trabeculectomy arm required cataract extraction after 4 years vs 9% of those in the initial medicine arm. Nonetheless, patients in the initial trabeculectomy group developed few intraoperative and postoperative complications that could potentially lead to significant prolonged loss of vision.

Assessment of OAG treatment on quality of life is important because treatment involves a major investment for patients, and the adverse effects of IOP-lowering therapy are common. Considerable resources were directed toward assessing patient perceptions of their disease and its treatment in the CIGTS. In fact, quality-of-life measures, not visual field or visual acuity score, dictated the reasonable sample size of the study. Therefore, it is reasonable to ask what insights have been gained from this assessment. Glaucoma is generally regarded as a disease with few if any early symptoms, yet the CIGTS investigators found that 30% to 48% of patients with OAG consistently reported difficulty with bright lights throughout the study. Whether these symptoms were attributable to glaucoma or another coexisting age-related eye disease, such as cataract or macular degeneration, is not known. Fifty percent of patients with newly diagnosed OAG harbored fears about going blind, and 25% remained concerned about glaucoma blindness after 5 years of follow-up. Ophthalmologists need to be aware of this perception in treating their patients with glaucoma. In general, there were few significant differences in quality-of-life measures in either treatment group during follow-up. Nonetheless, contrary to what the CIGTS investigators hypothesized, it was the initial surgical patients who were consistently more troubled by local eye symptoms. Perhaps we have underestimated the impact of limbal filtration blebs on the patient’s overall ocular comfort level.

The CIGTS investigators concluded that physicians should not change their practice patterns for patients with newly diagnosed OAG based on the interim results. They also mention that the excess cataract and reduced visual function reported in the initial trabeculectomy group need to be considered as more long-term results of the CIGTS cohort are reported. The most valuable lesson from the CIGTS thus far is that the judicious use of medical therapy guided by target IOP goals is effective in stabilizing the island of vision while having a favorable impact on visual acuity and quality of life, at least in the short term. The CIGTS is a work in progress, and a final opinion about the study and its impact on ophthalmic practice requires longer follow-up.

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REFERENCES

5. Singh K, Mehta K, Shaikh MM, et al. Trabeculectomy with intraoperative mito-


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Mr. W. H. H. Jessop read the notes of 13 cases which had been treated as in-patients at St. Bartholomew’s Hospital. All the cases had adherent membranes, which left a raw surface when it was stripped off. Eight of these cases had the Klebs-Loeffler bacillus, giving the characteristic reactions.