Ophthalmic lasers are most often associated with refractive surgery, but there are other uses for lasers to treat conditions and diseases of the eye. Laser refractive procedures have benefited by the development of improved and specialized devices, and similar infusion of technology is needed with other procedures. Four laser procedures are increasing in clinical need, causing demand on an already overwhelmed specialty. Besides the need for timely delivery, these procedures can have complications such as retinal detachments, macular edema, vitreous hemorrhages, and unintentional damage to other structures. Laser Peripheral Iridotomy and Selective Laser Trabeculoplasty to treat glaucoma, Capsulotomy to treat posterior capsule opacification, and Vitreolysis to treat posterior vitreous detachment require skill to deliver the laser with exact focus and minimal total energy. Even the most experienced physician cannot always deliver the accuracy or efficiency which would be optimal.

Opportunities exist for guided systems to improve the success of these procedures while reducing the number of complications. Some of the complications that lead to or result from these procedures are poorly understood because of the variability in current procedures, and it is hoped that with more precise laser delivery will come the opportunity to study and refine procedures with artificial intelligence systems which could optimize delivery of treatments through iterative learning.