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Microinvasive surgical (MIGS) devices and procedures for the treatment of moderate to severe glaucoma

English summary

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Québec

SUMMARY

Microinvasive surgical (MIGS) devices and procedures for the treatment of moderate to severe glaucoma

Mandate

The Institut national d'excellence en santé et en services sociaux (INESSS) was mandated by the Ministère de la Santé et des Services sociaux (MSSS) with providing an overview of microinvasive surgical (MIGS) devices used in the treatment of moderate to severe glaucoma and available on the Quebec market.

Methodology

The methodology comprises a rapid review of the scientific and grey literature, as well as consultations with Quebec clinicians. Efficacy and safety outcomes for each device are presented in narrative form. Relevant information drawn from practice guidelines, technology assessment frameworks and other guidance documents is also presented.

Description of glaucoma

Glaucoma refers to a group of ocular disorders that progressively damage the optic nerve, which may lead to visual impairment and, eventually, blindness. In Canada, it is estimated that 728,000 people are affected by this incurable disease, with primary open-angle glaucoma (POAG) being the most prevalent form. The main objective of treatment is to preserve visual function by controlling intraocular pressure (IOP), the only modifiable factor.

Pharmacological treatments and laser procedures are the first line options for controlling IOP. However, their efficacy may decline over time and may not be adequate for certain patients, in which case surgical intervention should be considered. While trabeculectomy remains the gold standard for filtering surgery, it also carries a significant risk of complications. MIGS devices have been developed to postpone the need for trabeculectomy. These devices involve minimal manipulation of ocular structures, and typically result in limited trauma to surrounding tissues.

Quebec population treated with MIGS

Between 2022 and 2024, a total of 34,971 patients in Quebec received treatment for POAG, according to associated procedure codes. Among them, 27.7% were treated by a MIGS, and many of these patients underwent more than one procedure. The number of patients treated for a POAG is increasing at a steady annual rate of 6.6%. The use of more invasive procedures, such as trabeculectomy, has declined sharply, while MIGS and laser treatments now account for 88.1% of all treatments.

Clinical data

Five MIGS devices have been identified for the treatment of moderate to severe POAG.

In the Quebec context, only the Kahook™ *Dual Blade*, PreserFlo™ *MicroShunt* and XEN45™ and XEN63™ *Gel Stent* devices appear to be in routine use. Data from the scientific literature indicate that, in intra-patient comparisons, these devices can reduce IOP from 20% to 55%, and the need for medication from 20% to 90% over the follow-up periods studied. The safety of these devices is favorable compared with trabeculectomy with most complications being transient and self-limiting. Post-operative interventions are relatively uncommon. According to the clinicians consulted, the use of the MIGS devices Trabectome™ and EX-PRESS™ *Glaucoma Filtration Device* is declining significantly.

Approaches and systems under development

Many devices in various stages of development have been identified. According to the clinicians consulted, some of these technologies may have a meaningful impact on patient care upon their introduction to the Quebec market, whether in the short or longer term.

Considerations for MIGS in Quebec

Findings from the consultations suggest that patient access to the various types of MIGSs is influenced by 2 factors: the level of clinicians' technical skills required for each of the procedures, and the budgetary allocation decisions made by each institution. This has led to disparities in access to the various MIGSs across Quebec, particularly outside university-affiliated centers.

For MIGS devices that have received favorable recommendations for public coverage in Quebec, simplifying procurement procedures could support their integration into the Quebec healthcare system.

Economic considerations

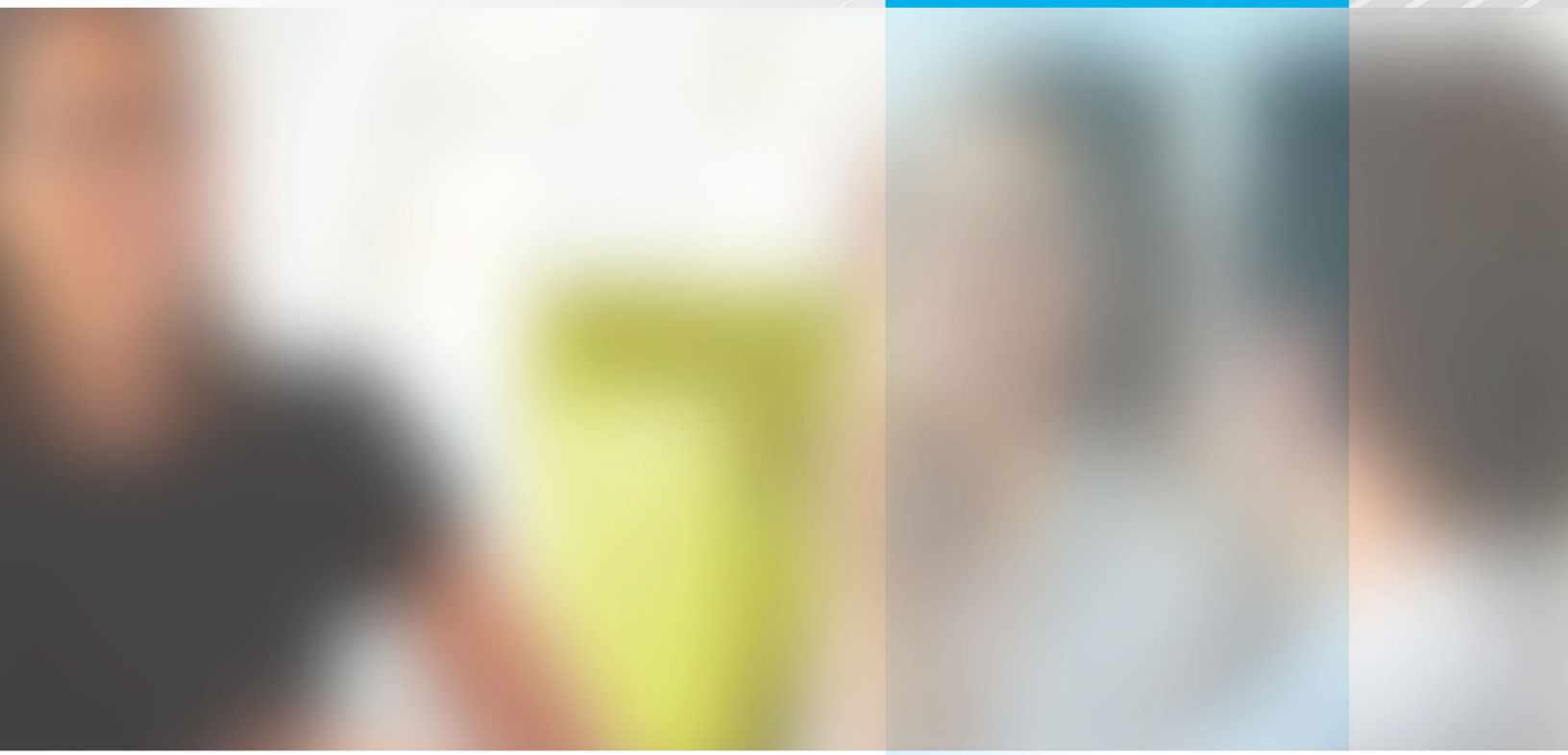
Few studies assessing the economic efficiency of MIGSs were identified. Among those selected, most focus on the PreserFlo™ device in different healthcare systems. The primary economic findings on efficiency are generally mixed and marked by a number of uncertainties which limit their usefulness for decision-making in Quebec. Consequently, their cost-effectiveness remains uncertain.

Studies examining the challenges of economic evaluation highlight the importance of adopting a standardized approach that accounts for the patient's entire care trajectory, including follow-up, reinterventions and long-term outcomes. For the public payer, the main economic incentive would remain the containment of rising costs associated with advanced stages of glaucoma, further complicated by the disease’s asymptomatic nature and frequent late diagnosis.

Conclusion

Technologies related to MIGS have developed rapidly in recent years. Although the evidence currently available may not adequately capture the benefits experienced by patients, it confirms a positive effect of MIGS on IOP and the number of medications required, while offering a better safety profile than traditional trabeculectomy.

To offer the most appropriate intervention from the expanding range of MIGS options, clinicians must consider several factors, including their technical expertise, upfront costs, follow-up requirements, potential re-interventions, and long-term outcomes. Other factors may also influence decision-making, for instance, the availability of MIGS devices may vary across the province, depending on decisions made by each institution.



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