INBRIEF | Summarizing the Evidence

# Minimally Invasive Glaucoma Surgery for Adults With Glaucoma

## Key Messages

- At the present time, there is insufficient evidence to make recommendations specific to the optimal use and funding of minimally invasive glaucoma surgery (MIGS).
- The comparative clinical effectiveness, cost-effectiveness, and safety of various MIGS devices and procedures (with or without cataract surgery) versus each other and versus alternative current glaucoma treatments is unclear.
- The Health Technology Expert Review Panel (HTERP) suggested that there is a potential role for MIGS devices and procedures in the treatment of adult patients with glaucoma, provided that the choice of MIGS is presented to patients with full consideration and disclosure of relevant factors, including:
  - the diversity of MIGS options including uncertainties and unknowns associated with their benefits and risks
  - individual patient factors bearing on the choice of treatment (e.g., vulnerabilities, geographical location, and financial considerations)
  - the surgeon's experience performing MIGS and potential conflicts of interest
  - alternative forms of treatment.
- HTERP further suggested that provinces and territories establish harmonized procedure codes for MIGS (to enable surveillance of access and treatment patterns) and document actual costs associated with MIGS and alternative treatments.
- The optimal use, including funding, of individual MIGS should be reassessed if further high-quality evidence addressing existing knowledge gaps becomes available.

## Context

Glaucoma is a leading cause of blindness. It affects more than 400,000 Canadians, and the direct costs in Canada are estimated at $300 million per year. The treatment spectrum for glaucoma extends from earlier-stage options such as pharmacotherapy and laser therapy to later-stage options such as invasive filtration surgery (or trabeculectomy). However, existing treatment options have both strengths and limitations.

The introduction of minimally invasive glaucoma surgery (MIGS) devices and procedures presents a newer surgical option that may fill a previously existing gap in the glaucoma treatment paradigm. As of March 2019, there are 11 MIGS devices and procedures approved for use in Canada. (Note that one device — the CyPass Micro-Stent — was voluntarily withdrawn from the global market in August 2018.)

## Technology

MIGS are devices and procedures that are used with the aim of lowering the pressure inside the eye (intraocular pressure, or IOP) by improving the outflow of eye fluid or reducing its inflow, while being less invasive than traditional surgery (i.e., no dissection of the sclera and minimal or no manipulation of the conjunctiva). MIGS can be performed alone or in combination with cataract surgery, which also independently lowers IOP.

Although MIGS devices and procedures are collectively categorized as a class of interventions, each MIGS is unique in its structure and/or mechanism of action. As a result, different MIGS may vary in their clinical effectiveness, cost-effectiveness, and safety profiles.

## Issue

Across Canada, there has been a growing demand for and use of MIGS. However, the direct and indirect costs of MIGS can be considerable, and coverage under the public health insurance plans is inconsistent across jurisdictions. Therefore, the aim of the health technology assessment (HTA) was to inform the optimal use, including appropriate patient selection and funding, of MIGS devices and procedures for adults with glaucoma.

## Methods

CADTH conducted an HTA that evaluated the comparative clinical effectiveness, cost-effectiveness, and safety of MIGS devices and procedures (with or without cataract surgery) versus each other and versus alternative current glaucoma treatments for the treatment of adults with glaucoma. The HTA also considered patients' and caregivers' perspectives and experiences, ethical

issues, and implementation issues. The Health Technology Expert Review Panel (HTERP) then developed recommendations based on the evidence presented in the CADTH HTA report and the HTERP deliberative framework.

## Results

There was insufficient evidence for the comparative clinical effectiveness and safety of MIGS devices and procedures (with or without cataract surgery) versus each other and versus alternative current glaucoma treatments. However, the available evidence for the effectiveness of MIGS was largely neutral (i.e., MIGS was neither more nor less effective than alternative treatments) and most adverse events were considered minor. Overall, the evidence was of "very low" or "low" quality.

The economic analyses suggested that there are certain cases in which MIGS may be cost-effective and others where MIGS may not be. However, caution is required in interpreting the economic findings because of high levels of uncertainty in relative efficacy and costs (e.g., based on the poor quality of the current clinical evidence and jurisdictional variability in costs).

It was found that patients value freedom from eye drops; however, the extent to which MIGS reduces the need for pharmacotherapy in comparison with other currently available treatments is unclear. There was variability in patients' viewpoints and preferences regarding eye surgeries, and individual factors influenced patients' perceptions of the acceptability of MIGS (e.g., age, geographical location, and capacity to pay non-insured or out-of-pocket costs associated with choosing MIGS compared with other treatment options).

Lastly, the HTA included a review of ethical and implementation issues including (but not limited to) concerns about public versus private payment for MIGS; concerns about equitable access to MIGS for patients living in rural and remote locations, and for patients from certain racialized groups; and concerns in the context of surgical innovation relating to potential conflicts of interest, assignment of responsibility for tracking and reporting outcomes of MIGS use, and challenges defining and carrying out the surgeon's responsibility to enable informed patient consent regarding the potential use of MIGS.

## Read more about CADTH and its reviews of minimally invasive glaucoma surgery for adults at:

**https://cadth.ca/optimal-use-minimally-invasive-glaucoma-surgery-health-technology-assessment**

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