PICO bypass requested

As MSAC and ESC have recently reviewed the use of MBGS stents during standalone glaucoma surgery, including review of devices inserted into the suprachoroidal space, it is proposed that the PICO process is bypassed.

This is supported by the following from the MSAC Public Summary Document (PSD) 1541 (August 2019; p. 17;) where "*ESC noted that MBGS devices include a variety of implanted, minimally invasive ocular stents and scaffolds that are placed via a corneal incision into the trabecular meshwork (TB MBGS) or suprachoroidal space (SC MBGS) of the eye. The exact positioning of implantation is specific to each device. These devices aim to improve aqueous humour outflow and lower intraocular pressure, which in turn reduces the reliance on topical hypotensive medication. ESC noted that although MBGS devices differ in design and manufacturer specifications, the complexity and resource burden of the implantation procedure is comparable.*"

Hence the PICO has been informed by this prior standalone MGBS application.

Population

An identical population to existing item 42504 is proposed, allowing the MGBS device to be inserted via the suprachoroidal space (MINIject® insertion site) as an alternative option to insertion into the trabecular meshwork.

Intervention

MINIject is a MBGS device inserted into the suprachoroidal space. Details of the device are provided, including key clinical and safety differences between MINIject and previously available devices inserted into the suprachoroidal space.

Comparator

The only key change from the PICO established for the standalone surgery devices inserted into the trabecular meshwork (item 42504; PSD 1541) is choice of comparator. At that time, since standalone MBGS surgery did not have a valid MBS item, the comparator was trabeculectomy. Since suprachoroidal MBGS surgery would replace the existing standalone MBGS where the stent system is inserted into the trabecular meshwork, this is now the comparator. As iStent is the most used trans trabecular meshwork MBGS stent system used (with supporting data, including expert opinion, provided in the comparator section) it is proposed that MBGS surgery using iStent is the comparator.

Outcomes

Relevant clinical study outcomes were established during the PSD 1541 (item 42504) process. As reduction in intraocular pressure is the only known modifiable risk factor in glaucoma that is associated with improved outcomes and MGBS results in reduced IOP, change from baseline IOP is the key outcome for consideration, plus IOP-lowering medication use changes. Additionally, safety outcomes including adverse events and serious adverse events are recognised as important outcomes that would be reported for MINIject and comparator.

Population

Describe the population in which the proposed health technology is intended to be used:

Patients with glaucoma requiring implantation of a micro-bypass surgery (MBGS) stent system into the suprachoroidal space, if:

(a) conservative therapies have failed, are likely to fail, or are contraindicated; and

(b) the service is performed by a specialist with training that is recognised by the Conjoint Committee for the Recognition of Training in Micro-Bypass Glaucoma Surgery

For the purpose of this application, the population does not include patients requiring concomitant cataract surgery. This population is already address in MBS code 42705.

Specify any characteristics of patients with the medical condition, or suspected of, who are proposed to be eligible for the proposed health technology, describing how a patient would be investigated, managed and referred within the Australian health care system in the lead up to being considered eligible for the technology:

Patients with glaucoma are usually identified by their optometrist during routine eye examinations. The Royal Australian and New Zealand College of Ophthalmologists (RANZCO) recommend that all patients with 'high suspicion' suspected glaucoma or definite glaucoma are referred to an ophthalmologist for development of a collaborative care plan between the optometrist and ophthalmologist, or in the case of advanced or acute glaucoma, for management specifically by the ophthalmologist according to the RANZCO referral pathway available at https://ranzco.edu/wp-content/uploads/2019/06/RANZCO-Referral-pathway-for-Glaucoma-management-1.pdf.

Patients with glaucoma are assessed for use of conservative therapies including topical hypotensive medication, oral systemic medication or laser trabeculoplasty, with therapy assessed on an ongoing basis. If intraocular pressure control can be established with adherence to well tolerated topical medications or with laser trabeculoplasty then stand-alone incisional glaucoma surgery should generally be deferred (RANZCO 2020b).

Once these conservative therapies have failed or are intolerable, patients can be considered for more intensive interventions which may include MBGS stent implantation or a glaucoma filtering operation (RANZCO 2020b). The current treatment algorithm for open angle glaucoma (OAG) is provided in Figure 1.

Provide a rationale for the specifics of the eligible population:

The patient population is consistent with the existing MBS item 42504 that allows the insertion of a glaucoma drainage implant during MBGS via the trabecular meshwork. As MINIject is inserted via the suprachoroidal (supraciliary) space, rather than the trabecular meshwork, this change is requested. No other change to the eligible population for MBS item 42504 is proposed.

It should be noted that it should be noted that in the PSD 1541 (p. 17, August 2019) that recommended a standalone MBGS surgery item "*ESC noted that MBGS devices include a variety of*

implanted, minimally invasive ocular stents and scaffolds that are placed via a corneal incision into the trabecular meshwork (TB MBGS) or suprachoroidal space (SC MBGS) of the eye. The exact positioning of implantation is specific to each device. These devices aim to improve aqueous humour outflow and lower intraocular pressure, which in turn reduces the reliance on topical hypotensive medication. ESC noted that although MBGS devices differ in design and manufacturer specifications, the complexity and resource burden of the implantation procedure is comparable."

It was also noted that:

"*ESC recalled that MSAC previously accepted that the two types of MBGS devices are comparable and should be covered under one MBS item in the cataract surgery setting*." (MSAC PSD 1541 p. 17, August 2019)

Hence the proposed MBGS standalone population proposed has already been assessed as being suitable for devices inserted into the suprachoroidal space, which is the site of MINIject insertion.

Are there any prerequisite tests?

Yes

Are the prerequisite tests MBS funded?

Yes

Please provide details to fund the prerequisite tests:

Provide a response if you answered 'No' to the question above

Intervention

Name of the proposed health technology:

The proposed health technology is the MINIject® micro-bypass surgery device, which is inserted into the suprachoroidal space during MBGS.

An overview of MINIject is provided below:

- MINIject® is TGA approved (ARTG ID 400268)
- MINIject consists of a glaucoma drainage implant, and a Delivery System (source: MINIject Instructions For Use).
    - The implant is composed of medical-grade silicone which has a precise porous microstructure and is 5.0 mm long with an oblong cross section of 1.1 x 0.6 mm.
    - It has a green marker (0.4 mm wide) on the proximal end of the implant ("coloured ring") that serves as a visual aid to assist with proper implantation depth in the supraciliary space
    - The MINIject implant is designed to be implanted with its head in the anterior chamber and its body in the supraciliary space. When correctly implanted using

the green ring, only 0.5mm of the implant is present in the anterior chamber, well away from the cornea.

As MINIject is inserted into the suprachoroidal space, a wording change in existing MBS item 42504 to allow this specific site of insertion is requested. All other components of the existing item MBS 42504 are proposed to be the same for this new device.

The proposed addition of MINIject to the MBS 42504 procedure code would allow use of the micro-bypass stent inserted into the suprachoroidal space as a standalone procedure for glaucoma (i.e. not in association with cataract surgery). This is because separate MBS items apply to micro-bypass stent insertion (item 42705) in conjunction with cataract surgery and removal (item 42505). Items 42705 and 42505 allow stent insertion/removal into both the trabecular meshwork and suprachoroidal space, and hence allow use of MINIject, as confirmed by MSAC applications 1496 and 1483, despite wording precising trans-trabecular devices in these two MBS items.

Redacted

Describe the key components and clinical steps involved in delivering the proposed health technology:

Once a patient is identified as a candidate for incisional surgery, and an MBGS device is considered appropriate, MINIject may then be selected by the surgeon according to surgeon preference and patient needs. MINIject would be implanted into the eye during MBGS. The insertion process is similar to other MBGS stents except that it is inserted into the suprachoroidal space, rather than the trabecular meshwork.

Patients are admitted to a day surgery centre or hospital for the procedure. MBGS (also called minimally invasive glaucoma surgery; MIGS) is a surgical procedure performed, usually under a local anaesthetic (peribulbar / retrobulbar / sub-tenon anaesthetic). Specialised equipment required for the procedure is the same as that used for implanting a stent into the trabecular meshwork, including the Ophthalmic Viscoelastic Device, gonioprism for visualisation, and anaesthesia, as currently done under item 42504.

The estimated time to undertake standalone MBGS was 45–60 minutes (including preparation, stent implantation and post-operative requirements) in MSAC PSD 1541 for standalone MBGS (PSD p. 19). However, in this PSD ESC noted that public consultation feedback in the critique for previous Applications 1483 and 1496 indicated that it might take less than 15 minutes of the surgeon's time. While the surgical procedure may only take around 15 minutes , the total time required for admission, preparation, surgery and recovery may be much longer, i.e. from 45 minutes to 2 to 3 hours.

In PSD1541, ESC noted that "*although MBGS devices differ in design and manufacturer specifications, the complexity and resource burden of the implantation procedure is comparable*." Importantly, the time required for MBGS using MINIject will be the same as that required for MBGS using the comparator stent since the surgeon follows the same general procedure and uses the same surgical equipment, regardless of the exact site of stent insertion.

Identify how the proposed technology achieves the intended patient outcomes:

MINIject implantation during MBGS lowers intraocular pressure (IOP) by enhancing aqueous outflow through the suprachoroidal space, while additionally reducing reliance on topical hypotensive medication. IOP is a known modifiable risk factor associated with long term, patient relevant outcomes including reduced visual loss and improvement in patients' quality of life.

Does the proposed health technology include a registered trademark component with characteristics that distinguishes it from other similar health components?

Yes

Explain whether it is essential to have this trademark component or whether there would be other components that would be suitable:

The proposed MBS item is not specific to the trademarked MINIject device, but rather focusses on the classes of MBGS devices. It was noted in PSD 1541, "*ESC recalled that MSAC previously accepted that the two types of MBGS devices are comparable and should be covered under one MBS item in the cataract surgery setting.*" It is thus proposed that MINIject be included in the MBS item 42504 with the other MBGS devices used in a standalone setting, similar to what is already done in item code 42705 in conjunction with cataract surgery. This provides the choice to surgeons to select the most appropriate device within the class according to their preference and patient needs.

Are there any proposed limitations on the provision of the proposed health technology delivered to the patient (For example: accessibility, dosage, quantity, duration or frequency):

No

Provide details and explain:

Use of MINIject as an alternative to other available micro-bypass surgery stents during standalone MBGS is proposed, consistent with use of trabecular meshwork implanted stents allowed under MBS item 42504.

Redacted

If applicable, advise which health professionals will be needed to provide the proposed health technology:

Ophthalmologists with surgical training (recognised by the Conjoint Committee for the Recognition of Training in Micro-Bypass Glaucoma Surgery).

If applicable, advise whether delivery of the proposed health technology can be delegated to another health professional:

No

If applicable, advise if there are any limitations on which health professionals might provide a referral for the proposed health technology:

Clinical ophthalmologists, Optometrists.

Is there specific training or qualifications required to provide or deliver the proposed service, and/or any accreditation requirements to support delivery of the health technology?

Yes

Provide details and explain:

The service must be performed by an ophthalmologist with surgical training that is recognised by the Conjoint Committee for the Recognition of Training in Micro-Bypass Glaucoma Surgery (consistent with the training requirements for use of item 42504). The Conjoint Committee comprises representatives from the Australian and New Zealand Glaucoma Society (ANZGS) and the Royal Australian and New Zealand College of Ophthalmologists (RANZCO).

Additionally the RANZCO Guidelines for standalone trabecular micro-bypass glaucoma MBGS stenting recommend that surgeons should be certified by the medical device supplier to ensure they have undergone training and possess the appropriate understanding, training and skills specific to the insertion of these devices (RANZCO 2020a). This requirement would also be applicable when MINIject is used for standalone MBGS.

Redacted

Indicate the proposed setting(s) in which the proposed health technology will be delivered: (select all relevant settings)

☐ Consulting rooms
☒ Day surgery centre
☐ Emergency Department
☒ Inpatient private hospital
☒ Inpatient public hospital
☐ Laboratory
☐ Outpatient clinic
☐ Patient's home
☐ Point of care testing
☐ Residential aged care facility
☐ Other (please specify)

The surgery would be carried out in day surgery centres or in a private hospital. While this surgery may be carried out in public hospitals, if the patient is a publicly-funded patient then the service would not be claimed under an MBS code.

Is the proposed health technology intended to be entirely rendered inside Australia?

Yes

Please provide additional details on the proposed health technology to be rendered outside of Australia:

Provide a response if you answered 'No' to the question above

Comparator

Nominate the appropriate comparator(s) for the proposed medical service (i.e. how is the proposed population currently managed in the absence of the proposed medical service being available in the Australian health care system). This includes identifying health care resources that are needed to be delivered at the same time as the comparator service:

The comparator is implantation of an alternative micro-bypass surgery stent system via the trabecular meshwork, specifically the most used stent in Australia iStent® (Glaukos).
The resources required to deliver the intervention (i.e. MBGS with the stent system (MINIject) delivered via the suprachoroidal space) would not change from that required to implant the comparator product (i.e. currently required for item 42504). Resources required for MBGS (using either the comparator or the intervention) include the requirement for anaesthesia, use of Ophthalmic Viscosurgical Devices (OVD), gonioprism for visualisation and surgical knife for the incision.

Overview of iStent and iStent inject from (RANZCO 2020b):

- iStent and iStent inject are titanium stents designed to cannulate the canal of Schlemm.
- The original iStent has an outlet at a right-angle to the stent body and a sharp front end to perform the initial goniotomy. It is held in place by semi-circumferential rings along the body of the stent. These are generally decreasing in usage since the advent of iStent inject. However, it is important to note that many of the published studies are of the single iStent.
- The iStent inject system contains two rivet-like stents with blunt arrowhead shaped front ends. They are designed to directly perforate the trabecular meshwork and penetrate the canal at right angles to the canal's course. Implantation force is provided by its spring-loaded introducer which contains a needle to incise the tissues.
- The two stents are designed to be placed adjacent to collector channels, approximately 2-3 clock hours away from each other. The stents are preloaded on the needle within the introducer and are delivered one at a time upon activation of the actuator.

List any existing MBS item numbers that are relevant for the nominated comparators:

Item 42504 – this item allows for insertion of a micro-bypass stent for glaucoma via the trabecular meshwork only. Hence item 42504 allows insertion of micro-bypass stents currently on

the Prostheses List (including iSTENT®) but cannot be used for insertion of MINIject that is implanted via the suprachoroidal space.

Other MBS item numbers for insertion (item 42705) and removal (item 42505) of MBGS stents in association with cataract surgery are not relevant to this application, as insertion of both suprachoroidal and trabecular meshwork stents were assessed by MSAC (Applications 1496 and 1483) and are therefore covered by the existing item numbers (advice from MSAC Surgical Services section, received 5 April 2023).

Please provide a rationale for why this is a comparator:

As iSTENT is the most used micro-bypass stent implanted into the trabecular meshwork in Australia this is proposed as the comparator.

In order to select the comparator for MINIject in the context of standalone treatment in the Australian glaucoma population, current alternative health technologies for that condition in Australia were reviewed as well as the technology most likely to be replaced in clinical practice.

The population expected for standalone treatment with MINIject is the same glaucoma population who are candidates for incisional surgery, who have failed or are ineligible for conservative medical therapies such as drops, and who could be treated by a standalone MBGS device, as defined by the 42504 MBS code for standalone implantation of a MBGS device. The most used device in this category is the iStent.

The use of iStent being the most frequent MBGS is confirmed by A/Prof. Ashish Agar:

"*The iStent platform (Glaukos) is the most widely used MBGS device; Hydrus (Ivantis) is the second most widely used. Both are TGA-approved and MBS-funded in Australia*," he says. (source: https://www.insightnews.com.au/making-a-stand-for-mbgs-under-medicare/ (Bowman 2021))

In addition, during the ASO Skills Expo in Sydney on Saturday 3rd June 2023, **redacted**, **redacted**, claimed in a panel that 800 surgeons in Australia are using iStent. This supports the claim that iStent is very widely used in Australia.

The number of Australian ophthalmologists currently performing MBGS could not be determined, however in 2018-2019 there were an estimated 1,000 full time equivalent ophthalmologists (AIHW 2021), with only a subpopulation of total ophthalmologists having surgical training. Hence assuming the cited 800 surgeons currently undertaking MBGS with iStent is accurate, it would be reasonable to assume that iStent is used by a majority of Australian ophthalmologists who undertake MBGS surgery.

The iStent device used within the same 42504 standalone code is the most appropriate comparator to MINIject compared with other procedures such as SLT and trabeculectomy, as the iStent belongs to the same "MBGS" class as MINIject, with a similar class level of safety and efficacy.

The iStent device is also the most appropriate comparator as it is this device which the MINIject device is most likely to replace in a standalone setting, according to surgeon preference and based upon patient needs. There would be no impact on use in hospital vs day surgery and private/public hospitals if MINIject was approved under MBS code 42504, as the existing iStent device usage would be replaced by MINIject with the same length of procedure, associated anaesthesia and surgical tools required, such as OVD. This is supported by the ESC discussion in

PSD 1541 which states: "*ESC noted that MBGS devices include a variety of implanted, minimally invasive ocular stents and scaffolds that are placed via a corneal incision into the trabecular meshwork (TB MBGS) or suprachoroidal space (SC MBGS) of the eye. The exact positioning of implantation is specific to each device. These devices aim to improve aqueous humour outflow and lower intraocular pressure, which in turn reduces the reliance on topical hypotensive medication. ESC noted that although MBGS devices differ in design and manufacturer specifications, the complexity and resource burden of the implantation procedure is comparable.*"

Additionally, in PSD 1541, after referring to the CyPass suprachoroidal stent and the iStent trabecular bypass stent, "*ESC recalled that MSAC previously accepted that the two types of MBGS devices are comparable and should be covered under one MBS item in the cataract surgery setting.*" Thus MINIject, a suprachoroidal implant, would also be considered comparable to the iStent comparator. Additionally, as MINIject would replace an existing device within the same class of MBGS devices, there would be no shift from current practice.

Similar to iStent, usage of MINIject may delay the need for trabeculectomy or other more invasive filtering procedures.

Clinical expert survey to confirm choice of comparator

In order to confirm the choice of iStent as the comparator for MINIject in a standalone procedure as a reasonable one, clinical experts were identified in different geographical regions based upon the highest volume of 42504 MBGS procedures performed. From July 2022 to May 2023, 90% of volume was performed in QLD, NSW and VIC in that order. Two surgeons from each region were identified based upon their qualified usage of MBGS procedures and their representation in professional societies (Table 1).

Table 1: Clinical experts surveyed (July 2023)

Title	Name	State	Affiliations
Redacted	Redacted	Redacted	Redacted
Redacted	Redacted	Redacted	Redacted
Redacted	Redacted	Redacted	Redacted
Redacted	Redacted	Redacted	Redacted
Redacted	Redacted	Redacted	Redacted
Redacted	Redacted	Redacted	Redacted

These surgeons were contacted individually by email and explained the need for a choice of comparator for the MINIject MSAC application submission regarding the standalone 42504 MBGS code. It was suggested that iStent could be the appropriate comparator with reasons given as listed above. A limitation of this research is that the MINIject device has not yet been used in Australia, and so these experts cannot be confident as to what its outcomes or projected usage may be. None of these experts have a financial relationship or other contractual agreement with the manufacturer. Responses received by the MSAC submission deadline are recorded in Table 2.

Table 2: Clinical expert responses on choice of comparator

Title	Name	State	Comparator selected	Additional comments
Redacted	**Redacted**	QLD	N/A	I feel that this matter should be referred to ANZGS committee for further comments rather than just myself as one person. Also would be better to get opinion from someone who has actually used the device in their patients. I will copy to ANZGS committee chairs and seek their advice.
Redacted	**Redacted**	QLD		
Redacted	**Redacted**	NSW	iStent	Agree with the comparator
Redacted	**Redacted**	NSW		
Redacted	**Redacted**	Vic	42504 code	I agree the 42504 code is the closest code for the istar device, although the medicare description is insertion of micro bypass into the trabecular meshwork.
Redacted	**Redacted**	Vic	iStent	Regarding your request to use iStent as the comparator for MINIject, I am comfortable supporting this decision. Given the widespread use of iStent as an MBGS device in Australia, it seems logical to use it as a comparator, especially considering that it falls under the same 42504 code. I believe this comparison will provide a clear and fair assessment of MINIject's potential impact and utility in a standalone setting.

N/A: not applicable

Pattern of substitution – Will the proposed health technology wholly replace the proposed comparator, partially replace the proposed comparator, displace the proposed comparator or be used in combination with the proposed comparator?

☐ None – used with the comparator
☐ Displaced – comparator will likely be used following the proposed technology in some patients
☒ Partial – in some cases, the proposed technology will replace the use of the comparator, but not in all cases
☐ Full – subjects who receive the proposed intervention will not receive the comparator

Please outline and explain the extent to which the current comparator is expected to be substituted:

Assuming 470 claims of the 42504 MBS item in 2023-2024 (consistent 9.7% growth as between the 2 prior financial years), **redacted**, we project that MINIject would be used **redacted** of the time in each of Years 1 and 2, and **redacted** of the time in each of years 3 and 4 post approval. The numerical number of MINIject item 42504 claims in year 1 (assuming constant number of total claims compared with the projection for the 2023-2024 financial year) would be **redacted** claims.

Note that these claims for MINIject under MBS item 42504 would be expected to be a replacement of claims for iStent, thus there would be no expected shift from current practice or usage.

In order to evaluate whether such an estimate is reasonable, experts were contacted individually via email regarding the above utilisation estimates for MINIject and responded with their

comments (Table 3). A limitation of this research is that the MINIject device has not yet been used in Australia, and so experts cannot be confident as to what its projected utilisation may be. These experts were chosen from the states QLD, NSW and VIC to represent the geographical states covering 90% of claims of the 42504 MBS code from July 2022 to May 2023. None of these experts have a financial relationship or other contractual agreement with the manufacturer.

Table 3: Clinical expert responses on projected utilisation of MINIject

Title	Name	State	Comments on projected utilization of MINIject
Redacted	**Redacted**	QLD	I feel that this matter should be referred to ANZGS committee for further comments rather than just myself as one person. Also would be better to get opinion from someone who has actually used the device in their patients. I will copy to ANZGS committee chairs and seek their advice.
Redacted	**Redacted**	QLD	
Redacted	**Redacted**	NSW	[No comment]
Redacted	**Redacted**	NSW	
Redacted	**Redacted**	Vic	
Redacted	**Redacted**	Vic	As for the expected standalone utilisation of MINIject, your projections seem reasonable. Given the number of claims for the 42504 MBS code in the past two years, assuming a **redacted** usage of MINIject in the first two years and a **redacted** usage in the following two years post-approval seems to be a sound estimate. Of course, these are projections and actual usage may vary, but it's a good starting point for your submission.

It is expected that the decision regarding the extent to which the comparator would be replaced with MINIject is to be made by surgeon preference, taking into consideration patient needs. This may include ease of use of the device, degree of expected efficacy in comparison with other MBGS devices, patient anatomy, patient disease, number of baseline medications used by the patient and whether these are desired to be eliminated in their totality, and implant cost.

Redacted

Outcomes

List the key health outcomes (major and minor – prioritising major key health outcomes first) that will need to be measured in assessing the clinical claim for the proposed medical service/technology (versus the comparator):

☒ Health benefits
☒ Health harms
☐ Resources
☐ Value of knowing

Major health outcomes:

- Intraocular pressure (IOP) change from baseline (mmHg, % reduction).
- Change from baseline in the mean number of IOP-reducing medications used

- Adverse events (AE), including ocular serious AEs (SAE) (number, % of patients) related to the device or surgical procedure

Minor health outcomes

- Proportion of patients with IOP ≤18 mmHg at endpoint
- Proportion of patients who are medication-free at follow-up

Outcome description – please include information about whether a change in patient management, or prognosis, occurs as a result of the test information:

Implantation of MINIject micro-bypass surgery stent during standalone surgery results in increased aqueous humour outflow into the suprachoroidal space leading to reduced IOP. Lowering of IOP is the only known modifiable risk factor for glaucoma progression and is hence the key clinically important outcome, being a marker of important long-term outcomes including visual acuity and quality of life.

The timeliness and appropriate intensity of glaucoma treatment can save sight, evidenced by the positive impact of IOP reductions reducing disease progression. Lowering IOP influences both the risk of developing glaucoma and the progression of existing disease (Jayaram 2020). While IOP alone does not explain all progression risk, every mmHg in IOP reduction is important, with evidence from a number of studies showing an impact on both functional and structural progression (as summarised by (Jayaram 2020)):

- Each initial 1 mmHg reduction of IOP at the first follow-up visit in a cohort of patients with manifest glaucoma (3 months following treatment initiation) decreased the risk of progression by 8%, whereas each 1 mmHg increase in the mean IOP at the first follow-up visit increased the risk of progression by 13% (Leske 2007).
- Each 1 mmHg increase in mean IOP over the follow-up period for patients with a baseline IOP ≥21 mmHg was associated with a 15% increase in the risk of progression and was 13% for patients with a baseline IOP <21 mmHg (Leske 2007).
- The Canadian Glaucoma Study prospectively followed up 258 patients over a median follow-up period of over 5 years and reported that a higher mean IOP was associated with glaucoma progression, with a 19% increase in risk per mmHg higher IOP (Chauhan 2008).
- A retrospective study of glaucoma patients with 5 years of follow-up also showed that the odds of glaucoma progression were 13% higher for every mmHg increase in peak IOP (De Moraes 2012).

Therefore, every mm of Hg reduction in IOP makes a difference in preserving vision for longer and may eliminate the occurrence of blindness. In addition, reduction of glaucomatous medication use also reduces issues associated with non-compliance which can cause IOP fluctuations and glaucoma progression, because surgical treatment of glaucoma takes treatment out of the hands of the patient by reducing reliance on topical therapy. Reduction of drop use also reduces side effects and reduces the need for taking additional dry-eye medication (39% of Australians with glaucoma suffer from dry-eye primarily due to glaucoma medication use (Chan 2013)), and subsequently improves patient quality of life.

Proposed MBS items

How is the technology/service funded at present? (for example: research funding; State-based funding; self-funded by patients; no funding or payments):

MINIject is not currently available in Australia. MBGS surgery (using alternative MBGS stents) is funded via the MBS (except in the public system), with the stents reimbursed via the Prostheses List for private patients.

State-based funding is applicable for MBGS surgery undertaken in public hospitals.

There has been an application submitted for Prostheses List funding of MINIject.

Please provide at least one proposed item with their descriptor and associated costs, for each population/Intervention:

Proposed item details

MBS item number (where used as a template for the proposed item)	42504
Category number	3
Category description	Therapeutic procedures
Proposed item descriptor	Glaucoma, implantation of a micro-bypass surgery stent system into the trabecular meshwork or suprachoroidal space, if: (a) conservative therapies have failed, are likely to fail, or are contraindicated; and (b) the service is performed by a specialist with training that is recognised by the Conjoint Committee for the Recognition of Training in Micro-Bypass Glaucoma Surgery
Proposed MBS fee	$329.40
Indicate the overall cost per patient of providing the proposed health technology	As for MBGS devices currently covered under item 42504
Please specify any anticipated out of pocket expenses	Expected to be consistent with current standalone MBGS surgery.
Provide any further details and explain	The proposed item is based on item 42504 but allowing insertion of the stent into the suprachoroidal space.

Algorithms

Preparation for using the health technology

Define and summarise the clinical management algorithm, including any required tests or healthcare resources, before patients would be eligible for the proposed health technology:

Patients are diagnosed with suspected or definite glaucoma usually by an optometrist, or by an ophthalmologist. RANZCO recommend the following glaucoma management referral pathway following suspected or definite diagnosis of glaucoma by an optometrist: https://ranzco.edu/wp-content/uploads/2019/06/RANZCO-Referral-pathway-for-Glaucoma-management-1.pdf.

Following definitive diagnosis by the ophthalmologist the patient may be considered for treatment as described in the treatment algorithm in Figure 1.

Is there any expectation that the clinical management algorithm *before* the health technology is used will change due to the introduction of the proposed health technology?

No

Describe and explain any differences in the clinical management algorithm prior to the use of the proposed health technology vs. the comparator health technology:

Please provide a response if you answered 'Yes' to the question above

Use of the health technology

Explain what other healthcare resources are used in conjunction with delivering the proposed health technology:

The MBGS procedure can be performed in hospital or in day surgery, with a sterile environment required for the procedure. Required equipment includes Ophthalmic Viscoelastic Device, gonioprism for visualisation, surgical knife for the incision, plus anaesthesia (peribulbar / retrobulbar / sub-tenon) required. These resources are standard for any MBGS procedure, and are no different for a procedure utilising MINIject.

Explain what other healthcare resources are used in conjunction with the comparator health technology:

The procedure can be performed in hospital or in day surgery, with a sterile environment required for the procedure. Required equipment includes Ophthalmic Viscoelastic Device, gonioprism for visualisation, surgical knife for the incision, plus anaesthesia (peribulbar / retrobulbar / sub-tenon) required. These resources are standard for any MBGS procedure, and are no different for the comparator.

Describe and explain any differences in the healthcare resources used in conjunction with the proposed health technology vs. the comparator health technology:

There are no expected differences in healthcare resources used in conjunction with the use of MINIject implanted into the suprachoroidal space, compared with the comparator implanted into the trabecular meshwork during standalone MBGS. This includes the same expected surgery time (including preparation, stent implantation and post-operative requirements) when either the intervention or comparator is used in standalone MBGS, as well as other healthcare resources required during and after the procedure.

Clinical management after the use of health technology

Define and summarise the clinical management algorithm, including any required tests or healthcare resources, *after* the use of the proposed health technology:

As for other MBGS devices, patients require regular reviews by their Clinical Ophthalmologist after surgery, including review of their IOP over time, their visual acuity, whether their glaucoma has progressed, and their need for IOP-reducing medication requirements.

Define and summarise the clinical management algorithm, including any required tests or healthcare resources, *after* the use of the comparator health technology:

As for other MBGS devices, patients require regular reviews by their Clinical Ophthalmologist after surgery, including review of their IOP over time, their visual acuity, whether their glaucoma has progressed, and their need for IOP-reducing medication requirements.

Describe and explain any differences in the healthcare resources used *after* the proposed health technology vs. the comparator health technology:

There are no expected differences in healthcare resources used after MBGS using MINIject suprachoroidal implant, compared with use of the comparator stent inserted into the trabecular meshwork. Regardless of the type of procedure used for patients with glaucoma, there is a need for ongoing monitoring by their key healthcare providers (HCPs) as glaucoma is an incurable, lifelong disease.

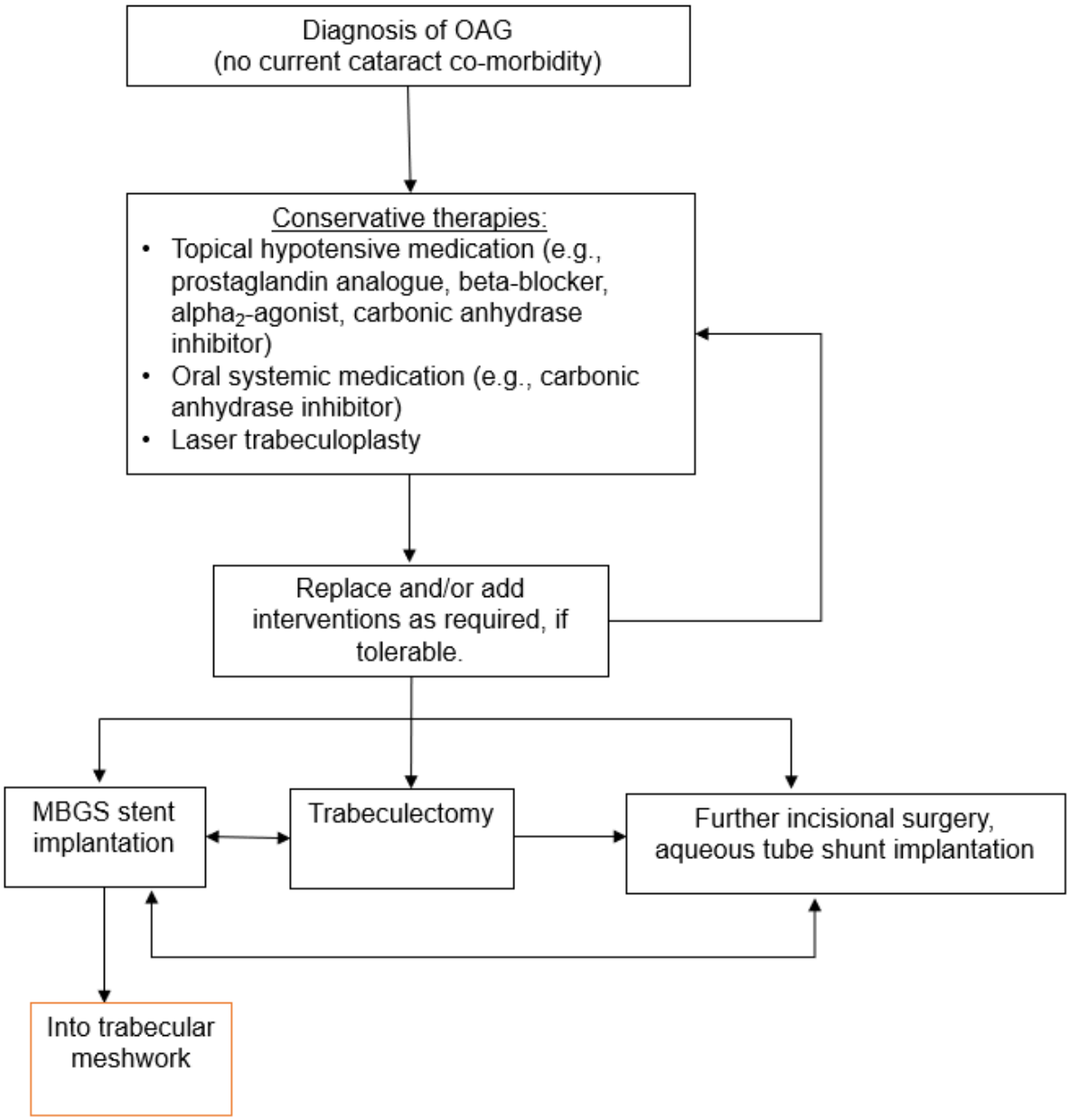
Algorithms

Insert diagrams demonstrating the clinical management algorithm with and without the proposed health technology:

Note: Please ensure that the diagrams provided do not contain information under copyright.

The current treatment algorithm for patients diagnosed with open-angle glaucoma (OAG) is provided in Figure 1. MBGS surgery, with stent implantation via the trabecular meshwork only, is currently an option for patients with OAG who have not responded to or cannot tolerate conservative therapies.

Figure 1: Current clinical management algorithm for MBGS stent implantation in the standalone patient population

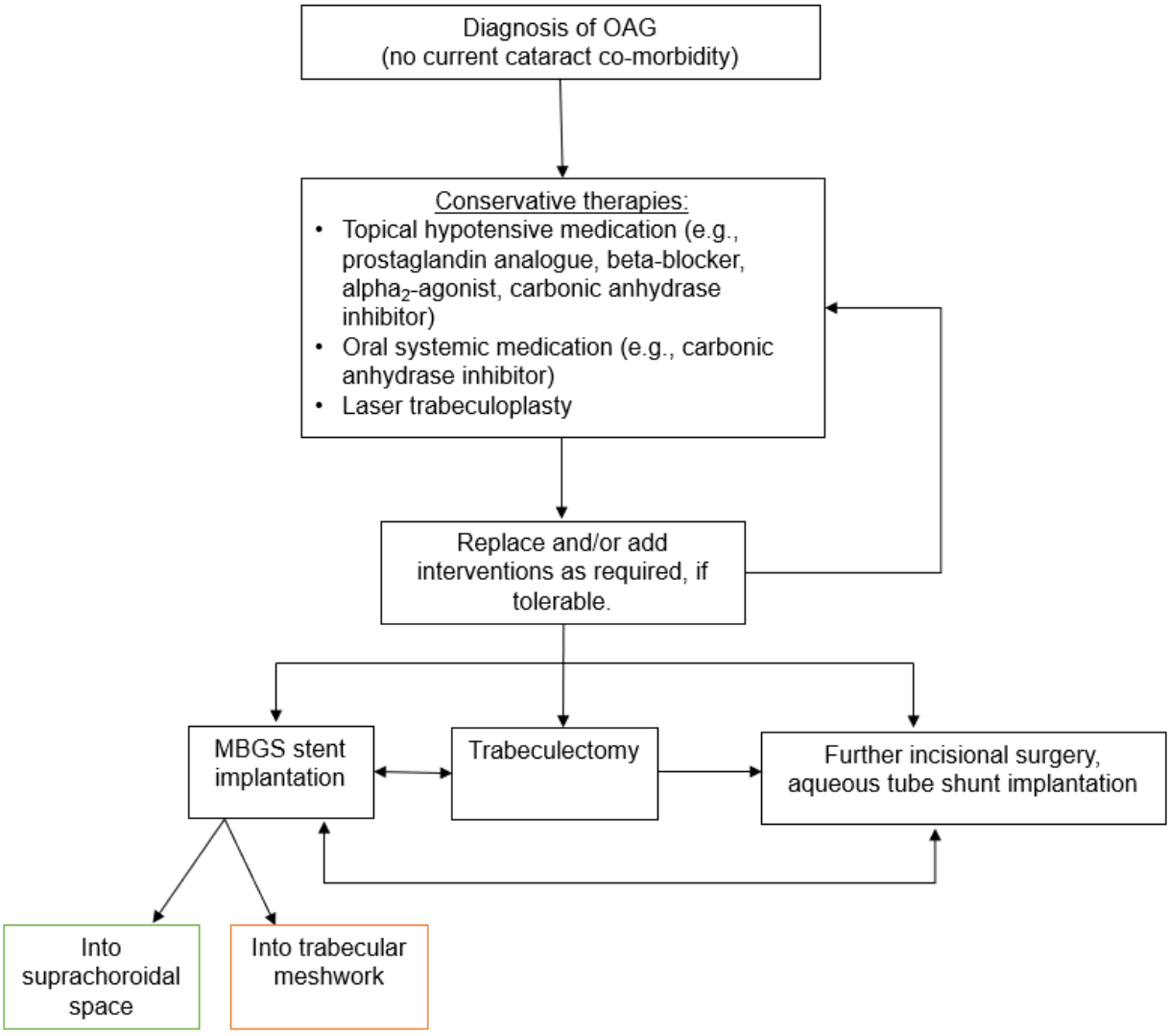


MBGS: micro-bypass glaucoma surgery; OAG: open-angle glaucoma

Source: Based on Figure 1 in MSAC 1541 – Final Public Summary Document (PSD) (available at http://www.msac.gov.au/internet/msac/publishing.nsf/Content/1541-public)

The proposed treatment algorithm allows for MBGS implant insertion into either the trabecular meshwork or into the suprachoroidal space (Figure 2). There is no other change to the current algorithm proposed, with the same general requirements (i.e. performed in a hospital or day surgery, requiring a sterile environment and the same surgical equipment). Thus the only key difference with the proposed algorithm is that it provide patients/surgeons with an option for the type of implant that is inserted into a slightly different part of the eye as part of standalone MBGS.

Figure 2: Proposed clinical management algorithm for MBGS stent implantation in the standalone patient population with implant into the suprachoroidal space an option



MBGS: micro-bypass glaucoma surgery; OAG: open-angle glaucoma

Source: Adapted from Figure 1 in MSAC 1541 – Final Public Summary Document (PSD) (available at http://www.msac.gov.au/internet/msac/publishing.nsf/Content/1541-public)

Claims

In terms of health outcomes (comparative benefits and harms), is the proposed technology claimed to be superior, non-inferior or inferior to the comparator(s)?

☐ Superior
☒ Non-inferior
☐ Inferior

Please state what the overall claim is, and provide a rationale:

Implantation of the MINIject MBGS system into the suprachoroidal space provides non-inferior effectiveness and non-inferior safety to stents inserted into the trabecular meshwork, as part of standalone MBGS for patients with open-angle glaucoma who have failed or are intolerant to conservative therapies.

The claim of non-inferior effectiveness and safety is based on an indirect comparison of the generally similar mean level of IOP lowering achieved in patients undergoing the two procedures and similar adverse event profiles. IOP lowering is a recognised modifiable risk factor associated with improvements in long term, patient-relevant outcomes including reduced rate of visual deterioration and improved quality of life.

The comparability of devices inserted into the two sites was recognised in PSD 1541 (p. 17, August 2019) that recommended a standalone MBGS surgery item "*ESC noted that MBGS devices include a variety of implanted, minimally invasive ocular stents and scaffolds that are placed via a corneal incision into the trabecular meshwork (TB MBGS) or suprachoroidal space (SC MBGS) of the eye. The exact positioning of implantation is specific to each device. These devices aim to improve aqueous humour outflow and lower intraocular pressure, which in turn reduces the reliance on topical hypotensive medication. ESC noted that although MBGS devices differ in design and manufacturer specifications, the complexity and resource burden of the implantation procedure is comparable.*"

Further, it was also noted that: "*ESC recalled that MSAC previously accepted that the two types of MBGS devices are comparable and should be covered under one MBS item in the cataract surgery setting*." (MSAC PSD 1541 p. 17, August 2019)

Significantly greater clinical efficacy in reducing IOP from baseline has been demonstrated for MINIject compared with iStent when used in standalone MBGS via a naïve indirect treatment comparison. A statistically significant additional reduction in mean change from baseline IOP of -5.20 mm Hg (95% CI -7.78, 95% CI -2.62; $p<0.001$) was achieved in favour of MINIject vs. iStent at 6 months, with this significant difference in reduction maintained for 24 months post-surgery. However, conservatively, a claim of non-inferior effectiveness is being proposed.

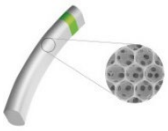
<u>Safety of suprachoroidal MBGS stents</u>

MINIject differs from CyPass Micro-stent, a previous suprachoroidal implant which was voluntarily withdrawn from the market due to safety concerns with endothelial cell density loss (leading to suprachoroidal MBGS being removed from MSAC application 1541) in the following ways:

- The material of MINIject is softer and more flexible than the CyPass Micro-stent (medical grade silicone with 2/3 empty space vs rigid polyimide) and thus better adapts to the eye anatomy. This means that MINIject is less likely to migrate long-term.
- MINIject is 1mm shorter than CyPass (5mm vs 6mm), and only 0.5mm remains in the anterior chamber after correct implantation, in comparison with 1mm in the anterior chamber after correct implantation with CyPass. This means that the MINIject implant is further away from the cornea and reduces the likelihood of corneal touch and subsequent endothelial cell density loss.
- The implantation time is slightly longer for MINIject than for CyPass. MINIject is not injected forcefully into the suprachoroidal space as is done by the hard material of the CyPass implant, but rather the correct position within the space is achieved by the surgeon using the delivery sheath and a green marking on the implant itself, then a wheel is retracted in several motions to withdraw the sheath which lays the implant in place.
- MINIject clinical trials have been studying endothelial cell density loss from the beginning. Current 3-year data for MINIject in the STAR-GLOBAL trial presented at the World Glaucoma Congress (WGC) in Rome in 2023 showed mean endothelial cell density loss of 9% at 3 years for MINIject implanted in a standalone procedure (n=48), which is less than that seen for CyPass in the COMPASS study at 2 years. ECD loss data is not readily available for MBGS devices used in a standalone study, apart for MINIject.

A comparison of key characteristics of MINIject and CyPass is provided in Table 4.

Table 4: Characteristics of MINIject and CyPass

	MINIject	**CyPass**
Manufacturer	iSTAR Medical	Alcon Inc.
Sponsor	Compliance Management Solutions	Alcon
Indication	Adult patients diagnosed with OAG	Adult patients with mild to moderate primary open-angle glaucoma (POAG)
Material	Soft and flexible, porous silicone in a network geometry of hollow spheres, 2/3rd empty space 	Hard polyimide stent 
Size	5mm long, 1mm wide, 0.5mm tall, spherical pores of 27µm	6.35mm long, outer diameter of 0.43mm, inner diameter of 0.3mm. 64 fenestrations
# implants required to deliver	1	1
Procedure type	Ab interno, minimally-invasive, no bleb or MMC	Ab interno, minimally-invasive, no bleb or MMC
Implantation location	Suprachoroidal space (natural drainage pathway)	Suprachoroidal space (natural drainage pathway)
Mechanism of action	Unconventional pathway: aqueous passes through the supraciliary space to the suprachoroidal space where it is drained both by the sclera to be resorbed by orbital vessels and the choroid to drain through vortex veins.	Unconventional pathway: aqueous passes through the supraciliary space to the suprachoroidal space where it is drained both by the sclera to be resorbed by orbital vessels and the choroid to drain through vortex veins.

	MINIject	CyPass
Deployment steps	Insert sheath of handle into desired implantation location in supraciliary space and roll back wheel to withdraw sheath to lay implant in place	Insert the tip of the guidewire into desired implantation location and advance with the stent into the supraciliary space. Then use the front button to retract the guidewire and leave the stent in position.
Size of implant in the anterior chamber when correctly positioned	≤0.5mm	≤1mm
MRI information	MRI safe	MRI safe
Mean IOP reduction 3Y	-8.5mmHg*	-4.5mmHg**
Mean med reduction 3Y	-0.9*	-0.20**

* STAR-GLOBAL standalone study first presented at the World Glaucoma Congress (29/6/23) – data on file, manuscript in progress. P<0.001 (See details in Summary of Evidence Section).

** Grisanti S, Grisanti S, Garcia-Feijoo J, et al. Supraciliary microstent implantation for open-angle glaucoma: multicentre 3-year outcomes. BMJ Open Ophthalmology 2018;3:e000183. doi:10.1136/bmjophth-2018-000183 (standalone study) (Grisanti 2018)

#: number of; POAG: primary open angle glaucoma; OAG: open angle glaucoma; MMC: mitomycin C; med: medication

Why would the requestor seek to use the proposed investigative technology rather than the comparator(s)?

The availability of the MINIject suprachoroidal implant provides an alternative option for surgeons undertaking MBGS, which currently is limited to using stents inserted into the trabecular meshwork. MINIject's enhanced efficacy and alternative implant location could be better suited to some patient's needs within the same population, in comparison with the comparator.

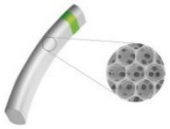
MINIject is composed of a biocompatible porous proprietary silicone (STAR®) material that provides minimal tissue reaction and theoretically reduces the risk of fibrosis, with the unique flexible design conforming to the shape of the eye (Kennedy 2022). Augmenting the uveoscleral outflow pathway with implantation of a suprachoroidal device provides an alternative approach for treating glaucoma (Kennedy 2022).

It is expected that the decision to substitute MINIject for the comparator would be made by surgeon preference, taking into consideration patient needs. This may include ease of use of the device, expected improved efficacy in comparison with other MBGS devices, patient anatomy which may preclude trabecular meshwork insertion, patient disease in the conventional outflow pathway or distal collector channels limiting effectiveness of trabecular MBGS, number of baseline medications used by the patient and whether these are desired to be eliminated in their totality.

A comparison of key characteristics of MINIject and iStent Inject W is provided in Table 5.

Table 5: Characteristics of MINIject and iStent W

	MINIject	iStent Inject W
Manufacturer	iSTAR Medical	Glaukos Corporation
Sponsor	Compliance Management Systems	RQ Solutions Medical Devices Distribution Support

	MINIject	iStent Inject W
Indication	Adult patients diagnosed with OAG	Adult patients with mild-to-moderate POAG treated with ocular hypotensive medication
Material	Soft and flexible, porous silicone in a network geometry of hollow spheres, 2/3rd empty space 	Hard and solid titanium stent tube with heparin coating (porcine source) 
Size	5mm long, 1mm wide, 0.5mm tall, spherical pores of 27µm	0.36mm in height, 0.36mm diameter, central inlet/outlet 80µm, side flow outlets 50µm
# implants required to deliver	1	2
Procedure type	Ab interno, minimally-invasive, no bleb or MMC	Ab interno, minimally-invasive, no bleb or MMC
Implantation location	Suprachoroidal space (natural drainage pathway)	Trabecular Meshwork (natural drainage pathway)
Mechanism of action	Unconventional pathway: aqueous passes through the supraciliary space to the suprachoroidal space where it is drained both by the sclera to be resorbed by orbital vessels and the choroid to drain through vortex veins.	Conventional pathway: aqueous flows through the bypass of the trabecular meshwork into Schlemm's Canal and through collector channels to be absorbed by the episcleral venous system.
Deployment steps	Insert sheath of handle into desired implantation location in supraciliary space and roll back wheel to withdraw sheath to lay implant in place	Slide retraction button to draw back insertion sleeve and advance trocar tip to centre of trabecular meshwork at implantation location. Press trigger to inject stent through trabecular meshwork and into Schlemm's Canal. Repeat for 2nd stent.
MRI information	MRI safe	MR Conditional
Mean IOP reduction 2Y*	-9.57mmHg	-4.92mmHg
Mean med reduction 2Y*	-1.0	-0.56

* Mean IOP and medication reductions at 2 years from meta-analysis of standalone studies – see Summary of Evidence section for details. P-value for IOP reduction: p=0.03. P-value for medication reduction: p=0.26.

#: number of; POAG: primary open angle glaucoma; OAG: open angle glaucoma; MMC: mitomycin C; med: medication

Identify how the proposed technology achieves the intended patient outcomes:

Insertion of an implant into the suprachoroidal space allows drainage of aqueous humour from the anterior chamber into the suprachoroidal space, often termed the uveoscleral pathway, resulting in reduced IOP. The negative pressure gradient towards the suprachoroidal space, and the absence of episcleral venous pressure in the space (which is present in the conventional outflow pathway), gives the space a theoretically larger absorptive potential and thus greater IOP-lowering potential. Elevated IOP is a modifiable risk factor for glaucoma progression, hence reduction in IOP improves outcomes in glaucoma by reducing the risk of progression leading to impaired vision.

It has been demonstrated that each additional mmHg of IOP lowering reduces the rate of progression of glaucoma by 10-20%. Thus the additional IOP lowering potential of MINIject over the comparator in a standalone setting, as demonstrated by a naïve indirect comparison through

a literature review, delays vision loss further and thus improves patient quality of life and reduces costs to the overall health system associated with loss of work productivity, inability to drive/traffic accidents, falls, etc. A greater elimination/reduction in drops the patient is required to administer also results in improved quality of life for patients, less associated ocular surface disease (experienced by 39% of glaucoma patients on drops in Australia (Chan 2013)), and resultant cost savings for the health system.

For some people, compared with the comparator(s), does the test information result in:

A change in clinical management?	**No**
A change in health outcome?	**No**
Other benefits?	**No**

Please provide a rationale, and information on other benefits if relevant:

Note that patients achieve an identical health outcome with the intervention or comparator, i.e. they undergo MBGS surgery (utilising the same MBS item) to lower IOP, using either MINIject or a comparator trans-trabecular stent. However post surgery, mean IOP lowering following surgery is expected to be greater following use of MINIject.

Use of MINIject during standalone MBGS is associated with a greater reduction in IOP compared with the comparator. Meta-analyses and an indirect treatment comparison of MINIject versus iStent used during MBGS were conducted for the Prostheses List submission, which showed a statistically significant additional reduction in mean change from baseline IOP of -5.20 mmHg (95% CI -7.78, 95% CI -2.62; $p<0.001$) in favour of MINIject vs. iStent at 6 months. This significant benefit in reduced IOP was maintained for 24 months post-surgery. The studies utilised for this indirect treatment comparison are reported in the summary of evidence table (at the end of this Application).

In terms of the immediate costs of the proposed technology (and immediate cost consequences, such as procedural costs, testing costs etc.), is the proposed technology claimed to be more costly, the same cost or less costly than the comparator? (please select your response)

☐ More costly
☒ Same cost
☐ Less costly

Provide a brief rationale for the claim:

Patient treatment prior to and post MBGS is not expected to differ between use of MINIject or the comparator stent. The procedure required to implant MINIject is similar to insertion of the comparator stents in MBGS, with no expected difference in the use of resources (e.g. theatre time, required equipment, anaesthesia, recovery time) when MINIject is used compared with the comparator. Hence no resource use differences or cost difference is assumed.

Summary of Evidence

Provide one or more recent (published) high quality clinical studies that support use of the proposed health service/technology. At 'Application Form lodgement', please do not attach full text articles; just provide a summary (repeat columns as required).

Identify yet-to-be-published research that may have results available in the near future (that could be relevant to your application). Do not attach full text articles; this is just a summary (repeat columns as required).

There are no directly comparative randomised, controlled trials of MINIject vs. the comparator, both used in glaucoma as part of a standalone MBGS procedure. Hence an indirect treatment comparison will be required.

Details of the 4 completed MINIject studies are provided in the table below.

Seven relevant comparator iStent studies identified from a literature search conducted in April 2023 are also provided in the table below. Patients in the MINIject studies could have previously undergone other procedures including cataract surgery and prior trabeculoplasty.

All the intervention and comparator studies were conducted in patients with OAG undergoing standalone OAG surgery, with all iSTENT studies including insertion of two stents, as recommended.

Long term, 3-year data on use of MINIject has recently been reported and is included in the table below.

	Type of study design*	Title of journal article or research project (including any trial identifier or study lead if relevant)	Short description of research (max 50 words)**	Website link to journal article or research (if available)	Date of publication***
MINIject studies (standalone procedure)					
1.	Prospective, interventional, open-label, multicentre	**STAR I** ClinicalTrials.gov listing: NCT03193736 6 month results: Denis P et al. A First-in-Human Study of the Efficacy and Safety of MINIject in Patients with Medically Uncontrolled Open-Angle Glaucoma (STAR-I). Ophthalmol Glaucoma. 2019 Sep-Oct;2(5):290-297 (Denis 2019) 2-year results: Denis P et al. Two-year outcomes of the MINIject drainage system for uncontrolled glaucoma from the STAR-I first-in-human trial. Br J Ophthalmol. 2022 Jan;106(1):65-70. (Denis 2022)	N=25 (ITT) adults with POAG or SOAG, uncontrolled with ≥1 IOP-lowering medication receiving a MINIject implant in a standalone procedure. During the 6-month follow-up period. Six months after surgery, mean diurnal IOP was 14.2 mmHg (SE 0.9) mmHg), equivalent to a reduction of 9.0 mmHg or 39.1% (P < 0.0001). Mean baseline IOP was 23.2±2.9 mmHg on 2.0±1.1 glaucoma medication ingredients and decreased to 13.8±3.5 mmHg (−40.7% reduction) on 1.0±1.3 medications 2 years after implantation. There were no SAEs related to the device or procedure, and no additional glaucoma surgery was required.	Denis 2019 Denis 2022	Online June 2019 Online October 2020
2.	Prospective, interventional, open-label, multicentre	**STAR II** ClinicalTrials.gov listing: NCT03624361 García Feijoó J et al. STAR-II Investigators. A European Study of the Performance and Safety of MINIject in Patients With Medically Uncontrolled Open-angle Glaucoma (STAR-II). J Glaucoma. 2020 Oct;29(10):864-871. doi: 10.1097/IJG.0000000000001632. PMID: 32769736; PMCID:	N= 27-29 (mITT). Adults (>50 years) with POAG, uncontrolled with ≥1 IOP-lowering medications undergoing a standalone procedure. Mean (SD) IOP (mm Hg) reduced from 24.6 ± 3.7 to 14.7 ± 6.0 at 6 months and 15.5 ± 5.7 at 24 months. Mean (SD) number of IOP-reducing medications reduced from 3.0 ± 1.2 at baseline to 0.9 ± 1.2 at 6 months to 1.4 ± 1.5 at 24 months. decreased to 13.8±3.5 mmHg (−40.7% reduction) on 1.0±1.3 medications 2 years after implantation. 6 device-related SAEs were reported all of which resolved.	Garcia Feijoo 2020	Online 5th August 2020

	Type of study design*	Title of journal article or research project (including any trial identifier or study lead if relevant)	Short description of research (max 50 words)**	Website link to journal article or research (if available)	Date of publication***
		PMC7647427. (García Feijoó 2020)			
3.	Prospective, interventional, open-label, multicentre	**STAR III** ClinicalTrials.gov listing: NCT03996200 Data on file	N= 18-20 (mITT). Adults with POAG or SOAG uncontrolled with ≥1 IOP-lowering medications receiving a MINIject implant in a standalone procedure. Mean (SD) IOP (mm Hg) reduced from 23.6 ± 3.1 to 14.4 ± 3.5 at 6 months and 13.6 ± 3.0 at 24 months. Mean (SD) number of IOP-reducing medications reduced from 2.2 ± 0.9 at baseline to 1.4 ± 1.5 at 6 months to 1.8 ± 1.4 at 24 months.		Not published.
4.	Prospective, interventional, open-label, multicentre	**STAR IV** Oral presentation at the World Glaucoma Congress (30 June 2023) in Rome, Italy by Prof. Antonio Fea (Turin, Italy). "Multi-Centre Study Of A Supraciliary Glaucoma Drainage Device In Patients With Open Angle Glaucoma: 1-Year Follow-Up Results"	N=17-19 (mITT). Adults (>50 years) with POAG or SOAG uncontrolled with ≥1 IOP-lowering medications undergoing a standalone procedure. Mean (SD) IOP reduced from 24.3 ± 3.2 to 14.2 ± 4.8 at 6 months and 16.0 ± 4.8 at 12 months. Mean (SD) number of IOP-reducing medications reduced from 2.5 ± 1.1 at baseline to 1.3 ± 1.3 at 6 months to 1.6 ± 1.2 at 12 months. The most common AEs were anterior chamber inflammation, blurred vision and IOP increase, with no significant loss of endothelial cell density and no eye with >30% loss from baseline.		Presented 2023.
5	Prospective, interventional, open-label, multicentre	Combined STAR I, II, III – 3 year follow-up data. Oral presentation at the World Glaucoma Congress (29 June 2023) in Rome, Italy by Dr Inder Paul Singh (WI, USA). "Sustainable effectiveness of MINIject: 3 year pooled data from the STAR-GLOBAL study"	N=48 patients with 3 year outcomes data from STAR I, II, III. Baseline IOP reduced from 23.6 mmHg to 13.5 mmHg at 2 years and 15.1 mmHg at 3 years (-35.6% change from baseline at year 3). Baseline mean number of IOP-reducing medications was 2.2, reduced to 1.1 at 2 years and 1.4 at 3 years. At 3 years: • 90% of patients had ≥20% IOP reduction from baseline, • 85% of patients had IOP ≤18 mmHg • 42% of patients were IOP-reducing medication free		Presented 2023.
iStent studies (standalone procedure)					
1.	Multi-centre prospective, post-market, unmasked	**(Voskanyan 2014)** Voskanyan L et al. Prospective, unmasked evaluation of the iStent® inject system for open-angle	N=99 Adults with POAG or SOAG. Mean (SD) IOP (mm Hg) reduced from 22.1 ± 3.3 to 16.8 ± 4.1 at 6 months and 15.7 ± 3.7 at 12 months. Mean (SD) number of IOP-reducing medications at baseline 2.21±3.5.	Voskanyan 2014	Online 23rd January 2014

	Type of study design*	Title of journal article or research project (including any trial identifier or study lead if relevant)	Short description of research (max 50 words)**	Website link to journal article or research (if available)	Date of publication***
		glaucoma: synergy trial. Adv Ther. 2014 Feb;31(2):189-201. ClinicalTrials.gov listing: NCT00911924	Post-operative complications occurred at a low rate and resolved without persistent effects.		
2.	Prospective, non-randomized, consecutive case series	**(Hengerer 2022)** 5 year results: Hengerer FH et al. iStent inject Trabecular Micro-Bypass with or Without Cataract Surgery Yields Sustained 5-Year Glaucoma Control. Adv Ther. 2022 Mar;39(3):1417-1431. **(Hengerer 2019)** 3 year results: Hengerer FH et al. Second-Generation Trabecular Micro-Bypass Stents as Standalone Treatment for Glaucoma: A 36-Month Prospective Study. Adv Ther. 2019 Jul;36(7):1606-1617 ClinicalTrials.gov listing: NCT02868190 (no results posted)	N=44 Adults with POAG, NAG or secondary glaucoma. Mean (SD) IOP (mm Hg) reduced from 25.3±6.0 to 15.2 ± 3.1 at 12 months, 15.0 ± 2.7 at 24 months and 14.6 ± 2.0 at 36 months. Minimal AEs and stable visual acuity were reported through to 36 months.	Hengerer 2022 Hengerer 2019	Online 3rd Feb 2022 Online 22nd May 2019
3.	Prospective, single-arm, single-surgeon	**(Lindstrom 2020)** Lindstrom R et al. Four-Year Outcomes of Two Second-Generation Trabecular Micro-Bypass Stents in Patients with Open-Angle Glaucoma on One Medication. Clin Ophthalmol. 2020 Jan 13;14:71-80 ClinicalTrials.gov listing: NCT02868190 (no results posted)	N=57 Adults with POAG with 1 IOP-lowering medication. Medicated IOP lowering not reported. During follow-up one eye underwent a secondary glaucoma surgery, and safety parameters were reported as favourable.	Lindstrom 2020	Online 13th Jan 2020
4.	Retrospective, non-randomized, non-controlled, interventional case series	**(Arnljots 2021)** Arnljots TS et al. Dual Blade Goniotomy vs iStent inject: Long-Term Results in Patients with Open-Angle Glaucoma. Clin	N=14 Adults with mild to moderate OAG undergoing a standalone procedure or combined cataract surgery (or goniotomy, this arm not included). Mean (SD) IOP reduced from 20.6±5.4 to 18.3 ± 2.3 at 6 months, 18.4 ± 2.4 at 12 months and 16.0 ± 4.38 at 24 months.	Arnljots 2021	Online 11th Feb 2021

	Type of study design*	Title of journal article or research project (including any trial identifier or study lead if relevant)	Short description of research (max 50 words)**	Website link to journal article or research (if available)	Date of publication***
		Ophthalmol. 2021 Feb 11;15:541-550.	Mean (SD) number of IOP-reducing medications unchanged from 3.0±1.1 at baseline to 3.0 ± 0.75 at 24 months. No major complications were reported.		
5.	Retrospective, single-centre study	**(Pahlitzsch 2021)** Pahlitzsch M et al. Selective Laser Trabeculoplasty Versus MIGS: Forgotten Art or First-Step Procedure in Selected Patients with Open-Angle Glaucoma. Ophthalmol Ther. 2021 Sep;10(3):509-524. ClinicalTrials.gov listing: NCT 01517477 (no results posted)	N=66 Adults with POAG who had received iStent (or selective laser trabeculoplasty or trabeculectomy, these arms not included). Mean (SD) IOP reduced from 19.5 ± 2.0 to 14.3 ± 3.0 at 6 months, 14.5 ± 3.0 at 12 months, 15.5 ± 2.3 at 24 months and 13.8 ± 2.7 at 36 months. Mean (SD) number of IOP-reducing medications reduced from 2.2 ± 1.2 at baseline to 1.7 ± 1.5 at 36 months.	Pahlitzsch 2021	Online 7th May 2021
6.	Prospective, randomized, open-label	**(Katz 2018)** Katz LJ et al. Long-term titrated IOP control with one, two, or three trabecular micro-bypass stents in open-angle glaucoma subjects on topical hypotensive medication: 42-month outcomes. Clin Ophthalmol. 2018 Jan 31;12:255-262	N=38 Adults with OAG (POAG, pseudoexfoliative, or pigmentary glaucoma. Mean (SD) IOP (mm Hg) reduced from 19.8±1.3 to 13.5 ± 2.3 at 6 months and 12.8 ± 1.4 at 12 months. Mean (SD) number of IOP-reducing at baseline 1.76 ± NR. Safety parameters were reported as favourable.	Katz 2018	Online 31st Jan 2018
7.	Prospective, multicentre, randomised, single masked study. Only the iStent arm will be included in the analysis.	**(Ahmed 2020)** 12 month results: Ahmed, I.I.K. et al. (2020). "A Prospective Randomized Trial Comparing Hydrus and iStent Microinvasive Glaucoma Surgery Implants for Standalone Treatment of Open-Angle Glaucoma: The COMPARE Study." Ophthalmology 127(1): 52-61. ClinicalTrials.gov listing: NCT02023242 (12 and 24 month results reported).	N=77 Adults with OAG Mean (SD) IOP (mm Hg) reduced from 19.1 ± 3.6 to 17.9 ± 3.8 at 6 months, 18.1 ± 3.7 at 12 months and 18.1 ± 3.7 at 24 months. Mean (SD) number of IOP-reducing medications reduced from 2.7 ± 0.8 at baseline to 1.91 ± 1.36 at 24 months. Secondary glaucoma surgery was performed in 2 eyes in the 2-iStent group (3.9%). One eye in the 2-iStent group had BCVA loss of ≥2 lines.	Ahmed 2020	Online 26th Apr 2019

	Type of study design*	Title of journal article or research project (including any trial identifier or study lead if relevant)	Short description of research (max 50 words)**	Website link to journal article or research (if available)	Date of publication***
		24 month results: no alternative citation was identified: https://www.prnewswire.com/news			

AE: adverse event; ITT: intention to treat; mITT: modified intention to treat; N: number of included patients; NR: not reported; POAG: primary open angle glaucoma; SAE: serious adverse event; SAF: safety; SOAG: secondary open angle glaucoma;

* Categorise study design, for example meta-analysis, randomised trials, non-randomised trial or observational study, study of diagnostic accuracy, etc.

**Provide high level information including population numbers and whether patients are being recruited or in post-recruitment, including providing the trial registration number to allow for tracking purposes. For yet to be published research, provide high level information including population numbers and whether patients are being recruited or in post-recruitment.

*** If the publication is a follow-up to an initial publication, please advise. For yet to be published research, include the date of when results will be made available (to the best of your knowledge).

Reference list

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