

# Medication Utilization Post Laser Trabeculoplasty or Minimally Invasive Glaucoma Surgeries in Patients With Open-Angle Glaucoma or Ocular Hypertension: A Systematic Review of Recent Literature

Authors: Mitisha Panda<sup>1</sup>, BA, MPH, Ashna Talwar<sup>2</sup>, MS., PhD, Teresa L. Brevetti<sup>2</sup>, MD, Abhishek A. Nair<sup>2</sup>, MS, PhD

Affiliations 1. University of Virginia, Charlottesville, VA, USA, 2. Bausch + Lomb Americas Inc., Bridgewater, NJ, USA

Poster # CO29

## BACKGROUND

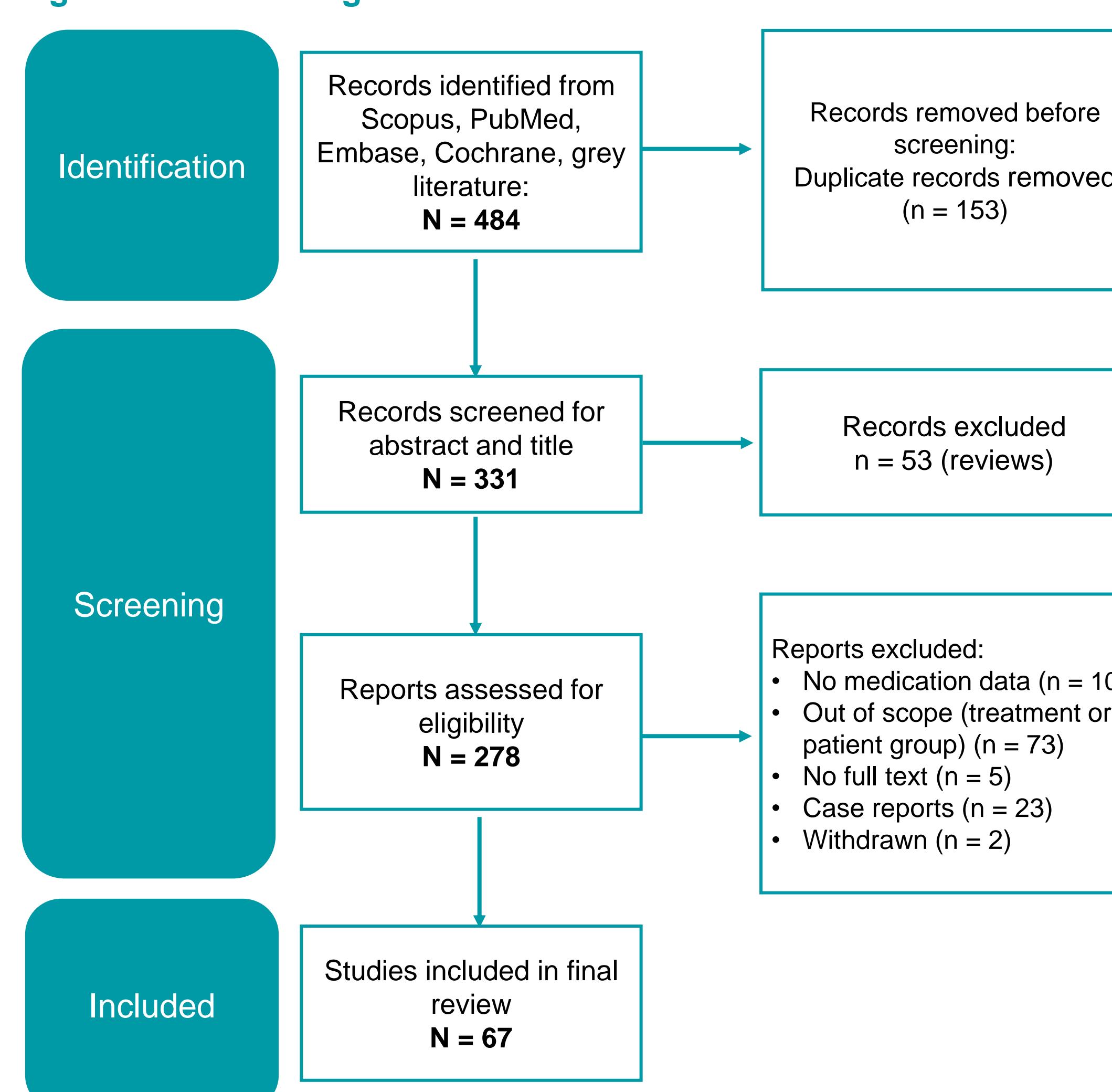
- Glaucoma is a group of neurodegenerative eye diseases that cause progressive vision loss.
- Procedures such as Selective Laser Trabeculoplasty, other Laser Trabeculoplasty (LT) procedures and Minimally Invasive Glaucoma Surgery (MIGS) effectively lower intraocular pressure (IOP), however, patients may still require IOP-lowering topical treatment post-procedure.
- This study systematically reviewed recent literature on the utilization of IOP-lowering medications post-LT or MIGS among patients with primary open-angle glaucoma (OAG) or ocular hypertension (OHT).

## METHODS

- A systematic search was conducted by two reviewers on EMBASE, PubMed, Scopus, and Cochrane Library databases to identify trials and databases studies evaluating IOP-lowering medication use post-LT or MIGS.

- Inclusion Criteria:**
  - Studies including patients diagnosed with Primary Open-Angle Glaucoma (POAG) or Ocular Hypertension (OHT);
  - Published in English between January 2019 and December 2024;
  - Medication usage measured as a primary or secondary outcome at clearly defined time points post-procedure.
- Exclusion Criteria:**
  - Studies involving trabeculectomy, shunts, or tube surgeries;
  - Review articles, case reports, editorials, and letters;
  - Animal studies and non-English language publications.
- Outcomes and Follow-Up Intervals:** Outcomes were observed at Baseline, Immediate Post-Procedure (1 day – 1 month), Short-Term Follow-Up (3–18 months), Long-Term Follow-Up ( $\geq 18$  – Beyond 3Y)
- Sub-Procedure definitions:**
  - MIGS:** included hydrex microstent, XEN implants, iStents, trabeculotomy, canaloplasty, goniotomy, OMNI surgical system, micropulse laser trabeculoplasty, MINIject and other MIGS procedures
  - Laser Trabeculoplasty:** included selective laser trabeculoplasty, direct selective laser trabeculoplasty, argon laser trabeculoplasty, and micropulse laser trabeculoplasty
- Geographic Distribution:** 28 countries, including United States, India, Saudi Arabia, Brazil, China, United Kingdom, Italy, Canada, Philippines, Poland, Spain, Germany, Mexico, France, Sweden, Australia, Turkey, Ireland, Switzerland, Israel, Austria, Armenia, Japan, Belgium, The Netherlands, and Singapore.
- Risk of bias and study quality were assessed using the Cochrane Collaboration guidelines.

Figure 1. Prisma Diagram



## RESULTS

- Out of 484 records identified, 67 studies met the inclusion criteria for evaluating IOP-lowering medication use following LT or MIGS procedures at specific time points.
- 3,628 of 8,574 (42.3%) eyes underwent cataract surgeries in conjunction with the procedures. Among these, 11 focused on SLT, 57 on MIGS, and 1 reported on both.
- The mean (SD) number of IOP-lowering medications across included studies was 2.32 (0.77).

Figure 2. Distribution of patient eyes across different procedures

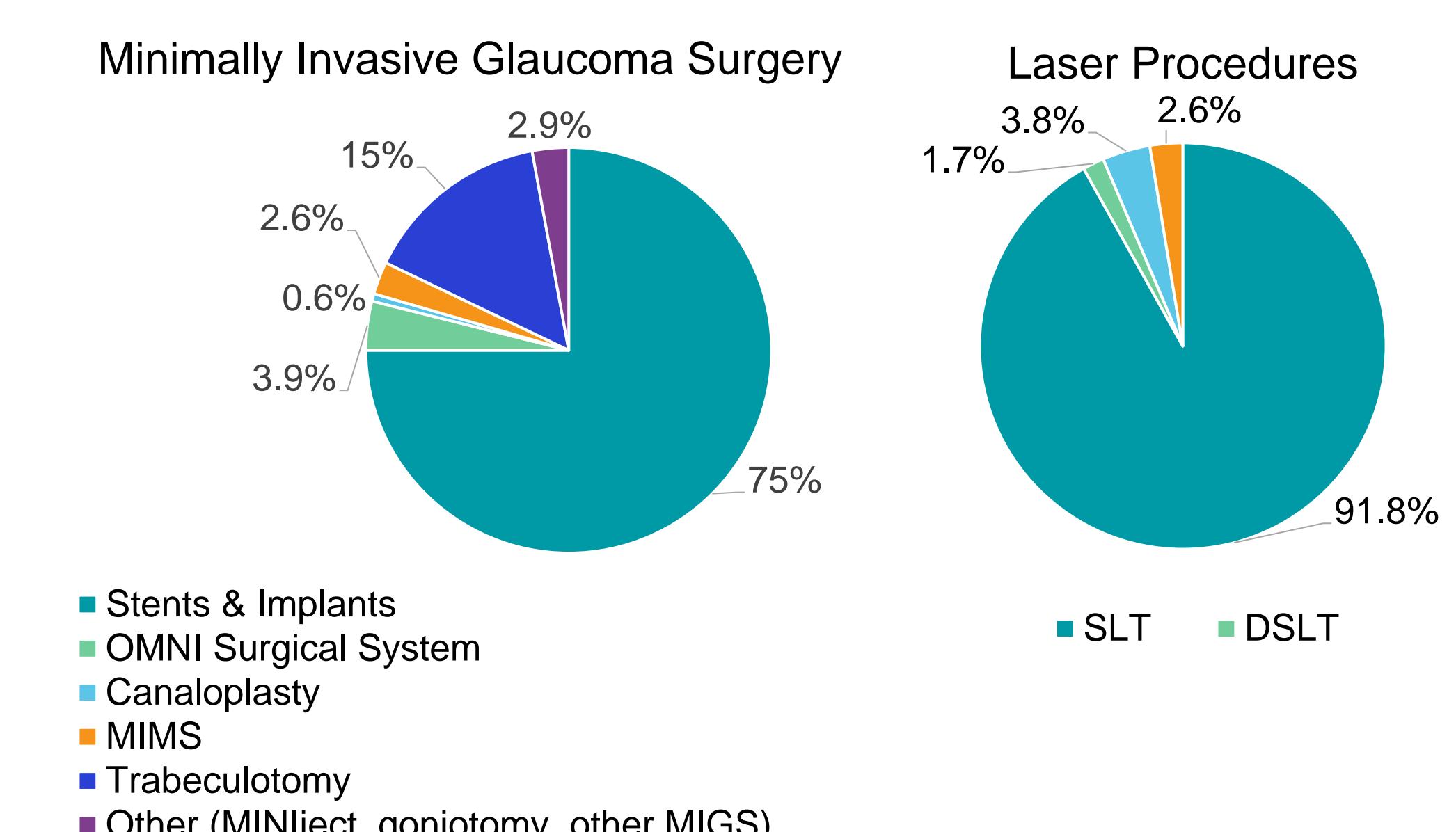


Table 1. Mean Medication Utilization post procedure across time

Time Period	Number of Studies	N (eyes)	Mean Medication (SD)
Baseline	67	8574	2.32 (0.77)
1D-1M	20	2173	0.63 (0.47)
3M	17	1330	0.68 (0.62)
6M-9M	27	3031	0.88 (0.69)
12M-18M	45	6315	0.98 (0.60)
18M-3Y	24	4716	1.07 (0.60)
Beyond 3Y	5	1164	1.08 (0.77)

Figure 2. Mean Medication Utilization over time

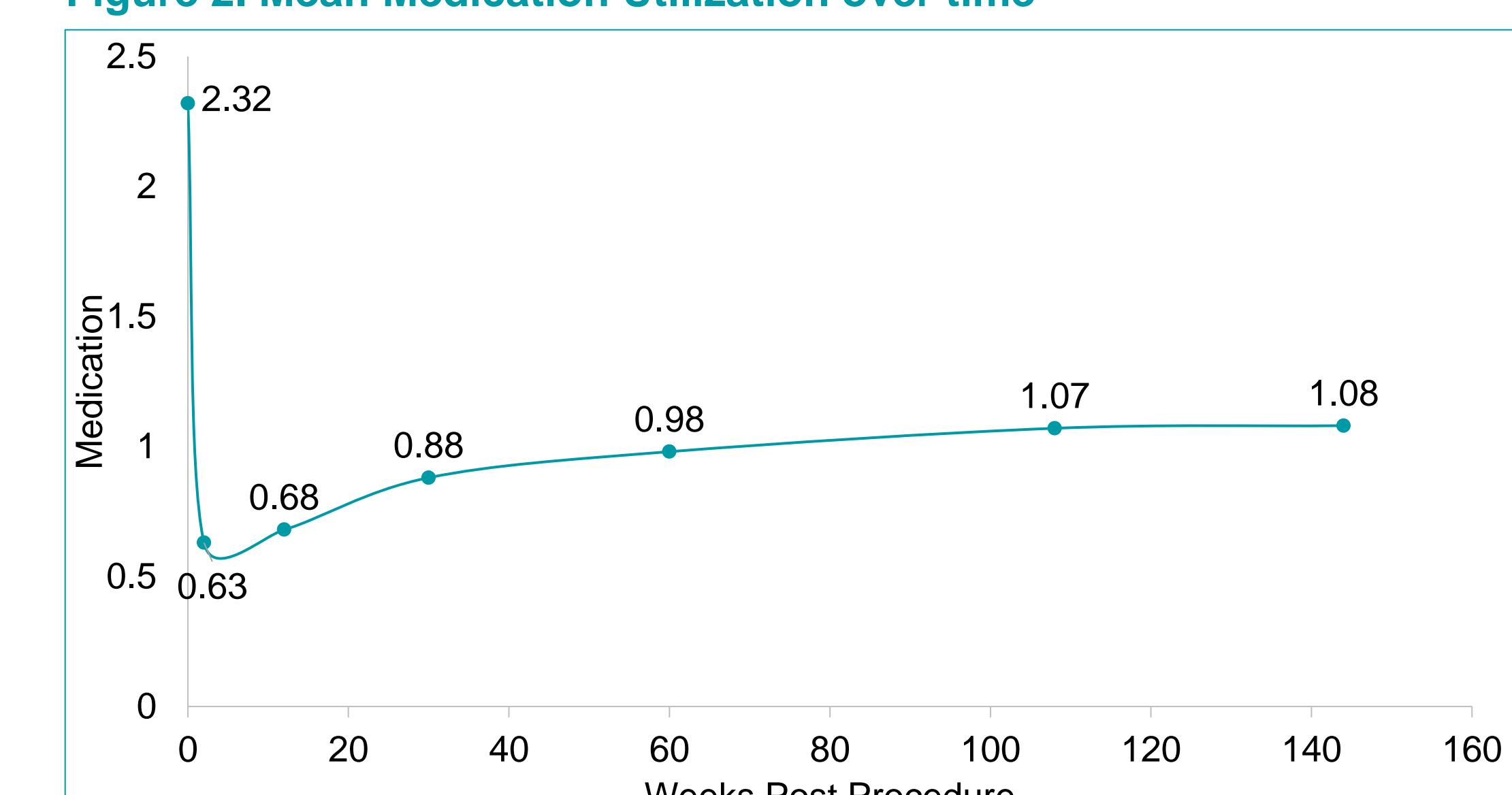


Table 2. Mean IOP post procedure across time points

Time Period	Number of Studies	N (eyes)	Mean IOP (SD)
Baseline	67	8574	21.70 (3.51)
1D-1M	24	2161	16.06 (2.54)
3M	21	1413	15.53 (2.13)
6M-9M	25	2136	15.60 (1.97)
12M-18M	41	5247	15.42 (1.86)
18M-3Y	21	3950	14.69 (1.29)
Beyond 3Y	5	744	14.20 (1.19)

## RESULTS

Figure 3. Mean IOP changes over time

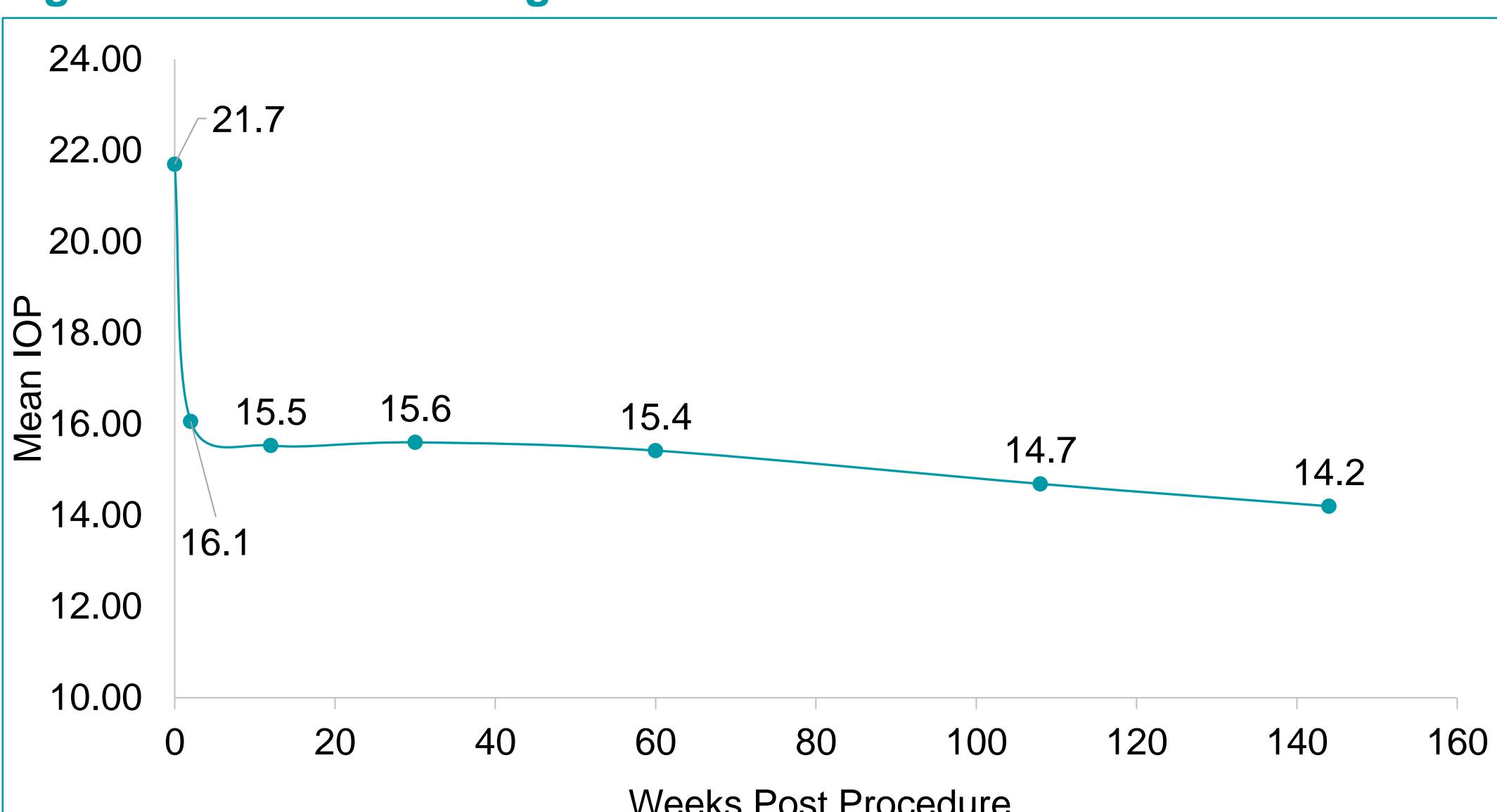
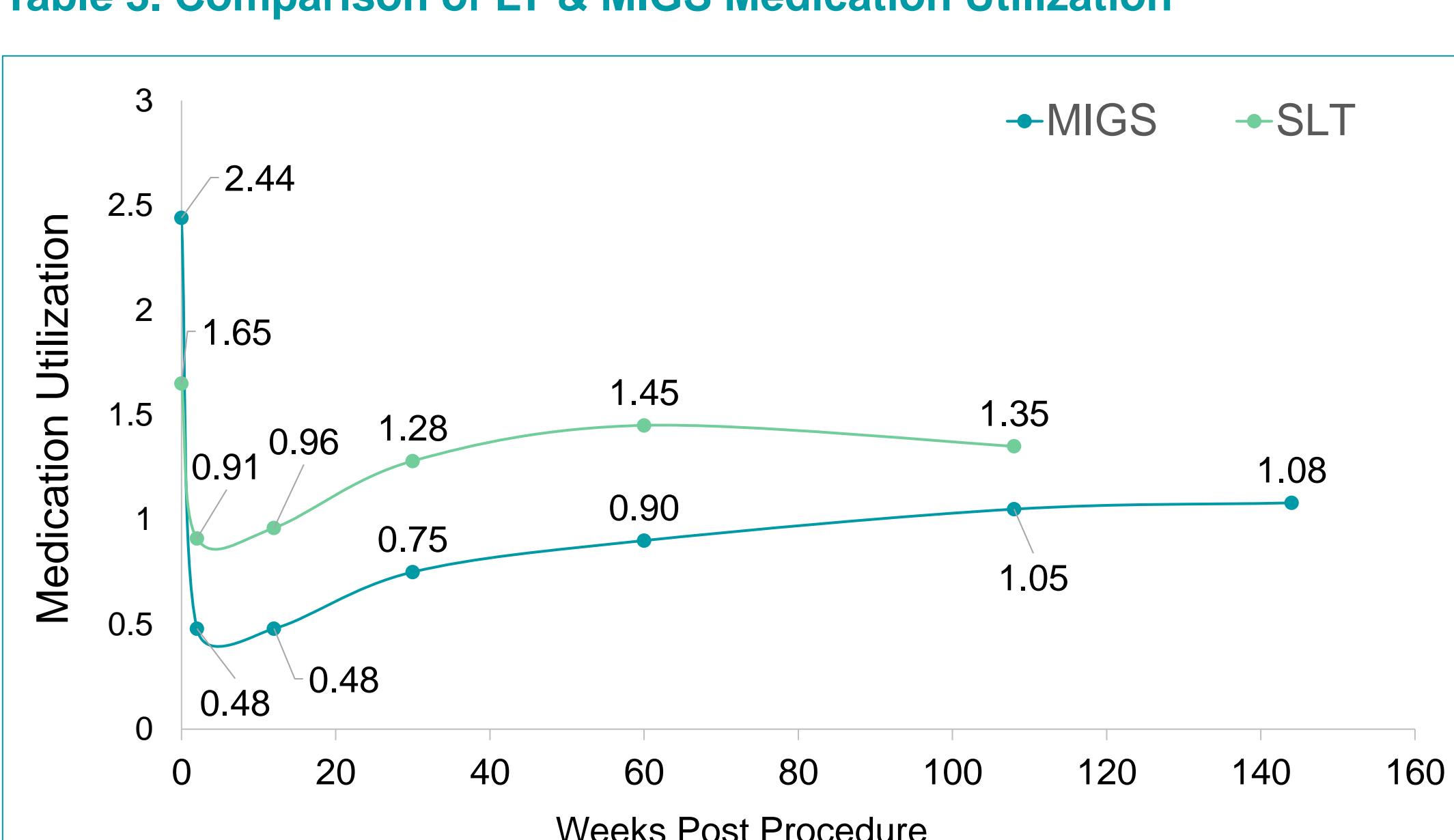


Figure 4. Medication Utilization post LT vs MIGS procedures

Time Period	Number of studies (MIGS)	Medication - MIGS (SD)	Number of Studies (LT)	Medication - LT (SD)
Baseline	59	2.44 (0.74)	11	1.65 (0.55)
1D-1M	15	0.48 (0.40)	4	0.91 (0.5)
3M	14	0.48 (0.46)	3	0.96 (0.26)
6M-9M	19	0.75 (0.61)	8	1.28 (0.78)
12M-18M	38	0.90 (0.60)	6	1.45 (0.34)
1.5Y-3Y	22	1.05 (0.62)	2	1.35 (0.09)
Beyond 3Y	5	1.08 (0.77)	0	No Data

Table 3. Comparison of LT & MIGS Medication Utilization



Comparing LT vs. MIGS:

- MIGS procedures were associated with more durable reductions in medication burden.
- SLT was effective in the short term but demonstrated a faster return to preoperative medication levels, underscoring its temporary therapeutic impact.

Table 4. Comparison of LT & MIGS IOP

Time Period	Number of studies (MIGS)	IOP – MIGS (SD)	Number of Studies (LT)	IOP – LT (SD)
Baseline	57	21.71 (3.58)	11	21.34 (3.32)
1D-1M	15	15.02 (2.07)	9	18.25 (1.99)
3M	14	14.59 (1.49)	7	17.62 (1.86)
6M-9M	17	14.82 (1.45)	9	16.54 (2.18)
12M-18M	35	15.15 (1.77)	6	16.99 (1.33)
1.5Y-3Y	19	14.52 (1.15)	2	16.79 (1.12)
Beyond 3Y	5	14.20 (1.19)	None	

## RESULTS

Figure 5. Comparison of MIGS and LT IOP

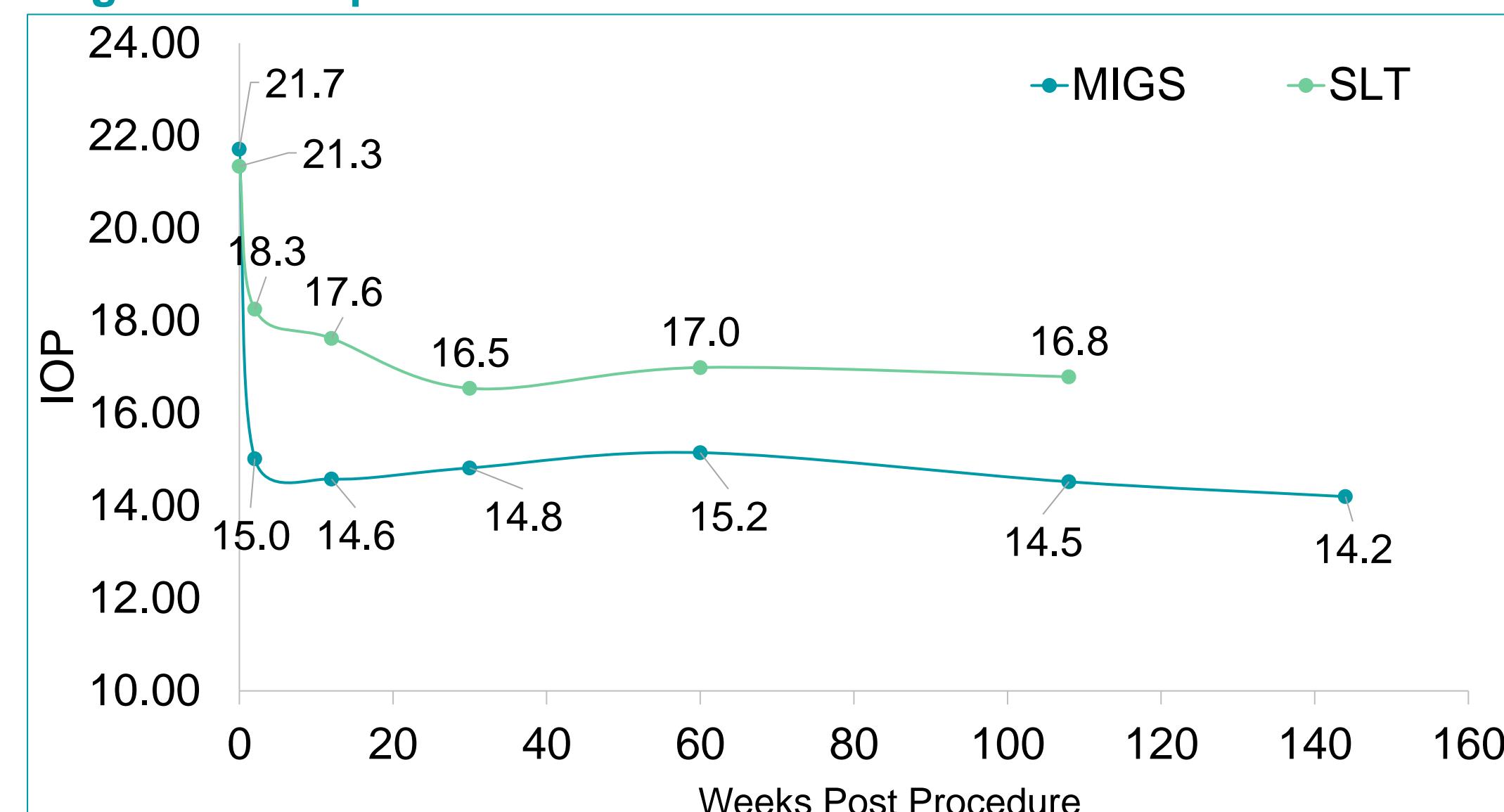
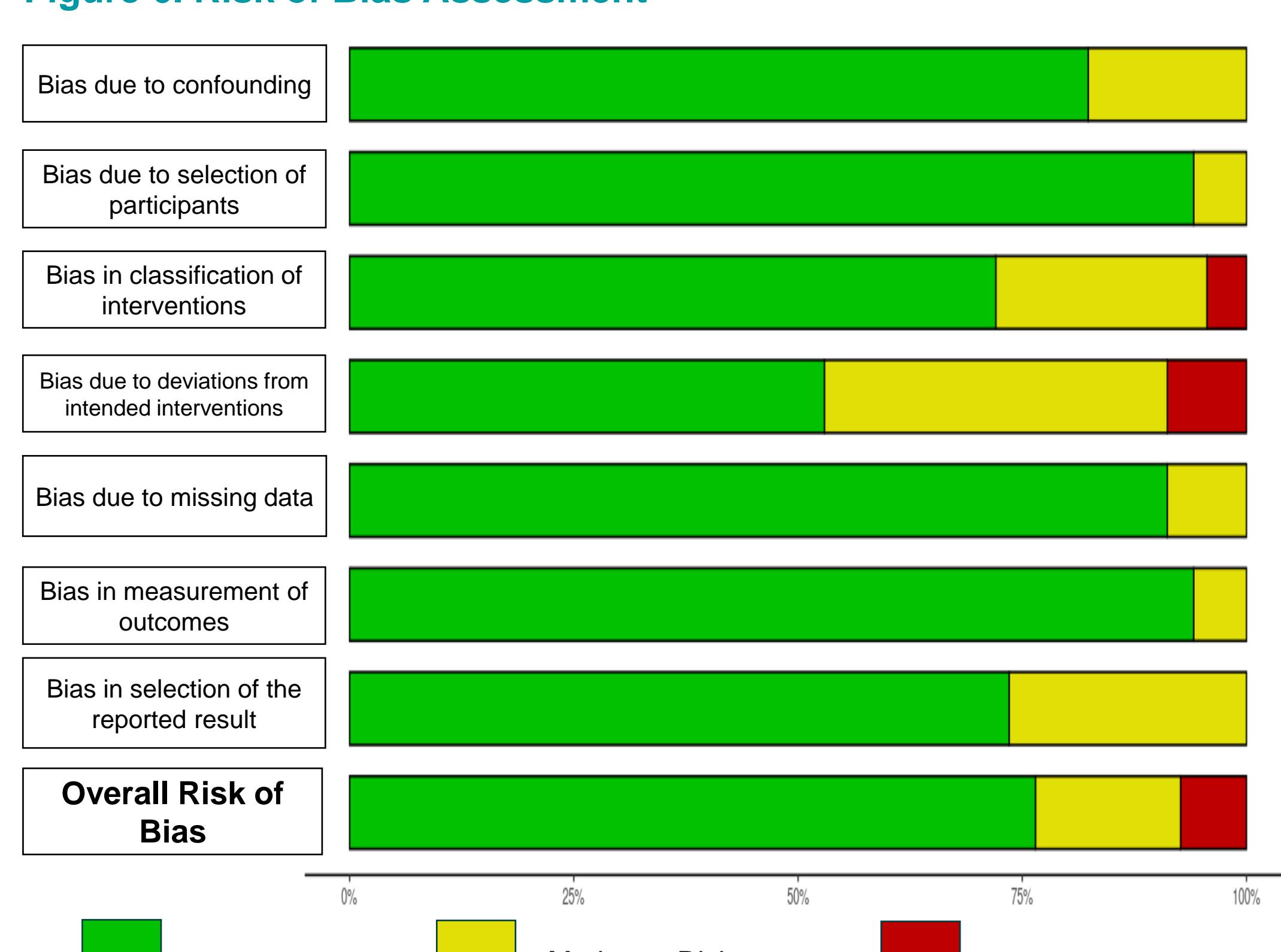


Figure 6. Risk of Bias Assessment



### Risk of Bias:

- Using the Cochrane Collaboration tool, most studies were assessed as having low to moderate risk of bias.
- Common sources of potential bias included deviation from intended treatments, selection bias in participants, classification of intervention and selection of reported result.
- 52 (78%) of articles presented a low risk of bias when assessed, indicating a high level of integrity for this SLR and its results.

## CONCLUSIONS

- This systematic review reveals a clear pattern in postoperative IOP-lowering medication use following LT and MIGS in patients with primary open-angle glaucoma or ocular hypertension.
- Both interventions result in a significant reduction in topical medication use immediately following the procedure. However, this effect diminishes over time.
- MIGS procedures demonstrate a more sustained benefit in reducing medication dependence. In contrast, the efficacy of LT appears more transient, with many patients requiring an increase in number of topical medications over time.
- The results highlight a key clinical consideration that while surgical options can temporarily alleviate the burden of topical therapy, they do not eliminate the need for long-term disease monitoring and treatment management.

## REFERENCES

All the references and articles used in this literature review can be found here:

