

" Selective Laser Trabeculoplasty (SLT) Course"
Improving the Standard of Care for Glaucoma Patients

SLT IN MY DAILY PRACTICE

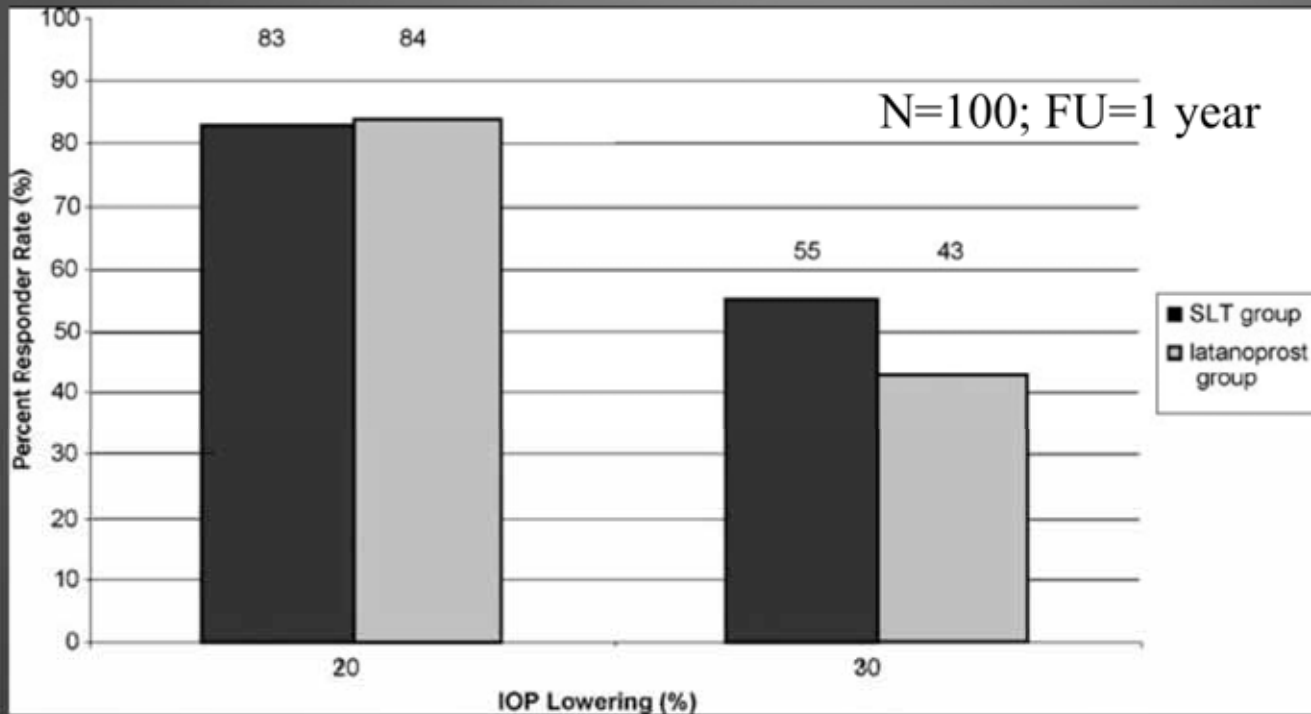
Prof. Roberto Carassa

Where to position SLT in the armamentarium ?

- SLT can be used as a primary therapy
 - No compliance issues
 - Better response
- SLT can be used as combination therapy with medication
 - Improve IOP control
 - Decrease or stop medical therapy when side effects or poor tolerance occur
 - Decrease diurnal fluctuations
 - Delay surgical option
- SLT can be used after surgery or ALT
 - Improve IOP control

SLT as primary therapy

SLT is as effective as latanoprost as primary therapy of POAG



SLT as primary therapy

WHEN:

- the impact of the disease / therapy highly affects QOL
- side effects of drugs are a major concern for the patient
- the patient has difficulties in using the drops
- there is a high risk of poor adherence

GLAUCOMA TREATMENT MUST BE INDIVIDUALIZED

“Individualized glaucoma treatment aims at providing glaucoma management tailored to the individual needs of the patients.”

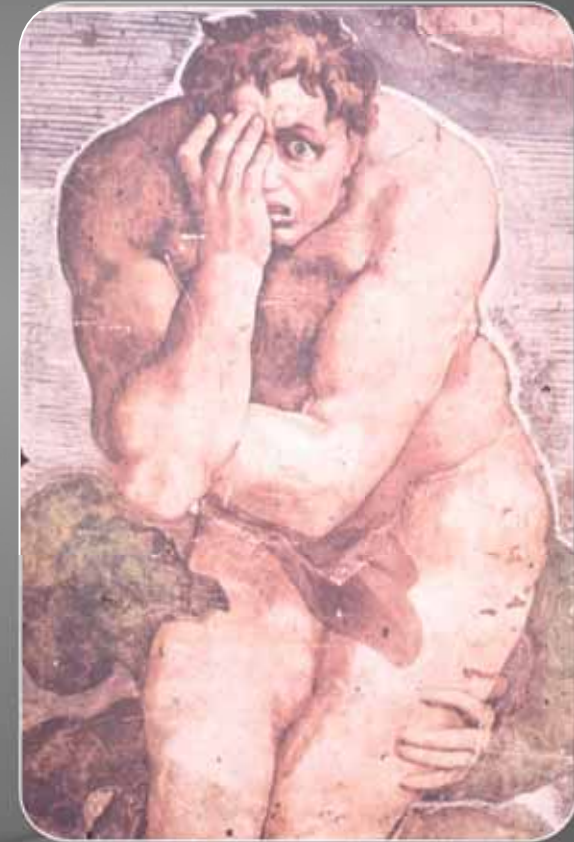
EGS Guidelines 3° ed., 2008

The impact of glaucoma on the quality of life of patients in Norway.

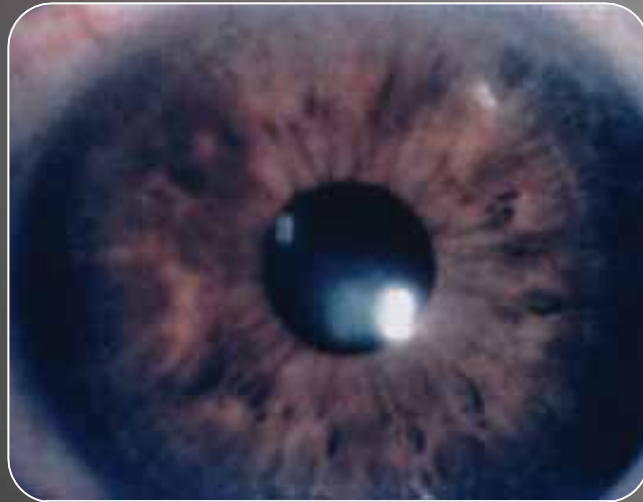
Odberg T, Jakobsen JE, Hultgren SJ, Halseide R.

Department of Ophthalmology, Central Hospital in Hedmark, Hamar, Norway. tor.ordberg@c2i.net

RESULTS: More than 80% reported negative emotions on learning that they had glaucoma, one-third were afraid of going blind. Half the patients had no visual problem at all, 14% complained of poor or very poor vision. This proportion increased with age. One-fourth of the patients on topical medication experienced adverse effects of moderate or high degree. About half the patients being treated with laser or surgery felt their situation had improved afterwards.



SIDE EFFECTS ARE A MAJOR CONCERN



DIFFICULTIES IN USING THE DROPS



Noncompliance with Ocular Hypotensive Treatment in Patients with Glaucoma or Ocular Hypertension

An Evidence-Based Review

Christine M. G. Olthoff, Dr med, MSc,¹ Jan S. A. G. Schouten, MD, PhD,²
Bart W. van de Borne, MSc, PhD,³ Carroll A. B. Webers, MD, PhD²

Ophthalmology 2005;112:953-961 ©

Features	Konstas et al ⁴	Gurwitz et al ⁵	Chang et al ⁶	Granström ⁷	MacKean and Elkington ¹	Spaeth ⁸
Study design	Cross-sectional	Retrospective cohort	Intervention study with preintervention/postintervention measurement	Prospective cohort with retrospective element	Cross-sectional	Cross-sectional
Results	Noncompliant vs. compliant: IOP 22.9 (±3.7) mmHg vs. 18.6 (±3.5) mmHg ($P > 0.001$); disc cupping: 0.69 ± 0.1 vs. 0.62 ± 0.1 ($P = 0.02$); VF loss 10.8 ± 5.8 vs. 7.0 ± 5.4 decibels ($P = 0.008$)	No difference in IOP at baseline, during and after study period	Overall drop in intraocular pressure of 0.8 ± 6 mmHg ($P = 0.003$) Drop of IOP of 1.7 ± 4.6 mmHg ($P = 0.052$) in patients reporting improved compliance Increase in IOP of 0.6 ± 8.3 mmHg ($P = 0.19$) in patients who reported 100% compliance at both visits	No significant association between compliance and VF progression after adjusting for other variables	No association between noncompliance and VF loss	Significant ($P \leq 0.01$) positive correlation between not using eyedrops and a full VF in both eyes

(continued)

Compliance Barriers in Glaucoma: A Systematic Classification

*†James C. Tsai, MD, MBA, ‡Cori A. McClure, BA, ‡Sarah E. Ramos, BA,
‡§David G. Schlundt, PhD, and ‡James W. Pichert, PhD

<u>Factors</u>	<u>Rational</u>
Therapeutic Regimen	<ul style="list-style-type: none">○ Number of drops per day○ Complexity of treatment○ Difficult timing of drops○ Side effects
Patient	<ul style="list-style-type: none">○ Forgetfulness○ Co-morbidity and other therapies○ Lack of knowledge on glaucoma
Doctor	<ul style="list-style-type: none">○ Dissatisfaction○ Lack of communication
Situational	<ul style="list-style-type: none">○ Competing activities○ Travel/away from home○ Change in routine

PATIENTS AT RISK OF NON-ADHERENCE



- Depressed traits
- Concerned by costs
- Concerned about medications
- Complaining about waiting time in office
- Affected by suspect or early stage gl.
- Stating being non-compliant
- Stating having problems with medication
- Poor health literacy
- Using multiple therapies
- Having complex therapeutical regimen
- Having side effects
- ?

SLT as combined therapy

WHEN:

- target IOP is not achieved with medical therapy
- the diurnal curve has high fluctuations
- one or more drugs are not tolerated

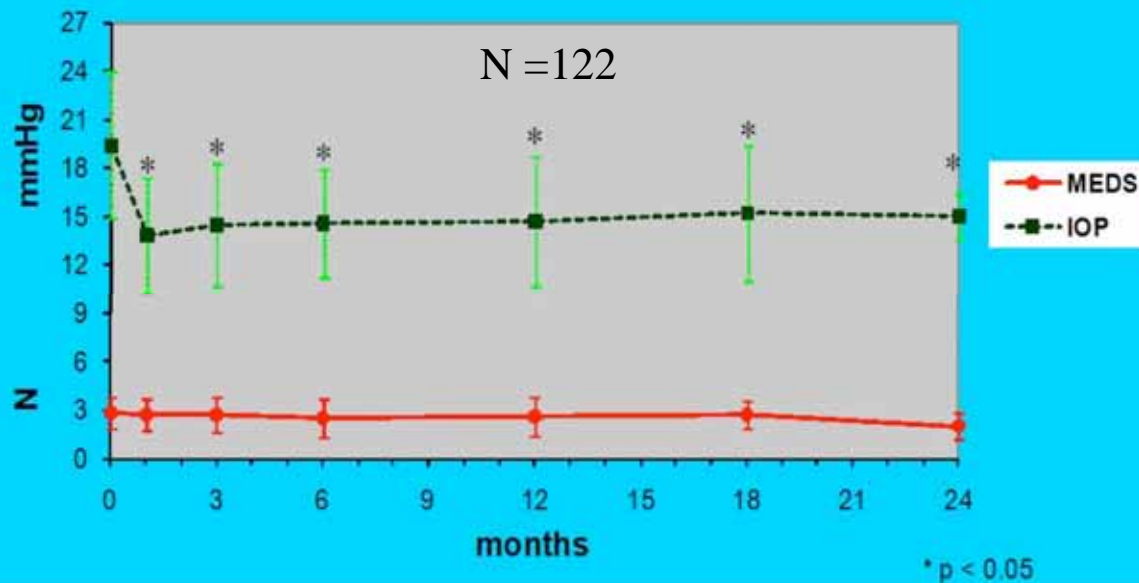
SLT: long-term IOP reduction

Study	N (eyes)	FU YEARS	IOP ↓ mmHg	IOP↓%
Gracner 06	90	6	5.4	22.8
Weinand 06	52	4	6.3	29.3
<i>Juzych 04</i>	41	5	5.9	21.2

SLT as combined therapy

When the target IOP is not achieved with medical therapy

SLT results



IOP (LOCF):

Initial 19.7 ± 4.5 mmHg

Final 13.3 ± 1.4 mmHg

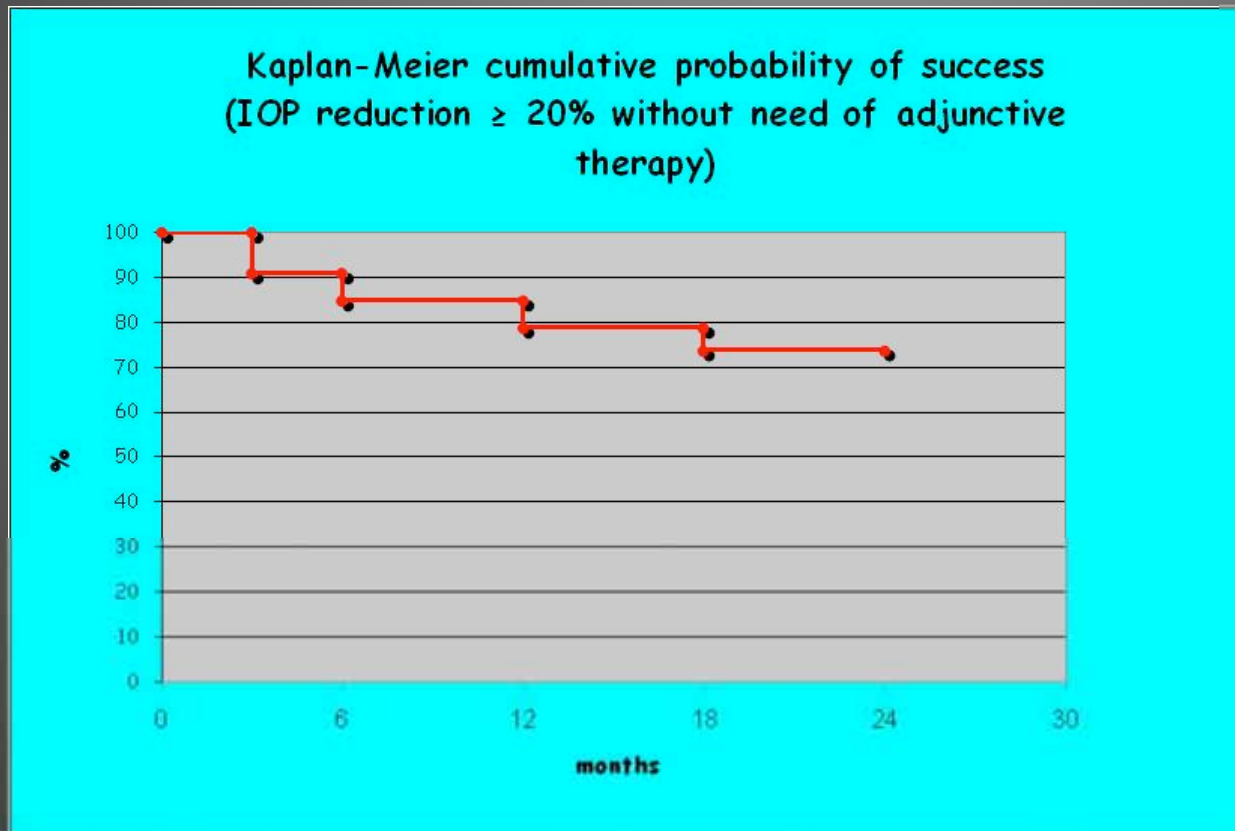
Mean \pm SD reduction:

$31.5 \pm 10.8\%$

(range 12.5% - 56.5%)

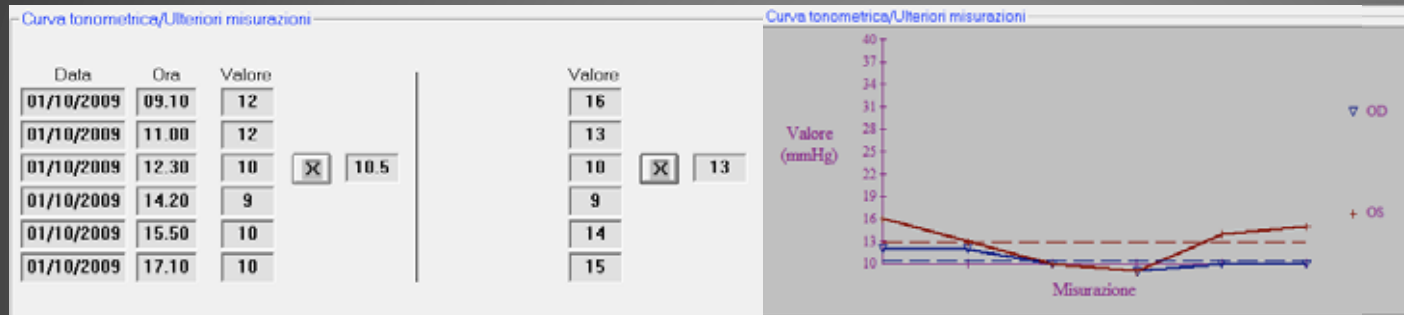
SLT as combined therapy

When the target IOP is not achieved with medical therapy



SLT as combined therapy

When the diurnal curve has high fluctuations



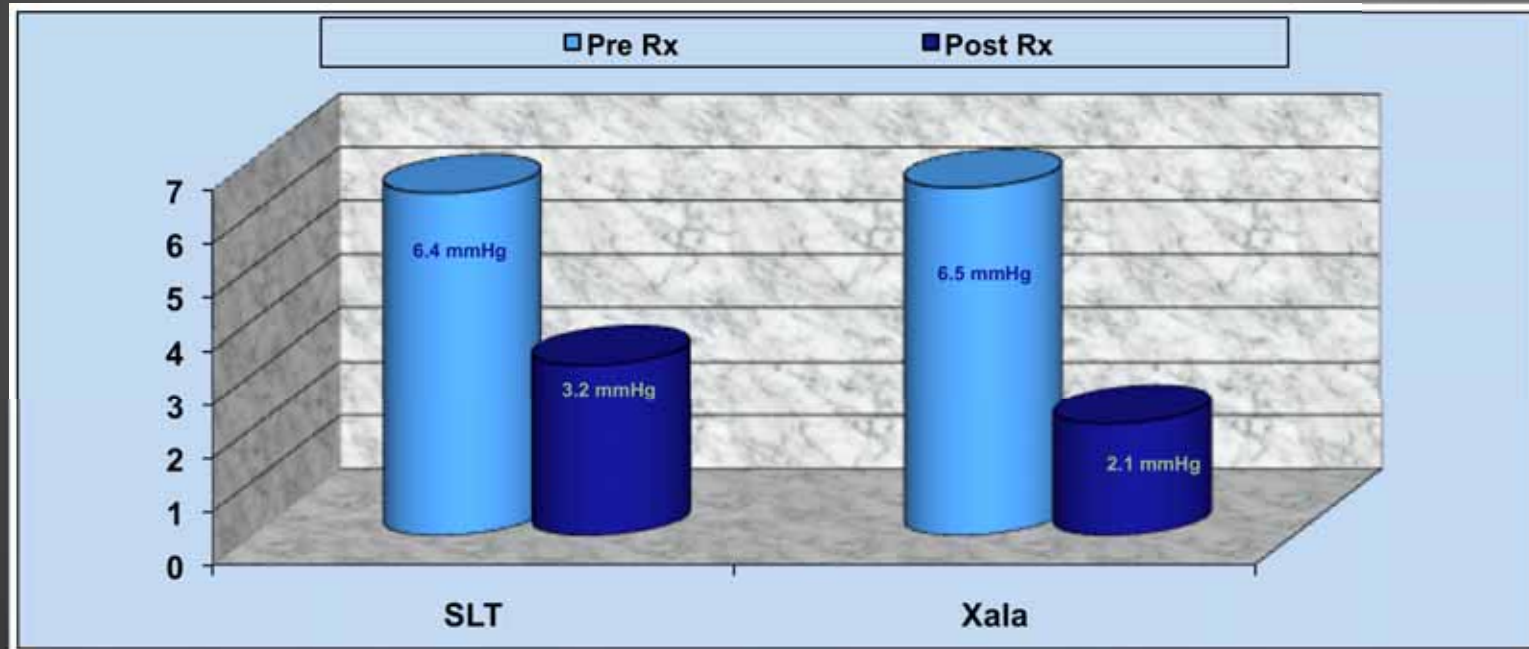
SLT OS (6/11/2009)



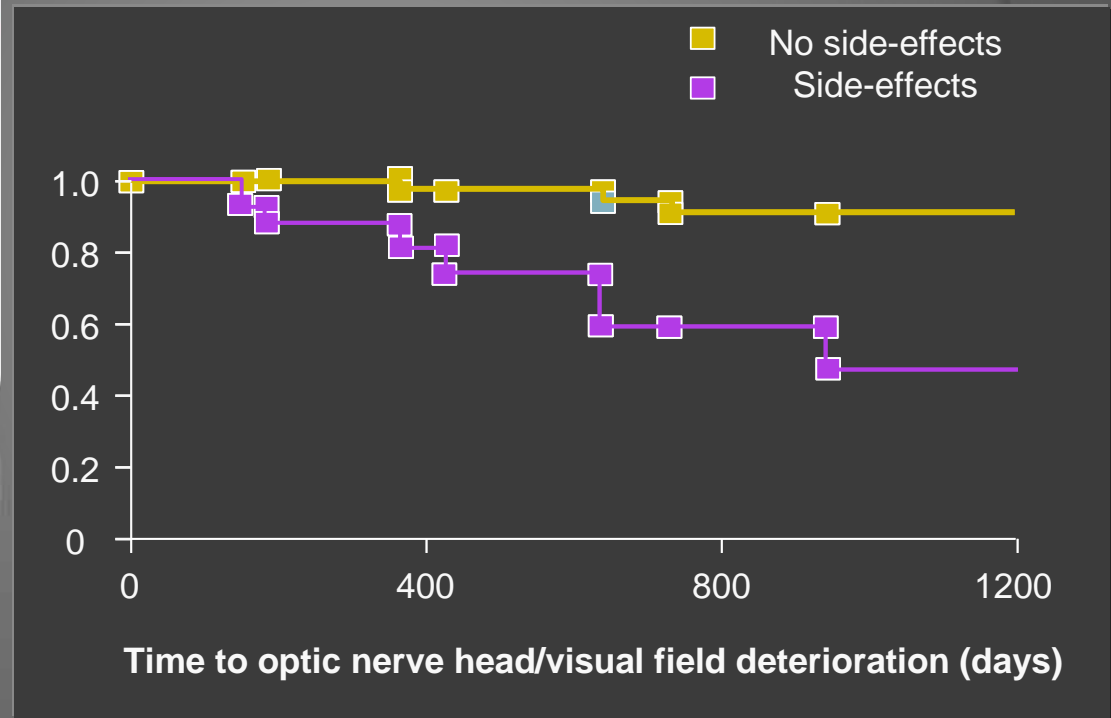
IOP fluctuations pre & post SLT

Pre SLT IOP Fluctuation – 6.4mmHg Post SLT IOP Fluctuation – 3.2 mmHg $p < 0.001$

Pre PGs IOP Fluctuation – 6.4mmHg Post PGs IOP Fluctuation – 2.1 mmHg $p < 0.001$



Side Effects of Medical Therapy

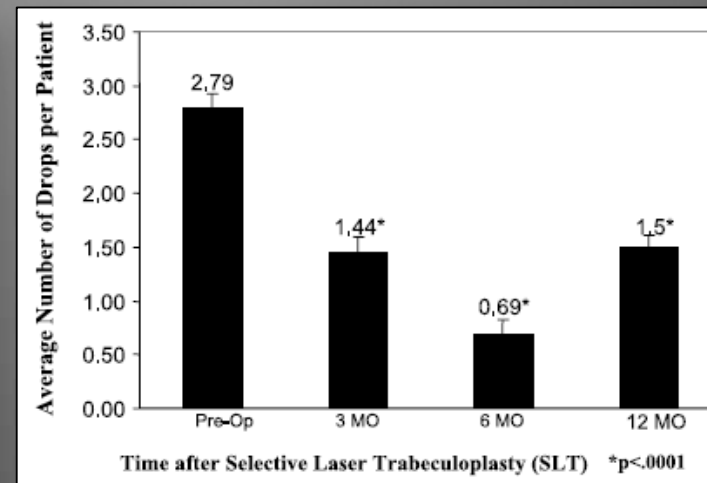
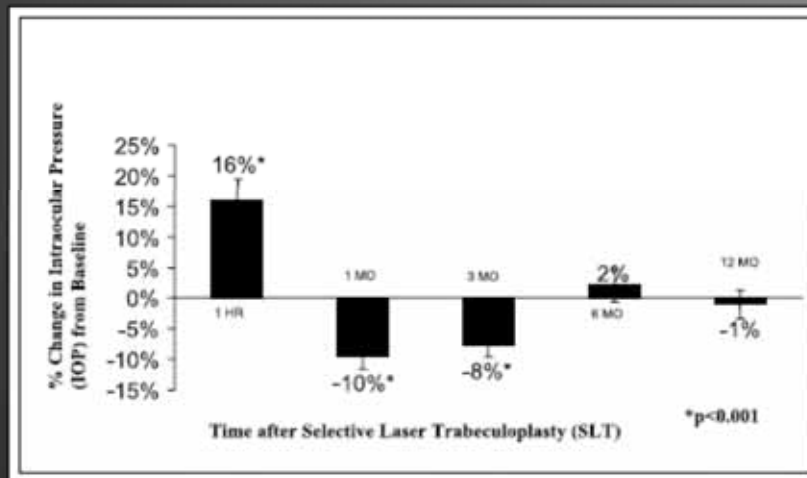


SLT as drug replacement

Selective Laser Trabeculoplasty as a Replacement for Medical Therapy in Open-Angle Glaucoma

Brian A. Francis, MD, Tsoncho Ianchulev, MD,
John K. Schofield, DO, and
Donald S. Minckler, MD

Am J Ophthalmol 2005;140:524-525.



SLT as drug replacement

Effect of Selective Laser Trabeculoplasty on Number of Medications Used

Elaine M. Miglino

Lawrence F. Jindra, MD

ASCRS 2011

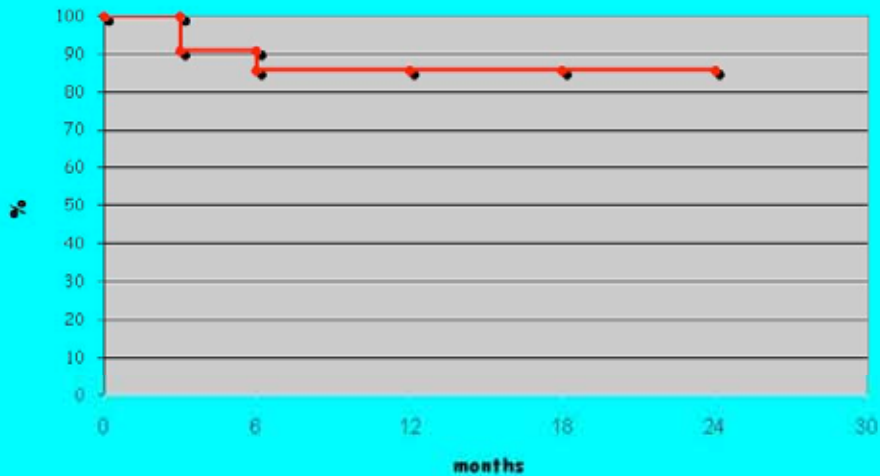
Meds Pre-SLT	Proportion of Eyes	Meds Post-SLT	Proportion of Eyes
• >3	18%	• >3	7%
• 3	21%	• 3	7%
• 2	26%	• 2	16%
• 1	35%	• 1	14%
• 0	0%	• 0	56%

Results were significant with $p < 0.05$

Retrospective chart review was performed on 997 eyes, from a consecutive case series of 3,034 eyes treated with SLT over 8 years.

SLT as drug replacement

Kaplan-Meier cumulative probability of success
(elimination of intolerant drugs)



IOP (LOCF):

Initial 18.8 ± 5.8 mmHg

Final 14.9 ± 3.6 mmHg

Mean \pm SD reduction:

$17.1 \pm 13.9\%$

(range 0% - 40.6%)

MEDS:

Initial 2.2 ± 1.1 mmHg

Final 1.6 ± 1.1 mmHg

87% succeeded

13% on 1 drug ended on no meds

5% on 2 drugs ended on no meds

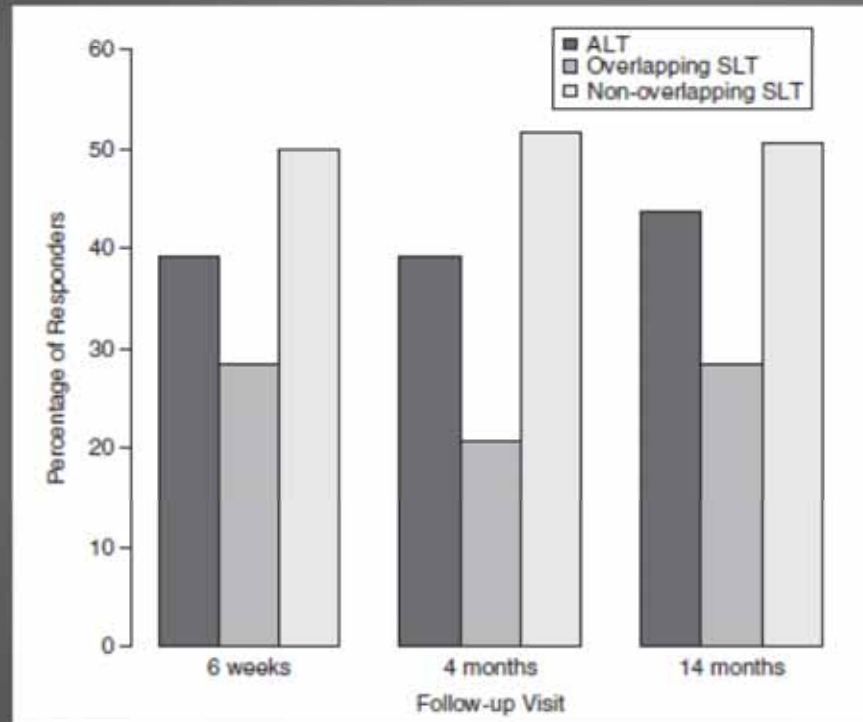
SLT: Technique

- use maximum treatment energy that will not cause photodisruption, seen as bubble formation. Set initial energy at 0.6 mJ. Increase energy in 0.1 mJ increments until bubble is observed. Then decrease of 0.1 mJ.
- place non-overlapping spots over 180° (50±10 spots) or (better) over 360°
- avoid blood vessels
- use a standard gonioscopy lens without magnifying optics



Evaluation of a Modified Protocol for Selective Laser Trabeculoplasty

Mathew K. George, MD, John W. Emerson, PhD,† Sameer A. Cheema, MD,*
Robert McGlynn, MD,* Bryce A. Ford, MD,‡ James F. Martone, MD,*
Milton Bruce Shields, MD,* and Martin Wand, MD§*

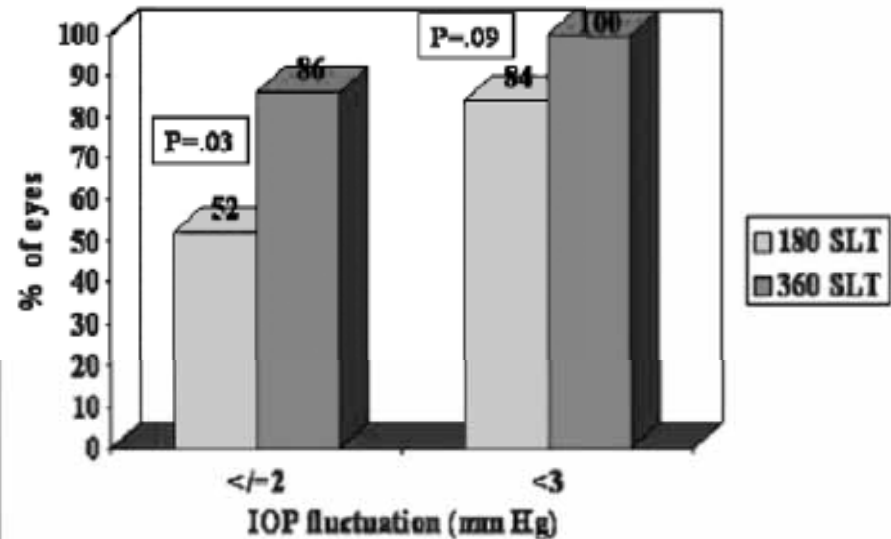
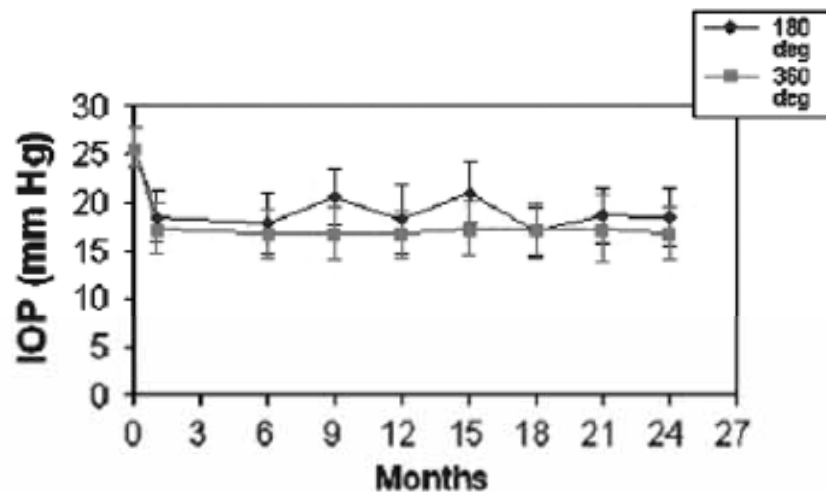


Non overlapping spots provide a better outcome

A Comparison of the Intervisit Intraocular Pressure Fluctuation After 180 and 360 Degrees of Selective Laser Trabeculoplasty (SLT) as a Primary Therapy in Primary Open Angle Glaucoma and Ocular Hypertension

Navin Prasad, MD,* Shashidhar Murthy, MS, FRCS,* John J. Dagianis, MD,†
and Mark A. Latina, MD‡

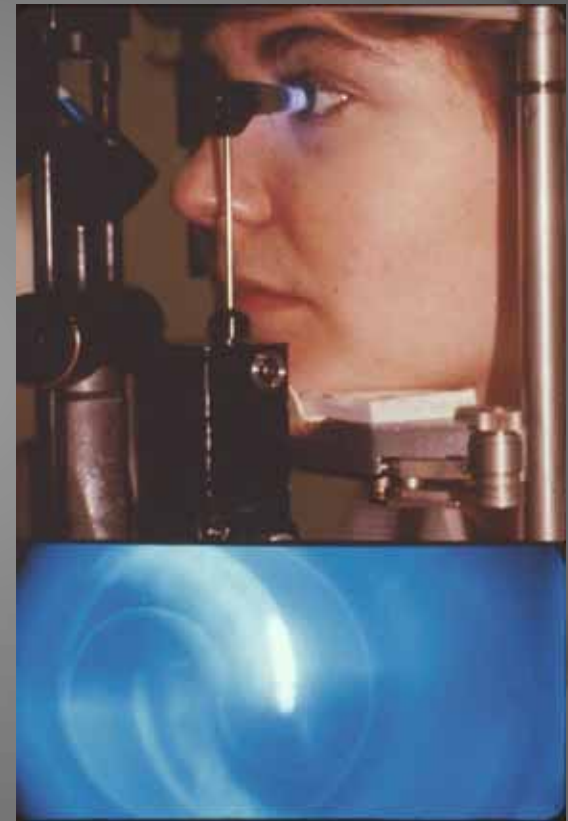
(*J Glaucoma* 2009;18:157–160)



360° treatment provides a better outcome when compared to 180°

How Quickly Does SLT Begin to Lower IOP ?

- unclear
- large decrease the day after, followed by a steady decline for up to 8 weeks before reaching a plateau¹
- -7.8 mmHg at 1hr, -10.6 mmHg at 2 hrs and at 6 weeks²
- IOP at 2 wks predicts the long term (up to 1 yr) IOP reduction³



1. Latina M et al., 1998; 2. Lanzetta P et al., 1999; 3. Johnson PB et al, 2006

What factors affect the results of SLT ?

SLT and Adjunctive Medical Therapy

A Prediction Rule Analysis

Evan Martow, BMSc, Cindy M.L. Hutnik, MD, PhD, and Alexander Mao, MD, MPH

(J Glaucoma 2011;20:266-270)

Conclusions: Topical medications do not adversely, nor favorably, affect SLT success. SLT efficacy is positively associated with the degree of IOP elevation before SLT treatment. Pigmentation of the anterior chamber angle, class of antiglaucoma medications, diabetes, sex, corneal thickness, pseudophakia, diagnosis, washout of eye drops, and previous argon laser trabeculoplasty treatment are not associated with SLT treatment efficacy.

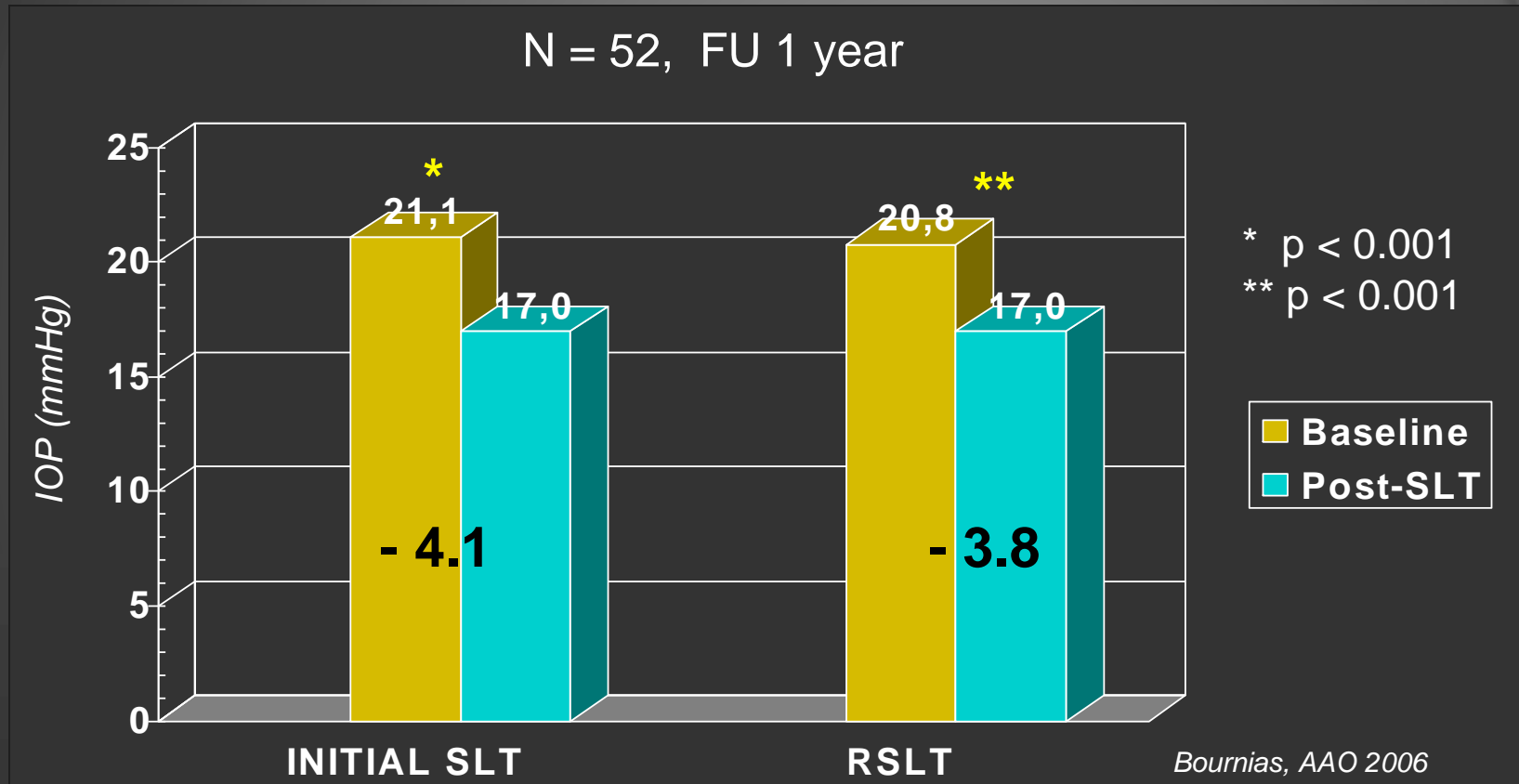
What factors affect the results of SLT ?

Development of a Prediction Rule to Estimate the Probability of Acceptable Intraocular Pressure Reduction After Selective Laser Trabeculoplasty in Open-angle Glaucoma and Ocular Hypertension

Alexander J. Mao, MD, OD, MPH, Xiao-jing Pan, MD,† Ian McIlraith, MD,* Maurice Strasfeld, MD,* George Colev, MD,* and Cindy Hutnik, MD**

Conclusions: SLT efficacy is positively associated with IOP elevation before SLT treatment and adversely associated with the maximum IOP ever recorded in history. Pigmentation of the anterior chamber angle, diagnosis, washout of eye drops, and sex are not associated with SLT treatment efficacy. This prediction rule should be further validated with a comparable prospective clinical study cohort.

Is SLT repeatable ?



Success of repeated SLT: 90%
[IOP ↓ ≥ 3 mmHg & IOP < 21 mmHg]

Is SLT repeatable ?

	Initial SLT	Repeat SLT
Number of eyes (n)	101	101
Pre-SLT IOP (mmHg)	26	23.7
Post-SLT IOP (mmHg)	19	16.2
IOP Change (mmHg)	-7.0	-7.5
% ↓ IOP	27	32
Follow up days	228	260
P-value	<0.01	<0.01

SLT: Indications

II. Selective Laser Trabeculoplasty: A Better Alternative

Karim F. Damji, MD, FRCSC, MBA

Tips for Selective Laser Trabeculoplasty Patient Selection

Patients for whom SLT may be appropriate

- Primary open-angle glaucoma, pseudoexfoliation glaucoma, or pigmentary glaucoma with medically uncontrolled IOP
- Other secondary open-angle glaucomas
- Previous “failed” ALT
- Patients in whom compliance is questionable
- Patients who cannot afford medications
- Patients who wish to reduce the number of medications they are taking
- Patients intolerant of drop therapy

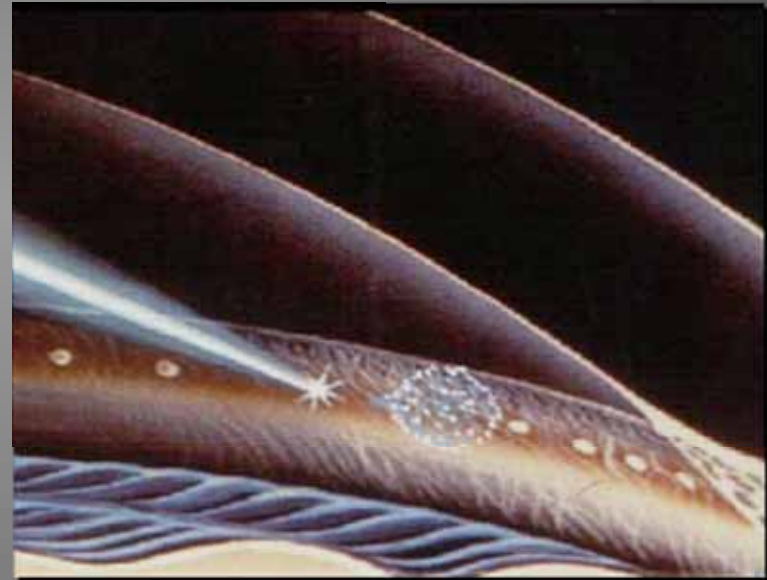
Patients not likely to be good SLT candidates

- History of or active uveitis
 - Neovascular glaucoma
 - Traumatic glaucoma
 - Congenital or early childhood glaucoma
 - Primary or secondary angle-closure glaucoma
 - Inadequate visualization of the trabecular meshwork (if pupillary block is present, consider peripheral iridotomy first)
-

SLT: Complications

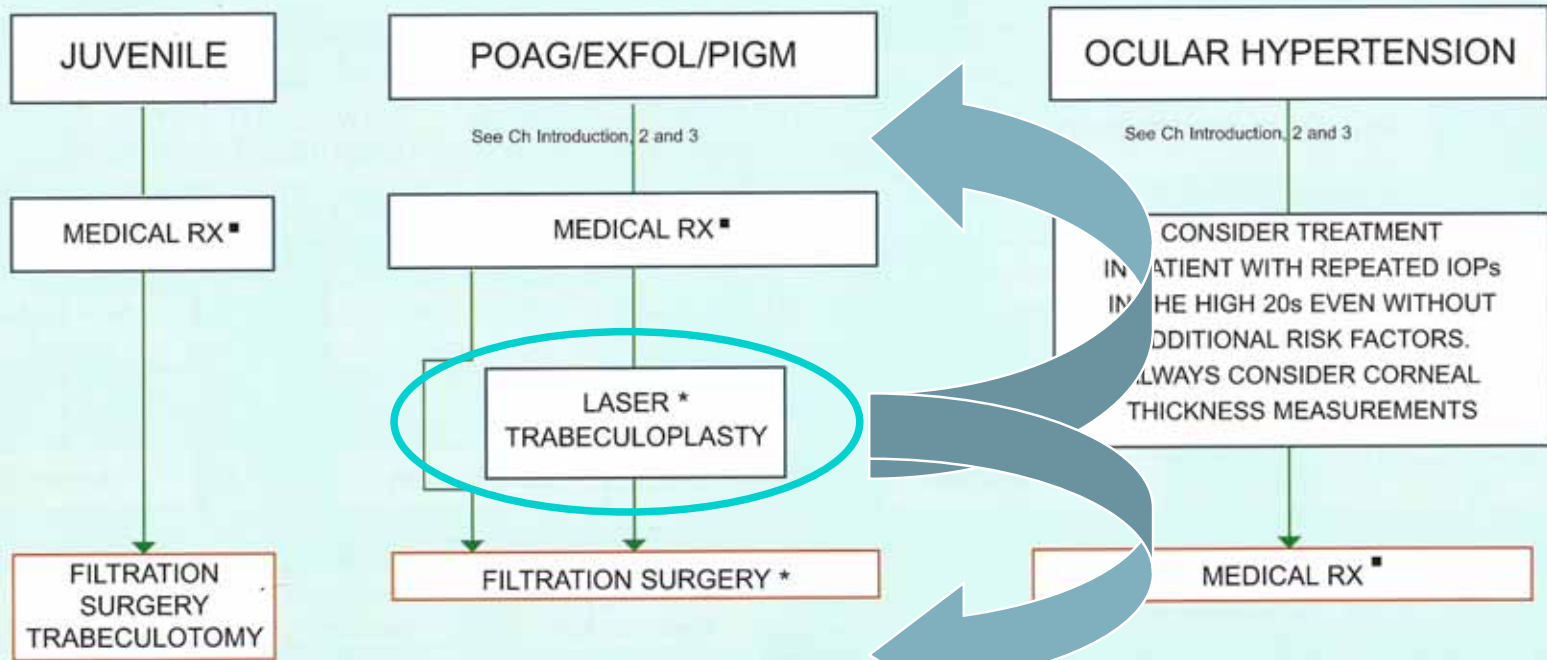
SLT IS A VERY SAFE PROCEDURE

- Mild inflammation, appearing 1 hr after SLT, decreasing by 24 hrs, and resolving in all cases within 5 days¹
- Ocular discomfort in 15%-39% of eyes, resolving in 1 day^{1,2}
- IOP spike (≥ 5 mmHg) in 3.4% - 25% 1 hr after treatment, resolved with medication^{1,3,4}



1. Latina M et al., 1998; 2. Nagar M et al., 2005; 3. Damji KF et al, 1999; 4. Lai JS et al.: 2004

VII - TREATMENT STEPLADDER



IF THE ABOVE NOT SUCCESSFUL, CONSIDER REPEAT FILTRATION SURGERY+ANTIMETABOLITES OR AQUEOUS DRAINAGE IMPLANT/CYCLO DESTRUCTIVE PROCEDURE

* In certain cases, it may be necessary to consider filtration surgery without resorting to laser trabeculoplasty

▪ up to 2-3 different drugs. Do not add a drug to a non-effective one; consider switching