

# Early treatment outcomes in dry eye patients treated with intense pulsed light therapy

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## PURPOSE

- The purpose of this retrospective study is to describe the early treatment outcomes for meibomian gland dysfunction (MGD) and ocular rosacea in dry eye patients treated with Intense Pulsed Light (IPL) therapy.

## METHODS

- Overview of IPL**
  - Most IPL patients receive this treatment as a last resort after trying several other therapies. They often have severe MGD and few glands expressing.
  - IPL is FDA approved for patients with rosacea and acne. Light emitted from the flashlamp is absorbed by oxyhemoglobin in blood vessels on the surface of the skin. The absorption generates heat that coagulates the cells, leading to thrombosis of the blood vessels.<sup>1-4</sup>
- Patient selection:** IRB approval was obtained for a chart review. Specific guidelines for selecting ideal IPL candidates have not been established. In our referral practice at Mayo Clinic Arizona, patients were selected based on the severity of their MGD, ability to tolerate the pain of lid margin expression, and willingness to withstand cost of treatments (\$500/treatment). Patients underwent Fitzpatrick skin typing to classify their skin response to sun exposure by degree of burning and tanning. For laser safety reasons, Fitzpatrick skin types I, II, and III (pale white to cream white) were included, and types IV, V, and VI (moderate brown to black) were excluded.

## RESULTS

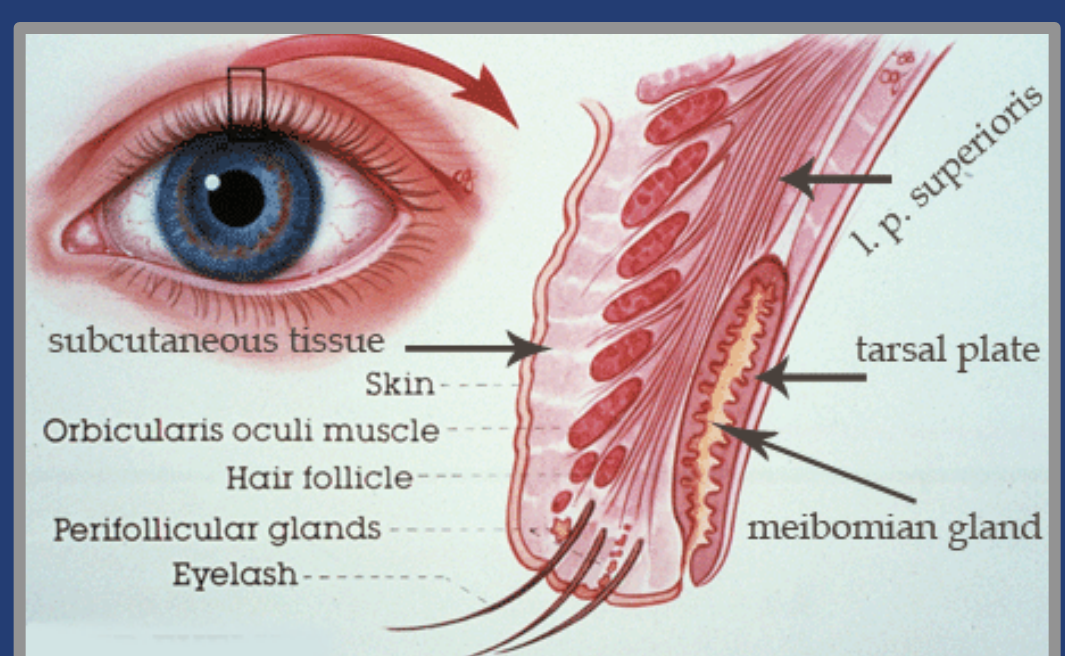
- Treatment:** Patients received 1-4 IPL treatments spaced 4-6 weeks apart. Each treatment was immediately followed by lid expression to remove the material plugging the glands. Slit lamp exams were performed before each treatment.
- Chart Review:** The medical records of 83 dry eye patients treated with IPL and meibomian gland expression between January 2013 and February 2014 were retrospectively examined to determine outcomes. Fifty-two charts had adequate records for inclusion in data analysis. Demographics, ocular histories, SPEED2 scores, slit lamp exam, and meibomian gland evaluation (MGE) at baseline and after IPL treatment were reviewed.
- SPEED2 Score:** Patients completed a SPEED2 questionnaire before and after each treatment. The purpose of SPEED2 is to evaluate the severity of dry eye symptoms patients subjectively experience. The score can range from 0 to 28; a higher score indicates more severe symptoms.
- MGE:** Typically each eyelid has 30-40 meibomian glands each. MGE is the number of glands observed yielding liquid secretions in the lower eyelid.



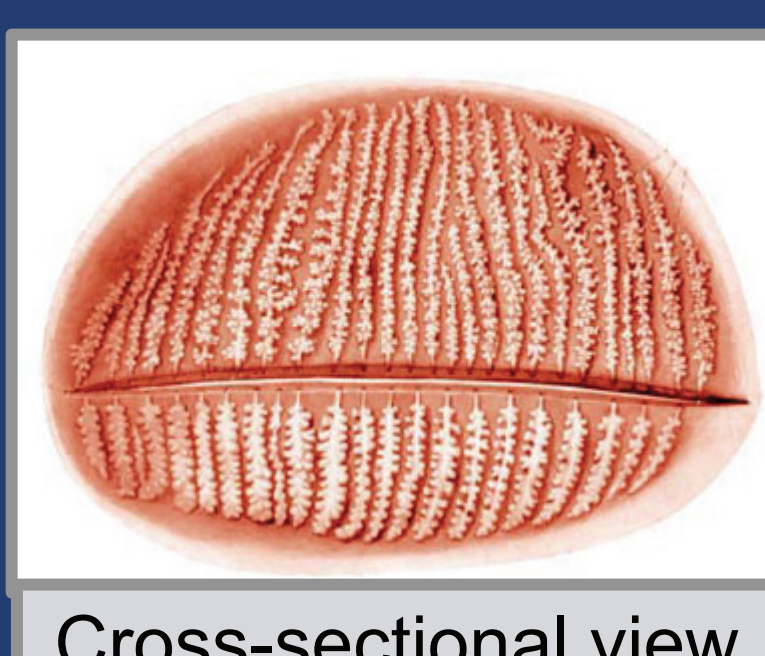
Intense Pulsed Light (IPL) treatment



Lid margin expression following IPL treatment



Anatomy of eyelid

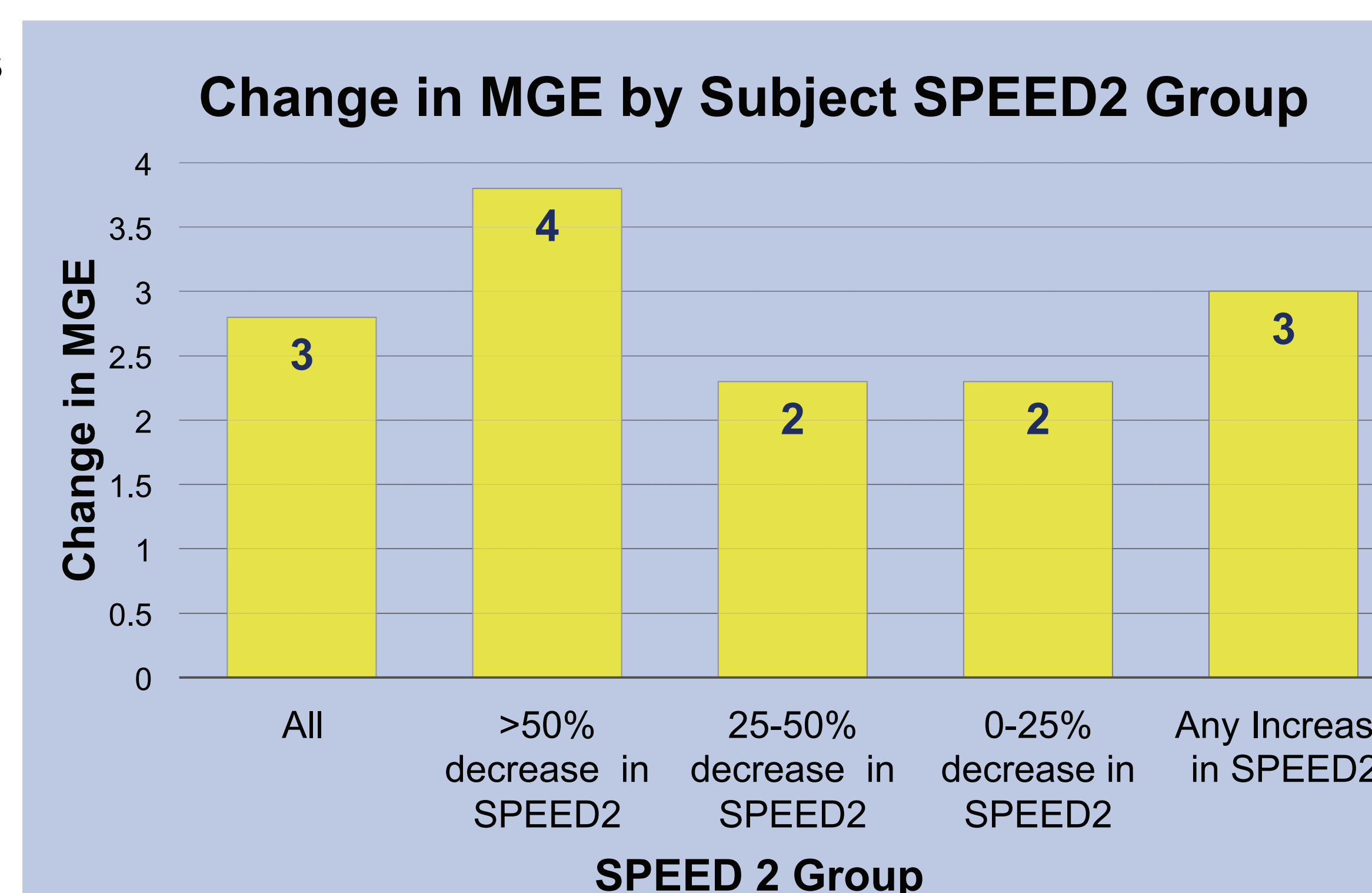


Cross-sectional view of meibomian glands

## RESULTS

- The average patient age was 62 years (20-84). The number of women was 44 (85%) and the number of men was 8. 51.9% of patients had previous ocular surgery and/or blepharoplasty. The average number of IPL treatments received was 3 (1-7).
- Two-tailed t-test showed a statistically significant ( $p < 0.0001$ ) decrease in SPEED2 with IPL therapy.
- Of the 52 patients
  - 14 (27%) were good responders ( $\geq 50\%$  decrease in SPEED2)
  - 16 (31%) were mild responders (25-50% decrease in SPEED2)
  - 14 (27%) were minimal responders (0-25% decrease in SPEED2)
  - 8 (15%) were adverse responders (no change or increase in SPEED2).
- Two-tailed t-test showed a statistically significant ( $p < 0.0001$ ) increase in MGE in both eyes with IPL therapy.
- 37 (71%) patients had improved MGE in one or both eyes.
- Pearson correlation coefficient between change in SPEED2 and change in MGE was
  - 0.544 ( $p < 0.0001$ ) OD
  - 0.496 ( $p < 0.0001$ ) OS

Subjects by change in SPEED2	Ave % Change in SPEED2 (mean, range)	Ave change in MGE
All	18.6% (4, -13 to 23)	3 (-5 to 14)
$>50\%$ decrease in SPEED2	62.3% (10, 2 to 23)	4 (-1 to 10)
25-50% decrease in SPEED2	34.3% (7, 2-12)	2 (-2 to 7)
0-25% decrease in SPEED2	14.9% (2, 1 to 4)	2 (-5 to 13)
Any increase in SPEED2	-82.5% (-6, -13 to -1)	3 (-2 to 14)



## CONCLUSIONS

- Evaporative dry eye is the most common cause of dry eye.
- 85% of patients had a positive subjective (SPEED2) response to IPL therapy.
- 71% of patients had a positive MGE response to IPL therapy.
- Subjective improvement (SPEED2) did not necessarily correlate with physical improvement in MGE. We suspect there is an alternate path of reduction of symptoms via lessening of inflammation that cannot be proven in this study.
- Patients who responded adversely with either increased SPEED2 or decrease in MGE did not have any pathological changes on slit lamp exam.
- In summary, IPL treatment for ocular rosacea can improve dry eye symptoms.
- This study is limited by its retrospective nature. Future prospective controlled studies are needed to validate the findings.

## REFERENCES

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## SUPPORT



## DISCLOSURES

None (All Authors)