

Globe and adnexal trauma terminology survey

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Introduction

Traumatic eye injuries affect a significant proportion of all patients presenting to emergency department and they are associated with considerable morbidity and Healthcare-associated costs. Several gaps have been identified in the terminology used for the classification of ocular trauma since the development of Birmingham Eye Trauma Terminology System (BETTs) which may limit the ability to communicate and prognosticate over the full spectrum of the globe and adnexal injuries.

Objectives

To review and refine terms from BETTs and to develop terms not captured previously.

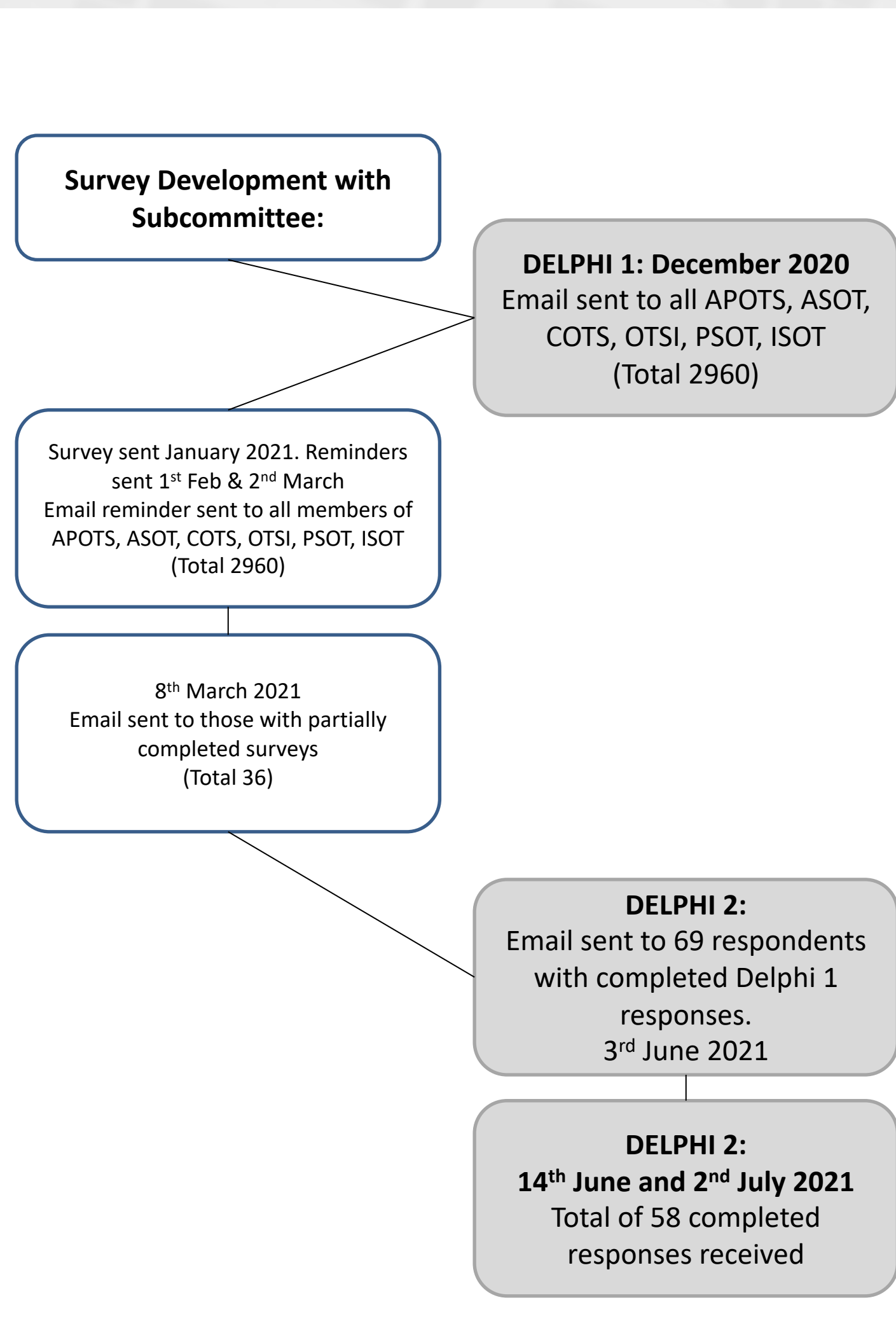
Methodology

A modified Delphi technique using experts' consensus through anonymous, controlled feedback was used to develop consensus to update commonly used terminology and classifications for globe and adnexal trauma. This survey study follows the American Association for Public Opinion Research standard definitions for Final Dispositions of Case Cades and Outcome Rates for Surveys.

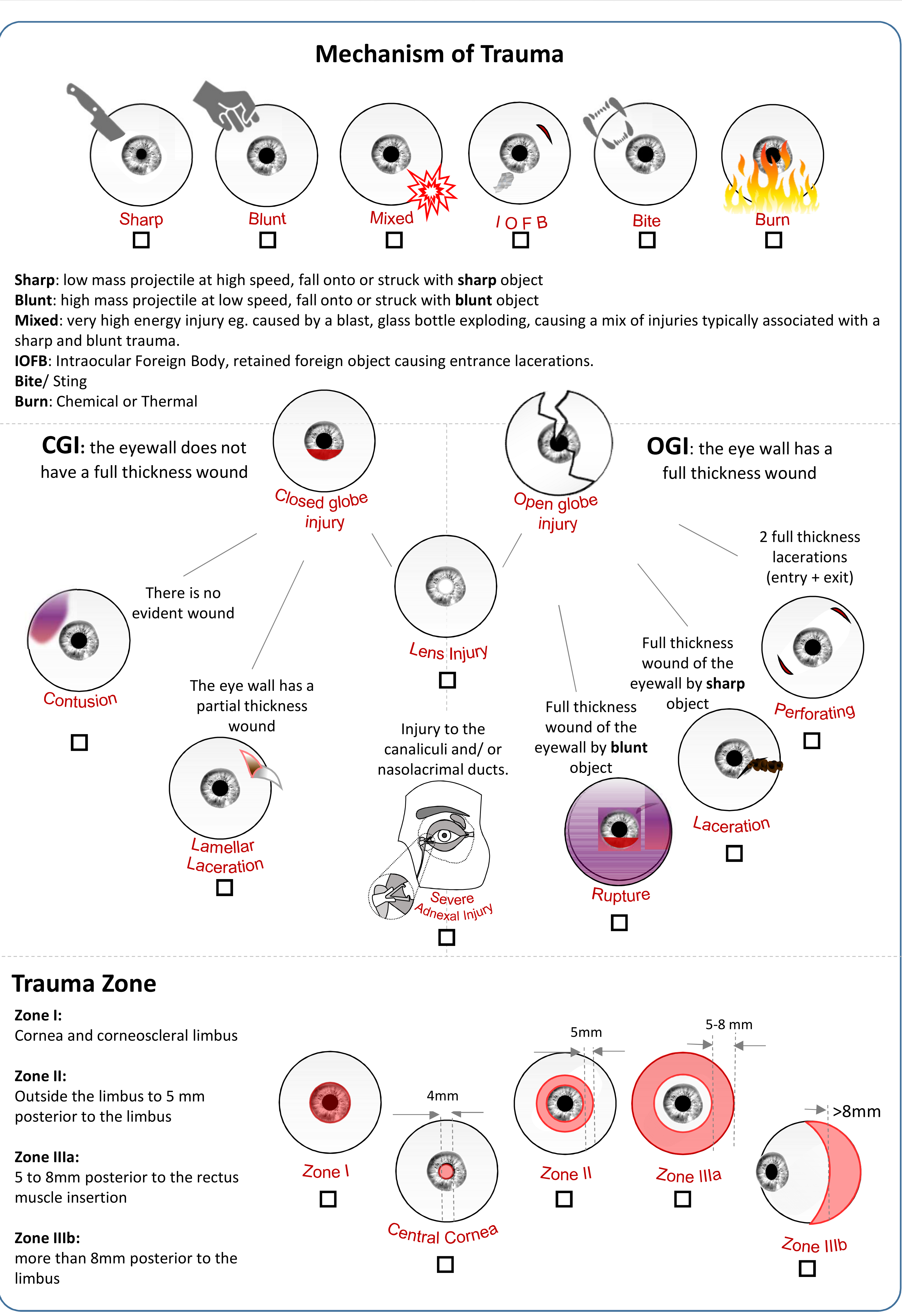
Round 1: Questions were stratified based on whether they related to validating existing (Section 1: BETTs) or developed new (Section 2: Non-BETTs) terminology for trauma classification. There were 22 questions, including nine questions with two potential responses, 12 questions with two potential responses, 12 questions question with four options.

Round 2: Total of 7 questions from Round 1 that did not reach consensus were included and rephrased for clarity. There were four questions with two potential responses, two questions with 3 responses and 1 question with four response options.

The consensus was considered to be reached when at least 67% of experts indicated agreement



Results



Results and Discussion

- Our modified Delphi supported that the majority of existing definitions for ocular trauma provided in BETTs were appropriate, with consensus achieved in 82% (9/11 current BETTs terms).
- New terminology for the classification of globe and adnexal trauma, proposed to overcome gaps identified in BETTs, reached consensus in 65% (11/17) questions in Round 1.
- In Round 2, 57% (4/7) of the new terms achieved consensus.

Additional term from IGATES terminology study group (addition to existing BETTs)

Category/ Term	New Terminology	Consensus %
Eye injury	Globe and adnexal trauma	67%
Retinal Trauma	Inclusion in terminology	72.6%
Mechanism of injury	Sharp: low mass projectile at high speed, fall onto or struck with a sharp object Blunt: high mass projectile at low speed, fall onto or struck with a blunt object Mixed: very high energy injury, e.g. caused by a blast, glass bottle exploding, causing a mix of injuries typically associated with a sharp and blunt trauma. IOFB: Intraocular Foreign Body, retained foreign object causing entrance lacerations. Bite/ Sting Burn: Chemical or Thermal	75%
Severe adnexal injury	Injury to the canaliculi and/ or nasolacrimal ducts.	78.1%
Corneal injury	Central/ Paracentral	81%
Zone I	Cornea and limbus	75%
Zone II	Outside the limbus to 5mm posterior to the sclera	75%
Zone IIIa	5 to 8mm posterior to the rectus muscle insertion	81%
Zone IIIb	More than 8mm posterior to the rectus muscle insertion	81%
Lens trauma	Cataract, Zonule status, Anterior/ Posterior capsule, Lensectomy required	79.5%

Conclusion

- The IGATES Terminology Consensus Group used the Delphi consensus methodology to confirm, update, and revise some of the terminologies for globe and adnexal trauma classification.
- The updated terminology may be used to comprehensively capture and monitor globe and adnexal trauma in clinical and research settings.

References

- Kuhn F, Morris R, Witherspoon CD, Mester V. The Birmingham Eye Trauma Terminology system (BETT). *J Fr Ophthalmol*. Feb 2004;27(2):206-10.
- Kuhn F, Morris R. A quarter of a century of the Birmingham Eye Trauma Terminology (BETT) system. *Graefes Arch Clin Exp Ophthalmol*. Oct 2021;259(10):2867-2868. doi:10.1007/s00417-021-05407-6
- Kuhn F, Morris R, Witherspoon CD, Heimann K, Jeffers JB, Treister G. A standardized classification of ocular trauma. *Graefes Arch Clin Exp Ophthalmol*. Jun 1996;234(6):399-403.
- Agrawal R, Shah M, Mireskandari K, Yong GK. Controversies in ocular trauma classification and management: review. *Int Ophthalmol*. Aug 2013;33(4):435-45. doi:10.1007/s10792-012-9698-y
- Kuhn F, Maisiak R, Mann L, Mester V, Morris R, Witherspoon CD. The Ocular Trauma Score (OTS). *Ophthalmol Clin North Am*. Jun 2002;15(2):163-5. vi.
- Hoskin AK, Low R, Sen P, et al. Epidemiology and outcomes of open globe injuries: the international globe and adnexal trauma epidemiology study (IGATES). *Graefes Arch Clin Exp Ophthalmol*. Jun 26 2021;doi:10.1007/s00417-021-05266-1