

**Study Mentors:**  
Professor Ferenc Kuhn, USA  
Professor Hua Yan, China  
Professor S Natarajan, India  
Professor Michael Grant, USA

**Principal Investigators (PI):**  
A/Prof Rupesh Agrawal, Singapore  
Ms Annette Hoskin, Australia  
A/Prof Gangadhara Sundar, Singapore  
A/Prof Fasika Woretta, United States  
Dr Andrés Rousselot, Argentina  
Prof Stephanie Watson, Australia

**Web platform and big-data administrator:**  
Dr. Rebecca Low, Singapore

**Country Representatives**

**Southern India**

Dr. Parveen, Dr R Kim

**Northern India**

Dr. Shakeen Singh, Dr. Anurag Mittal

**Central India**

Professor Rekha Khandelwal

**East India**

Dr. Kasturi Bhattacharjee

**West India**

Dr. Mehul Shah, Dr S Natarajan

**Singapore**

Dr. Victor Koh, Prof Gangadhara Sundar

**Australia**

Dr. Stephanie Watson, Ms Annette Hoskin

**China**

Prof Hua Yan

**USA**

Prof Fasika Woretta

**Malaysia**

Dr. Tengku Ain Kamalden

**Hong Kong**

Dr. Kendrick Shih

**Canada**

Dr. Kashif Baig

**UK**

Dr. Felipe Dhawahir-Scala

**Nepal**

Dr. Eli Pradhan, Dr. Meenu Chaudhary, Dr. Anadi Khatri

**Pakistan**

Dr. Hussain Khaqan, Dr. Amer Awan

**Jordan**

Dr. Nancy Rakkhad



Ocular Trauma  
Society Of India



**International Globe and Adnexal  
Trauma Epidemiology Study**

**Adj Associate Professor Rupesh Agrawal**

Senior Consultant Ophthalmologist  
National Healthcare Group Eye Institute  
Tan Tock Seng Hospital, Singapore

Honorary Consultant, Moorfields Eye Hospital, London, UK  
Adj Asst Professor, School of MSE,  
Nanyang Technological University, Singapore  
Adjunct Research Faculty, Singapore Eye Research Institute  
Clinical Senior Lecturer, Yong Loo Lin School of Medicine,  
National University of Singapore

Interested collaborators please contact  
[rupeshtsh@gmail.com](mailto:rupeshtsh@gmail.com)



*The International Globe and Adnexal Trauma Epidemiology Study (IGATES) is a collaborative effort by the Asia Pacific Ophthalmic Trauma Society (APOTS), International Society of Ocular Trauma (ISOT), Chinese Ocular Trauma Society (COTS), and Ocular Trauma Society of India (OTSI)*

## Why IGATES?

Ophthalmic trauma is associated with considerable morbidity and healthcare-associated costs. Determining the epidemiology, incidence, causes and outcomes of eye injuries is vital for prognostication, developing appropriate treatment plans, and instituting adequate eye injury prevention strategies.

The Birmingham Eye Trauma Terminology System (BETTS) and Ocular Trauma Score (OTS) have been widely adopted internationally since they were published and remain the benchmark for classification of ocular trauma. Whilst the current OTS has significantly contributed in reducing the ambiguity about classification and assisted the prediction of outcomes for most open globe trauma, there remain some limitations and controversies. This includes the exclusion of adnexal injuries from the score, as well as the significance of presenting visual acuity and RAPD as an absolute marker for the patient's final visual outcome. In clinical practice, the BETTS and OTS classifications can be difficult as not all data is collected.

We aim to build on the valuable aspects of the existing BETTS and OTS. Using big data analytics, cloud computing and machine learning, we aim propose a robust model incorporating a wider range of relevant markers relating to the outcome.

## Objectives

- 1) Identify the factors affecting the outcome of open globe and adnexal injury (ophthalmic trauma).
- 2) Develop a prognostic picture-based classification system for ophthalmic trauma
- 3) Conduct a large multicenter review of ophthalmic trauma utilizing the revised "Ophthalmic Trauma Score" (OTS-2)
- 4) Special emphasis on preventable and work-related injuries to advocate for regulatory measures to reduce incidence of ophthalmic trauma

## IGATES-1 and IGATES-2

IGATES will have two distinct phases in the study of patients with globe and adnexal trauma. IGATES-1 is a retrospective cohort study and IGATES-2 a prospective study. This study will provide extensive data relating to the factors affecting the outcome of open globe injury and repair is also anticipated to provide the largest data set of outcomes from globe and adnexal trauma to date.

## IGATES-Schematics

We developed a novel graphical software that allows for fast and precise data recollection in ophthalmic trauma using simple schematics. This may reduce ambiguity in communication with regards to ophthalmic trauma. This software enables users to enter details in different layers comprising the globe, intraocular structures, skin, lacrimal system, and bone structures. Data from IGATES-2 will be used to validate the graphical software for ophthalmic trauma medical records.

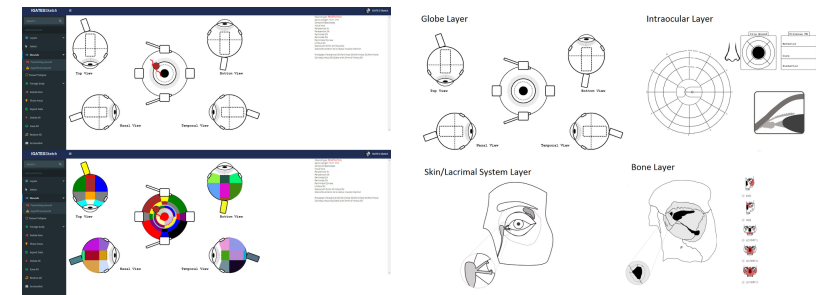


Fig 1: Sample images from the graphical software

## IGATES-Fireworks

This study will provide extensive data relating to firecracker/fireworks injury to the globe and adnexal structures. We will study the impact of the injuries to the eye as well as advocate safe regulatory and preventive measures.

Link to IGATES-1 form:

<https://www.cognitofrms.com/TanTockSengHospitalPteLtd/IGATES1Version11>

Link to IGATES-Fireworks form:

<https://www.cognitofrms.com/TanTockSengHospitalPteLtd/igatesfireworks>