

Protective Headgear for Neurosurgical Patients Following Cranial Surgery

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Problem Statement



3D model of a post-craniectomy skull

Decompressive craniectomies leave patients with an often disfiguring wound on the skull. The skull defect can result in social isolation, decreased quality of life, reduced independence, or fear of inadequate protection of the exposed soft tissue.

In Australia and UK, craniectomy patients are routinely given a bulky foam helmet. However, there is currently no protective headgear available in the local market, and options available overseas are often bulky, expensive, or both.

A prior needs analysis survey was conducted amongst 23 patients and their caregivers, demonstrating the demand for a form of protective headgear for patients who have undergone a form a brain injury.

Project Aim

To design a form of protective headgear to offer adequate protection to the more vulnerable head while fulfilling the criteria of comfort, aesthetics, and maintenance at an acceptable cost to the patient.

Lessons Learnt

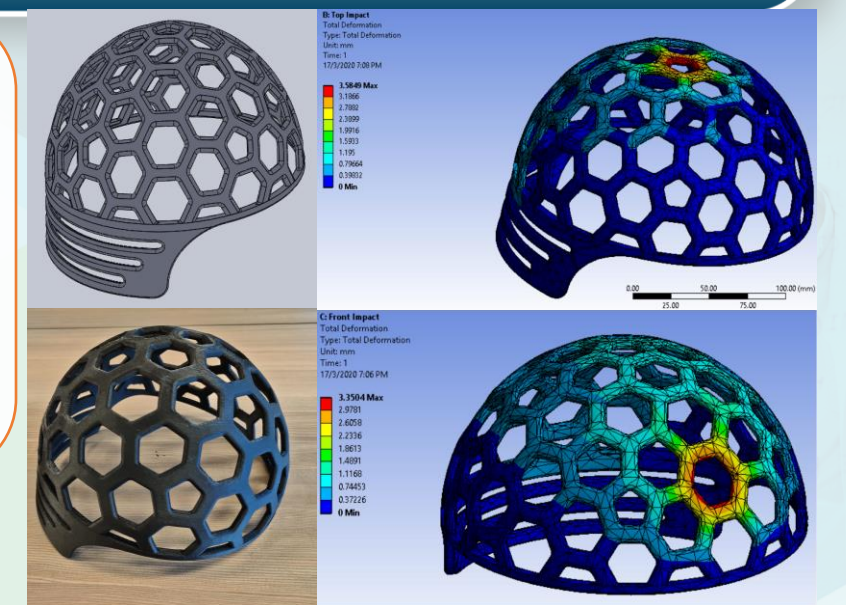
Importance of involving patients as partners in the innovation journey

- Patients and their caregivers were consulted heavily during the design and development of this project, ensuring that the final product would be able to best suit the end-user's needs. What patients and healthcare practitioners deem as priorities may not always coincide, and seeing things from the perspective of the patients and their families can often yield surprising insights.
- This project demonstrates the physical and social impact a protective headgear would have on the patient.

Potential Solutions

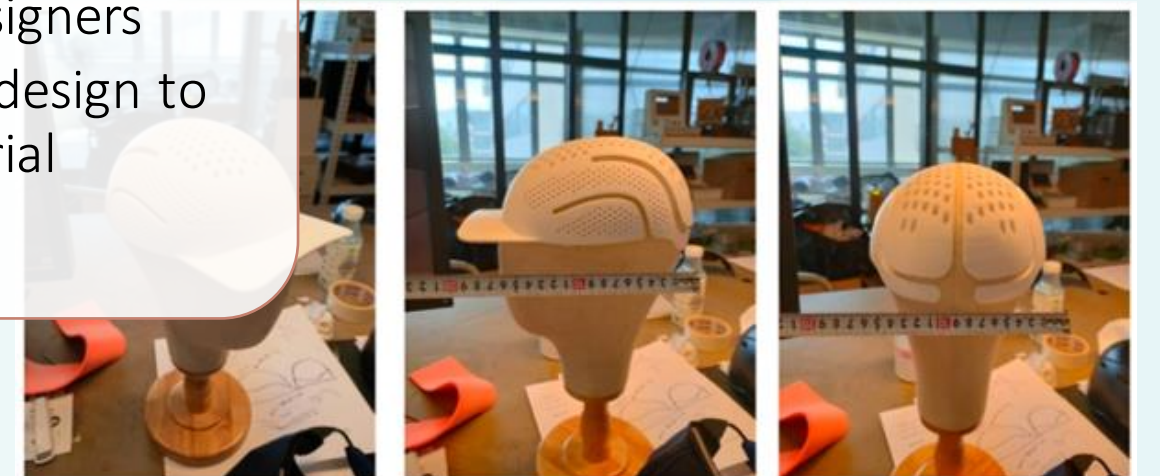
Design Phase

- Collaboration with Singapore Institute of Technology
- Focus groups with patients and caregivers



Prototyping Phase

- Collaborations with product designers
- Refining of design to meet material constraints



Clinical Trial

- 6 week clinical trial
- 5 participants recruited via referral



Outcomes & Impacts



Satisfaction

All 5 participants reported that they were satisfied or very satisfied with the product. 100% also reported satisfaction with the appearance, weight, durability, design and comfort of the product.



Of participants felt less self-conscious when looking at themselves in the mirror.



Of participants felt an improvement in their ability to socialise.



Of participants reported lesser feelings of others staring at them.



Of participants felt less limited in their activities of daily life.



The clinical trial was a successful first iteration of our protective headgear design, with good feedback from participants. There were no reports of pressure injuries or discomfort when wearing this device.

Anecdotally, participants also shared that they had newfound confidence in leaving their homes and engaging in social activities which they have shied away from since their initial cranial surgery such as going to the park.