



PEP talk: a case report on a custom positive expiratory pressure adaptor using 3D printing

Patient

83 year old male with a laryngectomy and underlying Bronchiectasis

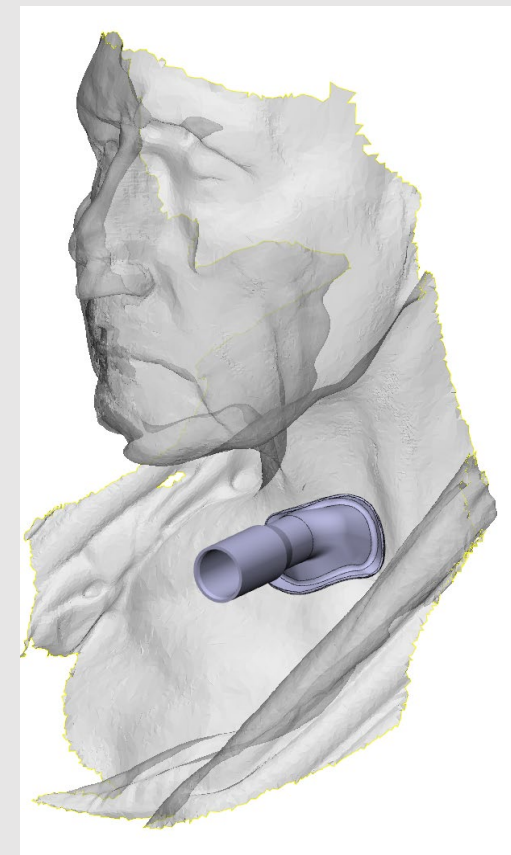
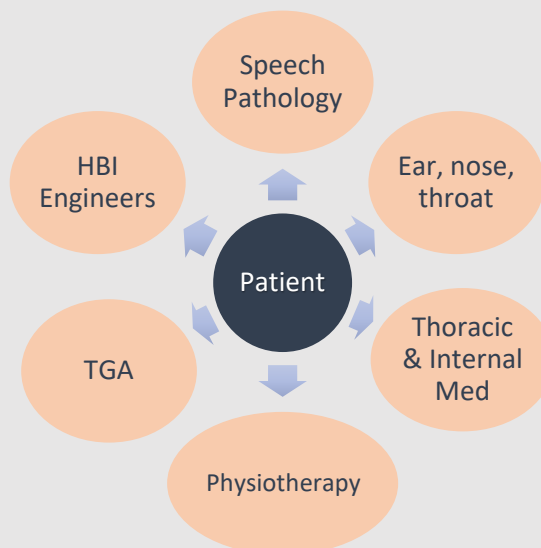
- Repeated admissions with pulmonary exacerbations
- Negative impact on quality of life (QOL)
- Standard of care would be to trial a **positive expiratory pressure (PEP) device** to aid with secretion removal

Problem

- No PEP interface existed to accommodate a laryngeal stoma.
- Due to an irregular neck contour, an off-the-shelf mask adaptor did not seal around stoma
- Poor adherence to airway clearance therapy as nil perceived benefit by patient

Intervention

- Multidisciplinary approach (below)
- 3D printed medical grade nylon adaptor developed
- Personalised airway clearance routine as per best evidence



Outcome

- ↑ adherence to therapy
- **Nil hospital admissions/** pulmonary exacerbations since use of PEP with 3D printed adaptor
- Improved QOL & cough as measured by St George Respiratory Questionnaire & Leicester Cough questionnaire



Investigators: Laura Daly¹, Julian De Looze², Mathilde Desselle³, David Forrestal³, Michael Wagels^{2,3}, Ann-Louise Spurgin¹, Juliet Hoey¹, Michael Holt², Sarju Vasani². ¹Allied Health Services, RBWH; ²Medical Services, RBWH; ³Herston Biofabrication Institute, MNHHS