



## ReCleft

Collaborative Project 2018 - 2019

### A high fidelity reusable training simulator for Cleft Palate Surgery.

Clinical Lead

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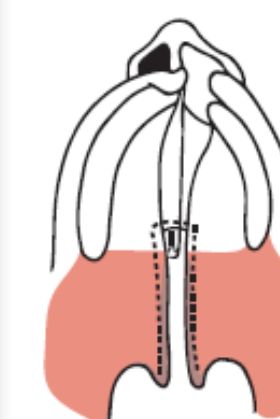
## The Challenge

Cleft lip and/or palate (CLP) is the leading craniofacial anomaly affecting 1 in every 500-700 births. Gaining hands-on experience in cleft surgery can be difficult due to limited access within the infant oral cavity and the delicate tissues of the velum. Even minor errors may lead to complications with serious consequences for the patient. Globally, it is estimated that 250,000 infants are born with cleft lip and/or palate in low resource countries each year and it is estimated that a significant proportion of these cases are not resolved. This is, in part, due to a lack of local cleft surgeons. Training in cleft surgery is time and resource-heavy, therefore tools which can accelerate the learning curve are of significant interest. Simulation allows surgeons-in-training to gain experience in a low-risk, low-stress environment, also resulting in safer surgery for the infants.

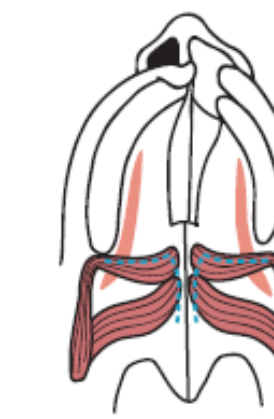
The current simulators for cleft palate surgery are either oversimplified or prohibitively expensive. The current, and only, commercially sold simulator costs £261 per simulated surgery.

This collaborative project with Evelina London Children's Hospital created a training service package with silicone soft tissue components, which can be re-moulded on site and replace the parts used in the simulated surgery. This collaborative Project led to a Patent being achieved.

## Design and development



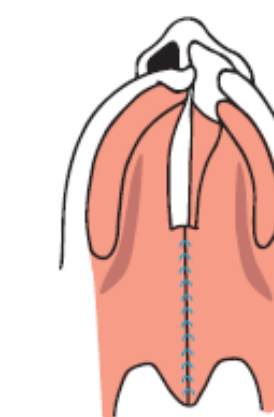
**1**  
Make incisions along the dotted lines. The vomer posterior to the vomer flap can simply be split down the middle of the distal part raises as a posteriorly based flap which can be reflected back.



**2**  
Lift the muscles of the back of the hard palate (shaded area). Lateral releases can be made by incising all the way down to the bone and lifting the oral mucosa off the hard palate.



**3**  
Suture the nasal mucosa. Leave a small cuff of muscle on the nasal mucosa to add some strength. The knots must be on the nasal side (deep surface)



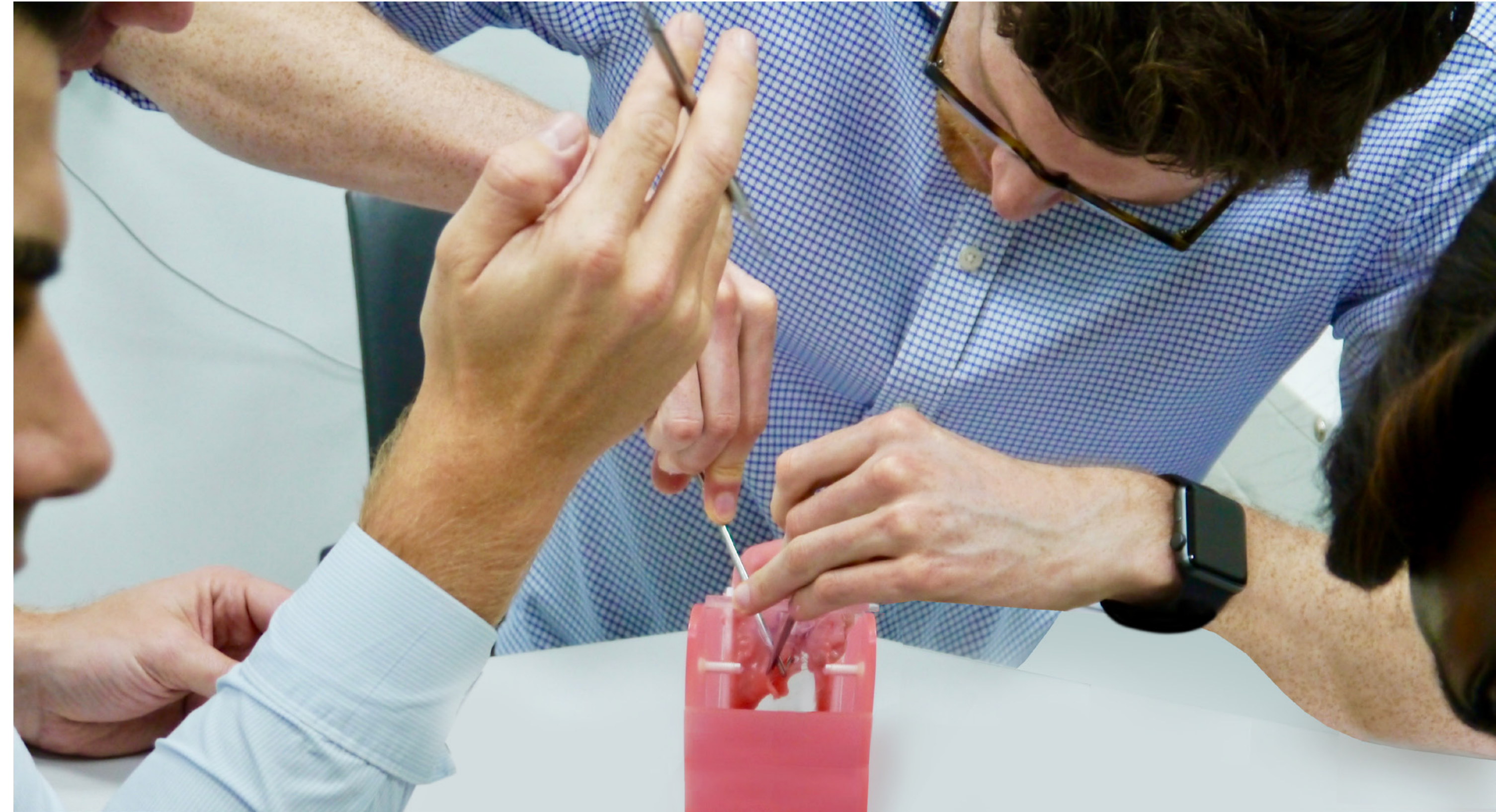
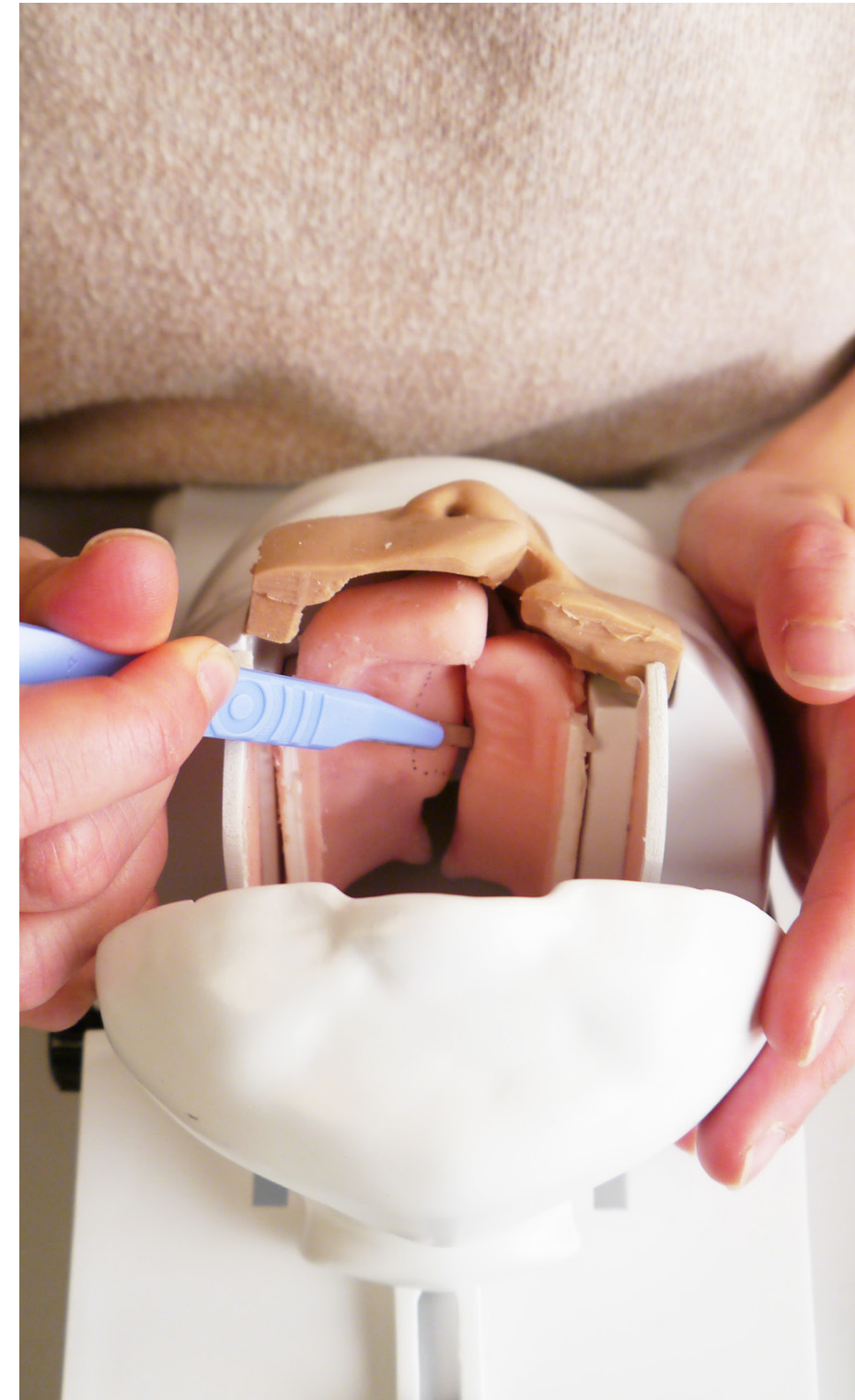
**4**  
The muscle in the soft palate needs to be separated from the oral mucosa overlying it and the nasal mucosa beneath it. Gently divide the muscle until the nasal mucosa is exposed. The nasal mucosa is very thin and is easy to make holes.

**5**  
Lift the muscles off the nasal mucosa and push the muscles to the back of the soft palate. Suture together.

**6**  
Suture oral mucosa down the mid-line leaving the lateral release incisions open.  
There are many variations on how a cleft palate can be repaired, this is just one technique.



## Final Prototype



**21%**

Increase in  
knowledge in just  
one hour

**18%**

Increase in  
confidence in just  
one hour

**89%**

Said it was a  
valuable learning  
experience

**92%**

Strongly agreed it  
helped them learn  
the procedure

"it helped me  
appreciate the surgical  
difficulties"

"it helped me  
understand the  
handling of fragile  
tissues"

"the simulator has  
taught me real-time  
feedback"