

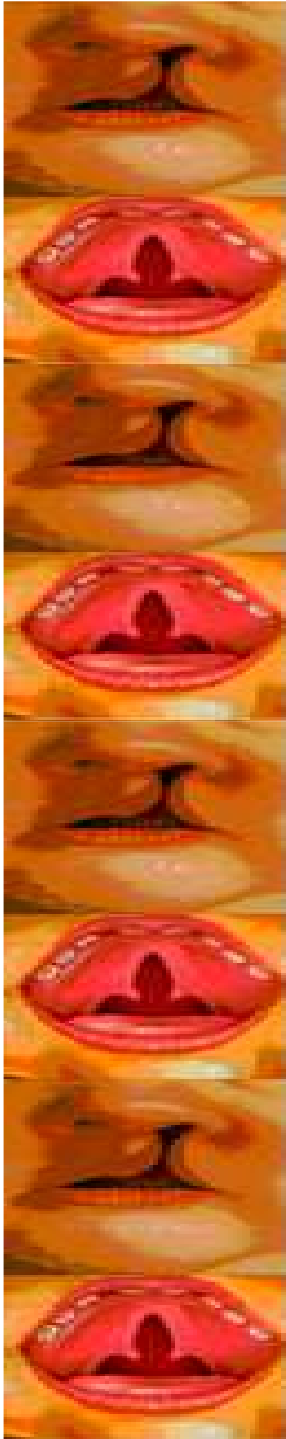
Grant McIntyre

Consultant / Reader in Orthodontics

Dundee

What will we cover?

- Cross-Scotland research synergies
- Benefits for patients



Cross-Scotland research synergies

- Multiple projects ongoing



University
of Glasgow



World Health
Organization



UNIVERSITY
OF ABERDEEN

NHS
SCOTLAND

scalp

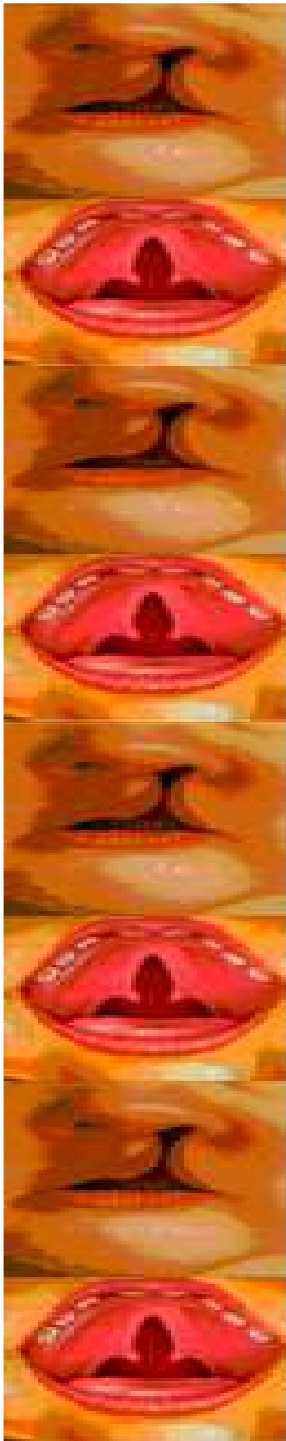
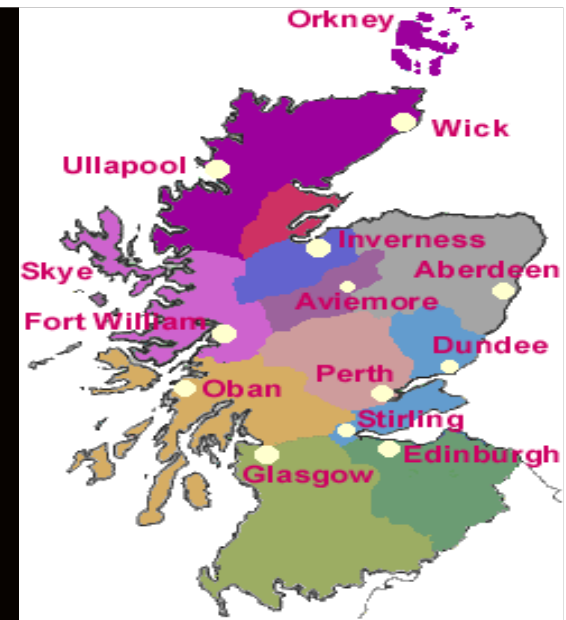
The difference a new smile can make

CLEFT
CARE
SCOTLAND



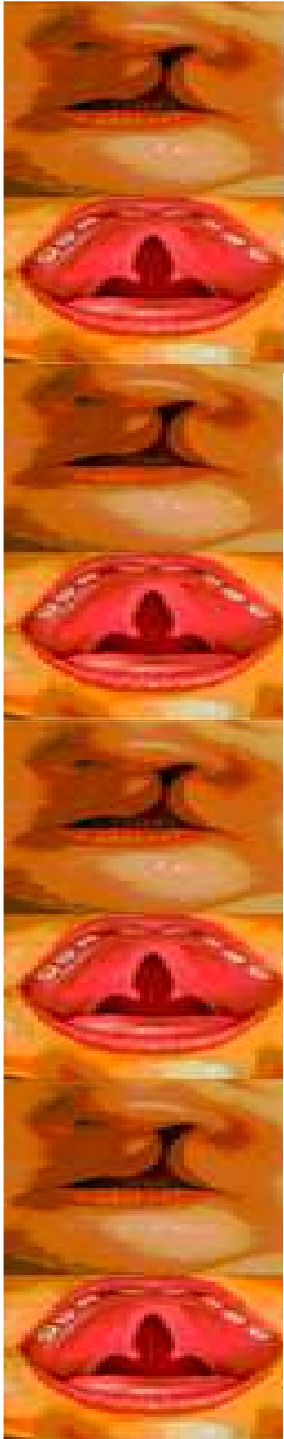
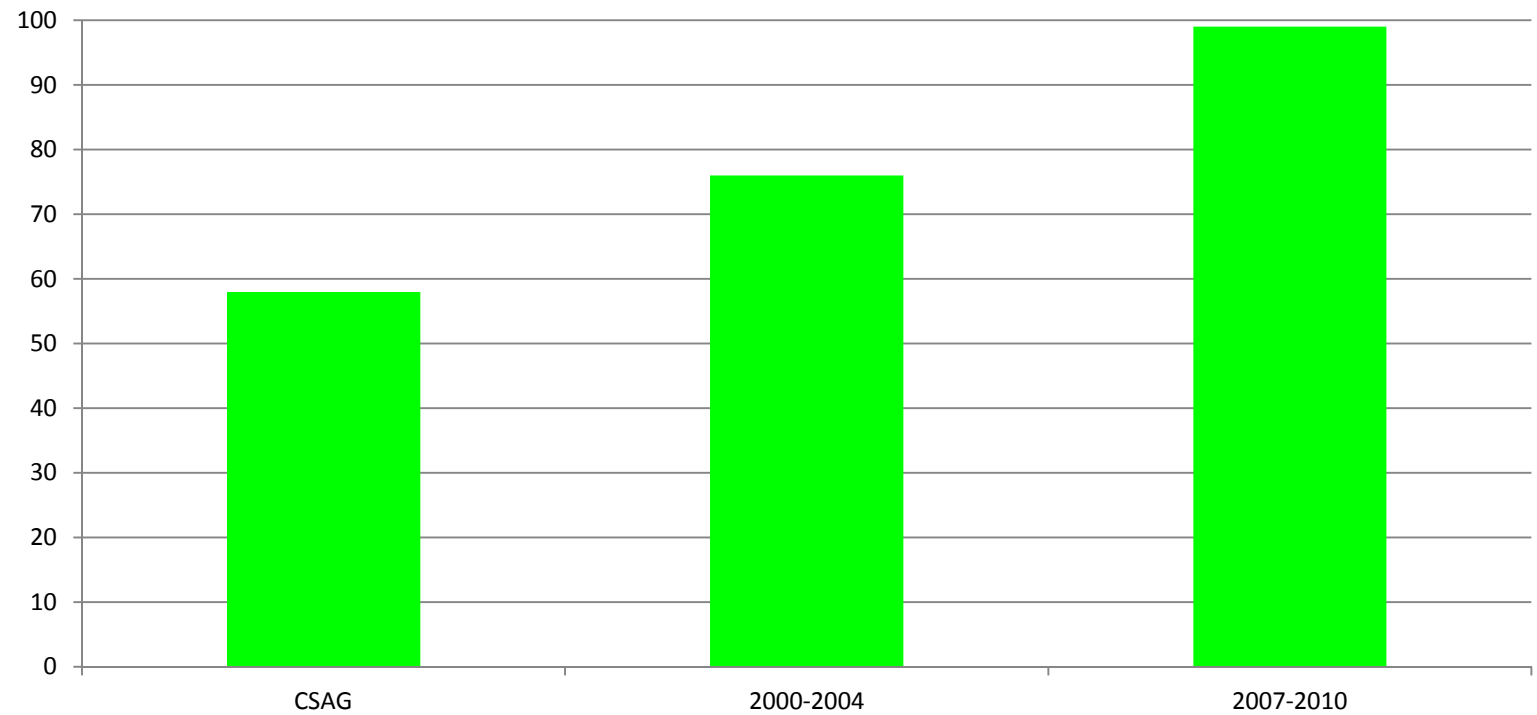
Areas of interest

- Facial stereophotogrammetry to determine surgical outcomes
- Infant feeding
- Dental health
- Outcomes of alveolar bone grafting
- Assessment of arch constriction to determine surgical outcomes
- Record linkage & epidemiological studies
- Validation of record archive
- International research
- Identification of genetic markers of cleft lip and palate
- Other



Alveolar bone grafting

Success



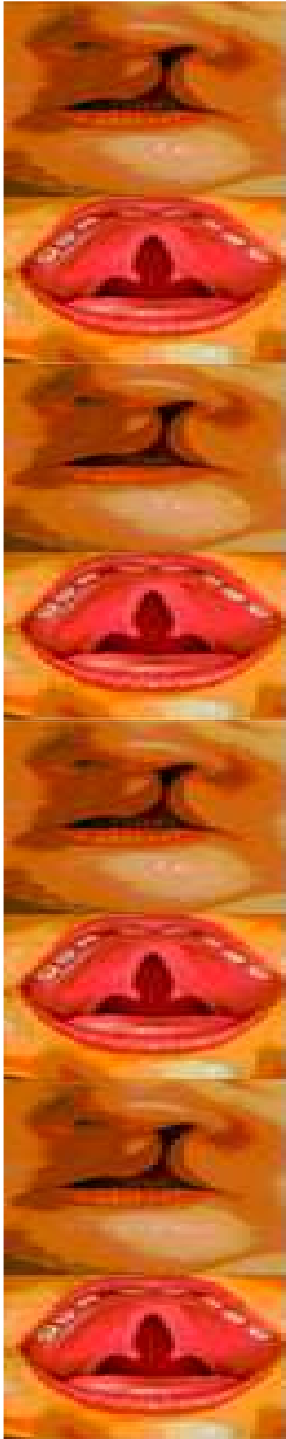


How has research helped?

- Building on successive annual audits (now 15th annual cycle)
- Exploring opportunities for improved outcomes across Scotland e.g.
 - Pre-operative 3D planning
 - Surgical timing
 - Dental health

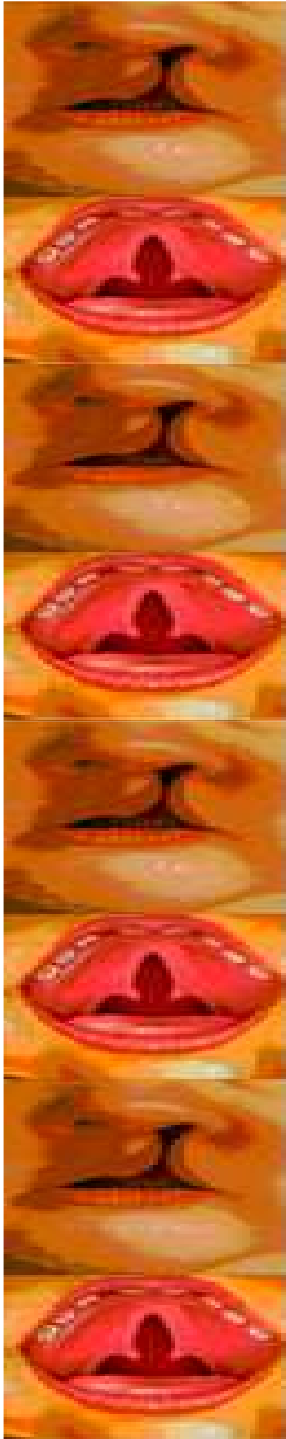
Identification of genetic markers of cleft lip and palate

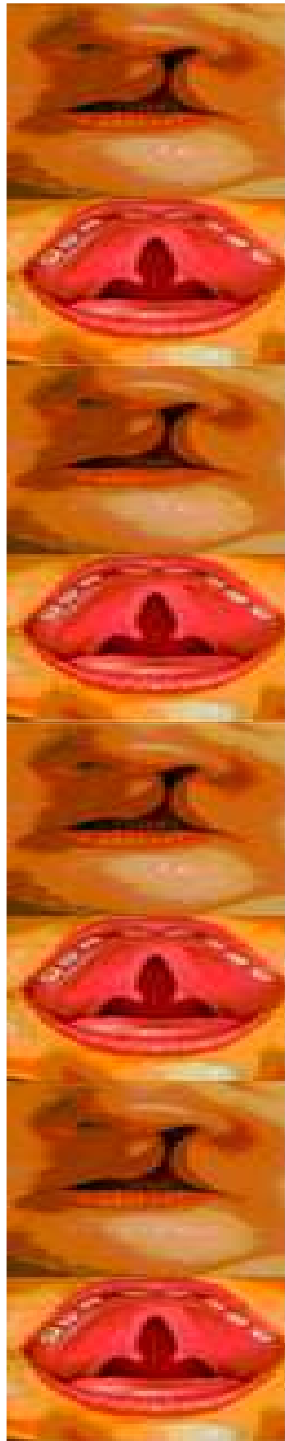
- Population based case-control study
- Cases: Parents of children with non-syndromic clefts (Dundee, Glasgow, Edinburgh, Fife)
- Controls: Students (Dundee)



Assessment of relative maxillary arch constriction to determine outcomes

- Development of an alternative to GOSLON scoring using Modified Huddart-Bodenham index
- Multiple MSc projects / publications to date

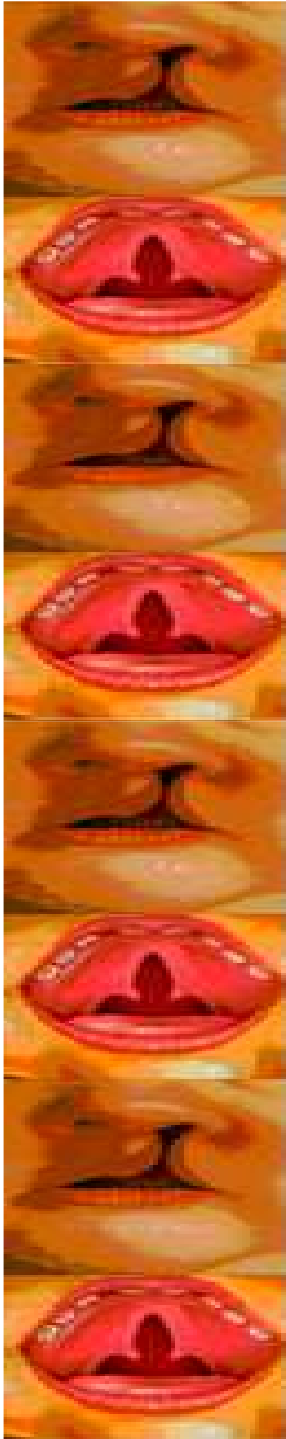




Studies to date	Use of national archive
1. Development of MHB index	✓
2. Use with clinical photographs	✓
3. Direct intraoral use	✗
4. Validity of digital study models	✓
5. Assessment of outcomes at 5, 10, 15 years old	✓
6. Intraoral scanning	✗
7. Automatic scoring using algorithm	✗
8. Longitudinal assessment of growth	✓

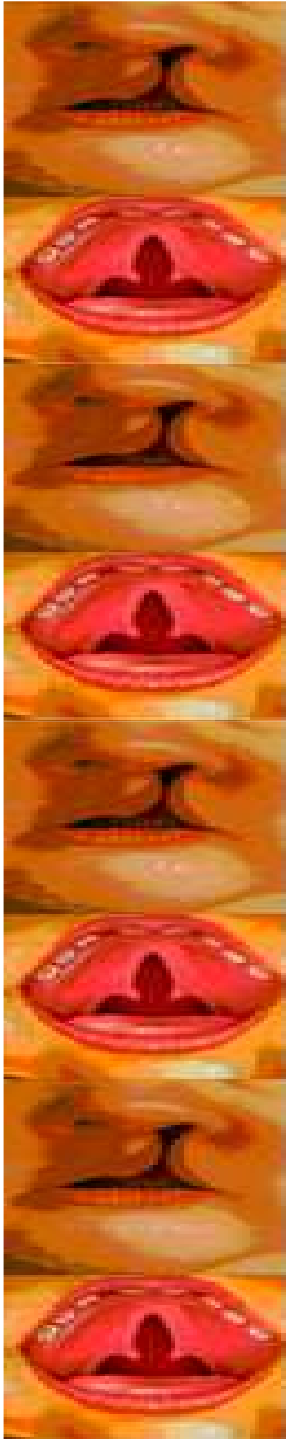
4. Validity of digital study models

- 30 sets of plaster models scanned
- Plaster & digital models scored
 - 5yr old index
 - MHB index

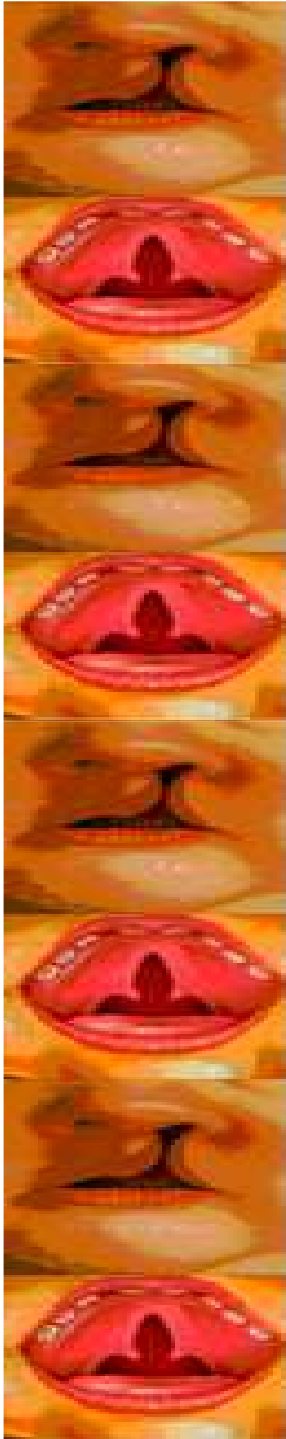


4. Were digital models valid?

- Reproducibility (Kappa) = 0.625-0.827
- 5 year old index $p=0.1197$
- MHB data $p=0.5063$



5. Assessment of outcomes at 5, 10, 15 years old



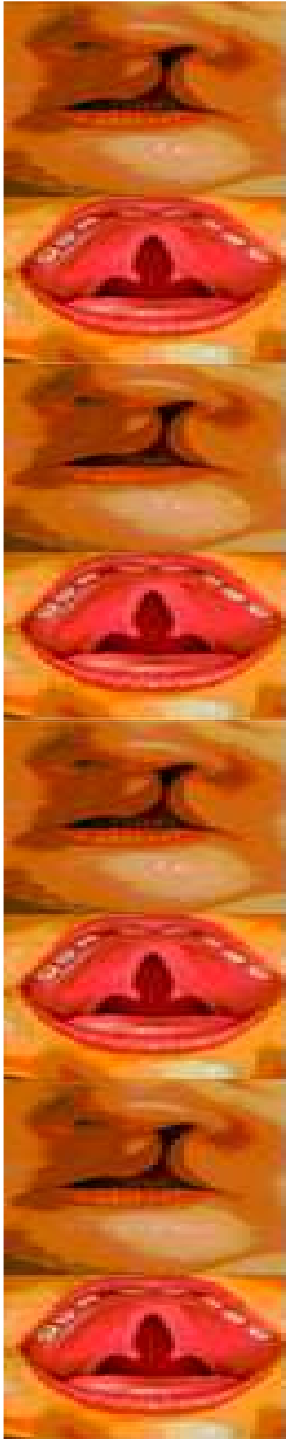
5. Assessment of outcomes at 5, 10, 15 years old

Model Type	Scores	Effect of age on scores p value##	Effect of group (UCLP & CP) on scores p value ##
Plaster	5 year old/ GOSLON	0.242366	0.000935***
Plaster	MHB	0.2813	0.0113*
Digital	5 year old/ GOSLON	0.12132	0.00106**
Digital	MHB	0.09810	0.00371**

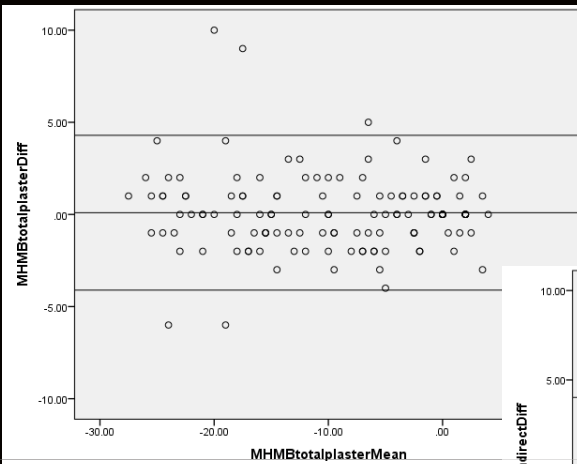
- The null hypothesis was accepted as relative maxillary constriction does not deteriorate progressively with age ($p > 0.05$)

6. Intraoral scanning

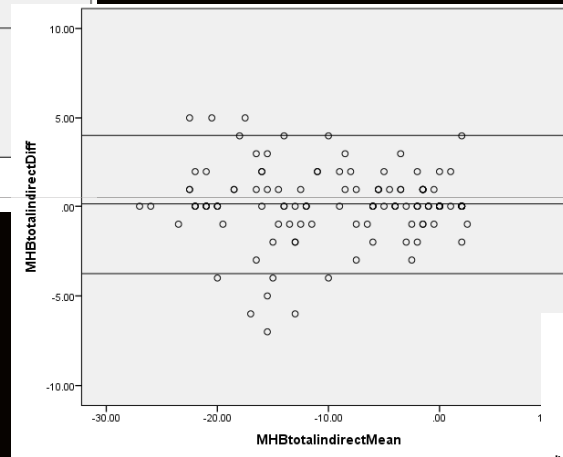
- 34 subjects with UCLP
 - Impressions
 - Intraoral scan
 - Questionnaire (subject + parent)



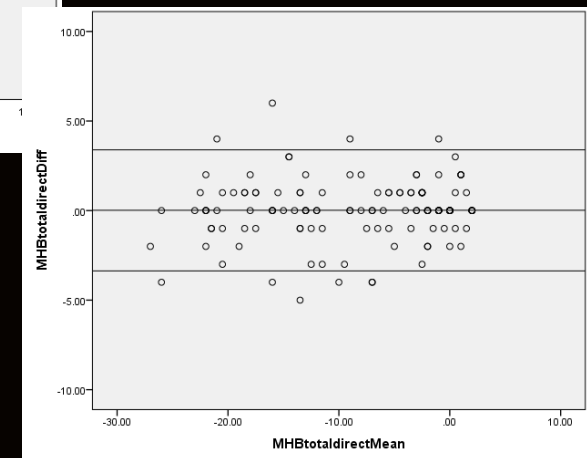
Bland Altman Plots



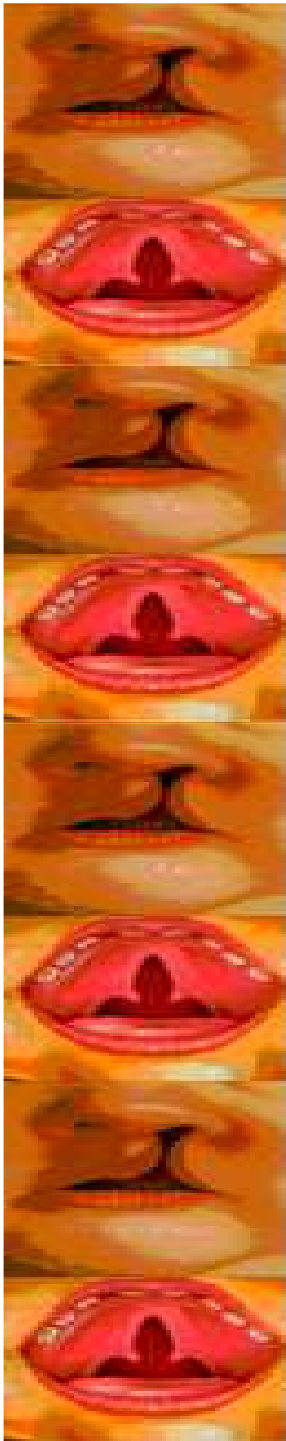
• Plaster



• Scanned plaster models

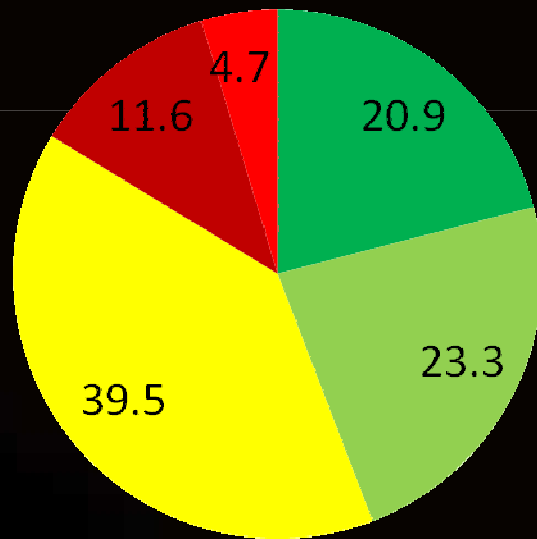


• Intraoral scans

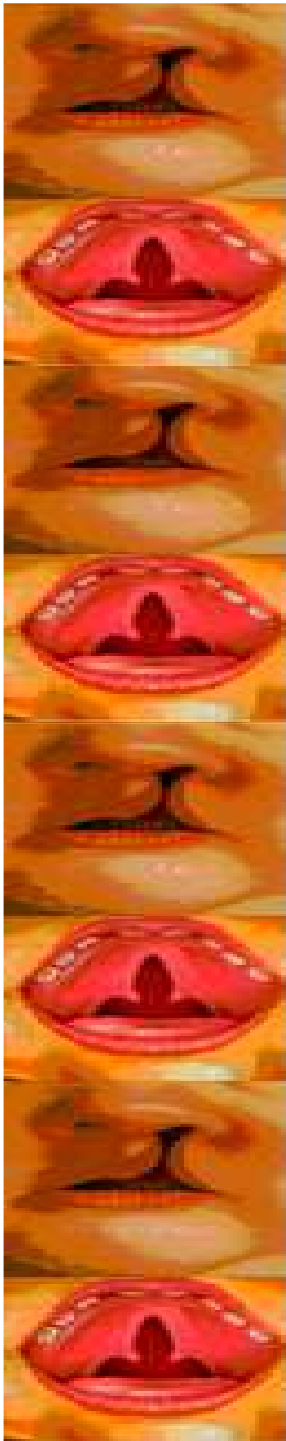
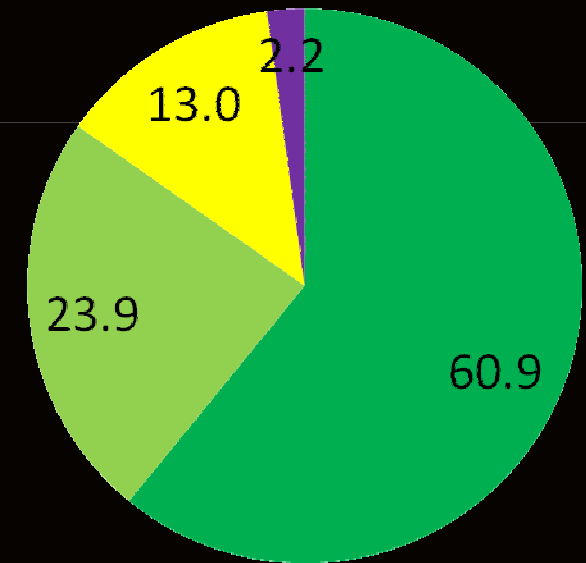


Feedback: impressions v intraoral scan

Impressions (n=10) Experimental



Scan (n=10) Experimental



Going forwards...

- Cleft Care Scotland archive has no curator
 - World leading content (around 1000 model sets)
 - Used by other UK investigators
- ‘Futureproof’ archive by scanning
- Development of automatic model scoring using CAD technology

