

A stylized illustration of a globe in the center, with four people (two women and two men) holding hands around it. The globe is light green and white, and the people are simple line drawings. The background is light blue with soft, rounded shapes.

Oral Health Promotion Research Group Bursary 2016

**Sponsored by the Dental Health
Foundation**

Fluoride varnish efficacy in preventing dental caries in high risk children following treatment under dental general anaesthesia: a prospective study

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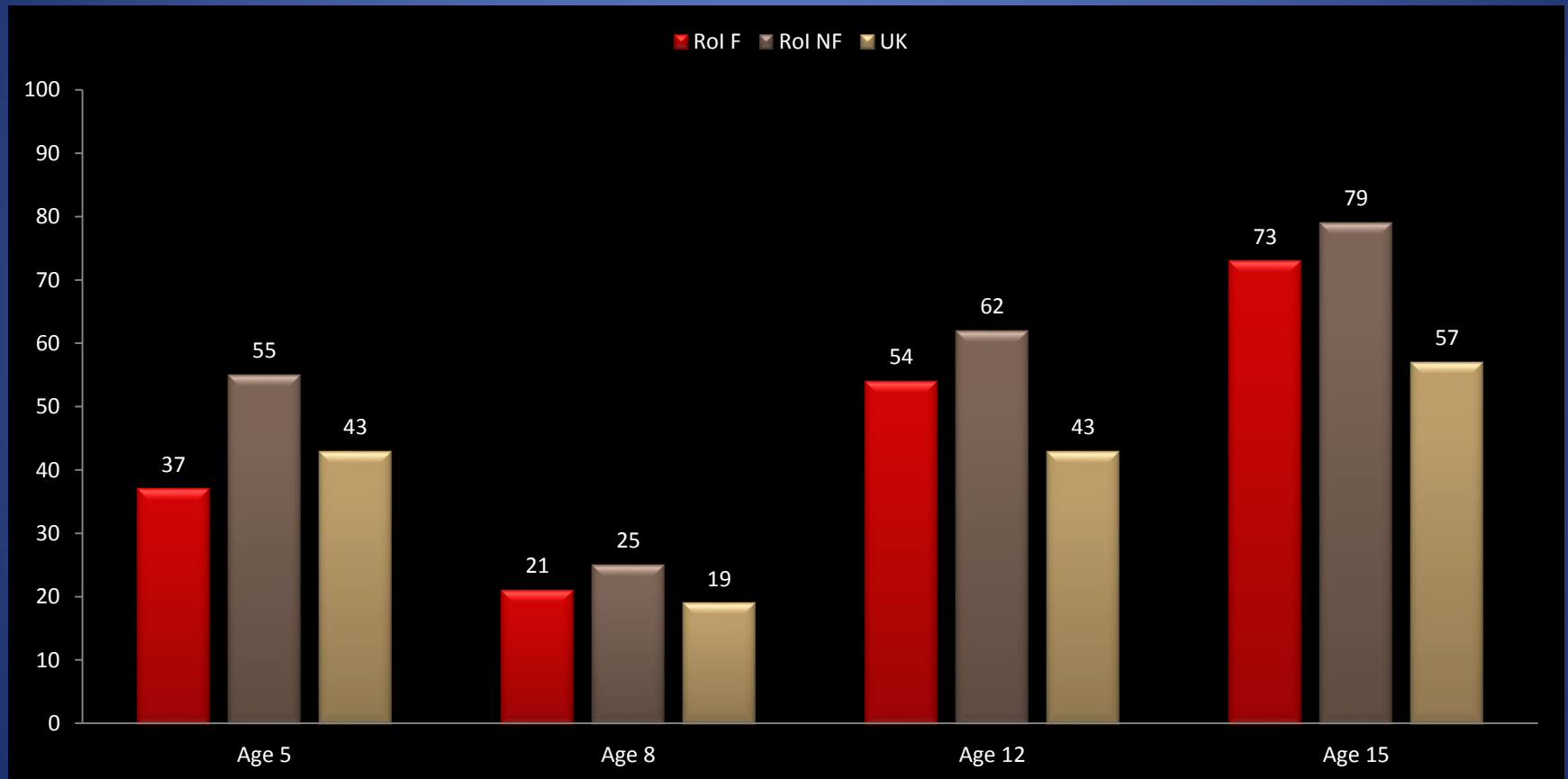
Rationale

- Oral Health is a basic human right, an integral element of health and well being. *(Watt R, 2005)*
- Caries is an entirely preventable disease affecting 60-90% of school-children. *(WHO, 2012)*
- Caries is the single most common chronic disease of childhood
 - five times more common than asthma
 - seven times more common than hay-fever. *(U.S Dept. of Health and Human Services, 2003)*

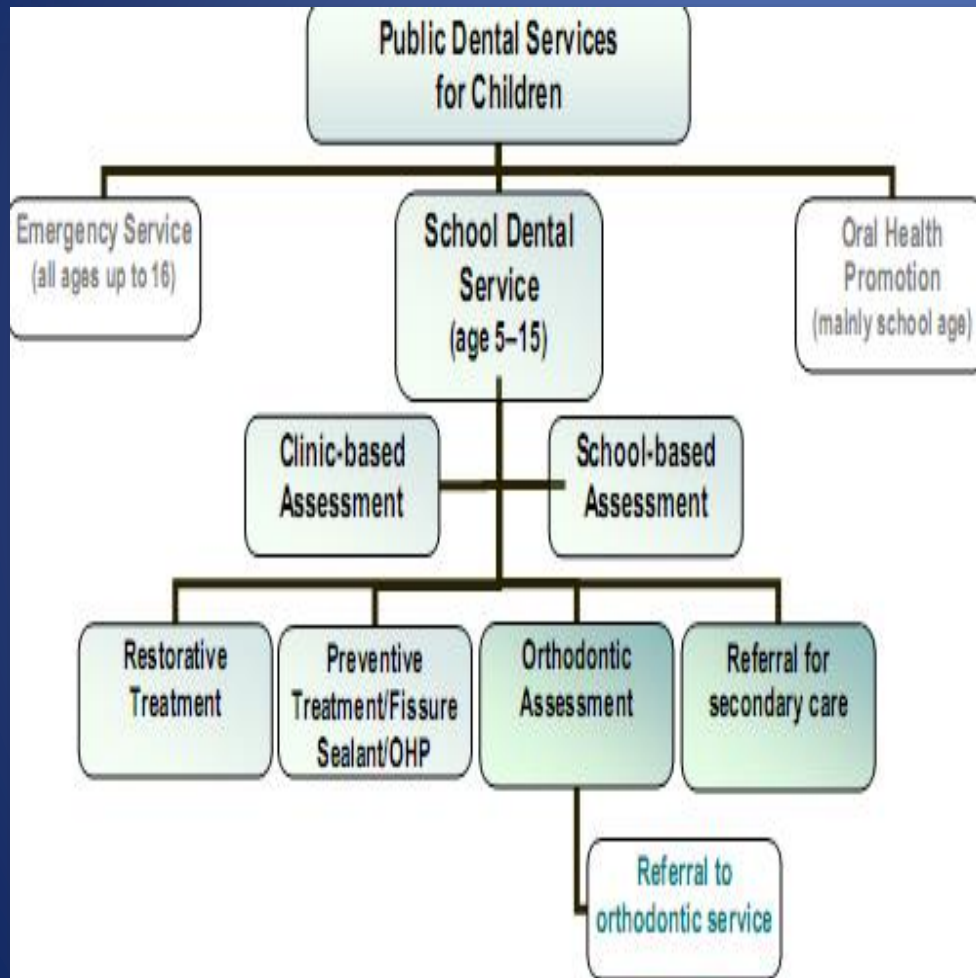


Oral Health of Children in Ireland

Percentage of children with caries in the Republic of Ireland (RoI) 2002 by fluoridation status and in the UK 2003 (*Whelton et al., 2006*)



Schools Dental Service



- No pre-school screening/prevention for those under 5 (*IOHSGI, 2009*)
- One in four 3-year-olds (27.4%) experienced dental caries. (*Tuohy et al., 2000*)
- Must seek treatment privately or attend HSE clinics complaining of pain/sepsis
- Only 19% of 5-year-olds and 22% of 8-year-olds normally attend for private treatment (*Whelton et al., 2006*)



Dental General Anaesthesia (DGA)



- Necessary component of dental public health service- not without risk
- Evidence has shown the most common reason for the administration of DGA in young children is treatment of dental caries (90.8%). *(Albadri et al., 2006)*
- Demand from both high and low SES Groups. *(Madan et al., 2010)*



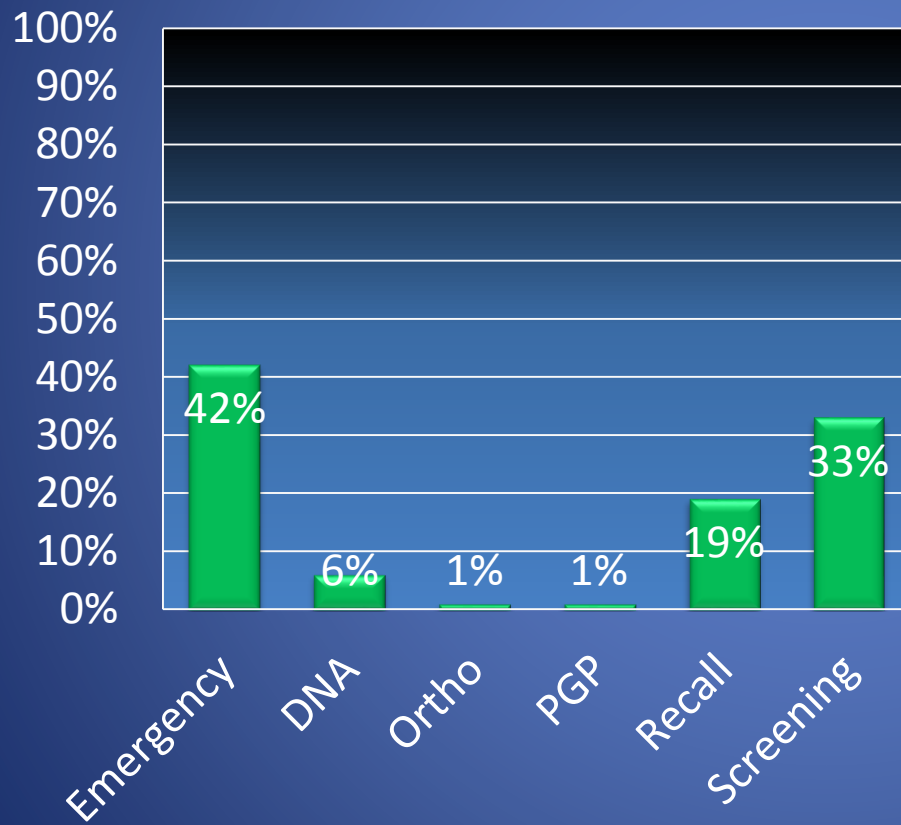
Pre-school children undergoing DGA at Cork University Hospital

- Primary indication for treatment due to dental caries
- More children attending disadvantaged schools required DGA with neither medical history nor fluoride status having any significant effect.
- Poor oral health into adolescence
 - High levels of dental caries in 1st/3rd/6th class
 - Further extractions, restorations and repeat DGA



Post DGA at CUH

First appointment category post-DGA



- 80% of patients did not receive a recall appointment
- Nature of treatment in first post DGA visit noted
 - 10% of subjects referred for DGA2
 - 15% placed on Ab or underwent xla



Cost of Dental General Anaesthesia (DGA)

- Economic climate dictates scarce resources be used efficiently and effectively
- Current service in Ireland is not achieving Value For Money. *(Deloitte & Touche, 2001)*
- Reported DGA costs vary:
 - USA: \$2,581 . *(Bruen et al., 2016)*
 - Australia: £840-2000/child. *(Kanellis et al., 2000)*
- Canadian hospitals estimate \$10.5 million dollars is spent on DGA annually *(Association of Dental Surgeons of British Columbia, 2001)*



Average Cost

Day service in CUH
treating 10
patients/day

Dental Extractions
only

Distinct separate
entity from special
needs service

€818.97
per child

> €8,000
per day



Average Cost of DGA in Cork University Hospital

DIRECT AND INDIRECT COSTS FOR DGA	
1. Annual Total Allocated Theatre Costs	€1,266,381.09
2. Annual third party cleaning	€15,246.00
3. Annual theatre consumables	€229,550.67
4. Annual waste management	€38,633.85
5. Annual theatre maintenance	€20,000.00
6. Total Annual Theatre Operating Costs (1+2+3+4+5)	€1,592,888.86
7. Cost per patient	€689.96
8. Patient loss	€129.41
TOTAL COST:	
9. Total Number of Patients P/A	2,310
10. Total Cost per Patient (9/10)	€818.97



Intervention V Treatment



- Question is not of one service or another but how much of what service should be provided
- Research indicates early parental education and timely intervention can lead to;
 - Improved health outcomes
 - Reduced costs “tens of millions of dollars”. (*Savage et al., 2004*)



Fluoride Varnish

Fluoride varnish application two or four times a year, either in the permanent or primary dentition, is associated with a substantial reduction in caries increment and has been shown to reduce caries in high risk children (*Marinho et al., 2002*)



Research Hypothesis

- High risk children require referral to an appropriate recall program following DGA
- Fluoride varnish is an effective means of reducing caries susceptibility in high risk patients
- Fluoride varnish is more effective than parental counselling alone
- The cost of a fluoride varnish based prevention program would require significantly less investment than DGA



Research Aim

Develop an evidence based protocol for a cost-effective prevention program aimed at reducing the caries susceptibility of high risk children who have had dental extractions under general anaesthesia in Ireland



Methods

Ethical Approval

- Clinical Research Ethics Committee of the Cork Teaching Hospital
- Nationally recognized by the Department of Health and Children

HSE Permission

- Make available data relating to children aged 5 years and younger who have had extractions completed under DGA in CHO-4

Enterprise BRIDGES/SOEL Computing

- Dental Patient Management System in the HSE South since 1999
- 200,000 unique patients , 800,000 chartings, over 26 million charted conditions



Recruitment

- Patients satisfying the inclusion criteria will be invited to partake.
- Full parental consent
- Age/Gender/Referral clinic
- Medical history
 - Full medical history form will be completed as part of the recruitment and consent process
- Presence of a fluoridated domestic water supply.
 - To be discussed with parent and confirmed on fluoride map
- Socio economic status
 - Using medical card ownership as the indicator
- DGA experience including indicator for DGA, waiting period and number of teeth extracted



Intervention: Randomly assigned to 3 groups

Group 1

No fluoride varnish

Parental counselling provided

Group 2

Fluoride varnish 3/12

Parental counselling

Group 3

Fluoride varnish 6/12

Parental counselling

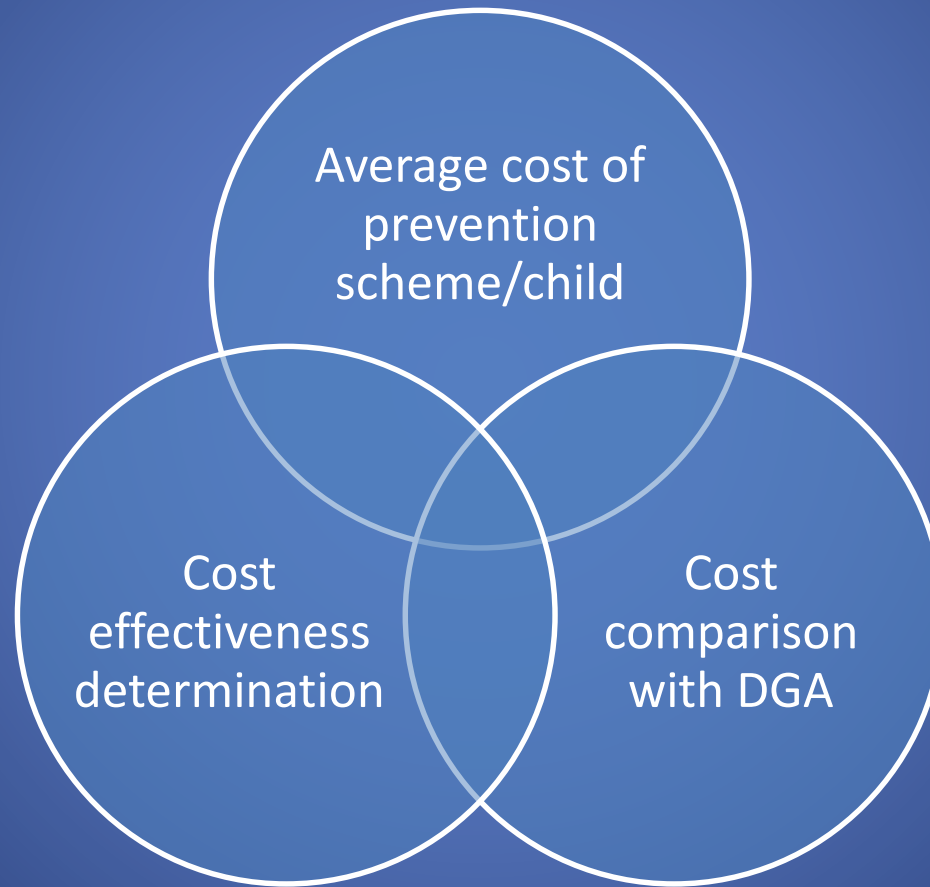


Outcome

- Dental examinations will be conducted three times:
 - Baseline
 - 6 months
 - One year following the intervention with longer follow up desired.
- The primary outcome measure is the presence of dental caries



Cost analysis



Conclusion

- Past caries experience is an indicator of future caries development (Almeida et al., 2000),
- Early preventive dental visits have the potential to improve oral health outcomes and reduce cost (American Academy of Pediatric Dentistry, 2013)
- The development of an evidence based protocol for recalling high risk patients into preventive services may:
 - Reduce caries levels
 - Improve oral health
 - Reduce associated costs



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