Protecting teeth and oral health in old age

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BNF Task Force Launch, 13th January 2009
Introduction

- Ageing and oral health status
- Acids and oral health
- Ageing mouths and function
- Ageing mouths and disease
Ageing mouths
Edentulism

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Ageing mouths and Teeth

• In 1998 only 20% of people over 85 had natural teeth
• This was little different to 1968
• Next year over 40% will have teeth
• In 12 years time it should be about 60%
Acids
Diet and root decay

pH
6.0
5.5

Dentine
Enamel

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The problems of sugars

“I do not want two diseases – one nature made, one doctor made”

*Napoleon Bonaparte, 1820*
Prolonged oral clearance (POC) medicines

**Oral liquid doses**
- Elixirs
- Linctuses
- Mixtures
- Oral drops
- Oral emulsions
- Oral solutions
- Oral suspensions
- Syrups

**Solid oral doses with POC**
- Pastilles and lozenges
- Sublingual and buccal tablets
- Chewable tablets
- Effervescent and dispersible tablets
Risks from sugars in medicines in older people?

- Prescribed medicines represent bulk of POC medicine use
- Oral liquids less likely to be SF
- Generic prescribing was more likely to result in sugars-containing medicines being dispensed
- Additional impact of xerogenicic medications
Ageing mouths

SPIT

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What does saliva do?

- Buffers
- Dilutes
- Lubricates
- Glues
- Digests
- Protects
  - IgA / IgM
  - Lactoperoxidase
What does saliva do?

- Buffers
- Dilutes
- Lubricates
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- Digests
- Protects
  - IgA / IgM
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- Caries
- Wear
- Denture Tolerance
- Mucositis
- Chewing
- Talking / Swallowing
Available secretory capacity

Age

Normal homeostasis cylinder

Sub-Mandibular

Parotid

Minor

Salivary flow with age
Glycopyrrolate and Parotid flow rates

% secretion

Time

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Young Subjects
Older Subjects
Root caries and saliva

- Saliva
  - Anti-cholinergic
  - \(\alpha\)-adrenergic blockers
  - Diuretics
  - \(\text{Ca}^{++}\) channel blockers
  - \(\beta\)-adrenergic blockers
Saliva flow rate by number of medications used

Flow rate (mL/min)

0
1-3
4-6
>7

Unstimulated saliva
Stimulated saliva

*
Xerostomia and oral disease

- Mucosal protection / immunity
  - Soft tissue pathology eg candidiasis
  - Periodontal diseases?
- Dental Caries
- Tooth Wear
The Xerostomia Inventory (XI)

<table>
<thead>
<tr>
<th>How often during a day does your mouth feel dry</th>
<th>NEVER</th>
<th>HARDLY EVER</th>
<th>OCCASIONALLY</th>
<th>FAIRLY OFTEN</th>
<th>VERY OFTEN</th>
<th>DON'T KNOW</th>
</tr>
</thead>
</table>

Thomson, Chalmers, Spencer, and Williams, 1999
Acids

- Reduce frequency of intakes
- Identify xerostomia
- Stimulate salivary function wherever possible
- Implement appropriate preventive measures using fluorides and Ca PO₄ products
Ageing mouths and function:

Masticatory efficiency
### National Diet and Nutrition Survey cf US VALDS

<table>
<thead>
<tr>
<th></th>
<th>Intact (21 or more)</th>
<th>Compromised 1-20 teeth</th>
<th>Edentulous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UK</td>
<td>US</td>
<td>UK</td>
</tr>
<tr>
<td><strong>Protein (63g/day)</strong></td>
<td>72.3</td>
<td>80</td>
<td>66.6</td>
</tr>
<tr>
<td><strong>NSP (25g/day)</strong></td>
<td>16.2</td>
<td>21</td>
<td>12.9</td>
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<tr>
<td><strong>Calcium 800mg/day</strong></td>
<td>883</td>
<td>773</td>
<td>812</td>
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<td><strong>Niacin (15 mg/day)</strong></td>
<td>33.8</td>
<td>32</td>
<td>31.0</td>
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<tr>
<td><strong>Vitamin C (60 mg/day)</strong></td>
<td>82</td>
<td>156</td>
<td>73</td>
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Krall *et al* J Am Dent Assoc 1998; **129**: 1261-1269
Sheiham *et al* J Dent Res 2001; **80**: 408-13
Do these apparent variations in intake of foods influence nutrient status?
NDNS: people aged 65 years and over

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<th>Edentate</th>
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<td>Mean</td>
<td>Median</td>
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<td><strong>Plasma ascorbate (vitamin C)</strong> (µmol/l)</td>
<td>49.1</td>
<td>48.7</td>
<td>39.4</td>
<td>40.1</td>
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<tr>
<td><strong>Plasma retinol (µmol/l)</strong></td>
<td>2.30</td>
<td>2.21</td>
<td>2.09</td>
<td>2.03</td>
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<tr>
<td><strong>Plasma α-tocopherol (µmol/l)</strong></td>
<td>38.6</td>
<td>36.9</td>
<td>37.0</td>
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Free-living

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Factors affecting food choice in older people

- Isolation
- Chronic illness
- Dentition
- Reduced taste perception
- Depression
- Institutionalisation
- Disability
- Transport, Access, Mobility, Income

Digestion, absorption and utilisation of nutrients