Oral Health

March 1998

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Other bulletins in the series address the following subjects:
- cancers
- cardiovascular diseases
- healthy environments
- healthy living
- injury prevention
- learning disabilities
- maternal and early child health
- mental health
- pain, discomfort and palliative care
- physical disability and discomfort
- respiratory diseases

The format of this bulletin was devised by Dr C Riley and Mrs J Barker of the Clinical Effectiveness Support Unit, Llandough and Dr AL Weightman of the Duthie Library, University of Wales College of Medicine, Cardiff.

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The planning of publicly funded health care must be based on an understanding of the effectiveness of interventions. Such planning can only happen if information is readily available, reliable and comprehensible, to people who do not necessarily have a medical training.

The original Protocols for Investment in Health Gain were written in the early 1990s to suggest areas where the introduction, or more widespread use, of certain practices could lead to worthwhile improvements in health for the people of Wales. The documents also highlighted current practices which were of questionable value. This revision has been prepared by reviewing the earlier Protocol for Investment in Health Gain: Oral Health to provide some clear, updated statements with a precise indication of the strength of the evidence and its sources for each statement; and to introduce new statements covering subjects of important current interest.

The statements represent a systematic summary of evidence found through a formal literature search across a wide range of sources. The evidence has been critically appraised using internationally accepted methods compiled into this document under the direction of a consultant in dental public health, and reviewed by a multidisciplinary team who are directly involved in patient care. In addition to this document, the information will be available electronically, via the NHS Cymruweb. Information on the methodology adopted (including a copy of the documentation), the formats in which the document is issued and details of other publications in the series, is available on request.

The health gain notation (used to indicate the potential benefit to health) is:

- ‘beneficial’ - effectiveness clearly demonstrated (1)
- ‘likely to be beneficial’ - effectiveness not so firmly established (2)
- ‘trade-off between beneficial and adverse effects’ - effects weighed according to individual circumstances (3)
- ‘unknown’ - insufficient/inadequate for recommendation (4)
- ‘unlikely to be beneficial’ - ineffectiveness is not as clearly demonstrated as for 6 (5)
- ‘likely to be ineffective or harmful’ - ineffectiveness or harm clearly demonstrated (6)

It should be stressed that these gradings, while aiming to be impartial, represent only the best advice of the professionals involved in preparing the Bulletin. Although the statements are deliberately brief, statistically significant quantitative information has been provided where possible. This is usually given as % change, in keeping with the original source of the information. Cost-benefit issues are not considered.

In keeping with the original Protocols, these revised documents are designed to assist Health Authorities in developing local strategies informing the development of Health Improvement Programmes and in purchasing high quality health care. It is anticipated, however, that they will be of value to all health professionals in keeping abreast of the increasing body of dental literature and can provide an
agenda for future action in a wide variety of settings. It should be stressed that the publications will act as a supplement to, not a substitute for, clinical skills and experience. We anticipate that some of the conclusions reached may be controversial. Every effort has been made to include the best evidence within a subject area. Readers who are aware of any important studies that have been overlooked are encouraged to contact the project team.

As in the original Protocol for Oral Health, diseases and disorders which compromise oral health have been grouped into subject areas. Eight subject areas were selected for the present exercise:

1. Tooth decay
2. Periodontal diseases
3. Dentofacial anomalies
4. Oral cancer
5. Temporomandibular joint disorders and complex facial pain
6. Tooth wear and hypersensitivity
7. Dental injuries
8. Inherited dental anomalies

Research retrieved via the Project Methodology proved the basis for the new statements. Many of the original Protocol statements lacked evidence which met the defined criteria for this project. However it was felt, by the expert review group that these statements were still valid and represented accepted good practice, they have been appended to each subject area as type V evidence, citing the original Protocol as the reference. The source of evidence upon which each statement is based has thereby been identified.

The project has served to highlight that much of dentistry carried out today is based on accepted good practice. For much of this practice, further research would be an inappropriate use of resources. However there remain several areas where further research would be extremely valuable. Thus in addition to summarising evidence for dentistry, this document aims to demonstrate the gaps in the evidence base and to highlight opportunities and priorities for future research in this field.

The Review Group hope that the document will be considered a useful starting point for those wishing to review the scientific evidence supporting this important area of health care.

3 See inside front cover.
4 Contact: Protocol Enhancement Project Office, Duthie Library, UWCM, Heath Park, Cardiff CF4 4XN.
5 This table is adapted from the Bandolier system (derived from the work at McMaster University, Canada) using the NHS Centre for Reviews and Dissemination criteria for a systematic review. See ref.3 or http://www.jr2.ox.ac.uk/Bandolier/band6/b6-5.html and the Database of Abstracts of Reviews of Effectiveness (DARE) in the Cochrane Library.
7 See 4.

This initiative is funded by the Wales Office of Research and Development for Health and Social Care.

Project Team

March 1998
1. **TOOTH DECAY**

**Users are advised to consult the supporting evidence** for a consideration of all the implications of a recommendation.

### The statements

1a. An optimal concentration of **fluoride ions in public water** supplies protects teeth against decay, leading to a reduction in dental caries by up to 50% in deciduous and permanent teeth and in the adult dentition. Some water fluoridation schemes have been running for more than 50 years. Despite extensive study, no adverse effects to the human body have been demonstrated. (Health gain notation - 1 "beneficial")

1b. The use of **fluoride supplementation** in caries prevention would seem to be effective but compliance can be problematic. A reduction in dental caries by up to 50% is observed in individuals at risk of developing dental caries, who can be persuaded to comply. (Health gain notation - 2 "likely to be beneficial")

Dosage for young children should aim to reduce the risk of fluorosis due to this source of fluoride.

1c. Plaque control using **fluoride toothpaste** is effective in the prevention of tooth decay. There are long term clinically significant reductions in dental caries showing a dose - response relationship. (Health gain notation - 1 "beneficial")

### The evidence

i. Ripa LW. A half-century of community water fluoridation in the United States: review and commentary. Journal of Public Health Dentistry 1993; 53 (1): 17-44 (Type III evidence - well designed non-random trial);

ii. Subcommittee on Health Effects of Ingested Fluoride. Health effects of ingested fluoride. Washington DC: National Academy Press, 1993 (Type IV evidence - observational studies);

iii. Community Dental Health. September 1996; Volume 13, Supplement 2 (Type IV evidence - observational studies)

i. Stephen KW. Systemic fluorides: Drops and tablets. Caries Research 1993; 27(suppl.1):9-15 (Type V evidence - expert opinion);


i. Stephen KW. Dentifrices: recent clinical findings and implications for use. International Dental Journal 1993; 43 (6 suppl.1): 549-553 (Type V evidence - expert opinion);

ii. Stephen KW. Fluoride toothpastes, rinses and tablets. Advances in Dental Research. 1994; 8 (2): 185-189 (Type V evidence - expert opinion);

iii. Johnson MF. Comparative efficacy of NaF and SMFP dentifrices in caries prevention: a meta-analytic overview. Caries Research. 1993; 27: 328-336 (Type I evidence - systematic review);

**The Statements**

1d. **Sodium fluoride** is recommended for use as the active system in fluoridated dentifrices whenever practically feasible. However, the formulation should include highly compatible abrasive systems, which must be demonstrated by critical evaluation of ionic fluoride within formulations for stability, availability and bioavailability. Over a 2-3 year period, caries reduction by sodium fluoride was 6.4% higher than by sodium monofluorophosphate. The average difference for that period in caries increment was 0.28 surfaces (confidence interval, 0.10 - 0.46). (Health gain notation - 1 “beneficial”)

1e. **Fluoride varnishes** reduce dental caries and are particularly recommended for special needs groups. (Health gain notation - 1 “beneficial”)

1f. **Fluoride rinses** reduce dental caries and are recommended for special needs groups. (Health gain notation - 1 “beneficial”)

1g. **A reduction in sugar** in the diet is associated with reduced levels of tooth decay. (Health gain notation - 1 “beneficial”)

1h. To reduce dental caries, **bottle feeding** should be discouraged, especially from the age of one year. (Health gain notation - 1 “beneficial”)

**The Evidence**

i. Johnson M F. Comparative efficacy of NaF and SMFP dentifrices in caries prevention: a meta-analytic overview. *Caries Research* 1993; 27: 328-336 (Type I evidence - meta-analysis);


i. Stephen KW. Fluoride toothpastes, rinses and tablets. *Advances in Dental Research* 1994; 8 (2): 185-189 (Type V evidence - expert opinion);


### 1. TOOTH DECAY CONT.

Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

#### The statements

| 1i. | A reduction in sugar based medicine will reduce dental decay. | (Health gain notation - 2 “likely to be beneficial”)
| 1j. | Sugar substitutes may be of benefit in reducing dental caries. However, other effects of such substitutes should be understood and taken into account. | (Health gain notation - 4 “unknown”)
| 1k. | Dietary control of sugars aids prevention of root caries. | (Health gain notation - 1 “beneficial”)
| 1l. | The effectiveness of programmes to modify diet remains unclear. | (Health gain notation - 4 “unknown”)
| 1m. | Oral health promotion is more effective when educational approaches are tailored to clients’ needs and when social and physical environments are considered. | (Health gain notation - 3 “weighted according to individual circumstances”)

#### The evidence

1. Resin based fissure sealants are effective in preventing dental caries. (Health gain notation - 1 "beneficial")

1o. Guidelines on the prevention of dental caries in children are available.

1p. Regular clinical examination is recommended for the early detection of tooth decay, with radiographs (x-rays) to detect caries not visible on examination. The interval between successive clinical and radiographic examinations should vary according to the caries susceptibility of the individual. (Health gain notation - 1 "beneficial")

1q. Regular clinical examination and radiographs (x-rays) are recommended for the continuing care of the restored dentition. The ideal interval between examination and radiography is affected by the oral health of the individual.

The statements

The evidence

i. Llodra JC, Bravo M, Delgado-Rodriguez M, Baca P, Galvez R. Factors influencing the effectiveness of sealants - a meta-analysis. Community Dentistry and Oral Epidemiology. 1993; 21(5): 261-8 (Type I evidence - systematic review);


i. Faculty of Dental Surgery. National Clinical Guidelines 1997. London: Royal College of Surgeons, 1997 (Recommendations classified according to type of evidence)

i. Angmar-Mansson B, ten Bosch JJ. Advances in methods for diagnosing coronal caries - a review. Advances in Dental Research 1993; 7(2): 70-79 (Type V evidence - expert opinion);


Part of the diagnostic process for dental caries is visual and gentle tactile examination of teeth. (Health gain notation - 1 “beneficial”)

New methods of diagnosing caries are under development but all require clinical testing. (Health gain notation - 4 “unknown”)

Diagnosis of approximal caries can be assisted by using fiber-optic transillumination. (Health gain notation - 4 “unknown”)

Dental amalgam is an effective filling material. Amalgam restorations do not appear to be hazardous to the general health of the population. (Health gain notation - 1 “beneficial”)

Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

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### The statements

**1r.** Part of the diagnostic process for dental caries is visual and gentle tactile examination of teeth. (Health gain notation - 1 “beneficial”)

**New methods of diagnosing caries** are under development but all require clinical testing. (Health gain notation - 4 “unknown”)

**1s.** Diagnosis of approximal caries can be assisted by using fiber-optic transillumination. (Health gain notation - 4 “unknown”)

**1t.** Dental amalgam is an effective filling material. Amalgam restorations do not appear to be hazardous to the general health of the population. (Health gain notation - 1 “beneficial”)

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### The evidence


**ii.** Angmar-Mansson B, ten Bosch JJ. Advances in methods for diagnosing coronal caries - a review. Advances in Dental Research 1993; 7(2): 70-79 (Type V evidence - expert opinion)


**ii.** Eley BM, Cox SW. The release, absorption and possible health effects of mercury from dental amalgam: a review of recent findings (erratum to the original review published on September 11, 1993). British Dental Journal 1993; 175(161): 355-362 (Type III/IV evidence - review of non-randomised trials and observational studies)

Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

1u. Dentists should be cautious when using **dentine bonding agents** because the permanence of the bond in the oral environment has not been extensively studied\(^1\).
   (Health gain notation - 2 “likely to be beneficial”)  
   (Type V evidence - expert opinion)

1v. Further research is recommended to validate the use of **laboratory predictors of clinical performance of filling materials** and to develop an accredited range of products supported by independent research evidence\(^1\).
   i. Internal Review Group (see inside front cover)  
   (Type V evidence - expert opinion)

1w. The success of **dentures, bridges and implants** is dependent on patient behaviour (eg plaque control) and operator efficiency; therefore the benefit to the patient must be weighed against the risks\(^1\).
   (Health gain notation - 3 “weighted according to individual circumstances”)  
   i. Internal Review Group (see inside front cover)  
   (Type V evidence - expert opinion)

1x. Correctly made **resin bonded bridges** are an effective way of replacing missing teeth (survival after 4 years = 74%)\(^1\).
   (Health gain notation - 1 “beneficial”)  
   (Type I evidence - systematic review)

1y. **Guidelines** are available for **crown and bridgework**.  
   (Type V evidence - expert opinion)

1z. **Guidelines** are available on the selection of patients to receive treatment with **dental implants** (priorities for the NHS) and on restorative indications for **porcelain veneer restorations**.  
   (Recommendations classified according to type of evidence)
2a. There is good evidence on which to recommend correctly conducted **toothbrushing and flossing** in the **prevention of gingivitis** in adults. (Health gain notation - 1 “beneficial”)

2b. There is good evidence on which to recommend correctly conducted **toothbrushing** in the **prevention of gingivitis** in children. (Health gain notation - 1 “beneficial”)

2c. The primary aetiology of periodontal disease is **bacterial plaque**. (Health gain notation - 6 “likely to be harmful”)

2d. There is weak evidence to recommend correctly conducted **toothbrushing and flossing** to prevent **periodontitis** in adults. (Health gain notation - 2 “likely to be beneficial”)

2e. A **reduction in smoking** will reduce periodontal disease. (Health gain notation - 1 “beneficial”)

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**The evidence**


2f. There is good evidence to recommend use of **chlorhexidine oral rinse** over a short period as an adjunct to self care in the prevention of gingivitis although staining is a problem. Newer rinses and gum protection toothpastes have an increasing role to play. (Health gain notation - 1 “beneficial”)

2g. **Community based oral health education programmes** can lead to improved gingival health (reduced plaque and gingivitis) but positive effects are short term. (Health gain notation - 4 “unknown”)

2h. **Guidelines** are available on screening of patients to detect periodontal diseases.

2i. The **recall interval** for dental examination, for individuals at risk of plaque associated periodontal disease, should differ between patients according to oral hygiene status, the severity of gingivitis and the status of the periodontal ligament. Further research is recommended on suitable recall intervals. (Health gain notation - 3 “trade-off between beneficial and adverse effects”)

2j. There is good evidence to recommend **professional scaling and plaque removal** every 3-4 months in patients with periodontitis to prevent the progression of the disease. (Health gain notation - 1 “beneficial”)

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**The evidence**


   (Type I evidence - systematic review using Medline only)

ii. Adams D, Addy M. Mouthrinses. Advances in Dental Research 1994; **8** (2): 291-301

   (Type I evidence - systematic review)

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**Users are advised to consult the supporting evidence** for a consideration of all the implications of a recommendation.

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**The statements**
PERIODONTAL DISEASES CONT.

Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

The statements

2k Antibiotics are not generally recommended for the prevention of gingivitis or periodontitis. (Health gain notation - 5 "unlikely to be beneficial")

However, acute specific infections such as acute necrotising ulcerative gingivitis and lateral periodontal abscess, together with more rare forms of periodontitis such as juvenile periodontitis are indications for use. (Health gain notation - 2 "likely to be beneficial")

i. Ismail AI, Lewis DW. Periodic health examination, 1993 update: 3. Periodontal diseases classification, diagnosis, risk factors and prevention. Canadian Medical Association Journal 1993; 149 (10): 1409-1422 (Type I evidence - systematic review using Medline only);

ii. Rams TE, Slots J. Antibiotics in periodontal therapy: an update. Compendium of Continuing Education in Dentistry; XIII (12): 1130-1145 (Type I evidence - systematic review);


The evidence

2l. A systematic review of systemic tetracycline use in chronic adult periodontitis is currently in progress.

2m. There is no clear evidence to suggest that surgical interventions are more effective than non surgical approaches in the treatment of periodontal disease. Further research is recommended. (Health gain notation - 4 "unknown")

i. Kaldahl WB, Kalkwarf KL, Patil KD. A review of longitudinal studies that compared periodontal therapies. Journal of Periodontology 1993; 64: 243-253 (Type I evidence - systematic review);


2n. Short term periodontal splinting techniques require further evaluation in their role in the continuing care of individuals who have undergone treatment for periodontal disease. Further research is recommended. (Health gain notation - 4 "unknown")

3a. Genetic counselling is likely to assist in the prevention of heritable dentofacial anomalies. (Health gain notation - 2 “likely to be beneficial”)

3b. Assessment of orthodontic needs can be made using the index of orthodontic treatment need (IOTN). (Health gain notation - 2 “likely to be beneficial”)

3c. IOTN 4 or 5 cases can be improved by orthodontic treatment. (Health gain notation - 1 “beneficial”)

3d. IOTN 3 cases, following expert opinion, can be improved by orthodontic treatment but further evaluation is recommended. (Health gain notation 3 “trade-off between beneficial and adverse effects”)

3e. IOTN 1 or 2 cases can be treated by orthodontic interventions but the health gain is unproven. (Health gain notation 4 “unknown”)

3f. In the diagnosis of dento-facial discrepancies, it is accepted custom and practice to consider information collected from sources in the following list:

- history
- visual examination
- palpation
- radiographs (x-rays)
- study models
- computerised tomography (CT) scans
- study models.

(Health gain notation - 1 “beneficial”)

3g. Prevention of tooth decay and of gingivitis is mandatory during orthodontic treatment. (Health gain notation - 1 “beneficial”)

The statements on this page are derived from:


(Type V evidence - expert opinion)
3h. Where extractions are indicated for orthodontic purposes, decayed or filled teeth with a poor prognosis should be chosen rather than sound teeth where possible.  
(Health gain notation - 1 “beneficial”)

3i. Multidisciplinary teamwork is required when, for example, orthognathic surgery and/or speech therapy is required in addition to orthodontic treatment.  
(Health gain notation - 1 “beneficial”)

3j. A systematic review of orthodontic treatment for posterior cross bites is currently in progress.

3k. The benefits of orthodontic treatment have to be balanced against the risks and the likely success of treatment. Orthodontic treatment should be directed at those individuals in which the greatest benefit can be achieved.  
(Health gain notation - 3 “trade-off between beneficial and adverse effects”)

3l. Orthodontic treatment assessment can be made using the peer assessment rating index (PAR).  
(Health gain notation - 2 “likely to be beneficial”)

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**The statements**

**The evidence**

(Type IV evidence - observational studies)

(Type V evidence - expert opinion)


(Type V evidence - expert opinion)

(Type V evidence - expert opinion)

(Type V evidence - expert opinion)
Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

3m. Guidelines on the management of patients with impacted third molar teeth, pericoronitis and the prevention of dry sockets are available.

3n. Guidelines on the management of palatally ectopic maxillary canine and unerupted maxillary incisors are available.

3o. Scarce, highly specialised resources are required for consistent success in the management of cleft lip and/or palate. Appropriate levels of expertise are likely to be achieved and maintained at specialist centres.

(Health gain notation - 2 "likely to be beneficial")


Type V evidence - expert opinion
4a. A reduction in tobacco use leads to a decreased incidence of oral cancer and precancer\textsuperscript{i,ii,iii,iv,v}. (Health gain notation - 1 "beneficial")


iii. Johnson NW, Warnakulasuriya KAAS. Epidemiology and aetiology of oral cancer in the United Kingdom. Community D.ental Health. 1993; 10 (Suppl.1): 13-29 (Type IV evidence - observational studies);

iv. Gupta PC, Murti PR, Bhosle RB, Mehta FS, Pindborg JJ. Effect of cessation of tobacco use on the incidence of oral mucosal lesions in a 10-year follow-up study of 12,212 users. Oral Diseases. 1995; 1: 54-58 (Type IV evidence - observational studies);


4b. A reduction in alcohol consumption leads to a decreased incidence of oral cancer and precancer\textsuperscript{i}. (Health gain notation - 1 "beneficial")


Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

4c. An increased consumption of fruit and vegetables leads to a decreased incidence of oral cancer and precancer.iii

(Health gain notation - 1 “beneficial”)  

4d. Health education of ‘at risk’ groups in the prevention of oral cancer appears promising but requires further evaluation. Further research is recommended.

(Health gain notation - 2 “likely to be beneficial”)  

4e. Education of medical and dental professionals in the prevention of oral cancer appears promising but requires further evaluation.

(Health gain notation - 2 “likely to be beneficial”)  

4f. Early diagnosis of oral cancer can dramatically increase survival. Further research is recommended to evaluate the effect of early diagnosis on survival rates.

(Health gain notation - 1 “beneficial”)  

   (Type IV evidence - observational studies)  

   (Type IV evidence - observational studies)  

   (Type IV evidence - observational studies)  

   (Type IV evidence - observational studies)  

   (Type V evidence - expert opinion)  

   (Type V evidence - expert opinion)
4 ORAL CANCER CONT.

Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

4g. The following approach to diagnosis and assessment of oral cancers is recommended:
- history,
- visual examination of soft tissue,
- palpation,
- biopsy,
- radiography (x-rays),
- computerised tomography (CT) scans.
(Health gain notation - 1 “beneficial”)

4h. Effective treatment and care for individuals with oral cancer includes surgery, radiotherapy, chemotherapy and reconstructive surgery.
(Health gain notation - 1 “beneficial”)

4i. There may be some evidence available soon concerning the role of chemopreventive agents (retinoids/beta-carotenes) in the reversal of carcinogenesis.
(Health gain notation - 4 “unknown”)

4j. Effective rehabilitation and continuing care of oral cancer patients includes implants, implant-supported prostheses, restorative dentistry, psychological support, speech therapy, smoking cessation and regular follow-up examination.
(Health gain notation - 3 “trade-off between beneficial and adverse effects”)

The statements


The evidence
5a. **Guidelines** are available for the management of unilateral fractures of the condyle.

5b. Temporomandibular joint disorders and facial pain may require **multiple diagnostic aids** followed by management which may include: counselling, physiotherapy, pharmacotherapy, occlusal treatments, surgery, pain clinics, behaviour therapy.

(Health gain notation - 2 “likely to be beneficial”)

5c. There is no evidence that the presence or extent of **radiographic signs of pathology** are of prognostic value in temporomandibular joint disorders.

(Health gain notation - 6 “likely to be ineffective”)

5d. A **key outcome measure** of the treatment of temporomandibular joint disorders (TMJ) is a stable functional TMJ with maximal intercuspation of the dentition. Success is dependent on the skills of the clinician in assessment as well as surgery, if indicated.

(Health gain notation - 1 “beneficial”)

5e. There is no good evidence concerning the effectiveness of **interventions** for temporomandibular joint disorders.

(Health gain notation - 4 “unknown”)

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**The statements**

**5. TEMPOROMANDIBULAR JOINT DISORDERS AND COMPLEX FACIAL PAIN**

*Users are advised to consult the supporting evidence* for a consideration of all the implications of a recommendation.

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**The evidence**


(Recommendations classified according to type of evidence)


(Type V evidence - expert opinion)


(Type III evidence - well designed non-randomised trial)

i. White RD. Temporomandibular joint considerations in orthognathic surgery. Annals of the Academy of Medicine, Singapore 1995; 24: 76-82

(Type V evidence - expert opinion)


(Type V evidence - expert opinion)


(Type V evidence - expert opinion)
5f. Long term outcome of facial pain treatment is largely unknown. Research shows that conservative treatments including drug therapy and counselling are effective for 70% of patients. Refractory pain is associated with a long complex history of pain, a preoccupation with physical symptoms and poor psychosocial adjustment.

(Health gain notation - 4 "unknown")


(Type V evidence - expert opinion)

5g. For the majority of patients with facial pain, symptoms can be managed quite effectively with nonsteroidal anti-inflammatory drugs (NSAIDs) and physical therapy to produce long term freedom from pain.

(Health gain notation - 3 "trade-off between beneficial and adverse effects")


(Type V evidence - expert opinion)
6a. The prevalence of **tooth wear** (loss of enamel with or without exposure of dentine) is widespread in children.

6b. Tooth wear may be caused by **acidic drinks**.

The sale of unconcentrated soft drinks in the United Kingdom has more than doubled between 1985 and 1995 (from 251 to 514 ml per person per week).

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**The evidence**

i. Milosevic A., Young PJ, Lennon MA. The prevalence of tooth wear in 14-year-old school children in Liverpool. Community Dental Health. 1994; 11: 83-86 (Type IV evidence - observational studies);


iii. Smith AJ, Shaw L. Baby fruit juices and tooth erosion. British Dental Journal 1987; 162: 65-67 (Type IV evidence - observational studies);


v. Milosevic A., Lennon MA, Fear SC. Risk factors associated with tooth wear in teenagers: a case control study. Community Dental Health. 1997; 14: 143-147 (Type IV evidence - observational studies);

6c. **Tooth wear** and **dentine hypersensitivity** may be prevented by:
- correct **toothbrushing**
- the application of **fluoride varnish**
  (Health gain notation - 1 “beneficial”)

6d. **Dentine Hypersensitivity** may be reduced by
- a **reduction in gingival trauma**
  (Health gain notation - 1 “beneficial”)
- a **reduction in periodontal disease**
  (Health gain notation - 2 “likely to be beneficial”)

6e. In the **diagnosis and assessment of tooth wear**, a dietary and medical history should be taken into account and referral made to medical personnel if appropriate.
  (Health gain notation - 1 “beneficial”)

6f. In the **diagnosis and assessment of dentine hypersensitivity**, it is important to eliminate other causes. History-taking, gentle tactile examination and cold air are useful diagnostic aids.
  (Health gain notation - 1 “beneficial”)

6g. Individuals suffering from **dentine hypersensitivity** should be advised on its aetiology.
  (Health gain notation - 1 “beneficial”)

6h. **Tooth wear** related to parafunction, may be controlled by the use of:
- **muscle relaxants or antidepressants**
- bite raising appliances
- **stress counselling**
  (Health gain notation - 2 “likely to be beneficial”)

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**The statements**

**The evidence**

**Statements on this page are derived from:**

(Type V evidence - expert opinion)
Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

6i. The aim of treatment of dentine hypersensitivity is to block dental tubules or to block nerve transmissions at the pulpal surface. (Health gain notation - 1 "beneficial")

6j. Therapeutic toothpaste or glass ionomer cement can be used to treat dentine hypersensitivity. (Health gain notation - 2 "likely to be beneficial")
   Further research is recommended on treatments for dentine hypersensitivity.

6k. Adhesive resin retained veneers and onlays can effectively restore lost tissue and remain retentive. (Health gain notation - 2 "likely to be beneficial")

6l. Veneers, fillings and/or crowns can replace lost tooth tissue. (Health gain notation - 1 “beneficial”)
   Further research is recommended to evaluate restorative treatment for toothwear.

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   (Type V evidence - expert opinion)

   (Type IV evidence - observational studies)
7a. A major risk factor in the aetiology of trauma to incisors is **protruding upper incisors**. In 1993, the proportions of 12-13 year-old children in the United Kingdom with fractured incisors was as follows:

- overjet under 5mm = 16%
- overjet over 5mm = 24%

**Odds ratio** = 1.66 for overjets over 5mm.

7b. **Mouthguards** used during sports reduce oral injuries.

(Health gain notation - 2 “likely to be beneficial”)

7c. **Measures to prevent dental injuries** in addition to mouth protection include head protection and seat belts at the appropriate times.

(Health gain notation - 1 “beneficial”)

See also the Injury Prevention Bulletin in this series.

7d. **Parents/school and sports staff should be educated in first aid measures for dental injuries**.

(Health gain notation - 1 “beneficial”)

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**The evidence**

   (Type IV evidence - observational studies)

   (Type V evidence - expert opinion)

   (Type IV evidence - observational studies)

   (Type IV evidence - observational studies)

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**The statements**

Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.
7e. Avulsed permanent teeth should be stored in isotonic media (eg milk) if instant replantation is not possible (over 80% periodontium healed in 8 weeks in an animal experiment where pre-implantation storage time was up to 3h)\(^i\). (Health gain notation - 1 “beneficial”)  

7f. The following information sources contribute to diagnosis and assessment:\(^i\):
- history
- visual examination
- palpation
- radiographs (x-rays) (Health gain notation - 1 “beneficial”)
- transillumination (Health gain notation - 2 “likely to be beneficial”)

7g. Avulsed permanent teeth should be replanted within 15 minutes. (Radiographic follow up for 5 years showed that 14/21 teeth were stable at the end of the study)\(^i\). (Health gain notation - 1 “beneficial”)  

7h. On reimplantation there should be a short period of splinting to allow re-establishment of a periodontal ligament. (Health gain notation - 2 “likely to be beneficial”)  

7i. In the event of pulp death occurring before the root apex has formed, calcium hydroxide pastes may promote formation of the apex or of a calcified barrier. (Bone healing and apical closure was noted in 50/55 cases)\(^i\). (Health gain notation - 1 “beneficial”)  

7j. Root resorption can be arrested by inserting calcium hydroxide paste into the root canal followed by obturation with gutta percha. (Healing was obtained in 192/197 teeth)\(^i\). (Health gain notation - 1 “beneficial”)  

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Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

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7 DENTAL INJURIES CONT.
The etch retained composite technique is now the accepted clinical standard for repairing an uncomplicated crown fracture, providing aesthetically pleasing restoration with acceptable longevity. (Health gain notation - 1 “beneficial”)

Regular follow-up is recommended after treatment of dental trauma. (Health gain notation - 1 “beneficial”)

Orthodontics, if indicated, is beneficial after treatment of dental trauma. (Health gain notation - 1 “beneficial”)

The dental team should be educated as to their role in the detection of non-accidental injury. (Health gain notation - 2 “likely to be beneficial”)

Guidelines on the treatment of avulsed permanent teeth and traumatically intruded permanent incisor teeth in children are available.

There is some evidence in the United Kingdom that primary care services for the treatment of dental trauma are inadequate, as dentists have insufficient knowledge. The situation should be reviewed locally and steps taken to address the problem if detected.

Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.
8. **INHERITED DENTAL ANOMALIES**

Users are advised to consult the supporting evidence for a consideration of all the implications of a recommendation.

The incidence of Amelogenesis Imperfecta is 1:4,000 - 1:14,000 births;

The incidence of Dentinogenesis Imperfecta is 1:5,000 - 1:8,000 births;

Hypodontia is observed in 5.7% women and 3.1% men.


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**8a. Genetic Counselling** can be of value in order to prevent inherited dental anomalies, although alone they are not fatal.

(Health gain notation - 2 "likely to be beneficial")

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**8b. As the effects of inherited dental anomalies can be minimised by professional treatment, early diagnosis and regular dental attendance favourably influence the treatment outcome**.

(Health gain notation - 1 “beneficial”)

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**8c. Treatment aims** include prevention of caries and periodontal disease.

(Health gain notation - 1 “beneficial”)

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**8d. In the treatment of Amelogenesis imperfecta** the aim is to retain the maximum amount of dental hard tissue until the individual reaches an age at which the necessary advanced restorative work can be carried out to rehabilitate the teeth. This can be measured as the proportion of permanent teeth remaining at age 16.

(Health gain notation - 1 “beneficial”)

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(Type V evidence - expert opinion)

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(Type V evidence - expert opinion)

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(Type V evidence - expert opinion)

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(Type V evidence - expert opinion)

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i. Witkop CJ, Rau S. Inherited defects in tooth structure. Baltimore: Williams and Wilkins, 1971 (Type V evidence - expert opinion);

8e. For Dentinogenesis imperfecta early diagnosis and treatment are required in order to prevent loss of vertical height. (Health gain notation - 1 “beneficial”)

8f. As the disorder dictates, the following treatments may be indicated:
- fluoride varnish
- glass ionomer cements
- composite veneers
- enamel micro-abrasion
- preformed stainless steel crowns
- overdentures
(Health gain notation - 2 “likely to be beneficial”)

8g. Longterm care (throughout adulthood) requires prevention of decay and of periodontal disease, crowns, bridges, dentures, possibly implants. (Health gain notation - 1 “beneficial”)

The evidence

(Type V evidence - expert opinion)

(Type V evidence - expert opinion)
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The contents of this Bulletin are likely to be valid for around one year, by which time significant new research evidence may have become available.
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