



Oral Health Screening Toolkit



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Introduction

Welcome to this toolkit designed to support teams in setting up screening and surveillance programmes.

Poor oral health will prevent athletes performing to their highest potential and being an elite athlete also presents many challenges to maintaining great oral health. In view of these challenges, we have designed this toolkit to support screening for oral health disease in athlete populations and to promote comparisons of data recorded at different times and in different populations.

Where possible we have chosen commonly used and evidence based indices for this toolkit, the toolkit is partly based on indices used by the English 2009 Adult Dental Health survey.

How to use the toolkit

Scope

This document will focus on common oral conditions (excluding oral cancer). Our research at the London 2012 games (*Needleman et al, 2013*); a systematic review of oral diseases in athletes (*Ashley et al, 2015*); with UK Professional Football (Needleman et al. 2016) and UK elite and professional athletes (Gallagher et al. 2017) has shown consistently that athletes have high levels of dental decay (caries), periodontal (gum) disease and dental erosion. In addition, problems with wisdom teeth may also impair performance.

Consent may be required for screening examinations. This is not covered by this document.

This document is not intended to provide detailed treatment planning guidance for oral health conditions. If the screening identifies treatment need, this will require more evaluation and planning by the dental professional.

Who is this for?

This toolkit is intended for groups or individuals responsible for athlete health. The indices can either be used to support research or as a screening tool to identify athletes that need treatment. The screening will need to be carried out by a dentist.

Please help us to improve the toolkit – we welcome your comments and suggestions.

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Screening

Environment and Cross-infection control

The participant should be seated in a comfortable chair, which has good head support, and which allows the examiner to access and examine the head and mouth.

A suitable external bright light source should be used such as a head torch or lamp.

The instruments should be laid out on a clean tissue out of sight of the participant if possible, but allowing easy access.

The light source should be set at the highest power setting and dark eye protection glasses placed on the subject.

There should be a source of compressed air to dry the teeth if caries examination is included.

Each examiner should carry sufficient sets of sterile **disposable** instruments to ensure that there are sterile instruments for every examination. Following the examination these should be disposed. Examiners should wear a clean pair of **latex-free gloves** for the examination of each participant along with a mask and eye protection. Appropriate cross-infection procedures must be followed throughout.

An example equipment list is in Appendix 1

Data collection

Where possible questionnaires for additional data should be completed by participants as they wait for the oral examination.

When scoring clinical outcomes, if in doubt score 'low'.

When part of research, any data collected should be anonymised.

Demographic data should include age, gender, participating sport, ethnicity and where possible a marker of deprivation/social status.

Examples of data collection forms are in appendices 2 and 3.

Examiner training

For research or when multiple examiners are used then consideration should be given to their training. The training should be structured to provide a clear understanding of the nature and aims of the study or screening exercise together with the assessment/examination procedures and completion of appropriate documentation. Preferably, examiners should be trained and compared to a gold-standard examiner. Furthermore, it will be important to assess their consistency in measurements (within-individual repeatability).

Oral Health behaviours

The following should be recorded

- Time since last visit to the dentist
- Toothbrushing frequency
- Flossing (or other method of interdental cleaning) frequency
- Mouthguard use
- Tobacco use

Specific questions on diet should distinguish between in-training nutrition and out of training nutrition. Targeted questions on known risk factors such as sports drink usage could be considered.

Example questions are in Appendix 3.

Caries and restorations

Caries and restorations should be scored using ICDAS criteria (<https://www.icdas.org>) with teeth scored as 3 or above requiring treatment.

In addition, teeth with unrestorable decay should be noted. This can be defined as: “Untreated teeth with extensive dentinal decay have obvious loss of tooth structure, with a cavity both deep and wide so that dentine is clearly visible on the walls and at the base. Such a cavity would involve at least half of a tooth surface, and teeth coded in this way are so broken down that it is inconceivable that there is not pulp involvement and so restoration of the tooth would be very involved or impossible.” (Adult Dental Health Survey, 2009)

Erosive wear

This should be recorded for all teeth using a modification of the Basic Erosive Wear (examination to exclude third molars (BEWE Bartlett *et al*, 2008).

The mouth is divided into sextants, excluding third molars defined by tooth type (numbers): upper right molars and premolars (17-14), upper right canine - upper left canine (13-23), upper left premolars and molars (24-27), lower left molars and premolars (37-34) lower left canine to lower right canine (33-43) lower right premolars and molars (44-47). A sextant should be examined only if there are two or more teeth present, a single tooth will be considered to belong to the adjacent sextant.

Codes and criteria

Score	Surface	Criteria
0	BOL	Sound, no surface loss
1	BOL	Loss of enamel surface texture
2*	BOL	Distinct defect, hard tissue loss less than 50% surface area
3*	BOL	Hard tissue loss more than 50% of the surface area
9*	BOL	Unscorable. >25% of the tooth surface obscured. All crowns and bridge abutments are given this code.

BOL: Buccal, occlusal, lingual

The examination is repeated for all teeth in a sextant but only the surface with the highest score is recorded for each sextant. Once all the sextants have been assessed, the sum of the scores is calculated

Dental Trauma

Trauma to teeth should be recorded as part of the basic examination and assessment of tooth wear. Cause of trauma (sport related or not) should also be recorded along with any soft tissue injury.

For each tooth traumatised, categorise as follows

Type of trauma			
Fracture site:	Crown	Root	Crown & root
Pulp involved	Yes	No	
Subluxated	Yes	No	
Lateral luxation	Yes	No	
	Palatal mm:	Buccal mm:	
Intrusion	Yes	No	
	mm:		
Avulsion	Yes	No	

Periodontal health

Periodontal health should be assessed as per the Basic Periodontal Examination (British Society of Periodontology 2016)

How to record the BPE

1. The dentition is divided into sextants (upper right (UR7-UR4); upper anterior (UR3-UL3); upper left (UL4-UL7); lower right (LR7-LR4); lower anterior (LR3-LL3); lower left (LL4-LL7)
The highest score for each sextant is recorded:
2. All teeth in each sextant are examined (with the exception of 3rd molars unless 1st and/or 2nd molars are missing)
3. For a sextant to qualify for recording, it must contain at least 2 teeth
4. A World Health Organisation (WHO) BPE probe is used. This has a 'ball end' 0.5mm in diameter and a black band from 3.5mm to 5.5mm. Light probing force should be used (20-25 grams).
5. The probe should be 'walked around' the teeth in each sextant. All sites should be examined to ensure that the highest score in the sextant is recorded before moving on to the next sextant. If a code 4 is identified in a sextant, continue to examine all sites in the sextant. This will help to gain a fuller understanding of the periodontal condition and will make sure that furcation involvements are not missed

Scoring codes

0	Pockets <3.5mm, no calculus/overhangs, no bleeding on probing (<i>black band entirely visible</i>)
1	Pockets <3.5mm, no calculus/overhangs, bleeding on probing (<i>black band entirely visible</i>)
2	Pockets <3.5mm, supra or subgingival calculus/overhangs (<i>black band entirely visible</i>)
3	Probing depth 3.5-5.5mm (<i>black band partially visible, indicating pocket of 4-5 mm</i>)
4	Probing depth >5.5mm (<i>black band disappears, indicating a pocket of 6 mm or more</i>)
*	Furcation involvement

An example BPE score grid might look like this:

4	3	3*
-	2	4*

Both the number and the * should be recorded if a furcation is detected. E.g. the score for a sextant could be 3* (indicating a probing depth 3.5-5.5 mm plus a furcation involvement in the sextant).

BPE should not be used around dental implants (4 or 6-point pocket charting should be used)

Pulp, Ulceration, Fistula and Abscess (PUFA Index)

Description of conditions to be recorded in PUFA

P = open pulp in permanent dentition

U = obvious ulceration

F = fistula in permanent dentition

A = abscess in permanent dentition

Codes and criteria:PUFA

0 = No lesions evident

1 = A single lesion present

2 = 2 or more lesions present

The mouth should be examined in the following order (upper right, upper left, lower left, lower right), ensuring that the lips or cheeks are gently retracted to allow the soft tissues to be examined.

A single code (0, 1 or 2) will be called for each of the four conditions examined.

Wisdom teeth

Previous wisdom tooth removal and any pain or infection related to the wisdom teeth should be noted.

Temporomandibular assessment

Any episodes of pain or limited opening.

Impact of oral health on athletic performance and training

Self-reported impacts can be assessed using a modification of the 4 item Oslo Sports Trauma Research Centre overuse injury questionnaire (Clarsen et al 2013). The questions and response options are listed below. Items 1 and 4 have four response options; items 2 and 3 have five response options. (A numerical value can be assigned to each response and totalled to give a severity score out of 100; 1 and 4 can be scored 0-8-17-25, items 2 and 3 can be scored 0-6-13-19-25). The reference period is the previous 12 months but could be reduced if screening is carried out more frequently.

1. Have you had any difficulties participating in normal training or competition due to problems with your mouth, teeth or gums over the past 12 months?

Full participation without mouth, teeth or gum problems
Full participation but with mouth, teeth or gum problems
Reduced participation due to mouth, teeth or gum problems
Could not participate due to mouth, teeth or gum problems

2. To what extent have you reduced your training volume due to mouth, teeth or gum problems over the past 12 months?

No reduction
Minor reduction
Moderate reduction
To a major extent
Could not participate at all

3. To what extent have problems with your mouth, teeth or gums affected your performance over the past 12 months?

No effect
To a minor extent
To a moderate extent
To a major extent
Could not participate at all

4. To what extent have you experienced pain from your mouth teeth or gums over the past 12 months?

No pain
Mild pain
Moderate pain
Severe pain

Athlete-reported psychosocial impacts are assessed with a further 3 items modified from the well-validated Oral Impacts on daily Performances (OIDP) questionnaire (White et al 2012, O’Sullivan et al 2011).

Over the past 12 months (or less if screening more frequently):

Have you had any difficulty eating or drinking because of your mouth, teeth or gums?

Have you had any difficulty relaxing (including sleeping) because of your mouth, teeth or gums?

Have you had any difficulty smiling, laughing or showing your teeth without embarrassment?

The responses will be scored on a five point scale as follows

Not at all	0
A little	1
Somewhat	2
A fair amount	3
A great deal	4

When reporting impacts, the responses are often dichotomised to no impact/any impact.

Self -reported health and oral health status is assessed with the harmonised five-category general health question previously used in the Adult Dental Health survey 2009 (O’Sullivan et al 2011). Self-assessed health status is a measure of how an individual perceives his or her health. Self-assessed health status has been validated as a useful indicator of health for a variety of populations and allows for broad comparisons across different conditions and populations ([www. healthypeople.gov](http://www.healthypeople.gov)).

Compared to other people,

How would you describe your general health at present?

How would you describe your oral health (mouth, teeth and gums) at present?

The responses will be scored on a five point scale as follows

Very good	0
Good	1
Fair	2
Poor	3
Very poor	4

When reporting, the responses are often dichotomised to very good or good/ fair to very poor

See appendix 3 for an example

References

Adult Dental Health Survey 2009.

<http://content.digital.nhs.uk/catalogue/PUB01086/adul-dent-heal-surv-summ-them-foun-2009-re14.pdf>.

Ashley P, Di Iorio A, Cole E, Tanday A, Needleman I. Oral health of elite athletes and association with performance: a systematic review. *British Journal of Sports Medicine*. 2015; 49:14-19.

Bartlett D, Ganss C, Lussi A. Basic Erosive Wear Examination (BEWE): a new scoring system for scientific and clinical needs. *Clinical Oral Investigations*. 2008;12(Suppl 1):65-68. doi:10.1007/s00784-007-0181-5.

British Society of Periodontology. Basic Periodontal Examination(BPE). 2016. www.bsperio.org.uk/publications/downloads/94_154250_bpe-2016-po-v5-final-002.pdf

Clarsen B, Myklebust G, Bahr R. Development and validation of a new method for the registration of overuse injuries in sports injury epidemiology: the Oslo Sports Trauma Research Centre (OSTRC) overuse injury questionnaire. *Br J Sports Med* 2013;47(8):495-502.

Gallagher J, Ashley P, Needleman I. Oral Health and Impact on Performance in UK elite and professional athletes. Poster #422 IOC World Conference on Prevention of Injury and Illness in Sport. 2017. Monaco.

Locker D. and Quiñonez, C, To what extent do oral disorders compromise the quality of life? *Community Dentistry and Oral Epidemiology* 2011; 39: 3–11. doi:10.1111/j.1600-0528.2010.00597.x

Needleman I, Ashley P, Petrie A, Fortune F, Turner W, Jones J, Niggli J, Engebretsen L, Budgett R, Donos N, Clough T & Porter S. Oral health and impact on performance of athletes participating in the London 2012 Olympic Games: a cross-sectional study. *British Journal of Sports Medicine* 2013; 47: 1054-1058

Needleman I, Ashley P, Meehan L, Petrie A, Weiler R, McNally S, Ayer C, Hanna R, Hunt I, Kell S, Ridgewell S, Taylor R. Poor oral health including active caries in 187 UK professional male football players: clinical dental examination performed by dentists. *British Journal of Sports Medicine* 2016; 50: 41-44

White DA, Tsakos G, Pitts NB, et al. Adult Dental Health Survey 2009: common oral health conditions and their impact on the population. *Br Dent J* 2012;213(11):567-72. <https://www.healthypeople.gov/2020/about/foundation-health-measures/General-Health-Status#selfAssessed>

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Appendix 1 Example equipment list

Examination

Sun lounger/portable dental chair/physio couch
Adjustable dental stool (for examiner)
Portable dental unit (PDU)
Back-up PDU
Air syringe
DARAY Light (with bulb and adapter) 1
Replacement light bulb 1

Instruments

World Health Organisation (WHO) BPE probe. This has a 'ball end' 0.5mm in diameter and a black band from 3.5mm to 5.5mm
Mirror
Cotton wool rolls

Infection Control

Disposable syringe tips
Syringe covers
Barrier for head rest
Vinyl examination gloves
Face masks
Safety glasses, operator and participant
Germicidal wipes,
Touchless hand decontamination liquid + dispenser
Waste bags, biohazard
Paper towels

Miscellaneous

Pens
Paperwork
Clip boards

Appendix 2 Example clinical examination data collection form

Dental history

	code
Do you have any problems or pain in your mouth at the moment? If yes	
Do you think that the pain is related to your teeth?	
Do you have any sensitivity to hot or cold related to your teeth at the moment?	
Do you notice any bleeding from your gums when cleaning your teeth?	
Have you ever had any swelling or infections around your wisdom teeth?	
Have you ever had any wisdom teeth removed?	
Have you ever had an injury to your teeth?	
If you did, was this related to your sport?	

No = 0 Yes (always/often) = 1 N/A =2 Sometimes/occasionally =3

PUFA index (Pulp, Ulceration, Fistula, Abscess)

	code
Pulp	
Ulcer	
Fistula	
Abscess	

0=no lesions, 1=single lesion, 2=2 or more lesions

	code
pericoronitis	

No clinical evidence =0 Clinical evidence present (swelling) =1

Periodontal examination

0,1,2,3,4,

Erosion

0= no surface loss, 1=early change, 2=<50% loss, 3=>50% loss

Total score: Posterior _____ Anterior _____ Total _____

Caries experience, trauma experience

Tooth	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
D																
O																
M																
B																
L																
Total score																
Tooth	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
D																
O																
M																
B																
L																
Total score																

Appendix 3 Example questionnaire

Project Title: Oral Health of Elite Athletes and Impact on Performance

This questionnaire should take no more than 15 minutes to complete. Please answer all questions. We appreciate your contribution towards this research.

First, some questions about you;

1. What is your competition sport?

.....

2. What is your age?

.....years

3. Are you?

0. Male	
1. Female	

4. What is your highest educational level to date?

0. GCSE (or equivalent)	
1. A-level (or equivalent)	
2. FE College (or equivalent)	
3. University undergraduate degree	
4. University postgraduate degree	

Now some questions about your oral health.

Compared to other people,

5. How would you describe your general health at present?

0. Very good	
1. Good	
2. Fair	
3. Poor	
4. Very poor	

6. How would you describe your oral health (mouth, teeth and gums) at present?

0. Very good	
1. Good	
2. Fair	
3. Poor	
4. Very poor	

Over the past 12 months:

7. Have you had any difficulty eating or drinking because of your mouth, teeth or gums?

0. Not at all	
1. A little	
2. Somewhat	
3. A fair amount	
4. A great deal	

8. Have you had any difficulty relaxing (including sleeping) because of your mouth, teeth or gums?

0. Not at all	
1. A little	
2. Somewhat	
3. A fair amount	
4. A great deal	

9. Have you had any difficulty smiling, laughing or showing your teeth without embarrassment?

0. Not at all	
1. A little	
2. Somewhat	
3. A fair amount	
4. A great deal	

10. Have you had any difficulties participating in normal training or competition due to problems with your mouth, teeth or gums?

0.Full participation without mouth, teeth or gum problems	
1.Full participation but with mouth, teeth or gum problem	
2.Reduced participation due to mouth, teeth or gum problems	
3.Could not participate due to mouth, teeth or gum problems	

11. To what extent have you reduced your training volume due to mouth, teeth or gum problems over the past 12 months?

0.No reduction	
1.Minor reduction	
2.Moderate reduction	
3.To a major extent	
4. Could not participate at all	

12. To what extent have problems with your mouth, teeth or gums affected your performance over the past 12 months?

0.No effect	
1.To a minor extent	
2.To a moderate extent	
3.To a major extent	
4.Could not participate at all	

13. To what extent have you experienced pain from your mouth teeth or gums over the past 12 months?

0.No pain	
1.Mild pain	
2.Moderate pain	
3.Severe pain	

14. How often do you eat a serving of any of the following; cakes, biscuits, puddings, pastries?

0.Rarely or never	
1.Less than once a week	
2.One to two times a week	
3.Three to five times a week	
4.Six or more times a week	

15. How often do you eat sweets and/or chocolate?

0.Rarely or never	
1.Less than once a week	
2.One to two times a week	
3.Three to five times a week	
4.Six or more times a week	

16. How often do you drink fizzy drinks or soft drinks like squash? Please do not include sports drinks in this section.

0.Rarely or never	
1.Less than once a week	
2.One to two times a week	
3.Three to five times a week	
4.Six or more times a week	

17. How often do you drink water?

0.Rarely or never	
1.Less than once a week	
2.One to two times a week	
3.Three to five times a week	
4.Six or more times a week	

18. Do you use tobacco or e-cigarettes? Please tick each line

	0. Have never done so	1. I used to but not now	2. Yes:
I smoke tobacco			
I use smokeless/chewing tobacco			
I use e-cigarettes with nicotine			
I use e-cigarettes without nicotine			

19. I use sports drinks Please tick each line

	0.Never	1.Sometimes	2.Always
Before training			
During training			
After training			
Before competition			
During competition			
After competition			

20. I use energy bars Please tick each line

	0. Never	1.Sometimes	2.Always
Before training			
During training			
After training			
Before competition			
During competition			
After competition			

21. I use energy gels Please tick each line

	0.Never	1.Sometimes	2.Always
Before training			
During training			
After training			
Before competition			
During competition			
After competition			

22. Which of the following do you think can cause damage to your mouth, teeth or gums? Please tick each line

	0.No	1.Yes	2.Don't know
Cakes, biscuits, puddings, pastries			
Sweets/chocolate			
Fizzy drinks and/or squash			
Sports drinks			
Energy bars			
Energy gels			
Smoking tobacco			
Smokeless/chewing tobacco			
e-cigarettes with nicotine			
e-cigarettes without nicotine			

23. When do you usually clean your teeth? Please tick each line

	1.Yes	0.No
In the morning		
Before going to sleep at night		
Before sleeping during the day		
After sleeping during the day		
Other time in the day		

24. Which of the following do you use to help keep your mouth, teeth and gums healthy? Please tick each line

	1.Yes	0.No
Normal toothbrush		
Electric toothbrush		
Dental floss/interdental brushes		
Regular (fluoride) toothpaste		
Fluoride mouthwash		
Other mouthwash		
Sugar free chewing gum		
Toothpicks		
Other		

25. Do you ever wear a gum shield in connection with your sport?

1.Yes	
0.No	

26. Have you ever been given advice from a dentist or dental hygienist about the following? Please tick each line

	0.Yes	1.No	2.Can't remember
How to look after your mouth, teeth and gums			
What to eat and/or drink			

27. About how long ago was your last visit to the dentist?

0.Within the past six months	
1.Six to 12 months ago	
2.One to two years ago	
3.More than two years ago	

28. For your most recent dental visit, what type of service did you use?

0.NHS dentist	
1.Private dentist	
2.Private dental hygienist	
3.Other	

29. Which of the following is most important to you when arranging a dental appointment?

0.Cost	
1.Convenience	
2.Reputation of the dentist	

30. What of the following do you think you could do if you thought it would help keep your mouth, teeth and gums healthy? Please tick each line

	3.No	2.With difficulty	1.Probably	0.Yes
Reduce snacking between meals (including energy bars/gels)				
Reduce sugary drinks (including sports drinks) between meals				
Brush teeth before sleeping				
Only spit out toothpaste, don't rinse with water				
Use fluoride mouthwash at a different time to brushing				
Use dental floss/interdental brushes every day				
Use sugar free chewing gum				
Regular visits to a dentist/hygienist for advice and monitoring				

31. Finally, what is your ethnic group?

Please tick one option that best describes your ethnic group or background.

White	1 English/Welsh/Scottish/Northern Irish/British	
	2 Irish	
	3 Gypsy or Irish traveller	
	4 Any other white background- please describe	
Mixed/Multiple Ethnic Group	5 White and Black Caribbean	
	6 White and Black African	
	7 White and Asian	
	8 Any other mixed/multiple ethnic background- please describe	
Asian/Asian British	9 Indian	
	10 Pakistani	
	11 Bangladeshi	
	12 Chinese	
	13 Any other Asian background, please describe	
Black/African/Caribbean/Black British	14 African	
	15 Caribbean	
	16 Any other Black/African/Caribbean background, please describe	
Other ethnic group	17 Arab	
	18 Any other ethnic background, please describe	

32. If you use them, what brand of sports nutrition products do you use?

.....

The questionnaire is now complete. Thank you