Recommendations and Guidelines for Examiners of Basic Erosive Wear Examination Index (BEWE)

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The BEWE index (Basic Erosive Wear Examination) is a practical index for the Erosive Tooth Wear screening and assessment, using a 4-score ordinal scale. It could be used on an individual and/or epidemiological level (1).

BEWE Index assessment (score and description)

Score	Description
0	No erosive tooth wear
1	Initial loss of surface texture (brightness loss, opaque surface or "frosted glass")
2	Distinct defect, hard tissue loss, less than 50% of the surface area. Dentin could be involved
3	Hard tissue loss in more than 50% of the surface area. Dentin could be involved

BEWE index assesses the damage according to the **tooth affected surface regardless its depth in dentin** (2).

Sextants' cumulative assessment (maximum 18) defines the **BEWE index value per assessed subject**, allowing the clinical management actions according to risk.

Recommendation and Guidelines:

1. To standardise the clinical examination, next order should be followed:

   - Examination should be performed following a clockwise direction **by sextant** to register **only the highest BEWE score (0-3) per sextant**, i.e.:
     Upper Jaw: Sextants 1 to 3, right to left.
     Lower Jaw: Sextants 4 to 6, left to right.

   When registering BEWE scores (0-3) **corresponding to each present tooth surface**, the examination order will follow the FDI two-digit nomenclature clockwise.

   The 6 sextants include the following teeth:

Sextant 1	**Sextant 2**	**Sextant 3**
17-16-15-14	13-12-11-21-22-23	24-25-26-27
Sextant 6	**Sextant 5**	**Sextant 4**
44-45-46-47	33-32-31-41-42-43	37-36-35-34

Only 28 teeth are considered. Third permanent molars are excluded and will only be considered if they are replacing a second permanent molar.

2. Teeth and surfaces to be assessed: buccal, occlusal and/or incisal (anterior teeth - canine to canine) and lingual/palatal (suggestion: follow this same order when assessing and registering the lesions).
3. Teeth must be clean before clinical examination. Cleaning could be previously done by the patient using a toothbrush. Plaque and food remains can be removed by the examiner using gauze, cotton rolls or the WHO probe. This is useful for detecting plaque stagnation areas, which is important to make a differential diagnosis with carious lesions.
4. Surfaces must be gently dried with the three-in-one syringe to remove excess moisture.
5. Good illumination is a must.
6. Visual-tactile method should be followed for clinical examination. Use a flat oral #5 mirror and the ball-ended WHO probe (*CPITN probe*). Magnification is not required.

7. In case of missing teeth, mark them with X in the correspondent registration space.
8. When in doubt take the less severe BEWE score
9. Identify and record in each quadrant the most severely affected tooth with wear
10. The BEWE should be performed at every new clinical examination and care plan.
11. In case of use BEWE index with children some adaptation must be made , specifically in primary or deciduous teeth the time interval for repetition of the established criteria should be decrease to between 6 to 12 month for routine maintenance (3)
12. For many patients over the age of 30 years it is inconceivable that they are wear free so the default value would be 1. The distinction between grade 0 and 1 is minor but the most important distinction is between 2 and 3.(4)

Specific considerations for the detection of Erosive Tooth Wear and its registration in <u>occlusal surfaces of molars and premolars</u> using the BEWE Index

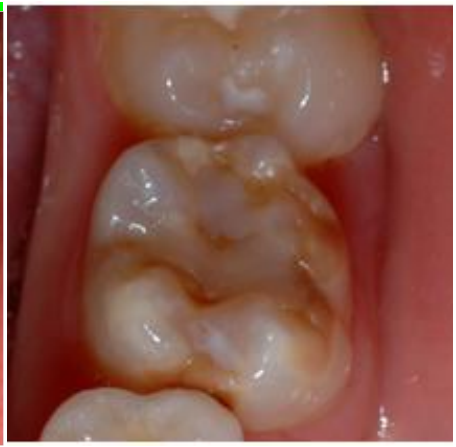
<u>BEWE Score 0:</u>

- No erosive tooth wear signs on the occlusal surface.
- Occlusal restored surfaces fully or partially adapted (marginal defects), with no erosive tooth wear signs around the restoration interface or cusps.
- Physiological and/or pathological wear on cusps (comparisons against wear facets in the corresponding antagonist should be done).

Occlusal surface, Sound tooth

Occlusal image, Defective Restoration

Oclussal and buccal attrition



Molar with Hypoplasia

BEWE Score 1:

- First Erosive Tooth Wear signs: Rounding of the cusps and grooves. Wear not related to the antagonist teeth.
- If concavities on cusps (*cupping*) with **diameter ≤ 0,5mm** (use the WHO probe to assess its diameter since its tip has a greater size). More than one cupping can be found on a single surface.

BEWE Score 2:

- Distinct defect. Hard tissue loss due to erosive tooth wears in less than 50% of the surface area. Dentine is often involved
- Concave wear on cusps (*cupping*). **Diameter ≥ 0,5mm** (it is possible to use the WHO probe to assess its diameter since its tip perfectly fits into the defect) **and overall < 50 %**
- On restored teeth: Erosive tooth wear is not related to the restoration marginal interface.

BEWE Score 3:

- Hard tissue loss signs in more than 50% of the surface area. Dentine is often involved
- Concavities merging (*cupping*) could be detected. Total or partial loss of the occlusal surface (more than 50%).
- On restored teeth: Erosive tooth wear is related to the restoration marginal interface, presenting "emerging" edges. In this case the restoration area is included in the total affected area.

Specific considerations for the detection of Erosive Tooth Wear and its registration in buccal and/or palatal/lingual using the BEWE Index

When evaluating the surface affected by erosive tooth wear in relation to the crown area, consider the concept of **clinical crown**: area comprising from the gingival margin (regardless of periodontal status) to the incisal/occlusal edge.

BEWE Score 0:

- No erosive tooth wear signs on the buccal/palatal/lingual surface
- Buccal/palatal/lingual restored surfaces fully or partially adapted (marginal defects) with no erosive tooth wear signs. Include suspicious or evident cases where a restoration has been placed due to erosive wear and there is no other adjacent new lesion at the occlusal, incisal or gingival level.
- Enamel developmental defects, opacities, fluorosis, amelogenesis, other.
- Anatomical defects

BEWE Score 1:

- First Erosive Tooth Wear signs: Initial loss of surface texture (brightness loss, opaque surface or “frosted glass”)

BEWE Score 2:

- Distinct defect. Hard tissue loss due to erosive tooth wears in less than 50% of the surface area. Dentine is often involved

BEWE Score 3:

- Hard tissue loss signs in more than 50% of the surface area. Dentine is often involved
- On restored teeth: Erosive tooth wear is related to the restoration marginal interface, presenting “emerging” edges. In this case the restoration area is included in the total affected area.

Specific considerations for the detection of Erosive Tooth Wear and its registration in <u>incisal edges</u> using the BEWE Index

If the wear is flat, register BEWE score 0; if it concave *("cupping"),* register BEWE scores 1 to 3 depending on the involved surface area.

Wear along the whole incisal edge without loss of crown height = score BEWE 2
Loss of crown height= score BEWE 3 (4)

Gingival recession: Make a differential diagnosis between Erosive Tooth Wear with exposition of root and gingival recession. This area can present a small depression or notch, anatomically normal. The use of a ball-ended probe (WHO) is recommended in case of doubts, comparing with neighbour teeth.

Peripheral crowns: Erosive tooth wear associated to crown margins interface. Do not include the crown to assess the total affected area. BEWE score 2 the highest possible.


Images teeth with crowns and different ETW severity stages

Veneers: Erosive tooth wear associated to direct and/or indirect veneers´ margins interface. Include the total surface area registering as BEWE score 3.

Rotated teeth: In case of tooth rotation, assess the position and name the assessed surfaces as follows: “the one that faces the cheek” or “the one that faces the palate/tongue without considering the normal tooth anatomy.

Missing neighbour tooth: If a neighbour tooth is missing and you can observe and detect an erosive lesion on the proximal area, verify whether the lesion starts in the buccal or palatal/lingual surface. In this case register one of these surfaces (buccal, palatal/lingual), or register the proximal surface as an extra comment.

Cervical wedge-shaped lesion or Non carious cervical lesions (NCCL): This type of lesions could be assessed following the BEWE evaluation criteria registering the score followed by an asterisk (*).

Differential diagnosis between Erosive Tooth Wear and Root/Cervical Caries Lesion

- Colour assessment: root caries lesions are presented in a brown-orange colour. Non-carious wear will have the corresponding tooth structure colour. Compare with neighbour teeth.
- Tactile sensation. Carious lesions can present a friable surface. Non-carious wear will present a hard surface. Use the WHO probe in case of doubts and compare with neighbour teeth.
- Plaque assessment. Plaque stagnation will be associated with a caries lesion. Register BEWE score 0.
- If you detect a caries lesion associated to an erosive tooth wear lesion, consider the correspondent BEWE score for the affected surface, regardless of the caries lesion.
- If still in doubt whether is a caries lesion or an ETW lesion, consider it as caries and register BEWE score 0.

Images : ETW and caries lesion

Recommendations for
Epidemiological surveys:

The following are general exclusion criteria for epidemiological surveys:

- Subject presenting one or more edentulous sextants.
- Subjects under fixed orthodontic treatment (post-orthodontic retainers are not considered)

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