

OSTEOLOGICAL EVALUATION

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Product No. BC-280

**Human 1-year-old Child
Skull with Calvarium Cut
(12 - 18 months)**



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OSTEOLOGICAL REPRODUCTIONS

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Human, Child (12-18 months), Calvarium cut

Product Number: BC-280

Specimen Evaluated: Natural Bone Specimen
One panoramic radiograph (Panorex)

Skeletal Inventory: 1 intact cranium (calvarium cut)
1 intact mandible

General observations:

***NOTE – Evaluation of demographic features was performed on BC-274, the same version of this skull without the calvarium.*

The general shape and configuration of the skull is within normal limits. The general morphology of the individual visible cranial bones is within normal limits. Sutural patterns are of expected configuration. The anterior and posterior intra-occipital sutures are not fused. There are no sutural bones. The foramina are of expected configuration. The skull is atraumatic.

Dentition:

There are 12 teeth in the maxillary arcade and 12 teeth in the mandibular arcade. There is a mixed pattern of deciduous and permanent dentition.

The following fully erupted teeth are in the maxillae: 5.1 [E], 5.2 [D], 5.4 [B], 6.1 [F], 6.2 [G], and 6.4 [I].

The following fully erupted teeth are in the mandible: 7.1 [O], 7.4 [L], 8.1 [P], 8.4 [S].

The following partially erupted teeth are in the maxillae: 5.3 [C], 5.5 [A], 6.3 [H] and 6.5 [J].

The following partially erupted teeth are present in the mandible: 7.2 [N], and 8.2 [Q].

The following teeth are beginning to erupt through the maxillary cortical bone: 1.6 [#1] and 2.6 [#14].

The following teeth are beginning to erupt through the mandibular cortical bone: 7.3 [M], 7.5 [K], 3.6 [#19], 8.3 [R], 8.5 [T] and 4.6 [#30].

There are no dental restorations or prostheses. There is no significant attrition.

Panoramic Radiograph:

Radio-opacities are at the apices of the primary maxillary incisors (permanent dentition tooth bud formation).

Crown formation is nearly complete on the primary canines and second molars. Crown calcification has begun in the permanent first molars.

The apices of the primary central incisors are nearly complete.

Root formation is approximately half complete in the primary lateral incisors.

Non-Dental Features of Age:

Fontanelles

The anterior fontanelle is open; it is .9 cm in the anteroposterior plane, and 1.3 cm in the transverse plane. The posterior, sphenoidal (anterolateral) and mastoidal (posterolateral) fontanelles are closed.

The spheno-occipital synchondrosis is open.

The calvarial sutures are all open (there is no evidence of ossification).

SUMMARY:

1. Age

Dental

Likely greater than 1 year, and less than 18 months of age.

Non-Dental

Anterior fontanelle open.

Closure: median 13.8 months[1], range 4 – 26 months.[2]

Posterior fontanelle closed.

Closure: 2 – 3 months.[3]

Sphenoidal (anterolateral) fontanelle closed.

Closure: 2-3 months.[3]

Mastoidal (posterolateral) fontanelle closed.

Closure: 1 year.[3]

Spheno-occipital synchondrosis open.

Closure: 10.5 – 16 years.[4, 5]

Posterior intra-occipital suture open.

Closure: 1 – 3 years.[6]

Anterior intra-occipital suture open.

Closure: 5 – 7 years.[6]

EDUCATIONAL RESOURCES:

1. This is an excellent example of a young child's skull.
2. It may be appropriate to discuss the differences between primary and secondary dentition, eruption patterns, and controversies surrounding the timelines that 'typify' those eruption patterns.
3. Age assessment of skeletal remains is best done in the context of the entire skeleton. It is important for educators to emphasize that when limited to the skull, age assessment of subadult remains is best done through a coordinated evaluation of such features as dentition and fontanelle closure, as well as radiographs and/or computed tomography (CT) scans. This is particularly key for studies of tooth development (calcification, eruption). It is important to emphasize that the evaluation of a skull without these methods is artificial, and not reflective of actual practice. However, the ability to analyze such remains from the strict perspective of osteology is fundamental, and students must feel comfortable analyzing subadult skulls and skeletons.
4. It is not currently possible to reliably differentiate amongst the major racial groups within subadults.[7]
5. It is not currently possible to reliably differentiate male and female infant and young child skeletal remains.[7]
6. In the evaluation of subadult skulls, particularly when studying 'typical' eruption patterns, students must be cautioned that statistical data is based on **populations**, and may not necessarily be reflective of reality in an **individual**.
7. It may be appropriate to discuss the concept of sutural (Wormian) bones and what role they may play in the forensic evaluation of cranial remains. It is most important that students understand sutural bones are normal variants which may be present with somewhat increased frequency in some racial groups; they must not be misdiagnosed as fractures.
8. By removing the calvarium, junior osteologists are able to learn the complex anatomy of the endocranium, especially including the pathways of the various foramina of the skull base, and the orbit.

***Bone Clones*® Osteological Evaluation Report**

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DISCLAIMERS:

This report is meant only as a teaching tool for introductory level students of the anatomical, anthropology or forensic sciences who might be using this specimen to learn human and forensic osteology. My opinions are based solely upon the material presented to me. This is somewhat artificial as in real forensic investigations additional studies would be undertaken prior to the formulation of diagnoses and the production of a report. These studies might include additional plain film radiography, computed tomography (CT) studies, histology, etc. My opinions regarding this skull were made without access to the postcranial skeleton

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