

Table 8.22: *Definitions for cranial measurements used in CRANID and FORDISC 3.0*

Code	Points	Measurement	CRANID Description of measurement	FORDISC 3.0 Description of Measurement
ASB	as-as	Biasterionic breadth	Direct measurement from one asterion to the other	
AUB	au-au	Biauricular breadth	Least exterior breadth across the roots of the zygomatic processes, wherever found	Last exterior breadth across the roots of the zygomatic processes, wherever found. With the skull resting on the occiput and with the base towards the observer, measure to the outside of the roots of the zygomatic processes at their deepest incurvature, generally slightly anterior to the external auditory meatus, with the sharp points of the calliper
BBH	ba-b	Basion–bregma height	Distance from basion to bregma, as defined	Direct distance from the lowest point on the anterior margin of the foramen magnum to bregma
BNL	ba-n	Basion–nasion length, cranial base length	Direct length between basion and nasion	Direct distance from nasion to basion
BPL	ba-pr	Basion–prosthion length	Facial length from basion to prosthion, as defined	
CDB	cdl-cdl	Bicondylar breadth		Direct distance between the most lateral points on the two condyles
DKB	d-d	Interorbital breadth	Breadth across the nasal space	Direct distance between right

			from dacryon to dacryon	and left dacryon
EKB	ec-ec	Biorbital breadth	Breadth across the orbits from ectoconchion to ectoconchion	Direct distance between right and left ectoconchion
FMB	fm:a- fm:a	Bifrontal breadth	Breadth across the frontal bone between frontomalar anterior on each side (i.e., the most anterior point on the frontomalar suture). Buikstra and Ubelaker (1994) measured between the most laterally positioned points on the frontomalar suture; this distance is perhaps 6 mm longer than Howells' FMB	
FOB		Foramen magnum breadth		Direct distance between the lateral margins of foramen magnum at the points of greatest lateral curvature
FOL	ba-o	Foramen magnum length		Direct distance from basion to opisthion. Calliper tips should rest precisely on opposing edges of the foramen magnum border
FRC	n-b	Frontal chord, nasion–bregma chord	Frontal chord, or direct distance from nasion to bregma, is taken in the midplane and at the external surface	Direct distance from nasion to bregma taken in the midsagittal plane
FRS		Nasion–bregma subtense, frontal subtense	Maximum subtense, at the highest point on the convexity of the frontal bone in the midplane, to the basion–bregma	

			chord	
GNI	id-gn	Chin height		Direct distance from infradentale to gnathion
GOG	go-go	Bigonial width		Direct distance between right and left gonion. Place the blunt points of the calliper to the most prominent external points at the mandibular angles
GOL	g-op	Glabello-occipital length, maximum cranial length	Greatest length, from the glabellar region, in the median sagittal plane	Distance between glabella and opisthocranion in the midsagittal plane, measured in a straight line. Place the skull on its side, holding one end of the calliper at the glabella and extending the calliper until the maximum diameter at posterior aspect of the skull is obtained
HMF		Height of mandibular body		Direct distance from the alveolar process to the inferior border of the mandible perpendicular to the base at the level of the mental foramen
JUB	ju-ju	Bijugal breadth	External breadth across the malars at the jugalia (i.e., at the deepest points in the curvature between the frontal and temporal process of the malars)	
MAB	ecm-ecm	Maxillo-alveolar breadth, palate breadth	Greatest breadth across the alveolar borders, wherever	Maximum breadth across the alveolar borders of the maxilla

		(external)	found, perpendicular to the median plane	measured on the lateral surfaces at the location of the second maxillary molars
MAL	pr-alv	Maxillo-alveolar length		Direct distance from prosthion to alveon. Position skull with basilar portion facing up; apply a thin wooden rod to the posterior borders of the alveolar arch and measure the distance from prosthion to the middle of the rod (on the midsagittal plane)
MAN		Mandibular angle		Angle formed by the inferior border of the corpus and the posterior border of the ramus
MDH		Mastoid height		Vertical projection of the mastoid process below and perpendicular to the eye-ear (Frankfort) plane. Rest skull on its right side and apply the calibrated bar of the calliper just behind the mastoid process, with the fixed flat arm tangent to the upper border of the external auditory meatus and pointing to the lower border of the orbit. Slide the measuring arm until it is level with the tip of the mastoid process
MLN		Mandibular length		Distance of the anterior margin

				of the chin from a centre point on the projected straight line placed along the posterior border of the two mandibular angles. Apply movable board of the mandibulometer to the posterior borders of the mandibular rami and the fixed board against the most anterior point of the chin; stabilise the mandible by applying gentle pressure to the left second molar
NLB	al-al	Nasal breadth	Distance between the anterior edges of the nasal aperture at its widest extent	Maximum breadth of the nasal aperture
NLH	n-ns	Nasal height	Average height from nasion to the lowest point on the border of the nasal aperture on either side	Direct distance from nasion to the midpoint of a line connecting the lowest points of the inferior margin of the nasal notches
NOL	n-op	Nasio-occipital length	Greatest cranial length in the median sagittal plane, measured from nasion	Refer to UFHT
NPH	n-pr	Nasion–prosthion height	Upper facial height from nasion to prosthion, as defined	
OBB	d-ec	Orbit breadth, left	Breadth from ectoconchion to dacryon, as defined, approximating the longitudinal axis that bisects the orbit into equal upper and lower parts	Laterally sloping distance from dacryon to ectoconchion. <i>Note:</i> Measure the left side unless damaged, pathological, or absent

OBH		Orbit height, left	Height between the upper and lower borders of the left orbit, perpendicular to the long axis of the orbit and bisecting it	Direct distance between the superior and inferior orbital margins, avoiding any orbital notches
OCC	l-o	Lambda–opisthion chord, occipital chord	External occipital chord, or direct distance from lambda to opisthion, taken in the midplane and at the external surface	Direct distance from lambda to opisthion taken in the midsagittal plane
OCS		Lambda–opisthion subtense, occipital subtense	Maximum subtense, at the most prominent point on the basic contour of the occipital bone in the midplane	
PAC	b-l	Bregma–lambda chord, parietal chord	External parietal chord, or direct distance from bregma to lambda, taken in the midplane and at the external surface	Direct distance from bregma to lambda taken in the midsagittal plane
PAS		Bregma–lambda subtense, parietal subtense	Maximum subtense, at the highest point on the convexity of the parietal bones in the midplane, to the bregma–lambda chord	
PBL	ba-pr	Basion–prosthion length		Direct distance from basion to prosthion
SSS		Zygomaxillary subtense	Projection or subtense from subspinale to the bimaxillary width (ZMB)	
TMF		Breadth of mandibular body		Maximum breadth measured in the region of the mental foramen perpendicular to the long axis of

				the mandibular body
UFBR	fmt-fmt	Upper facial breadth		Direct distance between the two external points on the frontomalar suture
UFHT	n-pr	Upper facial height	Refer to NOL	Direct distance from nasion to prosthion
WFB	ft-ft	Minimum frontal breadth		Direct distance between the two frontotemporal
WMH		Cheek height	Minimum distance, in any direction, from the lower border of the orbit to the lower margin of the maxilla, mesial to the masseter attachment, on the left side	
WRB		Minimum ramus breadth		Least breadth of the mandibular ramus measured perpendicular to the height of the ramus
XCB	eu-eu	Maximum cranial breadth	Maximum cranial breadth perpendicular to the median sagittal plane (above the supramastoid crests)	Maximum width of skull perpendicular to midsagittal plane wherever it is located, with the exception of the inferior temporal lines and the area immediately surrounding them
XFB		Maximum frontal breadth	Maximum breadth at the coronal suture, perpendicular to the medial plane	
XRB		Maximum ramus breadth		Distance between the most anterior point on the mandibular

				ramus and a line connecting the most posterior point on the condyle and the angle of the jaw
XRH		Maximum ramus height		Direct distance from the highest point on the mandibular condyle to gonion
ZMB	zm:a- zm:a	Zygomaxillary breadth, bimaxillary breadth	Distance from left to right zygomaxillare. Breadth across the maxillae, from one zygomaxillare to the other	
ZYB	zy-zy	Bizygomatic diameter		Direct distance between most lateral points on the zygomatic arches

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ASB	as-as	Biasterionic breadth	Direct measurement from one asterion to the other	CRANID
AUB	au-au	Biauricular breadth	Least exterior breadth across the roots of the zygomatic processes, wherever found	CRANID
AUB	au-au	Biauricular breadth	Last exterior breadth across the roots of the zygomatic processes, wherever found. With the skull resting on the occiput and with the base towards the observer, measure to the outside of the roots of the zygomatic processes at their deepest incurvature, generally slightly anterior to the external auditory meatus, with the sharp points of the calliper	FORDISC
BBH	ba-b	Basion–bregma height	Distance from basion to bregma, as defined	CRANID
BBH	ba-b	Basion–bregma height	Direct distance from the lowest point on the anterior margin of the foramen magnum to bregma	FORDISC
BNL	eu-eu	Basion–nasion length	Direct length between basion and nasion	CRANID
BNL	ba-n	Cranial base length	Direct distance from nasion to basion	FORDISC
BPL	ba-pr	Basion-prosthion length	Facial length from basion to prosthion, as defined	CRANID
CDB	cdl-cdl	Bicondylar breadth	Direct distance between the most lateral points on the two condyles	FORDISC
DKB	d-d	Interorbital breadth	Breadth across the nasal space from dacryon to dacryon	CRANID

DKB	d-d	Interorbital breadth	Direct distance between right and left dacryon	FORDISC
EKB	ec-ec	Biorbital breadth	Breadth across the orbits from ectoconchion to ectoconchion	CRANID
EKB	ec-ec	Biorbital breadth	Direct distance between right and left ectoconchion	FORDISC
FMB	fm:a- fm:a	Bifrontal breadth	Breadth across the frontal bone between frontomalar anterior on each side (i.e., the most anterior point on the frontomalar suture). Buikstra and Ubelaker (1994) measured between the most laterally positioned points on the frontomalar suture; this distance is perhaps 6 mm longer than Howells' FMB	CRANID
FOB		Foramen magnum breadth	Direct distance between the lateral margins of foramen magnum at the points of greatest lateral curvature	FORDISC
FOL	ba-o	Foramen magnum length	Direct distance from basion to opisthion. Calliper tips should rest precisely on opposing edges of the foramen magnum border	FORDISC
FRC	n-b	Frontal chord	Direct distance from nasion to bregma taken in the midsagittal plane	FORDISC
FRC	n-b	Nasion–bregma chord, frontal chord	Frontal chord, or direct distance from nasion to bregma, is taken in the midplane and at the external surface	CRANID
FRS		Nasion–bregma subtense, frontal subtense	Maximum subtense, at the highest point on the convexity of the frontal bone in the midplane, to the basion–bregma chord	CRANID

GNI	id-gn	Chin height	Direct distance from infradentale to gnathion.	FORDISC
GOG	go-go	Bigonial width	Direct distance between right and left gonion. Place the blunt points of the calliper to the most prominent external points at the mandibular angles.	FORDISC
GOL	g-op	Glabello-occipital length	Greatest length, from the glabellar region, in the median sagittal plane	CRANID
GOL	g-op	Maximum cranial length	Distance between glabella and opisthocranion in the midsagittal plane, measured in a straight line. Place the skull on its side, holding one end of the calliper at the glabella and extending the calliper until the maximum diameter at posterior aspect of the skull is obtained	FORDISC
HMF		Height of mandibular body	Direct distance from the alveolar process to the inferior border of the mandible perpendicular to the base at the level of the mental foramen	FORDISC
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MAB	ecm-ecm	Maxillo-alveolar breadth	Maximum breadth across the alveolar borders of the maxilla measured on the lateral surfaces at the location of the second maxillary molars	FORDISC
MAB	ecm-ecm	Palate breadth, external	Greatest breadth across the alveolar borders, wherever found, perpendicular to the median	CRANID

			plane	
MAL	pr-alv	Maxillo-alveolar length	<p>Direct distance from prosthion to alveon.</p> <p>Position skull with basilar portion facing up; apply a thin wooden rod to the posterior borders of the alveolar arch and measure the distance from prosthion to the middle of the rod (on the midsagittal plane)</p>	FORDISC
MAN		Mandibular angle	<p>Angle formed by the inferior border of the corpus and the posterior border of the ramus</p>	FORDISC
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MLN		Mandibular length	<p>Distance of the anterior margin of the chin from a centre point on the projected straight line placed along the posterior border of the two mandibular angles. Apply movable board of the mandibulometer to the posterior borders of the mandibular rami and the fixed board against the most anterior point of the chin; stabilise the mandible by applying gentle pressure to the left second molar</p>	FORDISC
NAS		Nasiofrontal subtense	Subtense from nasion to the bifrontal breadth	CRANID

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