



Reproductive Toxicology 15 (2001) 713–721  
Workshop report

**Reproductive  
Toxicology**

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Harmonisation of rat fetal skeletal terminology and classification.  
Report of the third workshop on the terminology in developmental  
toxicology  
Berlin, 14–16 September 2000

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## Analysis of 3<sup>rd</sup> workshop survey results

- Index of Agreement (IA):

$$IA = [ (M-V) \div (M + V + U) ] \times 100$$

M : Malformation

V : Variation

U : Can't decide

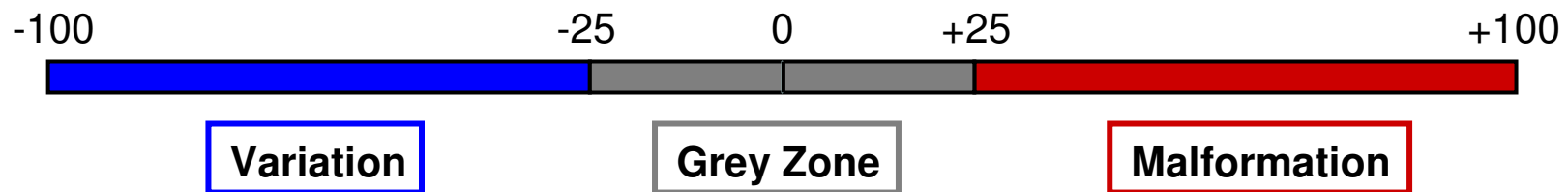


Table 1  
Survey Format

No.	Region	Code	Anomaly	Alternative term	M [%]	V [%]	U	N
1.	Skull, General	10402	Acrania		100.00	0.00		
2.		10403	Craniofenestria		100.00	0.00		
3.		10404	Craniostenosis		100.00	0.00		
4.		10405	Enlarged fontanel		9.09	90.91		
5.		10406	Extra ossification site		0.00	100.00		
6.	Alisphenoid	10407	Absent alisphenoid	Additional, Bone island, Fontanellar bone, Suture bone Agensis, Aplastic	100.00	0.00		

M = number of responses classifying the abnormality as a malformation

V = number of responses classifying the abnormality as a variation

U = number of responses of "can't decide between malformation and variation"

Table 4  
Indices of agreement for sternebrae and vertebrae

Bone	Absent	Fused	Malpositioned	Mis-aligned	Mis-shapened	Incomplete ossification	Unossified	Small	Hemi-vertebra	Supernumerary	Hemi-centric	Split cartilage	Unilateral cartilage	Bipartite ossification	Dumb-bell
Sternebra	84.6	15.4	76.9	-50.0	-15.4	-84.6	-84.6							-66.7	
Vertebra	100									23.1					
Cervical arch	100	92.3	100	-8.3	61.5	-84.6	-53.8	58.3		61.5					
Cervical Ct.	100	92.3		8.3	7.7	-84.6	-46.2			69.2	27.3	23.1	41.7	-53.8	-58.3
Cerv. Ct. Cart.		75.0													-58.3
Cervical Vert.	100		83.3						83.3	46.2					
Thoracic arch	100	84.6	75.0	7.7	15.4	-84.6	-46.2	38.5		61.5					
Thoracic Ct.	100	84.6		8.3	15.4	-84.6	-53.8			61.5	16.7	23.1	33.3	-53.8	-58.3
Thor. Ct. Cart.		69.2													-63.6
Thoracic Vert.	100		66.7						83.3	23.1					
Lumbar arch	100	84.6	83.3	0.0	15.4	-84.6	-46.2	30.8		61.5					
Lumbar Ct.	100	84.6		0.0	0.0	-84.6	-46.2			61.5	36.4	23.1	23.1	-53.8	-58.3
Lumb. Ct. Cart.		83.3													-58.3
Lumbar Vert.	100		83.3						83.3	23.1					
Sacral arch	100	100.0	83.3	-8.3	15.4	-84.6	-46.2	41.7		61.5					
Sacral Ct.	100	84.6		0.0	0.0	-84.6	-46.2			61.5	16.7	33.3	23.1	-53.8	-58.3
Sac. Ct. Cart.		69.2													-58.3
Sacral Vert.	100		83.3						66.7	23.1					
Caudal arch	58.3	41.7	50.0	10.0	18.2	-83.3	-45.5	36.4			0.0			-54.5	
Caudal Ct.	83.3	36.4		0.0	0.0	-81.8	-45.5								-54.5
Caudal Vert.	33.3		36.4						33.3	-36.4					

Ct, centrum; Cerv, cervical; Vert, vertebra; Thor, thoracic; Cart, cartilage; Sac, Sacral.

Table 6  
Indices of agreement for cranial bones

Bone	Absent	Fused	Small	Misshapened	Split	Unossified	Hole	Incomplete ossification	Bipartite	Bent
Alisphenoid	100	83.3	66.7	83.3		-11.1	-10.0	-55.6		
Auditory oss.	100	100		100		-33.3				
Basioccipital	100	84.6	53.8	69.2		-30.8	-27.3	-84.6		
Basisphenoid	100	100	66.7	83.3		-25.0	-10.0	-83.3		
Exoccipital	100	100	53.8	69.2		-30.8	-25.0	-84.6		
Frontal	100	50.0	53.8	83.3		-16.7	-18.2	-83.3		
Hyoid	100		33.3	23.1		-63.6		-100		-23.1
Interparietal	100	69.2	53.8	76.9		-41.7	-18.2	-84.6	-76.9	
Lacrimal	100	92.3	40.0	70.0		-40.0		-80.0		
Mandible	100	92.3	76.9	84.6				-84.6		
Maxilla	100	100	76.9	84.6		-7.7		-84.6		
Nasal	100	80.0	69.2	84.6		-7.7	-20.0	-76.9		
Palatine	100	100	61.5	84.6	100	-46.2		-69.2		
Parietal	100	100	53.8	84.6		-15.4	-33.3	-84.6		
Premaxilla	100	100	75.0	83.3		-16.7	-20.0	-83.3		
Presphenoid	100	100	55.6	83.3		-50.0	-71.4	-77.8		
Squamosal	100	100	66.7	69.2		-38.5	-83.3	-84.6		
Supraoccipital	100	100	66.7	83.3		-25.0	-30.0	-83.3	-75.0	
Tympanic ann	100	100	41.7	83.3		-50.0		-83.3		
Vomer	100	100	41.7	75.0		-33.3		-77.8		
Zygomatic	100	100	38.5	84.6		-46.2		-84.6		

Table 5  
Rib findings

Finding	Index of agreement
Rib, absent	92.3
Rib, bent	-15.4
Rib, branched	61.5
Rib cartilage, branched	-15.4
Ribs cartilage, fused	-7.7
Rib, cervical	-61.5
Rib, detached	80.0
Rib, discontinuous	-41.7
Rib, fused	84.6
Rib, incomplete ossification	-69.2
Rib, intercostal	72.7
Rib, knobby	-66.7
Rib, malpositioned	100
Rib, misaligned	-9.1
Rib, misshapened	61.5
Ribs, short	38.5
Ribs, thickened	-83.3
Ribs, unossified	-30.8
Ribs, wavy	-76.9
Ribs, supernumerary, full	-84.6
Ribs, supernumerary, short	-100

Table 2  
Indices of agreement for forelimbs

Bone	Absent	Fused	Malpositioned	Short	Bent	Misshapened	Small	Supernumerary	Incomplete ossification	Unossified	Thickened
Clavicle	100				38.5	76.9	53.8		-84.6	-30.8	-61.5
Scapula	100				46.2	69.2			-84.6	-7.7	-61.5
Humerus	100	100	84.6	100	75.0	84.6			-69.2	-7.7	-50.0
Radius	100	100	84.6	100	75.0	84.6			-69.2	-15.4	-50.0
Ulna	100	100	84.6	100	75.0	84.6			-69.2	-15.4	-50.0
Carpal bone	100	100	83.3			66.7	30.8	38.5	-80.0	-40.0	
Metacarpal	100	100	75.0			66.7	41.7	69.2	-84.6	-53.8	
Phalanx	84.6	84.6	75.0			83.3	66.7	84.6	-84.6	-69.2	-50.0

Table 3  
Indices of agreement for hindlimbs

Bone	Absent	Fused	Malpositioned	Short	Bent	Misshapened	Small	Misaligned	Supernumerary	Incomplete ossification	Unossified	Thickened
Ilium	100	83.3	100		75.0	83.3	91.7			-83.3	-41.7	-50.0
Ischium	100	83.3	100		75.0	83.3	91.7			-83.3	-41.7	-50.0
Pubis	100		100		91.7	83.3	91.7	66.7		-83.3	-41.7	-50.0
Femur	100	100	83.3	100	75.0	83.3				-58.3	-18.2	-50.0
Fibula	100	100	83.3	100	75.0	83.3				-66.7	-16.7	-50.0
Tibia	100	83.3	83.3	100	75.0	81.8				-66.7	-16.7	-50.0
Calcaneus	100	100	83.3			83.3	75.0			-80.0	-30.0	
Talus	100	100	83.3			83.3	75.0			-80.0	-30.0	-40.0
Tarsal bone	100	100	81.8			83.3	75.0		50.0	-80.0	-40.0	-40.0
Metatarsal	100	100	81.8			83.3	75.0		66.7	-83.3	-50.0	
Phalanx	83.3	83.3	63.6			83.3	66.7		83.3	-83.3	-66.7	-50.0