

Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.	
Sternebra Cont.	Xiphoid cartilage	S					New	
		S					New	
		S					New	
		S	Long, Short, Wide				New	
		S					New	
		S					New	
		S					New	
		S					New	
		S					New	
		S					New	
Sternum	Sternum (omosternum may be described separately)	S	Malpositioned		Sternebrae located one or more positions higher or lower, relative to ribs/vertebrae		New	
		S					New	
		S					New	
		S					New	
		S					New	
		S					New	
		S					New	
		S					New	
		S					New	
		S					New	
Rib	Rib (tubercle may be described separately; see Appendix E)	S	'N' only, Reduced number			Usually refers to advanced ossification between sternbral centers	10619	
		S				Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of ribs present should be specified	10621	
		S						10622
		S						10623
		S						10626
		S						10629
		S						10632
		S						10627
		S						New
		S						New
		S					10634	
		S					10635	
		S					10636	
		S					10633	
		S					New	
		S					10637	
		S					New	
		S						New
		S						New
		S						New
	Supernumerary site	S	Increased number, 'N'				New	
		S					10639	
		S					New	

S: structural term – relates to abnormality of structure affecting either the visible area of ossification and/or the bone precursor (cartilage or membrane).

O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/ structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Rib Cont.	Wavy	S	Kinked		Undulation(s) along the length of a rib	May be transient in rats; for additional information, see Kast (1994) [9]	10641
	Incomplete ossification	O	<i>Discontinuous ossification, Interrupted ossification</i> Long ossified portion				10631
	Increased ossification	O					New
	Isolated ossification site	O					New
	Unossified	O					10640
	Absent	S					New
	Branched	S			A rib cartilage that partially (distally or proximally) divides into two or more cartilages		10624
	Intercostal	S	Supernumerary non-articulated	Floating	An additional, cartilaginous rib-like structure between two ribs, not articulated with vertebral column		New
	Interrupted	S	Discontinuous			Applies to cervical ribs and 'false' ribs only; see Appendix D	New
	Fused	S				Applies to 'true' ribs only; see Appendix D	10630
Fused to sternum	S					New	
Not fused to sternum	S					New	
Long	S					New	
Misaligned	S					New	
Misshapen	S					New	
Partially duplicated	S		<i>Knobby, Nodulated, Wide</i>			New	
Short	S					New	
Thick	S					New	
Thin	S					New	
Supernumerary rib	Cervical	S	Cervical rib (CR), Cervical rib full, Cervical rib long, Long		An extra rib at the cervicothoracic border with length greater than one third of the length of the ossified portion of the first thoracic rib and/or costal cartilage distal	Usually associated with last cervical vertebra. If location is elsewhere or more than one supernumerary rib is present, details should be specified. Presence of costal cartilage may be described separately	New
	Short	S	Cervical ossification site (COS), Cervical rib rudimentary, Cervical rib short, Rudimentary		An extra rib at the cervicothoracic border with the distal extremity rounded, length less than one third of the length of the ossified portion of the first thoracic rib and no costal cartilage distal	Usually associated with last cervical vertebra. If location is elsewhere or more than one supernumerary rib is present, details should be specified	10625
	Cartilaginous	S				Length (e.g., 'full' or 'short') may be specified	New
	Full	S	Extra thoracic rib, Extra thoracolumbar rib full, Extra thoracolumbar rib long, Long, Lumbar rib (LR), Lumbar rib full, Lumbar rib long		An extra rib at the thoracolumbar border with length greater than one third of the ossified portion of the preceding rib and/or with costal cartilage distal	Can be associated with first lumbar vertebra. If location is not at thoracolumbar border or more than one supernumerary rib is present, details should be specified. Presence of costal cartilage may be described separately	10628

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Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.	
Superumerary rib Cont.	Short	S	Extra thoracolumbar rib rudimentary, Extra thoracolumbar rib short, Lumbar ossification site (LOS), Lumbar rib rudimentary, Lumbar rib short, Rudimentary		An extra rib at the thoracolumbar border with the distal extremity rounded, length less than one third of the length of the ossified portion of the preceding rib and no costal cartilage distal	Usually associated with first lumbar vertebra. If location is elsewhere or more than one superumerary rib is present, details should be specified	10638	
		S	Cartilaginous Branched			Length (e.g., 'full' or 'short') may be specified	New 10624	
		S	Fused					10630
		S	Fused to sternum					New
		S	Interrupted		Discontinuous			New
		S	Long					New
		S	Present					New
		S	Absent		'N' only, 'N' prepelvic, 'N' presacral, <i>Reduced number</i>		Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Should take into account the prepelvic vertebra count ('N') for the species (see Appendix D)	10642
		S	Supernumerary		Increased number, 'N', 'N' prepelvic, 'N' presacral		Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Should take into account the prepelvic vertebra count ('N') for the species (see Appendix D)	10643
		S	Supernumerary site			An additional cartilaginous or ossified site located along the vertebral column that cannot be clearly identified as an arch or centrum		New
Vertebra	Vertebral canal	O	Isolated ossification site				New	
		S	Absent			Most likely to be used when describing the entire vertebral column	New	
		S	Interrupted					New
		S	Large					New
		S	Double		Duplicated			New
		S	Small		Narrow			New
		S	Absent					New
		S	Fused		Cartilaginous fusion			New
		S	Hemicentric					New
		S	Large					New
Atlas, ventral arch (atlas = cervical vertebra 1), (ventral tubercle may be described separately; see Appendix E)	Atlas, ventral arch (atlas = cervical vertebra 1), (ventral tubercle may be described separately; see Appendix E)	S	Malpositioned				New	
		S	Misaligned				New	
		S	Missshapen		Long, Short			New
		S	Small					New
		S	Split					New
		S	Supernumerary					New
		S	Supernumerary site					New
		O	Bipartite ossification					New
		O	Incomplete ossification		Fragmented ossification			New
		O	Increased ossification					New
O	Isolated ossification site					New		
O	Unilateral ossification					New		
O	Unossified					New		

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 O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Vertebra Cont.	Absent	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system	10644
	Cervical arch (anterior tubercle [ventral plate, lamina ventralis], usually located on vertebra 6, and transverse foramen [vertebral canal] may be described separately; see Appendix E)						
	Bent	S					New
	Branched	S					New
	Fused	S	Cartilaginous fusion			Refers to cartilaginous dorsal fusion of arches, around vertebral canal	10645
	Incompletely fused dorsal	S					New
	Large	S					New
	Malpositioned	S					10647
	Malaligned	S					10648
	Misshapen	S	Long, Short			Refers to cartilaginous dorsal fusion of arches, around vertebral canal. See also: Cervical arch – Splayed	10649
	Not fused dorsal	S					New
	Small	S					10650
	Splayed	S			Paired structures diverge from one another		New
	Split	S					New
	Supernumerary	S	Interrupted Increased number, 'N'			Related terms recommended only when complexity of abnormality precludes use of normal numbering system	10651
	Supernumerary site	S					New
	Thick	S	Wide				New
	Thin	S	Narrow				New
	Incomplete ossification	O	Discontinuous ossification, Interrupted ossification				10646
	Increased ossification	O				Specific vertebral processes may be specified	New
	Isolated ossification site	O					New
	Unossified	O					10652
	Absent	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of vertebrae present should be specified	10653
	Cervical centrum (odontoid process [dens] of cervical vertebra 2 may be defined separately; see Appendix E)						

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O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Vertebra Cont.	Dumbbell-shaped	S					10656
	Fused	S	Cartilaginous fusion				10657
	Hemicentric	S					10659
	Large	S					New
	Malpositioned	S					New
	Misaligned	S					10661
	Misshapen	S					10662
	Small	S		Asymmetric			New
	Split	S					10663
	Supernumerary	S		Increased number, 'N'		Related terms recommended only when complexity of abnormality precludes use of normal numbering system	10664
	Supernumerary site	S					New
	Asymmetric ossification	O			Alizarin red stain uptake greater in one hemicenter than the other		New
	Bipartite ossification	O					10654
	Dumbbell ossification	O					10655
	Incomplete ossification	O					10660
	Increased ossification	O					New
	Isolated ossification site	O					New
	Misshapen ossification site	O					New
	Unilateral ossification	O					New
	Unossified	O					10666
Absent	S		'N' only, Reduced number		Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of vertebrae present should be specified	10667	
Cervical vertebra (Atlas and Axis may be defined separately)					Absent arch and hemicentrum may be recorded separately	10668	
Hemivertebra	S					10669	
Malpositioned	S					New	
Misaligned	S					New	
Small	S					New	
Supernumerary hemivertebra	S					10670	
Supernumerary	S		Increased number, 'N'		Related terms recommended only when complexity of abnormality precludes use of normal numbering system	10670	

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O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Vertebra Cont.	Thoracic arch (processes [e.g., neural spine, articular processes] may be described separately; see Appendix E)	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system	10671
	Absent	S					
	Bent	S					New
	Branched	S					New
	Fused	S	Cartilaginous fusion			Refers to cartilaginous dorsal fusion of arches, around vertebral canal	10672
	Incompletely fused dorsal	S					New
	Large	S					New
	Malpositioned	S					10674
	Misaligned	S					10675
	Misshapen	S	Long, Short			Refers to cartilaginous dorsal fusion of arches, around vertebral canal. See also: Thoracic arch – Splayed	10676
	Not fused dorsal	S					New
	Small	S					10677
	Splayed	S			Paired structures diverge from one another		New
	Split	S	Interrupted				New
	Supernumerary	S	Increased number, 'N'			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. See Appendix D for species differences	10678
	Supernumerary site	S					New
	Thick	S	Wide				New
	Thin	S	Narrow				New
	Incomplete ossification	O	Discontinuous ossification, Interrupted ossification				10673
	Increased ossification	O				Specific vertebral processes may be specified	New
	Isolated ossification site	O					New
	Unossified	O					10679
	Absent	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of centra present should be specified	10680
Thoracic centrum							
	Dumbbell-shaped	S					10683
	Fused	S	Cartilaginous fusion				10684
	Hemicentric	S					10686
	Large	S					New
	Malpositioned	S					New
	Misaligned	S					10688
	Misshapen	S	Asymmetric				10689
	Small	S					New
	Split	S	Increased number, 'N'			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. See Appendix D for species differences	10690
	Supernumerary	S					10691

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Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.	
Vertebra Cont.	Supernumerary site Asymmetric ossification	S			Alizarin red stain uptake greater in one hemicenter than the other		New	
		O				New		
	Thoracic vertebra	Bipartite ossification	O					10681
		Dumbbell ossification	O					10682
		Incomplete ossification	O					10687
		Increased ossification	O					New
		Isolated ossification site	O					New
		Misshapen ossification site	O					New
		Unilateral ossification	O					New
	Unossified	O					10693	
	Absent	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of vertebrae present should be specified	10694	
	Lumbar arch (processes [e.g., neural spine, transverse processes, articular processes] may be described separately; see Appendix E)	Hemivertebra	S				Absent arch and hemicentrum may be recorded separately	10696
		Malpositioned	S					10695
		Misaligned	S					New
		Small	S	Increased number, 'N'				New
Supernumerary		S				Related terms recommended only when complexity of abnormality precludes use of normal numbering system. See Appendix D for species differences	10697	
Supernumerary hemivertebra		S					New	
Absent		S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of arches present should be specified	10698	
Bent		S					New	
Branched		S					New	
Fused		S	Cartilaginous fusion			Refers to cartilaginous dorsal fusion of arches, around vertebral canal	10699	
Incompletely fused dorsal		S					New	
Large		S					New	
Malpositioned	S					10701		
Misaligned	S					10702		
Misshapen	S	Long, Short			Refers to cartilaginous dorsal fusion of arches, around vertebral canal. See also: Lumbar arch – Splayed	10703		
Not fused dorsal	S					New		
Small Splayed	Small	S				See also: Lumbar arch – Not fused dorsal	10704	
	Splayed	S			Paired structures diverge from one another		New	
	Split	S	Interrupted				New	
Supernumerary	S	Increased number, 'N'			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. See Appendix D for species differences	10705		

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O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/ structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Vertebra Cont.	Supernumerary site	S					New
	Thick	S	Wide				New
	Thin	S	Narrow				New
	Incomplete ossification	O	Discontinuous ossification, Interrupted ossification				10700
	Increased ossification	O				Specific vertebral processes may be specified	New
	Isolated ossification site	O					New
	Unossified	O					10706
	Absent	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of centra present should be specified	10707
	Dumbbell-shaped	S					10710
	Fused	S	Cartilaginous fusion				10711
	Hemicentric	S					10713
	Large	S					New
	Malpositioned	S					New
	Misaligned	S	Asymmetric				10715
	Misshapen	S					10716
Small	S					New	
Split	S	Increased number, 'N'				10717	
Supernumerary	S					10718	
Supernumerary site	S					New	
Asymmetric ossification	O			Alizarin red stain uptake greater in one hemicenter than the other		New	
Bipartite ossification	O					10708	
Dumbbell ossification	O					10709	
Incomplete ossification	O					10714	
Increased ossification	O					New	
Isolated ossification site	O					New	
Misshapen ossification site	O					New	
Unilateral ossification	O					New	
Unossified	O					10720	
Absent	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of vertebrae present should be specified	10721	
Lumbar vertebra					Absent arch and hemicentrum may be recorded separately	10722	
Hemivertebra	S					10723	
Malpositioned	S					New	
Misaligned	S					New	
Small	S					New	

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O: ossification term – relates to extent of ossification of the structure.



Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Vertebra Cont.							
	Supernumerary	S	Increased number, 'N'			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. See Appendix D for species differences	10724
	Supernumerary hemivertebra	S					New
	Absent	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of arches present should be specified	10725
	Sacral arch (processes [e.g., neural spine, transverse processes, articular processes] may be described separately; see Appendix E)						
	Bent	S					New
	Branched	S					New
	Fused	S	Cartilaginous fusion			Refers to cartilaginous dorsal fusion of arches, around vertebral canal	10726
	Incompletely fused	S					New
	dorsal	S					10728
	Large	S					10729
	Malpositioned	S					10730
	Misaligned	S	Long, Short			Refers to lateral fusion of adjacent arches to form sacrum. In rat, mouse, and rabbit fetuses, fusions are normally cartilaginous	New
	Misshapen	S				Refers to cartilaginous dorsal fusion of arches, around vertebral canal. See also: Sacral arch – Splayed	New
	Not fused	S					10731
	Not fused dorsal	S				See also: Sacral arch – Not fused dorsal	New
	Small	S					10732
	Splayed	S			Paired structures diverge from one another		New
	Split	S	Interrupted				New
	Supernumerary	S	Increased number, 'N'			Related terms recommended only when complexity of abnormality precludes use of normal numbering system	10732
	Supernumerary site	S					New
	Thick	S	Wide				New
	Thin	S	Narrow				New
	Incomplete ossification	O	Discontinuous ossification, Interrupted ossification				10727
	Increased ossification	O					New
	Isolated ossification site	O				Specific vertebral processes may be specified	New
	Unossified	O					10733

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Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Vertebra Cont.	Sacral centrum	Absent					10734
		S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where possible, total number of centra present should be specified	10737 10738 10740 New New 10742 10743 New 10744 10745
	Dumbbell-shaped	S					
	Fused	S	Cartilaginous fusion				
	Hemicentric	S					
	Large	S					
	Malpositioned	S					
	Misaligned	S	Asymmetric				
	Misshapen	S					
	Small	S					
	Split	S					
	Supernumerary	S	Increased number, 'N'			Related terms recommended only when complexity of abnormality precludes use of normal numbering system	New New
	Supernumerary site	S					
	Asymmetric ossification	O			Alizarin red stain uptake greater in one hemicenter than the other		10735 10736 10741 New New New New New 10747 10748
	Bipartite ossification	O					
	Dumbbell ossification	O					
	Incomplete ossification	O					
	Increased ossification	O					
	Isolated ossification site	O					
	Misshapen ossification site	O					
	Unilateral ossification	O					
	Unossified	O					
	Absent	S	'N' only, Reduced number			Related terms recommended only when complexity of abnormality precludes use of normal numbering system. Where present should be specified	10750 10749 New New 10751
	Hemivertebra	S				Absent arch and hemicentrum may be recorded separately	New
	Malpositioned	S					
	Misaligned	S					
	Small	S					
	Supernumerary	S	Increased number, 'N'			Related terms recommended only when complexity of abnormality precludes use of normal numbering system	10752
	Supernumerary hemivertebra	S					
	Absent	S	Fewer than 'N', Reduced number				
	Caudal arch (processes [e.g., neural spine] may be described separately; see Appendix E)	S					
	Bent	S					
	Branched	S					
	Fused	S	Cartilaginous fusion				New New 10753

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O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/ structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Vertebra Cont.	Incompletely fused dorsal	S				Refers to cartilaginous dorsal fusion of arches, around vertebral canal	New
	Large	S					New 10755
	Malpositioned	S					10756
	Misaligned	S	Long, Short				10757 New
	Misshapen	S				Refers to cartilaginous dorsal fusion of arches, around vertebral canal. See also: Caudal arch – Splayed	10758 New
	Not fused dorsal	S					
	Small	S				Paired structures diverge from one another	
	Splayed	S					
	Split	S	Interrupted				
	Supernumerary	S	Increased number, More than 'N'				
	Supernumerary site	S					
	Thick	S	Wide				
	Thin	S	Narrow				
	Incomplete ossification	O	Discontinuous ossification, Interrupted ossification				
	Increased ossification	O					
	Isolated ossification site	O					
	Unossified	O					
Caudal centrum	Absent	S	Fewer than 'N', Reduced number				New New 10759 10760
	Fused	S					10763
	Hemicentric	S	Cartilaginous fusion				10764 New
	Large	S					New
	Malpositioned	S					10766
	Misaligned	S					10767 New
	Misshapen	S	Asymmetric				New
	Small	S					New
	Split	S					New
	Supernumerary	S	Increased number, More than 'N'				New
	Supernumerary site	S				Alizarin red stain uptake greater in one hemiscenter than the other	New New
	Asymmetric ossification	O					
	Bipartite ossification	O					10761
	Dumbbell ossification	O					10762
	Incomplete ossification	O					10765 New
	Increased ossification	O					New
	Isolated ossification site	O					New
Misshapen ossification site	O					New	
Unilateral ossification	O					New	
Unossified	O					10768	

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O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/ structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Vertebra Cont.	Caudal vertebra	Absent					10769
		Hemivertebra	S	Fewer than 'N', Reduced number		Absent arch and hemicentrum may be recorded separately	10770
		Malpositioned	S				New
		Misaligned	S				New
		Small	S				New
		Supernumerary	S	Increased number, More than 'N'			10772
		Supernumerary hemivertebra	S				New
		Malpositioned caudal bilateral	S	Caudal shift bilateral, displaced articulation bilateral [caudal], Misaligned caudal bilateral, Supernumerary presacral vertebra(e)/vertebral arches, Supernumerary presacral vertebra(e)/vertebral arches		Number of prepelvic vertebrae can be specified, includes complete girdle (ilium, ischium and pubis)	New
		Malpositioned cranial bilateral	S	Cranial shift bilateral, Displaced articulation bilateral [cranial], Misaligned cranial bilateral, Reduced number of prepelvic vertebra(e)/vertebral arches, Reduced number of presacral vertebra(e)/vertebral arches		Number of prepelvic vertebrae can be specified, includes complete girdle (ilium, ischium and pubis)	New
		Malpositioned caudal unilateral	S	Caudal shift unilateral, Displaced articulation unilateral [caudal], Misaligned caudal unilateral, Supernumerary prepelvic vertebral arches, Supernumerary presacral vertebral arches		Number and laterality of prepelvic vertebrae can be specified, includes complete girdle (ilium, ischium and pubis)	New
Pelvic girdle	Pelvic girdle	Malpositioned cranial unilateral	S	Cranial shift unilateral, Displaced articulation unilateral [cranial], Misaligned cranial unilateral, Reduced number of prepelvic vertebral arches, Reduced number of presacral vertebral arches		Number and laterality of prepelvic vertebrae can be specified, includes complete girdle (ilium, ischium and pubis)	10773
		Absent	S				10774
		Bent	S				10775
		Fused	S	Cartilaginous fusion			New
		Large	S				10777
		Malpositioned	S				New
		Misaligned	S				10778
		Misshapen	S	Long, Short		See pelvic girdle observations above	10779
		Small	S				New
		Supernumerary	S				New
Ilium	Ilium (ischial arch may be described separately)	Supernumerary site	S				10780
		Thick	S				New
		Thin	S				10776
		Incomplete ossification	O				New
		Increased ossification	O				New
		Isolated ossification site	O				New
		Unossified	O				10781
		Absent	S				10782
		Bent	S				10783
		Fused	S	Cartilaginous fusion			10784
Ischium	Ischium (ischial arch may be described separately)	Large	S				New
		Malpositioned	S				10786
		Misaligned	S				New
		Misshapen	S	Long, Short		See pelvic girdle observations above	10787
		Small	S				10788
		Supernumerary	S				New
		Supernumerary site	S				New
		Thick	S				10789
		Thin	S				New

S: structural term – relates to abnormality of structure affecting either the visible area of ossification and/or the bone precursor (cartilage or membrane).

O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/ structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.	
Pelvic girdle Cont.		O			Incomplete ossification		10785	
		O			Increased ossification		New	
		O			Isolated ossification site		New	
		O			Unossified		10790	
		S			Absent		10791	
	Pubis (pubic symphysis may be described separately)		S			Bent		10792
			S		Cartilaginous fusion	Fused		New
			S			Large		New
			S			Malpositioned		10794
			S			Misaligned		10795
			S		Long, Short	Misshapen	See pelvic girdle observations above See pelvic girdle observations above	10796
			S			Small		10797
			S			Supernumerary		New
			S			Supernumerary site		10798
			S			Thick		New
Hindlimb		O			Thin		10793	
		O			Incomplete ossification		New	
		O			Increased ossification		New	
		O			Isolated ossification site		10799	
		O			Unossified		10799	
		S			Absent		10800	
	Femur (proximal and distal epiphyses may be described separately)		S			Bent		10801
			S		Cartilaginous fusion	Fused		10802
			S			Long		New
			S			Malpositioned		10804
		S			Misshapen		10805	
		S			Short		10806	
		S			Supernumerary		New	
		S			Supernumerary site		New	
		S			Thick		10807	
		S			Thin		New	
		O		Epiphyseal ossification site		May be generalized or localized May be generalized or localized	10807	
		O				Ossification site(s) in the cartilaginous distal region of the bone	New	
		O					10803	
		O					New	
		O				See also: Femur – Proximal ossification site and distal ossification site	New	
Patella		O		Epiphyseal ossification site			New	
		O			Ossification site(s) in the cartilaginous proximal region of the bone		10808	
		S			Unossified		New	
		S			Absent		New	
		S			Large		New	
		S			Malpositioned		New	
		S			Misshapen		New	
	S			Small		New		
	S			Supernumerary		New		

S: structural term – relates to abnormality of structure affecting either the visible area of ossification and/or the bone precursor (cartilage or membrane).

O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.		
Hindlimb Cont.	Fibula (proximal and distal epiphyses may be described separately)	S					10809		
			Absent						
		S	Bent					10810	
		S	Fused	Cartilaginous fusion				10811	
		S	Long					New	
		S	Malpositioned					10813	
		S	Missshapen					10814	
		S	Not fused to tibia				Normal in rat and mouse	New	
		S	Short					10815	
		S	Supernumerary					New	
		S	Supernumerary site					New	
		S	Thick					10816	
		S	Thin				May be generalized or localized	New	
		O	Distal ossification site	Epiphyseal ossification site		Ossification site(s) in the cartilaginous distal region of the bone	May be generalized or localized	New	
		O	Incomplete ossification					10812	
		O	Increased ossification					New	
		O	Isolated ossification site				See also: Fibula -- Proximal ossification site and distal ossification site	New	
		O	Proximal ossification site	Epiphyseal ossification site		Ossification site(s) in the cartilaginous proximal region of the bone		New	
		Tibia (proximal and distal epiphyses may be described separately)	O	Unossified					10817
			S	Absent	Tibial hemimelia				10818
S	Bent						10819		
S	Fused		Cartilaginous fusion				10820		
S	Lack of fusion to fibula					Rabbit only	New		
S	Long						New		
S	Malpositioned						10822		
S	Missshapen						10823		
S	Short						10824		
S	Supernumerary						New		
S	Supernumerary site						New		
S	Thick					May be generalized or localized	10825		
S	Thin					May be generalized or localized	New		
O	Distal ossification site		Epiphyseal ossification site		Ossification site(s) in the cartilaginous distal region of the bone		New		
O	Incomplete ossification					10821			

S: structural term – relates to abnormality of structure affecting either the visible area of ossification and/or the bone precursor (cartilage or membrane).

O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/ structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.	
Hindlimb Cont.		O	Increased ossification				New	
		O	Isolated ossification site				New	
		O	Proximal ossification site	Epiphyseal ossification site		Ossification site(s) in the cartilaginous proximal region of the bone	See also: Tibia – Proximal ossification site and distal ossification site	New
	Calcaneus	O	Unossified					10826
		S	Absent					10827
		S	Bent					New
		S	Fused					10828
		S	Large	Cartilaginous fusion				New
		S	Malpositioned	Long, Thick				10830
		S	Missshapen					10831
		S	Small	Short, Thin				10832
		S	Supernumerary					10833
		S	Supernumerary site					New
		O	Incomplete ossification					10829
		O	Increased ossification					New
		O	Isolated ossification site					New
		O	Unossified					10834
Talus	S	Absent					10835	
	S	Bent					New	
	S	Fused					10836	
	S	Large	Cartilaginous fusion				New	
	S	Malpositioned	Long, Thick				10838	
	S	Missshapen					10839	
	S	Small	Short, Thin				10840	
	S	Supernumerary					New	
	S	Supernumerary site					New	
	O	Isolated ossification site					New	
	O	Unossified					10842	
	S	Absent					10843	
	Tarsal bone (for purpose of this table, excludes calcaneus and talus – see above)	S	Bent					New
		S	Fused					10844
S		Large	Cartilaginous fusion				New	
S		Malpositioned	Long, Thick				10846	
S		Missshapen					10847	
S		Small	Short, Thin				10848	
S		Supernumerary					10849	
O		Incomplete ossification					10845	
O		Increased ossification					New	
O		Unossified					10851	
S		Absent					10852	
S		Bent					New	
S		Fused					10853	
S		Large	Cartilaginous fusion				New	
Metatarsal	S	Long					New	
	S	Malpositioned					10855	
	S	Missshapen					10856	
	S	Short					New	
	S	Small					10857	
	S	Supernumerary					10858	
	S	Supernumerary site					New	

S: structural term – relates to abnormality of structure affecting either the visible area of ossification and/or the bone precursor (cartilage or membrane).

O: ossification term – relates to extent of ossification of the structure.

Table 3 (Continued)

Region/organ/structure	Observation	S or O	Synonym or related term	Non-preferred term	Definition	Note	Version 1 Code No.
Hindlimb Cont.	Thick	S					New
	Thin	S					New
	Incomplete ossification	O					10854
	Increased ossification	O					New
	Isolated ossification site	O					New
	Unossified	O					10859
	Absent	S	Aphalangia				10860
	Bent	S					New
	Fused	S		Cartilaginous fusion			10861
	Large	S					New
	Long	S					New
	Malpositioned	S					10863
	Misshapen	S					10864
	Short	S					New
	Small	S					10865
	Supernumerary	S					10866
Supernumerary site	S					New	
Thick	S					10867	
Thin	S					New	
Incomplete ossification	O					10862	
Increased ossification	O					New	
Isolated ossification site	O					New	
Unossified	O					New	
						10868	

S: structural term – relates to abnormality of structure affecting either the visible area of ossification and/or the bone precursor (cartilage or membrane).

O: ossification term – relates to extent of ossification of the structure.



**Table 4**  
Maternal–fetal abnormalities.

Region/organ/structure	Observation	Synonym or related term	Non-preferred term	Definition	Note	Recommended additional information	Version 1 code no.	
Amniotic fluid	Discolored amniotic fluid Oligohydramnios	Reduced volume amniotic fluid		Less than normal amount of amniotic fluid	Specify color	Severity	New 10006	
	Polyhydramnios	Increased volume amniotic fluid		Excessive amount of amniotic fluid		Severity	10007	
Placenta	Altered consistency Altered texture Discolored placenta Fused placenta	Conjoined placenta			Specify color Specify structures that are fused		New New New New	
	Large placenta Malpositioned placenta Misshapen placenta	Displaced, Ectopic Abnormally shaped, Irregularly shaped				Location Description	New New New	
	Pale placenta Red material around placenta Shared placenta	Placental twins		Two fetuses on one placenta			New New New	
	Single lobe				Abnormal in rabbits		New	
	Small placenta	Reduced	Hypoplastic, Rudimentary			Severity	New	
	Split Supernumerary lobe						New New	
	Umbilical cord	Long umbilical cord Short umbilical cord		Hypoplastic, Rudimentary			Severity Severity	New New

**Appendix A. Common descriptive terminology used more than once in the glossary**

Term	Definition	Synonym or related term	Non-preferred term
Absent	Not present. In the case of bone, a structural change involving the bone precursor. Not to be used to describe an absent ossification site where there is no evidence that the bone precursor is absent. In endochondral bone, cartilage staining can aid assessment	<i>Agenesis</i>	Aplastic (unless mechanism is known), Missing, Unossified
Altered surface texture	Atypical texture observed on intact or cut surface of a structure. Examples of qualifiers are: spongy, fibrous, or granular. May be preparation artifact		
Asymmetric	Lack of symmetry: the two sides of a normally symmetrical structure appear to be unequal in size/shape. In the case of bone, a structural change involving the bone precursor and commonly used for structures arising from two or more primary centers (e.g., sternbrae, vertebral centra). Not to be used to describe an asymmetric ossification site where there is no evidence that the precursor is asymmetrical. Cartilage staining can aid assessment	<i>Misshapen</i>	Asymmetric ossification
Asymmetric ossification	Commonly used for structures arising from two or more primary ossification centers (e.g., sternbrae, vertebral centra). Ossification, as indicated by stain uptake, is greater in one or more of the centers than the other(s). Applies only to ossification sites and does not imply that the structure, as represented by the bone precursor, is asymmetrical	<i>Incomplete ossification, Increased ossification</i>	Asymmetric
Atretic	Absence or closure of a normal body orifice or tubular organ	<i>Atresia, Imperforate, Non-patent, Blind-ending</i>	
Bent	Abnormal curvature	<i>Angulated, Bowed, Curved</i>	Bent
Bipartite ossification	Ossification centers not fused. Commonly used for structures arising from two or more primary ossification centers (e.g., sternbrae, vertebral centra). Applies only to the ossification sites and does not imply that the structure, as represented by the bone precursor, is divided (split)	<i>Bifid ossification, Ossification sites not fused</i>	Cleft, Split

## Appendix A (Continued)

Term	Definition	Synonym or related term	Non-preferred term
Branched	Having one or more collateral divisions of the structure, resembling the branches of a tree	Bifurcated, Forked	
Cyst	Any abnormal sac; usually containing fluid or other material		
Dilated	Widened or expanded orifice or vessel (not due to an increase of the contents)	Bulbous	Swollen
Discolored	Not the normal color; the discoloration may be overall, localized, patterned, or mottled appearance	<i>Hemorrhagic, Mottled, Pale</i>	
Distended	Enlarged or expanded organ (due to an increase of the contents)		Swollen
Diverticulum	A localized sac or pouch formed in the wall of a organ and opening into its lumen		
Dumbbell ossification	Two approximately spherical ossification sites attached at or near the mid-line by an ossified bridge. Commonly used for structures arising from two primary centers (e.g., sternbrae, vertebral centra). Applies only to the ossification sites and does not imply that the structure, as represented by the bone precursor, is dumbbell shaped	Dumbbell-shaped ossification, Ossification sites incompletely fused, Semi-bipartite ossification	Bilobate, Bilobed, Dumbbell shaped
Dumbbell shaped	Two approximately spherical areas attached at or near the mid-line by a bridge. In the case of bone, a structural change involving the bone precursor (cartilage) and commonly used for structures arising from two primary centers (e.g., sternbrae, vertebral centra). Not to be used to describe a dumbbell ossification site where there is no evidence that the precursor is dumbbell shaped. Cartilage staining is generally necessary for accurate assessment	<i>Missshapen</i>	Dumbbell ossification
Fistula	Abnormal passage or communication between two normally unconnected structures, body cavities, or the surface of the body		
Fused	Joined or blended together. Might involve an ossified structure, or a bone precursor only. In endochondral bone, cartilage staining can aid assessment of the latter. Fused structures should be specified	<i>Cartilage bridge, Cartilage fusion, Ossification bridge</i>	
Hemicentric	Absence of either hemicentrum of a centrum. Structural change involving the bone precursor; not to be used to describe a unilateral ossification site where the precursor is present on the non-ossified side. Cartilage staining can aid assessment	Hemicentrum absent	Unilateral ossification
Hemivertebra	Absence of a lateral half (arch + hemicentrum) of a vertebra. Structural change involving the bone precursor; not to be used to describe unilateral ossification of a vertebra where the precursors are present on the non-ossified side. Cartilage staining can aid assessment	Arch and hemicentrum absent	Unossified hemicentrum and arch
Hemorrhagic	Descriptive of any tissue into which abnormal bleeding is observed (may be characterized as petechia, purpura, ecchymosis, or hematoma)	<i>Hemorrhage, Red/brown area, deposit, focus, or material</i>	
Hole	Discrete area of absent ossification and bone precursor. In endochondral bone, cartilage staining can aid assessment		Unossified area
Incomplete ossification	Partial ossification (assessed by reduced alizarin red uptake) at a site that, in controls of the same age, usually has a more advanced degree of ossification. Does not imply any change to the bone precursor	Poorly ossified, Reduced ossification, <i>Diffuse ossification, Fragmented ossification, Irregular ossification, Patchy ossification, Uneven ossification, Unossified area</i>	Delayed ossification, Retarded ossification, Small
Increased ossification	A greater degree of ossification (assessed by increased alizarin red uptake) at a site that, in controls of the same age, usually has less ossification. Does not imply any change to the bone precursor	Ossified, Ossification present (for bones that are not normally ossified at the time of examination)	Large, Precocious ossification
Interrupted	Discontinuity of a longitudinal structure, e.g., blood vessels, ribs, etc. In the case of bone, a structural change involving the bone precursor. Not to be used to describe an incomplete ossification site where there is no evidence that the precursor is interrupted. In endochondral bone, cartilage staining can aid assessment	Discontinuous	Incomplete ossification, Interrupted ossification
Isolated ossification site	Ossification site within the margins of a normal bone precursor but separated from the main ossified (alizarin red stained) area. Does not imply any change to the bone precursor	<i>Incomplete ossification, Increased ossification</i>	Supernumerary site
Large	Larger than normal but normally proportioned. In the case of bone, a structural change involving the bone precursor. Not to be used to describe increased ossification where there is no evidence that the precursor is large		Hyperplastic, Increased ossification
Long	Greater than the normal or expected length. In the case of bone, a structural change involving the bone precursor. Not to be used to describe increased ossification where there is no evidence that the precursor is long		Increased ossification

## Appendix A (Continued)

Term	Definition	Synonym or related term	Non-preferred term
Malpositioned	Not occurring in the proper position and/or orientation	Displaced, Ectopic, <i>Abnormal pathway, Malrotated Splayed</i>	Dislocated, Misdirected
Malrotated Misaligned	Structure rotated from proper position and/or orientation Abnormal position of structures in relation to one another on opposite sides of a dividing line or about the center or axis. In the case of bone, a positional change involving the bone precursors. In the case of a sternbra, not to be used where there is no evidence that the costal cartilages are misaligned. Cartilage staining can aid assessment	Asymmetric alignment, Offset	Asymmetric, Misaligned ossification site, Unaligned
Misaligned ossification sites	Abnormal position of ossification sites in relation to one another on opposite sides of a dividing line. Commonly used for structures arising from two primary centers (e.g., sternbrae, vertebral centra). Applies only to the ossification sites and does not imply any change to the bone precursor. Cartilage staining can aid assessment	Asymmetrically aligned ossification sites, Offset ossification sites	Misaligned
Misshapen	Abnormally shaped. In the case of bone, a structural change involving the bone precursor. Not to be used to describe a misshapen ossification site where there is no evidence that the precursor is misshapen	Abnormally shaped, Irregularly shaped	Misshapen ossification site
Misshapen ossification site	Abnormally shaped ossification site. Applies only to the ossification site and does not imply any change to the bone precursor	<i>Incomplete ossification, Increased ossification</i>	Misshapen
Mottled	Spotting with patches of discoloration of an organ or tissue		
Narrow	Less than the normal side to side dimension. Constriction of a cylindrical structure, such as the aorta or tail, or of a lumen	Coarctation, Constriction, Stenosis, Stricture	
Red/brown material	Presence of colored substance in hollow organ structure	<i>Blood in-, Hemorrhagic, Red/brown fluid</i>	
Retro-esophageal Retrotracheal Short	Passing dorsal to the esophagus Passing dorsal to the trachea Less than the normal or expected length. In the case of bone, a structural change involving the bone precursor. Not to be used to describe incomplete ossification where there is no evidence that the precursor is short. In endochondral bone, cartilage staining can aid assessment		Hypoplastic, Incomplete ossification, Vestigial
Small	Smaller than normal but normally proportioned. In the case of bone, a structural change involving the bone precursor. Not to be used to describe incomplete ossification where there is no evidence that the precursor is small. In endochondral bone, cartilage staining can aid assessment	<i>Reduced, Rudimentary</i>	Atrophic, Hypoplastic, Incomplete ossification, Underdeveloped, Vestigial
Splayed Split	Paired structures diverge from one another Division of a single structure (usually into two parts) with no intervening structure between the parts. In the case of bone, a structural change involving the bone precursor. Not to be used to describe a bipartite ossification site where there is no evidence that the precursor is split. In endochondral bone, cartilage staining can aid assessment	<i>Open</i> Bifid, Cleft	Bipartite ossification, branched, Forked
Supernumerary	More than the usual or expected number	<i>Accessory, Additional, Extra, Doubled, Duplicated</i>	Supernumerary site
Supernumerary site	Extraneous localized bone [or cartilage] area. Used to describe an extra 'bone [or cartilage] island', and not an isolated ossification site within the margins of a normal bone precursor	<i>Additional site, Bone [or cartilage] island, Extra site, Sutural bone, Fontanelar bone</i>	Isolated ossification site
Thick	Relatively greater extent than normal from one surface to the other of a tissue or skeletal element. In the case of bone, a structural change involving the bone precursor. Not to be used to describe increased ossification where there is no evidence that the precursor is thick		Bulbous, Clubbed, Increased ossification
Thin	Relatively lesser extent than normal from one surface to the other of a tissue or skeletal element. In the case of bone, a structural change involving the bone precursor. Not to be used to describe incomplete ossification where there is no evidence that the precursor is thin. In endochondral bone, cartilage staining can aid assessment		Incomplete ossification
Unilateral ossification	For structures arising from two primary centers (e.g., sternbrae, vertebral centra): alizarin red stain uptake in one center (one side of the structure) only. Applies only to the ossification site and does not imply that the structure, as represented by the bone precursor, is unilateral	<i>Incomplete ossification</i>	Hemicentric

## Appendix A (Continued)

Term	Definition	Synonym or related term	Non-preferred term
Unossified	Absence of ossification (assessed by absence of alizarin red stain) at a site which, in controls of the same age, is usually at least partially ossified. Applies only to the ossification site and does not imply any change to the bone precursor	Not ossified	Absent
Unossified area	Discrete area of absent ossification (assessed by absence of alizarin red stain) with underlying bone precursor present. In endochondral bone, cartilage staining can aid assessment	Incomplete ossification	Hole
Unossified line	Linear break in ossification (assessed by absence of alizarin red stain) with underlying bone precursor present. Usually seen in the intramembranous bones of the skull	Supernumerary suture	Cleft, Fissure, Split
Wide	Greater than the normal or expected width. In the case of bone, a structural change involving the bone precursor. Not to be used to describe increased ossification where there is no evidence that the precursor is wide		Increased ossification

Synonym = having the same definition; interchangeable with the primary term.

Related Term = describes a similar condition or finding; but the word is not generally interchangeable with the primary term

## Appendix B. Syndromes and combining terms

## SYNDROMES

Caudal dysplasia	Severe reduction of caudal structures, including reduction of or absence of hindlimbs, tail, and/or sacral area
Cebocephaly	Two orbital cavities and two eyes present, the region between being narrowed. Expected skeletal alterations may include fused frontonasal and/or maxillary bones and incisors
Celosomy	A developmental defect characterized by incomplete closure of the anterior body wall, resulting in herniation, to variable degrees, of thoracic and/or abdominal viscera. The sternum, sternal ends of ribs, and muscular body wall are usually defective or poorly developed. The simplest and most logical classification of celosomies are defined: <ul style="list-style-type: none"> <li>• Anterior (or superior) celosomy: The opening is above the umbilicus which is normal. Gastroschisis, sternoschisis, thoracoschisis and thoracogastroschisis all belong to this category.</li> <li>• Median celosomy: The parietal dehiscence involves the umbilicus. Omphalocele belongs to this category.</li> <li>• Posterior (or inferior) celosomy: The dehiscence is below the umbilicus which is not affected. An extrophy of the bladder is always present.</li> <li>• Laparoschisis: The parietal orifice is always lateral and paraumbilical. The origin of the umbilical cord is normal.</li> </ul>
Cheilognathopalatoschisis	Cleft lip, jaw, and palate; also called cheilognathouranoschisis
Cheilognathoschisis	Cleft lip and jaw
Craniorachischisis	Failure of the neural tube to close in regions of both the brain and spinal cord.
Ethmocephaly	Some degree of cyclopia in which the eyes may be closely set and the snout is small
Otocephaly	Absence or extreme underdevelopment of the lower jaw, producing closeness of the ears below the face.
Rhinocephaly	Proboscis-like nose above partially or completely fused eyes.
Sirenomelia	Any of several degrees of side-to-side fusion of lower extremities and concomitant midline reduction of the pelvis. Soft tissues and long bones, lower paw (feet), and viscera of the pelvis tend to be reduced or absent; anus and external genitalia are often absent. Also called symmelia.
Tetralogy of fallot	Defect of the heart which includes all of the following: pulmonary stenosis, interventricular septal defect, dextraposed aorta overriding the ventricular septum, and thickened right ventricular wall.

## COMBINING TERMS

Acrania	Absence of the calvarium and variable other bones comprising the braincase
Craniofenestria	Multiple unossified area(s) of the cranium
Craniosynostosis	Premature closure of cranial sutures with fusion of bone, resulting in small maldeveloped skull; used to describe multiple skull bone fusions
Cranium – incomplete ossification	Used only when the majority of cranial structures are affected
Multiple external abnormalities including...	Used only in extreme cases where detailed description would be unnecessarily complex. Major features (e.g., acephaly, thoracogastroschisis, spina bifida, amelia) should be specified
Multiple craniofacial skeletal abnormalities including...	Used only where craniofacial structures are markedly abnormal and individual descriptions would be unnecessarily complex. Major features (e.g., absent, fused, severely malpositioned or misshapen bones) should be specified
Multiple rib abnormalities including...	Used only when many ribs are abnormal and numbering system breaks down. Major rib observations (e.g., absent, fused, misshapen) and, if localized, region(s) of ribcage affected (e.g., upper, lower) should be specified
Multiple vertebral abnormalities including...	Used only when many vertebrae are abnormal and numbering system breaks down. Major features (e.g., region(s) of vertebral column with absent, supernumerary, disorganized and malformed structures) should be specified
Orbita	Used when specification of individual structures would be unnecessarily complex
– Absent	
– Incomplete ossification	
– Large	
– Malpositioned	
– Misshapen	
– Small	
– Unossified	
Skull – incomplete ossification	Used only when the majority of skull structures are affected