The Rickets Severity Score (RSS)

The RSS is a method to grade the severity of the radiographic changes in rickets. The RSS correlates with the values of serum alkaline phosphatase (ALP) in nutritional rickets and can be used to assess the radiographic response to treatment.[1]

It is a **10-point score** for radiographs of wrists and knees to assess the degree of metaphyseal fraying and cupping, and the proportion of the growth plate affected. The score progresses in half point increments from 0 (normal) to 10 points (severe).[1]

The RSS and X-linked hypophosphataemia (XLH)

The RSS can also be used to assess the rickets severity in XLH and the radiographic changes following treatment. The RSS was shown to correlate to the ALP levels, clinical features and functional assessments in XLH (higher RSS values being associated with greater biochemical, clinical, and functional impairments in children with XLH).[2]

RSS Scoring Form

WRIST — score both radius and ulna separately (score the worst wrist)[1,2]

0	Normal growth plate without changes of rickets			
0.5	Lucency of metaphyseal margin without fraying or irregularity			
1	Widened growth plate, irregularity of metaphyseal margin, but without concave cupping			
1.5	Partial metaphyseal concavity or incomplete fraying of metaphyseal margin			
2	Metaphyseal concavity with fraying of margins			
Radius grade:		Ulna grade:	Total wrist:	/4

KNEE — score both femur and tibia separately (score the worst knee)[1,2]

Multiply the grade in A by the multiplier in B for each bone, then add femur and tibia scores together			
A (grade)	0	Normal growth plate without changes of rickets	
	1	Partial lucency, smooth margin of metaphysis visible	
	2	Partial lucency, smooth margin of metaphysis NOT visible	
	3	Complete lucency, epiphysis appears widely separated from distal metaphysis	
B (multiplier)	0.5	≤1 condyle or plateau affected	
	1	2 condyles or plateaus affected	
Femur grade × multiplier:	+	Tibia grade × multiplier:	Total knee:	/6

Total RSS score

WRIST + KNEE:	/10	0 = normal 10 points = severe

1. Thacher TD, et al. *J Trop Pediatr.* 2000; 46:132–9. **2.** Thacher TD, et al. *Bone.* 2019;122:76–8.

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