



Ideal and Average Values of Lumbar Lordosis

The ideal Harrison lumbar spine lordotic model is used as a reference guide to calculate a given patient's percent abnormality of the sagittal lumbar spine. The Harrison lumbar spine model indicates that the lumbar lordosis can be approximated with a piece of an ellipse from T12-S1. The lumbar lordosis increases moving distally where 65% of the curve is present at L4-S1. Clinically, we measure the total angle of lumbar spine curvature using lines tangent to the mid-bodies of L1-L5, termed the Absolute Rotation Angle or ARA. While all angles from L1-L5 need to be measured to accurately assess the lumbar curvature, it is more efficient to report to the patient one single value that represents their unique spinal Subluxation. To calculate the patient's percent abnormality of lumbar lordosis, we use three simple steps:

- 1) Take the measured ARA value and divide it by the ideal value,
- 2) Multiply the value obtained above by 100 to get %,
- 3) If the patient's curve is lordotic, then this new value is subtracted from 100% and you have the % abnormality. If the curve is kyphotic then this value is added to 100%.

On the back is a complete table of percent abnormality for possible ARA values. In the table below, the Harrison Ideal and Average values of lumbar lordosis are provided. These values represent the best available evidence and this is an Evidence Based Approach to quantify Subluxation.^{1,2}

References

1. Janik TJ, Harrison DD, Cailliet R, Troyanovich SJ, Harrison DE. Can the Sagittal Lumbar Curvature be Closely Approximated by an Ellipse? J Orthop Res 1998;16(6): 766-770.
2. Harrison DD, Cailliet R, Janik TJ, Troyanovich SJ, Harrison DE. Elliptical Modeling of the Sagittal Lumbar Lordosis and Segmental Rotation Angles as a Method to Discriminate Between Normal and Low Back Pain Subjects. J Spinal Disord 1998;11(5):430-439.

Table 1

Level	Average Value	Ideal Value
T12-L1	0°	0°
L1-L2	2.9°	5.1°
L2-L3	7.4°	6.3°
L3-L4	11.9°	9.1°
L4-L5	16.6°	18.5°
L5-S1	32.4°	33.0°
S1 to horizontal	39.2°	40.0°
ARA L1-L5	39.7°	40.0° Rounded Up
Sagittal Translation T12-S1		0mm



Kyphotic ARA	% Decreased	Hypo-Lordotic ARA	% Decreased	Hyper-Lordotic ARA	% Increased
0	100.0%	0	100.0%	-41	2.5%
+1	102.5%	-1	97.5%	-42	5.0%
+2	105.0%	-2	95.0%	-43	7.5%
+3	107.5%	-3	92.5%	-44	10.0%
+4	110.0%	-4	90.0%	-45	12.5%
+5	112.5%	-5	87.5%	-46	15.0%
+6	115.0%	-6	85.0%	-47	17.5%
+7	117.5%	-7	82.5%	-48	20.0%
+8	120.0%	-8	80.0%	-49	22.5%
+9	122.5%	-9	77.5%	-50	25.0%
+10	125.0%	-10	75.0%	-51	27.5%
+11	127.5%	-11	72.5%	-52	30.0%
+12	130.0%	-12	70.0%	-53	32.5%
+13	132.5%	-13	67.5%	-54	35.0%
+14	135.0%	-14	65.0%	-55	37.5%
+15	137.5%	-15	62.5%	-56	40.0%
+16	140.0%	-16	60.0%	-57	42.5%
+17	142.5%	-17	57.5%	-58	45.0%
+18	145.0%	-18	55.0%	-59	47.5%
+19	147.5%	-19	52.5%	-60	50.0%
+20	150.0%	-20	50.0%	-61	52.5%
+21	152.5%	-21	47.5%	-62	55.0%
+22	155.0%	-22	45.0%	-63	57.5%
+23	157.5%	-23	42.5%	-64	60.0%
+24	160.0%	-24	40.0%	-65	62.5%
+25	162.5%	-25	37.5%	-66	65.0%
+26	165.0%	-26	35.0%	-67	67.5%
+27	167.5%	-27	32.5%	-68	70.0%
+28	170.0%	-28	30.0%	-69	72.5%
+29	172.5%	-29	27.5%	-70	75.0%
+30	175.0%	-30	25.0%	-71	77.5%
+31	177.5%	-31	22.5%	-72	80.0%
+32	180.0%	-32	20.0%	-73	82.5%
+33	182.5%	-33	17.5%	-74	85.0%
+34	185.0%	-34	15.0%	-75	87.5%
+35	187.5%	-35	12.5%	-76	90.0%
+36	190.0%	-36	10.0%	-77	92.5%
+37	192.5%	-37	7.5%	-78	95.0%
+38	195.0%	-38	5.0%	-79	97.5%
+39	197.5%	-39	2.5%	-80	100.0%
+40	200.0%	-40	0.0%		