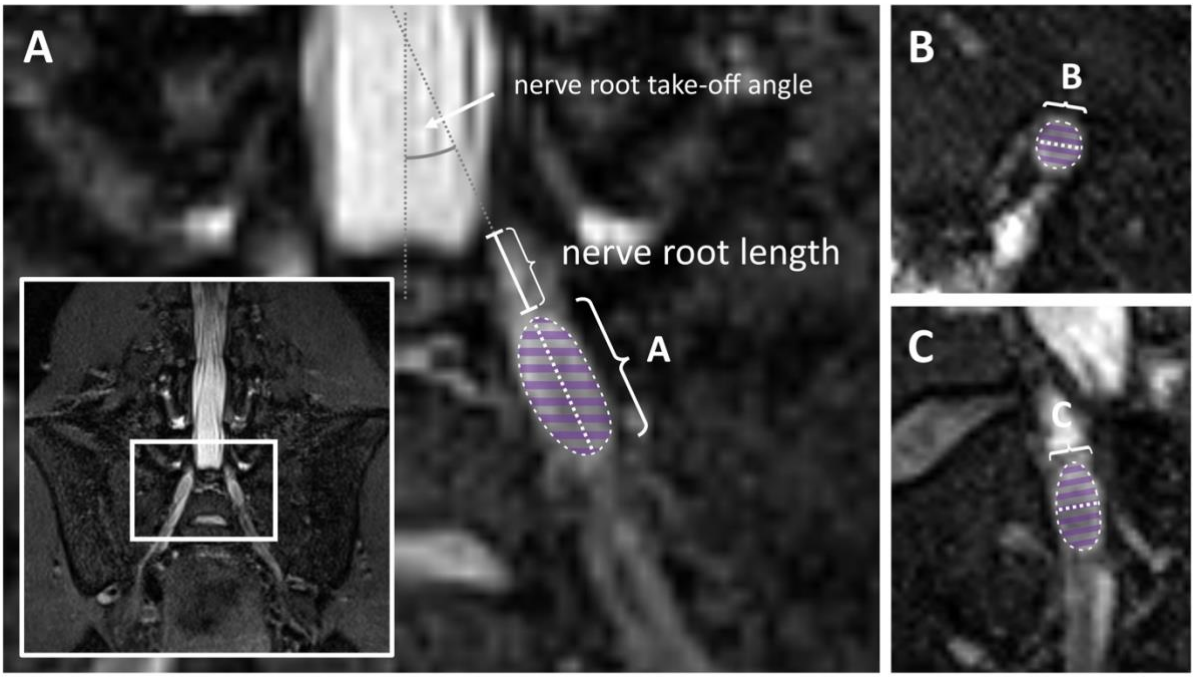
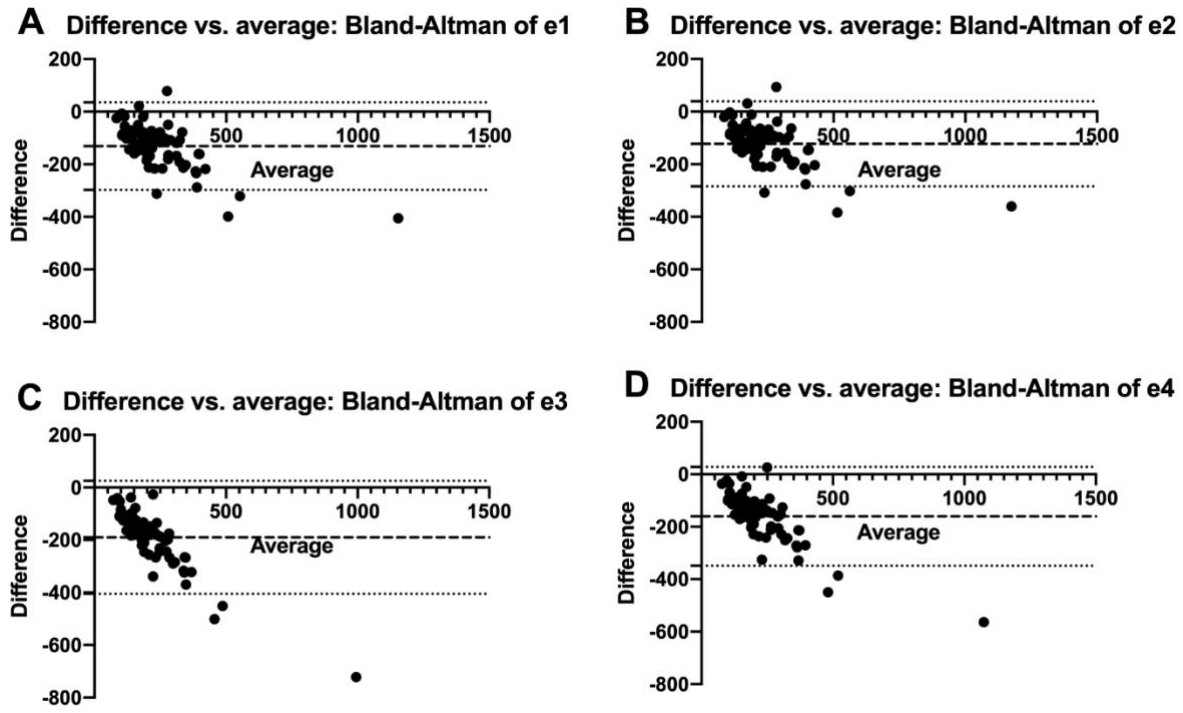
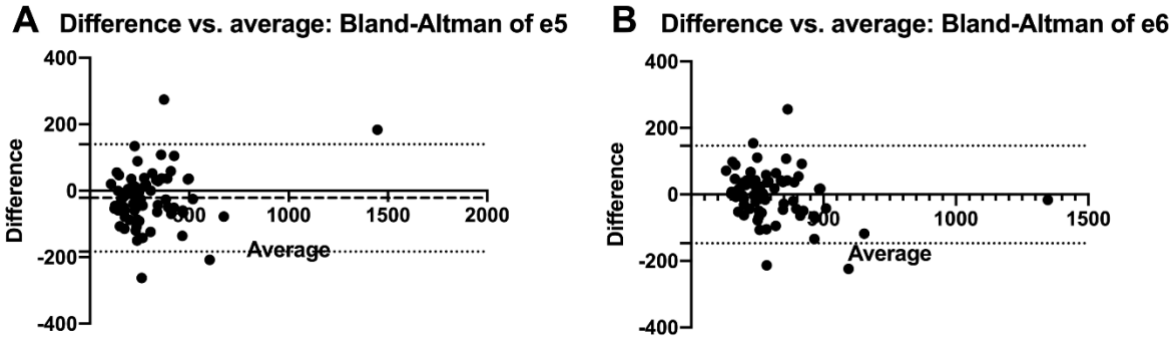


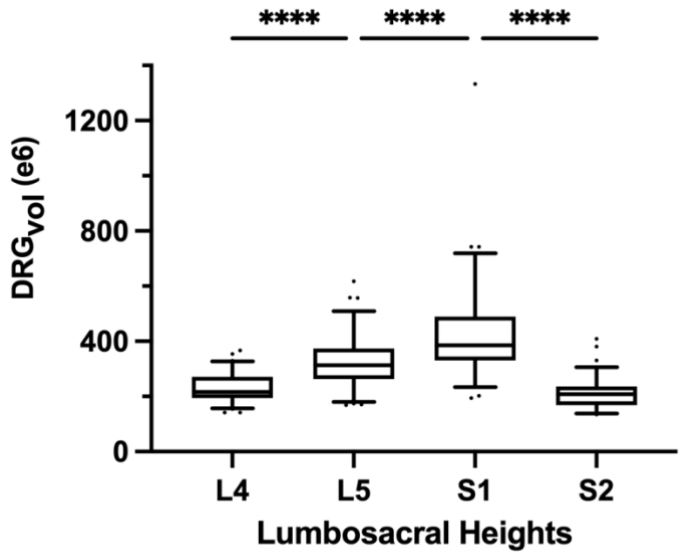
Online Figure 1 Visualization of the acquisition of the three principal geometric axes **A** in coronal, **B** in axial and **C** in sagittal reformations; **A** Visualization of the acquisition of take-off angle and length of nerve root.



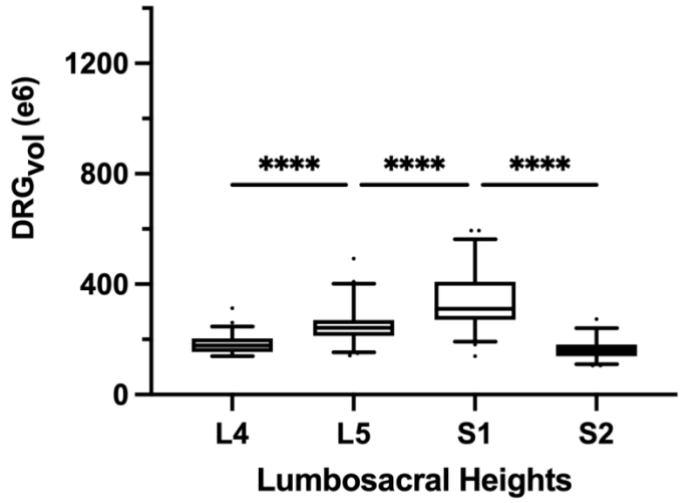
Online Figure 2 Bland-Altman plots of **A** DRG_{vol} (e1) vs. DRG_{vol} (r), **B** DRG_{vol} (e2) vs. DRG_{vol} (r), **C** DRG_{vol} (e3) vs. DRG_{vol} (r), **D** DRG_{vol} (e4) vs. DRG_{vol} (r); the x-value shows the mean of the two volumes and the y-value shows the difference between the volumes; the dashed horizontal line shows the bias of the paired difference; the dotted horizontal lines show limits of agreement from - 1.96 x standard deviation to + 1.96 x standard deviation. Abbreviations: DRG_{vol} = dorsal-root-ganglion volume; DRG_{vol} (r) = real dorsal-root-ganglion volume, determined by mean of voxel-wise segmentation by three raters; e1/e2/e3/e4 = equation 1/2/3/4; DRG_{vol} (e1/e2/e3/e4) = estimated dorsal-root-ganglion volume by equation e1/e2/e3/e4/



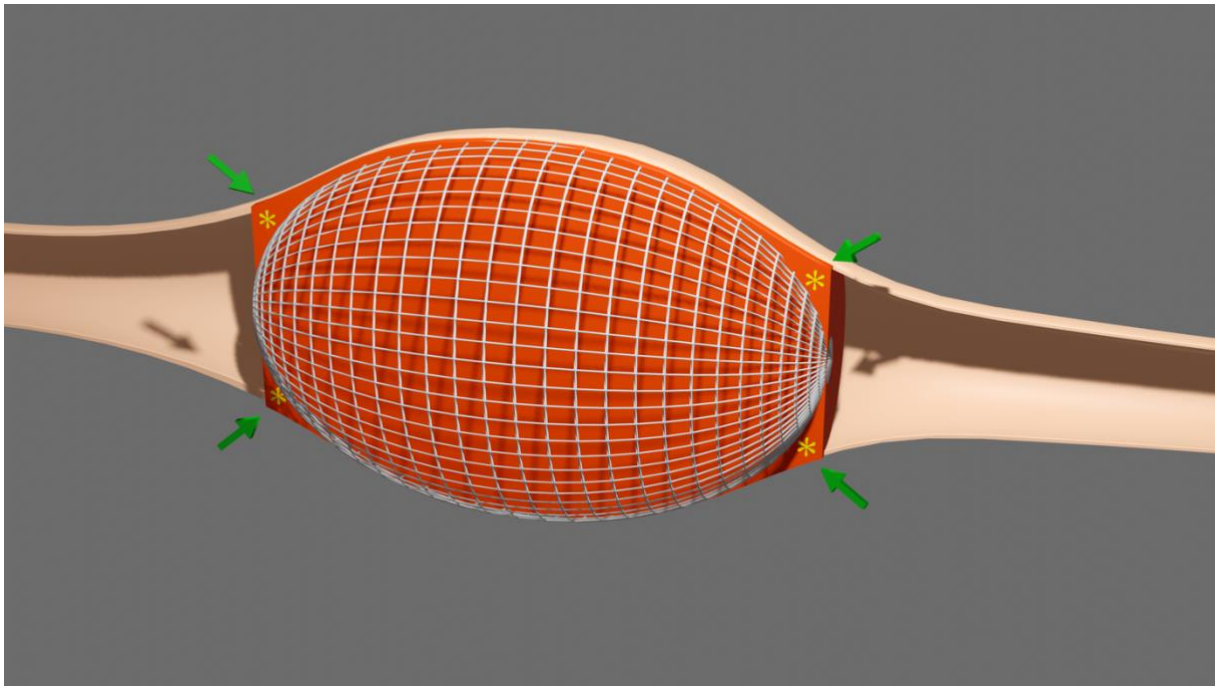
Online Figure 3 Bland-Altman plots of **A** DRG_{vol} (e5) vs. DRG_{vol} (r), **B** DRG_{vol} (e6) vs. DRG_{vol} (r); the x-value shows the mean of the two volumes and the y-value shows the difference between the two volumes; the dashed horizontal line shows the bias of the paired difference; the dotted horizontal lines show limits of agreement from - 1.96 x standard deviation to + 1.96 x standard deviation. Abbreviations: DRG_{vol} = dorsal-root-ganglion volume; DRG_{vol} (r) = real dorsal-root-ganglion volume, determined by mean of voxel-wise segmentation by three raters; e5/e6 = equation 5/6; DRG_{vol} (e5/e6) = estimated dorsal-root-ganglion volume by equation e5/e6



Online Figure 4 Boxplot of DRG_{vol} (e6) showing the DRG_{vol} [mm^3] for the different lumbosacral heights L4 – S2 of men (n=294). The top of the box represents the 75th percentile, the bottom of the box represents the 25th percentile. The line in the middle represents the 50th percentile (median). The whiskers represent the 5th and 95th percentiles, and values beyond lower and upper bounds represent outliers and extreme values. Significances are marked with asterisks (indicating $p < .001$). Abbreviations: DRG_{vol} (e6) = estimated dorsal-root-ganglion volume by equation e6; L4 = 4th lumbar level; L5 = 5th lumbar level; S1 = 1st sacral level; S2 = 2nd sacral level



Online Figure 5 Boxplot of DRG_{vol} (e6) showing the DRG_{vol} [mm^3] for the different lumbosacral heights L4 – S2 of women (n=216). The top of the box represents the 75th percentile, the bottom of the box represents the 25th percentile. The line in the middle represents the 50th percentile (median). The whiskers represent the 5th and 95th percentiles, and values beyond lower and upper bounds represent outliers and extreme values. Significances are marked with asterisks (indicating $p < .001$). Abbreviations: DRG_{vol} (e6) = estimated dorsal-root-ganglion volume by equation e6; L4 = 4th lumbar level; L5 = 5th lumbar level; S1 = 1st sacral level; S2 = 2nd sacral level



Online Figure 6 3D rendered visualization of the DRG as geometrical body that is connected to the adjacent nerve segments. An ellipsoidal 3D object was projected onto the sectional surface of an idealized DRG (gray mesh surface). This ellipsoid tapers at its medial and lateral end. However, real DRG morphology at these ends merges with the adjacent nerve segments over a broader volume area (triangular volume regions not incorporated into ellipsoid object, marked by asterisks and arrows). Neglecting this triangular region by simply applying ellipsoid geometry without offset correction would underestimate true DRG volume.

Online Table 1

Overview of the length of principal geometric axes and volumes of 96 dorsal root ganglia for ground truth derivation

	all DRG				L4				L5				S1				S2			
Parameter	*n*	*M*	*SD*	*95% CI*	*n*	*M*	*SD*	*95% CI*	*n*	*M*	*SD*	*95% CI*	*n*	*M*	*SD*	*95% CI*	*n*	*M*	*SD*	*95% CI*
DRG_{vol} (r) [mm³]	96	280.1	165.4	[246.6, 313.6]	24	202.3	64.1	[175.2, 229.3]	24	299.7	91.9	[260.9, 338.6]	24	421.0	243.5	[318.2, 523.8]	24	197.2	80.7	[163.1, 231.3]
└ female	56	221.5	88.8	[197.8, 245.3]	14	160.0	35.0	[139.8, 180.2]	14	255.1	63.7	[218.3, 291.8]	14	307.7	92.4	[254.3, 361.0]	14	163.4	51.5	[133.7, 193.0]
└ male	40	362.0	209.0	[295.1, 428.9]	10	261.5	45.3	[229.1, 293.9]	10	362.3	91.1	[297.1, 427.4]	10	579.7	301.9	[363.7, 795.7]	10	244.5	92.7	[178.2, 310.8]
A [mm]	96	9.8	2.8	[9.2, 10.4]	24	7.8	1.5	[7.2, 8.5]	24	10.4	2.6	[9.3, 11.5]	24	12.5	2.6	[11.5, 13.6]	24	8.3	1.8	[7.6, 9.1]
B [mm]	96	5.3	1.1	[5.1, 5.5]	24	5.3	1.0	[4.8, 5.7]	24	5.5	0.9	[5.2, 5.9]	24	5.8	1.3	[5.3, 6.3]	24	4.5	0.8	[4.2, 4.9]
C [mm]	96	5.5	1.3	[5.2, 5.7]	24	5.0	0.8	[4.6, 5.3]	24	6.1	0.7	[5.8, 6.4]	24	6.4	1.3	[5.9, 7.0]	24	4.5	1.1	[4.0, 4.9]
DRG_{vol} (e1) [mm³]	96	161.8	118.1	[137.9, 185.7]	24	107.7	39.4	[91.1, 124.3]	24	184.2	60.5	[158.7, 209.8]	24	262.9	176.7	[188.3, 337.6]	24	92.4	43.2	[74.2, 110.6]
DRG_{vol} (e2) [mm³]	96	154.5	112.8	[131.7, 177.4]	24	102.8	37.6	[87.0, 118.7]	24	175.9	57.7	[151.5, 200.3]	24	251.1	168.8	[179.8, 322.4]	24	88.2	41.2	[70.8, 105.6]
DRG_{vol} (e3) [mm³]	96	103.0	75.2	[87.8, 118.2]	24	68.6	25.1	[58.0, 79.1]	24	117.3	38.5	[101.0, 133.5]	24	167.4	112.5	[119.9, 214.9]	24	58.8	27.5	[47.2, 70.4]
DRG_{vol} (e4) [mm³]	96	128.8	94.0	[109.7, 147.8]	24	85.7	31.3	[72.5, 98.9]	24	146.6	48.1	[126.3, 166.9]	24	209.2	140.7	[149.8, 268.6]	24	73.5	34.3	[59.0, 88.0]
DRG_{vol} (e5) [mm³]	96	253.4	184.9	[215.9, 290.9]	24	168.6	61.6	[142.6, 194.7]	24	288.5	94.7	[248.5, 328.5]	24	411.8	276.8	[294.9, 528.7]	24	144.7	67.6	[166.2, 173.2]
DRG_{vol} (e6) [mm³]	96	281.0	150.2	[250.6, 311.5]	24	212.1	50.1	[191.0, 233.3]	24	309.6	77.0	[277.0, 342.1]	24	409.8	225.0	[314.8, 504.8]	24	192.6	54.9	[169.4, 215.8]

Note. DRG_{vol} (r) = real dorsal root ganglion volume, A = length of dorsal root ganglion, B = width of dorsal root ganglion, C = depth of dorsal root ganglion, DRG_{vol} (e1) - DRG_{vol} (e6) = estimated dorsal root ganglion volume by equation e(1) - equation e(6) respectively. n = number of elements, M = mean, SD = standard deviation, 95% CI = 95% confidence interval.

Online Table 2

Overview of the length of principal geometric axes and volumes of the 510 dorsal root ganglia and overview of the take off angle and length of the corresponding nerve roots

	L4				L5				S1				S2			
Parameter	*n*	*M*	*SD*	*95% CI*	*n*	*M*	*SD*	*95% CI*	*n*	*M*	*SD*	*95% CI*	*n*	*M*	*SD*	*95% CI*
A [mm]	128	7.4	1.4	[7.1, 7.6]	128	9.2	2.1	[8.8, 9.6]	128	12.2	2.2	[11.9, 12.6]	126	8.5	1.6	[8.2, 8.7]
B [mm]	128	5.5	0.9	[5.3, 5.6]	128	5.5	0.9	[5.4, 5.7]	128	5.7	1.0	[5.5, 5.8]	126	4.4	0.9	[4.3, 4.6]
C [mm]	128	5.0	0.9	[4.8, 5.2]	128	6.2	1.1	[6.0, 6.4]	128	6.4	1.1	[6.2, 6.6]	126	4.5	0.9	[4.4, 4.7]
DRG_{vol} (e6) [mm^3]	128	211.3	52.5	[202.2, 220.5]	128	290.7	90.9	[274.8, 306.6]	128	384.2	145.0	[358.8, 409.5]	126	192.4	52.6	[183.1, 201.7]
NR length [mm]	128	9.2	2.1	[8.8, 9.5]	128	13.0	2.9	[12.5, 13.6]	128	14.6	4.0	[13.9, 15.3]	126	16.5	4.4	[15.7, 17.2]
NR angle [°]	128	37.9	9.0	[36.4, 39.5]	128	35.5	8.0	[33.9, 36.7]	128	22.8	6.4	[21.7, 23.9]	126	17.4	5.0	[16.5, 18.3]

Note. DRG_{vol} (e6) = dorsal root ganglion volume estimated by equation e(6), A = length of dorsal root ganglion, B = width of dorsal root ganglion, C = depth of dorsal root ganglion, NR angle = nerve root take off angle in coronal plane, NR length = length of nerve root. n = number of elements, M = mean, SD = standard deviation, 95% CI = 95% confidence interval.