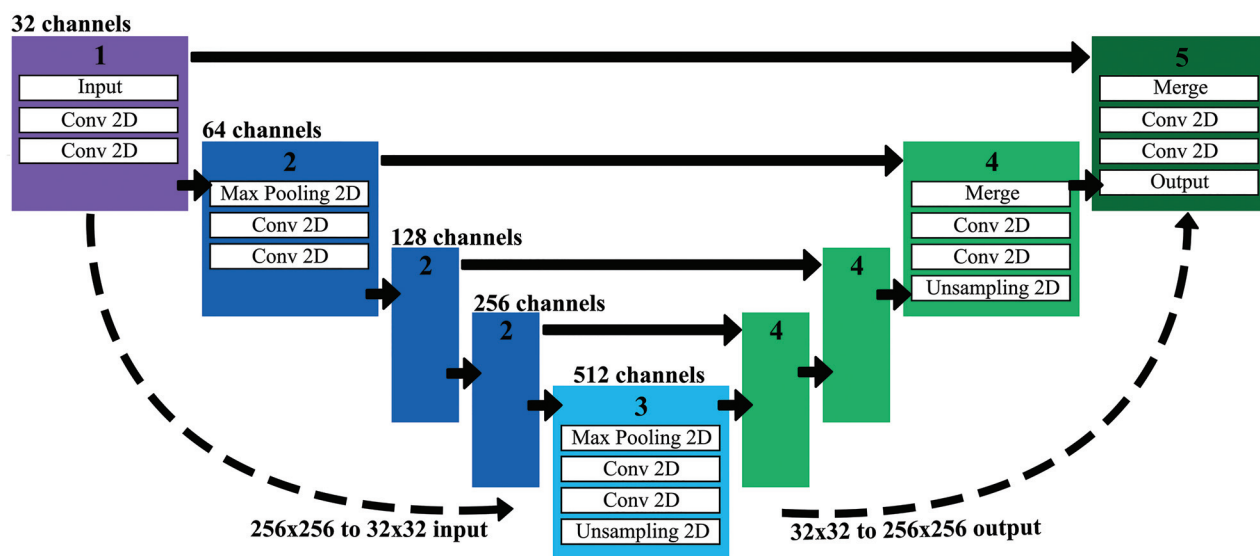


ON-LINE APPENDIX

Data extraction from the PACS archive. The system at the University of California, Los Angeles, David Geffen School of Medicine, was used to generate the lumbar MR imaging dataset. We queried for individuals who had undergone any form of spine imaging at the University of California, Los Angeles, using CPT¹⁷ codes corresponding to spine image acquisitions. This yielded 39,295 unique MRNs. The CPT codes used for the initial query are listed in On-line Table 1. Using this list, we queried the PACS to autonomously extract and anonymize all images and store them on a locally encrypted hard drive. Subsequently, we cross-

referenced image accessions with anonymized patient records and eliminated studies corresponding to patients whose records were associated with any ICD-9²¹ code related to the presence of spinal pathology or symptoms attributable (eg, sciatica) to the spine. The ICD-9 codes used to filter these studies are listed in On-line Table 2. The resulting dataset contained 3837 unique MRNs, which were included in this study.

MR imaging sequence: All images used in this study were sagittal T2 MRI acquisitions. The acquisition parameters varied among the subjects with a mean TR = 3756 ± 738 ms and a mean TE = 107 ± 12 ms.



ON-LINE FIGURE. The U-Net contained 4 downsampling units (1 and 2) followed by a core unit (3) and by 4 upsampling units (4 and 5) with 10 skip connections between the respective downsampling and upsampling units. Each downsampling unit consisted of a convolutional layer and a maximum pooling layer. The convolutional layers had a stride of 1 pixel and a kernel size of 3×3 . The upsampling units consisted of convolutional layers followed by upsampling layers to drive output sizes back from 32×32 to 256×256 .

On-line Table 1: CPT codes used to query the PACS

CPT Code
72141 (MR imaging cervical spine; without contrast)
72156 (MR imaging cervical spine; without contrast followed by contrast)
72148 (MR imaging lumbar spine; without contrast)
72158 (MR imaging lumbar spine; without contrast followed by contrast)
72146 (MR imaging thoracic spine; without contrast)
72157 (MR imaging thoracic spine; without contrast followed by contrast)
72090 (Radiologic study of the spine supine or erect)
72126 (CT cervical spine; with contrast)
72125 (CT cervical spine; without contrast)
72132 (CT lumbar spine; with contrast)
72131 (CT lumbar spine; without contrast)
72129 (CT thoracic spine; with contrast)
72128 (CT thoracic spine; without contrast)

On-line Table 2: ICD codes used to filter asymptomatic patients

ICD Codes				
353.9	907.3	953	953.1	953.2
953.3	953.8	953.9	729.2	724.4
646.4	646.41	646.42	646.43	646.44
723.4	355.8	355.9	357.1	357.2
357.3	357.4	357.6	337	356
356.2	357.82	377.34	357.9	357.89
337.09	356.8	356.9	337	727.2
357.5	356.4	53.13	724.4	723.4
729.2	353	729.2	724.3	724
724.01	724.02	724.03	724.09	723
722	722.1	722.2	724.4	722.11
722.7	722.71	722.72	722.73	722.3
722.31	722.32	722.39	722.4	722.51
722.6	722.52	722.8	722.81	722.82
722.83	722.9	722.91	722.92	722.93
724.6	721	721.1	721.2	721.3
721.41	721.42	721.5	721.6	721.7
721.8	721.9	721.91	756.12	738.4
353.8				

On-line Table 3: Quality control questionnaire

Questionnaire
Are canal areas available at all 5 levels?
Are segmentations > 5 pixels (discs and canals)?
Are all 5 discs segmented?
Is any canal area <5 pixels?