

Algorithm module network architectures

Segmentation algorithm (heart, aorta, lung lobes, vertebrae)

The algorithm network architecture used for the anatomical segmentations (heart, aorta, lung lobes and vertebrae) corresponds to the architecture published and graphically illustrated by Yang *et al.* (please compare to *Figure 1* of this paper) (16). The front part is a convolutional encoder-decoder network with feature concatenation, and the backend is deep supervision network through multi-level. Blocks inside deep image-to-image network (DI2IN) consist of convolutional and upscaling layers.

Coronary plaque detection (Figure S1)

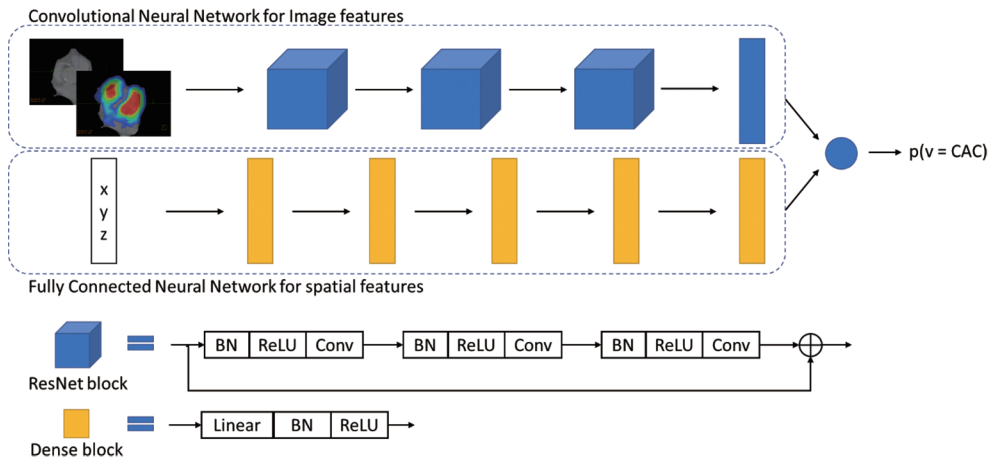


Figure S1 Architecture of the deep learning chest CT calcium detection model used for predicting the probability that each candidate voxel belongs to the coronary arteries. Inputs to the convolutional neural network are a cropped image of the heart and a co-registered territory map of the coronary arteries. Inputs to the fully connected neural network are spatial features. CT, computed tomography.

Lung lesion analysis (Figures S2,S3)

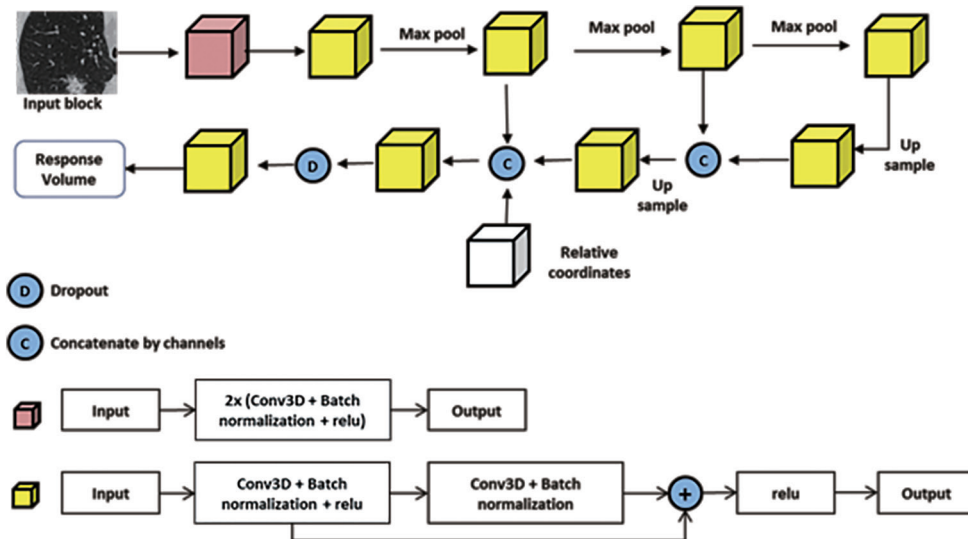


Figure S2 Block diagram for candidate generation.

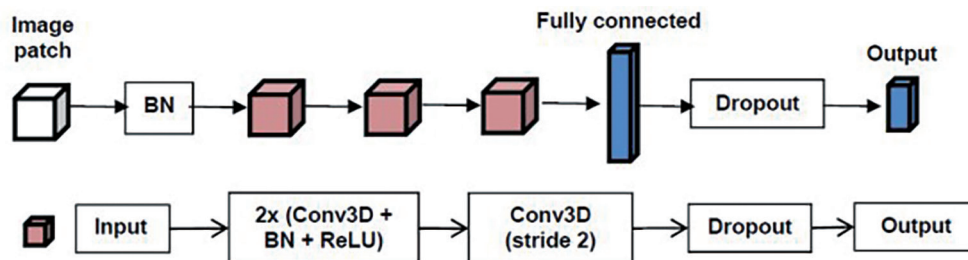


Figure S3 Block diagram for false positive reduction.