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Appendix E1

As a reference of our proposed manufacturer adaptation method, we performed comparison experiments using three conventional image normalizing methods for the manufacturer shift problem:

1. Intensity adjustment: a simple normalization method that rescales the intensity values of any image to a normalized range. Here we scaled the intensity range to [0, 1].

2. Histogram equalization: a classic method to increase the global contrast of images by equally distributing the gray values on the histogram. The method equalizes contrast among different images.

3. Bias correction: a method to remove undesirable artifact that primarily arises from the image acquisition or from specific properties of the imaged object. Here we applied an established bias correction method that has proven suitable for the subsequent image segmentation tasks (28).

In these experiments, we set Manufacturer1 as training set and Manufacturer2 as the test set. The results are reported in Table E1. All three preprocessing methods led to improvements in cross-manufacturer generalization. The improvements are statistically significant, however, they are marginal in absolute values.

Reference

28. Li C, Gore JC, Davatzikos C. Multiplicative intrinsic component optimization (MICO) for MRI bias field estimation and tissue segmentation. Magn Reson Imaging 2014;32(7):913–923.

Table E1. Performance of Segmentation on Other-manufacturer Data Using Conventional Image-Normalization Methods.

Preprocessing Technique		None	Intensity Adjustment	Histogram Equalization	Bias Correction
Dice	Myocardium	67.4 ± 11.4	68.2 ± 9.7*	69.1 ± 12.2*	68.9 ± 10.2*
	Blood pool	78.0 ± 9.1	79.2 ± 10.5*	80.3 ± 9.4*	79.6 ± 9.8*

Note.—Performance values are presented as Dice indexes (%) ± SD.

* Indicates $P < .05$ by paired Wilcoxon signed rank test comparing the segmentation performance after preprocessing to that without any image preprocessing.