SUPPLEMENTARY MATERIAL

MR-based cardiac and respiratory motion correction of PET: Application to static and dynamic cardiac 18F-FDG imaging

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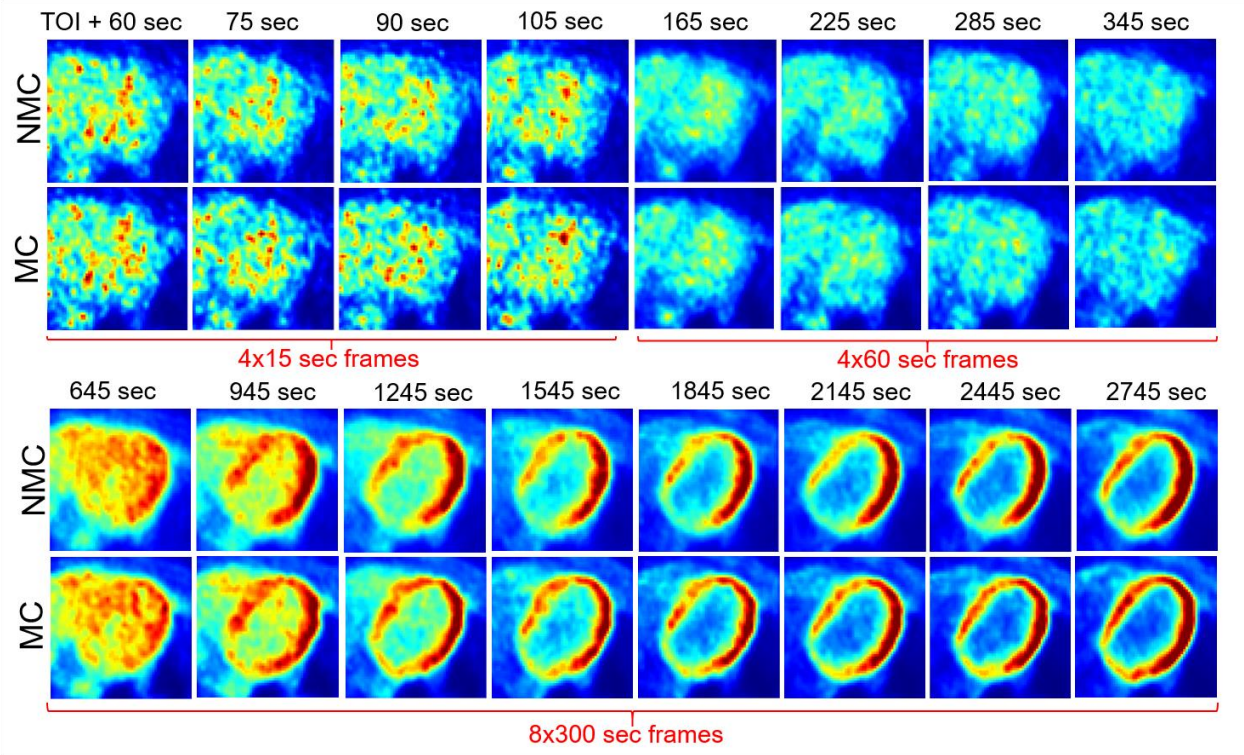
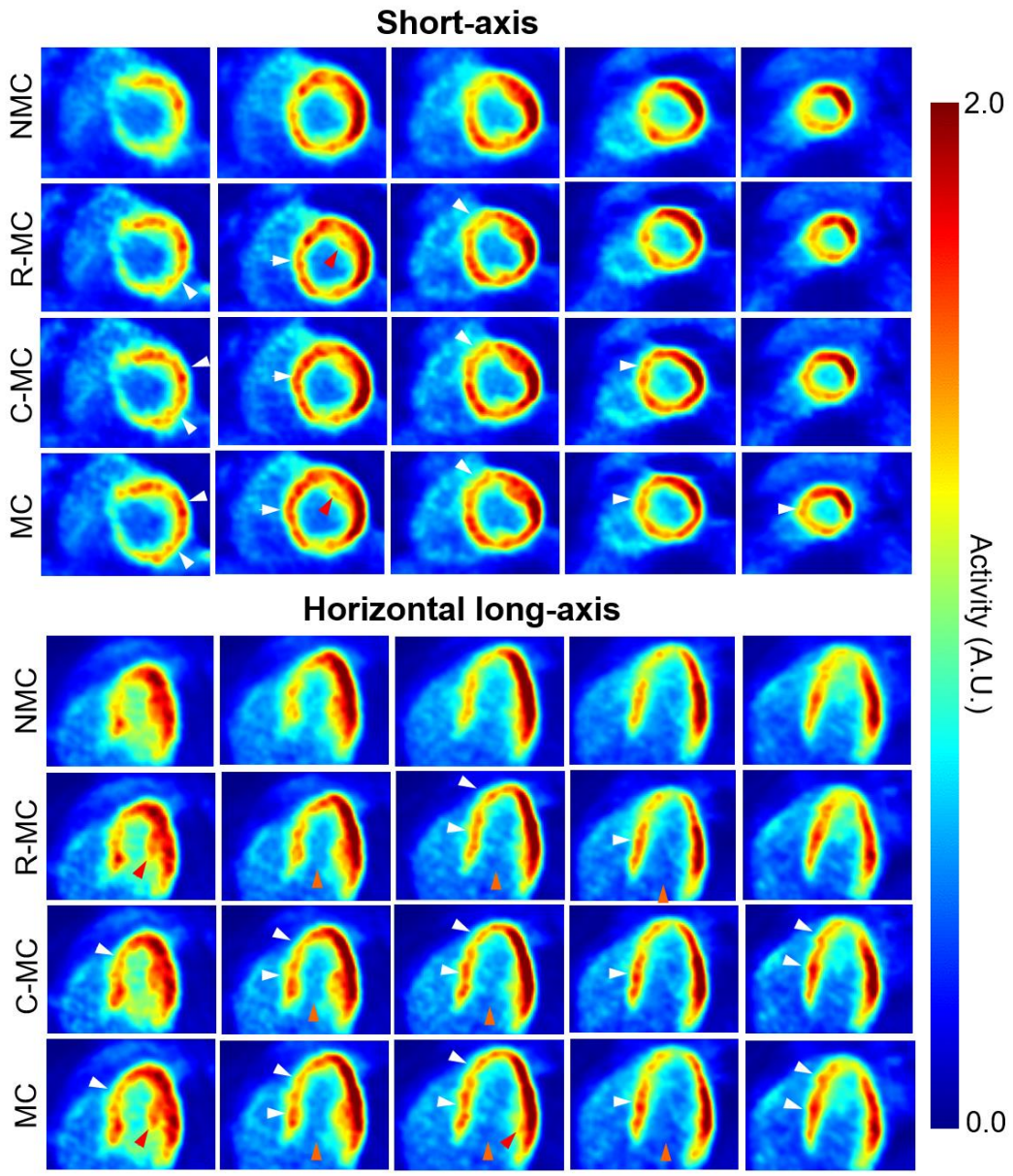
1. Impact of motion correction across dynamic frames



Supplemental Figure 1: Same transverse slice across dynamic frames for NMC and MC methods (subject 1). Note that, to facilitate comparison of NMC and NMC images, the display range was adapted specifically for each dynamic frame. The first 4 frames after injection are not included in the figure as they were not corrected for motion. TOI = time of injection.

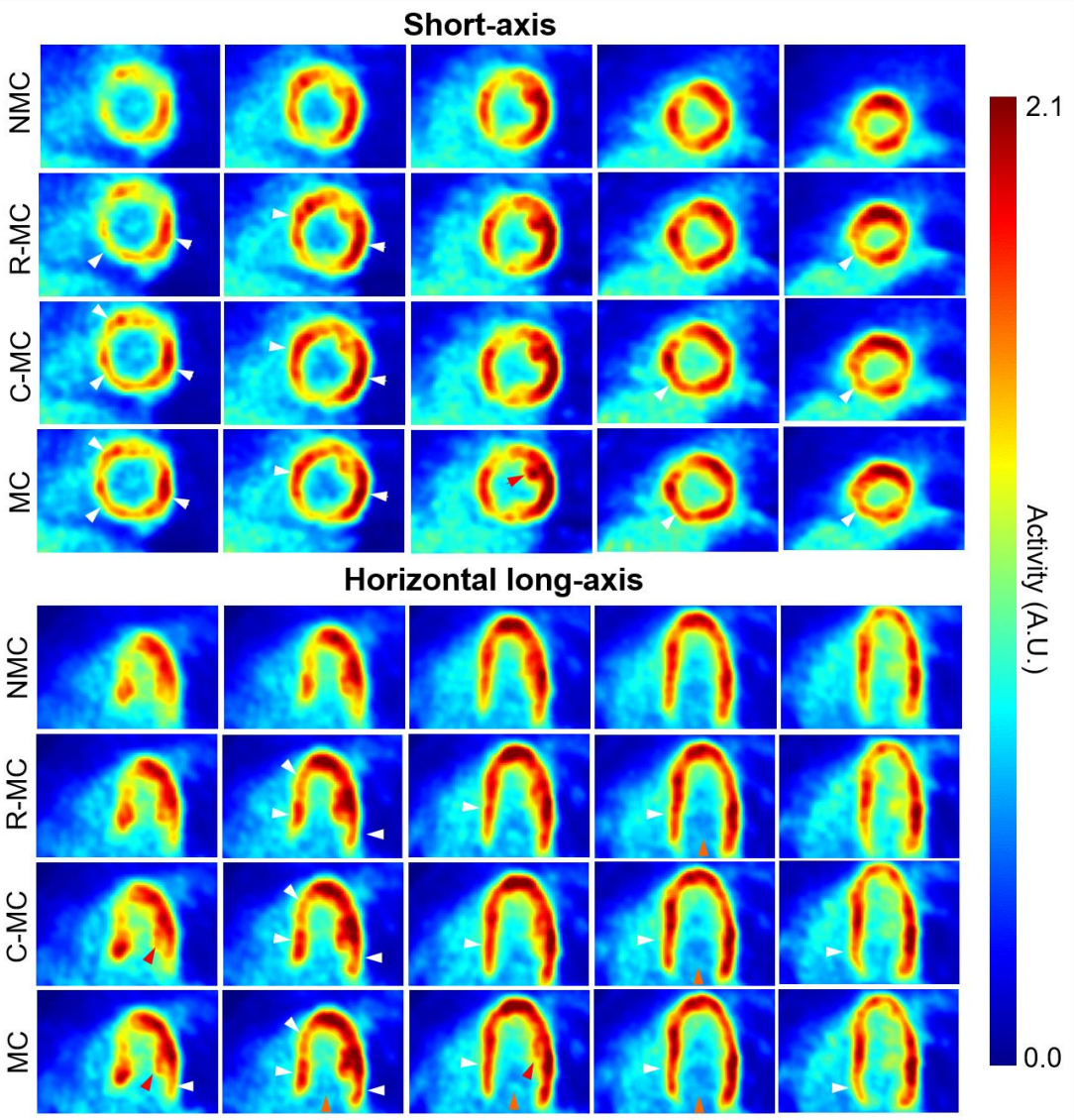
2. Relative impact of respiratory, cardiac and dual (i.e. respiratory + cardiac) motion correction

To evaluate the relative impact of respiratory and cardiac motion correction, **Supplemental Figures 2-5** show images of activity and Ki obtained without motion correction ('NMC') and with respiratory-only (R-MC), cardiac-only (C-MC) and both respiratory and cardiac motion correction ('MC', as used throughout the article). Respiratory (respectively, cardiac) MC images were obtained by motion-compensated reconstruction (**Eq. 3**) of the respiratory- (cardiac-) gated sinograms using the motion fields determined with the golden-angle (tagging) MRI sequence.

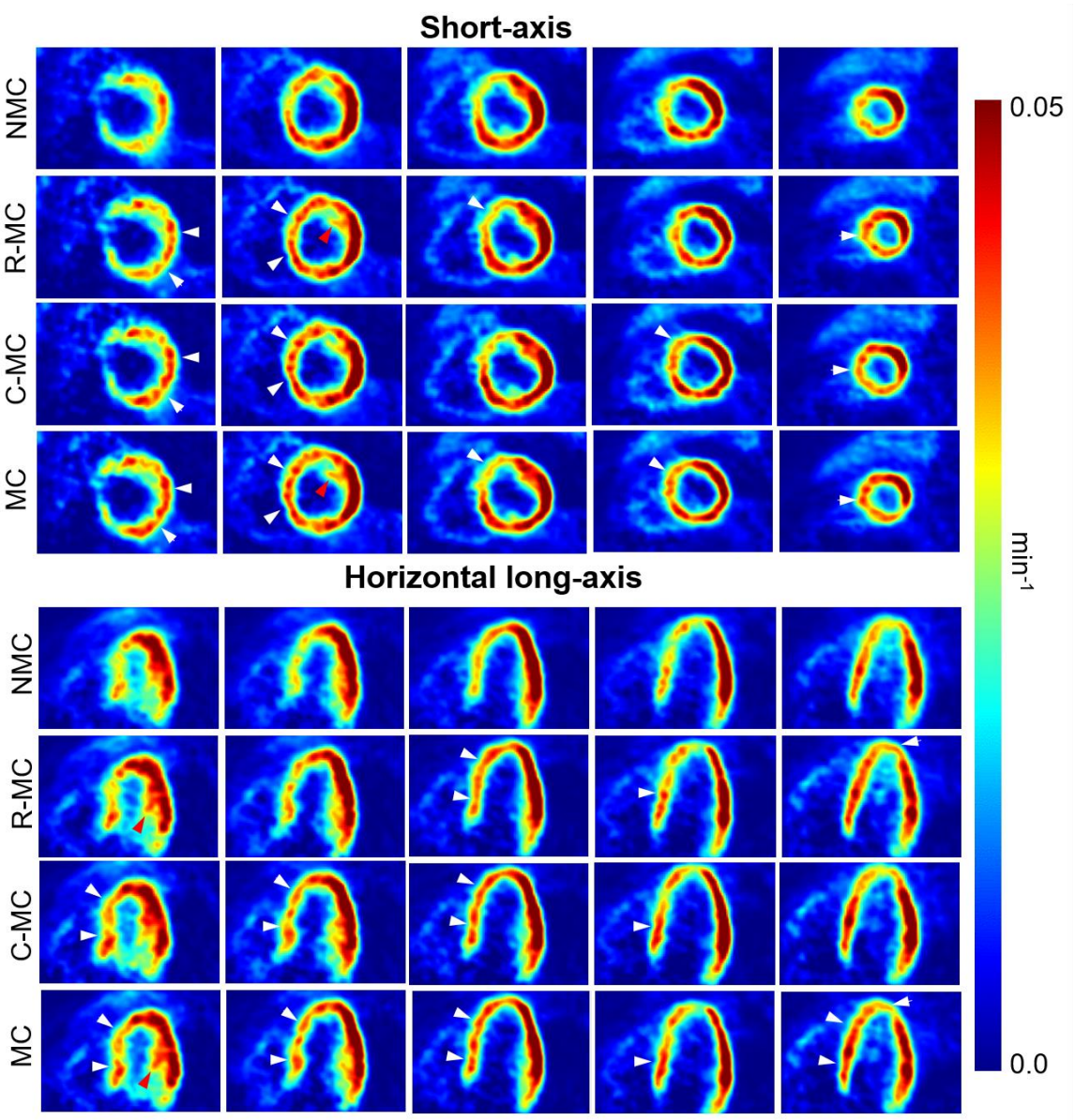


Supplemental Figure 2: Short-axis and horizontal long-axis images of a late dynamic frame reconstructed with NMC, respiratory MC ('R-MC'), cardiac MC ('C-MC') and both respiratory and cardiac MC ('MC') for subject 1. White arrows in motion corrected images indicate locations where the reconstructed wall activity is clearly higher than in NMC. Red arrows point to papillary muscles whose structure is more visible in corrected images, indicating improved spatial resolution. Orange arrows indicate areas where spillover from the myocardium to the left-

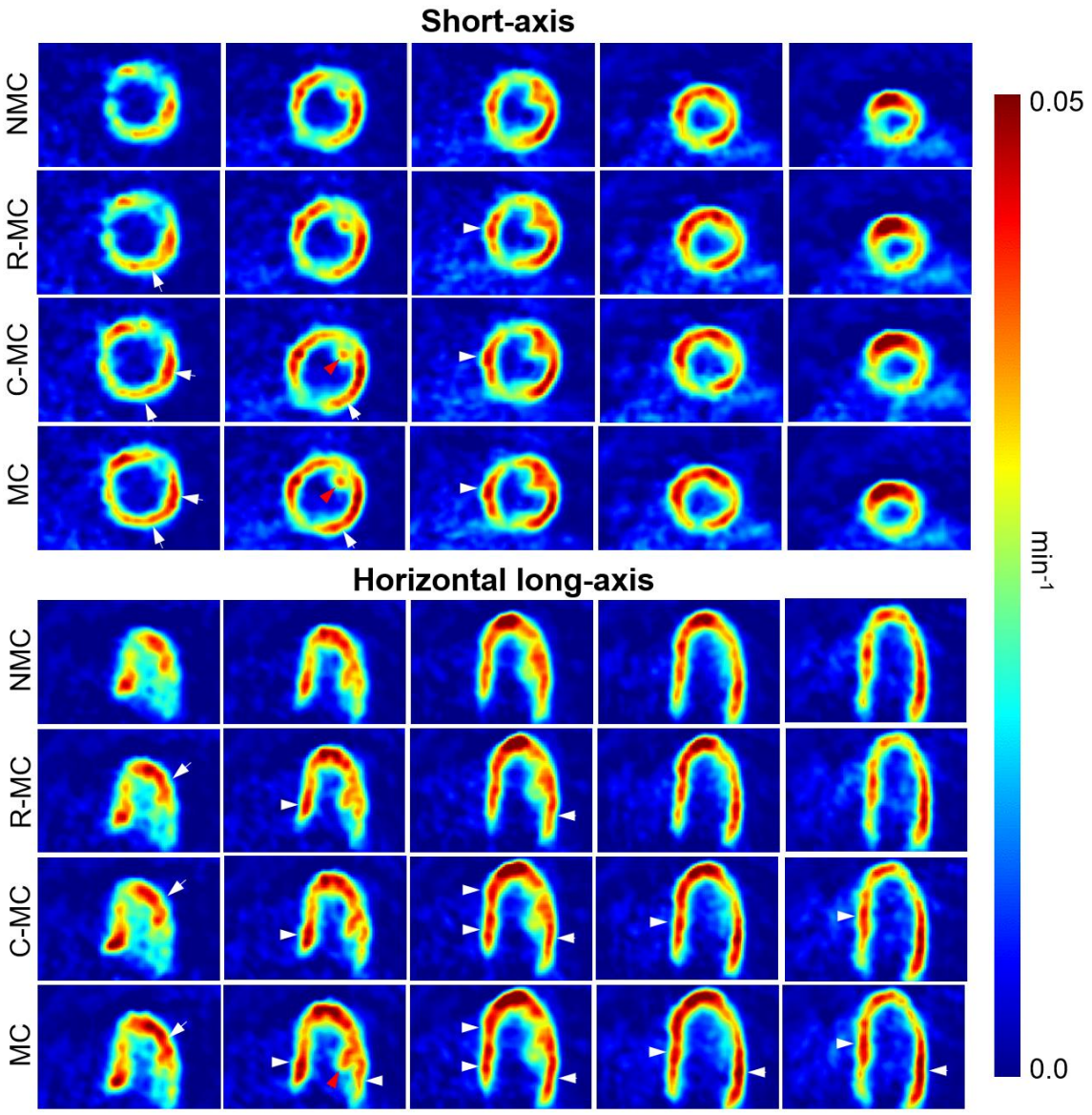
ventricle cavity is visibly reduced in motion corrected images.



Supplemental Figure 3: Short-axis and horizontal long-axis images of a late dynamic frame reconstructed with NMC, respiratory MC ('R-MC'), cardiac MC ('C-MC') and both respiratory and cardiac MC ('MC') for subject 2.



Supplemental Figure 4: Short-axis and horizontal long-axis K_i slices obtained using NMC, respiratory MC ('R-MC'), cardiac MC ('C-MC') and both respiratory and cardiac MC ('MC') for subject 1. Motion corrected images yielded overall higher K_i values than NMC, especially in regions evidenced by white arrows. Structures such as papillary muscles are also easier to delineate in motion corrected K_i maps (see red arrows).



Supplemental Figure 5: Short-axis and horizontal long-axis K_i slices obtained using NMC, respiratory MC ('R-MC'), cardiac MC ('C-MC') and both respiratory and cardiac MC ('MC') for subject 2.