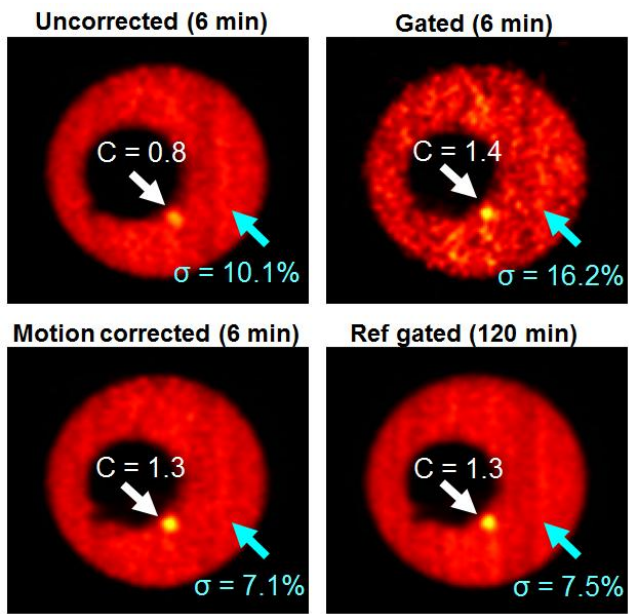


**SUPPLEMENTAL FIGURE 1.** A schematic figure of a motion phantom. Each sphere has different level of  $^{18}\text{F}$ FDG activity and experiences different level of nonrigid motion.



**SUPL. FIGURE 2.** Reconstructed PET images at Sphere 3 of our phantom with Uncorrected, Gated, MR motion corrected methods. Tagged MR based motion correction can reduce motion blurs as compared to Uncorrected (white arrows, C: contrast) and can achieve lower noise as compared to Gated (light blue arrows,  $\sigma$ : standard deviation).