Towards Best Practices for Reproducibility in Research MRI

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Reproducibility in neuroimaging is essential to scientific integrity and translation. We present practical recommendations that can be adopted immediately. First, containerisation and accessible, well-documented analysis software help track exact code and library dependencies; this is crucial because small dependency differences can yield divergent results. Second, we recommend vendor-neutral, transparent, documented, and consistent QA/QC reports across all research-centre instruments to verify scanner stability and data quality. Third, harmonized acquisition and processing protocols are needed to achieve comparable images and outputs across sites. Finally, clear provenance (inputs, parameters, software versions, and environment) should be captured automatically, alongside preregistration of analysis plans where feasible. These solutions are being implemented by the Australian National Imaging Facility alongside Australian Imaging Service, providing users with greater transparency and confidence that their neuroimaging outputs are both high quality and reproducible.

1. Masson-Trottier et al. Aperture Neuro. 2025;5(SI 3). doi:10.52294/001c.143700