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🌐 MRI_preprocessing_protocol

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Protocol status: Working
We use this protocol and it's working

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Abstract

Preprocessing protocol for structural, DWI and T2* MRI acquisitions

Structural T1w (MP-RAGE acquisition)

1 Data transformation from DICOM to NIFTI standard (software: dcm2niix)

2 Field of view optimization (command: fslreorient2std; software: FSL)

3 Bias field correction (command: N4BiasFieldCorrection; software: ANTs)

4 Non-brain tissue removal (command: bet; software: FSL)

5 Deep-brain nuclei segmentation (command: run_first_all; software: FSL)

6 CSF, GM and WM tissue segmentation (command: fast; software: FSL)

7 Diffeomorphic registration to MNI152 2009c sym tempate (command: antsRegistrationSyN.sh; software: ANTs)

T2* (multi-echo gradient echo acquisition)

8 Data transformation from DICOM to NIFTI standard (software: dcm2niix)

9 Affine registration to structural T1w using the first volume as reference (command: antsRegistration; software ANTs)

Single-shell DWI (single-shot 2D spin-echo, b=1000)

10 Data transformation from DICOM to NIFTI standard (software: dcm2niix)

11 B0 pair isolation (AP and PA)

12   Image denoising using the overcomplete local PCA appoach (MATLAB)

13   Geometric distortions and magnetic field inhomogeneities corrections (command: topup; software: FSL)

14   Eddy current-induced distortion corrections (command: eddy; software: FSL)

15   Bias field correction (command: N4BiasFieldCorrection; software: ANTs)

16   Affine registration to structural T1w using the first volume (B0) as reference (command: antsRegistration; software ANTs)