QA Process

Reward Structural Data

Purpose

Analysis of mean cortical thickness and surface area data within Cortical ROIs

Data:

- Day2
- Fndm
- Nodra
- Effort

Outline

Introduction to FreeSurfer

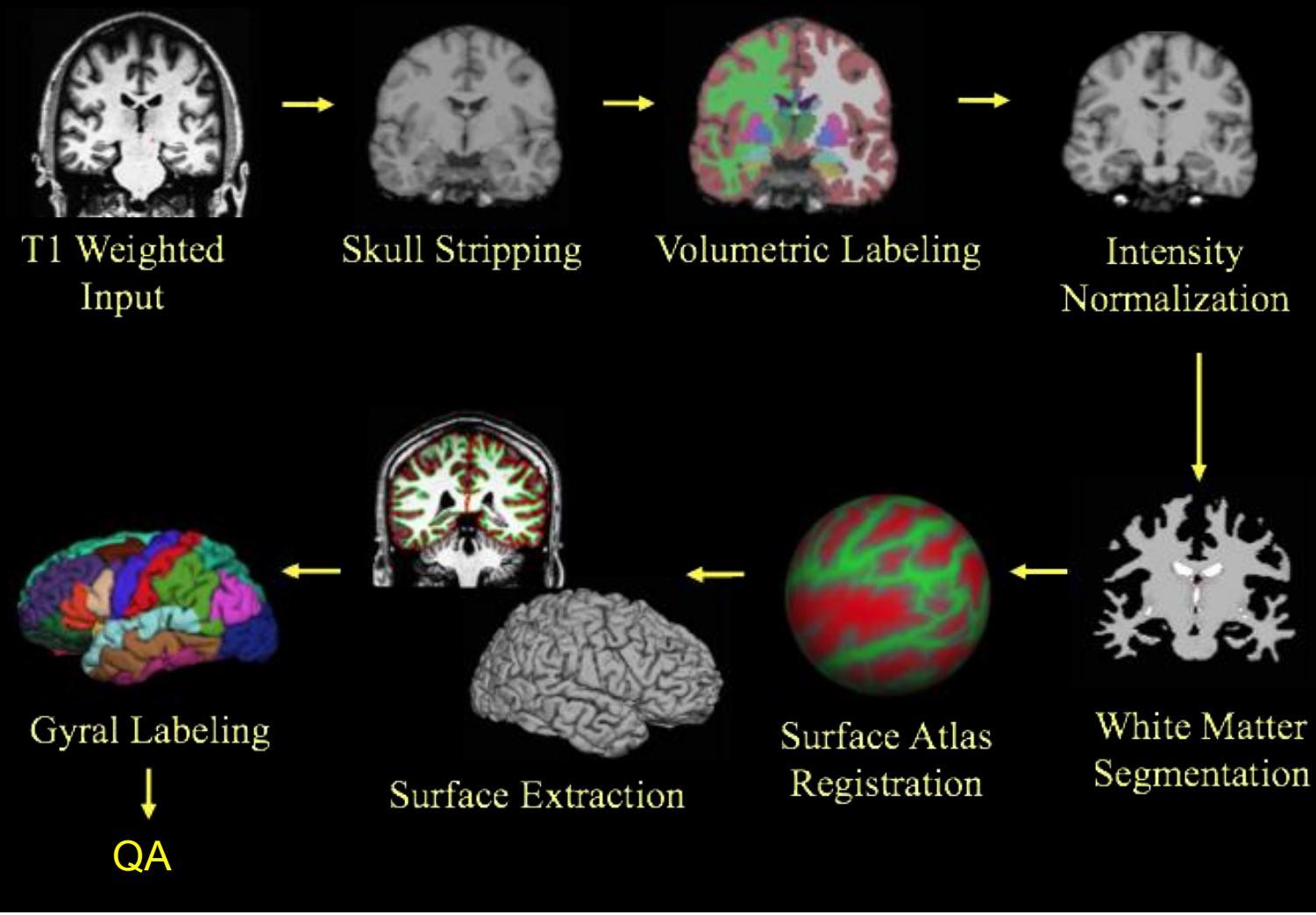
QA Methods

- ENIGMA
  - Structure
  - Output
  - Results
- BBL
  - Structure
  - Whole-Brain Measures
  - ROI Measures
  - Results

Final Results

Introduction to FreeSurfer

Processing Stream Overview

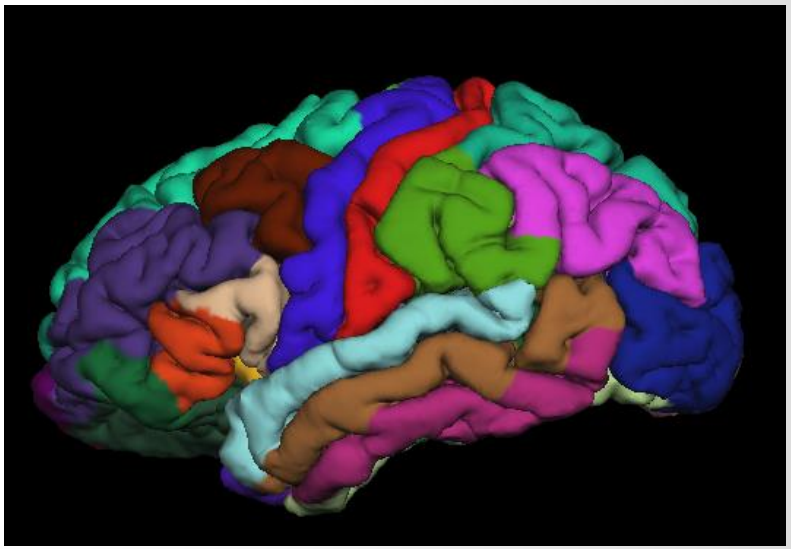


FreeSurfer Output

Quantitative
- Cortical

Thickness
- Surface Area
- Curvature
- Depth

External Construction



QA Methods

ENIGMA QA Structure

34 cortical ROIs
0 Subcortical ROIs (previous subset)

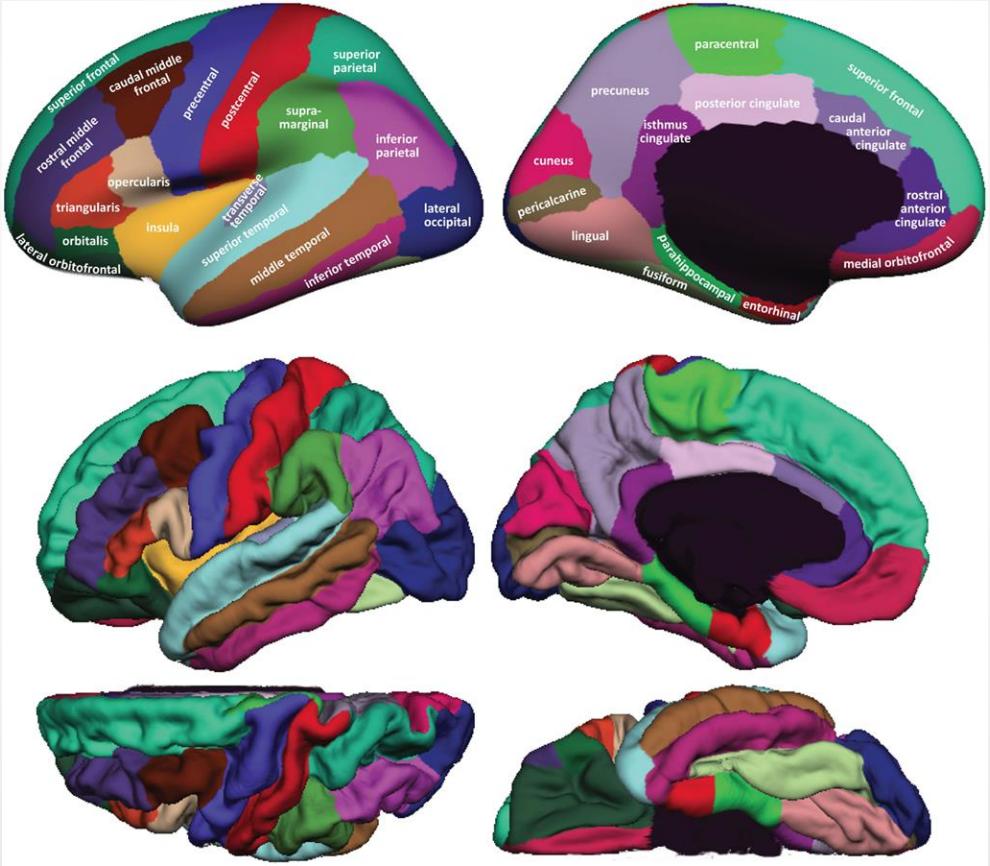
Flag outliers using R

- 2 SD for each respective measure

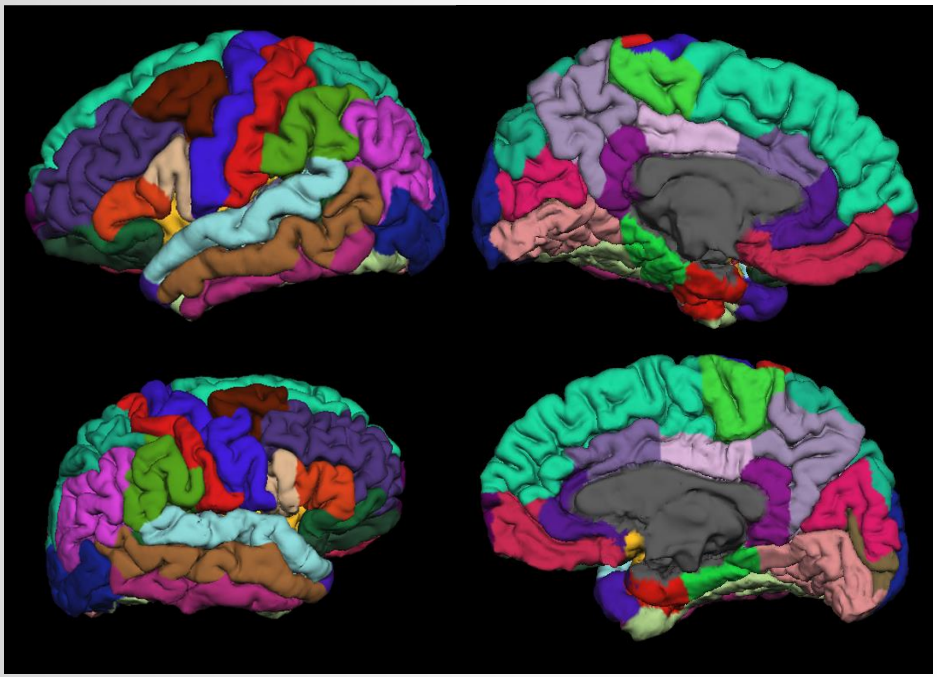
External method

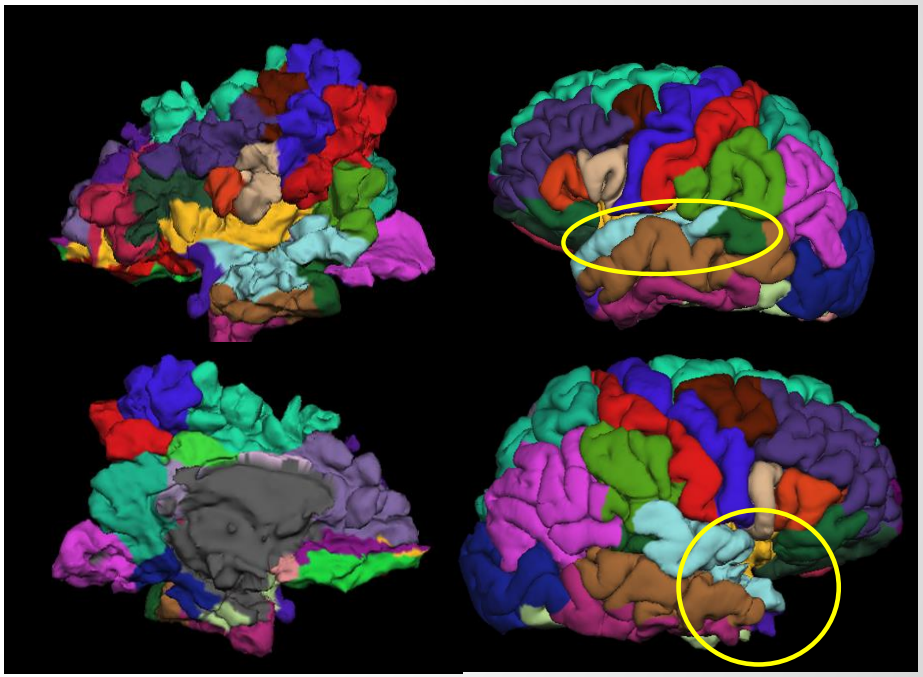
- visual inspection of lateral and medial snapshots of pial surface reconstructions

Visual Inspection



ENIGMA Output





ENIGMA Results

Subject Level ROIs Flagged

- Thickness: 0.716%
- Surface Area: 0.888%

Excluded

- Thickness: 0.91%
- Surface Area: 1.04%

Total subjects excluded: 2

BBL QA Structure

Quantitative approach: considers both whole-brain and ROI-based statistical measures

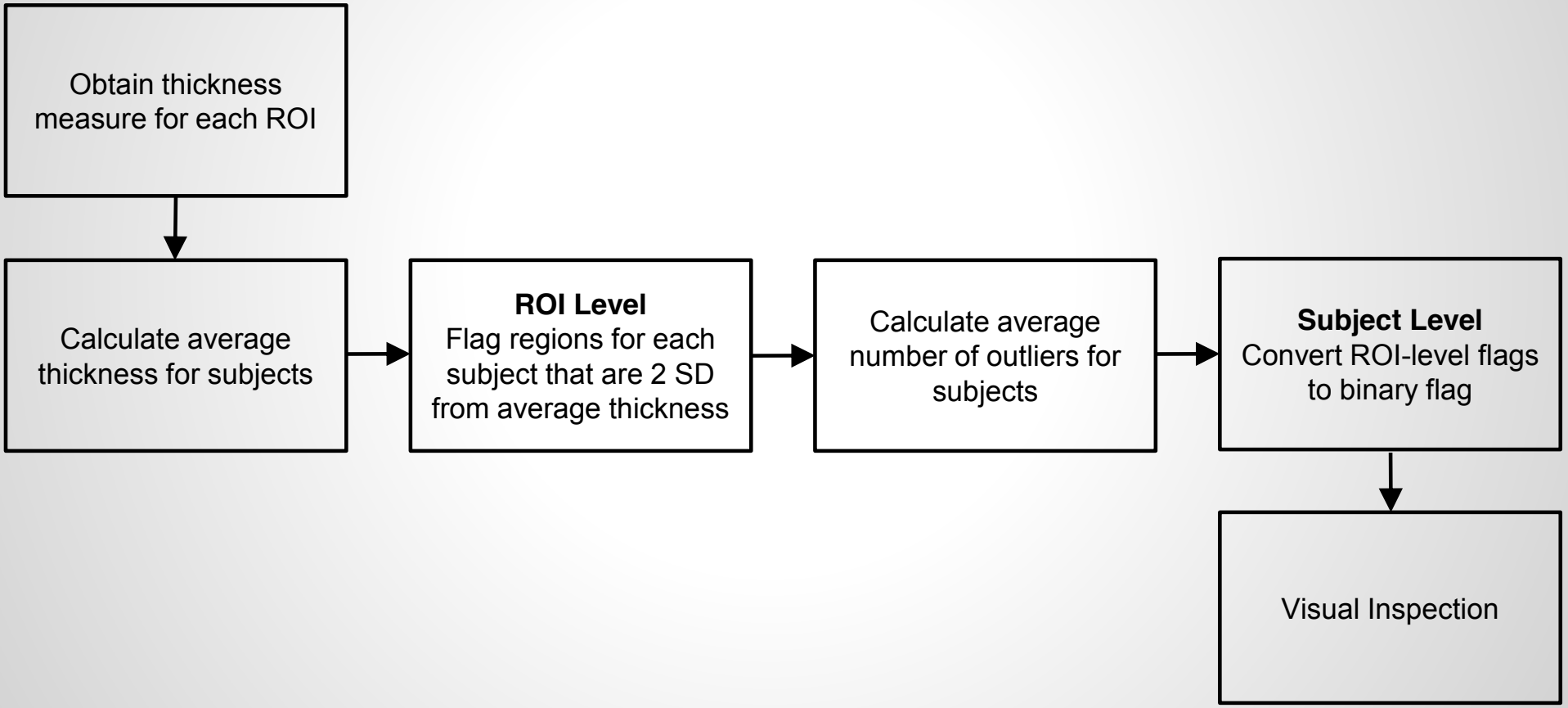
Flag outliers based on 2 SD for

- hemispheric thickness and total area
- cnr and snr
- volume

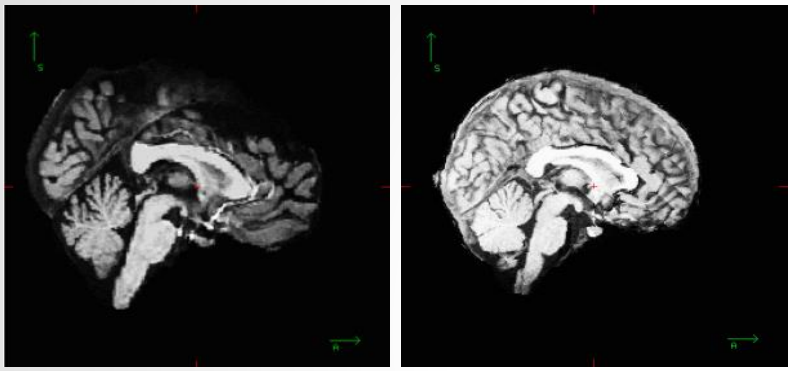
Whole Brain Measures

Measure	# Outliers	SD w/ Outlier	SD w/o Outlier
Mean Thickness	14	0.123	0.110
Total Area	9	20146.377	18513.500
CNR	4	0.119	0.115
SNR	7	3.880	3.628
Subcortical Gray Volume	12	5496.687	5377.020
Cortex Volume	13	64051.834	57009.400
Cortical WM	12	62963.235	56506.000

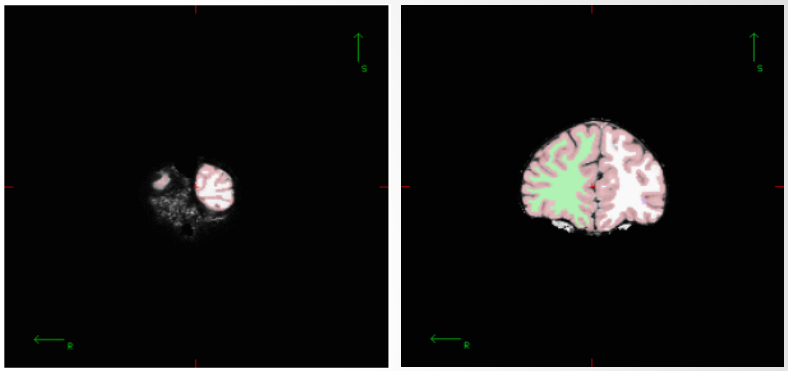
ROI Measures to Subject Flags



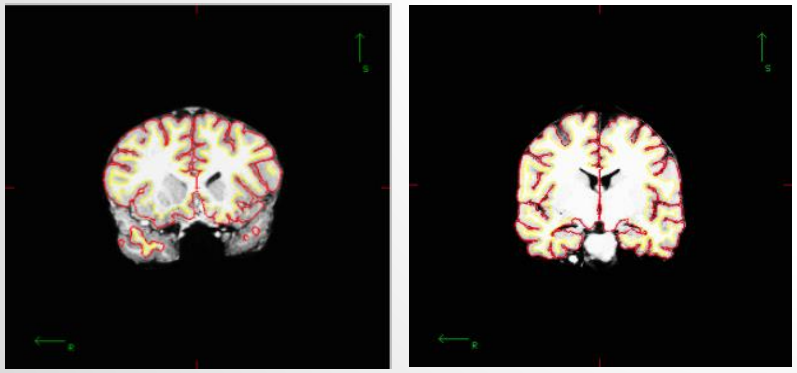
Visual Inspection



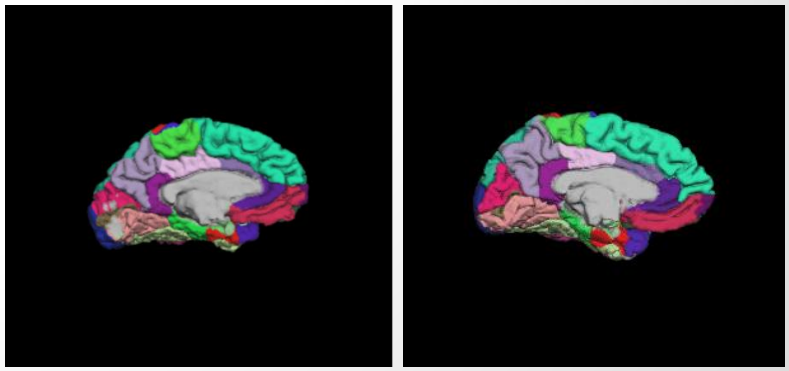
Scan



Labelling



Surface Extraction



Parcellation

BBL QA Results

Flagged: 23

Excluded: 15

- poor scan
- poor volumetric labelling
- poor surface extraction
- poor parcellation (ENIGMA overlap)

Final Results

Good subjects: 272

Failed subjects: 15

- scan: 4
- volumetric labelling: 3
- surface extraction: 6
- parcellation: 2