BRIEF INTRO TO CORTICAL NEUROANATOMY

14 Major Sulci

Main sulci are formed early in development
Fissures are really deep sulci

Typically continuous sulci
- Interhemispheric fissure
- Sylvian fissure
- Parieto-occipital fissure
- Collateral sulcus
- Central sulcus
- Calcarine Sulcus

Typically discontinuous sulci
- Superior frontal sulcus
- Inferior frontal sulcus
- Postcentral sulcus
- Intraparietal sulcus
- Superior temporal sulcus
- Inferior temporal sulcus
- Cingulate sulcus
- Precentral sulcus

Other minor sulci are much less reliable

Source: Ono, 1990
Interhemispheric Fissure

- hugely deep (down to corpus callosum)
- divides brain into 2 hemispheres

Sylvian Fissure

- hugely deep
- mostly horizontal
- insula (purple) is buried within it
- separates temporal lobe from parietal and frontal lobes
Parieto-occipital Fissure and Calcarine Sulcus

Parieto-occipital fissure (red)
- very deep
- often Y-shaped from sagittal view, X-shaped in horizontal and coronal views

Calcarine sulcus (blue)
- contains V1

Cuneus (pink)
- visual areas on medial side above calcarine (lower visual field)

Lingual gyrus (yellow)
- visual areas on medial side below calcarine and above collateral sulcus (upper visual field)

Collateral Sulcus
- divides lingual (yellow) and parahippocampal (green) gyri from fusiform gyrus (pink)
Cingulate Sulcus
- divides cingulate gyrus (turquoise) from precuneus (purple) and paracentral lobule (gold)

Central, Postcentral and Precentral Sulci

Central Sulcus (red)
- usually freestanding (no intersections)
- just anterior to ascending cingulate

Postcentral Sulcus (red)
- often in two parts (superior and inferior)
- often intersects with intraparietal sulcus
- marks posterior end of postcentral gyrus (somatosensory strip, purple)

Precentral Sulcus (red)
- often in two parts (superior and inferior)
- intersects with superior frontal sulcus (T-junction)
- marks anterior end of precentral gyrus (motor strip, yellow)
Intraparietal Sulcus

- anterior end usually intersects with inferior postcentral (some texts call inferior postcentral the ascending intraparietal sulcus)
- posterior end usually forms a T-junction with the transverse occipital sulcus (just posterior to the parieto-occipital fissure)
- IPS divides the superior parietal lobule from the inferior parietal lobule (angular gyrus, gold, and supramarginal gyrus, lime)

Slice Views

- inverted omega = hand area of motor cortex
Superior and Inferior Temporal Sulci

Superior Temporal Sulcus (red)
- divides superior temporal gyrus (peach) from middle temporal gyrus (lime)

Inferior Temporal Sulcus (blue)
- not usually very continuous
- divides middle temporal gyrus from inferior temporal gyrus (lavender)

Superior and Inferior Frontal Sulci

Superior Frontal Sulcus (red)
- divides superior frontal gyrus (mocha) from middle frontal gyrus (pink)

Inferior Frontal Sulcus (blue)
- divides middle frontal gyrus from inferior frontal gyrus (gold)
  orbital gyrus (green) and frontal pole (gray) also shown

Frontal Eye fields lie at this junction
Medial Frontal

- superior frontal gyrus continues on medial side
- frontal pole (gray) and orbital gyrus (green) also shown

Learning More Anatomy

- beautiful pictures
- clear anatomy
- slices of real brain

Damasio, 1995, Human Brain Anatomy in Computerized Images
- good for showing sulci across wide range of slice planes
- really crappy reconstructions

Ono, 1990, Atlas of the Cerebral Sulci
- great for showing intersubject variability
- gives probabilities of configurations and stats on sulci

- good overview