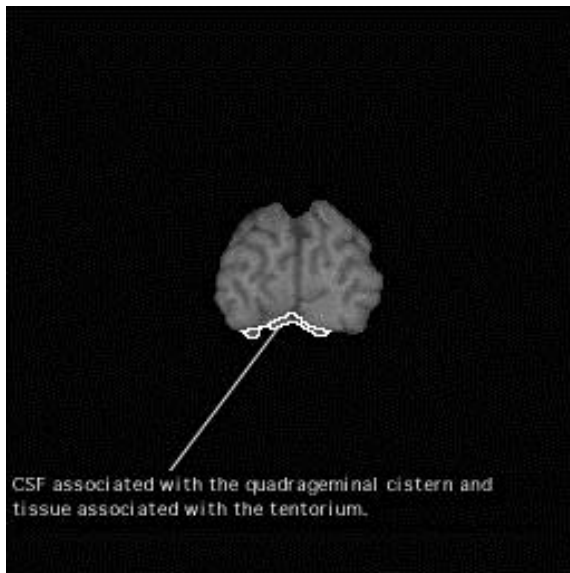


MANUAL DELINIATION OF THE POSTERIOR FOSSA IN THE CORONAL ORIENTATION (v.1.0)

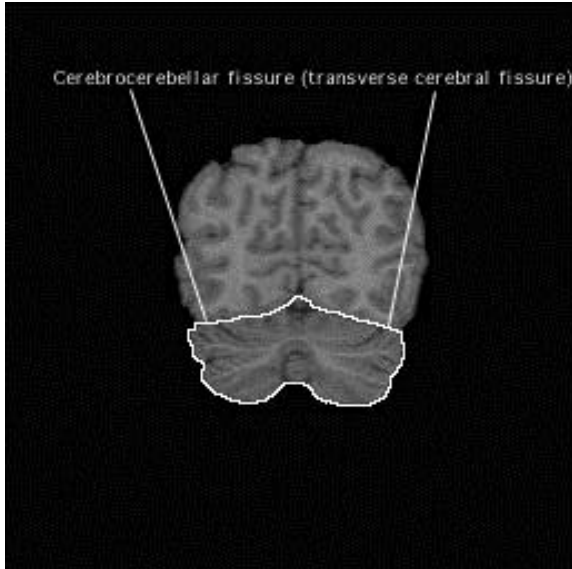
February 1999. Stanford Psychiatry Neuroimaging Laboratory, Stanford University School of Medicine, Stanford, CA 94305
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Notes:

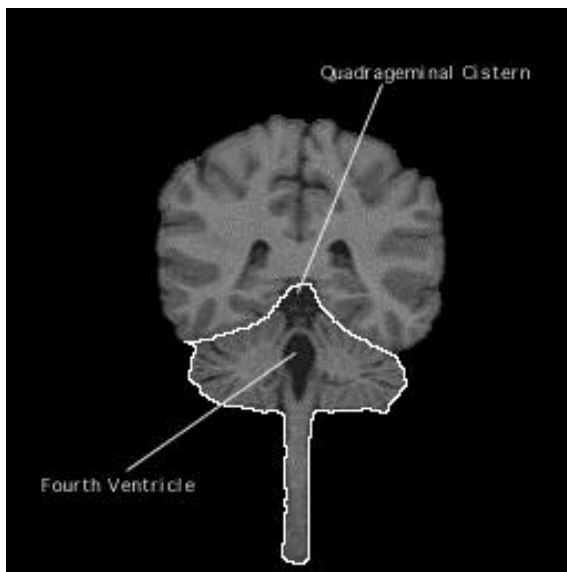
1. Posterior Fossa rois are made on resliced cubic voxel data sets of coronal acquisitions.
 2. Rois should be drawn using the latest version of *BIP* (3.1.9.4 or later) employing the interpolation tool.
 3. Hand drawn ROI's should be drawn on at least every 3rd slice in the stack and on the first and last slices of interest before the interpolation (warping) tool is used.
 4. This protocol describes slice by slice PF drawings from the posterior to anterior end of the edited brain using the *freehand* drawing tool.
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1. On the most posterior end of the brain the inferior border of the cerebrum is the superior border of the posterior fossa (PF). All CSF and tentorial membrane occurring below the inferior border of the cerebrum should be included in the PF ROI on the most posterior slices.



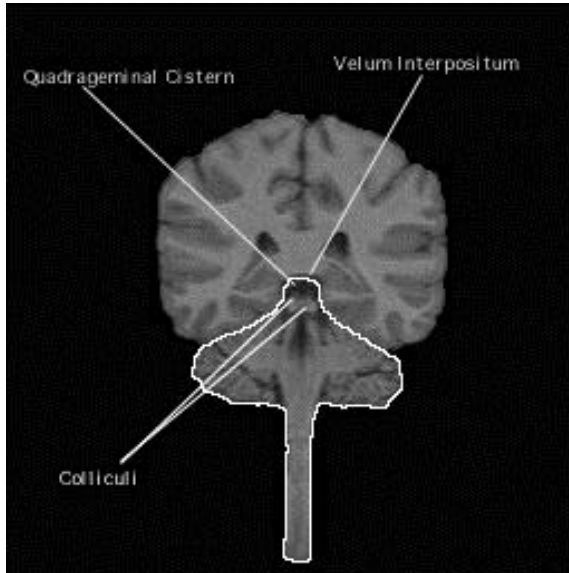
2. Progressing anteriorly through the brain, the superior border of the PF coincides with the cerebroserebellar fissure (transverse cerebral fissure) and extends to the lateral extent of the cerebellum. Inferiorly the PF extends to the inferior border of the cerebellum. The PF is outlined in this way until the posterior ends of the fourth ventricle and brainstem/spinal cord appear.



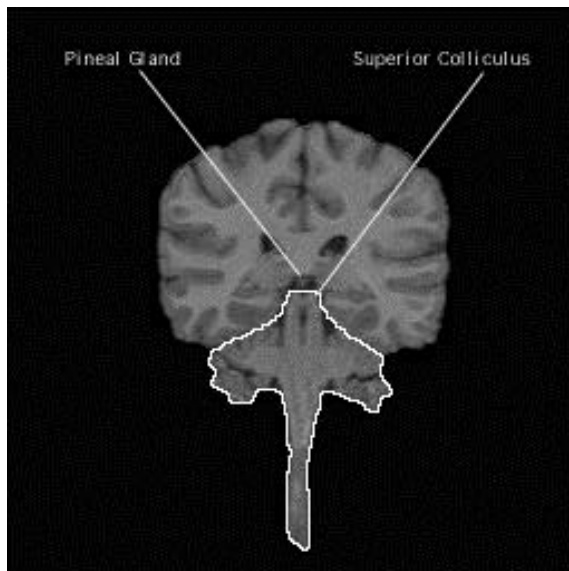
3. The inferior border of the PF now extends to include all the brainstem and spinal cord included in the slice. Lateral boundaries continue to include the lateral extent of the cerebellum. The cerebroserebellar fissure and the roof of the quadrigeminal cistern serve as the superior boundary of the PF. Note that medially the ROI should extend to the top of the fourth ventricle but should not include the small amount of vasculature and tissue (velum interpositum) that may occur just below the splenium of the corpus callosum.

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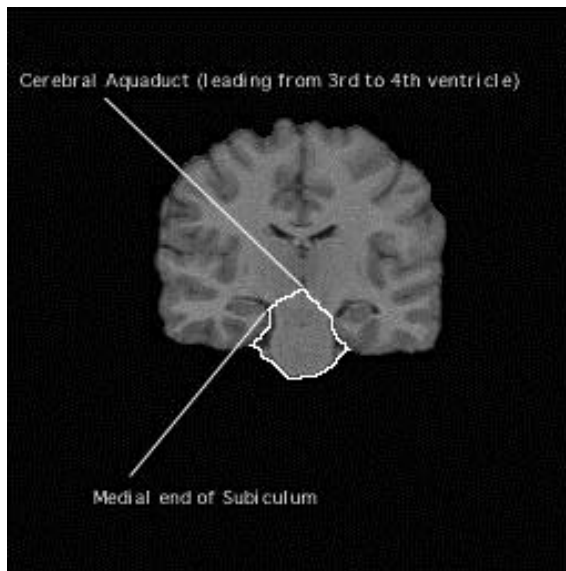
4. Progressing anteriorly, continue to use the roof of the quadrigeminal cistern and cerebrocerebellar fissure as the superior border of the PF. Include both the superior and inferior colliculi in the ROI.



5. Progressing anteriorly the quadrigeminal cistern collapses and the pineal gland appears above the superior colliculus. At this level the inferior colliculus joins with the superior cerebellar peduncle to form a single continuous structure. The superior border

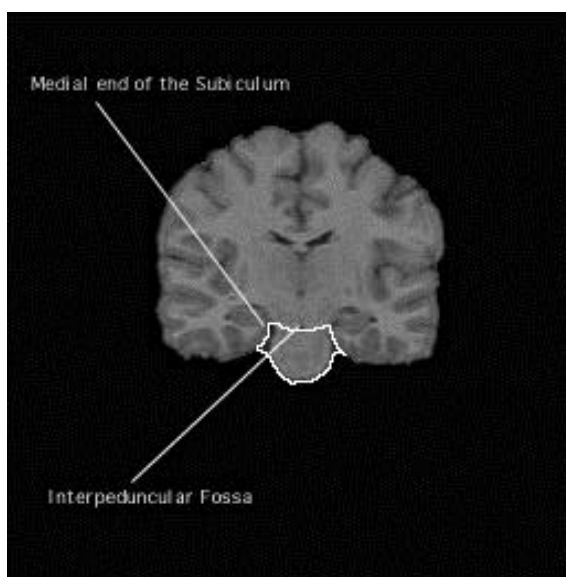


of the PF follows the cerebrocerebellar fissure and over this colliculi/peduncle structure. However it should not include the Pineal gland. Inferiorly continue to include the brainstem/spinal cord in the ROI.



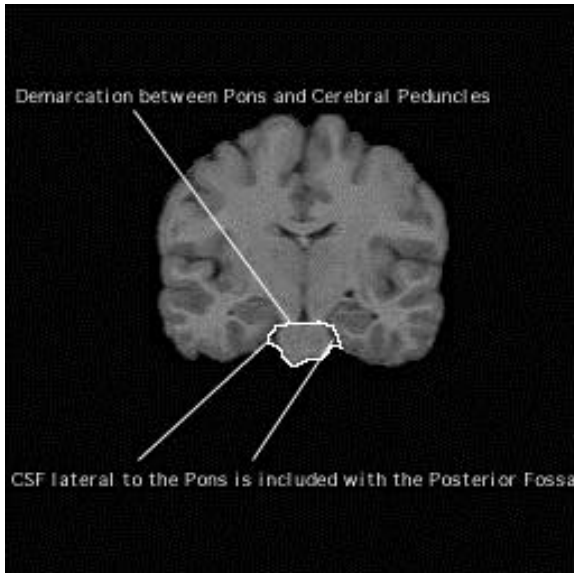
5. Travelling anteriorly the cerebellar peduncles eventually fuse with the thalamus on either side. At this level the fourth ventricle collapses and forms the cerebral aqueduct in between the thalami and peduncles. Drawing a straight line between the base of the cerebral aqueduct to the medial extent of the subiculum makes the superior border of the PF. The subiculum is a white matter tract located just below the hippocampus at this level. This line should be drawn for each hemisphere of the brain independently since each side may join the peduncles with the thalamus at different levels. The lateral border of the PF includes all of the CSF occurring in the cleft between the brainstem and temporal lobe. The inferior border extends to the bottom of the pons (and medulla if it is present).

6. Eventually the cerebral aqueduct widens and ascends to form the third ventricle. At this level the interpeduncular fossa appears just below the substantia nigra and above

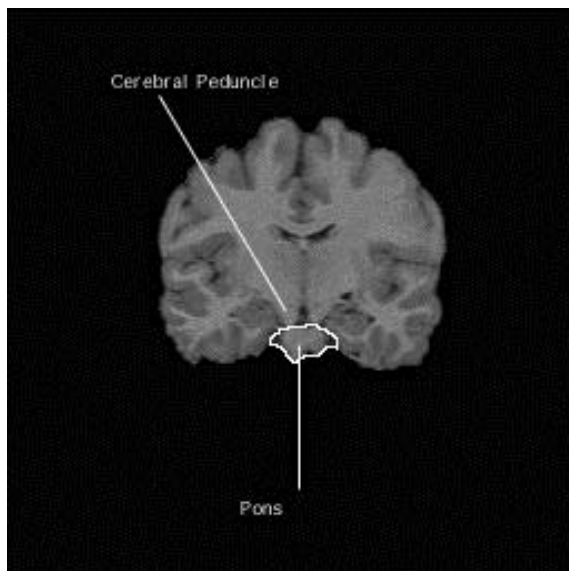


the pons. The superior border of the PF is made by a straight line between the medial extent of the subiculum and the base of the interpeduncular fossa. The lateral extent of the PF includes all CSF occurring lateral to the pons. The inferior extent of the pons is also the inferior border of the PF.

7. Anteriorly the interpeduncular fossa widens to form a distinguishable line between

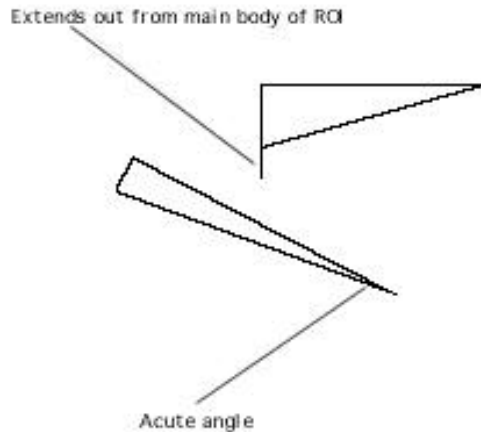


the cerebral peduncles and the pons. The superior border of the PF follows this line and extends downward to include the CSF occurring lateral to the pons. The inferior border again coincides with the extent of the pons. The most anterior portions of the PF essentially consist only of pons and CSF.

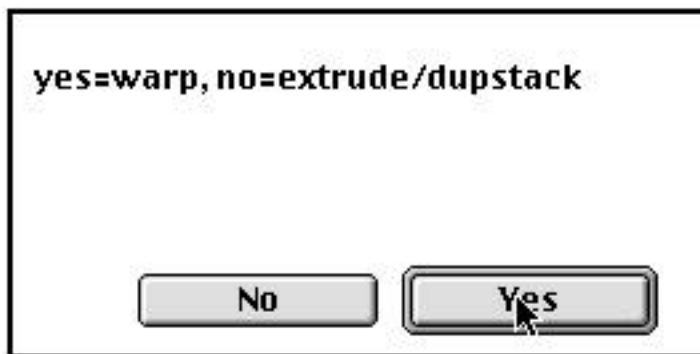


8. ROI Interpolation

As noted above manual ROI's for PF are drawn on every third slice while traveling anteriorly in the brain. ROI's on the remaining slices with PF are interpolated using the "AssertRois" tool included in BIP. Using the interpolation tool requires that none of the manual rois have acute angles (less than 15°) or that any portion of the ROI extends apart from the main body of the ROI shape. For example the following ROI's would not be usable...



Once manual ROI's have been drawn the interpolation is started by the menu selection **Enhance Experiments AssertRois**. A pop up window will give you a yes/no option. Click Yes.



The ensuing interpolation will create a Tempstack with the new set of ROI's loaded onto them. **These are the Posterior Fossa roi's. Save these ROI's in the PDF folder with the following naming convention: SUBJ#_PF.RaterInitials.**

The PF ROI's should be loaded onto the greyscale stack and inspected for accuracy. Ensure that the inferior border of the ROI's include all the brainstem and spinal cord that may occur on particular slices- and reinclude those regions if necessary.

9. Modification after ROI-interpolation.

Just anterior to the cerebellum and at the level of the brainstem the superior border of the PF coincides with the superior border of the superior colliculi/cerebellar peduncles until these structures fuse with the thalami. At this point the superior border includes the cerebral aquaduct (Figure A) and more anteriorly changes to include the most posterior slices with the interpeduncular fossa (Figure B).



Figure A



Figure B

Unfortunately, because ROI's are manually drawn on every third slice many interpolated ROI's encompass "transitional" areas of tissue on slices occurring between the cerebral aquaduct (Figure A) and the interpeduncular fossa (Figure B) as shown in Figure C.

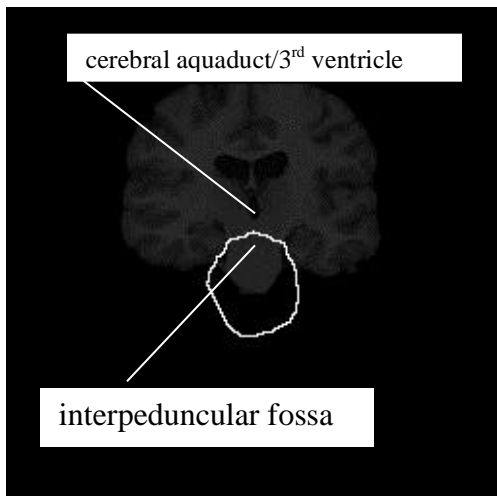


Figure C

On these 2-3 "transitional" slices the superior border of the PF lies between the cerebral aquaduct and the interpeduncular fossa. On slices where no interpeduncular fossa is

apparent the superior border should be edited to include the 3rd ventricle/cerebral aquaduct as in more posterior slices. Progressing anteriorly the 3rd ventricle/cerebral aquaduct continues to be the superior border of the PF until the interpeduncular fossa is distinguishable. On this slice the superior border changes to include the interpeduncular fossa and no longer includes the 3rd ventricle. Consequently on two adjoining slices (Figure D) the superior border changes dramatically.

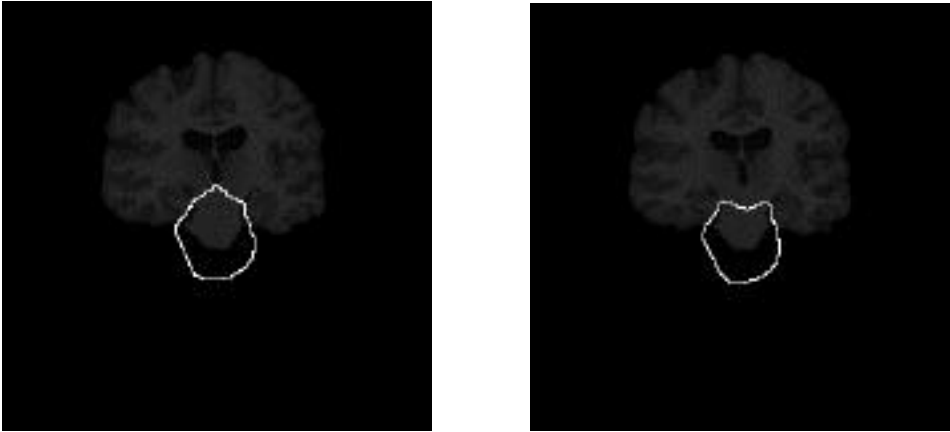


Figure D: Posterior slice with PF (left) and adjoining anterior slice (right)