CT INNER EAR PROTOCOL

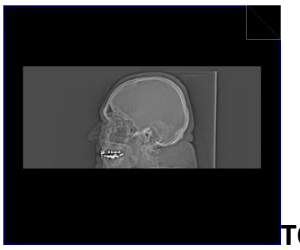
PATIENT POSITIONING:

Patient lying supine on CT table, with head in head rest. Head in neutral position, chin slightly elevated to avoid scanning over the eyes. Soft cushions placed next to the ears, and head strapped in lightly over forehead for immobilization.

SCAN PROTOCOL

TOPOGRAM:

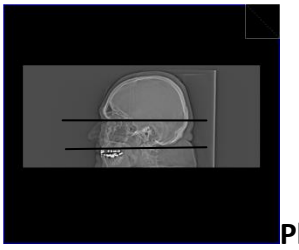
- Lateral topogram
- mA: 35
- KV: 120
- Slice thickness: 0.6mm
- Length of topogram: 256cm
- Scan direction: craniocaudal



TOPOGRAM

INNER EAR SCAN:

- Plan on topogram to scan from the top of the ear to the base of the skull, including the mastoids
- Effective mAs: 350
- KV: 120
- Slice: 0.6mm (acq 12 x 0.6mm)
- Pitch: 0.8
- Scan direction: caudocranial
- Care dose: switched OFF



Planning for scan

RECONSTRUCTIONS WITHIN THE EXAMINATION CARD

1. **AXIAL RECONSTRUCTION RIGHT & LEFT EAR**

- Slice thickness: 0.6mm
- Recon increment: 0.4mm
- Recon Job type: axial
- Kernel: U90u ultra sharp
- Window: inner ear

2. **AXIAL RECON OF RIGHT EAR**

   A localized axial reconstruction of only the right ear is done, using the same parameters as reconstruction 1.

3. **AXIAL RECON OF LEFT EAR**

   A localized axial reconstruction of only the left ear is done, using the same parameters as reconstruction 1.

4. **AXIAL RECON OF RIGHT EAR (FOR COCHLEAR IMPLANT)**

   A localized axial reconstruction of only the right ear is done, using the same parameters as reconstruction 1, but the kernel must be changed to U70u sharp.

5. **AXIAL RECON OF LEFT EAR (FOR COCHLEAR IMPLANT)**

   A localized axial reconstruction of only the left ear is done, using the same parameters as reconstruction 1, but the kernel must be changed to U70u sharp.

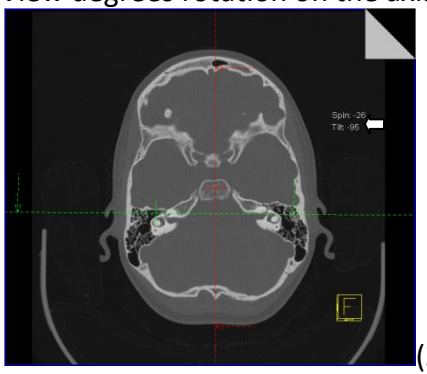
Reconstruction jobs 1, 2 and 3 are loaded into **3D.**
Reconstruction jobs 4 and 5 are loaded into **inspace.**

RECONSTRUCTIONS WITHIN THE 3D CARD

1. Load the 1st reconstruction job (axial recon of right and left ears) into the 3D card. On the sagittal image, rotate the axial line through the anterior and posterior limbs of the lateral semi-circular canals. (see image 1).

(1)

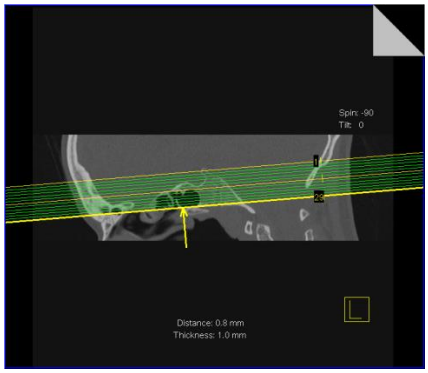
View degrees rotation on the axial image (see image 2). eg -95



(2)

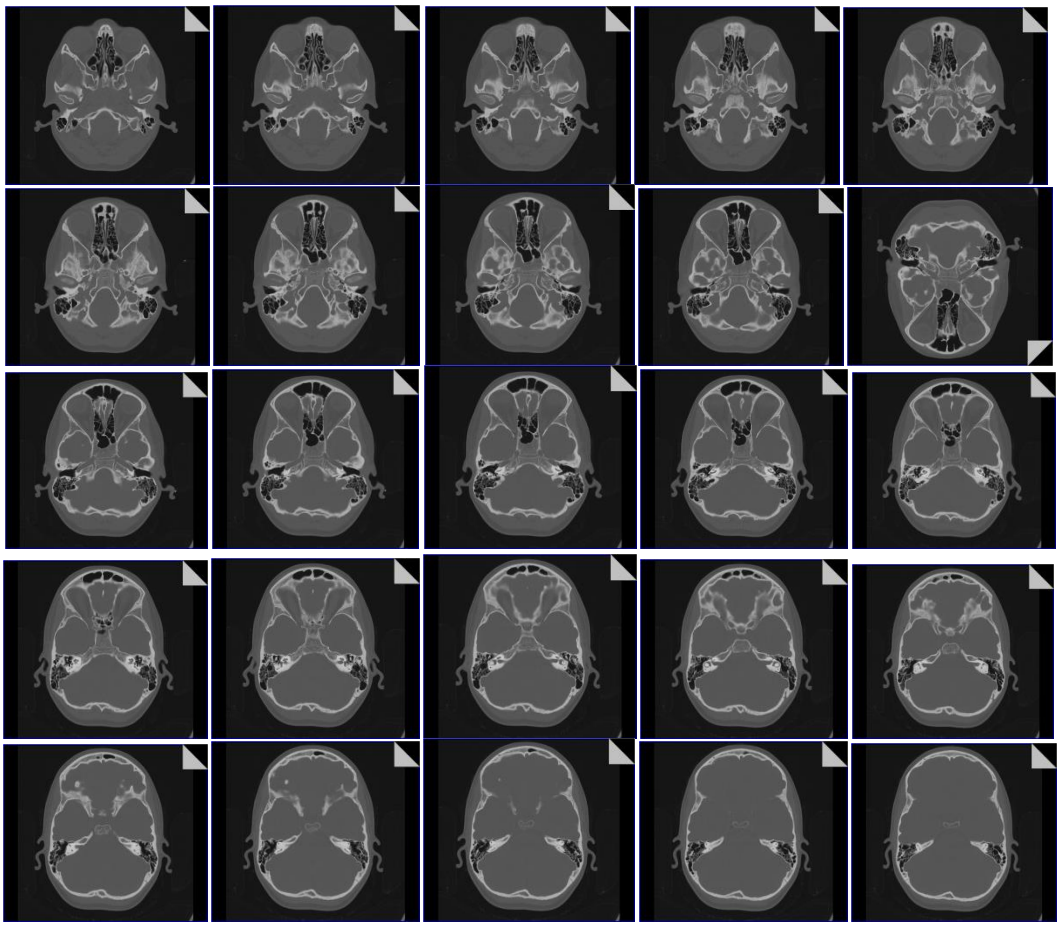
Place parallel ranges on the axial line in the sagittal images with the following parameters:

1.0mm slices with 0.8mm distance = 29 slices (see image 3)

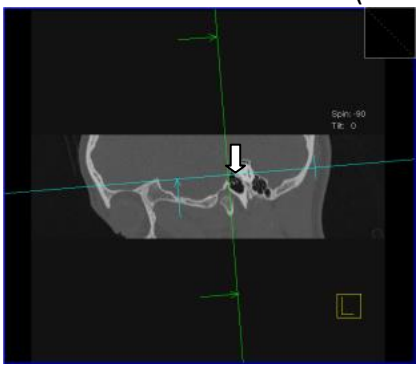


(3)

Make sure that images are symmetrical and not rotated. See series below:



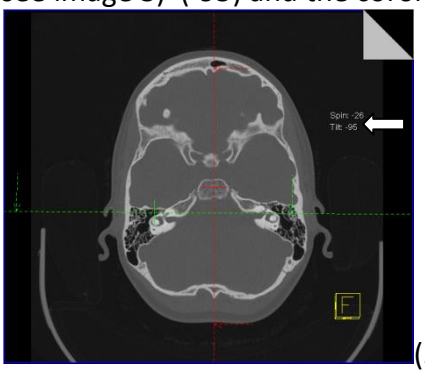
2. Load the 1st reconstruction job (axial recon of right and left ears) into the 3D card. On the sagittal image, rotate the axial line through the anterior and posterior limbs of the lateral semi-circular canals (see image 1)



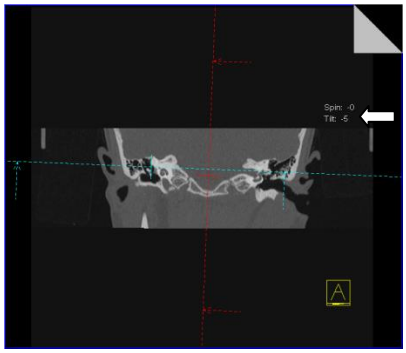
Now rotate the coronal line on the sagittal image perpendicular to the axial line (see Image 2)

(2)

Verify that the rotation is correct by checking the degrees rotation of the axial image (see image 3) (-95) and the coronal image (see image 4) (-5)



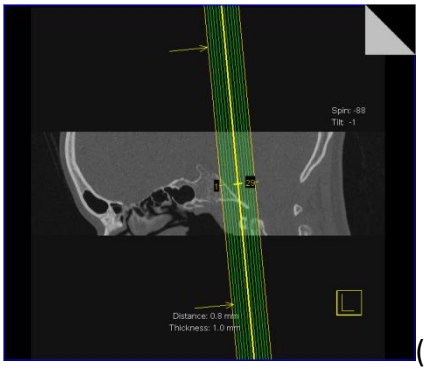
(3)



(4)

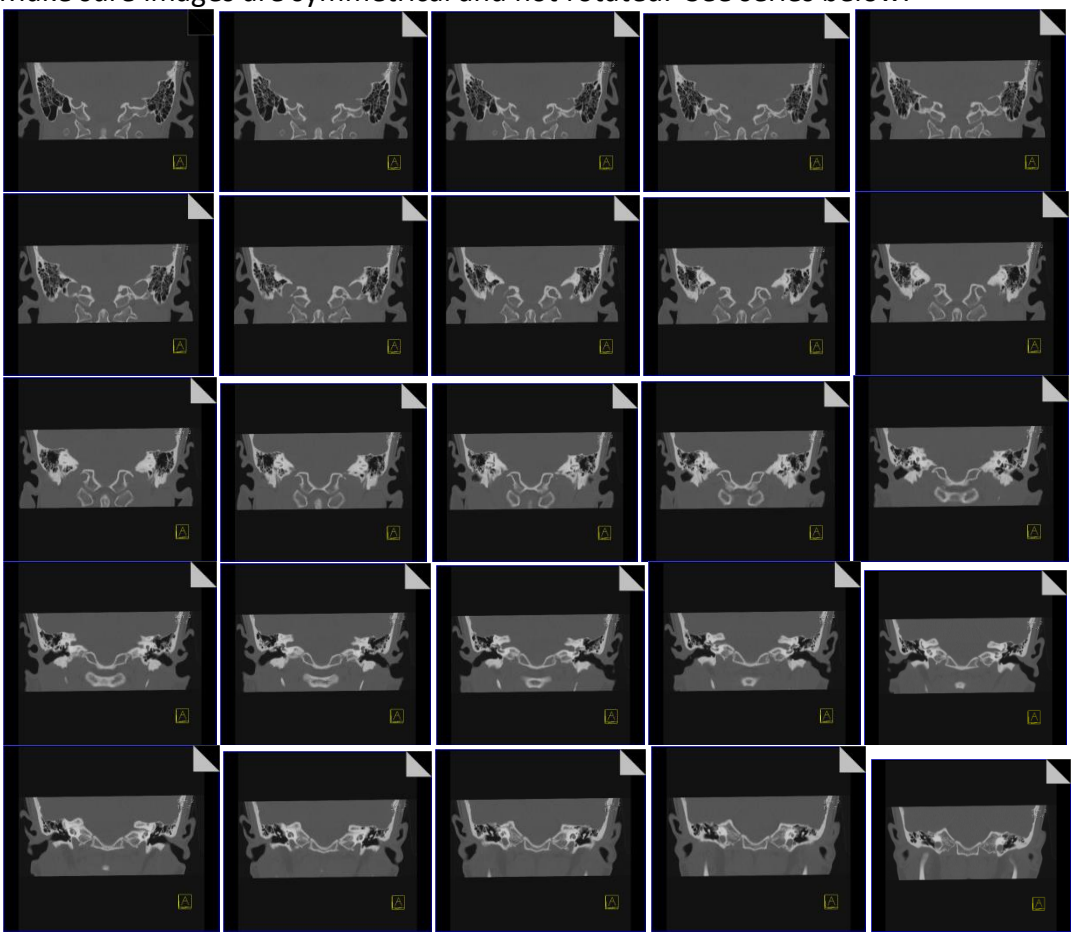
Place parallel ranges on the coronal line on the sagittal image with the following parameters:

1.0mm slices with a distance of 0.8mm = 29 slices (see image 5)



(5)

Make sure images are symmetrical and not rotated. See series below:



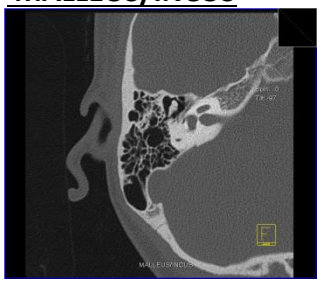
3. Load reconstruction job 2 (axial recon of right ear) and job 3 (axial recon of the left ear) respectively into the 3D card. On the sagittal image rotate the axial line through the anterior and posterior limbs of the lateral semi-circular canals and rotate the coronal line perpendicular (90 degrees) to the axial line. (see image 1)


(1)

Now image the following:

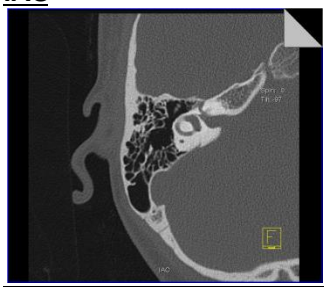
ON THE AXIAL IMAGES:

1. **MALLEUS/INCUS**



2. **BASAL TURN**

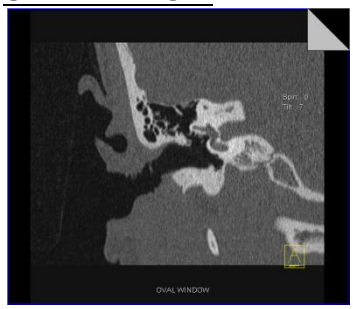
3. **IAC**



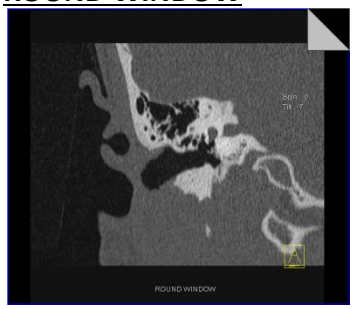
ON THE CORONAL IMAGES:

1. **MALLEUS/INCUS**

2. **OVAL WINDOW**



3. **ROUND WINDOW**



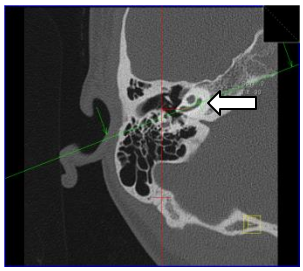
ON THE SAGITTAL IMAGES:

1. **SAGITTAL ROUND WINDOW**

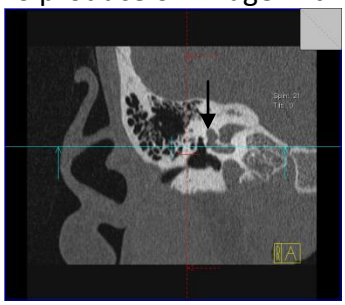
SPECIALIZED RECONSTRUCTIONS WITHIN THE 3D CARD

1. **BASAL TURN**

   Load the axial reconstruction of the R or L ear respectively into the 3D card. No rotation of the axial or coronal lines on the sagittal image must be done. On the axial image, rotate the coronal line through the basal turn (see image below)



To produce on image in the coronal plane that looks like this:



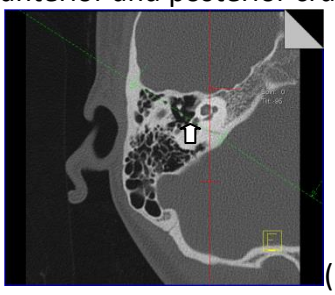
BASAL TURN

2. DOUBLE OBLIQUE

Load the axial reconstruction of the R or L ear respectively into the 3D card. On the sagittal image, rotate the axial line through the anterior and posterior limbs of the lateral semi-circular canals.
(See image 1)


(1)

On the axial image, rotate the coronal line through the incus and the centre of the anterior and posterior crus (see image 2)


(2)

On the coronal image, rotate the axial line through the “tail” of the malleus/incus and the oval window. (see image 3)

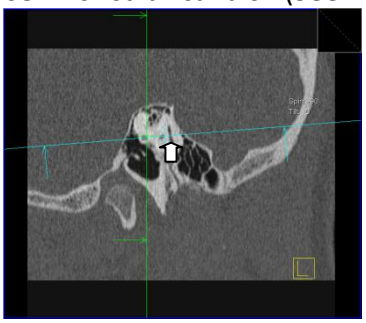

(3)

This will give an image in the axial frame that looks like this:


DOUBLE OBLIQUE

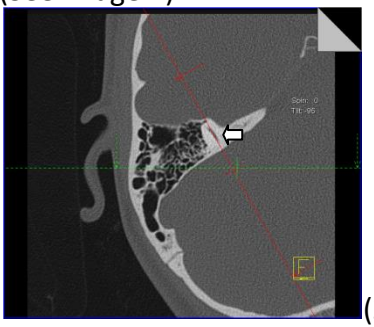
3. **POSCHEL VIEW**

Load the axial reconstruction of the R or L ears respectively into the 3D card. On the sagittal image, rotate the axial line through the anterior and posterior limbs of the lateral semi-circular canals. (See image 1)



(1)

On the axial image, rotate the sagittal line through the superior semi-circular canals (See image 2)



(2)

This will give an image in the sagittal frame that looks like this:

POSCHEL VIEW

INSPACE RECONSTRUCTION FOR COCHLEAR IMPLANTS

Load reconstruction jobs 4 and 5 respectively into INSPACE.

Select a modality preset (which will have to be installed/set up by an application specialist) and using the VOI clipbox and cutting tools, obtain images as shown below: