GE Healthcare   **TiP Training in Partnership**

Volume Rad (Tomosynthesis) Reference Guide

What is Volume Rad (Tomosynthesis):

Volume Rad involves a series of x-ray exposures during a single tomographic sweep with a fixed image receptor; the system then reconstructs the data in order to visualize multiple level planes (slices) from the surface of the image receptor up through the imaged anatomy. Volume Rad removes overlapping/overlying structures and enhances the conspicuity of anatomy in the different slices. The Figures below illustrate the 4 Volume Rad configurations:

1-Table Sweep   2-Wall Sweep Vertical   3-Wall Sweep Horizontal (Extended only)   4-Wall Sweep Cross Table Lateral

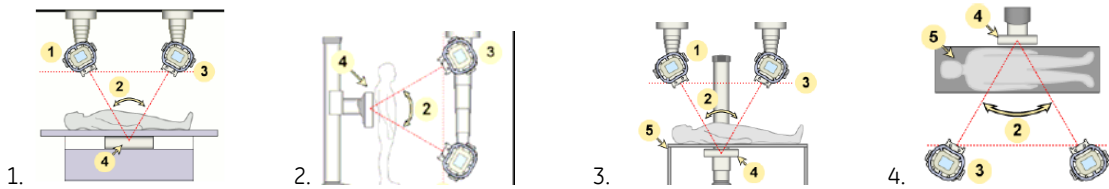1.   2.   3.   4.

Image Acquisition:

- Select appropriate Patient Demographics from Worklist or Manual data entry
- Select appropriate Protocol from Protocol Database (Volume Rad)
- Position patient, OTS and Image Receptor
- Take Volume Rad Scout acquisition to confirm positioning, collimation and technique. Multiple scouts may be taken for better positioning or improved technical parameters, by selecting "Retake Scout" button.
- Press and Hold the Auto Positioning button in the RCIM until OTS is in position for Volume Rad sweep.
- Press and Hold the Exposure button, until the sweep has finished and acquisitions are complete

Note: There are a fixed number of Raw images and Reconstructed slices that are dependant on protocol. Refer to Operators Manual.

Image Review:

The Image Viewer displays all acquisitions and reconstructed images. To view slices in sequence, Double Click on the image, and use the PAGE UP and PAGE DOWN buttons on the keyboard. Any adjustments (brightness, contrast, rotation, etc) made on one image/slice are applied to ALL images/slices in that series.

Add Image Annotation:

- Select Annotation button, Type, and move Annotation
- Click APPLY TO ALL SLICES if desired
- Annotations may be deleted with ERASE or ERASE ALL

Applying Quality Control Tags:

Quality Control Tags may be applied to all images in a Volume Rad series or to specific slices.

- Click Quality Control Tags
- Select the slices to which the Tag should be applied (All or Slices)
- Slices: allows you to type the number of the slice(s), a range of slices, or a combination of slices

The Anatomy of a Volume Rad Slice:
- Volume Rad slices are not uniform blocks or slabs of data. (Similar to conventional Tomography).
- Volume Rad Slices have a "Spread" or "Profile" along the long axis of the tube movement.
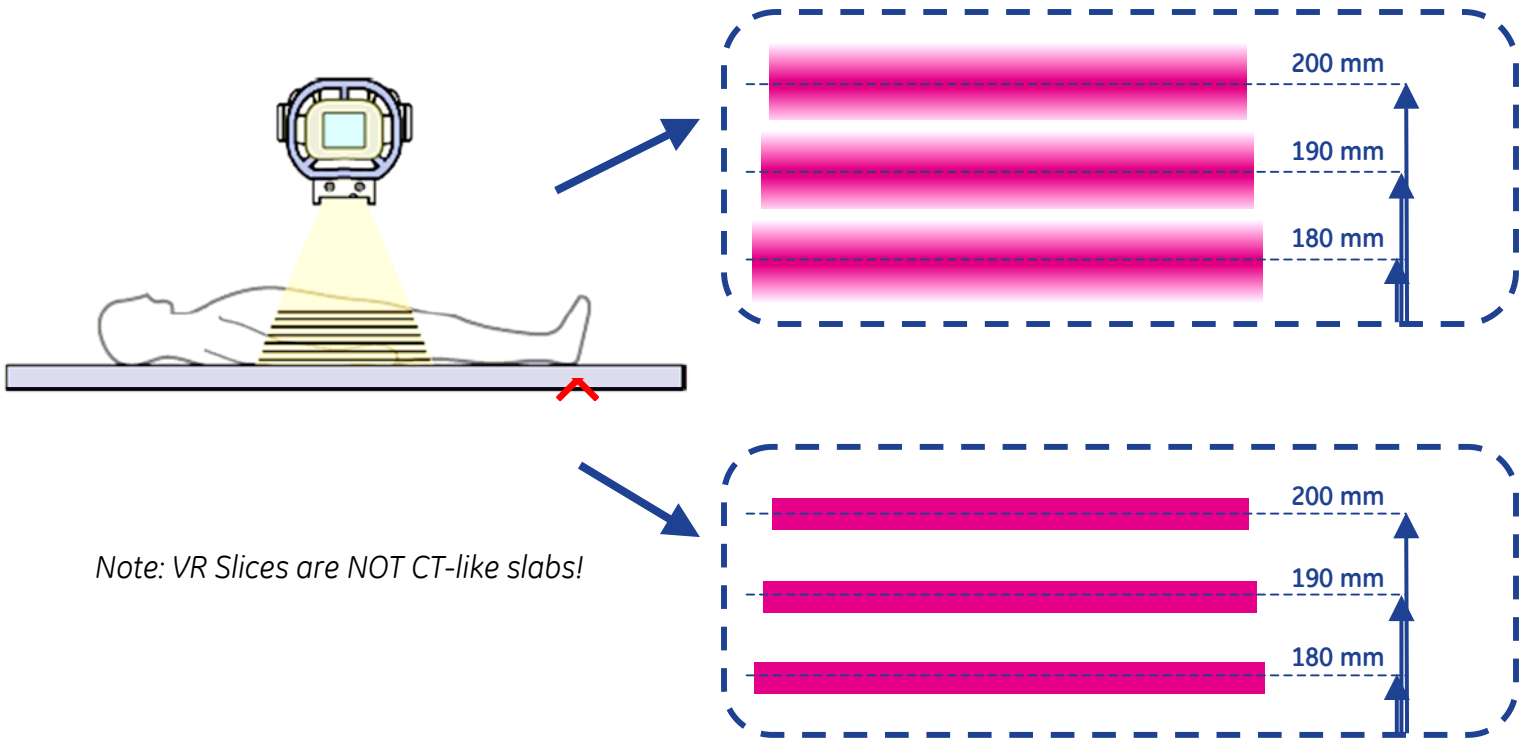
Note: VR Slices are NOT CT-like slabs!

VR Slice Reconstruction Parameters:
- Start Height = Height (in mm) of the First slice from the tabletop/wall stand
- End Height = Height (in mm) of the last slice from tabletop/wall stand
- Slice Interval = Distance Between 2 slices
- Sampling Factor = Number of Reconstructed slices averaged together for display

Note: The same data from a single clinical exam can be retrospectively reconstructed with different settings.
Note: All Volume Rad Default reconstruction parameters are listed on Table A-1 Pages 327-332 of the OM.

Reprocessing Images (Adjust Slices):
- Select the Image Processing Tab
- Determine and Input the above-mentioned Recon Parameters (Start Height, End Height, Slice Interval and Sampling)
- Select Appropriate Anatomy, View, Image Type, Patient Size, and Look from the Drop Down Menus.
- Click RECON button. Newly Reconstructed images will begin to appear in the image viewer as a new Series.
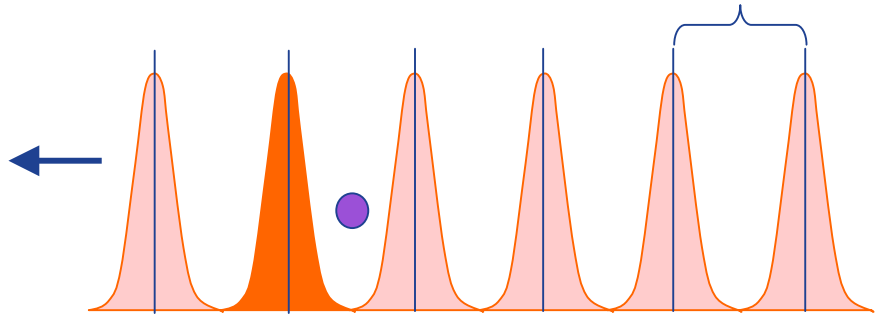
VolumeRAD Slices
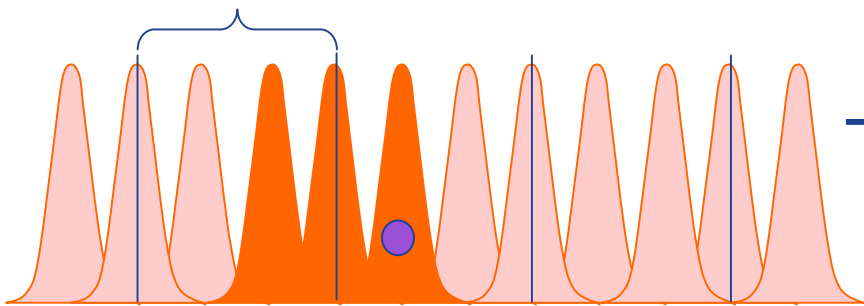
Sampling Factor = 1
Slice Interval = 1
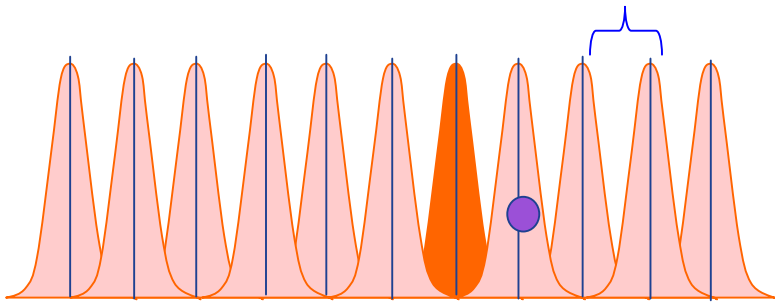
More slices,
High resolution

Sampling Factor = 1
Slice Interval = 2

Increase Slice Interval, Less slices, Small structures in between slices may be less visible
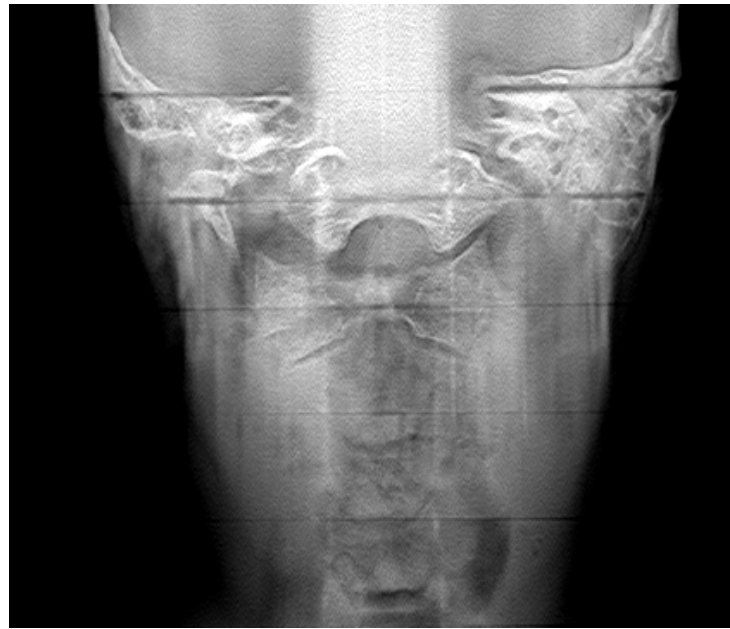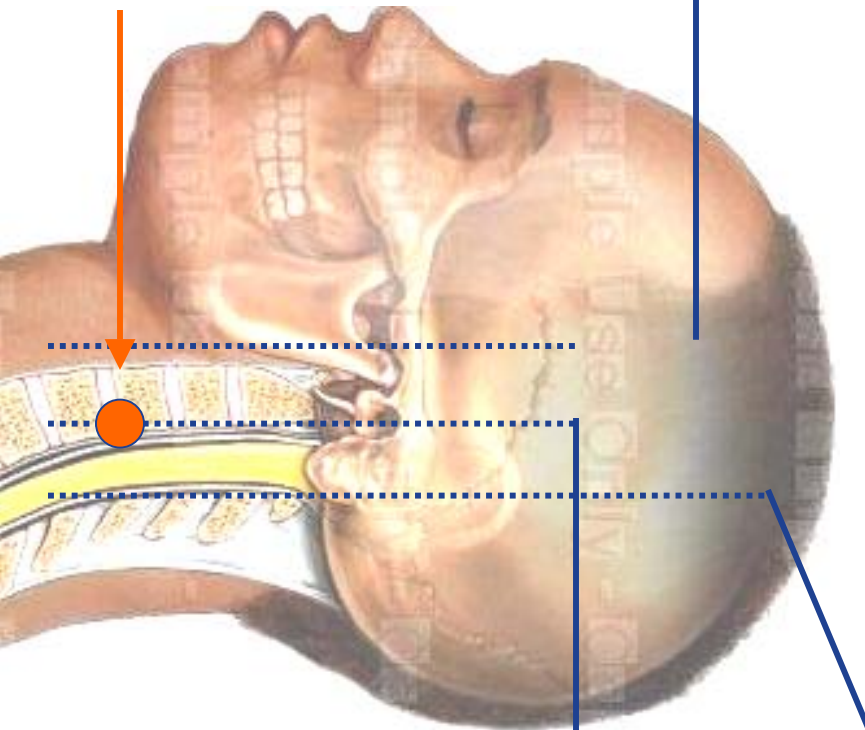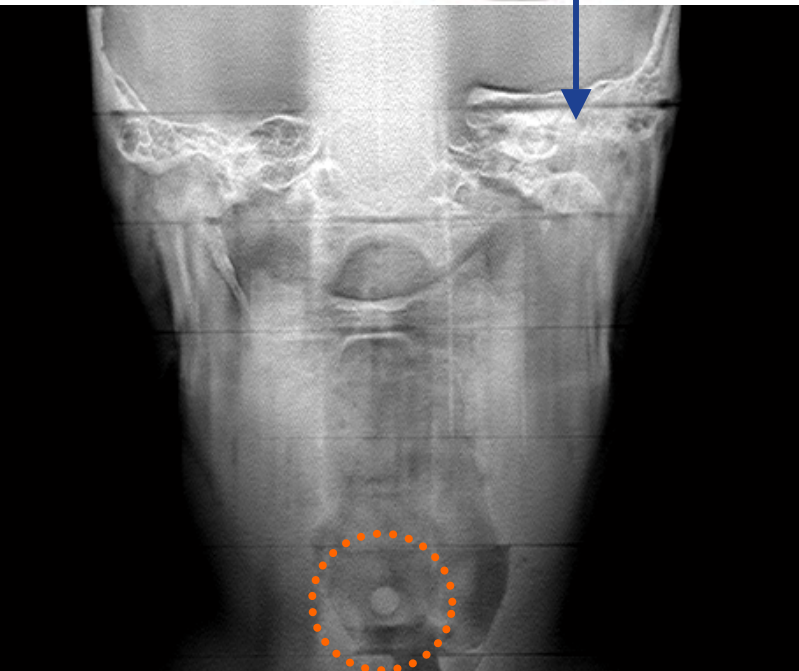

Sampling Factor = 3
Slice Interval = 3

Increase Sampling Factor,
Same # of slices, Lower risk of missing structures

General Electric Company

1/4" polymer ball

1/4" polymer ball

Slice Interval for VolumeRad Images