



## MR Abdomen Protocol – Pancreas/MRCP with Contrast

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**Standard uses:** Characterization of cystic and solid pancreatic lesions. Evaluation of biliary tree pathology such as: jaundice, cholestatic LFTs, elevated Alk Phos, elevated bilirubin, bilirubinemia, etc.)

**FYI:** This is similar to a liver protocol MRI, but FOV tailored to pancreas with addition of MRCP sequences. Try to cover as much liver as possible as this is a common organ for metastases from pancreatic cancers.

**Patient prep:** Should be NPO for >4 hours prior to study if possible.

**Oral contrast:** None.

**Coil:** Body Coil.

**Coverage:** Position the coil such that there is good coverage and signal from the pancreas.

**Intravenous contrast:** Single dose gadolinium.

Adult - 0.5 mmol/mL, maximum 20mL. Administer 2mL per second, example - MultiHance/ProHance/Doterem  
0.25 mmol/mL, maximum 10mL, Administer 1.5mL per second, example – Gadavist, Eovist

**Anti-peristaltic agent:** None.

### SUMMARY:

1. Localizer BH  
Localizer Free Breathing
2. Cor HASTE
3. Ax HASTE
4. Ax HASTE FS
5. Ax In-Out of Phase
6. Cor Radial HASTE
7. Sag HASTE
8. Ax Diff
9. Cor Space
10. Ax Vibe Pre
11. Ax Vibe Arterial
12. Ax Vibe Venous
13. Ax Vibe 5 min Delay
14. Cor Vibe Post



## **SEQUENCES:**

### **1. Localizer**

- a. Breath hold
- b. Free Breathing

### **2. Coronal T2 Ultra fast SE (HASTE, SSFSE, FASE)**

- a. Multi-breath hold as needed
- b. Complete front to back coverage, A → P, skin to skin.
- c. Goal parameters
  - i. 3 mm thickness, (ACR Slice thickness  $\leq$  7.0 mm, Gap  $\leq$  1.5 mm, Pixel area  $\leq$  7.2 mm<sup>2</sup>)
  - ii. 33% gap (0.9 mm)

### **3. Axial T2 Ultra fast SE (HASTE, SSFSE, FASE) thin slice WITHOUT fat suppression**

- a. Multi-breath holds as needed
- b. Slices should include coverage of the intrahepatic biliary tree, extrahepatic biliary tree and pancreatic duct.
- c. Goal parameters
  - i. 3 mm thickness, (ACR Slice thickness  $\leq$  7.0 mm, Gap  $\leq$  1.5 mm, Pixel area  $\leq$  7.2 mm<sup>2</sup>)
  - ii. 33% gap (0.9 mm)

### **4. Axial T2 Ultra fast SE (HASTE, SSFSE, FASE) thin slice WITH fat suppression**

- a. Multi-breath holds as needed
- b. Slices should include coverage of the intrahepatic biliary tree, extrahepatic biliary tree and pancreatic duct.
- c. Goal parameters
  - i. 3 mm thickness, (ACR Slice thickness  $\leq$  7.0 mm, Gap  $\leq$  1.5 mm, Pixel area  $\leq$  7.2 mm<sup>2</sup>)
  - ii. 33% gap (0.9 mm)

### **5. Axial in and out of phase T1 GRE**

- a. Multi-breath holds as needed
- b. Slices should include coverage of the intrahepatic biliary tree, extrahepatic biliary tree and pancreatic duct.
- c. Goal parameters
  - i. 3 mm thickness, (ACR Slice thickness  $\leq$  7.0 mm, Gap  $\leq$  1.5 mm, Pixel area  $\leq$  7.2 mm<sup>2</sup>)
  - ii. 33% gap (0.9 mm)



**6. Coronal Radial T2 Ultra fast SE (HASTE, SSFSE, FASE) thick slab**

- a. Three thick slab slice groups
  - i. angled to the head of pancreas
  - ii. angled to body of pancreas
  - iii. angled to the tail of pancreas.
- b. Goal Parameters
  - i. 2D Thick Slab:
  - ii. Slice thickness 40 mm, (ACR >40, < 60 mm Pixel area  $\leq 1.0 \text{ mm}^2$ )

**7. Sagittal T2 Ultra fast SE (HASTE, SSFSE, FASE) thin slice withOUT fat suppression**

- a. Multi-breath holds as needed
- b. Slices should include pancreas in its entirety, head  $\rightarrow$  tail, left  $\rightarrow$  right.
- c. Goal parameters
  - i. 3 mm thickness, (ACR Slice thickness  $\leq 7.0 \text{ mm}$ , Gap  $\leq 1.5 \text{ mm}$ , Pixel area  $\leq 7.2 \text{ mm}^2$ )
  - ii. 33% gap (0.9 mm)

**8. Axial DWI with ADC map**

- a. Free breathing
- b. Slices extend from dome of liver to inferior aspects of liver and pancreas to include all intrahepatic biliary tree, extrahepatic biliary tree and pancreatic duct.
- c. Goal parameters
- d. B-values of 0, 600, 800, 1000
  - i. 3 mm thickness
  - ii. 33% gap (0.9 mm)

**9. Coronal 3D T2 TSE (SPACE, CUBE, VISTA)**

- a. First choice if available, preferred "MRCP" sequence
- b. Respiratory navigated
- c. Must cover the central biliary tree including the second order branches. Must cover the entire pancreas. Bile ducts and pancreatic ducts must be well defined
- d. 3D MIP recons with 2 plane rotation, (ACR Requires one)
- e. Goal Parameters
  - i. 1 mm slice thickness, (ACR Slice thickness  $\leq 2.0 \text{ mm}$ , Voxel volume  $\leq 5.2 \text{ mm}^3$ )

**10. Axial T1 Ultra fast 3D-GE with fat suppression (VIBE, LAVA, TIGRE) pre-contrast**

- a. Breath hold



- b. Slices extend from dome of liver to inferior aspects of liver and pancreas to include all intrahepatic biliary tree, extrahepatic biliary tree and pancreatic duct.
- c. Goal parameters
  - i. Slab slices  $\leq 3$  mm, ACR Slice thickness  $\leq 6.0$  mm, Gap = 0 mm, Pixel area  $\leq 4.5$  mm<sup>2</sup>

**11. Axial T1 Ultra fast 3D-GE with fat suppression (VIBE, LAVA, TIGRE) post contrast**

- a. Goal parameters
  - i. Copy pre-contrast
- b. Arterial phase trigger off aorta if possible, otherwise time at 25 seconds

**12. Axial T1 Ultra fast 3D-GE with fat suppression (VIBE, LAVA, TIGRE) Venous Phase**

- a. Goal parameters
  - i. Copy pre-contrast
- b. Venous phase, +35 seconds or 1 minute

**13. Axial T1 Ultra fast 3D-GE with fat suppression (VIBE, LAVA, TIGRE) Equilibrium Phase**

- a. Goal parameters
  - i. Copy pre-contrast
- b. Equilibrium phase, +100 seconds or 2 minutes

**14. Axial T1 Ultra fast 3D-GE with fat suppression (VIBE, LAVA, TIGRE) 5 Minute Delay**

- a. Goal parameters
  - i. Copy pre-contrast
- b. Delay 5 minutes

**NOTE:** Add Subtractions for all phases

**15. Coronal T1 Ultra fast 3D-GE with fat suppression (VIBE, LAVA, TIGRE) post-contrast**

- a. Breath hold
- b. Slices extend to cover the entire liver. Sort Anterior to Posterior
- c. Goal parameters
  - i. Slab slices  $\leq 3$  mm, ACR Slice thickness  $\leq 6.0$  mm, Gap = 0 mm, Pixel area  $\leq 4.5$  mm<sup>2</sup>