Austin Radiological Association

MRI Body Protocols

Adult 1.5T

Questions?

Last Update: 11/20/2024 9:29 AM

1.5T Body Protocols

1.5T Preferred

ACR Requirement – Do Not Adjust

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General Guidelines

BODY	
General	• NEVER hesitate to reach out to a radiologist for guidance!

Technique	• Siemens / GE terminology, other abbreviations:
	  ○ HASTE / SSFSE
	  ▪ 1.5T HASTE – ideal TR 1400, no less than 1200
	  ▪ 3T HASTE – ideal TR 1600, no less than 1200
	  ○ VIBE / LAVA
	  ○ TRUFI / Fiesta
	  ○ FLASH/SPGR/FL2D – with in-phase TE
	  ○ BH – Breath Hold
	• FB – Free Breathing
	• Careful of tight FOVs with the use of iPAT, the combination of the two can lead to artifacts.
	  ○ The FOV should include air on all sides.
	  ○ If using iPAT, must have at least two coil elements on in the phase direction.
	• Dixon – do not send non-fat sat series to PACS.

Protocol	• Volumes of organs - Volume measurement is performed by CT 3D Lab. Reserve study in pending 3D folder in PACS, e-mail *3DPostprocessing with details
	  ○ Prostate volumes are automatically performed in DynaCAD.
	• Prostates
	  ○ HCA Urologist; send images to HCA DynaCAD
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	  – Dr. Chris Yang
	  – Dr. Kouskik Shaw, NPA Alecia Zuehlke
	  – Dr. Lawrence Tsai
	  – Dr. Matthew Pearson, PA Diane Warmoth
	  – Dr. Michael Trotter

	– Dr. Samantha Thiry – Dr. Sandeep Mistry, PA's Dustin Fontenot & Jason Ramsdell, Leonora Brown, RN – Dr. Stacy Ong – Dr. Subir Chhikara, PA's Ashley Dufour & Terry Farley – Heather Lenz, PA o PACS will auto push images to Seton DyncCAD, see Provider Comments for workflow. – Aaron Laviana, MD – Charles Osterberg, MD
Contrast	• Full dose by weight, 3ml/sec, followed by 20ml normal saline flush. o Arterial phase is most crucial with liver imaging. Set up the Care bolus in an axial plane and position slightly inferior to right side diaphragm. Initiate the immediate post once contrast is in descending aorta. o 5-minute wait post injection for delayed post series. • Always perform T1 FS Axial Pre, even if not contrasting • MR Abdomen with immediate post contrast & can be done consecutively with female pelvis oncology or pelvis for rectal mass or cancer. Post pelvis performed after 2-minute abdomen. • Perform DatScans, X-ray / CT abdomen Body imaging prior to MR contrast exams.
Sedation	• MRCP – can sedate, but do not give patient oral contrast agent with radiologist approval. • Enterography – do not sedate. • Defecography – do not sedate.

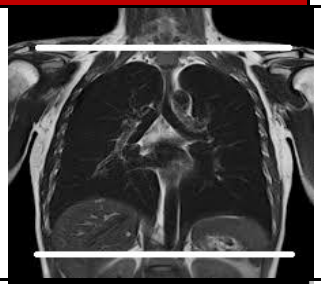
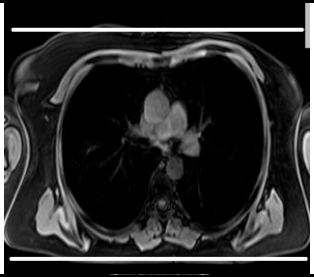
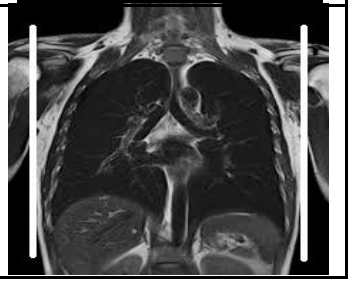
1.5T and 3T Preferred Exams

1.5T	3T
• Appendicitis during Pregnancy • Fetal • Pelvis Placenta Accreta	• Abdomen for Iron and Fat Quantification (LiverLab) • Enterography • Female Pelvis for Cancer • Pelvis Bladder for Cancer • Pelvis Rectum for Cancer and Anal Fistula • Pelvis Urethral Diverticulum • Prostate • Pelvis RTP, Dr. Garza

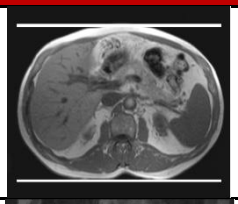
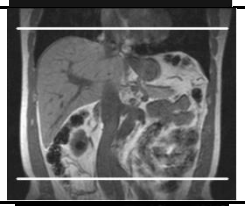
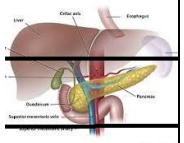
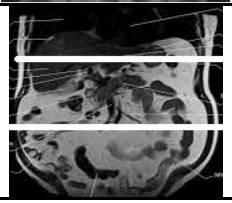
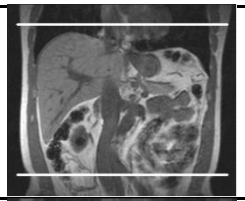
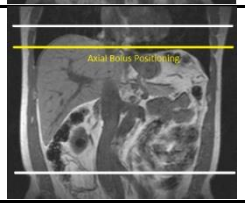
Chest

(mediastinum, pleura)

- Check with a Radiologist before performing an MR, may prefer CT.
- Perform for entire chest imaging, not chest wall

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax 2d flash T2 FS HASTE Ax (HASTE IR if poor FS)	~360	7 x 2		
T1 Cor 2d flash T2 FS HASTE Cor (HASTE IR if poor FS)	~360	6 x 1		
T1 Sag 2d flash T2 FS HASTE Sag (HASTE IR if poor FS)	~360	7 x 2		

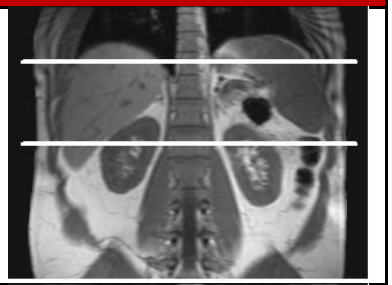
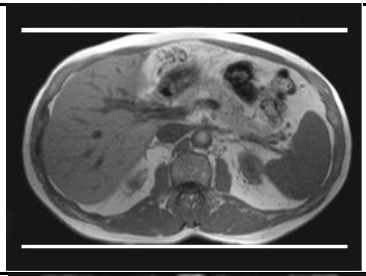
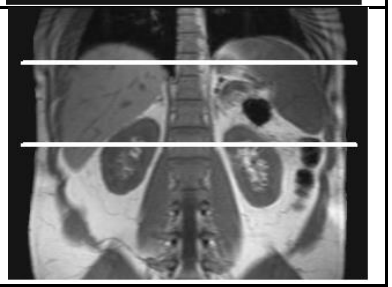
Abdomen Routine

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor BH	~360	8 x 2		
T1 In/Out Ax BH T2 HASTE Ax BH T2 FS Ax BH	~360	7 x 2	Includes diaphragm through kidneys	
T1 Ax BH **Optional for pancreatic indications*	~360	5 x 1	• Include entire pancreas • Perform MRCP for follow up pancreatic cysts 	
DIFF Ax	~360 100% pFOV	7 x 2 TE 94 TR 4000 min.		Copies T1 In/Out Ax BH
T1 FS VIBE Ax Pre BH	~360	3 – 4 *as thin as possible with single breath-hold	Includes diaphragm through kidneys	
Ax Care Bolus			Begin immediate post once contrast is in the aorta, take into consideration timing of breath hold instructions.	
T1 FS VIBE Ax Immediate Post BH T1 FS VIBE Ax 2 min Post BH T1 FS VIBE Ax Delayed Post BH	~360	3 – 4	Delayed series must be at least 5 min post injection.	
• T1 FS VIBE Ax Pre must be performed on all abdomens without contrast • Send care bolus and subtractions to PACS				

Adrenals

(Updated 2/27/17)

For follow-up with prior imaging of existing benign mass, IV contrast is not utilized

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 FS Ax BH T2 HASTE Ax BH	~360	5 x 0 ~24 slices		
T1 In/Out Ax BH	~360	2.5 x 0 ~44 slices 3 x 0 mm: Symphony SM, WMC, WLK		
T1 In/Out Cor BH	~360	5 x 1	Cover diaphragm through bifurcation S-I	
T1 FS VIBE Ax Pre BH *Ax Care Bolus* T1 FS VIBE Ax Immediate Post BH T1 FS VIBE Ax Delayed Post BH	~360	~3 x 0	Delayed series must be at least 5 min post injection.	

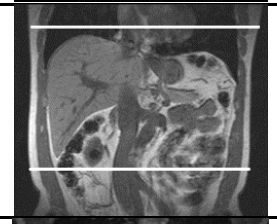
- T1 FS VIBE Ax Pre must be performed on all abdomens without contrast
- Send carebolus and subtractions to PACS

Kidneys

(New finding and follow up renal lesion)

(Updated 7/11/17)

- Perform routine abdomen protocol if exam is follow up post nephrectomy. This is to better visualize the renal bed and surrounding organs
- Abdomen for tuberous sclerosis is a renal study

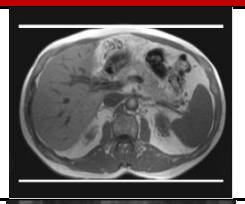
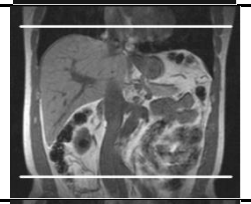
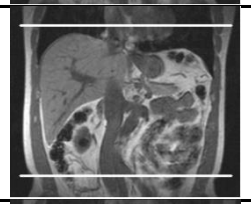
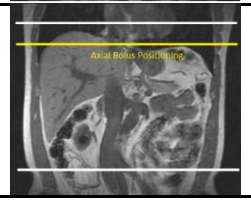
SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor BH	~360	4 x 0 ~30 slices	Include kidneys and mass	
T1 In/Out Ax BH	~360	7 x 2 ~24 slices	Includes entire liver and kidneys.	
T1 Ax BH T2 FS Ax BH T2 HASTE Ax BH	~360	4 X 0 ~36 slices	Include kidneys and mass	
T1 FS VIBE Ax Pre BH *Ax Care Bolus* T1 FS VIBE Ax Immediate Post BH	~360	3 x 0		Copies center T1 Ax
T1 FS VIBE Cor post BH	~360	3 x 0	Scanned after immediate post	
T1 FS VIBE Ax Delayed Post BH	~360	3 x 0	Delayed series must be at least 5 min post injection.	

- T1 FS VIBE Ax Pre must be performed on all abdomens without contrast
- Austin Kidney Associates: if requested for total kidney volume, reserve exam for 3D lab to process then send an email to 3D_Postprocessing@ausrad.com
- Send care bolus and subtractions to PACS

Liver Routine

(hemangioma, lesion)

(Update 12/2/19)

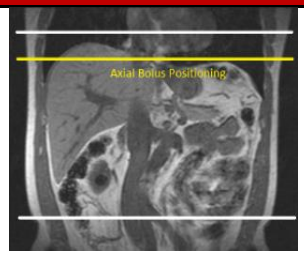
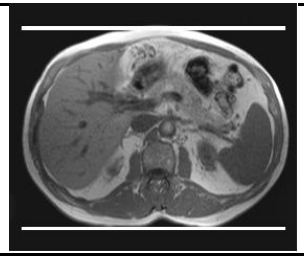
SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor BH	~360	8 x 2		
T1 In/Out Ax BH T2 HASTE Ax BH T2 FS Ax BH	~360	7 x 2 ~24 slices		
T1 FS VIBE Ax Pre BH	~360	3 – 4	• Slice thickness, as thin as possible within single breath hold.	
Ax Care Bolus			• Begin immediate post once contrast is in the aorta, take into consideration of breath hold instructions.	
T1 FS VIBE Ax Immediate Post BH T1 FS VIBE Ax 2 min Post BH T1 FS VIBE Ax Delayed Post BH	~360	3 – 4	• Delayed series must be at least 5 min post injection.	
• T1 FS VIBE Ax Pre must be performed on all abdomens without contrast • Send care bolus and subtractions to PACS				

Eovist

(focal nodular hyperplasia)

(Updated 1/26/24)

- A Body radiologist must approve all Eovist studies if a previous ARA study does not recommend Eovist.
- GFR testing is necessary if the patient has kidney disease, diabetes, hypertension, multiple myeloma, solid organ transplant, severe hepatic disease, or orde red by an oncologist.
- Do not perform at ARA non-CT sites.

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 In/Out Ax BH *(if Dixon is unavailable)* T2 HASTE Ax BH	~360	7 x 2		
T1 FS Dixon or VIBE Ax Pre *Ax Care Bolus* T1 FS Dixon or VIBE Ax Immediate Post T1 FS Dixon or VIBE Ax 2 min Post T1 FS Dixon or VIBE Ax 5 min Post	~360	3 – 4	• Slice thickness, as thin as possible within single breath hold • Start immediate post once contrast is in the aorta, take into consideration time for breath hold instructions.	
T2 FS Ax BH	~360	7 x 2		
T2 FS HASTE Cor BH	~360	8 x 2		
T1 FS Dixon or VIBE FS Cor 20 min Post	~360	3 – 4		
T1 FS Dixon VIBE Ax 20 min Post	~360	3 x 0		Copies everything from pre

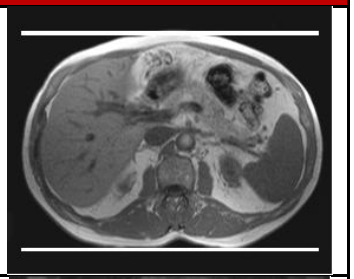
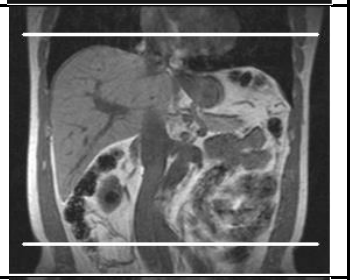
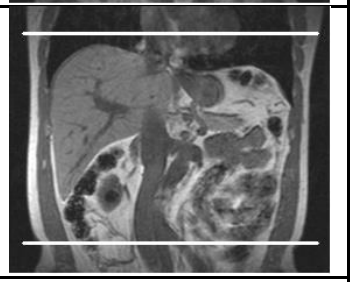
Send to PACS:

- Pre-FS VIBE: in phase, out of phase and FS series. Do not send the WS water series.
- Post-FS VIBE: FS and respective subtraction series. Do not send the in phase, out of phase or water series and respective subs.
- Care Bolus
- If study is without contrast, include the T1 FS DIXON/VIBE Ax Pre and T2 FS Ax

Gaucher Disease / Lipidosis

(Updated 8/6/15)

- This study does not need contrast, if contrast is ordered, add pre/post dynamic sequences from routine liver protocol
- Include both liver and spleen

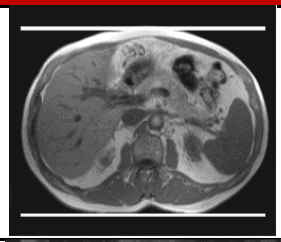
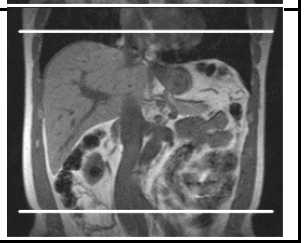
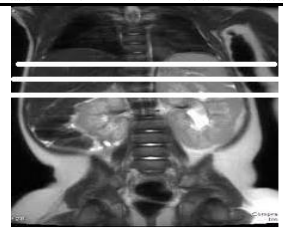
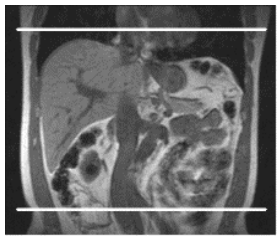
SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor BH T1 Cor BH	~360	8 x 2 22 slices		
T1 In/Out Ax BH T2 HASTE Ax BH T2 FS Ax BH T2 Heavy TE Ax BH (TE>200)	~360	7 x 2 ~24 slices		
T2 FS HASTE Ax BH	~360	10 x 0 ~24 slices	This sequence is usually used for volume measurement	

- If contrast is given, use any VIBE series without motion artifact for measurement
- Volume measurement is performed by CT 3D Lab. Reserve study in pending 3D folder in PACS, e-mail *3DPostprocessing with details
- If 3D post processing is down, measurement is done using ROI tool in viewer of the MR console. Using ROI tool, trace around the liver on each image in which the liver is seen. Save these images in a new series and send to PACS. Add the area (in square centimeters) of the ROI of each image together and enter this information into the notes in PACS
- Repeat measurement process for Spleen

Hemochromatosis, 3T Preferred for LiverLab

(Iron overload)

- Only perform for 3T contraindicated patients
- Do not perform on GE or Symphony A40 (SM, WLK, WMC)
- TR must remain consistent on T1 Axials with varying TEs, do not adjust parameters

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor BH	~360	8 x 2		
T1 In/Out Ax BH T2 HASTE Ax BH T2 FS Ax BH	~360	7 x 2 ~24 slices		
T1 Ax Fl2D (TE 2.38) BH T1 Ax Fl2D (TE 4.76) BH T1 Ax Fl2D (TE 7.14) BH	~360	7 x 2 ~24 slices		
T2* Multi Echo Gre BH	~360	3 slices	Post Processing T2* Maps	
T1FS VIBE FS Ax Pre BH *Ax Care Bolus* T1 FS VIBE Ax Immediate Post BH T1 FS VIBE Ax 2 min Post BH T1 FS VIBE Ax Delayed Post BH	~360	3 – 4	Delayed series must be at least 5 min post injection.	

- Send care bolus and subtractions to PACS.
- Post Process the T2* Maps from the T2* Multi Echo GRE sequence and send to PACS

MRCP

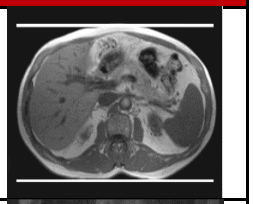
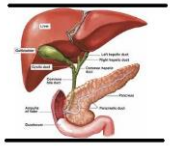
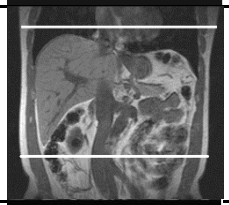
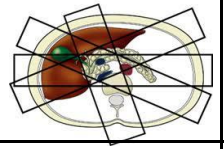
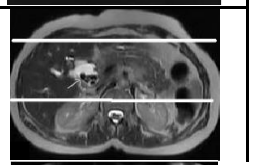
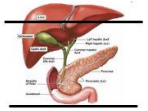
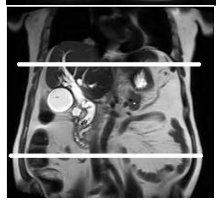
(follow-up pancreatic cysts, gallbladder, bile duct)

(Updated 9/20/24)

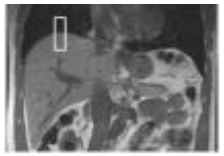
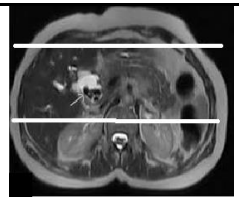
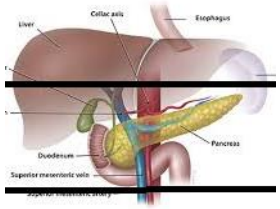
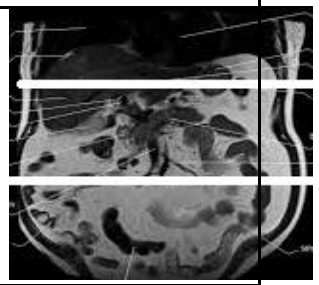
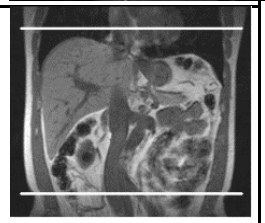
Prep

- NPO for 8 hours
- 12oz. of Pineapple or Blueberry (if diabetic) juice 10-15 minutes prior to scanning. Do not provide if sedating.
- Cannot be performed same day as PET/CT due to water only restriction.

- Include entire pancreas for any pancreatic indications.

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor BH	~360	8 x 2		
T1 In/Out Ax BH T2 FS Ax BH T2 HASTE Ax BH	~360	7x 2 ~24 slices	Include-Liver, GB, pancreas, spleen, biliary system, and duodenum 	
Radial thick slab MRCP BH	~250	40-80 thick ~6 slices	Scan 1 image per location with angles similar to what is pictured. Radial projection through biliary system. 	
FS HASTE Cor hires BH	~360	3.5 x 0	Include pancreas and biliary system as shown in the image	
FS HASTE Ax hires BH	~280	4 x 0	Include right and left main hepatic ducts through pancreatic head and duodenum. Include the bottom of the kidneys to ensure coverage. 	

- continued next page –

T2 3D Cor MRCP Trigger FB	~380	1.5 x 0 ~40 slices	- Include Gallbladder, biliary system, and pancreas - Place trigger box on dome of the liver on a free breathing Cor scan/loc, center trigger box A-P using sag loc. Respiratory coaching might be necessary. Trigger box location 	
T1 Ax BH (only if MRCP is for a pancreatic indication)	~360	5 x 1	Entire pancreas 	
T1 FS VIBE Ax Pre BH Ax Care Bolus T1 FS VIBE FS Immediate Post BH T1 FS VIBE Ax 2 min Post BH T1 FS VIBE Ax Delayed Post BH	~360	3 – 4	- Slice thickness, as thin as possible within single breath hold - Include liver, GB, pancreas, spleen, biliary system, and duodenum - Delayed series must be at least 5 min post injection.	
• Create Lateral & Tumble cut MIPs off T2 3D Cor MRCP trigger. • Send care bolus and subtractions to PACS. • Do not perform on WLK MRI Symphony				

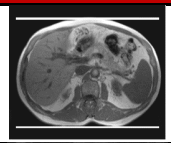
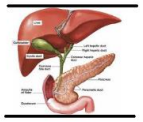
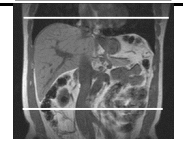
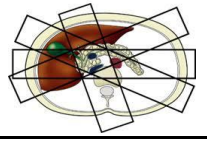
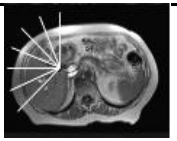
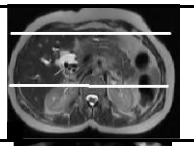
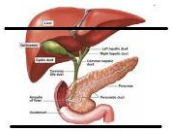
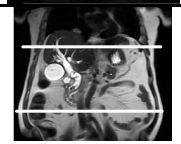
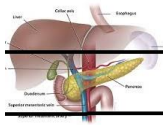
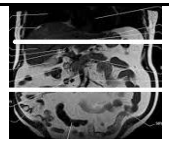
MRCP Non-contrast

(Updated 7/11/17)

Prep

- NPO for 8 hours
- 12oz. of Pineapple or Blueberry (if diabetic) juice 10-15 minutes prior to scanning. Do not provide if sedating.
- Do not perform on the same day as PET/CT due to water only restriction.

- Include entire pancreas for any pancreatic indications.

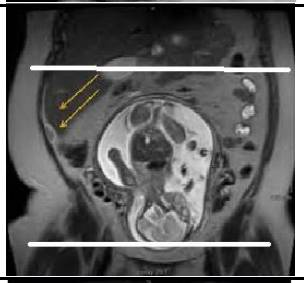
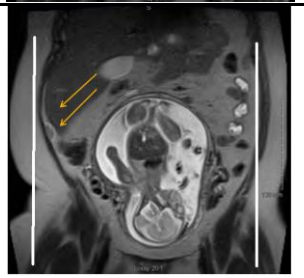
SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor BH	~360	8 x 2		
T1 In/Out Ax BH T2 FS Ax BH T2 HASTE Ax BH	~360	7 x 2 ~24 slices	Include-Liver, GB, pancreas, spleen, biliary system. and duodenum 	
T1 FS VIBE Ax Pre BH	~360	3 – 4		
Radial thick slab MRCP BH	~250	40 – 80 thick ~6 slices	Scan 1 image per location with the angles similar to what is pictured. Radial projection through biliary system. 	
FS HASTE Cor hires BH	~360	3.5 x 0	Include pancreas and biliary system as shown in the image	
FS HASTE Ax hires BH	~280	4 x 0	Include right and left main hepatic ducts through pancreatic. head and duodenum. Include the bottom of the kidneys to ensure coverage. 	
T1 Ax BH (only if MRCP is for a pancreatic indication)	~360	5 x 1	Entire pancreas 	

- T1 FS VIBE Ax Pre must be performed on all abdomens without contrast
- Create Lateral & Tumble cut MIPs off T2 3D Cor MRCP trigger.
- Do not perform on WLK MRI Symphony

Appendicitis during Pregnancy*

(Updated 1/25/24)

- Include from mid-upper abdomen through pubic symphysis on all scans

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor T2 HASTE FS Cor	~360 (adjust FOV as needed)	4 x 1		
T2 HASTE Ax T1 FL2D In/Out Ax T1 FS Ax 2D TOF Ax	~360	4 x 1 6 x 1.2mm (-33% gap) ~70 slices)		
T2 HASTE Sag	~360	4 x 1		

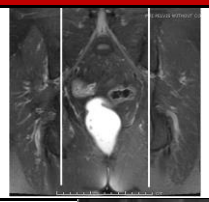
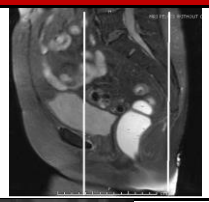
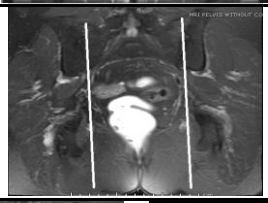
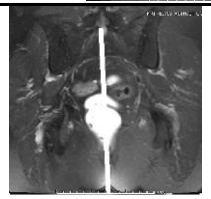
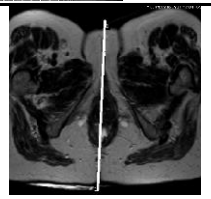
Perform / schedule as MR abdomen & pelvis

Defecography

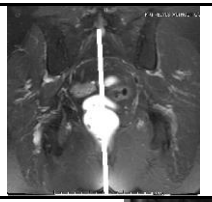
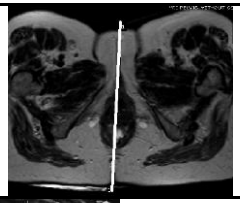
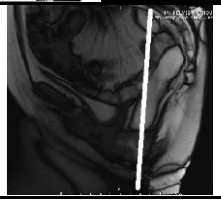
Available locations:
- CP MR1, MPT MR2, SM & QRY

Prep:
- Saline fleet enema 6-hours prior to arrival.
- Explain every step of the exam to the patient before beginning. Cooperation is a key factor for this exam.
- Do not sedate; sedated patients may not be able to complete the required functions of the procedure.

Position:
- All patients should have 240cc KY jelly in the rectum. Use a 60cc catheter tip syringe connected to 4-6" clear tube connected to enema tip to place KY jelly in rectum.
- Supine with knees bent as much as the space within the magnet bore allows

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 FS Cor loc T2 FS Sag loc	280	6 x 0		 
T2 Ax	280	5 x 1		
T2 Sag	240	5 x 1		
T2 TRUFI Sag Resting	220	10 1 slice at midline	Confirm satisfactory view of rectal canal before proceeding	 
T2 TRUFI Sag Constrict (repeat 3 times)	220	10 1 slice at midline	Instruct the patient to **constrict** their anal sphincter as much as possible. Resting between each run	
T2 TRUFI Sag Strain (repeat 3 times)	220	10 1 slice at midline	Instruct patient to **strain** but not enough to defecate KY Jelly. Again, resting between each run	

- continued next page -

Instructions for the next sequence: Likely the patient will already have the urge to defecate due to the presence of the KY jelly in the rectum. Do not tell the patient to strain to defecate, just simply to defecate out the jelly. Confirm with the patient if defecation occurred without or without straining. In theory, a normal patient should not need to strain to defecate out the jelly, rather the patient should be able to just relax & defecate. Be sure to document in tech notes if the patient strained to defecate.				
T2 TRUFI Cine Sag (repeat 3-4 times)	220	10 1 slice at midline 25 measurements	Instruct patient to relax for the first 5 measurements, defecate over the next 15 measurements and relax for the remaining 5 measurements	 
T2 TRUFI Cine Cor	240	10 1 slice at midline 25 measurements	Instruct patient to relax for the first 5 measurements, defecate over the next 15 measurements and relax for the remaining 5 measurements position the slice through the rectum and anus. Use sag cine to set up	

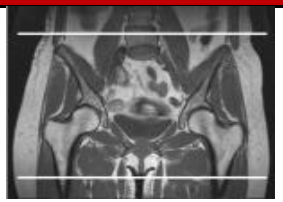
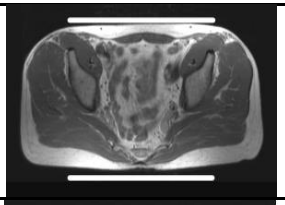
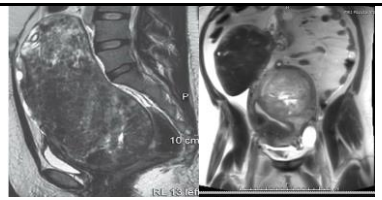
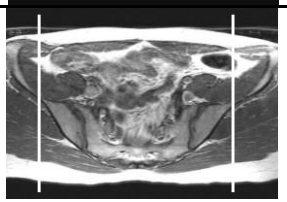
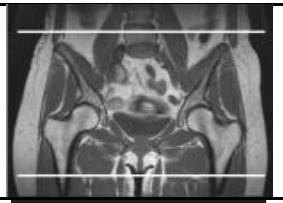
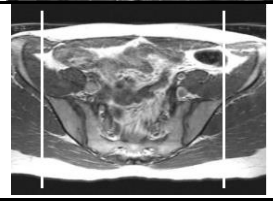
Female Pelvis – Routine

(Updated 11/28/23)

Prep

- Empty bladder
- If bladder is area of interest, then image with full bladder

- Indications: routine, adenomyosis, endometriosis, adnexal mass, uterine fibroids, Pre/Post uterine fibroid embolization (UFE), etc.
- Increase FOV and/or slice coverage to include uterus with any fibroids in its entirety on both sagittal and coronal views, i.e., do not images as cor upper and cor lower. This is so that the rads can provide an accurate measurement of uterus and tumors.

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax	~360 Pixel Area ≤ 2.4 mm²	5 x 1	ACR: must include entire boney pelvis	
T2 HASTE Ax T2 FS Ax	~240 Pixel Area ≤ 1.0 mm²	5 x 1	ACR: must include vaginal introitus through iliac crests & pelvic sidewalls	
T2 Cor	~240 mm (increase FOV if need)	5 x 1		
T2 Sag T2 HASTE Sag	~200 Pixel Area ≤ 1.0 mm² (increase FOV if needed)	5 x 1	 (ex. of a giant uterine mass in single FOV)	
T1 FS Ax Pre T1 FS Ax Post	~360 Pixel Area ≤ 2.4 mm²	5 x 1	ACR: must include entire boney pelvis	
T1 FS Sag Post	~240 (increase FOV if needed)	5 x 1	For fibroids or pre/post UFE only.	

- Send subtractions to PACS.

* ACR Requirements – Do not adjust parameters.

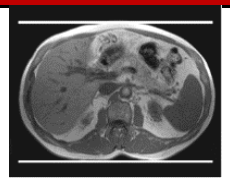
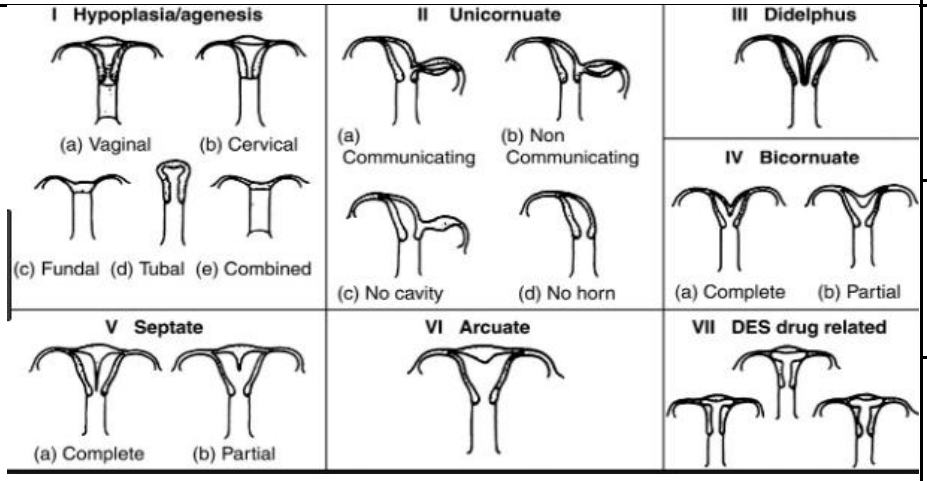
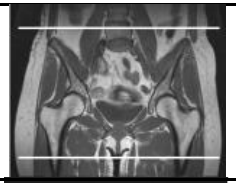
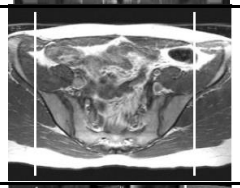
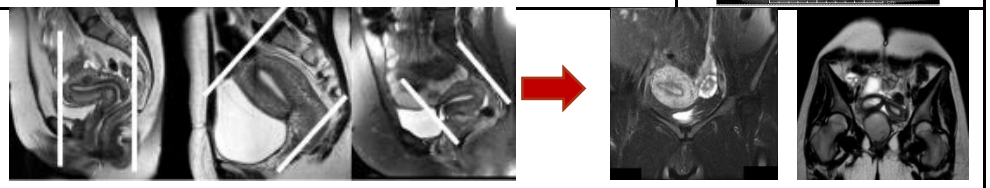
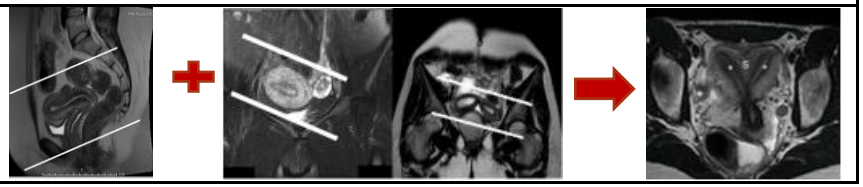
Mullerian Duct

(Updated: 11/4/19)

Prep

- Empty bladder

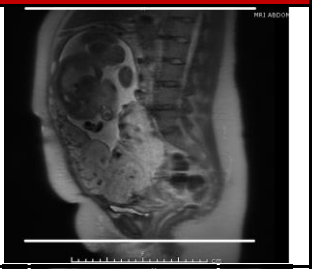
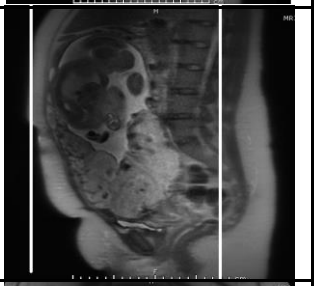
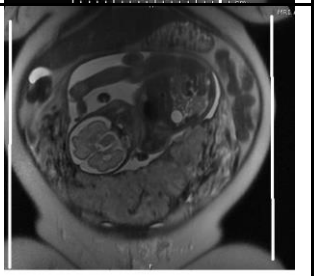
- Infertility, Unicornuate, Arcuate, Bicornuate, Septate, or Didelphic

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Cor - abdomen	~360	8 x 2	Renal agenesis can be associated with mullerian duct anomalies	
T1 Ax T2 HASTE Ax BH T2 FS Ax	~240	5 x 1		
T2 Sag T2 HASTE Sag	~240	5 x 1		
T2 FS Cor	~240	4 x 0		
T2 HASTE Obl Ax loc (short axis) A haste *3-plane loc positioned parallel/perpendicular to uterus should be ran before this sequence for better planning of the Oblique scans.	~240	4 x 0		
T2 Obl (long axis - parallel to long axis of uterus)	~200	4 X 0		

Placenta Accreta / Increta / Percreta / Previa *1.5T Only

(Updated: 02/25/22)

- Encourage a full bladder to accurately assess for placenta percreta.
- FOV and slices to cover entire uterus to below the bladder.
- Using a second coil (flex/torso) can help with signal.
- Recumbent supine position is difficult for pregnant patients. Imaging fast and words of encouragement will help them complete the exam

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 HASTE Ax T1 In/Out AX	~360 (adjust FOV as needed)	7 x 2		
T2 HASTE Cor BH	~380	5 x 1		
T2 HASTE Sag BH T2 FS HASTE Sag BH TRUFI /Fiesta Sag BH	~380	5 x 1		

- Placenta Accreta – placenta grows too deeply into the uterine wall.
- Placenta Increta – attaches even deeper into the uterine wall and penetrate the uterine muscle.
- Placenta Percreta – placenta penetrates through the entire uterine wall and attaches to another organ such as the bladder.
- Placenta Previa – placenta covers the opening in the mother's cervix

Oncology *3T Preferred

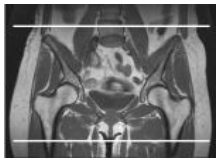
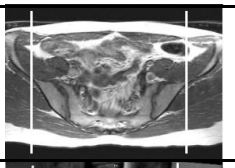
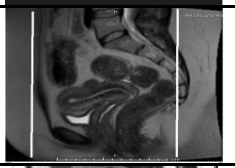
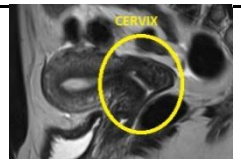
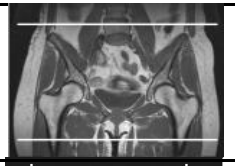
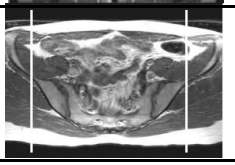
(MRPERONCS: Uterine, Ovarian, Endometrial, Cervical, Vaginal Ca and Dr. Wu RTP)

(Updated 1/17/24)

Prep

- Empty bladder
- Instruct the patient to insert 20 -30 cc of KY jelly into the vagina.

- For known cancer of Uterus, endometrium, cervix, vagina, adnexa and any Dr. Wu and Dr. Wu RTP. Typically referred by oncology/gynecological oncology. Do not run this for fibroids or evaluation of cancer without prior positive pelvic female or gan findings. This is not a screening exam for metastasis.

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax	~340 (include entire bony pelvis)	5 x 1.5		
T2 FS Ax Trigger	240	5 x 1.5		
T2 TSE Sag T2 HASTE Sag (for motion on T2 Sag)	200	3.5 x 0.5		
T2 Cor	240	4 x 1		
T2 Obl Ax Hires (if for cervical CA)	180	3 x 0	• Consult with body positioning. • True axial through axis of cervix  rad for long	
Diffusion Ax (B0, B400, B800 Values)	260	3.6 X 0 ~46 slices	• Cover area of interest • Calculated not available on 1.5T	
T1 FS Ax Pre T1 FS Ax Post	~340	5 x 1.5		
T1 FS Sag Post	200	3.5 x 0.5		

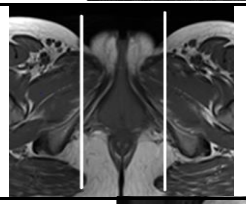
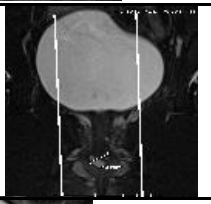
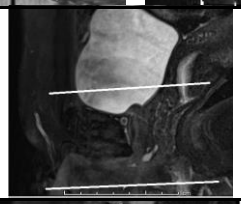
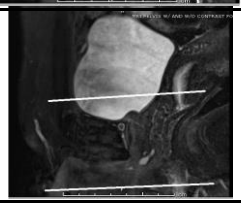
Urethral Diverticulum *3T Preferred

(Updated 12/2/19)

Prep

- Empty bladder

- Instruct the patient to hold still and relax the pelvic muscles during imaging.
- Increase phase oversampling on larger patients to avoid/reduce wrap around artifact.
- Contact radiologist for male patients; may want retrograde Urogram fluoroscopy

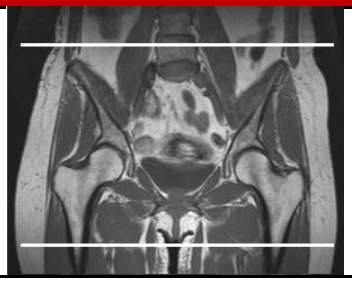
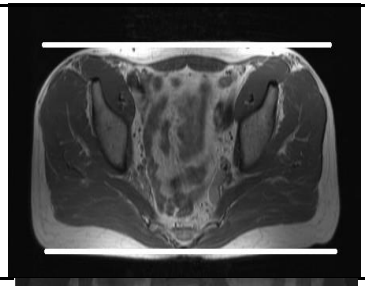
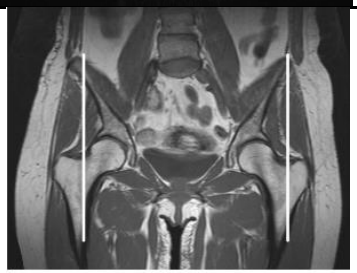
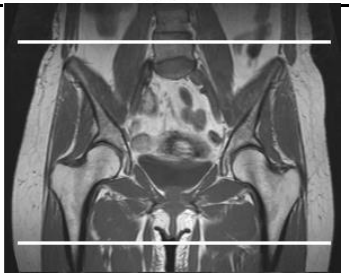
SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax	~340 (minimum FOV to include entire bony pelvis)	5 x 1.5		
T2 Sag Hires	180	3 x 0 24 slices		 
T2 FS Ax Hires T2 Ax Hires	180	3 x 0 24 slices		
T2 Cor Hires	180	3 x 0 24 slices		
T1 FS Ax Hires Pre T1 FS Ax Hires Post	180	3 x 0		

- Send subtractions to PACS

Male Pelvis – Routine

(Updated 12/6/19)

- With full bladder, if it is the area of interest
- Post cystectomy (bladder removal) patients, run the routine male pelvis protocol and add the diffusion axial sequence

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax	~360 (minimum FOV to include entire boney pelvis)	8 x 2		
T2 HASTE Ax T2 FS Ax	~240	8 x 2		
T2 Cor	240	7 x 1		
T2 Sag	~240	5 x 1		
T1 FS Ax pre T1 FS Ax Post (2-minute delay)	~360 (minimum FOV to include entire boney pelvis)	8 x 2		

Penis

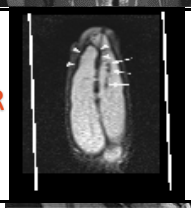
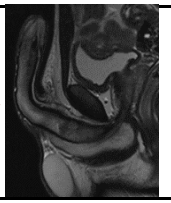
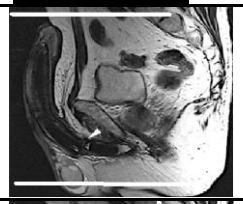
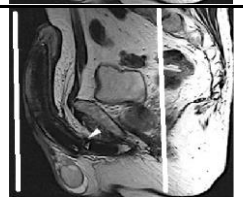
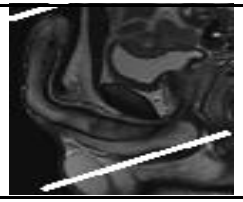
(MRPECS: Urethral discharge, etc.)

(Updated 11/20/24)

Prep

- Empty bladder

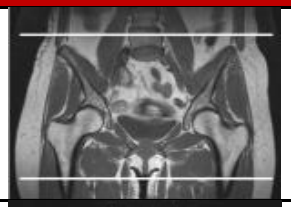
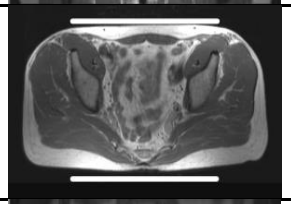
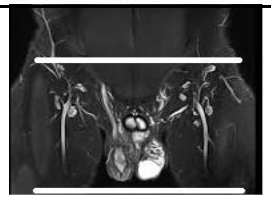
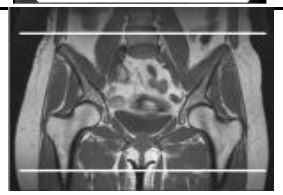
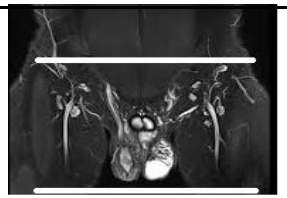
- Instruct patient to position anatomy midline, straight and pointing down.

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax	~340 (minimum FOV to include entire pelvis, penis, and testes)	7 x 1		
T2 Sag hires	~200	3 x 0.5		 OR  
T2 Ax hires	~200	3 x 0.5		
T2 Cor hires	~200	3 x 0.5		
T1 FS DIXON VIBE Obl Ax Pre T1 FS DIXON VIBE Obl Ax Post	~200	3 x 0		

Testicles

(Updated 12/6/19)

- With empty bladder/
  /Build up testes using a folded towel. Tape penis to pelvis

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax	~360 (minimum FOV to include entire pelvis and testes)	8 x 2		
T2 HASTE Ax T2 FS Ax	~240 (include pelvis and testes)	8 x 2		
T2 HASTE Cor	280 mm	4 x 1		
T2 HASTE Sag	~280	4 x 1		
T2 FS Ax Hires T2 HASTE Ax Hires	~200	3 x 1		
T1 FS Ax Pre T1 FS Ax Post (2-minute delay)	~360 (minimum FOV to include entire pelvis and testes)	8 x 2		
T1 FS Ax Hires Post	~200	3 x 1		

Prostate – Diagnostic *3T Preferred

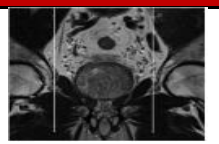
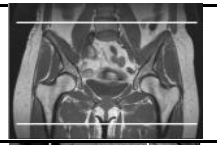
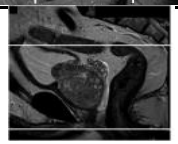
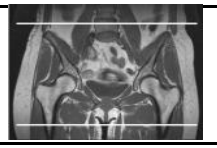
MRPRPFCS, MRI PROSTATE W/ PERFUSION AND 3D WITH AND WITHOUT CONTRAST

(Updated 5/13/24)

Prep

- 12 to 16-hr bowel prep with water enema 1 to 2-hrs prior to exam. Includes dietary restrictions.
- Void prior to exam.

- Prostate volumes are performed in DynaCAD.
- If 3T is contraindicated, MRI may be performed on 1.5T SW MR3 Aera preferred; CP MR1 Espree or MPT MR2 Espree backup.
- Wait to image 4 – 6 weeks post biopsy due to residual edema; does not apply to patients with recent positive biopsy.
- Minimal wrap is OK, must not interfere with prostate or seminal vesicles

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 Sag	200	3 x 0		
Diffusion Ax (B0, 400, 800 Value)	200	3.6 x 0 (~33 slices)	• Include from top of seminal vesicles through urogenital diaphragm. • Split and save B-Values into its own series. • Calculated not available on 1.5T B19 software	
T2 Ax	180	3 x 1	• Include from top of seminal vesicles through urogenital diaphragm. • Best image quality required, repeat for motion	
T1 Ax	~360	5 x 1.5	• Include entire bony pelvis from L5-lesser through trochanter	
T2 Cor	180	3 x 1	• Include seminal vesicles	
T1 VIBE Ax Dynamic Perfusion Pre/Post	200	3.6 x 0	• Include from top of seminal vesicles through urogenital diaphragm. • Scan time is approximately 6-minutes. • 60 total measurements • Begin contrast injection after the second measurement. • Inject at 3ml/sec	
T1 FS VIBE Ax Post	~360 (minimum FOV to include entire boney pelvis)	5 x 1.5		

Send: Review Provider Comments for appropriate DynaCAD destinations; do not rename series or add "repeat"

- PACS: T2 Sag, T2 Ax, T1 Ax full pelvis, T2 Cor, Diff ADC & Calc, T1 Vibe Axials, renamed B0 Value, B400 Value, B800 Value, any repeats.
- DynaCAD (ARA, HCA, Seton): T2 Sag, T2 Ax, T1 Ax full pelvis, T2 Cor, Diff ADC map, T1 Vibe Axials

Tech Notes: Include DynaCAD location, example: ARA CAD, Seton CAD, HCA CAD. Include PSA & biopsy date(s)

Post Prostatectomy *3T Preferred

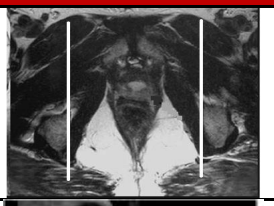
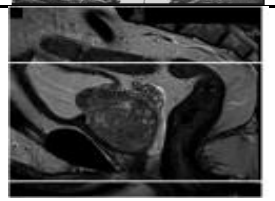
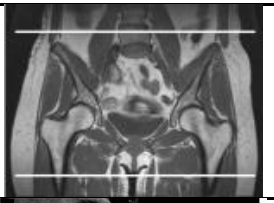
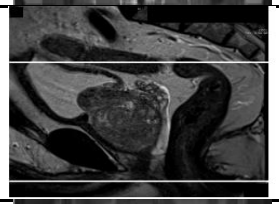
MRPRCS, MRI PROSTATE WITH AND WITHOUT CONTRAST / MRPRS, MRI PROSTATE WITHOUT CONTRAST

(Updated 5/13/24)

Prep

- 12 to 16-hr bowel prep with water enema 1 to 2-hrs prior to exam. Includes dietary restrictions.
- Void prior to exam

- If 3T is contraindicated, MRI may be performed on 1.5T SW MR3 Aera preferred; CP MR1 Espree or MPT MR2 Espree backup

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 Sag	200	3 x 0		
Diffusion Ax (B 0, 400, 800 Value)	200	3.6 x 0 (~33 slices)	• include from top of seminal vesicles through urogenital diaphragm. • Split and save B-Values into its own series. • Calculated not available on 1.5T	
T2 Ax T2 FS Ax T1 Ax	200	3 x 1	• Include from top of seminal vesicles through urogenital diaphragm. • T2 Ax - best image quality required, repeat for motion	
T1 Ax	~360	5 x 1.5	• Include entire bony pelvis from L5-lesser through trochanter	
T1 VIBE Ax Dynamic Perfusion Pre/Post	200	3.6 x 0	• Include from top of seminal vesicles through urogenital diaphragm. • Scan time is approximately 6-minutes. • 60 total measurements • Begin contrast injection after the second measurement. • Inject at 3ml/sec	
T1 FS VIBE Ax Post	~360 (minimum FOV to include entire boney pelvis)	5 x 1.5	•	

Send:

- PACS: T2 Sag, T2 Ax, T1 Ax full pelvis, T2 Cor, Diff ADC & Calc, T1 Vibe Axials, renamed B0 Value, B400 Value, B800 Value, any repeats.
- DynaCAD (ARA, HCA, Seton): do not send

Prostate Non-contrast

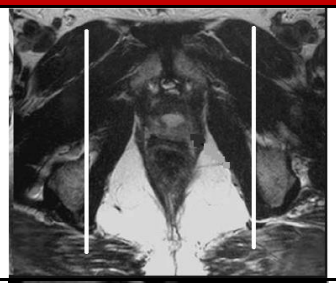
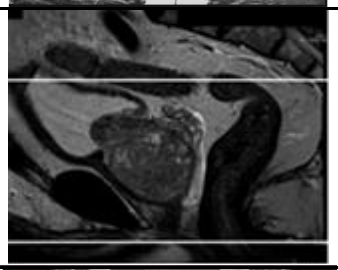
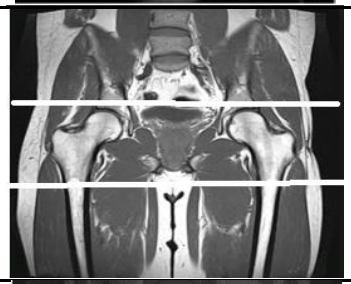
(Dr. Hsu)

MRPRS, MRI PROSTATE WITHOUT CONTRAST

Prep

- 12 to 16-hr bowel prep with water enema 1 to 2-hrs prior to exam. Includes dietary restrictions.
- Void prior to exam

- If 3T is contraindicated, MRI may be performed on 1.5T SW MR3 Aera preferred; CP MR1 Espree or MPT MR2 Espree backup.
- Patients with recent positive prostate biopsy can have their MRI immediately and do not have to wait 4-6 weeks for the inflammation to do down

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 Sag	200	3 x 1 ~30 slices		
Diffusion Ax (B 0, 400, 800 Value)	~200	3.6 x 0 (~33 slices)	• Includes seminal vesicles through urogenital diaphragm. • Split and save B-Values into its own series. • Calculated not available on 1.5T	
T2 Ax	~150	3 X 1 ~30 slices	• Include from top of seminal vesicles through urogenital diaphragm	
T2 Ax	~400 100 PFOV	3 x 0 ~38 slices	Skin to skin, no angles	
T1 Ax	~340 (minimum FOV to include entire bony pelvis)	5 x 1.5 ~40 slices		

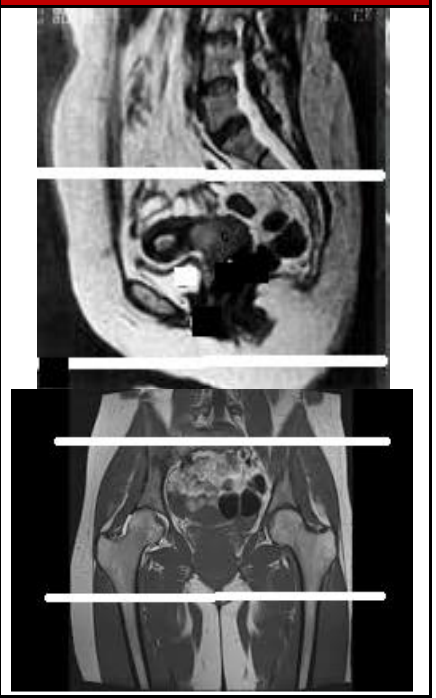
Radiation Therapy Planning

Female Pelvis RTP Non-contrast

PREP

- With empty bladder, unless specified otherwise by oncologist.

- RTP for Dr. Wu is oncology pelvis.
- Include entire anatomy in the FOV, skin to skin

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T2 3D Ax T2 FS Ax T1 Ax T1 FS Ax *Administer contrast, if needed* T1 FS Ax Post	Include entire soft tissue pelvis, skin to skin from side to side and front to back	3 x 0 ~32 – 48 slices	Acquire enough slices to cover abnormality.	

Prostate Central Texas Cancer Center (CTCC) Therapy Staging

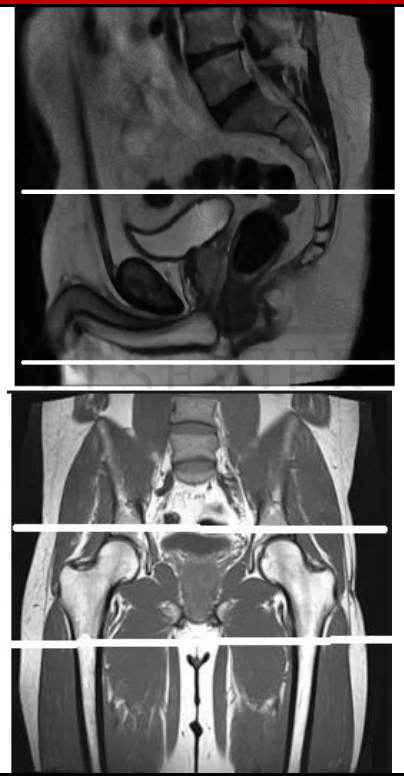
(Central Texas Cancer Center previously known as Austin Cancer Center)

PREP

- Full bladder, instruct the patient to drink 16 oz. of water one hour before their exam.

Slice Coverage

- Include entire anatomy, 100% FOV, skin to skin, no angle

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax T1 FS Ax T2 FS Ax T2 3D Ax	~400 - 500	3 x 0		

Prostate CyberKnife Therapy Planning Non-contrast

(Dr. Ghafoori)

PREP

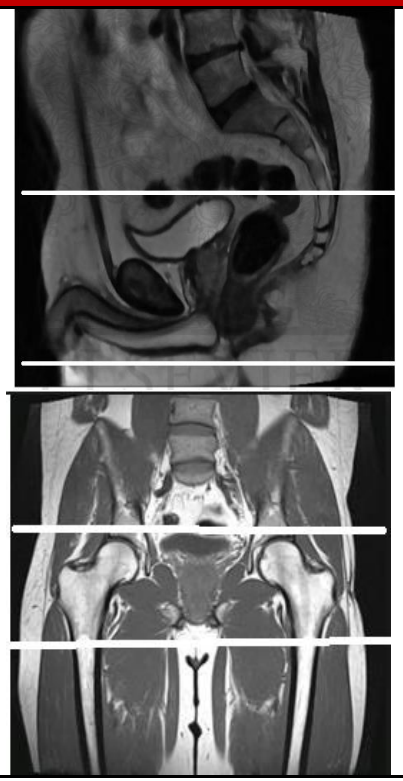
- Full bladder, instruct the patient to drink 16 oz. of water one hour before their exam.

Patient Positioning

- Feet first supine, tape feet together

Slice Coverage

- Include entire anatomy, 100% FOV, skin to skin, no angle

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 FS Ax T2 FS Ax *Administer contrast, if needed* T1 FS Ax Post	~400 - 500	2 x 0 ~54 slices		

Prostate Therapy Planning

(Dr. Rufus Mark)

PREP

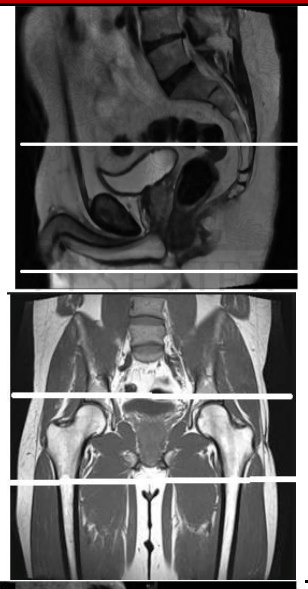
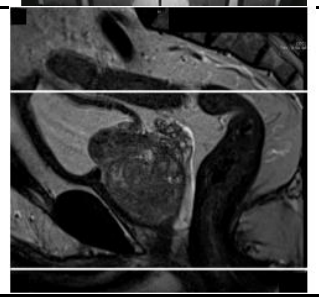
- Full bladder, instruct the patient to drink 16 oz. of water one hour before their exam.

Patient Positioning

- Feet first supine, tape feet together

Slice Coverage

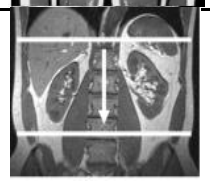
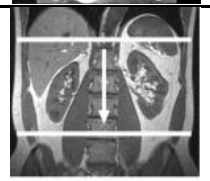
- Include entire anatomy, 100% FOV, skin to skin, no angle

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax T1 FS Ax T2 FS Ax T2 3D Ax	~400 - 500	3 x 0 ~54 slices	Include 10 cm above prostate to 6 cm below prostate	
T2 Ax T2 FS Ax (if post prostatectomy)	~140	3 x 0	Include from urogenital diaphragm through seminal vesicles	

Urogram

(Updated 9/20/24)

- Do not scan on an Espree due to the limited H-F FOV
- Administer 10 mg of Lasix IV prior to scanning

SEQUENCE	FOV (mm)	SLICE (mm)	COMMENTS	IMAGES
T1 Ax T2 FS Ax	~340	8 x 0 ~42 slices	Scan from above kidneys through bladder	
T2 HASTE Ax	~340	5 x 0 ~36 slices	Kidneys only	
T2 FS HASTE Cor	~380	5 x 0	Kidneys, ureters, and bladder	
T1 FS VIBE Ax Pre *Ax Care Bolus* T1 FS VIBE Ax Post	~340	4 x 0	• Kidneys only • Begin immediate post once contrast is in the aorta, take into consideration of breath hold instructions.	
T1 FS VIBE Sag 5 min	~380	4 x 0 ~64 slices		
T1 FS VIBE Cor 10 min	~380	2.5 x 0 ~64 slices		
T1 FS VIBE Ax 10 min	~340	4 x 0		Copies to T1 FS VIBE Ax Pre

- Consult a radiologist if you have any concern if enough contrast is visible in the kidneys, ureters, or bladder prior to removing the patient from the table.