

**KNEE \*\*IMAGE\*\***

1. 3 Pl Loc  
 2. Sag PD—Include all bone through ligaments  
 3. Sag T2 cl fat  
 4. Ax T2 cl fat—4 slices above patella through tib/fib joint  
 5. Cor PD—If protocol Knee Pain/Menisci/Ligaments or Synovitis  
 Cor T1—If protocol Knee AVN/OCD/FX  
 6. Cor PD cl fat—Popliteal Artery through patella

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7a. 1.5T - Obl Ax PD cl FAT Through Meniscus  
 ► no need to run if SAG PD CUBE FAT is done  
 7b. 3T - Sag PD CUBE cl FAT (skin to skin)  
**RP3, MR5, MR6, TAC 2has Sag PD CUBE FAT (Freq S/1) Use Med Flex or 18ch QED coil.**  
 ► Scan must be no longer than 5:30. Increase Hypersense factor if needed to include skin to skin.  
 ► Reformat this sequence at 1mm slice thickness in all three planes. The current MSK reformat is set at 1.5, so it will need to be adjusted.  
 \*\*\* If Large Flex used, run "old" Sag CUBE PD FAT protocol under Lg flex header and cover skin to skin ► if coil doesn't allow slice accel replace with OBL Ax PD cl FAT  
 8. **\*\*18 and Under—Sag T2 Map if avail**  
 \*\* OK to not scan CUBE when T2 Map ran\*\*

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Synovitis: 8. +C Ax T1 dk fat 9. +C Sag T1 dk fat  
**\*\* METAL--SCAN Routine Knee (keep FAT SAT on), but add an additional Sagittal STIR**

**Request:**  
 MRI Knee wo  
 or  
 MRI Knee wo/w

**USE 8 or 16 ch knee coil when possible**  
**Opt 2: 16 ch wrap coil**

**Contrast:**  
 Multihance  
 .1mmol/kg  
 Max 20 mL  
 Low eGFR inpatient  
 Dose: No Change

**MSK TIPS:**

- Ensure extremity of interest is as isocenter as possible
- SHIM all Fat sat scans!!
- Use Smallest coil possible to ensure coverage for anatomy

**TIBIAL STRESS FRACTURE (Best on 3T)**

► **Place marker at max pain or at upper & lower limits.**  
 1. 3 Pl loc \*\*center over area of pain\*\*  
 2. Sag FSTIR (4/4) \*\*IMAGES\*\*  
 3. Ax T1 (3/1.5) \*\*cover through area of pain/pathology\*\*  
 4. Ax T2 dk fat (3/1.5)  
 5. Long Axis T1 Perpendicular to edema (3/0) (see images)  
 6. Long Axis T2 dk fat Perpendicular to edema (3/0)  
 ► If edema cannot be seen, oblique sagittally to tib/fib

**Request:**  
 MRI Calf w/o

**Coil:**  
 8 ch Cardiac  
**Gems:**  
 30 Small

**THIGH OR CALF**

(Not for hamstring injury, Quadriceps tear, or Tibial stress FX)

► **Place marker at max pain or at upper & lower limits**  
 1. 3 Pl loc  
 2. & 3. Cor T1 & Cor T2 STIR (5/2)  
 4. & 5. Sag T1 & Sag T2 STIR (5/2)  
 & 7. Ax T1 & Ax T2 dk fat (5/1.5 or 7/3 as needed)

**Request:**  
 MRI Calf or Thigh wo

**ZIMMER KNEE (RP 1 ONLY)  
 FOLLOW INSTRUCTIONS ON BULLITIN BOARD**

**\*\*Run a T2 Map sequence in Knee and spondylo protocols in patient's 18 and Under Available on TAC 1, TAC 2, RP 1, RP 3, RP4, CSC3, CSC4, CSC 5, CSC 6, AFCH**  
**Copy FOV, Slice Thickness and Spacing from the Sag T2 in protocol. Reduce number of slices to cover joint.**  
**\*\*On 26.0 scanners sequences are longer. If patient is doing well cover entire joint (8 min scan). If time constraints or patient is moving, OK to run in 2 acquisitions (4:30 scan). Ensure slices at least go through the medial aspect of knee joint (opposite side of fibula).**  
 \*OK to leave out Sag PD Cube Fat when adding T2 Mapping to a knee

**Functool T2 MAP Post Processing**

Highlight series in Browser, Click Functool  
 Film Save Report  
 Functional Maps  
 Select "Left" next to Visible Maps  
 Select Multiple Locations  
 Select Next  
 Save as SCREENSAVE image  
 Select Save  
 Select Save as Processed images  
 Select Save  
 Send T2 Map Series and post processing to **SOURCE**  
 Color Map post processing can go to **ALI**

**READYView T2 Map Post Processing**

Highlight series in Browser, Click READYView  
 In export tab at top of screen Select "Save Function Volume" (disc with Rainbow)  
 Select T2 Map, select Processed, and then Save- this saves this series in the browser—Bone will be dark on images—this is OK with rads--send to **SOURCE**

In export tab at top of screen Select "Quick Export" (disc with running stick figure)  
 Hover over lower right view port (the icon should be a camera) Left Click—this saves this series in the browser—send to **ALI**

**OSTEO – ABSCESS – TUMOR "Nine Series Wonder"**

**\*\*For Long Bone try to get one slice down middle of bone**  
**\*\*If there is a small ROI (tumor, mass, or area of pain) OK to decrease FOV after large FOV COR STIR. Ensure to use thinner Axial Slices (5/1) to insure area of interest is adequately covered. Call radiologist to check if questions\*\***  
 1. 3 Pl loc ► **SKIN TO SKIN**  
 1. & 3. Cor T1 & Cor FSTIR (Knee—Cor T2 Fat)  
 4. & 5. Ax T1 & Ax T2 dk fat (**upr and lwr long bones**)  
 ► Thigh or calf Axial scans: (5/1.5 or 7/3 as needed)  
 6. & 7. Sag T1 & Sag FSTIR (Knee—Cor T2 Fat)  
**FOR TUMOR—PRE AX T1 FAT (1 nex-ok if grainy)**  
 ► 18 and Under Knee-Scan **Sag T2 Map**  
 8.+c Cor T1 dk fat 9. +c Sag T1 dk fat  
 10. +c Ax T1 dk fat (**upr and lwr long bones**)  
 ► Metal /poor fat sat: for Ax T2 FAT substitute STIR or T2 No FAT. For T1 FAT substitute T1 No FAT.  
 Only do IDEAL if requested by radiologist.

**Request:**  
 MRI wo/w  
 ► Thigh  
 ► Calf  
 ► Knee

**Contrast:**  
 Multihance  
 .1mmol/kg  
 Max 20 mL  
 Low eGFR inpatient Dose:  
 No Change

**HAMSTRING or QUADRICEPS INJURY**

► **Place marker at max pain or at upper & lower limits**  
 ► **Prox injury: Prox 2/3 thigh → above ischial tuberosity**  
 ► **Distal injury: Distal 2/3 thigh → below knee, incl prox tibia**  
 1. 3 Pl loc  
 2. & 3. Cor T1 & Cor T2 dk fat (5/1.5)  
 4. & 5. Sag T1 & Sag T2 dk fat (5/1.5)  
 6.& 7. Ax T1 & Ax T2 dk fat (5/1.5 or 7/2 as needed)

**Request:**  
 MRI Thigh wo  
**Coil:**  
 8 Ch or  
 12 Ch Body array

**QUICK TIBIA (FOR SHIN SPINTS ONLY)**

1. 3 Pl loc ► **MARKER ON POINT OF MAXIMAL PAIN**  
 2. Sag SSFSE (24 fov) Center on single marker  
 3. Ax T2 fat (5/2.5 16 fov) 32 slices with the center slice on marker

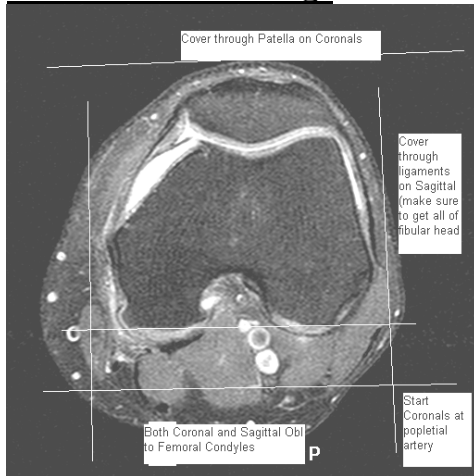
**NEUROGRAM Long Segment Calf (3T ONLY) MONITORED**

1. 3 Pl loc  
 2. Ax T1 (3/0.5)  
 3. Ax T2 cl fat  
 4. Cor T1 (3/1) Skin to Skin  
 5. Cor T2 cl fat  
 6. Sag IDEALarc (3/1)  
 7. +c Axial T1 FAT  
 8. +c Coronal T1 FAT

See Instruction sheets for Thigh, Calf Peronal Nerve and Knee Peronal Nerve protocols.

**Request:**  
 MRI Calf wo & w  
**Contrast:**  
 Multihance  
 .1mmol/kg Max 20 mL  
 Low eGFR inpatient  
 Dose: No Change

## Routine Knee Coverage



**\*\*Back to Protocol\*\***

## Tibial Stress FX Instructions:

3 Examples of areas of edema

**Step 1. Sag STIR look for bright areas of edema**

**Step 2. Ax T2 look for bright areas of edema**

**Example 1**

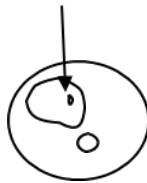
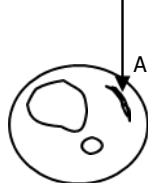
**Example 2**

**Example 3**

**Periosteal reaction  
Outside edge of bone**

**Muscle tear  
Soft tissue**

**Stress Fx  
Within bone**

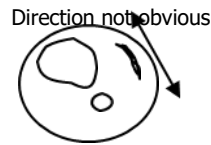
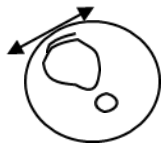


**Step 2. Determine direction of edema**

**Example 1**

**Example 2**

**Example 3**

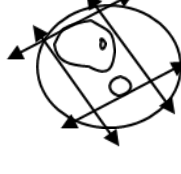
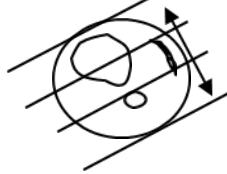


**Step 3. GRx slices long axis perpendicular to edema**

**Example 1**

**Example 2**

**Example 3**



**Periosteal reaction  
tibia**

**Muscle tear**

**Stress Fx within**

Scan thru tibia & fibula  
planes if unsure

Scan thru entire leg

Scan in both

Sagittal and Coronal

**\*\*Back to Protocol\*\***