

THE PIPER TMJ MRI SCAN PROTOCOL

THREE TIERS · SCREENING, BASIC, FULL

SCREENING MRI EXAM							4 sequences — Is there a derangement? Start here.		
ORIENTATION	SEQUENCE	OCCCLUSION	STARTING SIDE	VIEW	STARTING POINT	ENDING POINT	QTY	TRS	HFS SP
AXIAL	T2	NONE	BILATERAL	SUP TO INF	SUPERIOR ORBIT	MANDIBULAR RAMUS	20	180/3.0	3.0
SAGITTAL	STIR	BITE 1 FSCP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
CORONAL	T2	BITE 1 FSCP	LEFT THEN RIGHT	POST TO ANT	EAC ANTERIOR	ANTERIOR TO EMINENCE	18	140/3.0	2.8
SAGITTAL	PROTON DENSITY	BITE 2 IEP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8

BASIC MRI EXAM							7 sequences — Stage the joint for treatment planning.		
ORIENTATION	SEQUENCE	OCCCLUSION	STARTING SIDE	VIEW	STARTING POINT	ENDING POINT	QTY	TRS	HFS SP
AXIAL	T2	NONE	BILATERAL	SUP TO INF	SUPERIOR ORBIT	MANDIBULAR RAMUS	20	180/3.0	3.0
SAGITTAL	T1	BITE 1 FSCP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
SAGITTAL	STIR	BITE 1 FSCP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
CORONAL	T2	BITE 1 FSCP	LEFT THEN RIGHT	POST TO ANT	EAC ANTERIOR	ANTERIOR TO EMINENCE	18	140/3.0	2.8
SAGITTAL	PROTON DENSITY	BITE 2 IEP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
SAGITTAL	PROTON DENSITY	PROP OPEN TCP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
SAGITTAL	PROTON DENSITY	CLOSED MOUTH MIP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8

FULL MRI EXAM							12 sequences — Surgical planning and medicolegal documentation.		
ORIENTATION	SEQUENCE	OCCCLUSION	STARTING SIDE	VIEW	STARTING POINT	ENDING POINT	QTY	TRS	HFS SP
AXIAL	T1 LOCALIZER	NONE	BILATERAL	INF TO SUP	MANDIBULAR RAMUS	SUPERIOR ORBIT	16	240/4.0	5.0
AXIAL	T2	NONE	BILATERAL	SUP TO INF	SUPERIOR ORBIT	MANDIBULAR RAMUS	20	180/3.0	3.0
CORONAL	T2 LOCALIZER	NONE	BILATERAL	POST TO ANT	EAC ANTERIOR	ORBIT POSTERIOR	14	200/4.0	4.0
SAGITTAL	T1	BITE 1 FSCP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
CORONAL	T1	BITE 1 FSCP	LEFT THEN RIGHT	POST TO ANT	EAC ANTERIOR	ANTERIOR TO EMINENCE	18	140/3.0	2.8
SAGITTAL	STIR	BITE 1 FSCP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
CORONAL	T2	BITE 1 FSCP	LEFT THEN RIGHT	POST TO ANT	EAC ANTERIOR	ANTERIOR TO EMINENCE	18	140/3.0	2.8
SAGITTAL	PROTON DENSITY	BITE 2 IEP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
CORONAL	PROTON DENSITY	BITE 2 IEP	LEFT THEN RIGHT	POST TO ANT	EAC ANTERIOR	ANTERIOR TO EMINENCE	18	140/3.0	2.8
SAGITTAL	PROTON DENSITY	PROP OPEN TCP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8
CORONAL	PROTON DENSITY	PROP OPEN TCP	LEFT THEN RIGHT	POST TO ANT	EAC ANTERIOR	ANTERIOR TO EMINENCE	18	140/3.0	2.8
SAGITTAL	PROTON DENSITY	CLOSED MOUTH MIP	LEFT THEN RIGHT	LAT TO MED	LATERAL TO CONDYLE	MEDIAL TO CONDYLE	16	140/3.0	2.8

OCCCLUSAL POSITIONS

BITE 1 — FSCP, fully seated condylar position. A manipulated posture of the mandible, seating the condylar heads as high within each respective fossa as possible with reasonable comfort. Requires a bite registration.

BITE 2 — IEP, incisal edge position. Recorded with the incisors contacting edge-to-edge and the central incisor midlines aligned. Requires a bite registration.

PROP OPEN — TCP, translated condylar position. Registered with a ratchet prop during the MR examination. The condyle is first translated comfortably, then rotated open with the ratchet prop titrated to the patient's comfort level.

CLOSED MOUTH — MIP, maximal intercuspation position. The posture the patient bites into habitually, contacting the posterior teeth. Practice this with the patient and verify it before they go to the scanning center.

HOW TO USE THE TIERS

The tiers are additive. Every sequence in the screening exam appears in the basic exam, and every sequence in the basic exam appears in the full exam, so a screening study is never wasted work if the patient escalates.

Bilateral surface coils. Left joint then right joint throughout.

BACKGROUND

Schellhas KP, Piper MA, Omlie MR. Facial skeleton remodeling due to temporomandibular joint degeneration: an imaging study of 100 patients. *AJNR Am J Neuroradiol* 1990;11:541–51.

Schellhas KP, Piper MA, Bessette RW, Wilkes CH. Mandibular retrusion, temporomandibular joint derangement, and orthognathic surgery planning. *Plast Reconstr Surg* 1992;90:218–29.