

Appendix 3. Summary of the literature evaluating small joint injections.

Author/Year	Target	Study Design	Level of Evidence	Subject Type/Number	Accuracy Confirmation	Outcome
Lopes 2008 ³¹	MCP joint	Prospective LMGI accuracy	Level 1	39 live human subjects	Arthrogram	LMGI = 97% accurate
Reach 2009 ⁷¹	MTP joint	Cadaveric USGI accuracy	Level 2	10 cadaveric specimens	Dissection	USGI = 100% accurate
Wempe 2012 ⁸³	MTP joint	Cadaveric USGI accuracy	Level 2	5 cadaveric specimens	Dissection	USGI = 100% accurate
Jones 1993 ²⁶	CMC, MCP, DIP joints	Human LMGI accuracy	Level 3 for CMC, level 5 for MCP and DIP	Live human subjects (CMC = 3, MCP = 1, DIP = 1)	Arthrogram	LMGI CMC, MCP, and DIP = 0% accurate
Khosla 2009 ⁶⁶	TMT joint	Cadaveric USGI vs. LMGI accuracy	Level 2	14 cadaveric specimens	Arthrogram and dissection	USGI = 64% accurate, LMGI = 25% accurate
Umphrey 2008 ⁸²	CMC joint	Cadaveric USGI accuracy	Level 2	17 cadaveric specimens	Arthrogram	USGI = 94% accurate
Balint 2002 ⁵²	CMC, MTP, PIP joints	Prospective, non-randomized comparison study between ability to aspirate fluid from joint using USG vs LMG	Level 3	30 live human subjects	None	Successful aspiration with USG = 100%, successful aspiration with LMG = 0%

Raza 2003 ⁸¹	MCP, PIP joints	Prospective, non- randomized comparison study of USGI vs LMGI accuracy	Level 3	70 live human subjects	Ultrasound imaging	USGI = 96% accurate, LMGI = 59% accurate
Gonclaves 2011 ¹⁶	MCP, MTP joints	Human USGI efficacy	Level 4	27 live human subjects	None	Accuracy was not assessed, all subjects improved

MCP = metacarpophalangeal joint, MTP = metatarsophalangeal, USGI = ultrasound-guided injections, LMGI = landmark-guided injections, vs = versus, TMT = tarsometatarsal, CMC = carpometacarpal, PIP = proximal interphalangeal, USG = ultrasound-guidance, LMG = landmark-guidance