

Intramedullary nailing of tibial shaft fractures: a scoping review into the outcomes reported in 165 studies.

ANZORS Supplementary material

Table 1: Inclusion and exclusion criteria for article screening.

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none">• Intramedullary nail fixation• All suprapatellar and infrapatellar nailing approaches• Tibial shaft fractures• All populations• All study designs (including cadaveric studies without presence of tibial shaft fracture)• Original work• English	<ul style="list-style-type: none">• Review articles• Non-tibial shaft fracture• Open fractures only• Other fracture fixation• Intra-articular fractures• Nail removal only presented• Technical notes / technique description without a case series presented

Table 2: Number of publications (n (%)) by country of origin. 'Other' threshold < 4, included as supplementary material

Country	n	(%)
United States	58	(35.2)
Other	32	(19.4)
UK	24	(14.5)
Canada	11	(6.7)
China	11	(6.7)
Turkey	9	(5.5)
Germany	7	(4.2)
Finland	5	(3.0)
Austria	4	(2.4)
India	4	(2.4)

Table 3: study designs

Study design	n	(%)
Retrospective cohort study	76	(45.5)
Cadaveric	28	(16.8)
Prospective cohort study	23	(13.8)
Case series	18	(10.8)
Randomised controlled trial	18	(10.8)
Case control study	3	(1.8)
Case report	1	(0.6)

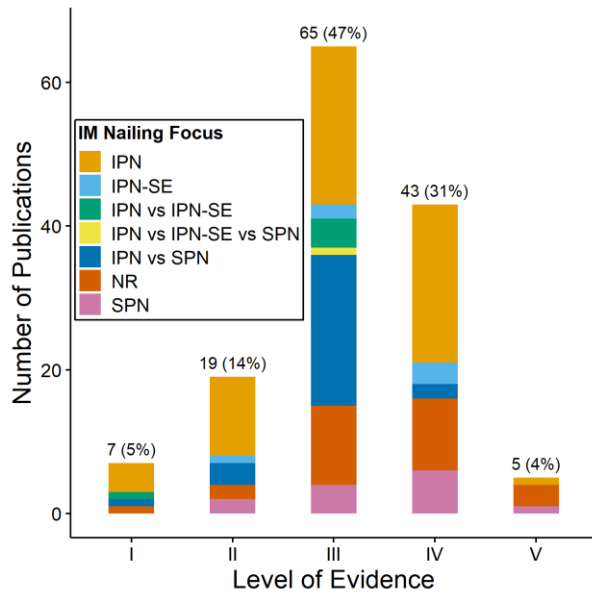


Figure 1: Level of evidence

Table 4: Summary of intramedullary nailing techniques. For in vivo studies, the number of tibial shaft fractures (n_{fracs}); for cadaveric studies, the number of tibias (n_{tibias}). IM – intramedullary; IP – infrapatellar; SE – semi-extended; SP – suprapatellar; ND – no description.

IM nailing approach		In vivo (n_{fracs})	Cadaveric (n_{tibias})	Totals
IP	Lateral parapatellar	10	37	47
	Medial parapatellar	2599	119	2718
	Medial transtendinous	21	-	21
	Transtendinous	2072	43	2115
	Grouped transtendinous and lateral parapatellar	14	-	14
	Grouped transtendinous and medial parapatellar	228	-	228
	Grouped transtendinous and medial/lateral parapatellar	134	-	134
	Unspecified	1069	-	1069
	Subtotal	6147	199	6346
SE	Lateral parapatellar	211	-	211
	Lateral paratendinous	40	-	40
	Medial parapatellar	97	-	97
	Superomedial	84	-	84
SPN	Subtotal	432	-	432
	Chinese aircraft-shaped sleeve	33	-	33
	Lateral	22	10	32
	Midline	770	67	837
SP	Unspecified	1044	33	1077
	Subtotal	1869	110	1979
ND Subtotal		4141	56	4197
Total		12589	365	12954

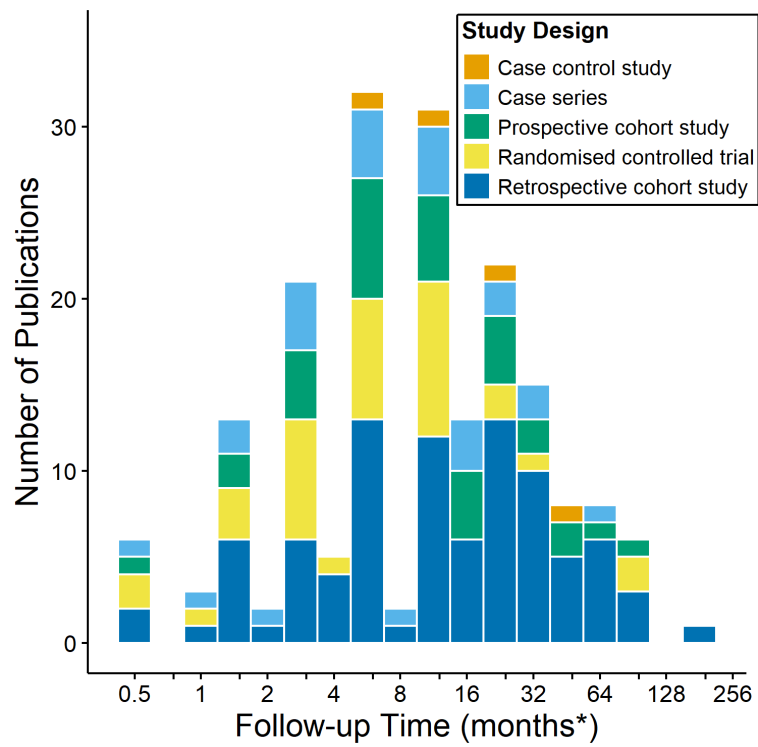
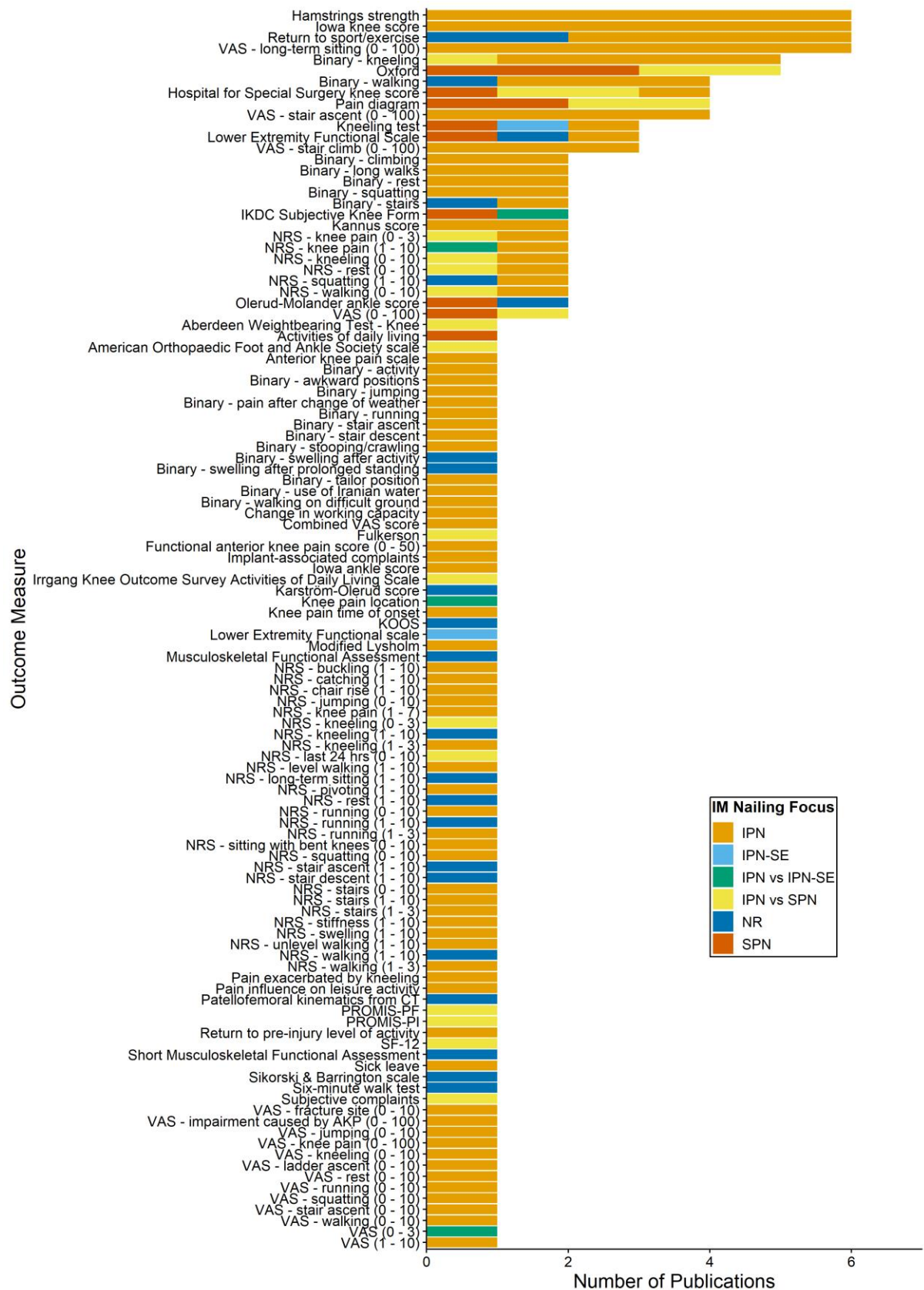


Figure 2: Follow-up times in months. *log2 scale.

Full list of patient outcomes



Full list of clinical outcomes

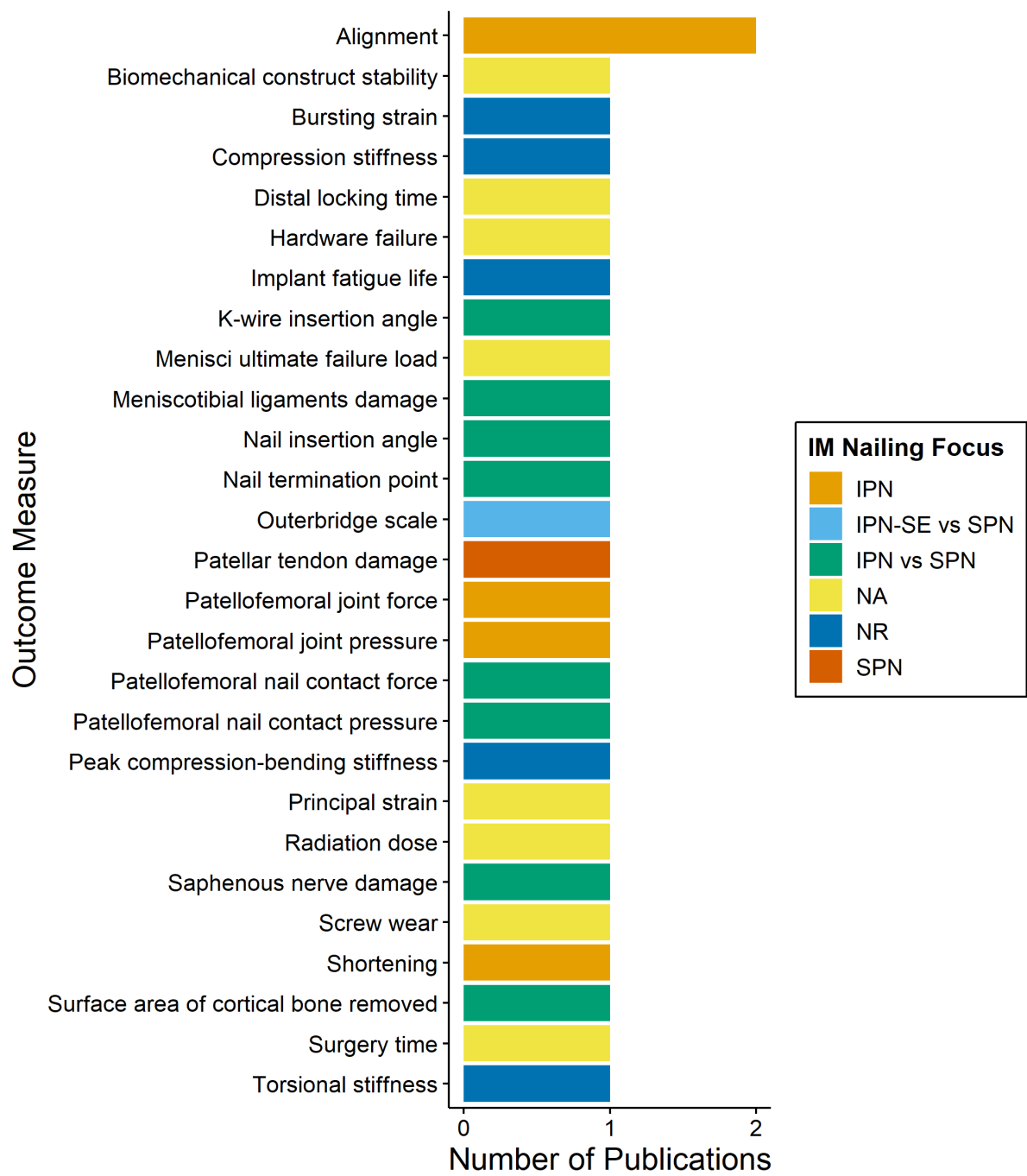


Table 5: Number of publications (n (%)) of grouped 'Other' countries from Table 2. 'Other' threshold < 4.

Country	n	(%)
Greece	3	(1.8)
Iran	3	(1.8)
Italy	3	(1.8)
Brazil	2	(1.2)
Croatia	2	(1.2)
Nepal	2	(1.2)
Norway	2	(1.2)
Pakistan	2	(1.2)
Switzerland	2	(1.2)
Taiwan	2	(1.2)
The Netherlands	2	(1.2)
Buckley	1	(0.6)
Denmark	1	(0.6)
France	1	(0.6)
Istanbul	1	(0.6)
Japan	1	(0.6)
Republic of Korea	1	(0.6)
Thailand	1	(0.6)

Search strategies

PubMed

Intramedullary nailing	tibia	Technique
"Fracture Fixation, Intramedullary"[mh]	"tibial fractures"[mh]	suprapatellar[tiab]
OR "bone nails"[mh]	OR tibia* shaft[tiab]	OR infrapatellar[tiab]
	OR tibia*[tiab]	OR semiextended[tiab]
	OR fracture*[tiab]	OR retropatellar[tiab]
OR "intramedullary nail*" [tiab]		OR supra-patellar[tiab]
		OR infra-patellar[tiab]
		OR semi-extended[tiab]
		OR retro-patellar[tiab]
		OR medial parapatellar[tiab]
		OR lateral parapatellar[tiab]
		OR medial para-patellar[tiab]
		OR lateral para-patellar[tiab]
		OR transtendinous[tiab]

Embase

Intramedullary nailing	tibia	technique
"intramedullary nail*"/de	"tibial shaft"/de	"suprapatellar intramedullary nailing"/de
OR "fracture fixation*"/de	OR "tibia shaft fracture"/de	OR "infrapatellar intramedullary nailing"/de
OR "bone nail"/de	OR "tibia fracture"/de	OR "semiextended intramedullary nailing"/de
		OR "suprapatellar portal technique"/de
OR "intramedullary nail*":ti,ab	OR "tibia* shaft":ti,ab	OR "infrapatellar tibial nail insertion"/de
	OR "tibia":ti,ab	OR "suprapatellar tibial nail insertion"/de
	OR "fracture":ti,ab	
		OR "suprapatellar":ti,ab
		OR "infrapatellar":ti,ab
		OR "semiextended":ti,ab
		OR "retropatellar":ti,ab
		OR "supra-patellar":ti,ab
		OR "infra-patellar":ti,ab
		OR "semi-extended":ti,ab
		OR "retro-patellar":ti,ab
		OR "medial parapatellar":ti,ab
		OR "lateral parapatellar":ti,ab
		OR "medial para-patellar":ti,ab
		OR "lateral para-patellar":ti,ab
		OR "transtendinous":ti,ab