

Multidisciplinary team management in fracture-related infection: a systematic review of clinical outcomes



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Introduction

- Management of FRI necessitates coordinated decision-making regarding debridement, implant retention or exchange, bone reconstruction, soft-tissue reconstruction, antimicrobial therapy, rehabilitation, and optimisation of patient comorbidities (1,2).
- Recognising this complexity, the international FRI consensus group recommended MDT management in 2018 (3).
- Although MDT management is widely advocated in FRI guidance, its implementation remains unknown, with different centres relying on informal or ad hoc collaboration rather than structured MDT pathways (1).
- Establishing structured MDT services requires organisational, workforce, and financial resources (4,5).
- It is therefore important to determine the strength of the evidence supporting MDT management and whether it is associated with improved clinical outcomes in FRI.

Aim

- MDT management is recommended in international guidance, but the evidence for its benefit on clinical outcomes has not been evaluated.
- This systematic review synthesised the available evidence on MDT management in adults with FRI.

Methods

- MEDLINE, Embase, Scopus, and the Cochrane Library were searched from database inception to 31 July 2025.
- Experimental and observational studies of adults with FRI managed through MDT care were eligible.
- Comparative studies formed the primary evidence, with single-arm MDT studies included for secondary descriptive analysis.
- Primary outcomes were infection recurrence, fracture union, reoperation, and amputation.
- Risk of bias was assessed using ROBINS-I for comparative studies and the JBI Critical Appraisal Checklist for single-arm studies.
- Results were synthesised narratively because of clinical and methodological heterogeneity.
- The review was registered with PROSPERO (CRD420251111990).

Results

- Of 14,602 records identified, seven retrospective single-centre case-control and cohort studies involving 441 patients in Europe and China were included.
- Two studies compared MDT with non-MDT or ‘standard’ care, and five were single-arm MDT cohorts.

	Study	MDT Disciplines					
		Ortho-paedics	Infectious Disease	Plastics	Radiology	Micro-biology	Other
Comparative	Rupp et al. (6)	Y	Y	Y	Y	Y	Pathology, vascular surgery, endocrinology, psychosomatic medicine, geriatrics
	Lu et al. (7)	Y	-	-	-	-	Nutritionist, psychological counsellor, specialised nurse, rehabilitation therapist
Single-arm	Sliepen et al. (8)	Y	Y	Y	Y	Y	Specialised nurse, physical therapist, pharmacist
	De Meo et al. (9)	Y	Y	Y	-	-	-
	Bauer et al. (10)	Y	Y	-	Y	Y	Anaesthetist, specialised nurse, pharmacist
	Bose et al. (11)	Y	Y	Y	Y	-	-
	Tedeschi et al. (12)	Y	Y	-	-	Y	-

- Comparative studies:**
 - MDT care was associated with fewer:
 - index-admission amputations
 - perioperative complications
 - revision procedures
 - However, longer-term infection recurrence and fracture union favoured MDT care, but were not consistently statistically significant.
- Both comparative studies were at serious risk of bias, while single-arm studies were at low to moderate risk.
- Heterogeneity existed in MDT composition, infection definitions, follow-up duration, and outcome reporting.

- Single-arm MDT studies:**
 - Fracture union rates exceeded 90% at final follow-up
 - Infection recurrence rates ranged from 6.3-16.6%
 - Reoperation rates ranged from 11.8-32.1%
 - Amputation rates ranged from 3.8-10.4%.

Conclusion

- Current observational evidence suggests that MDT management may reduce perioperative complications and surgical burden in patients with FRI.
- However, interpretation is limited by the retrospective design of all included studies, the small number of comparative studies, and substantial heterogeneity in MDT models, outcomes, and follow-up.
- Prospective comparative studies using standardised MDT definitions and core outcome reporting are needed to determine its independent effect on patient outcomes.

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