

How to Best Measure Changes in Clinical Status over Time: An Analysis of the Performance of Generic and Musculoskeletal Specific Functional Outcome Measures in Single Injury and Multiply Injured Patients

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Purpose: Patient-reported outcome measures (PROs) are the gold standard for assessing outcomes in orthopaedic trauma, but if multiple measures are used they can be a significant burden. Previous studies into specific injuries identified the Short Form-36 (SF-36) as the most responsive PRO and suggested that the Short Musculoskeletal Function Assessment (SMFA) may be unnecessary, but no studies have looked at multiple versus isolated injuries.

Methods: 659 patients were identified from prospective studies into operatively treated lower limb fractures, of whom 485 had isolated and 174 multiple injuries. For each group we assessed the responsiveness of the SF-36 and SMFA by calculating the standardized response mean (SRM), the proportion meeting minimal clinically important difference (MCID) between time points, and floor and ceiling effects.

Results: Between baseline and 6 months, the SRM of SF-36 was consistently greater than that of SMFA for both groups of patients. Between 6 and 12 months, the SRM for the SF-36 was greater in single injury patients. The proportion of patients who achieved MCID was consistently higher for SF-36 compared with SMFA. No ceiling effects were observed. However, at baseline, floor effects were seen in SMFA scores for both groups. No floor effects were seen at follow-up.

Conclusion: This study demonstrates that SF-36 has superior responsiveness versus SMFA in both isolated and multiple injury patients and supports the collection of SF-36 as the primary PRO irrespective of whether the patient has other injuries.

PAPER ABSTRACTS

Score Improvement	Isolated Trauma (n=485)						Polytrauma (n=174)							
	SF-36 PCS			SMFA DI			SRM p-value	SF-36 PCS			SMFA DI			SRM p-value
	Mean	SD	SRM	Mean	SD	SRM		Mean	SD	SRM	Mean	SD	SRM	
Baseline to 6 months	-15.5	10.93	-1.42	-11.18	10.90	-1.03	<0.0001	-20.39	11.95	-1.71	-18.10	13.43	-1.35	<0.01
6 months to 12 months	4.62	7.95	0.58	3.09	6.17	0.50	<0.0001	4.45	7.40	0.80	4.43	7.63	0.58	0.98

Table 1: Standardized Response Mean for Isolated Trauma and Polytrauma

		SF-36 PCS		SMFA DI		p-value
		MCID	Number achieving (%)	MCID	Number achieving (%)	
Baseline to 6 months	Isolated Trauma	5.47	395 (81.44)	5.45	323 (66.66)	<0.0001
	Polytrauma	5.97	144 (82.76)	6.72	134 (77.01)	0.11
	All	5.70	539 (81.79)	6.00	449 (68.13)	<0.0001
6 months to 12 months	Isolated Trauma	3.97	304 (62.68)	3.08	278 (57.32)	0.07
	Polytrauma	3.70	111 (63.79)	3.82	97 (55.75)	0.10
	All	3.90	417 (63.28)	3.30	365 (55.39)	<0.01

Table 2: Numbers achieving minimal clinically important difference