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IN BRIEF

Statistics In Brief: Minimum Clinically Important Difference—Availability of Reliable Estimates

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Background

To enter the era of value-based orthopaedics ("health outcomes per dollar spent") [2, 19], clinical researchers will have to prove that each treatment produces a meaningful clinical improvement using outcomes that are relevant for patients. The American Association of Hip and Knee Surgeons has recommended the use of patient-reported outcome measures to evaluate the results of knee and hip arthroplasties [16]. Studies have focused on statistically detectable (sometimes called statistically significant) differences [35]; however, it can be possible to detect statistical differences between interventions that are so small as not to be discernible to patients. Such small differences may not justify the cost or risk of the intervention. It seems much more important that treatments should result in clinical improvements big enough for patients to consider clinically important.

For a given outcome measure, we questioned how much improvement is needed for patients to consider the difference clinically important? Stated otherwise, what is the minimum clinically important differences (MCID) for a specific outcomes measurement tool, such as the SF-36 or the Oswestry Disability Index?

Discussion

According to Cook [5], the idea of the MCID was originally conceived by Jaeschke in 1989, whose definition was "the smallest difference in score in the domain of interest which patients perceive as beneficial and which would mandate, in the absence of troublesome side effects and excessive cost, a change in the patient management." Cook's interpretation of this seminal definition establishes two essential characteristics: (1) a minimal amount of change perceived by the patient; and (2) a change sufficiently relevant to determine a modification in patient management. The alternative term, minimal clinically important improvement (MCII) is defined as the "smallest change in measurement that signifies an important improvement" [16], and has encountered more support than the MCID in musculoskeletal research, especially in rheumatology [31, 32]. In the accompanying tables (Tables 1–8), we refer to their results as MCID or MCII, but acknowledge it may not be consistent among them. For simplicity, we will use the term MCID throughout this paper.

The application of MCIDs in clinical research has been difficult largely owing to various methods for estimating them [5, 14, 15]. Wright et al. [35] enumerates nine possible methods that can be divided in two possible

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Each author certifies that his or her institution approved the human protocol for this investigation and that all investigations were conducted in conformity with ethical principles of research.
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Table 1. Minimal clinically important improvements for the hip

Test	Subset	Method	Anchor	Value (points)	Variability (if given)	Patient group	Citation
HOOS	Pain	Mean change between groups	Reported improvement	24	20–28	All THA	Paulsen et al. [22]
	PS			23	19–29		
	QoL			17	12–22		
	Pain	ROC (maximum accuracy)		33	29–40		
	PS			35	27–50		
	QoL			38	32–39		
	Pain	ROC (80% specificity)		33	29–40		
	PS			35	27–50		
	QoL			38	32–39		
EURO-QOL	EQ-5D	ROC (maximum accuracy)	Reported improvement	0.14	0.10–0.18		
	EQ-VAS	Mean change between groups		7	1–12		
	EQ-5D		General health	0.31	0.29–0.34		
	EQ-VAS			23	21–5		
	EQ-5D	ROC (80% specificity)	Reported improvement	0.16	0.12–0.23		
	EQ-VAS			23	3–28		
	EQ-5D		General health	0.18	0.07–0.34		
	EQ-VAS			12	7–14		
	EQ-5D	ROC (maximum accuracy)	Reported improvement	0.33	0.13–0.33		
	EQ-VAS			15	10–20		
	EQ-5D		General health	0.31	0.37–0.44		
	EQ-VAS			35	30–40		
	EQ-5D	ROC (80% specificity)	Reported improvement	0.16		Femoroacetabular impingement	Impellizzeri et al. [10]
	EQ-VAS			15			
Harris hip score (MCII)		Mean change between groups	Health transition (SF-36) and satisfaction	18	SD 18.2	Primary THA; 2 years	Singh el al. [24]
				40.1	SD 12.8	Primary THA; 5 years	
Mayo hip score (MCII)				22.4	SD 19.5	Primary THA; 2 years	Singh et al. [25]
				22.7	SD 19.4	Primary THA; 5 years	
Oxford Hip Score (MCIC)	OHS	ROC (80% specificity)	Reported improvement	6		Femoroacetabular impingement	Impellizzeri et al. [10]
WOMAC	Pain	ROC (80% specificity)	Reported improvement	28		Femoroacetabular impingement	Impellizzeri et al. [10]
	Stiffness			25			
	Function			21			
	Total			22			

Table 1. continued

Test	Subset	Method	Anchor	Value (points)	Variability (if given)	Patient group	Citation
SF-36	Physical Function	Systematic review	Not applicable	20.40	14.4–26.4	Primary hip; osteoarthritis; 6 months postoperatively	Keurentjes et al. [12]
	Role Physical			10.78	1.5–20.0		
	Pain			14.67	6.8–22.6		
	General Health			0.40	−5.2 to +6.0		
	Energy/ Vitality			10.14	3.1–17.2		
	Social Function			8.63	0.9–16.4		
	Role Mental			−6.45	−24.5 to +11.6		
	Mental Health			8.99	2.3–15.7		
	Physical Function			8.29	−1.8 to +18.4	Primary hip; osteoarthritis; 2 years postoperatively	
	Role Physical			11.00	−13 to +23.3		
	Pain			18.34	9.1–27.6		
	General Health			−6.37	−10.9 to +1.9		
	Energy/ Vitality			14.51	6.4–22.6		
	Social Function			17.97	7.8−28.1		
	Role Mental			20.83	−0.6 to +28.3		
	Mental Health			16.15	9.0–23.3		
	Physical Function			3.25	2.8–3.9	Revision hip; osteoarthritis; 6 months postoperatively	
	Role Physical			4.78	4.1–5.8		
	Pain			14.91	12.7–18.0		
	General Health			14.12	12.1–17.0		
	Energy/ Vitality			22.81	19.5–27.5		
	Social Function			15.83	13.5–19.1		
	Role Mental			19.98	17.1–24.1		
	Mental Health			12.37	10.6–14.9		

HOOS = Hip Osteoarthritis Outcome Score; PS = Physical Function Short Form; QoL = quality of life; WOMAC = Western Ontario and McMaster Universities Arthritis Index; MCII = minimal clinically important improvement; MCIC = minimal clinically important change; ROC = receiver operating characteristic

Table 2. Minimum clinically important differences for the knee

Test	Subset	Method	Anchor	Value (points)	Variability (if given)	Patient group	Citation
KOOS	PS	Mean change between groups	Arthritis better	−2.2	SD 17.5	Osteoarthritis	Singh et al. [23]
	QoL			8	SD 16.1		
	Sport/recreation	ROC (maximum accuracy)	Improve ADL	40		MACI for chondral defects	Ebert et al. [9]
	Sport/recreation		Return to recreation	40			
	Sport/recreation		Return to sport	45			
	Sport/recreation		Overall satisfaction	40			
	QoL		Improve ADL	23			
	QoL		Overall satisfaction	31			
IACOP	Pain	Mean change between groups	Arthritis better	18.5	SD 22.0	Osteoarthritis	Singh et al. [23]
	Constant Pain			18.7	SD 24.4		
	Intermittent Pain			18.4	SD 25.4		
SF-36	Physical Function	Meta-analysis		11.57	6.5–16.7	Osteoarthritis; 6 months postoperatively	Keurentjes et al. [12]
	Role Physical			11.69	3.8–19.6		
	Pain			16.86	9.7–24.0		
	General Health			0.85	−3.2 to +4.9		
	Energy/Vitality			3.86	−1.7 to +9.4		
	Social Function			11.66	3.7–19.6		
	Role Mental			7.65	−4.5 to +19.8		
	Mental Health			−0.32	−5.5 to +4.9		

KOOS = Knee Osteoarthritis Outcome Score; PS = Physical Function Short Form; QoL = quality of life; MACI = matrix-induced autologous chondrocyte implantation; IACOP = intermittent and constant osteoarthritis pain; ADL = activities of daily living; ROC = receiver operating characteristic curve.

Table 3. Minimum clinically important differences for the spine

Test	Type	Method	Anchor	Value (points)	Patient group	Citation
mJOA	MCID	Mean change between groups	Health transition (SF-36)	3.07	Cervical spondylotic myelopathy	Zhou et al. [36]
		ROC (maximum accuracy)		1.25		
		Average change of responders		2.7		
		Mean change between groups	Improvement on NDI	1.11	Degenerative cervical myelopathy (overall)	Tetreault et al. [29]
		ROC (maximum accuracy)		2		
		Mean change between groups		0.43	Degenerative cervical myelopathy; mild mJOA	
		Mean change between groups		0.44	Degenerative cervical myelopathy; moderate mJOA	
		Mean change between groups		1.76	Degenerative cervical myelopathy; severe mJOA	
ODI	Cutoff (outcome scores)	ROC (unclear)	Reported disability	12	Lower back pain	Tonosu et al. [30]
	MCII	Preoperative questionnaire	Minimal acceptable outcome	28.7	Spondylolisthesis (lumbar fusion)	Carragee and Cheng [3]
				SD, 9.31; range, 6–53		
			Minimal acceptable outcome	29.2	Degenerative disc disease (lumbar fusion)	
				SD, 7.80; range, 8–48		
	MCID	Mean change between groups	Health transition (SF-36) and satisfaction	15.6	Revision for lumbar stenosis	Parker et al. [21]
		ROC (unclear)		9		
		Average change in responders		19.9		
		Mean change between groups	Health transition (SF-36)	13.8	Revision for lumbar adjacent segment disease	
		ROC (unclear)		11		
		Average change in responders		14.9		
		Mean change between groups	Satisfaction	12.4		
		ROC (unclear)		12		
		Average change in responders		16.7		
	MCID	ROC (unclear)	Health transition (SF-36)	13.9	IDEM spinal tumors	Zuckerman et al. [37]
	MCID	ROC (maximum accuracy)	Health transition (SF-36)	11.3	Cervical spine	Skolasky et al. [26]
EQ-5D	MCID	Mean change between groups	Health transition (SF-36) and satisfaction	0.52	Revision for lumbar stenosis	Parker et al. [21]
		ROC (unclear)		0.43		
		Average change in responders		0.52		
		Mean change between groups	Health transition (SF-36)	0.29	Revision for lumbar adjacent segment disease	
		ROC (unclear)		0.4		
		Average change in responders		0.48		
		Mean change between groups	Satisfaction	0.29		
		ROC (unclear)		0.49		
		Average change in responders		0.53		
SF-36 PCS	MCID	ROC (maximum accuracy	Health transition (SF-36) I	6.5	Cervical spine	Skolasky et al. [26]
SF-36 MCS				5		

Table 3. continued

Test	Type	Method	Anchor	Value (points)	Patient group	Citation
SF-12 PCS	MCID	Mean change between groups	Health transition (SF-36) and satisfaction	12.1	Revision for lumbar stenosis	Parker et al. [21]
		ROC (unclear)		4.4		
		Average change in responders		11.5		
		Mean change between groups	Health transition (SF-36)	8.8	Revision for lumbar adjacent segment disease	
		ROC (unclear)		6.2		
		Average change in responders		11.7		
		Mean change between groups	Satisfaction	7.5		
		ROC (unclear)		10.1		
		Average change in responders		12.6		
	MCID	ROC (unclear)	Health transition (SF-36)	2.8	IDEM spinal tumors	Zuckerman et al. [37]
	MCID	Mean change between groups		9.62	Cervical spondylotic myelopathy	Zhou et al. [36]
		ROC (maximum accuracy)		4.09		
		Average change of responders		5.44		
SF-12 MCS	MCID	Mean change between groups	Health transition (SF-36) and satisfaction	9.2	Revision for lumbar stenosis	Parker et al. [21]
		ROC (unclear)		7.0		
		Average change in responders		15.9		
		Mean change between groups	Health transition (SF-36)	6.3	Revision for lumbar adjacent segment disease	
		ROC (unclear)		7.3		
		Average change in responders		10.6		
		Mean change between groups	Satisfaction	4.4		
		ROC (unclear)		10.0		
		Average change in responders		10.8		
	MCID	ROC (unclear)	Health transition (SF-36)	10.7	IDEM spinal tumors	Zuckerman et al. [37]
	MCID	Mean change between groups	Health transition (SF-36)	7.41	Cervical spondylotic myelopathy	Zhou et al. [36]
		ROC (maximum accuracy)		3.91		
		Average change of responders		3.11		

MCID = minimum clinically important difference; ROC = receiver operating characteristic; NDI = Neck Disability Index; mJOA = modified Japanese Orthopaedic Association. ODI = Oswestry Disability Index; IDEM = intradural extramedullary; MCS = Mental Component Summary; PCS = Physical Component Summary; MCII = minimal clinically important improvement.

Table 4. Foot and ankle scores based on reported improvement for anchor

Test	Subset	Type	Method	Value (points)	Patient group	Citation
AOFAS	Hallux MTP-IP	MCID	ROC (maximum accuracy)	17 for pain; 7 for other foot problems	Surgery for hallux valgus	Dawson et al. [8]
	Ankle-hindfoot			2		
	Midfoot			5		
	Lesser toes MTP-IP			7 for pain; 3 for other foot problems		
MOXFQ	Walking/standing			14.29		
	Pain			25		
	Social interaction			25 for pain; 18.75 for other foot problems		
MOXFQ	Walking/standing	MCIC	Mean change between groups	13.03	Surgery for hallux valgus (Pain Group)	Dawson et al. [6]
	Pain			13.01		
	Social interaction			12.94		
	Walking/standing			11.02	Surgery for hallux valgus (other problems)	
	Pain			13.76		
	Social interaction			12.28		
	Walking/standing	MCID		16.2	Surgery for hallux valgus (Pain Group)	
	Pain			9.9		
	Social interaction			9.3		
	Walking/standing			9.7	Surgery for hallux valgus (other problems)	
	Pain			9.1		
	Social interaction			10.6		
SF-36	Physical Function	MCID	ROC (maximum accuracy)	5	Surgery for hallux valgus (Pain Group)	Dawson et al. [8]
	Role Physical			25		
	Role Mental			N/A		
	Social Function			12.5		
	Mental Health			5		
	Energy/Vitality			N/A		
	Pain			0		
	General Health			10		
	Physical Function			10	Surgery for hallux valgus (other problems)	
	Role Physical			25		
	Role Mental			N/A		
	Social Function			12.5		
	Mental Health			5		
	Energy/Vitality			N/A		
	Pain			11.1		
	General Health			10		

Table 4. continued

Test	Subset	Type	Method	Value (points)	Patient group	Citation
Physical Function	MCIC	Mean change between groups	−5.00	Surgery for hallux valgus (Pain Group)	Dawson et al. [6]	
Role Physical			−3.09			
Role Mental			3.57			
Social Function			0.15			
Mental Health			−0.88			
Energy/Vitality			−0.22			
Pain			−6.93			
General Health			4.36			
Physical Function			−2.65	Surgery for hallux valgus (other problems)		
Role Physical			−1.85			
Role Mental			1.63			
Social Function			1.34			
Mental Health			0.38			
Energy/Vitality			2.14			
Pain			−7.96			
General Health			3.94			

AOFAS = American Orthopaedic Foot and Ankle Society; MTP-IP = metatarsophalangeal-interphalangeal; MOXFQ = Manchester-Oxford foot questionnaire; MCID = minimum clinically important difference; MCIC = minimal clinically important change; N/A = not available; ROC = receiver operating characteristic.

Table 5. Minimum clinically important differences for the lower extremity functional score

Subset	Type	Method	Based on	Anchor	Value (points)	Variability (if given)	Patient group	Citation
N/A	MCID	ROC (unclear)	Change score	Prognostic rating	9	SEM ± 3.9	Physical therapy patients with any joint, muscle, or soft tissue condition of the lower extremity	Binkley et al. [1]
Functional status	MCII	ROC (maximum accuracy)	Change score	Reported improvement	12	5–14, lower for higher initial functional status scores; also variations with age, gender, and acuity	All patients with knee surgery	Wang et al. [33]

MCID = minimum clinically important difference; MCII = minimal clinically important improvement; ROC = receiver operating characteristic; SEM = standard error of mean; N/A = not applicable.

Table 6. Minimum clinically important differences for the hand

Test	Subset	Method	Anchor	Value (points)	Variability (if given)	Patient group	Citation
CTQ	Symptom severity	ROC (maximum accuracy)	Satisfaction	1.45		Carpal tunnel, patients with diabetes, 3 months	Ozer et al. [20]
	Function severity			1.95			
	Symptom severity			0.8		Carpal tunnel, patients without diabetes, 3 months	
	Function severity			1.25			
	Symptom severity			1.55		Carpal tunnel, patients with diabetes, 6 months	
	Function severity			2.05			
	Symptom severity			1.6		Carpal tunnel, patients without diabetes; 6 months	
	Function severity			1.45			
	Overall	ROC (maximum accuracy)	Reported improvement	0.92		Limited carpal tunnel release	Kim and Jeon [13]
	Symptom severity			1.14			
	Function severity			0.74			
PWRE		ROC (maximum accuracy)	Reported improvement	17		Idiopathic ulnar impaction syndrome	Kim and Park [14]
		Mean change between groups		14	SD 15	All patients	Sorensen et al. [27]
				10	SD 20	Osteoarthritis	
				9	SD 11	Nerve compression	
				17	SD 15	Tendinitis	

CTQ = Carpal Tunnel Questionnaire; PWRE = Patient-rated Wrist Evaluation; ROC = receiver operating characteristic curve.

Table 7. Minimum clinically important differences for the shoulder and elbow

Test	Subset	Method	Anchor	Value (points)	Variability (if given)	Patient group	Citation
ASES	Total score	ROC (maximum accuracy)	Reported improvement	6.4		Outpatient shoulder	Michener et al. [17]
	Function	Mean change between groups	Reported improvement	12.01		Nonoperative tendinitis or rotator cuff tear	Tashjian et al. [28]
	Pain			16.92			
	Satisfaction			16.72			
	Work anchor	Mean change	Satisfaction	6.3	−2.3 to +15.0	TSA	Werner et al. [34]
	Activity anchor			9.1	1.3–16.9		
	Overall satisfaction			13.5	4.8–22.3		
	SF-12 activity anchor			7.7	1.4–14.0		
	Work anchor	Mean change	Satisfaction	6.2	−6.3 to +18.7	RSA	Werner et al. [34]
	Activity anchor			8.9	−3.4 to +21.3		
	Overall satisfaction			8.4	2.8–14.0		
	SF-12 activity anchor			13.9	3.5–24.2		
OES	Function	Mean change between groups	Reported improvement	9.23		Elbow surgery	Dawson et al. [7]
		ROC (maximum accuracy)		5			
		Mean change between groups		9.64		Elbow problems	
		ROC (maximum accuracy)		0			
	Pain	Mean change between groups		19.23		Elbow surgery	
		ROC (maximum accuracy)		12.5			
		Mean change between groups		17.41		Elbow problems	
		ROC (maximum accuracy)		6.25			
	Social-psychological	Mean change between groups		17.79		Elbow surgery	
		ROC (maximum accuracy)		12.5			
		Mean change between groups		18.30		Elbow problems	
		ROC (maximum accuracy)		6.25			

OES = Oxford Elbow Score; ASES = American Society of Shoulder and Elbow Surgery; TSA = total shoulder arthroplasty; RSA = revision shoulder arthroplasty; ROC = receiver-operating characteristic.

Table 8. Minimum clinically important differences for the DASH and QuickDASH scores

Test	Method	Anchor	Value (points)	Variability (if given)	Patient group	Citation
DASH	ROC (maximum accuracy)	Reported improvement	13.5		Idiopathic ulnar impaction syndrome	Kim and Park [14]
DASH	Mean change between groups	Reported improvement	10	SD 13	All patients	Sorensen et al. [27]
QuickDASH			14	SD 14		
DASH			15	SD 20	Osteoarthritis	
QuickDASH			19	SD 19		
DASH			6	SD 14	Nerve compression	
QuickDASH			10	SD 16.1		
DASH			10	SD 10	Tendinitis	
QuickDASH			16	SD 13		
DASH	Mean change between groups	Reported improvement	10.32		Elbow pain	Dawson et al. [7]
	ROC (maximum accuracy)		5			
	Mean change between groups		9.11		Elbow problems	
	ROC (maximum accuracy)		5			
QuickDASH (MCII)	ROC (maximum accuracy)	Satisfaction	20		All patients with carpal tunnel disorders	Clement et al. [4]
			4		Baseline 0–25	
			12		Baseline 25–50	
			23		Baseline 50–75	
			39		Baseline 75–100	

DASH = Disabilities of the Arm, Shoulder and Hand; ROC = receiver-operating characteristic; MCII = minimal clinically important improvement.

approaches. One approach uses distribution-based methods, based on statistically detectable changes. However, MCIDs calculated using statistical distributions—particularly when they represent small effect sizes—may not reflect clinically important changes. This topic is discussed in more detail in the "Myths and Misconceptions" Section.

The other approach is to define a binary anchor based on a patient's reported outcome—for example, was the patient satisfied, or did (s)he feel that his or her health had improved? In this anchor approach, there are two commonly used methods to estimate MCID. One is to use a statistical test to estimate the difference between patients answering 'yes' and 'no' to the anchor. Another is to use a receiver-operating characteristic (ROC) curve to identify the MCID as the threshold best separating 'yes' and 'no' responses. In studies using the ROC approach, two additional alternatives exist: studies that focus on maximum overall accuracy, and studies that ascertain whether 80% specificity had been achieved. Importantly, Katz et al. [11] also warn that anchor-based approaches may be misleading in scenarios where a few patients show large benefits, but most show negligible changes.

Although we believe the anchor approach is relatively robust, we acknowledge that different calculation methods lead, unsurprisingly, to different results. Other factors affecting results include whether the calculations were based on raw outcome scores or changes from baseline (MCID vs MCII) and the underlying diagnosis for the patients. Accordingly, we sometimes found a range of possible MCID values for the same outcomes tool (Tables 1–8).

Myths and Misconceptions

The MCID and the Minimal Detectable Change are the Same (or Even Similar)

They are not the same. By definition, the minimal detectable change (MDC) is the smallest change that can be distinguished from background variation among subjects, which may depend on the variability of the measurement in the population or on the standard error of measurement associated with the test. However, a statistically detectable change may not be one that matters to the patient, although the two may be related. For example, Norman et al. [18] reported that for quality-of-life outcome scores across a range of conditions, the MCID was generally approximately half the standard deviation of the reported scores' ranges, perhaps reflecting discrimination thresholds of patients. If the MDC is less than the MCID/MCII, then a study may suggest that a treatment results in a difference in outcomes (based on distribution) but the patients may not be able to perceive this difference. If the MCID/MCII is less than the MDC, then we may have the opposite situation, in which numerous patients will report a real benefit, but there is no way to verify it using hard data.

The difference between a statistically detectable and clinically meaningful difference is important (Fig. 1). Imagine a series of clinical studies, each of which returns an estimate of the size of a treatment's effect, with a confidence interval drawn around that estimate. If the confidence interval crosses the vertical line representing "no change," the result is not statistically significant, meaning that the observed "difference" may be simply the influence of chance. If the confidence interval is entirely to the right of the vertical line indicating "no change" then the effect is unlikely to be a chance effect. The clinical importance of this effect increases with its distance from the vertical line; that is, confidence intervals that are to the right of the line of "no change" represent "real" effects, but if they are very close to that line, those treatment effects are very small. Therefore it is possible to have situations that reflect statistically detectable changes, but ones that are not clinically important. It also is possible to have intermediate situations, in which there is no statistical effect but we cannot exclude the possibility of a clinical one (this comes into play when there is insufficient

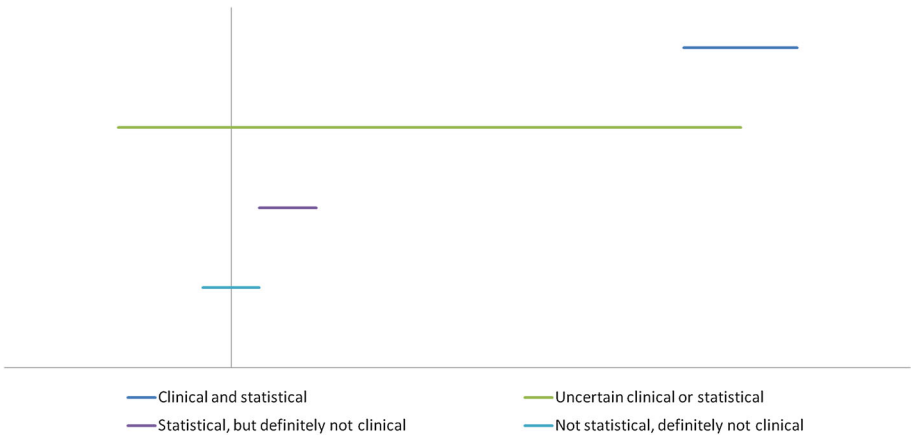

Fig. 1 A comparison of clinical and statistical significance is presented. The vertical line indicates the "no change" region of a measured effect. The horizontal distance from the line measures strength of the effect. Any confidence interval crossing that vertical line is not statistically significant, and any confidence interval near that line may not be clinically significant.

statistical power, commonly the result of too few patients studied), or in which there is a statistical effect (the confidence interval remains entirely to the right of the line of "no change"), and the point estimate—such as the mean value on a patient-reported outcomes score, or an odds ratio—seems large enough to care about, but a confidence interval whose left-hand boundary is a very small number, suggesting the effect may in fact not be clinically important.

For a Specific Outcomes Tool, the MCIDs for Various Treatments of a Single Joint Will Always be the Same (or Even Similar)

One expects MCID estimates to differ depending on patients' pathologic characteristics and comorbidities, even when the same calculation method is used for a given outcomes tool. For example, the MCID for hip osteoarthritis may vary based on whether the operation was a first-time arthroplasty or a revision, and based on the timetable of recovery (Table 1). Other examples include those reported by Ozer et al. [20], who found that patients with diabetes had higher MCIDs on the Carpal Tunnel Questionnaire (Table 6), and Wang et al. [33], who found that the MCID for Lower Extremity Functional Scale scores after treatment are at least in part related to the scores those patients reported at baseline (Table 5) and also that age, gender, and symptom acuity could affect estimated MCIDs.

The MCID Can be Used as a Basis for Planning Studies

This is not so much a misconception as a potential caveat. Before the current work, a compendium of outcome scores was assembled by Katz et al. [11], who reviewed painful orthopaedic conditions. They found, as we have, that there is a range of MCIDs for the same condition, and that some scores depend on the initial condition of the patient. Their concern was that averaging across groups could be misleading, if only a few patients change substantially, and most patients change only slightly, if at all. They recommended that in clinical trials comparing two treatments, studies should compare the percentages of patients achieving the MCID.

Conclusions

The tables summarize the range of MCIDs for various outcome tools as an aid to clinicians who may be planning studies or seeking to evaluate patient outcomes in their practices. We caution, based on our findings presented here, that none of the MCID estimates can be considered definitive. However, it may be sufficient for an investigator's purpose to know a range of probable values for differences between patient groups.

Methodologic Note

The articles referenced were found by using a Boolean search in PubMed using the terms "MCID" or ("Clinically Important" AND ("Minimum" OR "Minimal") plus "orthopedic" in September 2016. These results were not as comprehensive as we had expected, although still broad enough to provide ample evidence of the variation in MCID. We focused on anchor-based methods because they are tied to patient outcomes, whereas statistical detection thresholds (distribution-based methods) may be irrelevant to the patient.

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