

Accuracy of Clinical Impressions and Mini-Mental State Exam Scores for Assessing Capacity to Consent to Major Medical Treatment

Comparison With Criterion-Standard Psychiatric Assessments

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The authors evaluated the accuracy of clinical impressions and Mini-Mental State Exam scores for assessing patient capacity to consent to major medical treatment, relative to expert psychiatric assessment. Consecutive medical inpatients (N = 63) facing a decision about major medical treatment received a clinical impression of capacity from their treating physician and the Standardized Mini-Mental State Exam (SMMSE); 48 received independent psychiatric assessment of capacity. Analyses revealed that both clinical impressions and SMMSE scores were generally inaccurate in determining capacity, although all 23 participants with a clinical impression of "definitely capable" were found capable by the psychiatrist. Given the importance of assessing capacity to consent to major medical treatment, better approaches to the clinical assessment of capacity are required. Several strategies are discussed.

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Determination of a patient's capacity to consent to treatment is a fundamental process in shared decision making about health care treatment. Providing treatment against the expressed wishes of a capable patient violates the principle of patient autonomy, but foregoing treatment based on the expressed wishes of an incapable patient violates the principle of physician beneficence.¹

According to various well-accepted definitions of capacity, a capable person is one who

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has the ability to understand relevant information and the ability to appreciate the reasonably foreseeable consequences of a decision.^{2,3} Moreover, capacity is specific for particular decisions.² Therefore, a person may be capable with respect to one decision, such as deciding where to live, but incapable with respect to another decision, such as deciding about a major medical treatment.

Capacity assessment is a complex process that may be influenced by both physician and patient factors.⁴ Physician factors include skill in explaining relevant medical facts to the patient at a level consistent with the patient's educational and cultural background, and the clinician's ability to assess the patient's capacity to understand and appreciate the medical situation at hand. This may require a careful evaluation of the patient's cognitive function, emotional state (i.e., level of anxiety), and the personal and cultural significance attached to the illness and proposed treatment. Patient factors affecting accuracy of capacity evaluations include cooperation, ability to articulate motives and values, and fluctuations in the patient's medical and mental state.

Accurate capacity assessment is particularly important for decisions about major medical treatments, such as cardiopulmonary resuscitation, dialysis, and blood transfusion. Patients who accept such treatments are exposed to significant risk of discomfort and serious side effects, whereas patients who refuse these treatments are exposed to a very high risk of death.

Despite the complexity and importance of capacity assessments, physicians rely on informal clinical impressions⁵ and/or cognitive status tests such as the Mini-Mental State Exam to evaluate capacity to consent to major medical treatment.^{6,7} No study has evaluated the accuracy of these measures for this purpose. One study compared Mini-Mental State Exam scores to patients' understanding of legal concepts of consent and advance directives.⁶ The applicability of this study to the assessment of patient capacity to consent to major medical treatment is uncertain, because capacity

assessments should involve information that is relevant to a person's situation.⁸

Our study's objectives were to evaluate the accuracy of clinical impressions and the Standardized Mini-Mental State Examination, in assessing capacity to consent to major medical treatment, when compared with the clinical reference standard of assessment by a consultation-liaison psychiatrist.

METHODS

The study was conducted from September to October 1992 and from March to October 1993. At daily morning rounds, staff internists and medical residents on a general medical inpatient service at the Western Division of the Toronto Hospital were asked to identify inpatients who were 1) 16 or older, 2) able to communicate in spoken English, and 3) capable of making a decision regarding major medical treatment proposed by the treating physicians.

Consecutive patients who were identified by their physicians were asked to participate. We also obtained consent from a "substitute" decision maker if the physician was already involved in the treatment decision. We ascertained that the treating physician (usually a medical resident) had informed each participant about his/her medical condition, treatment options, and the risks and benefits of each option, and had given the participant an opportunity to ask questions.

Measurements

Consenting eligible participants received the following assessments within a 72-hour period: a clinical impression of capacity obtained from the treating physician, the Standardized Mini-Mental State Examination (SMMSE), and a psychiatric assessment of capacity.

The clinical impression by the treating physician was provided by the physician, usually a medical resident or intern, who had primary responsibility for the patient's care. The physician was asked to give an impression of his/her patient's capacity to consent to the

actual treatment being proposed, rather than a hypothetical treatment. For example, if the patient was making a decision about blood transfusion, then the physician gave an impression of the patient's capacity to decide about blood transfusion. Potential results of the clinical impressions were as follows: definitely capable, probably capable, probably incapable, or definitely incapable.

The SMMSE is a modified version of the original Mini-Mental State Exam, but with improved reliability.⁹ The result is a score from 0 to 30. The SMMSE was administered by a study physician who was unaware of the results of the clinical impression or the psychiatric assessment.

Psychiatric assessments were conducted by one of two consultation-liaison psychiatrists experienced in assessing capacity of medical patients. At the start of the study, the psychiatrists standardized their approach based on the criteria of Appelbaum and Grisso,³ then independently assessed four participants, with perfect agreement (three capable, one incapable). Each assessment included a chart review, an interview with the participant and, if necessary, discussions with the participant's physicians, nurses, and family. During the interview with the participant, the psychiatrist would test the patient's understanding of relevant information, such as the nature of the medical condition and details of the treatment recommended and any alternative, including the risks and benefits of accepting and refusing the treatment. In addition, the psychiatrist would evaluate the participant's ability to appreciate the consequence of making a decision on his/her life and quality of life and explore reasons for the participant's decision to accept or refuse treatment. If necessary, the psychiatrist would provide relevant information, then test the patient's understanding of this information. The psychiatrists also sought evidence of psychopathology affecting capacity, such as a delusional system. The potential results of the psychiatric assessment were "capable" or "incapable." The psychiatrists were blinded to the results of the clinical impressions and the SMMSE. The

psychiatrists performed mental status assessments as required but did not obtain SMMSE scores during their assessments.

Data Analysis

The characteristics of participants and non-participants were compared by using *t*-tests for continuous variables, and chi-square analysis or Fisher's exact test for categorical variables, using SSPS (Version 6.0) for Windows software. Statistical significance was defined as a two-tailed *P*-value less than 0.05.

To compare the clinical impressions and SMMSE scores to psychiatric assessment, we calculated likelihood ratios (with 95% confidence intervals [CI]) by using the maximum likelihood option of ROC Analyzer (Version 6.0) software.¹⁰ Likelihood ratios are preferable to sensitivities and specificities when a diagnostic test has more than two possible results.¹¹ A likelihood ratio (LR) of greater than 1 increases the likelihood of an abnormality (in this case, a finding of incapacity); an LR ratio less than 1 reduces the likelihood of incapacity; and an LR equal to 1 means that the test result does not alter the likelihood of incapacity.

Ethics. The research protocol was approved by The Toronto Hospital Committee for Research on Human Subjects.

RESULTS

We approached 89 potentially eligible participants and got 63 to participate in the study. The reasons for nonparticipation were as follows: refusal (17), died (3), discharged from hospital (2), language barrier (2), medical deterioration requiring intubation (1), and preference of treating physician (1). Compared with the participants, the nonparticipants were similar in age (median 73.5 years for nonparticipants, 69 years for participants, *P* = 0.81); male gender (58% vs. 66%, *P* = 0.49); and treatment decision (46% vs. 52% accepting treatment, 42% vs. 33% refusing treatment, and 12% vs. 16% not yet decided, *P* = 0.12).

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Of the 63 participants, 48 (76%) received psychiatric assessment of capacity. Fifteen participants did not receive psychiatric assessment for the following reasons: discharged before assessment (6), refused assessment (4), unable to assess because of intubation/coma (2), and unable to complete assessment (3). The 15 participants who were not assessed by a psychiatrist had similar clinical impressions ($P = 0.80$) and SMMSE scores ($P = 0.75$) to the 48 participants who were assessed by a psychiatrist.

Characteristics of the 48 participants who were assessed by a psychiatrist are listed in Table 1. Of these 48 participants, data collection was complete, with the following exceptions: 3 participants did not receive a clinical impression (SMMSE scores were 12, 21, and 23; all 3 found capable by psychiatric assessment), and 1 participant did not complete an SMMSE (clinical impression was "definitely incapable," psychiatric assessment was "capable").

Clinical Impressions

For the patients who received clinical impressions, the prevalence of incapacity by psychiatric assessment was 20% (9/45). We combined the clinical impressions of "probably" and "definitely incapable," because few

physicians gave these clinical impressions. A clinical impression of "probably" or "definitely incapable" significantly increased the probability of incapacity to 63% (LR: 6.7, 95% CI: 2.0–21), but 3 capable participants were falsely classified as incapable (error rate $3/8 = 37\%$). A clinical impression of "definitely capable" significantly reduced the probability of incapacity to 0% (LR: 0.0, 95% CI: 0.0–0.60), and no incapable participants were falsely classified as capable (error rate $0/23 = 0\%$). A clinical impression of "probably capable" insignificantly changed the probability of incapacity (LR: 1.6, 95% CI: 0.60–3.6), and 4 incapable participants were falsely classified as "probably capable" (error rate $4/14 = 29\%$). We also found that the accuracy of clinical impressions was similar for the patients who were refusing and accepting treatment (data not shown). See Table 2.

To determine whether fluctuations could explain disagreements between the clinical impressions and the psychiatric assessment, we retrospectively reviewed the medical records of the participants who were falsely classified by the clinical impressions. Of the seven participants who were falsely classified by the clinical impression, two had evidence of a fluctuating clinical status.

SMMSE Scores

For the participants with SMMSE scores, the prevalence of incapacity was 19% (9/47). An SMMSE score of 16 or less significantly increased the probability of incapacity to 67% (LR: 8.4, 95% CI: 2.0–35), but 2 capable participants were falsely classified as incapable

TABLE 1. Characteristics of study participants who received psychiatric assessment ($n = 48$)

Age (mean, interquartile range)	72 years (43–81)
Male gender, n (%)	32 (67)
Standardized Mini-Mental State Exam score (median, interquartile range)	25 (20–29)
Treatment Decision, n (%)	
Accept treatment	25 (52)
Reject treatment	15 (31)
Undecided	8 (16)
Proposed Treatment, n (%)	
Blood transfusion	11 (23)
Intravenous antibiotics	10 (21)
Cardiopulmonary resuscitation	7 (15)
Dialysis	6 (13)
Surgical treatment	4 (8)
Others	10 (21)

TABLE 2. Clinical impressions compared with psychiatric assessment of capacity

Clinical Impression	Psychiatric Assessment		Totals
	Incapable	Capable	
Definitely or probably incapable	5	3	8
Probably capable	4	10	14
Definitely capable	0	23	23
Totals	9	36	45

(error rate 2/6 = 33%). An SMMSE score of 25 or more significantly reduced the probability of incapacity to 4% (LR: 0.16, 95% CI: 0.03–0.66), but 1 incapable participant was falsely classified as capable (error rate 1/27 = 4%). SMMSE scores from 17 to 24 did not significantly change the probability of incapacity (LR: 1.7, 95% CI: 0.64–3.8); 4/14 (29%) participants with scores between 17 and 24 were incapable. See Table 3.

Combination of Clinical Impressions and SMMSE Scores

For the participants with both SMMSE scores and clinical impressions, the prevalence of incapacity was 9/44 (20%). A clinical impression of “definitely” or “probably incapable” combined with an SMMSE score of 16 or less significantly increased the probability of incapacity from 20% to 100% (LR: infinity, 95% CI: 3.2–infinity), so no capable participants were falsely classified as incapable (error rate 0/4 = 0%). A clinical impression of “definitely” or “probably capable” combined with an SMMSE score of 25 or more significantly reduced the probability of incapacity from 20% to 0% (LR: 0.0, 95% CI: 0.0–0.51), so no incapable participants were falsely classified as capable (error rate 0/26 = 0%). Other combinations of clinical impressions and SMMSE scores did not significantly change the probability of incapacity (LR: 2.2, 95% CI: 0.89–4.6); 5/14 (36%) were incapable. See Table 4.

TABLE 3. Standardized Mini-Mental State Exam (SMMSE) scores compared with psychiatric assessment of capacity

SMMSE	Psychiatric Assessment		
	Incapable	Capable	Totals
16 or less	4	2	6
17–24	4	10	14
25 or more	1	26	27
Totals	9	38	47

DISCUSSION

We found that if the treating physician’s clinical impression was “definitely capable,” then the person was very likely to be found capable by independent psychiatric assessment. However, other clinical impressions, from “probably capable” through to “definitely incapable,” were inaccurate.

There are several potential explanations for the inaccuracy of the clinical impressions. First, we asked medical house staff with 1 to 3 years of clinical experience to make a complex assessment without specific training or instruction, so it is not surprising that some disagreements were observed. It is possible that experienced clinicians may have more accurate clinical impressions. However, a recent survey found that while older physicians were more likely to make accurate capacity assessments than younger physicians, the accuracy of the older physicians was still very poor.¹² Second, clinicians must disclose relevant information in an understandable way during capacity assessments, and ineffective disclosure leads to inaccurate capacity assessments.³ Although we ensured that pertinent information was disclosed to the patients, the physicians’ disclosure skills may have varied significantly.

We also found that the SMMSE scores were not accurate for assessing capacity to consent to treatment. Our results are consistent with prior studies that found that Mini-Mental State Exam

TABLE 4. Combination of clinical impressions and Standardized Mini-Mental State Exam (SMMSE) scores compared with psychiatric assessment of capacity

Clinical Impression	Psychiatric Assessment		Totals
	Incapable	Capable	
Definitely incapable or probably incapable and SMMSE 16 or less	4	0	4
Other combinations	5	9	14
Definitely capable or probably capable and SMMSE 25 or more	0	26	26
Totals	9	35	44

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scores are inaccurate for assessing capacity to understand legal aspects of informed consent and advance directives,⁶ and inaccurate for assessing capacity to make financial decisions.⁷ An explanation of the inaccuracy of SMMSE scores is that the SMMSE measures only cognitive functions. Although cognition and capacity are related constructs,¹³ they are not identical, so some aspects of capacity are not measured by the SMMSE. For example, one participant had an SMMSE score of 30 but was found incapable by psychiatric assessment. His refusal of anticoagulation for cardioembolic stroke was based on an acute delusional belief that the nursing staff were vampires.

Combining the clinical impression and the SMMSE score resulted in slightly fewer errors. The combination of a clinical impression of “definitely” or “probably incapable” with an SMMSE score of 16 or less had an excellent LR of infinity, but this estimate is based on only 4 participants. Also, the combination of clinical impressions and SMMSE scores was not prospectively determined, so this result requires validation in a separate population. Even with optimal combinations of clinical impressions and SMMSE scores, many participants with SMMSE scores of 16–23 were still falsely classified. A possible explanation is that mild-to-moderate cognitive impairment has a variable effect on capacity.¹⁴ Therefore, our results suggest that a skilled assessment of cognitive functioning, and its impact on capacity, is required in patients with mild-to-moderate cognitive impairment.

One limitation of our study is that some participants did not receive psychiatric assessment for a variety of reasons. However, the participants who were not assessed by the study’s psychiatrists otherwise appeared similar to those participants who were assessed, so we feel that our results are not biased by the exclusion of patients who did not receive psychiatric assessments. Another limitation is the potential for fluctuating capacity in medically ill patients. We found evidence of fluctuating medical status in two participants, where the clinical impressions disagreed with the psychiatric assessments. Even if we assume that fluctuation

caused both of these disagreements, our conclusions would remain unchanged. Finally, our sample size was small, so we cannot make any conclusions regarding the characteristics of patients in whom there was a discrepancy between the clinical impressions, the Mini-Mental State Exam scores, and the psychiatric assessments.

A central limitation to all studies of capacity is the absence of widely accepted criterion-standard protocols for capacity assessment. We chose psychiatric assessment because it is the most commonly used and available criterion-standard assessment in routine medical practice. Our study psychiatrists had special interest and experience in capacity assessment and applied published guidelines in a standard fashion. Since our study was completed, a comprehensive criterion-standard assessment protocol has been developed and evaluated.¹⁵ This comprehensive protocol may be useful in subsequent studies.

Our results suggest that better methods of assessing capacity to consent to treatment are needed. Several approaches may be potentially useful. First, physicians could improve their skills regarding disclosure of relevant information. We observed several instances where capable patients had not understood information that had been disclosed. Physicians need to carefully outline the medical situation in words the patient understands and encourage the patient to ask questions. Second, educational sessions may help physicians to learn the criteria for capacity and to develop questioning techniques to elicit information about understanding and appreciating. Third, specific measures of capacity could be developed for routine clinical use. Several semistructured decisional aids have been developed, but none have been evaluated in patients who are actually making a decision about treatment.^{16,17} Another approach involves assessment of capacity by using hypothetical treatment scenarios.^{18,19} However, the relationship between capacity, as measured by hypothetical treatment scenarios and capacity to consent when faced with a real treatment decision, will require further study.

Our results also suggest that psychiatric consultation, and other expert evaluation,

should be sought in uncertain cases, particularly for patients with mild-to-moderate cognitive impairment. Even if the clinical impression is "definitely capable," psychiatric consultation may also be helpful for patients who are refusing treatment, particularly if the refusal does not appear to be a well-thought decision based on previously expressed values and wishes. In this situation, the purpose of psychiatric consultation is not capacity assessment, but rather to address potentially remediable factors that may be contributing to the treatment refusal, such as poor communication, anxiety, or a breakdown in the therapeutic relationship.²⁰

We have conducted the first evaluation of existing clinical measures of capacity to consent to major medical treatment. Our results

suggest that a clinical impression of "definitely capable" is very accurate, but other clinical impressions are inaccurate. Mini-Mental State Exam scores are also not accurate for assessing capacity to consent to major medical treatment. We conclude that better methods for evaluating capacity are needed when the clinical impression is other than "definitely capable."

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