Published in final edited form as:

J Alzheimers Dis. 2020 ; 73(2): 431–442. doi:10.3233/JAD-190457.

The U-ARE Protocol: A Pragmatic Approach to Decisional Capacity Assessment for Clinical Research

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Abstract

With increased longevity and growth in the number of older adults comes rising rates of individuals with cognitive impairment and dementia. The expansion of this population has important implications for research on aging and dementia syndromes, namely increased enrollment of older individuals in clinical research. Ethical prerogatives, as well as historical underrepresentation of persons with dementia in research studies due to the perceived burden of traditional decisional capacity evaluations, necessitates the development of pragmatic approaches to ascertain decisional abilities in research settings. We outline a protocol used in the Wisconsin Alzheimer's Disease Research Center (ADRC) that adopts a stepped approach to the evaluation of decisional capacity meant to maximize study visit efficiency while preserving participant safety and autonomy. The protocol specifies the structure of the consent process and incorporates a brief semi-structured interview based on Appelbaum & Grisso's theoretical model for evaluating a patient's decisional capacity to provide informed consent to participate in research. This protocol is easily implemented in a research study visit and is designed to minimize participant burden and ensure reliable assessment of decisional capacity in older adults across a wide range of research protocols. The protocol emphasizes capacity optimization, using memory aids and other compensatory strategies to preserve participant autonomy while protecting welfare.

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Conflict of Interest/Disclosure Statement

The authors have no conflict of interest to report.

Keywords

Clinical Research Protocol; Dementia; Informed Consent; Mental Competence

Informed consent is a fundamental ethical obligation that protects persons from exploitation and preserves their rights while they contribute to scientific advancement in the context of research [see 1, 2, 3]. Key to protecting research participants' welfare is assurance that they have decisional capacity when providing informed consent, defined as the cognitive ability to consent to or refuse clinical care or participation in a research protocol [4]; the concept of decisional capacity is closely related to the legal construct of competency [5]. The assessment of decisional capacity to consent to research is a priority in populations in which decision-making capacity may be compromised [see 6], such as older adults with potential cognitive impairment. This group has historically been excluded from research on aging diseases due to conflation of 'cognitive impairment' and 'impaired decisional capacity,' as well as common misperceptions that programmatic implementation of decisional capacity assessments is burdensome and time-consuming [7–9]. In such cases, researchers must be prepared to routinely evaluate decisional ability to verify that participants are able to provide informed consent.

A capacity assessment is the dichotomous determination as to whether a participant can comprehend the purpose and procedures of a research study and weigh the specific risks and benefits of, as well as alternatives to, research participation. The assessment provides research teams with the information needed to evaluate whether an individual has sufficient cognitive ability to make an informed choice when considering enrollment in a research study. Research capacity assessments are situation-specific and often viewed on a 'sliding scale' such that studies or treatments that pose a high degree of risk require greater evidence of decision-making abilities, compared to studies involving minimal risk [10–15]. Assessments of decisional capacity pose unique challenges in the context of clinical research, not limited to a lack of both brief assessment tools [see 16 for a review of current capacity assessment measures] and a structured protocol delineating how those tools should be optimally implemented.

The need for a pragmatic approach to assess decisional capacity in a research setting is pressing given the growing number of older adults (i.e., individuals over the age of 65) with potential cognitive impairment and the increasing need for research in this population. By the year 2040 the number of people aged 65 and older is predicted to double relative to 2010 [17–19]. Dementia incidence doubles every 5 years from ages 65 to 90 years, and continues to increase exponentially past that age [20]. Alzheimer's Disease International predicts that 135 million people worldwide will meet clinical criteria for dementia by 2050 [21]. Patients with dementia or mild cognitive impairment (MCI), particularly those with pronounced executive function or memory deficits, frequently demonstrate reduced understanding of treatment and research-related information relative to cognitively healthy individuals. Cognitive changes can manifest as a person's decreased ability to appreciate the personal implications of information received and to make a reasoned decision based on that information [22, 23]; assessment of decisional capacity is necessary to avoid assumptions

that a person can or cannot provide informed consent [24]. Moreover, more than half of the cases of dementia syndromes remain undiagnosed [25–28]. The increasing prevalence of neurodegenerative diseases and the high rate of undiagnosed dementia cases necessitate the development of a protocol for determining decisional capacity in healthcare and research settings [29, 30].

We present a stepped approach to the assessment of decisional capacity in clinical research with older adults who may be at higher risk for having cognitive deficits that impact capacity. The outlined Understanding, Appreciation, Reasoning, Expression (U-ARE) protocol includes a semi-structured interview that is based on an eminent theoretical model of decision-making capacity [31], which facilitates consistency in assessment outcomes. The stepped approach ensures high sensitivity in the detection of decisional capacity impairment without placing undue demand on research team resources.

Specific aims of the current article include: (1) a brief overview of contemporary capacity assessment tools and their limitations; (2) introduction to the U-ARE protocol and the theoretical basis of its semi-structured screening questions; (3) a description of how this protocol has been successfully implemented in our clinical research program enrolling cognitively healthy and impaired older adults; and (4) discussion of important features of this pragmatic approach to capacity assessment in clinical research settings.

Background of Capacity Assessment

Until the late twentieth century, assessment of decisional capacity relied on unstructured clinical assessment or diagnosis alone. This lack of standardization and the lack of conceptual framework guiding the assessment process resulted in low reliability [32]. Modern legal standards for decision-making capacity prompted the shift from focusing on diagnosis to relevant functional skills. The shift from defining capacity based on neurocognitive diagnosis fostered the development of standardized instruments to supplement and improve upon more general clinical examinations [23].

A chief goal in the creation of capacity assessment instruments is the sufficient and thorough evaluation of one's ability to make situation-specific decisions [see 33]. For instance, a global assessment of cognitive status (e.g., the Mini-Mental State Examination or the Montreal Cognitive Assessment) or the use of hypothetical healthcare and safety-related scenarios would not be appropriate for assessing the more specific ability to differentiate research from healthcare or the demands of research participation [30, 34–36].

Appelbaum and Grisso [31] state that the foundation of decisional abilities rests on whether participants can demonstrate four functional abilities: understand, appreciate, reason, and express (a choice). Assessment tools must address all four facets to sufficiently determine capacity. Vellinga and colleagues [37] compared decisional capacity assessment tools and found that few adequately cover all four criteria [see 16 for a review of other assessment tools]. Rather, most published assessment tools focus exclusively on the understanding of disclosed information [38].

A summary of contemporary capacity assessment measures, as well as their limitations, is featured in Table 1. Among current measures used to evaluate capacity to provide consent, those that address all criteria are often difficult to execute within the context of research visits or are not well-validated for use with participants with dementia. For example, many measures take at least 15 to 30 minutes to administer and must be given by a trained clinician rather than research staff [see 16 for a review of current capacity assessment measures]. Additionally, existing measures designed for use by researchers or physicians not clinically trained in capacity assessment have low sensitivity in identifying patients lacking decisional capacity [e.g., 39]. The time and extensive training involved in the administration of effective capacity assessment tools make them impractical for capacity assessments administered within the parameters of demanding and often lengthy research visits already burdensome to participants.

Growing acknowledgement of these limitations has incited the development of briefer capacity evaluation tools to screen for capacity to consent to research participation among those at risk for decisional incapacity, as well as validation of these measures amongst diverse clinical populations [40]; however, to date there is no standardized protocol for the implementation of capacity assessment tools. Likewise, there are no standard guidelines for managing cases in which research participants lack capacity, particularly in minimal risk studies. Accordingly, these limitations call for delineation of a protocol designed to evaluate decisional capacity among individuals with cognitive impairment.

The U-ARE Protocol

Researchers at the University of Wisconsin's Division of Geriatrics, Wisconsin Alzheimer's Disease Research Center (ADRC) and Madison VA Geriatric Research Education and Clinical Care (GRECC) have been using the U-ARE protocol (see Figure 1) for over a decade to assess for decisional capacity of both cognitively healthy and cognitively impaired older adults. The inception of the Wisconsin ADRC in 2009 marked the formalization of the protocol.

The U-ARE protocol is a stepped approach using a theoretically based semi-structured capacity assessment interview at two levels.

Step 1: Screening by Study Coordinator

At the first level, a study coordinator conducting the initial evaluation meets first with a participant to evaluate their decisional abilities. The coordinator conducts a brief semi-structured interview (see Table 2) embedded into the informed consent process. If a participant successfully answers each question in this interview, there is sufficient evidence to continue with the research protocol, i.e., the participant is deemed to have decisional capacity and can provide informed consent to participate. If a research participant's answers are insufficient, suggesting that he or she may lack decisional capacity to provide informed consent for research participation, a more comprehensive capacity assessment is triggered. Indications of potentially deficient capacity include a participant's inability to unequivocally and effectively answer any of the questions or an inconsistent, fluctuating presentation of

cognitive symptoms. Additionally, the presence of a dementia diagnosis automatically triggers Step 2.

Step 2: Clinician Evaluation

When triggered, the second step is conducted by a trained clinician who is knowledgeable about informed consent and cognitive capacity. In the Wisconsin ADRC, clinician evaluators include psychologists, neuropsychologists, and physicians. If the resources are available, the capacity assessment should be performed by a licensed health care practitioner who has the legal ability to determine decisional capacity per local regulations.

Step 3: Surrogate Consent and Assent

A critical component of the U-ARE protocol is inclusion of a study partner for all participants with a dementia diagnosis or potentially impaired decisional capacity. Presently, federal regulations do not specify guidelines for the inclusion of cognitively impaired persons in clinical research [41]. Rather, management of research activities involving adults lacking decisional capacity has depended on local Institutional Review Boards and relevant state laws and regulations. As a result, there is heterogeneity in the promotion of research with and in the protection of vulnerable subjects. In general, Federal Policy for the Protection of Human Subjects (i.e., The Common Rule) dictates that investigators may obtain surrogate consent from a participant's legally authorized representative if a participant lacks decisional capacity to consent [42]. Accordingly, one commonly used procedure involves completing a power of attorney prior to loss of decisional; in cases in which participants lose the capacity to provide informed consent, the authorized proxy can provide surrogate consent for more than minimal risk studies [43].

The U-ARE protocol specifically incorporates mechanisms to allow a potential participant to designate a proxy to carry out their intended directive by supervising the participant's participation in the research. Specifically, study partners are selected in advance of the study visit to act as surrogates for research consent in anticipation of declining capacity. These partners are appointed by participants to make a research decision that serves the interests of the participant without conflicts of interest [see 44]. In cases in which participants lose decisional capacity, the research power of attorney is activated, and the study partner acts as a surrogate decision maker. It is important to note that this process is unique from other types of advance directives (e.g., durable power of attorney for health care) and that the proxy decision maker is not necessarily a legally authorized representative. Due to the lack of consensus on substitute decision-making and proxy consent, more research on the topic is needed [45].

In short, a lack of decisional capacity does not necessarily prohibit a volunteer from participating in research with the potential for benefit within the U-ARE protocol. In cases in which participants lack decisional capacity as evidence in Step 2, clinicians perform the Step 3: evaluation of both assent from the potential participant and consent from the study partner [46]. A participant with the lack of decisional capacity can (define assent and how it works in this context) and thus contribute to decision-making.

Interview Questions

The interview questions used in Steps 1 and 2 of the U-ARE protocol are derived from Appelbaum and Grisso's [31] model of assessment of capacity to consent to clinical treatment (see Table 2). Each of the four interview questions assess a research volunteer's ability to:

- Understand the relevant information regarding participation,
- Appreciate any potential consequences,
- (make a) Reasoned decision regarding participation, and
- Express that choice.

Within the U-ARE protocol, some individuals will demonstrate an understanding of the study and its implications through questioning and thus display decisional capacity, while others will not. This latter group would be identified for a more formal capacity assessment (Step 2).

It is important to note that the U-ARE interview is not meant to assess participant's exhaustive knowledge of every aspect of the consent form; it is meant to assess whether the participant has the cognitive capacity to process the consent discussion. Additionally, while each element of decisional capacity is featured in a unique section, this division is somewhat artificial as there is overlap among each construct. In other words, although each question in the U-ARE protocol interview is meant to target one aspect of decisional capacity, it may provide information about the other elements of the decisional process. For example, the research volunteer's ability to understand the personal implications of participating in research is queried with a question about the risks involved, but their response to other questions may also address this component of decisional abilities. The questions target the critical elements evaluated in a capacity assessment and are meant to function as semi-structured interview prompts for the research team. Follow-up questions may be necessary to clarify unclear or vague responses. It is important to note that informed consent is a process rather than an event [i.e., signing a consent form; 47]. As such, the research team first clearly explains to the participant the purposes, procedures, and risks and potential benefits of, as well as alternatives to, the study as part of an informed consent discussion prior to initiating the capacity assessment.

Element 1: Understand the Relevant Information.

Question 1: "What is your understanding of what you will be doing during today's visit? Do you have to participate?": According to Appelbaum and Grisso [31], the first component of decisional capacity involves the ability to understand decision-related information. In the context of research, this criterion relates to an individual's ability to comprehend and paraphrase the information being disclosed regarding the nature of the study (i.e., the differentiation of clinical care and research participation) and the study procedures. For example, volunteers must clearly understand that they are being asked to participate in an optional research study, and that their choice to not participate will not have negative consequences. Clinical research has the goal of creating generalizable knowledge that will benefit society at large [48]; this goal contrasts with that of clinical care, which

aims to optimize individual patient welfare. By indicating that an individual is volunteering to join an optional research study, the research participant also acknowledges the potential risks and benefits of, as well as alternatives to, participating. Participants could be asked to communicate how they would withdraw from the study or demonstrate awareness that their signature on the informed consent form does not represent a contractual agreement, but rather documents that consent occurred. Participants should not be penalized for not spontaneously offering critical information; rather, in cases in which participants do not freely provide an adequate response, researchers must probe participants' understanding through additional prompting (e.g., "Will you be penalized if you decide not to participate?" or "If you need to drop out, what would be the negative consequences?"). To optimize capacity, researchers can remind participants that they can withdraw from the study at any point and that they will not be penalized for their decision.

In the U-ARE protocol, if an individual's response to the questions of Element 1 suggest miscomprehension or lack of relevant knowledge, attempts are made to maximize capacity in whichever way seems most appropriate for the individual's needs (e.g., reminding the individual of the information presented in informed consent, ensuring that the individual is able to hear the information that is presented, simplifying language, rewording phrases, providing written material for reference, etc.), as encouraged in American Bar Association / American Psychological Association (ABA-APA) guidelines regarding capacity [49]. It is critical to differentiate between a misunderstanding of relevant information due to capacity deficits versus misconceptions. Individuals who continue to be unable to convey understanding of the differences between therapeutic and research involvement, relevant procedures, and possible risk and benefits after the use of modifications may lack decisional capacity to provide consent for their participation and merit further evaluation.

Element 2: Appreciate Potential Consequences.

Question 2: "What are the risks of participating in this research study? The benefits?": The second component of decisional capacity is appreciation of the situation and potential consequences of a decision [50]. In the U-ARE protocol, an individual must demonstrate the understanding that personal risks associated with research are primarily taken for the benefit of the public and scientific advancement, rather than for individual benefit (i.e., not for treatment of a medical condition); this understanding is especially important in trials where a potential for benefits exists but is not guaranteed. Participants must be able to explain the likely outcomes of their participation options. Participants who fail to verbalize these factors should be provided with additional resources to determine their appreciation for the situation. These resources include a written list of the associated risks and a review and discussion of the potential consequences. Individuals who continue to demonstrate a lack of appreciation for their involvement and potential risks despite attempts to support their cognitive deficits may not have decisional capacity to provide consent to their participation and are referred for further evaluation as per the protocol.

Element 3: (make a) Reasoned Decision Regarding Participation.

Question 3: "How did you make your decision [to participate or not participate in the study]?": The third component of decisional capacity is the ability to reason rationally

based on the provided information [50]. This element focuses on evaluation of the process by which an individual reaches a decision rather than the outcome itself. In the U-ARE protocol, an individual must be able to demonstrate the ability to weigh the consequences of participating versus not participating in a study, provide reasons for his or her choice (i.e., acknowledge factors considered when making the decision), and demonstrate how he or she would withdraw from participating should he or she become enrolled. Participants should be able to justify their choice to participate or not in the study by demonstrating the logical thought processes behind their choice.

Element 4: Express a Choice.

Question 4: “Do you want to participate in this study?”: The final criterion for decisional capacity is the ability to communicate a preferred choice regarding participation [50]. An individual must be able to express his or her decision, either verbally or nonverbally, and to maintain a stable choice throughout the research visit. If the volunteer provides an answer to this question that indicates ambivalence or hesitation, the researcher should explore further until reassured that the participant is fully willing to participate. Individuals failing to meet this criterion are either unable to effectively communicate their choice or continually change their decisions from moment to moment [see 5].

U-ARE Protocol Features

The questions featured in the U-ARE protocol interview are designed to minimize the burden on participants and to be valid for use with research volunteers with dementia or other neurocognitive disorders. Interview prompts use simple vocabulary and generally require only a brief response from the participant. In other words, the questions are written in a manner that makes it easy for individuals with or without cognitive deficits to understand and respond, with minimal cognitive demand placed on the research volunteers. In the U-ARE protocol, researchers are encouraged to remind the participant of the information provided in the informed consent as corrective feedback as often as needed throughout the duration of the study. Reminders, memory aids (e.g., handouts, summaries, etc.), inclusion of a study partner, and other compensatory strategies may enable the participant’s ongoing, informed participation in research, per recommendations of American Psychological Association/American Bar Association (ABA/APA) guidelines for capacity assessments [49]. Additionally, the U-ARE protocol is adaptable in that the interview can be completed either in person or as a screening measure over the phone.

Use of the U-ARE protocol is not restricted to minimal risk studies (e.g., observational studies or educational interventions). Rather, the protocol has been used in higher-risk studies such as drug trials or studies involving invasive procedures. In these studies, criteria for demonstrating decisional capacity is generally more stringent (e.g., a participant should be able to identify risks associated with taking a specific medication). In short, the U-ARE protocol is adaptable for a wide-range of research settings, with adjustments to the depth of the screening depending on the threshold of decision-making abilities required and potential participant risk.

A key feature of the U-ARE protocol is its focus on the implementation of capacity assessments: it emphasizes both (1) the comprehensive assessment of capacity to consent to clinical research based on the four tenets of decisional capacity, as well as (2) the procedures surrounding implementation of the capacity assessment. It thus offers a ‘meta-framework’ (i.e., a framework for thinking about capacity assessment approaches) that distinguishes it from published decisional capacity assessment tools [for overview of standardized measures see Table 1; see also 51, 52].

Implementation

The University of Wisconsin’s Health Sciences IRBs have supported the U-ARE protocol as a programmatic approach to decisional capacity of participants in research studies. In addition to use in studies where participants have known cognitive deficits, the protocol has been used in investigations where memory impairment is possible given the age of the participant sample but not the focus of the investigation.

Conclusion

Awareness of the heterogeneity of decisional competencies is key, both in clinical and research settings [18]. The U-ARE protocol represents a pragmatic approach to capacity assessment that provides guidance for a standardized practice of decisional capacity evaluation. A critical component of the U-ARE model is the use of aids to attempt to mitigate the influence of cognitive deficits, minimizing cognitive load and participant burden during the consenting process (e.g., requiring a participant to remember study components when trying to gauge understanding). The U-ARE protocol offers clear guidelines to avoid exploitation of a vulnerable population while facilitating scientific research with populations who have known or potential cognitive impairments and is easily adapted to institutional requirements. Our stepped approach, and the inclusion of a brief semi-structured interview into the consent process to either 1) screen for decisional impairment or 2) trigger a more comprehensive capacity assessment (as merited) allows for rapid yet comprehensive assessment of study participants. Overall, the U-ARE protocol provides a pragmatic framework grounded in an accepted conceptual model of decisional ability [i.e., 31], allowing for the preservation of autonomy while maximizing beneficence and research screening.

Acknowledgments

This work was supported by the Wisconsin Alzheimer’s Disease Center [grant number NIH-NIA P50 AG033514]; the NIH-NIA for African Americans Fighting Alzheimer’s at Midlife [grant number AA-FAIM, R01 AG054059] and work supported by Clinical Science Research and Development Service of the VA Office of Research and Development, Award Number 1K2CX00535. The authors would like to acknowledge the clinical and administrative support provided by the Wisconsin ADRC’s Clinical and Administrative Cores. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of this manuscript. The contents do not represent the views of the Department of Veterans Affairs or the United States Government. For her contributions to early drafts of this manuscript, the authors wish to acknowledge attorney Lisa A. Wilson from the Office of Legal Affairs, University of Wisconsin - Madison.

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Figure 1.
Flowchart outlining the U-ARE protocol's steps

Table 1.

Overview of Contemporary Capacity Assessment Measures and their Limitations

Measure	Description	Limitations
Cognitive status screening tests	Global cognitive screening measures (e.g., Mini Mental Status Exam [MMSE], Montreal Cognitive Assessment [MoCA]) can provide objective data on cognitive functioning. Extreme scores can support a determination of decisional incapacity [53].	<ul style="list-style-type: none"> Information is not specific to the patient and decision-at-hand Uncertain utility for decisional capacity assessment without clinical interview Many frequently used tools provide limited information on executive functioning [51] Not integrated into formalized capacity assessment protocol
Aid to Capacity Evaluation (ACE)	The ACE [54] is a semi-structured clinical interview designed to assess the four elements of capacity when a patient is facing a medical decision. Instructions and training materials are available online.	<ul style="list-style-type: none"> Takes 15–20 minutes to administer Designed for medical decision-making Emphasis on Understanding and Appreciation Not integrated into formalized capacity assessment protocol
Assessment of Capacity for Everyday Decision-Making (ACED)	The ACED [55] is a semi-structured interview format to assess the capacity to make decisions about solving functional problems through assessment of the four decision-making abilities. It requires the collection of collateral information from caregivers regarding functional deficits to allow the ACED content to be tailored to each patient.	<ul style="list-style-type: none"> Takes 15–20 minutes to administer Requires collateral information on functional abilities from caregivers Not integrated into formalized capacity assessment protocol
Vignettes of hypothetical scenarios	The Assessment of Consent Capacity for Treatment (ACCT), Capacity to Consent to Treatment Instrument (CCTI), and Hopement Capacity Assessment Interview (HCAD) present patients with vignettes of hypothetical decisions and asks them structured questions that assess decisional abilities [see 37, 56].	<ul style="list-style-type: none"> Take 30–45 minutes to administer Do not assess Appreciation Information is not specific to the patient and decision-at-hand Assess general (vs. specific) decisional abilities Poor agreement with physician's judgment of decisional capacity Not integrated into formalized capacity assessment protocol
Brief Informed Consent Evaluation Protocol (BICEP)	The BICEP [57] is a brief (5 to 10 minute) 11-item telephone-based assessment of a patient's understanding of the purpose and procedures of research, the benefits and risks of the research, the distinction between research and clinical care, voluntariness of participation, and recall of signing a consent document.	<ul style="list-style-type: none"> Only assesses Understanding Not integrated into formalized capacity assessment protocol

Measure	Description	Limitations
California Scale of Appreciation (CSA)	The CSA [58] is an 18-item instrument developed to assess the appreciation component of capacity in persons with psychotic disorders.	<ul style="list-style-type: none"> • Takes 10–20 minutes to administer • Only assesses Appreciation • Not integrated into formalized capacity assessment protocol
Capacity Assessment Tool (CAT)	The CAT [59] is a structured evaluation of the participant's decision-making capacity for a specific medical decision based on six abilities: communication, understanding choices, comprehension of risks and benefits, insight, decision/choice process, and judgment. It uses a structured interview format to assess capacity to choose between two actual treatment options.	<ul style="list-style-type: none"> • Unreported administration time • Designed for medical decision-making • "Insight" not defined • Not integrated into formalized capacity assessment protocol
Capacity-to-Consent screen	The Capacity-to-Consent screen [60] is a 10-item questionnaire designed to assess the capacity to consent to research participation based on the four components of decisional capacity. It requires that participants provide acceptable responses to eight questions over up to three consecutive administrations to demonstrate capacity.	<ul style="list-style-type: none"> • Takes 20–30 minutes to administer • Not integrated into formalized capacity assessment protocol
Competency Interview Schedule (CIS)	The CIS [61] is a 15-item standardized interview of a patient's capacity to consent electro-convulsive therapy (ECT) based on the four components of decisional capacity.	<ul style="list-style-type: none"> • Designed for medical decision-making • Questions specific to ECT treatment • Not integrated into formalized capacity assessment protocol
Evaluation to Sign Consent (ESC)	The ESC [62] is a brief (5–10 minute) structured interview designed to assess comprehension of research proceedings (procedures and risks) during the consent process.	<ul style="list-style-type: none"> • Only assesses Understanding • Not integrated into formalized capacity assessment protocol
Hopkins Competency Assessment Test (HCAT)	The HCAT [63] is a semi-structured interview designed to assess capacity to provide informed consent or complete an advance directive. It involves presenting patients with an essay (worded at the sixth, eighth, or thirteenth grade level) describing the process of informed consent followed by six questions about the presented material. It takes 10 minutes to administer.	<ul style="list-style-type: none"> • Only assesses Understanding • Not integrated into formalized capacity assessment protocol
Informed Consent Survey (ICS)	The ICS [64] is a thorough 31-question measure designed to evaluate the four commonly recognized dimensions of capacity to consent to research. It was developed to assess the capacity to consent to clinical trial participation in individuals with schizophrenia. The questionnaire allows for multiple administrations to support adequate understanding and retention of material.	<ul style="list-style-type: none"> • Long administration time • Not integrated into formalized capacity assessment protocol
MacArthur Competence Assessment Tool for Clinical Research (MacCAT-CR)	The MacCAT-CR [65] is a structured interview for assessing decision-making abilities relevant for judgments about participants' ability to consent to participation in research. It assesses the four components of decisional capacity: understanding information relevant to their condition and the recommended treatment, reasoning about the potential risks and benefits of their choices, appreciating the nature of their situation and the consequences of their choices, and expressing a choice.	<ul style="list-style-type: none"> • Takes 15–20 minutes to administer • Primarily intended to treatment studies • No specified cut-off scores • Not integrated into formalized capacity assessment protocol

Measure	Description	Limitations
Measuring Understanding of Disclosure (MUD)	The MUD [66] is an instrument developed to assess psychiatric patients' understanding of information relevant for patient decision making about treatment with medication.	<ul style="list-style-type: none"> • Only assesses Understanding • Not integrated into formalized capacity assessment protocol
Older Adults' Capacity to Consent to Research (OACCR)	The OACCR [67] is a brief, four-item assessment tool developed to assess the capacity of the older adults to consent to research based on the four components of decisional capacity.	<ul style="list-style-type: none"> • Not integrated into formalized protocol
Structure Interview for Competency and Incompetency Assessment Test and Ranking Inventory (SICIATRI)	The SICIATRI [68] is a structured interview guide to assess the competency for giving informed consent to treatment among psychiatric and medical patients. It consists of 12-items rated on a 3-point scale. Patients are categorized into one of five groups based on their competency score, with lower scores indicating impairment.	<ul style="list-style-type: none"> • Takes 20 minutes to administer • Designed for medical decision-making • Different levels of competency confusing • Not integrated into formalized capacity assessment protocol
Quality of Informed Consent (QuIC) questionnaire	The QuIC [69] is a brief (i.e., under 10 minutes) 34-item questionnaire designed to assess understanding of research proceedings and therapeutic misconception in cancer clinical trials. Responses are rated on a three-option Likert scale indicating subjects' actual (objective) and perceived (subjective) understanding of cancer clinical trials.	<ul style="list-style-type: none"> • Only measures Understanding • Not integrated into formalized capacity assessment protocol
University of California, San Diego Brief Assessment of Capacity to Consent (UBACC)	The UBACC [70] is a 10-item scale designed to assess the capacity to consent to clinical research based on the four elements of capacity. It was intended to help investigators identify research participants who warrant more thorough decisional capacity assessment and/or remediation efforts prior to enrollment. The UBACC takes less than 5 minutes to administer and involves minimal training to administered validly and reliably. Instructions and training materials are available online.	<ul style="list-style-type: none"> • Not integrated into formalized capacity assessment protocol

Table 2.

Decisional Capacity Criteria and the U-ARE Approach to Capacity Assessment

Criterion	Definition	Questions for Clinical Assessment	Capacity Indicators
Understanding	The ability to comprehend the presented information, risks and benefits associated with participating in clinical research, and the participant's role in the research process	<ul style="list-style-type: none"> • What is your understanding of what you will be doing during today's visit? • This is a research study; do you have to participate? 	<ul style="list-style-type: none"> • Comprehension of basic procedures, risks, and benefits • Recognition of research rather than medical visit • Recognition of lack of obligation • Ability to provide examples of how to not participate (e.g., call study coordinator)
Appreciation	The ability to understand the personal implications of participating in research	<ul style="list-style-type: none"> • What are the risks of participating in this research study? • What are the benefits of participating? 	<ul style="list-style-type: none"> • Ability to explain risks • Awareness that research participation has no direct or personal benefits
Reasoning	The ability to evaluate the costs and benefits of research participation in a logical way to reach a conclusion and to be able to justify that conclusion	<ul style="list-style-type: none"> • How did you make your decision [to participate or not participate in the study]? • Why did you make that decision? 	<ul style="list-style-type: none"> • Ability to rationally justify their decision to participate
Expression of choice	The ability to maintain a preferred choice and to express that preference	<ul style="list-style-type: none"> • Would you like to participate in this study? 	<ul style="list-style-type: none"> • Verbal or non-verbal expression of decision