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Clinicians' perceptions of the clinical utility of the Multiple Errands Test for adults with neurological conditions

Emily J. Nalder^{1,2,3}, Amanda J. Clark⁴, Nicole D. Anderson^{3,5}, and Deirdre R. Dawson^{2,3}

¹March of Dimes, Paul J.J. Martin Early Career Professor, University of Toronto, Toronto, Canada

²Department of Occupational Science & Occupational Therapy & Rehabilitation Sciences Institute, University of Toronto, Toronto, Canada

³Rotman Research Institute, Baycrest, Toronto, Canada

⁴Department of Psychology, University of Tennessee at Chattanooga, Chattanooga, USA

⁵Departments of Psychiatry & Psychology, University of Toronto, Toronto, Canada

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This study examined the clinical utility of the Multiple Errands Test (MET) from the perspective of clinicians. Employing a qualitative descriptive design, in-depth semi-structured interviews were conducted with eight occupational therapists. Participants had an average of 12 years clinical experience and their experience using the MET varied. Interviews were transcribed and analysed using framework analysis. Three dominant themes emerged from the data. Theme 1 was that clinicians value the MET because it reflects real-life functioning. Clinicians perceived the MET to be a unique assessment collecting data on functional performance, and sensitive to higher level cognitive deficits. Theme 2 was that the MET could be used flexibly depending on one's rehabilitation goals. Clinicians employed the MET as an assessment to

Correspondence should be addressed to Emily Nalder, Rehabilitation Sciences Building, University of Toronto, 160–500 University Ave, Toronto, ON, M5G 1V7, Canada. E-mail: emily.nalder@utoronto.ca

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inform the direction of treatment and as a component of their intervention. Theme 3 was that the MET is a challenging assessment requiring buy in and commitment from therapists. This study is the first to report clinicians' perspectives of the clinical utility of the MET. It reinforces the importance of ecologically valid tests, and augments existing research evaluating psychometric properties of the MET by describing how the MET has been employed in rehabilitation settings to improve health outcomes for adults with neurological conditions.

Keywords: Ecological validity; Assessment; Executive functions; Clinical utility.

INTRODUCTION

The Multiple Errands Test (MET) is a performance-based assessment used to detect problems in everyday life experienced by individuals with impairments in executive functions (Alderman, Burgess, Knight, & Henman, 2003; Dawson et al., 2009). Executive functions are higher level integrative cognitive skills required to produce purposeful, goal-directed behaviour (Alderman et al., 2003; Cicerone, Levin, Malec, Stuss, & Whyte, 2006). These include skills such as problem solving and switching attention and thus executive functions are essential to performing complex activities of everyday life including driving, responding to unplanned events, or managing finances (Bottari, Dassa, Rainville, & Dutil, 2009; Perna, Loughan, & Talka, 2012). For several decades clinicians and scientists have recognised the limitations of traditional pencil-and-paper neuropsychological tests in assessing executive functions as they are highly structured and lacking in ecological validity (Chan, Shum, Touloupoulou, & Chen, 2008). To be ecologically valid, assessments should be representative of real-life activities and contexts, and performance on the test should generalise to functioning in everyday life (Burgess et al., 2006). Shallice and Burgess (1991) developed the MET and described several unique characteristics of the assessment that increase its ecological validity. Firstly, it is a performance-based assessment requiring participants to complete a series of real-life tasks (e.g., shopping or mailing a letter); generalisability is enhanced as testing occurs in a real-world context (e.g., in a shopping mall) and the MET is unstructured as testing occurs over a longer period of time, and participants are given minimal instructions for how to complete the tasks. Research has demonstrated that the MET is an ecologically valid assessment capable of detecting executive dysfunction evident in everyday life (Dawson et al., 2009; Knight, Alderman, & Burgess, 2002). However, there is little evidence regarding how the MET is utilised in clinical practice.

The current health context demands evidence-based practices and as a result there is growing recognition that evaluations of assessment properties must include clinical utility (Bossuyt, Reitsma, Linnet, & Moons, 2012). There are varied definitions of clinical utility used in research; broadly speaking it refers to the ability of an assessment to cause meaningful change in health outcomes for a clinical population (Bossuyt et al., 2012). A conceptualisation of clinical utility presented for diagnostic tests (Bossuyt et al., 2012) includes how effectively it generates information which guides clinical decision-making and treatment plans. This model describes clinical utility of an assessment as a variable construct. Variability is evident as test results can lead to different treatment recommendations when combined with other information pertaining to clients and their contexts, individuals' responses to testing can differ, and because utility is judged against a comparator, generally the current gold standard assessment in that field (Bossuyt et al., 2012). Clinical utility has also been measured by exploring clinicians' perspectives regarding the value of the information provided by an assessment, as well as of the pragmatic factors (e.g., time and labour involved) influencing implementation of the assessment in their setting (Donnelly & Carswell, 2002). In this study clinicians' perceptions regarding the clinical utility of the MET are examined including how clinicians use it in practice to influence health outcomes for clients with neurological conditions, the perceived value of MET data relative to other cognitive assessments, and how this shapes treatment plans.

Research has reported on the basic psychometric properties of the MET. Ecological validity of the MET has been established as the assessment identifies performance problems in real-world activities such as shopping, finding information, and making phone calls (Dawson et al., 2009; Rand, Rukan, Weiss, & Katz, 2009). Concurrent validity is supported by correlations between MET performance and performance on other executive function assessments (Dawson et al., 2009; Knight et al., 2002; Morrison et al., 2013). Additionally, inter-rater reliability for MET scores is strong with intra-class correlation coefficients above 0.7 for hospital versions (Cuberos-Urbano et al., 2013; Dawson et al., 2009; Knight et al., 2002; Morrison et al., 2013). These psychometric data support the clinical utility of the MET for adults with neurological conditions.

Since the MET is a naturalistic (or contextualised) assessment, clinicians must develop site-specific versions of the test for use in their workplace or local environment. The number of different versions described in the literature provides encouraging evidence that the MET can be adapted for use in different settings. For example, in addition to the original shopping mall version, hospital versions of the MET have been created and evaluated in the UK (Knight et al., 2002), Canada (Dawson et al., 2009), Israel (Maier, Krauss, & Katz, 2011), Spain (Cuberos-Urbano et al., 2013) and the USA

(Morrison et al., 2013). Shopping mall versions (Alderman et al., 2003) and virtual METs (Rand et al., 2009) have also been created. However, these studies provide little information on the processes that should be used when creating a site-specific MET. Information on how administration procedures may change across different sites is also lacking. For instance, the test involves purchasing items from a store which may preclude use of the test in certain environments that have limited access to shops. Thus, in considering clinicians' perceptions of utility it is important to ascertain whether and how the test items or administration processes have been altered for use in clinical environments.

Other considerations regarding the clinical utility of the MET relate to scoring and how clinicians interpret MET data to inform clinical decisions. The scoring procedures outlined in the literature focus on recording the number of tasks completed, and the number of errors, which are classified as rule breaks, inefficiencies or interpretation failures (Alderman et al., 2003; Dawson et al., 2009). An alternative scoring procedure assessing performance efficiency (the ratio of total tasks completed to total number of locations visited) has also been developed to increase the sensitivity of the MET for use with a mild brain injury population (Morrison et al., 2013). While the scoring processes have been described in the literature, information on how clinicians interpret these scores to inform their treatment plans is lacking. This information is vital to understanding clinical utility, particularly as evidence suggests that clinicians can have difficulty judging whether isolated errors on the MET (such as going to a mailbox and not putting anything in it) are attributable to brain pathology or slips of action naturally occurring in everyday life (Bottari & Dawson, 2011).

Generating information on clinical utility is of critical importance to understanding the needs of clinicians so that they can readily implement and interpret the MET in clinical practice. We therefore conducted a qualitative investigation to explore the utility of the MET from the perspective of clinicians working with adults with neurological conditions. Specific objectives of the research were to determine (1) how and why the assessment is used in clinical practice, (2) how MET data are interpreted and used in clinical decisions and (3) factors which shape usability of the assessment in clinical settings.

METHODS

Design

A qualitative descriptive study (Sandelowski, 2000) was conducted involving semi-structured in-depth interviews.

Sample

Clinicians were recruited from occupational therapists and neuropsychologists who had previously requested and been provided with a copy of the Baycrest-MET and scoring templates by one of the authors (DD). Participants were included if they were a trained clinician, and/or had used the MET as part of their clinical practice working with adults with neurological conditions. They were provided with a brief summary of the research study and invited to contact the first author (EN) if they were interested in participating. Thirteen occupational therapists expressed interest, however four were excluded as they not used the MET clinically ($n = 3$) or were unable to complete an interview in English ($n = 1$).

Nine clinicians were interviewed. The audio quality of one telephone interview precluded transcription and analysis, therefore data from eight participants are reported. Participants were employed in acute care ($n = 1$), inpatient rehabilitation ($n = 4$), and outpatient rehabilitation ($n = 3$). Seven participants worked in Canada and one in the UK. Average time practising was 12 years ($SD = 9.1$). The number of times the MET had been administered by participants ranged from once to an estimated 50 or more times (mean = 22, $SD = 21.9$). [Table 1](#) provides details regarding participants' experience administering the MET and other performance-based assessments of executive functions.

Study procedure

Semi-structured in-depth interviews were conducted by the first author (EN) with participants either in person ($n = 2$), by telephone ($n = 5$) or via Skype ($n = 1$). An interview guide was utilised with six core questions covering: (1) work roles in which the MET was administered, (2) how the MET informed clinical practice, (3) the processes used in administration, (4) scoring procedures used, (5) how MET data are interpreted, and (6) the processes and challenges encountered when developing a site-specific MET. Interviews lasted 59 (± 7.4) minutes and were conducted over a period of 3 months in 2013. Neither the mode of delivery (telephone, skype or in-person interview) nor the clinicians' experience using the MET affected the quality of the interviews. Some clinicians ($n = 4$) were not able to comment on the development of a site-specific MET as they had not been involved in this process at their workplace. Interviews were transcribed verbatim by trained research assistants and then checked by the first author. The study had ethics approval from the Baycrest Research Ethics Board and all participants provided informed consent.

Analysis

A framework analysis was used; this is an approach to qualitative data analysis that describes and interprets participants' views (Smith & Firth, 2011).

TABLE 1
Sample characteristics

	<i>Practice setting (current)</i>	<i>Primary population working with (current)</i>	<i>Practice setting where the MET was used</i>	<i>Times administered the MET (n)</i>	<i>Other executive functioning assessments used</i>
P1	Outpatient rehabilitation	ABI	Outpatient rehabilitation	30–50	AMPS, ADL & IADL Profile, EFPT, BADS
P2	Outpatient clinic	Older adults	Outpatient clinic	1	–
P4 ^a	Inpatient rehabilitation	Older adults	Outpatient clinic, In-patient geriatric psychiatry	8	BADS
P5	Acute stroke unit + acute neurosurgical ward	Stroke and ABI	Acute stroke unit, Acute neurosurgical ward, Inpatient rehabilitation	50	BADS
P6	Inpatient rehabilitation	Older adults	Outpatient neurological clinic	2	BADS
P7	Inpatient rehabilitation	Older adults	Outpatient rehabilitation	6	BADS
P8	Outpatient rehabilitation	ABI	Outpatient rehabilitation, Inpatient rehabilitation	25	BADS
P9	Inpatient rehabilitation	Stroke and ABI	Inpatient rehabilitation	50	EFPT BADS

^aRefers to use of an adapted version of the MET participant had developed – a multi-tasking activity with no rules to follow. MET = Multiple Errands Test; AMPS = Assessment of Motor and Process Skills; ADL = Activities of daily living; IADL = Instrumental activities of daily living; EFPT = Executive Function Performance Test; BADS = Behavioural Assessment of the Dysexecutive Syndrome; ABI = Acquired brain injury.

Researchers employing a framework approach follow a series of interconnected steps to identify recurring themes, connect themes and produce a cohesive explanation of the data. This method of analysis was selected because it uses a matrix to store and analyse data. The matrix assists in the management of large volumes of text, provides a systematic approach to analysis (e.g., comparing themes within and across participants), and ensures transparency by documenting the authors' interpretations of the data and how this influenced theme development (Smith & Firth, 2011).

Familiarity with the data was obtained by reading and checking transcripts. All transcripts were coded by the first author (EN) and organised into a preliminary coding framework (e.g., the codes “strategy use” and “executive functions”, were organised under a broader code, “what to look for when scoring”). Peer checking was completed whereby two authors (EN and AC) independently coded two transcripts and came to consensus on a list of codes. The following codes were added to the framework following peer checking; “uniqueness of the MET”, “flexibility in administration”, “working with resources in the environment”, and “value of a prospective memory task occurring outside the therapy setting”. In addition, one code, “simplify scoring resources”, was renamed “resource needs for scoring”. The revised coding framework was applied to all transcripts by EN. Data pertaining to each code were then extracted and analysed to identify themes by grouping data with similar meaning. A matrix was developed in which each theme was allocated a column, each participant a row and factors influencing the experiences of each theme within and across participants were examined. An explanatory summary of themes was then developed, discussed amongst the research team, and checked with participants. No changes were made to the thematic structure based on team discussion and participants’ feedback as there was consensus on all themes. All coding was completed using Nvivo 8 (QSR International Pty Ltd., 2008).

Rigour

The trustworthiness of the data analysis was enhanced by including peer and member checking, maintaining an audit trail of decisions made during coding and theme development, and having discussions with the research team to obtain multiple perspectives of the data.

RESULTS

Three major themes emerged reflecting participants’ perspectives of using the MET with adult clients with neurological conditions: (1) clinicians value the MET because it reflects real-life functioning, (2) the MET could be used flexibly depending on one’s rehabilitation goals, and (3) the MET is a challenging assessment requiring buy in and commitment from clinicians.

Theme 1: Clinicians value the MET because it reflects real-life functioning

This theme captures the essence of why clinicians value the MET – that it *reflects real-life functioning*; exemplar quotes are provided in [Table 2](#). Clinicians valued the fact that the MET was truly an ecologically valid test

TABLE 2
Exemplar quotes for theme 1: Clinicians value the MET because it reflects real-life functioning

<i>Theme/sub-theme</i>	<i>Exemplar quotes</i>
MET reflects real-life	<p>“Well the thing I really like about the MET is the fact that you can get so much out of that one assessment and that is more of a true-to-life assessment, I find, than the paper-and-pencil task. I find the BADS, for example . . . I don’t find them similar enough to the true tasks that our patients are doing at home. Whereas the MET I find people relate very well to, and it kind of gives you more of an actual look into what people will be like once they are out in the community.”</p> <p>“I think I get more of a functional assessment opportunity. Because it is less standardised and they’re out in the world. So, different things are going to happen to different clients . . . So they have to navigate different things that come up that are real-life scenario kind of things that you can’t really plan for.”</p>
Sub-theme 1: Complexity	<p>“What am I looking for? I want complexity, messiness, I want multiple tasks, I want juggling of information and activities. I don’t want structure, I don’t want me to be leading it, I don’t want me to be guiding them in any way. I want to know what they’re like, completely on their own.”</p> <p>“The cognitive performance test totally has a ceiling effect, totally. It’s like not challenging enough compared to the MET. You take the Kettle test and you take the MET and you have got them on a total continuum.”</p>
Sub-theme 2: Sensitivity to detect high level deficits	<p>“I used it for almost every single client. Because I had higher level clients who had neuro-cognitive issues more than the physical issues . . . Yeah, it was really one of my core go-to tests because it told me a lot about what was going on and, you know, I found that clients could recover very well verbally or even in structured tasks but with the MET that’s where you really saw the difficulties that they had.”</p>

MET = Multiple Errands Test; BADS = Behavioural Assessment of the Dysexecutive Syndrome.

showing both verisimilitude and veridicality. Verisimilitude refers to the degree to which the test items are theoretically similar to the demands of everyday life, whereas veridicality reflects how well performance on the test corresponds to performance in everyday life (Chaytor & Schmitter-Edgecombe, 2003). Features of the MET that clinicians perceived as making it reflective of real-life functioning included its complexity, that tasks represent everyday activities, and that testing occurs in an unstructured environment, all of which provide evidence of verisimilitude. This also meant the MET was easier to explain and often more acceptable to clients who could see the relevance of the tasks. Clinicians also perceived that the MET provided a clearer

picture of how someone would function outside of the rehabilitation context than other standardised cognitive tests, indicating veridicality.

A sub-theme related to the MET being a real-life assessment is *complexity*. Clinicians viewed the MET as a complex assessment and this was deemed to be both unique to the MET, and critical to providing information on how clients would manage the complex tasks of everyday life. Participants described other standardised cognitive assessments such as the Behavioural Assessment of the Dysexecutive Syndrome (BADS; Wilson, Alderman, Burgess, Emslie, & Evans, 1996) or Cognitive Performance Test (Burns, Mortimer, & Merchak, 1994) as having more structure, but they valued the MET because it allowed observation of how clients perform a series of tasks without cueing or prompting.

Complexity also stemmed from the fact that testing occurs in a changing and unpredictable environment, and because individuals must carry out multiple tasks while following set rules, meaning executive control is required to override automatic responses. As a result, the MET was viewed as a more sensitive measure of executive dysfunction when compared to pen-and-paper cognitive tests. Clinicians used it most often with higher functioning clients (i.e., those with complex goals or those who seemed to have functional difficulties despite scoring well on other cognitive tests).

Theme 2: The MET could be used flexibly depending on one's rehabilitation goals

This theme captures the value of the MET to therapists because it could be administered flexibly based on the goals of the clinician and/or client. Therapists used the MET not only as an assessment but also as a treatment, or therapy tool, and appreciated being able to adapt the mode of administration to achieve therapeutic goals. Three sub-themes related to the flexible use of the MET also emerged: (1) *assessment to inform rehabilitation plans*, (2) *therapy tool* and (3) *administration process*, and illustrative quotes for sub-themes 1 and 2 are provided in Table 3.

The MET was often utilised in clinical practice as an *assessment to inform rehabilitation plans*. As a top down functional assessment, the MET was used to identify areas where performance was breaking down during functional tasks and to formulate rehabilitation plans and goals accordingly. The opportunity to gather a wide range of data from using the MET was highly valued, with clinicians describing it as providing information not only on executive functions but also on factors such as mobility, endurance, communication, social skills, and emotional regulation. The MET was used as part of an assessment battery to identify cognitive deficits and provide a functional perspective to compliment data from standardised cognitive tests. Additionally, it was useful in clarifying discrepancies between clients' reports of cognitive

TABLE 3

Exemplar quotes for theme 2: The MET can be used flexibly based on rehabilitation goals

<i>Participant</i>	<i>Sub-theme 1: Assessment to inform rehabilitation plans</i>	<i>Sub-theme 2: Therapy tool</i>
P1	<p>“I know what their performance will be on something like the MET. But I also want to know, what do I do next? How do I put in those strategies and make their performance look as close to a normal performance as I can.”</p> <p>“I would use it towards the end to kind of measure how the therapy has progressed as an outcome measure.”</p>	<p>“I would say, okay these are all the strategies you have available to you, we’re going to wait a week and then we’re going to redo the MET – a different version of it. I want you to use those strategies and see if you’re more or less successful the second time around.”</p> <p>“Sometimes I’d use the MET in a non-standardised way for those that I wanted to build insight with because I would just stop them right in the task and say right there and then, this is the error you’ve made. And that was more for insight-building when that was my goal of doing the test.”</p>
P2	<p>“If you have got someone who is going back into the community that superficially they may seem like they are fine but it is a way of actually being able to assess, Are they able to manage a simple shopping task? Are they able to organise and plan their movements? and its . . . it probably won’t answer all of the questions but it may give a piece of information that when added to everything else clarifies the picture.”</p>	–
P4	<p>“So if this person does well on this and shows really good organisational skills and good memory and retaining instructions and good reasoning and can follow these tasks then I know that they could live on their own and have these types of demands being made on them and function.”</p>	–
P5	<p>“Yeah, I think in some cases as well it’s to demonstrate just how cognitively impaired they are so that you can fight their corner a bit more that they do need more in-patient rehab. So they might be the patient that um, maybe is a little bit disorientated, attention’s a bit poor, and it’s just sort of, again, highlighting what the problems are and how serious the problems are so the medical team can understand why you’re keeping that patient in hospital and that they do need further specialist in-patient rehab.”</p>	<p>“We, would do that [video tape performance] more in rehab if people had some issues with their insight then we would use videotape to sort of give them a bit of feedback and that sort of thing. But on the acute setting, no.”</p>

(Continued)

TABLE 3
Continued

<i>Participant</i>	<i>Sub-theme 1: Assessment to inform rehabilitation plans</i>	<i>Sub-theme 2: Therapy tool</i>
P6	“So individuals that were advanced in their recovery from a stroke and with only minor physical deficits, but where the family were reporting concerns about whether they are able to go in the community by themselves, or whether they were able to drive. So that kind of prompted us to administer the assessment.”	–
P7	“I think it was during the goal setting, and it came up that something to do with organisation was a challenge, or that if they said something that I need the MET to address in a functional way rather than the BADS, which isn’t totally functional. If it’s something they reported a few times, just in conversation, having challenges within a functional setting, then I would administer the MET.”	“The MET was mostly used later on, um like we, for example, some of my patients had a lot of trouble with organisation, so we would do some treatment, do some talking about how to organise their time, and then I would give the MET, to give them an opportunity to utilise the strategy and see how they would do.”
P8	“I’ll use it as just a pure assessment at the beginning to see where they’re having trouble, particularly if they’ve done really well on other standardised assessments like the BADS, for example. And yet, you know if they’re going to be, like I said, returning to independent living or even work, these aren’t really work-related tasks, but if they can do this [complete the MET] correctly and quickly I think it shows a lot.”	“I want to see if they’re going to use the strategies but more as an after the fact kind of thing like we’ve talked about all of the strategies, you’ve talked about how you’re going to use them, here’s an activity that you can use to practise them. So it’s really, I think, helpful for that.”
P9	“I use the MET when I want to look at executive function, and just also to look at IADL performance as well, and also to prepare for . . . I found it a really good assessment for preparing for discharge. So my role is to actually administer the MET, and interpret it after.”	“So we set them goals and they apply those strategies throughout their stay and in completing the MET again at the end with the strategies applied, they were able to perform much better.”

MET = Multiple Errands Test; IADL = Instrumental activities of daily living; BADS = Behavioural Assessment of the Dysexecutive Syndrome.

problems and the lack of deficits evident in standardised testing. In addition, clinicians reported using the MET extensively in discharge planning; and some clinicians stated the MET provided evidence of cognitive and/or

functional problems that could assist in advocating for the clients' ongoing rehabilitation needs.

The MET was also used as a *therapy tool* during rehabilitation. Primarily, the MET was used to teach clients strategies to improve their functional performance, to provide opportunities to practise strategies once learned, and/or to monitor progress in therapy. One clinician provided an example of how the MET was used to teach a client landmarking, a strategy to improve navigational skills. Another key aspect of how the MET was used as a therapy tool was to build a client's insight into performance difficulties. Clinicians described that the real-life and complex nature of the MET surprised some clients and increased their awareness of why their performance was breaking down and what they would need to be able to do to function well in the community. At other times, administration of the MET was modified by clinicians to build insight either through showing clients videotapes of their performance, or by interrupting them during testing to point out when errors occurred. How the MET was used, either as an assessment or treatment tool, seemed linked to the clinicians' practice setting. Four therapists who worked or had worked in the same outpatient acquired brain injury (ABI) rehabilitation team described using the MET as a therapy tool for teaching, practising and monitoring the effectiveness of strategy use and described learning to administer and interpret the MET by observing their peers (see Table 3).

A third sub-theme relates to how the purpose for using the MET influenced *administration processes* (i.e., preparing for, administering, and then scoring the MET). For example, clinicians described providing more feedback to clients during testing if the goal of administering the MET was therapeutic (e.g., building insight or practising use of strategies) compared to if they were using the MET purely as an assessment. While clinicians valued flexibility in how they could use the MET, they also expressed a need for instructions or guidelines on how to administer the test in a standardised manner. All therapists described several steps which seem critical to this process: (1) preparing the test kit (task and rule sheets, a bag, and money), (2) providing instructions to clients, (3) administering the test and scoring behaviour, and (4) doing a post-assessment feedback interview. This feedback interview involved obtaining clients' self-assessment of their own performance, which was useful in assessing their recall and insight, and in clarifying why errors occurred. The other role of the interview was to provide the clients with feedback on their performance in order to build insight, set goals, and form rehabilitation plans. Although the overall process for how to administer the test was consistent across clinicians, finer details of administration were more variable, and even the same clinician varied his or her style when using the test with different clients.

Two more commonly reported variations in administration processes related to the instructions given to clients, and how the MET was scored.

All therapists noted the importance of having clear instructions so that clients had accurate knowledge of what was expected of them. Six therapists had adapted the standardised instructions used with the Baycrest MET while two others reported using no standardised instructions. Even where standardised instructions existed, therapists noted that the specifics of the approach varied with each client (e.g., having to repeat the rules more times to assist individuals from non-English speaking backgrounds or those with memory problems). Clinicians felt that greater clarity was needed regarding whether clients doing the MET should be instructed to spend time planning before starting the test.

The process of scoring the MET was similar for all clinicians and involved observing clients' behaviour and recording the tasks completed, strategies used, and errors made. There were differences in how this information was recorded, with some clinicians using structured score sheets developed with the Baycrest MET and others making general notes of the clients' actions and subsequently using these to tally the number of tasks completed and errors made. No clinicians reported videotaping the test for the purpose of scoring, and all felt score sheets would be useful as a prompt in knowing what behaviours to look for.

Theme 2 highlights the flexibility of the MET in clinical practice as clinicians employed it both as an assessment to guide treatment and as a therapy tool, or a component of their intervention. The purpose for using the MET inherently influenced the administration process and therefore clinicians consistently called for resources (e.g., an administration manual) to document how the MET can be employed in clinical practice, and for standardised procedures for administration and scoring.

Theme 3: The MET is a challenging assessment requiring buy in and commitment from clinicians

Table 4 contains exemplar quotes related to the third theme, that the MET is a challenging assessment to administer and score, and as a result its use within clinical practice requires buy in and commitment from clinicians. "Buy in" reflects the value that clinicians placed on the MET data which in turn was one factor shaping their decisions around how and when to use it in clinical practice. The themes presented in this paper were inter-related as the major reason why therapists did "buy in" to the MET was because it was viewed as being representative of real-life situations, and because of its flexibility in addressing a range of rehabilitation goals (i.e., themes 1 and 2). Commitment reflects the sense that some therapists were willing to do what was required to overcome challenges in order to use the MET in practice.

Clinicians weighed the value of the MET in the context of other challenges to using it. Information clinicians used in this evaluation can be classified as client factors, environmental factors, and the clinicians' experiences using the MET. Information pertaining to clients included their rehabilitation goals or the reason for the referral, their functional ability and the potential safety risks associated with testing. Information from the environment included organisational priorities and policies (e.g., prioritising an early discharge or policies governing when patients can be taken off the ward), and available resources in the environment (e.g., amount of travel required to reach a suitable MET administration location). Also, the experience of the clinicians played a role in influencing their confidence in administration and scoring, and how easily they could adapt the administration processes to suit the needs of their clients or setting. Clinicians reported that doing the MET themselves, and/or hearing how other clinicians in their setting had used the MET, was important in learning to administer the test and in developing an appreciation for the data that the MET can provide. The clinicians' experience using the MET as well as factors related to the client and testing environment influenced clinicians' reasoning both for and against using the MET. For example, the physical requirements of the MET made it unfeasible to use with some clients with substantial mobility impairments; however, it also provided information on how someone with mobility problems carried out tasks required to live independently, information critical in discharge planning.

A sub-theme emerged in relation to the MET requiring buy in and commitment from clinicians, *the challenge of knowing what normal performance is*. Clinicians had varying confidence levels in interpreting MET data, specifically in judging how an error on the MET could be used to inform rehabilitation plans. For instance, clinicians had difficulty determining if an error such as buying an anniversary card instead of a birthday card reflected a normal slip of action, or the presence of executive dysfunction requiring intervention. Clinicians felt more confident using the MET to identify and address concrete skills (e.g., teaching a strategy to improve planning), rather than extrapolating performance on the MET to performance in everyday life. Access to supports or training was deemed important in interpreting MET data. Clinicians generally accessed support from within their setting (e.g., talking with more experienced colleagues), and also clarified with clients why an error had occurred to interpret their overall performance. All clinicians felt there needed to be better characterisation of "normal performance" to assist in interpreting the MET. This might be in the form of video examples, guidelines, or normative data.

Clinicians also focused less on individual errors and more on the overall consistency and organisation of performance when interpreting the MET. In determining overall consistency clinicians differentiated between

TABLE 4
 Exemplar quotes for theme 3: The MET is challenging to administer and score and requires buy in and commitment from clinicians

<i>Theme and sub-theme</i>	<i>Exemplar quote</i>
MET is a challenging assessment requiring buy in and commitment	<p>“So it is a commitment. And I’d say that’s why some clinicians never did it. Because now that lengths of stay are getting shorter and shorter, you’re taking probably half a session to prepare, in terms of preparing the client saying this is coming up, a session to do the MET and then maybe half a session to debrief. So you’re talking about 2 sessions; if they’re only here 6–8 weeks that is a good chunk of our available time. And that does not include, and this is the thing that makes it onerous, it doesn’t include the scoring. . . . So, you really have to value the information that it gives you in order to do it.”</p> <p>“I think having the experience of people that have used it was helpful, ‘cause I find our length of stay is decreasing rapidly, and the buying-in of the therapists to complete the assessment now . . . you have to hear from your colleagues that it’s worth your time.”</p>
<p>Sub-theme 1 <i>Weighing the value of the data against challenges for administration and interpretation</i></p>	<p>“One of my patients, she had anxiety attacks in large, busy settings, and we would step out to [hospital] which is a very busy setting. I decided not to do the MET on her because I was scared that if she had an anxiety attack I would not know what to do because this was when I was just starting, so I didn’t feel comfortable doing that. I think that I would be different now, in terms of being little bit more comfortable, but I think as a starting therapist, I wasn’t ready for that.”</p> <p>“A challenge with it is in terms of the mobility of the patients, and you were asking about the timing, in terms of how long it takes to complete the task, that’s a real challenge. At the same time, I found that very helpful because most of the other tasks that we saw, they are seated tasks, you are not moving around, whereas this, it adds in the difficulty of mobility . . . that’s what I like about the MET, there’s things even outside the cognitive component, that I can pull out of the assessment if I need to.”</p>

(Continued)

TABLE 4
Continued

<i>Theme and sub-theme</i>	<i>Exemplar quote</i>
Sub-theme 2 2.1: <i>The challenge of knowing what normal performance is</i>	<p>“I wouldn’t know what the norms are. You know, I didn’t know how I would perform on it or how someone with perfect . . . you know who is functioning quite normally would perform on it, so that is where I needed to have the opportunity to talk to others who were more familiar with the test and had seen a range of people going through it.”</p> <p>“Well I think that it would be useful to know for example um how many . . . if there were normative data then that would be very useful because then you would have a sense of well oh you only made an error on whatever question 7 and 60% of people who have no cognitive deficits make that error.”</p>
2.11: <i>Estimating “normal performance” by looking at executive functions and overall consistency</i>	<p>“So I might look at, basically, was the patient able to follow the instructions, were they able to remember the instructions, were they able to maintain their attention to tasks, were they able to plan out how they would complete the different tasks, how did that affect what they were doing, if they got stuck, you know, how do they manage, how do they problem solve in the moment, what strategies did they use, all those sorts of things. So trying to hit on the different areas of executive functioning.”</p> <p>“So in terms of my clinical decision-making I spoke with [researcher] and this client, she made a significant error with the envelope task, ended up opening up the envelope and not giving it to me. Listening to her narrative about it and she had assumed that the instructions were inside um and then when the paper was blank you know she put it away . . . it was helpful as you know she was not distracted by anything, she went rickety split through the whole thing, she planned it ahead of time and she organised herself and she was whipped through it, so that then led me to believe well this is not [executive dysfunction] you know if she was having a lot of really significant executive dysfunction she shouldn’t be able to do these tasks, this quickly.”</p>

quantitative and qualitative data that was obtained. Quantitative data (e.g., number of task completions or rule breaks) was used to provide evidence supporting clinical recommendations in reports or chart entries, and in monitoring progress following treatment. In contrast, qualitative data on performance (i.e., clinicians' own observations on how accurately and efficiently their client had executed the tasks) were perceived as most useful in shaping treatment plans. During testing, clinicians observed their clients' executive functions (e.g., planning ability and attention), functional performance (e.g., money management, ability to work under pressure, and social skills), and strategy use.

DISCUSSION

This study is the first to describe the perspectives of clinicians regarding the clinical utility of the MET. Qualitative methods were used to explore how and why the MET is used in clinical practice, how MET data are interpreted and used in clinical decision-making, and factors influencing usability of the test from the perspective of clinicians. Three key themes emerged in the data: (1) that clinicians value the MET because it reflects real-life functioning, (2) that the MET could be used flexibly, based on rehabilitation goals, and (3) that the MET is a challenging assessment requiring buy in and commitment from clinicians. The findings are discussed with reference to the components of clinical utility and the challenges of creating and interpreting ecologically valid tests.

Clinical utility

In this study clinicians reported that the MET is used flexibly in clinical practice as both an assessment and therapy tool. Clinical utility captures a measure's ability to cause meaningful changes in health outcomes (Bossuyt et al., 2012) and the MET is therefore influencing health outcomes by gathering necessary information to plan treatment and evaluate its success. Alternatively, the MET can influence health and well-being directly when used as a therapy tool, the most common example of which was clinicians using the MET to teach and practise strategies to improve performance of everyday activities. As has been done elsewhere, we addressed clinical utility by exploring the perceptions of clinicians regarding the value of information provided by an assessment (Donnelly & Carswell, 2002).

Clinicians interviewed in this study all valued the MET because of its representativeness to real-life functioning, which supports other research reporting ecological validity of the MET (Alderman et al., 2003; Dawson et al., 2009). However, the complexity of the tool meant clinicians felt it was not appropriate for use in all situations and almost exclusively employed

the MET when working with high functioning clients with ABI or stroke, the population for whom the MET has primarily been evaluated in the research literature (Dawson et al., 2009; Maeir et al., 2011; Morrison et al., 2013). Future research may be required to refine and evaluate the assessment to increase its utility with other populations (e.g., those in a more acute phase of recovery).

Assessing clinical utility requires comparing the MET to other tests of executive functions. Although other naturalistic and ecologically valid tests are now available, such as the ADL and IADL profile (Bottari et al., 2009; Dutil, Forget, Vanier, & Gaudreault, 1990) and Executive Function Performance Test (Baum, Morrison, Hahn, & Edwards, 2003), clinicians interviewed generally were not trained in these measures (see Table 1) and thus compared the utility of the MET to pen-and-paper neuropsychological tests. The MET was perceived as useful, because it provided data on everyday functioning. However, challenges to administering and interpreting the MET were considered in relation to the value of the data in deciding when to use it.

To our knowledge the clinical utility of executive function measures has not previously been considered by examining clinicians' perspectives regarding the usefulness of the test. The clinical utility of performance-based assessments of executive functioning has been demonstrated by (1) evidence that these tests can discriminate the performance of healthy participants from individuals with neurological conditions (Poulin, Korner-Bitensky, & Dawson, 2013) and (2) correlations between scores on performance-based tests and other real-world outcomes such as driving ability and self-reported executive impairments in everyday life (Asimakopulos et al., 2012; Poulin et al., 2013). Interviewing clinicians provided information about the processes and challenges they encountered when implementing the MET which cannot be elicited through quantitative testing alone. More routine employment of qualitative methods may generate information on contextual factors shaping how the test is used and interpreted and this can be used to develop implementation tools (e.g., assessment manuals, scoring guides) to support application of the measure in clinical practice. A further step in assessing clinical utility would be to use these interviews to explore differences in treatment plans and outcomes of treatment when the MET is employed, compared to when other cognitive assessments are used.

Challenges of creating and interpreting ecologically valid assessments

The practice context shaped clinicians' decisions around their goal or purpose for using the MET, how regularly it was used, and their "buy in"

or the value and relevance they perceived it had in their day-to-day practice. For instance, therapists working in acute care or inpatient rehabilitation noted a major aspect of their role was discharge planning (Shepperd et al., 2013). The MET was valued in these cases due to the broad range of information that can be gathered elucidating barriers to safe discharge in a timely fashion. Incorporating information on clinical utility in different practice contexts will be an important component of training on the MET. Understanding the clinical reasoning styles employed by clinicians using the MET, particularly pragmatic reasoning (Schell & Cervero, 1993) whereby the practice and personal context of therapists influence decision-making, may be an important next step in understanding how to create site-specific versions of the MET.

Clinicians in the current study unanimously described having difficulty interpreting the MET. This adds to a growing body of evidence suggesting that interpreting behaviours observed during naturalistic testing is a very challenging process (Bottari & Dawson, 2011; Morrison et al., 2013). The lack of confidence in interpreting MET data may reflect an underlying desire in clinical practice to achieve certainty in assessment and/or the lack of normative data for the MET. Clinicians who have traditionally relied more on neuropsychological tests with greater structure and often normative data may be used to accessing concrete evidence of the presence or absence of impairment from their assessments (Zihl, 1996). As a result they may feel uncomfortable using the MET as it requires a more flexible approach to administration and interpretation. This highlights a potential paradox for clinicians who desire certainty in assessment results, but who also desire ecologically valid tests that are necessarily complex and unstructured.

Clinicians described looking at overall efficiency in the test rather than focusing on individual errors when determining how well someone had performed. Interestingly, to judge “overall efficiency” clinicians relied less on the MET scores described in existing literature (e.g., number of errors, number of tasks completed) (Alderman et al., 2003), and more on their own observations of how individuals carried out the tasks. This suggests that training on scoring must not only involve quantifying task completions and errors, but also provide clinicians with knowledge of behaviours or strategies to look for when scoring, and to provide some rationale for examining these behaviours in order to understand the impact of cognition upon performance in everyday life (Marcotte, Cobb Scott, Kamat, & Heaton, 2010).

In particular, clinicians judged overall MET performance based on executive functioning (e.g., evidence of planning and organisation), and efficient task performance. Bottari, Iliopoulos, Lam Wai Shun, and Dawson (2014) also showed that clinicians considered executive functioning when trying to

distinguish pathological from normal errors among individuals performing the MET. One theme which was not present in Bottari's study (2014), but that clearly emerged in our data, was looking at strategy use to judge overall efficiency. We have explored how strategy use correlates with overall performance on the MET in a separate paper (Andre, 2009). This seems particularly important for training clinicians in interpreting MET data given it can have a direct impact on rehabilitation planning and on improving functional performance.

In summary, these data highlight the challenges of conducting ecologically valid cognitive assessments both in determining when to use the tests, how to create tests that will suit the practice context and knowing how to interpret the data once collected. Providing appropriate training on administration and scoring procedures, potential clinical applications of the MET in different practice contexts, and how to interpret performance may be important to improve the clinical utility of the MET. Moreover, these concepts may also be relevant to other performance-based executive function assessments.

Limitations and future research

This qualitative study used a small convenience sample of clinicians, all of whom were occupational therapists, known to have used the MET in their clinical practice. As such, the generalisability of the data to other contexts, or other therapists, is unknown. Future research examining clinical utility of the MET with a sample of therapists working in other contexts and including clinicians from other professional backgrounds (e.g., neuropsychology) is important. As well, future research examining clinical utility from a quantitative perspective and using more objective measures, such as developing longitudinal models of data on community reintegration or executive dysfunction in clients where the MET was and was not used to guide their rehabilitation, will also be useful.

CONCLUSION

These data highlight the complexity of determining the clinical utility of the MET as it is dependent on the practice context and the specific needs and goals of the client. Overall, clinicians viewed the MET as a unique and valuable assessment that provides a broad array of information on functioning in real-life situations. A further benefit is that the MET can be used flexibly either as an assessment to inform the direction of treatment, or as a component of the intervention. These findings add to existing knowledge on the MET and reinforce the importance of ecologically valid assessments such as the MET

in delivering rehabilitation to improve performance of everyday activities in adults with neurological conditions.

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