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Clinical competence: A review of the health care literature with a focus on occupational therapy

ABSTRACT This paper provides a review of the health care literature on clinical competence with a focus on occupational therapy. A simple *know-can-do* hierarchical model provides a framework for understanding the concept of clinical competence and for exploring the issues related to its definition and assessment. While there is general agreement across the health professions regarding the broad meaning of competence, the profession-specific components have been more difficult to identify and measure. Much of the research on the assessment of clinical competence has focused on the validity of certification examinations, especially in medicine, or on the evaluation of student performance, as is the case in occupational therapy. Although a variety of evaluation measures have been developed, the evidence is clear that one comprehensive tool that provides a reliable, valid and cost-effective measure of clinical competence does not exist; therefore, a combination of evaluation methods is needed for assessment purposes. Defining and assessing competence remains a particular challenge for the profession of occupational therapy.

RESUMÉ Cet article présente une revue de littérature sur la compétence clinique dans le secteur de la santé, tout en mettant l'accent sur l'ergothérapie. Un modèle simple de hiérarchisation des connaissances, des habiletés et de la performance définit le cadre permettant de comprendre le concept de la compétence clinique et d'explorer des questions ayant trait à la définition générale et à l'évaluation de ce concept. Bien que l'ensemble des professionnels de la santé s'entendent sur la définition au sens large de la compétence, les composantes liées à la profession ont été plus difficiles à identifier et à mesurer. Jusqu'à présent, la plupart des recherches sur l'évaluation de la compétence clinique se sont penchées sur la validité des examens d'agrément, notamment en médecine, ou sur l'évaluation du rendement de l'élève, comme on le fait en ergothérapie. Bien que diverses mesures d'évaluation aient été mises au point, il est clair qu'il n'existe actuellement aucun outil complet fournissant une mesure d'évaluation fidèle, valide et efficace de la compétence clinique. Ainsi, le clinicien qui s'engage dans une démarche évaluative doit combiner de nombreuses méthodes d'évaluation. La définition et l'évaluation de la compétence clinique représentent toujours un défi de taille pour notre profession.

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An essential responsibility of any profession is to establish standards of competence to assure the general public, the profession, and employers that members of the profession who provide services to the public are competent (Coates & Chambers, 1992; Hawkes, 1985; Norman, 1991). The profession of occupational therapy is no exception (Baum & Gray, 1988). While the word *competent* conveys a clear message to the public, the essential profession-specific components and minimum standards of performance have not been so easily defined or evaluated by the professions. Many of the health disciplines continue to struggle with the tasks of clearly articulating the components of clinical competence and developing valid methods to assess the performance of both students and practicing clinicians. While the responsibility of maintaining competence belongs to the individual health professional, each of the professions maintains the responsibility for establishing minimum standards and evaluating performance outcomes. The current political and economic climate, along with the rapid changes that are occurring within the various health care systems across Canada, make this gatekeeping role for the professions even more challenging. In addition, the tremendous growth in the demand for occupational therapy services in recent years, the expanding roles of professional practice, and the birth of new provincial self-regulatory bodies, have all served to add an additional dimension to the challenge of defining and assessing clinical competence in the occupational therapy profession. The first half of this paper will address the issues of defining and measuring competence from the broad perspective of a variety of health disciplines; the second half of the paper will focus specifically on the occupational therapy literature.

DEFINING COMPETENCE

There exists no consensus statement in the health care literature of precisely what is meant by the term *competence*. Although there is general agreement that clinical competence includes more than just knowledge or information, there are many opinions regarding the exact components of competence. Neufeld (1985), in a critical analysis of the concept of competence, suggests four dimensions: 1) the nature of the discipline itself, 2) the scope of patients and presenting problems, 3) the knowledge and skills (both technical and interpersonal skills) required to assess and treat patients, and 4) problem solving ability. A similar list is offered by Norman (1985): knowledge and understanding, clinical skills, interpersonal skills, problem solving, clinical judgment and technical skills. Ramsey et al. (1989) support Norman's definition but add the components of communication skills, humanistic qualities, personal attitudes and ethical behaviour. In describing the competence of physicians, Keynan, Friedman and Benbassat (1987) specify certain criteria such as history-taking skills, diagnostic ability, physical examination skills and rapport with patients and colleagues as essential components of competence. In the most comprehensive look at physician competence, Cox (1988) identifies the following key components: technical competence in knowledge and skills of diagnosis and patient management; efficiency in the management of finite resources; balanced judgment to resolve trade-offs and competing values; and habitual behaviour in meeting expectations. All of the above views of competence are consistent in that they include elements of knowledge, skills and professional behaviours.

Marshall (1993) describes professional competence in terms of three broad domains. He postulates that the cognitive domain encompasses behaviours based on knowledge and judgment; the affective domain captures the attitudes and values of the clinician; and the psychomotor domain reflects the clinician's manual and perceptual skills. According to Marshall, overall competence of the professional is determined by demonstration of a combination of behaviours in all three domains. Kane (1994) also supports this paradigm of three domains and suggests that a working model of practice is useful "to identify the knowledge, skills and judgments that are used in practice and that make a difference in practice, in the sense that the practitioner's level of mastery of knowledge, skills and judgment has a substantial impact on the effectiveness of the practitioner's performance" (p. 148).

An additional and important issue to consider in the definition of the concept of competence is its dynamic nature. Given the ongoing changes in the delivery of health care, the components of competence must continually evolve and be evaluated. For example, Cox (1988) has identified three

factors that demand ongoing attention: changing roles of health professionals, increasing expectations of society, and the powerful influence of third-party payers.

In summary, all definitions of clinical competence include the common elements of knowledge, skill and professional judgment. These three domains provide a useful generic framework within which each of the health disciplines can articulate the specific knowledge, skills and behaviours unique to their profession, and identify the minimum standards of performance associated with each domain. Unfortunately, the complexity and breadth of most of the health professions make such an in-depth analysis a difficult and onerous task.

MEASURING COMPETENCE

Given the problems of defining competence in specific measurable terms, it is not surprising that the task of assessing competence continues to challenge health care educators and certification boards (Eisenburg, 1989; Keynan et al., 1987). Norman (1991) offers a simple generic *know-can-do* hierarchical model that is particularly useful for conceptualizing the construct of clinical competence as described above, and for examining the various methods used for assessment purposes. At the most basic level of the hierarchy, a clinician *knows* how to do something in theory, but not necessarily in practice. Written tests are typically used to assess the knowledge level of competence. At the middle level, clinicians, when observed directly, are able to demonstrate that they *can* do something in a real or simulated setting. The *can* level therefore captures both the knowledge and skill components of competence but does not guarantee the examiner that the examinee will perform in the same manner in actual clinical situations on a day-to-day basis. Practical examinations and other direct observation methods are typically used to assess this level of competence. At the highest level of the hierarchy, the clinician actually does *do* something on a day-to-day basis in practice when unobserved and unmonitored. The *do* level therefore captures the ultimate performance level of competence which goes beyond the simple knowledge and skill levels to incorporate those additional aspects and professional behaviours essential to competent practice such as critical thinking, clinical reasoning, morality, integrity, responsibility, accountability, etc. Chart audits, patient satisfaction surveys and supervisor ratings are typically used to assess the do level of competence. Regardless of the method used to assess performance at this level, it is important that the clinician is able to justify what is being done. The provision of this kind of rationale, either as part of the chart record or by personal interview, serves as evidence of a sound knowledge base and clinical reasoning skills, and the doing is thus shown to be more than merely robotic performance. Norman (1991) suggests that the do level of competence is of utmost importance in the delivery of health care because it is the level of competence that certifying authorities guarantee to the general public and the consumers of health care when they certify a practitioner as competent. McGuire (1993) lends support to Norman's model by stating that when assessing competence there is a need to measure habitual everyday performance rather than relying solely on tests which measure maximal one-time performance.

In all of the health professions, multiple efforts have been made in recent years to find appropriate methods for evaluating the various aspects and levels of clinical competence. Approaches include direct observation, written tests, oral examinations, computer simulations, the use of standardized patients, patient satisfaction surveys and medical record audits (Eisenburg, 1989; Neufeld & Norman, 1985). Regardless of the approach, there is general agreement that any measure of clinical competence should be objective, reliable and valid (Coates & Chambers, 1992). According to Fidler (1993), a test's ultimate utility hinges on the demonstration of validity which he purports "is especially salient in the health-credentialing field where practitioners who deliver critical health care services to individuals may be certified largely on the basis of an examination" (p.14).

Keynan et al.(1987) classify the methods used to measure competence as objective or subjective, and further suggest that both approaches have their limitations. Objective techniques, such as multiple choice question exams (MCQs), are rela-

tively easy to establish as reliable and valid. Although MCQs tend to measure only limited dimensions of clinical competence, typically at the know level of competence, they have been shown to predict performance in clinical practice (van der Vleuten, van Luyk & Beckers, 1989). More recent modifications of the traditional MCQ exam purport to tap higher level thinking and clinical reasoning skills (Norman, 1995). However, Elstein (1993) is particularly critical of multiple-choice examinations as a measure of physician competence because of their low face validity and their implicit assumption that there is one best answer to every question. Elstein further suggests that the important social context of clinical practice, with all of its reality-based ethical dilemmas (encountered at the *do* level of practice), is not tapped using multiple-choice examinations. Despite these criticisms however, it is clear that objective multiple-choice type written examinations, most often used for certification purposes, provide a reliable and valid measure of the *know* level of competence.

Direct observation techniques allow for the assessment of clinical skills and are often used as one component of certification examinations. Typically, they involve real or simulated patient encounters where the observer evaluates the performance of the examinee using some kind of objective criterion-based checklist and usually a more subjective global rating as well. The Objective Structured Clinical Examination (OSCE), originally described by Harden and Gleeson (1979), has been used to assess clinical competence in several health professions including veterinary medicine, dentistry, nursing, medicine and physiotherapy. The OSCE is set up as a series of timed stations at which examinees are asked to perform specific tasks such as taking a patient history, performing a physical examination or diagnostic procedure, interpreting findings such as lab reports and x-rays, teaching/counselling a patient, writing a prescription or report, or performing a treatment technique (Harden, 1988; Nayer, 1993; Salvatori & Brown, 1995). Evaluation criteria and scoring systems for each station are prepared in advance. The OSCE has undergone much investigation and is considered to have good inter-rater reliability with reported coefficients of 0.62-0.99 (Roberts & Brown, 1990), 0.80 (van der Vleuten, van Luyk & Swanson, 1988), and 0.90 (Stratford et al., 1990), and also good test-retest reliability (r= 0.66-0.86) (Roberts & Norman, 1990). However, internal consistency is a concern because of high station-to-station variability, and it has been recommended that five to eight hours of testing is required to obtain a stable estimate of performance (Newble & Swanson, 1988; Stillman et al., 1990). In a review article, Nayer (1993), comments on satisfactory content and construct validity of the OSCE but points out that criterion validity has been much more difficult to establish because of low correlations with various other measures. Direct observation techniques, such as the OSCE, are not only resource-intensive and time-consuming methods of clinical assessment, but also suffer from the Hawthorne or audience effect (Portney & Watkins, 1993; Wakefield, 1985) which suggests that examinees perform at their best when observed directly. The observed level of performance, therefore, is not necessarily a good predictor of habitual day-to-day performance. This phenomenon helps to explain why Norman (1991) considers direct observation methods to evaluate performance at the *can* level rather than the *do* level of competence.

Subjective techniques, such as peer assessment, patient satisfaction surveys and supervisors' ratings, tend to address a broader range of competency components (Williams et al., 1987); however, controversy exists regarding the reliability and validity of these methods. Some would argue that subjective ratings are less valid and reliable because they tend to be biased, inflated and subject to generalizations because of the halo effect (Eisenburg, 1989; Streiner & Norman, 1989). Support for this argument can be found in the literature on the use of peer review to assess quality of care. In a meta-analysis of the reliability of peer assessment, Goldman (1994) reported a weighted mean kappa of only .31 and concluded that the interrater reliability of peer assessment is quite limited. On the other hand, it has been suggested that subjective expert evaluation is a superior approach for assessing the art and science of clinical practice (Keynan et al., 1987). In a study which investigated the

competence of medical students, Keynan et al. (1987) reported that supervisors' global ratings were not only reliable (Cronbach's alpha of 0.83 - 0.91), but also significantly correlated with objective multiple choice examination scores (Pearson r= 0.25 - 0.54); they concluded that "the reproducibility of subjective expert assessment of performance through global rating scales is comparable to that of objective evaluation through written MCQ, even though these measures assess different domains of competence at different levels of simulations" (p. 477). Fidler (1993) reported similar findings in his studies of medical technologists and medical laboratory technologists in which he reported that employers' ratings (three months post-examination) were correlated with test performance for both groups of examinees; he further concluded that these results provided sufficient evidence of criterion validity of the certification examination. Norcini, Webster, Grosso, Blank and Benson (1987) compared ratings of competence by clinical supervisors and related scores on the multiple choice American Board of Internal Medicine (ABIM) certification examination for medical residents. They reported modest correlations for knowledge (r= 0.41), clinical judgment (r= 0.37), and clinical skills (r= 0.34 - 0.36); however, the level of statistical significance was not reported. Although the correlations regarding human qualities (r= 0.19) and attitudes (r= 0.22) were lower than those for the more objective components, the investigators concluded that the exam had satisfactory validity as a measure of overall clinical competence. Markert (1993) drew similar conclusions when comparing supervisors' ratings of competence prior to the completion of medical school with scores on the ABIM certification examination. In summary, all of these studies not only serve to support the validity of written certification examinations (which measure performance at the *know* level of competence) but also suggest that supervisors' global ratings (which measure performance at the do level of competence) may be sufficiently reliable and valid to use as global measures of clinical competence.

There is also some evidence that the review of medical records, a process commonly referred to as chart audit, may be one of the best ways to measure competence related to patient management at the do level of Norman's (1991) hierarchy. Chart audit, which involves a random sampling of patient medical records or progress notes, has been used extensively to evaluate clinical competence and quality of care provided by medical students and practitioners. This method of evaluation can be used either formatively, to provide a source of feedback, or summatively, to make pass/fail decisions for certification (Tugwell & Dok, 1985). Stenvig and Karpiuk (1991) also support the use of chart audit to assess the multiple components of care provision and clinical performance in the nursing profession. Some critics of the chart review process suggest that simple chart audits likely reflect patterned behaviour rather than quality of care (Borgeil et al., 1989). Chart audit is also criticized because of the clinician's tendency to fail to record all clinical actions or negative findings, which may also lead to inaccurate and non-valid conclusions (Norman, 1985). However, Tugwell and Dok (1985) suggest that the inherent limitations to using chart reviews to assess clinical competence can be reduced by formulating explicit criteria by which to rate clinical performance before reviewing the chart. Ognibene et al. (1994) developed specific criteria for the purpose of chart review in their study of 22 residents' physical examination skills and reported significant correlations between chart audit and physician interview (r= 0.75) and chart audit and patient interview (r= 0.89). They suggested that "25 chart reviews per resident would provide a small enough error of measuring completeness scores for evaluating an individual resident" (p. 586), and concluded that the use of chart reviews, especially when independently verified by patient interviews, were useful as both a measure of clinical competence and as a means of identifying the need for remediation (Ognibene et al., 1994). Gerbert and Hargreaves (1986) compared four methods of obtaining information on physician behaviour in the area of ambulatory care of chronic obstructive pulmonary disease: medical record audit, physician interview, patient interview and videotaped observation. Of these techniques, chart audit was found to be the most acceptable to physi-

cians, the least expensive, the least invasive and the easiest to complete. Although chart audit and physician interview were found to have good inter-rater reliability (Kappa = 0.82 and 0.89 respectively), content validity was reported as poor. Content validity was measured by examining the proportion of cases in which each of 20 key items were present; the median percentage for chart audit was only 33% in comparison to 97% for physician interview. The authors suggest, however, that the poor content validity may be accounted for in terms of limited sampling since only one visit per patient on the medical record was audited. This problem of content specificity, as described by Elstein, Shulman and Sprafka (1978), suggests that the charts audited may not have been representative of physician performance over time. While Gerbert and Hargreaves (1986) noted that the chart audit was the most useful measure of competence in their study, they also concluded that no one method provides an accurate assessment of physician behaviour, and further recommended that a combination of methods be used. In a follow-up study of 63 physicians and 197 patients with chronic obstructive pulmonary disease, physician interviews were reported to be the most precise source of data (Gerbert, Stone, Stulbarg, Gullion & Greenfield, 1988). Although this study was limited to assessing competence in terms of medication regimens, the authors reaffirmed that the use of multiple visits per patient was necessary when using chart review methods for performance assessment purposes and also concluded that patient interviews were not a reliable or valid source of information (Gerbert et al., 1988). In summary, depending on the rigour of the study design and sampling procedure, the purpose of the review and scope of data collection, the assessment criteria, and the completeness and legibility of the chart record, there is some evidence to suggest that the chart audit may be a reliable and valid tool to assess the do level of competence in practice, especially when combined with an in-person clinician interview.

Chart Stimulated Recall (CSR) is one such modified form of chart audit that includes a personal clinician interview as part of the chart review process. This review method has been used to measure clinical competence in physicians (Norman et al., 1993). The CSR process entails the use of a few randomly selected patient charts in an interview situation with an external evaluator. The charts are used to stimulate the clinician's recall of the case and to facilitate discussion of the cases being reviewed. In the process of reviewing several charts and discussing each with the clinician, the clinician is able to verbalize the process of clinical reasoning and rationalize decisions made, thereby providing the assessor with a more complete picture of actual practice behaviour (Hollis & Clark, 1993). The evaluator is thus better able to make judgments about the level of competence of the clinician in the areas of basic knowledge, data gathering, problem solving and clinical reasoning, management approaches, record keeping and overall clinical competence (Norman, 1991; Solomon, Reinhart, Bridgham, Munger & Starnaman, 1990). In this sense, CSR overcomes some of the problems of the traditional chart audit related to poor record-keeping practices and content validity. Inter-rater reliability using CSR as a measure of overall competence has been reported to be as high as 0.90 (Norman et al., 1993). Ramsey et al. (1989), who used CSR to examine the relationship between physicians' performance on the ABIM certification examination and performance in practice, reported moderate correlations between examination scores and practice behaviour, and concluded that the certification examination was a good predictor of clinical competence in practising interns. Similar findings were reported by Solomon et al. (1990) who found significant correlations between the emergency medicine certification examination scores and a chart stimulated recall measure. Borgeil et al. (1989) found a similar relationship between the multiple choice component of the College of Family Physician's certification exam and a CSR measure. These three studies not only provide further evidence of the criterion validity of certification examinations but also suggest that CSR shows significant promise as a valid measure of the do level of clinical competence.

To summarize the issues related to the measurement of clinical competence outlined in this section of the paper, it is clear that a variety of eval-

uation methods are required for a comprehensive and valid assessment of the knowledge, skill and behavioural domains of professional practice. Multiple choice examinations, commonly used for certification purposes, are reliable and valid measures of the *know* level of competence. Direct observation methods such as OSCEs, which are often used as a component of certification examinations, serve as satisfactory measures of the *can* level of competence. Chart audit, especially when used in combination with personal clinician interviews as in the Chart Stimulated Recall method, provides the best measure available to assess the *do* level of competence; however, supervisor ratings and patient satisfaction surveys and interviews may also add a useful and important dimension to the assessment of overall clinical competence.

DEFINING AND MEASURING COMPETENCE IN OCCUPATIONAL THERAPY

The profession of occupational therapy is not immune to the challenges of defining and measuring clinical competence. However, there is a paucity of occupational therapy literature that addresses these issues. Most of the attention to date on the topic of clinical competence in occupational therapy has been devoted to student-related issues. Ernest and Polatajko (1986) offer a view of professional competence that makes a distinction between the clinical and academic performance of students. They define clinical competence as "the ability of the about-to-graduate student to integrate knowledge, judgment, affective behaviour and professional skill..." (Ernest & Polatajko, 1986, p.256). In an article on clinical teaching, Edwards & Baptiste (1987), refer to Norman's (1991) framework of clinical competence which includes the components of clinical skills, knowledge and understanding, interpersonal attributes, problem-solving and clinical judgment, and technical skills; however, they do not attempt to describe these components in specific occupational therapy terms. The importance of attitudes and values is supported by Burrows (1989) who found that Kielhofner's Model of Human Occupation was useful for focussing attention on some of the unobservable attributes of clinical competence of student occupational therapists. MacKinnon (1987) has also suggested that the role of education is "to go beyond the transmission of professional knowledge, to develop critical thinking, creative problem-solving skills, decision making ability and flexibility of personality" (p. 161). In more recent years, much has been written on the importance of problem-solving ability and lifelong learning (Saarinen & Salvatori, 1994), clinical reasoning in occupational therapy practice (Cohn, 1989; Fleming, 1991; Neistadt, 1987) and the need for education programmes to prepare reflective practitioners (Royeen, 1995). The literature is clear that professional competence in occupational therapy, like other health professions, extends well beyond the know and can levels of Norman's hierarchical model to include various aspects of professional judgment and behaviour. In addition, the literature suggests that such a broad view is critical to our survival in an environment of rapid change.

Burrows (1989) also supports a "multi-dimensional and somewhat ambiguous" view of competence in occupational therapy, and states that "competence remains elusive and is recognizable more by its absence than by readily measurable behaviours" (p. 222). It is not surprising, therefore, that the profession has devoted a lot of time and attention to defining the specific components of competence and specifying the standards below which one would be considered incompetent. The *Occupational Therapist Occupational Profile* (OTOP) was developed to identify the core skills and minimum acceptable levels of competence for each skill required of an entry level occupational therapist (Bridle, 1977). The OTOP, presented in the form of a dacum chart, attempted to capture the scope of occupational therapy practice as a set of major skill categories with numerous subskills. The major skills included: communicate; develop professional competence; identify and evaluate function and needs; analyze and interpret evaluations; plan and develop programmes; utilize therapeutic procedures; select and utilize equipment and materials; apply educational and instructional methodology; participate in research activities; perform administrative functions; and perform supervisory functions (Bridle, 1977). Given the changes in occupational therapy practice over the last 20

years, the OTOP is no longer considered to be truly reflective of occupational therapy practice. However, the Canadian Association of Occupational Therapists (CAOT) has developed a new *Profile of Occupational Therapy Practice in Canada* (CAOT, 1996) which will replace the outdated OTOP. It is broader in scope, more comprehensive in terms of performance requirements, and more reflective of the current shifts and future trends in occupational therapy practice in Canada. A functional analysis methodology was used to develop a description of what constitutes the work of an occupational therapist and to identify performance criteria that are based on the outcomes of work. In its early stages of development, this competency-based profile of professional competence was referred to as the Occupational Therapy Functional Analysis (OTFA) and was described by Brown and Strickland (1994) as "a foundation which outlines overriding and integrated elements and performance components of the practice of occupational therapy" (p.20). The new *Profile of Occupational Therapy Practice in Canada* will provide the profession of occupational therapy with a new way of conceptualizing professional practice and understanding the specific knowledge, skill and behavioural components of clinical competence. It will also serve as the "basis for developing academic standards for the profession, validating the blueprint for CAOT's national certification examination, and as a self-assessment tool for individual members" (CAOT, 1996, p. 79).

According to CAOT, the goal of an occupational therapy education programme is to produce competent generalists who are able to demonstrate a reasonable level of expertise in a variety of practice areas (CAOT, 1986). Evert (1993) also supports the notion of a broad assessment of competency that "can be applied to all aspects of our daily professional life along the entire spectrum of our careers and includes specialization" (p. 487). It has been argued, therefore, that evaluation of clinical competence must address the entire scope of occupational therapy practice as well as the specific techniques required for the demonstration of expertise in a given area of practice (Missiuna, Polatajko & Ernest-Conibear, 1992).

Since 1948, CAOT has been committed to the development and implementation of a national certification examination as a measure of basic entry-level competence to practice occupational therapy in Canada. It is important to note that the profession in Canada has never formally supported the concept of specialization nor the certification of therapists for practice in specialty areas. Gill (1984) refers to certification as "...a minimum competency requirement and the endorsement of the right to practice" (p.31). Hawkes (1985) suggests some additional benefits of pursuing the certification examination route: 1) graduate occupational therapists can obtain a measure of whether they have achieved a basic level of knowledge to enter the profession, 2) immigrant clinicians can gain recognition of their qualifications as being comparable to Canadian standards, and 3) the certification examination provides a national standard for membership in the Association and thus facilitates professional mobility across Canada (p.186).

In 1985, the first Canadian national certification examination for entry to practice was implemented by CAOT. The examination attempts to define and measure competence for entry-level practice in terms of basic content and professional content (CAOT, 1995). Basic content includes the categories of professional knowledge, biomedical/clinical sciences, social sciences and managerial sciences, while the professional content stream assesses knowledge of activity analysis, assessment of occupational performance, programme planning and intervention in occupational performance, programme evaluation, administration and supervision, professional behaviour, and applied research and statistics. The examination is a six-hour written examination using a multiple-choice format with approximately 40 vignettes and 300 questions (CAOT, 1995). According to CAOT (1995), "high standards ... are ensured by the close working relationships among CAOT, the Certification Examination Committee, the Education Committee, members of CAOT, CAOT staff, and test and measurement experts" (p. 1). Although the process of assessing the reliability and validity of the national examination is underway, there have yet been no published reports of the research find-

ings. Consequently, to date, there is limited evidence to support the link between knowledge (as measured at the know level by the certification examination) and clinical competence (as measured at the do level) in occupational therapy practice.

The Performance Evaluation of Occupational Therapy Students (PEOTS) tool was developed in 1985 to objectively assess the performance of occupational therapy students (Ernest & Polatajko, 1986). The PEOTS measure is grounded in the OTOP skills profile and rates the student's performance of clinical skills based on the expected performance of the hypothetical new graduate. The PEOTS has 122 items which are grouped into seven areas of performance evaluation: general communication skills; professional relationships; professional competence; identify and evaluate function and needs; plan and develop programmes; utilize therapeutic procedures; and select and utilize equipment and materials. The levels of competence used to rate the student's performance for each item are as follows: proficient, independent, minimal supervision, assistance required, and cannot do (Polatajko, Lee & Bossers, 1994). Although the PEOTS is considered to have good content and construct validity (Ernest & Polatajko, 1986) and good inter-rater reliability (Polatajko et al., 1994), it relies on direct observation and somewhat subjective ratings of performance. The assessment of clinical competence using the PEOTS tool has indicated that graduating students have a tendency to be competent in core but not specialty skills (Missiuna et al., 1992). These findings are consistent with those of Hollis and Clark (1993) who, in a study of 35 British occupational therapists with various amounts of practice experience, reported a tendency for the sequential development of expertise over time, and that differences in the time required to develop specific competencies were related to personal and professional needs and duties. Both these studies suggest that a minimum level of competence is acquired during training and that expertise or competence in specialty areas of practice develops over time with additional training and experience.

The American Occupational Therapy Association (AOTA) has developed and approved a similar tool to PEOTS for evaluating the performance of students during fieldwork (Crist & Cooper, 1988). This tool entails the evaluation of 51 items which are classified as performance, judgment, or attitude components of competence. Again, although reported to have acceptable internal consistency and reliability (Cooper & Crist, 1988), the tool relies on observation and subjective performance ratings. Given the competency-based criteria of the PEOTS and AOTA instruments, as well as the supervisory and observational nature of the relationship between student and supervisor, it can be concluded that both tools measure student performance primarily at the can level of competence.

There is some occupational therapy literature that addresses the assessment of competence at the do level of Norman's hierarchical model, specifically on the topic of record-keeping and use of chart review procedures. Edwards and Baptiste (1987) have summarized the benefits and limitations of the traditional chart audit as a method of evaluating clinical competence. They state that chart reviews provide information regarding the clinician's skills in problem formulation, data interpretation, patient care, continuity of care, adjustment for illness severity, written communication and prioritization, in an easily accessible and relatively unobtrusive manner. Limitations of this method include the fact that documentation is unstandardized and therefore, information obtained may differ per setting. Finally, Edwards and Baptiste (1987) point out that proficiency in charting tends to improve with experience which, in turn, affects the accuracy, and therefore validity, of the data obtained. Fearing (1993) has discussed the value of structuring the charting process in occupational therapy using the *Occupational Therapy Guidelines for Client-Centred Practice* (CAOT, 1991); however, she does not make the link to using the chart audit as a means of assessment of clinical competence. Criteria mapping as a method of quality assurance in occupational therapy has been described by Law, Ryan, Townsend and O'Shea (1989). This particular form of chart audit " allows the simultaneous assessment of both the process and the outcome of care by means of health

record abstraction [and] is particularly well suited to occupational therapy because it includes branching to reflect the sequential judgments of therapists and does not penalize the clinician for omitting unnecessary procedures" (Law et al., 1989, p. 104). In a study which used criteria mapping to evaluate the quality of care provided for a self-care disability in an acute care setting, Law et al. (1989) reported good intra-observer reliability (r= 0.65- 0.77) and inter-observer reliability (r= 0.72-0.73), and concluded that this method of chart audit is an appropriate quality assurance tool for use in occupational therapy. While this study did not specifically address the competence of individual therapists, it does indicate that chart review, particularly in the form of criteria mapping, is a reliable method for data collection purposes; with further testing and evaluation, this modified form of chart audit may prove to be a useful measure of clinical competence in occupational therapy.

The paucity of literature regarding clinical competence in occupational therapy is obvious. While there is general agreement regarding the broad components of clinical competence, a clear and comprehensive definition is not yet available. Although the PEOTS offers a reliable and valid measure of student competence, the reliability and validity of the national certification examination has not yet been demonstrated. The chart audit has been used to a limited degree as a quality assurance tool in occupational therapy but not as a measure of the competence of individual therapists. Unfortunately, no occupational therapy literature exists on the maintenance or the assessment of competence beyond the entry level of practice.

CONCLUSION

A review of the health care literature has revealed a simple but useful know-can-do model to examine and understand the issues related to the definition and assessment of clinical competence in the health professions. There is general agreement that clinical competence should be defined broadly as a combination of knowledge, skills and professional behaviour and judgment. Occupational therapy, as a profession, is still struggling to define its scope of practice and to articulate clearly the specific components of professional competence; however, the new *Profile of Occupational Therapy Practice in Canada* (CAOT, 1996) will undoubtedly provide much direction in this regard.

Since a strong link between the assessment of knowledge and clinical competence in practice does not exist, the evidence in the literature is clear that a variety of methods are required to provide a comprehensive, reliable and valid assessment of all three levels of clinical competence. Written examinations, direct observation methods, chart audits, supervisor ratings, patient satisfaction surveys and clinician interviews all have a role to play in the assessment process. Although CAOT's national certification examination purports to measure basic competence in occupational therapy at the entry-level to practice, its reliability and validity have yet to be demonstrated. The ongoing evolution of the profession of occupational therapy and expansion of existing roles have undoubtedly added to the challenge of defining and measuring competence in our profession. Given the responsibilities inherent in self-regulation and the demand for public accountability in health care, the professional responsibility to continue to address the complex matter of competence in occupational therapy is clear.

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