Occupational Therapy Diagnostic Reasoning: A Component of Clinical Reasoning

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In its most simplistic form, the occupational therapy process can be conceptualized as comprising two stages (see Figure 1). The first stage involves the sensing and defining of a patient’s functional problems and is accomplished through assessment. The second stage focuses on the resolution of problems and is accomplished through intervention and reassessment. Stage 1 of the occupational therapy process ends in a problem statement or a series of problem statements that describe the functional deficits toward which occupational therapy intervention is directed. We (Holm & Rogers, 1989; Rogers & Holm, 1989) applied the term occupational therapy diagnosis to these problem statements.

The phrase to diagnose means to investigate or analyze the cause or nature of a condition, situation, or problem. A diagnosis is the end product of this investigation. The occupational therapy diagnosis thus reflects a conclusion concerning the nature or cause of a phenomenon requiring occupational therapy intervention. It describes the actual or potential effects of disease, trauma, developmental disorders, age-associated changes, environmental deprivation, and other etiologic agents on occupational status. The sequence of decisions that leads to the occupational therapy diagnosis is referred to as diagnostic reasoning. Diagnostic reasoning is one component of the clinical reasoning involved in the occupational therapy process. The objective of this article is to clarify the concepts of diagnosis as process (i.e., occupational therapy diagnostic reasoning) and as product (i.e., occupational therapy diagnosis).

Occupational Therapy Diagnosis as Process

Diagnostic reasoning encompasses problem sensing and problem definition. A therapist senses a problem by framing it, that is, by deciding what will be included in or excluded from the picture. The picture of the patient that is inside the frame is the clinical image. Many problem sensing decisions are made by habit and custom. The decisions are often based on groups of patients rather than on an individual patient. A therapist defines a problem by describing it concisely and precisely and then naming it. As a result of this descriptive process, the therapist’s clinical image of a patient becomes more like the actual patient encountered in the clinic. Problem definition decisions require active problem solving and are specific to the patient. These decisions are the essence of diagnostic reasoning. Although active problem solving is the preferred strategy for the making of problem definition decisions, these decisions can be made by habit or custom. If problem definition is done by habit or custom, diagnosis follows a recipe, or standard operating procedure, mode of decision making (Line, 1969). Accordingly, the therapist’s clinical image of the patient remains generic and fails to correspond to the individual patient; the

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occupational therapy diagnosis is thus predetermined by the recipe.

In practice, there is no sharp distinction between problem sensing and problem definition; the two processes are synergistic. The clinical image is framed and reframed as the image itself becomes increasingly refined. For convenience, however, we will discuss problem sensing decisions first and then proceed to problem definition decisions.

Problem Sensing

Usually before a therapist approaches a patient, many diagnostic decisions have already been made, such as what to focus on, what specific data to gather, what methods to use to gather the data, and how much data to gather. Some decisions are made explicitly through a process of deliberate choice. Many more are made implicitly, however, thereby reflecting professional, practice, and personal priorities; habits; and routines. Thus, the prototype clinical image is not blank. Rather, it has been framed and shaped by factors in the domain of occupational therapy, the practice setting, and the therapist as well as in the patient.

Domain of Occupational Therapy

Of all aspects of human behavior that could be assessed, the parameters of occupational therapy have been delimited to occupational role performance, occupational performance, and the components of occupational performance (American Occupational Therapy Association, Commission on Practice, 1979). Patients are referred for occupational therapy primarily because of problems in occupational performance, that is, because they have problems performing and completing daily living tasks. These problems may be caused by personal elements, such as a lack of ability or skill, or by physical, cognitive, or emotional impairments. They may also be caused by inadequacies of environmental elements, such as architectural barriers, familial attitudes, or societal prejudices. Tasks may be coalesced to become role performance, such as that of student, worker, or spouse. Tasks also may be dissociated to become components of task performance, such as muscle strength, manual dexterity, visual perception, or motivation. Collectively, the dimensions of occupational role performance, occupational performance, and components of occupational performance are called occupational status. Human behaviors that are not task-related and do not fall within these parameters are excluded from the occupational therapy assessment.

Practice

The setting in which a therapist provides service may, by its mission, limit the content and scope of the occupational therapy assessment. The limitations imposed by the setting may be connoted by titles such as adult day care, long-term-care facility, neonatal intensive care unit, Goodwill Industries, and United Cerebral Palsy. Settings may regulate the type of diagnoses seen and the acuity or chronicity of illness. In turn, this regulation may determine the specific focus of the assessment. For example, in Goodwill Industries, the emphasis is more apt to be on occupational performance or occupational role performance than on the components of occupational performance. Limitations may also be imposed by the use of a specific philosophy or theoretic model. A community mental health clinic, for example, may use a behavioral, psychoanalytic, or psychobiologic model, which in turn would affect the type of occupational therapy assessment that would be acceptable. Use of the occupational behavior model, for example, in the context of behaviorally oriented programming would be conflictual, because the former emphasizes intrinsic motivation and the latter, external reinforcement.

Physical, fiscal, and personnel resources within a setting can also restrict the assessment. The limitations imposed by space and budget allocations can affect the choice as well as the variety of specific evaluation tools, materials, and equipment. If space is limited, tumble forms may need to suffice for therapy balls; a heating element and toaster oven for a standard size stove; and tabletop evaluation tools for freestanding work sample systems. If the budget is limited, cheaper evaluation tools may need to be chosen. For example, a setting that has just added a physical capacities evaluation as the first step in a return-to-work program may need to rely on the Purdue Pegboard (Purdue Research Foundation, 1969) for evaluations of manual dexterity rather than a work sample, such as Valpar 1: Small Tools (Valpar Corporation, 1975). In multidisciplinary settings, informal norms or formal policies define the practice domains of professional staff. Transfer techniques are taught by occupational therapists in some settings and by physical therapists in others.

Therapist

Therapists differ greatly in their clinical and diagnostic expertise. Although all therapists meet the same mini-
mum educational standards, their clinical proficiency varies. Some therapists are better diagnosticians than others. Recency, intensity, and frequency of contacts with patients similar to the one to be assessed influence diagnostic decisions. Although diagnostic reasoning is generic to all practice areas, 15 years of practice in adult mental health does not qualify one to take a position in pediatric arthritis (recency). Similarly, the competence derived from 6 months of experience with a total caseload (intensity) of infants with developmental delay differs from that derived from assessing only one or two such infants a week (frequency) over the same time period.

A critical determinant of the occupational therapy assessment is a therapist's repertoire of clinical frames of reference and preferred frame of reference for practice. The therapist's frame of reference sets the cues that will be attended to during data collection, the concepts that will be used to describe problems, and the labels that will be used to summarize a patient's performance problems. In an assessment of the trunk stability and postural responses of a 5-year-old boy with cerebral palsy who does not maintain an upright position for more than 10 min out of each hour when performing desktop activities, the therapist's frame of reference focuses on data collection. The therapist with a neurodevelopmental frame of reference will attend to cues that are indicative of adductor spasticity, weak external hip rotators, and the ability to shift and distribute weight while keeping the trunk in alignment. The therapist with an acquisitional frame of reference will attend to external cues that reinforce the child's behavior and perhaps motivate him to assume an upright posture for an extended period of time. The therapist with a rehabilitation frame of reference will attend to cues that would indicate the most efficacious compensatory technique or assistive technology device (e.g., a kneel stander with a gluteal strap) to support the child and substitute for his inadequate trunk stability and postural responses. Descriptions of patients' performance will correspond to the frame of reference used. For example, automatic and volitional movement patterns, facilitation, and inhibition; internal and external reinforcement and mastery; and compensation, substitution, and adaptation are concepts associated with the neurodevelopmental, acquisitional, and rehabilitation perspectives, respectively.

**Patient**

**Prior to the initial encounter with the patient, the occupational therapy assessment is further shaped by referral information. Research (Kraus, 1976; Neistadt, 1987) has shown that data received by therapists prior to the initial encounter with the patient can influence the assessment in several ways. First, it can narrow the scope of the assessment. For example, the referral for an older adult with low vision may specify a home management evaluation including safety concerns. Second, the preencounter information can help in the interpretation of ambiguous information. An example of this is the 21-year-old male patient who returns from an extended bathroom break during a work-readiness evaluation and suddenly has difficulty attending to the task and, in addition, starts laughing to himself several times without explanation. Preencounter information of a substance abuse history can assist in the organization and interpretation of these behaviors. Third, referral data can influence the importance placed on information. For example, if the medical chart states, "Rule out petit mal seizure disorder," we are apt to become attuned when we observe the patient staring into space. If this information were not available, we might dismiss the staring behavior as daydreaming or meditating. Fourth, the preencounter information can influence the certainty with which information is accepted. If the referral states that a patient has a history of petit mal seizures, the certainty with which we can interpret behaviors, such as staring, is increased.

Salient referral information that helps a therapist delimit and refine the clinical image involves pathology, severity of illness or condition, age, sex, and reason for referral.

**Pathology.** A primary cue used to guide occupational therapy diagnosis is the medical or psychiatric diagnosis. Pathology establishes certain expectations concerning a patient's overall abilities and disabilities. Scleroderma, stroke, and depression each conjure up unique images of occupational status. The accuracy and richness of the image elicited by the pathologic label depend on the therapist's knowledge of and experience with this and similar diagnoses.

**Severity.** A patient's illness in terms of acuteness or chronicity extends the information given by the medical or psychiatric diagnosis. Terms reflective of status are exacerbation, progressive, regressive, recurrent, and remission. These words modify the clinical image of the patient's occupational status formulated on the basis of the diagnosis. The image of a patient with multiple sclerosis who is in remission is quite different than that of the patient whose condition is exacerbated.

**Age.** Because there are normal age-related changes in body structure and function throughout the life span, the patient's age provides an important delimiter to the clinical image and subsequent configuration of the occupational therapy assessment. One forms a different image of a 5-year-old female patient with traumatic, bilateral, below-elbow amputations than of the patient who is 35 or 75 years old. The image changes because of normal age-related differences in body structure (e.g., bone growth, body size), body function (e.g., dexterity, hormone secretion), and age-associated developmental tasks (e.g., learning to print, preparing the next day's lesson plans, filling out Medicare reimbursement forms).

**Sex.** Sex may interact with occupational status in
several ways. Most tasks are not sex specific. However, because of culture, family tradition, or personal opinion, tasks may be associated with sex. Many men, for example, shy away from doing laundry; many women avoid changing the oil in a car. Occupational roles like combat soldier and homemaker remain tagged for men and women, respectively. However, in recent years, social change has blurred distinctions in occupations previously linked with sex, such as nurse, secretary, flight attendant, airline pilot, and engineer. In terms of the components of occupational performance, men and women generally evoke different images for factors like strength and dexterity. In shaping the clinical image, one has to be sensitive to the cultural connotations assigned to sex as well as to any generational differences in these assignments.

Reason for referral. Regardless of whether patients refer themselves to occupational therapy or are referred by a physician or other health care professional, they come for a reason. The reason for referring a patient for occupational therapy generally frames the clinical image in two ways. First, it indicates the preferred level of assessment in terms of occupational role performance, occupational performance, or the components of occupational performance. Thus, the content of the assessment is focused. Second, the reason for referral indicates the purpose of the referral, namely, to screen for dysfunction, diagnose dysfunction, or monitor change in occupational status. Thus, the extent of the assessment is framed.

Problem Definition

Research on diagnostic reasoning has emanated primarily from three psychological paradigms—information processing, judgment, and decision making (Elstein & Bordage, 1979). An information-processing perspective was selected for elaboration here because it is based on studies of problem solving in actual clinical situations and hence most closely parallels the daily behavior of therapists in action. From the information-processing perspective, the therapist is the data processor. As such, the therapist searches for, collects, organizes, analyzes, and synthesizes data about a patient’s occupational status. The patient and the patient’s living situation provide the data field. Diagnostic reasoning in this paradigm involves four basic processes: cue acquisition, hypothesis generation, cue interpretation, and hypothesis evaluation (Carnvali, Mitchell, Woods, & Tanner, 1984; Elstein & Bordage, 1979).

Cue Acquisition

The first task of the therapist as data processor is to acquire relevant data from the data field. Not all available data are attended to by the therapist. Data that are attended to are called cues. Cues may be obtained from subjective or objective phenomena. Examples of subjective phenomena are the patient’s perceptions of competence in occupational performance and attitudes toward occupational therapy services. Examples of objective phenomena are the patient’s passive range of motion, the patient’s capability to perform activities of daily living, and architectural barriers in the home. Cue acquisition is selective because it is based on how the clinical image is framed and refined by the processes used for problem solving. Accordingly, some areas of the data field are searched thoroughly, others in a cursory fashion, and still others not at all.

Therapists use several strategies for entering the data field. Some therapists begin by asking patients their chief complaint. A therapist may ask, for example, “What activities are you having difficulty doing?” Other therapists begin with the first item on a data collection protocol. For example, a protocol designed for stroke patients may begin with an evaluation of stereognosis in the affected hand or of the extension synergy. Commonly, therapists develop unique routines based on what works best for them.

Once the data field has been entered, strategies for the systematic search of it are activated. These include allowance of one cue to be the stimulus for the next cue search, completion of the items on the data collection protocol in the order in which they are listed on the form, and selective evaluation of tasks regarded as high risks for the patient being evaluated. Within the first few minutes of actually seeing a patient, the therapist’s ideas about the patient’s performance change. The area of the data field to be searched also changes to accommodate the revised clinical image.

The clinical image plays a powerful role in the occupational therapy diagnostic process by dictating the cues that the therapist searches for. The selectivity of cue acquisition is also related to the limited data processing capabilities of the human data processor. Cues obtained from the occupational therapy assessment are held in working memory. A problem arises, however, because the storage capacity of working memory is extremely limited (Elstein & Bordage, 1979). Only 5 to 7 chunks (i.e., particular amounts of information that have specific psychological importance) of data are believed to be stored in working memory at any one time (Simon, 1974). Thus, for example, the number sequence 1–2–6–3–5–8–4–7–9–2 is difficult to recall because the 10 numbers exceed the estimated limit of working memory. This storage limitation of working memory imposes restrictions on the number of cues that can be processed at any one time.

One technique commonly used to circumvent the limited storage capability of working memory is the recording of cues on protocol forms. The human data processor also employs several cognitive strategies for achieving more economical cue storage. For example, the numbers 126–358–4792 are easier to recall than the random number sequence given above because the 10 num-
bers are treated as 3 rather than as 10 information chunks. The format used for telephone numbers is designed to take advantage of chunking. Thus, one way of retaining cues in working memory is to link them into patterns. A therapist, for example, may obtain the following cues through observation: (a) Cue A, the patient is unable to stoop to pick up objects from the floor, and (b) Cue B, when seated, the patient is unable to raise his or her right foot to a foot stool. An additional cue, Cue C, is obtained through testing and indicates that active hip flexion on the right side is limited to 0° to 45°. These three cues might be linked conceptually to suggest that the functional consequences of restricted range of motion at the hip (Cue C) are an inability to stoop (Cue A) and to raise the foot (Cue B). In effect, linking cues into patterns increases the information value of each chunk. A similar objective is accomplished by a related cognitive strategy—hypothesis generation.

**Hypothesis Generation**

Cues indicative of dysfunction, either alone or in clusters, trigger the generation of one or more diagnostic hypotheses. A hypothesis is a tentative explanation of the cause or causes of the observed dysfunction. Hypotheses elicit a representation of the patient’s occupational status. One might hypothesize, for example, that a dressing dysfunction is related to apraxia or decreased range of motion.

The generation of hypotheses early in the diagnostic process is one of the major insights gleaned about diagnosis from information-processing research. Early hypothesis generation implies that hypotheses are being proposed on the basis of extremely limited data. Such cognitive behavior is in contrast with the guideline to refrain from drawing conclusions until cue collection is completed or almost completed (Cutler, 1979). Diagnosticians apparently initiate hypotheses early in the process however, because hypotheses serve several critical energy-conserving data management functions.

One data management function is to direct the continuing search of the data field. Once a hypothesis has been put forward, subsequent cue acquisition aims largely at finding cues to confirm it (Faust, 1986; Koester, 1954; Sober, 1979). The therapist reasons, “If this hypothesis is true, what characteristics of occupational status would I find?” and then sets out to collect this evidence. Newly acquired cues are then organized around the hypotheses. Thus, cue organization is the second function served by hypotheses.

Hypotheses also promote efficient storage of clinical data in working memory by retrieving information from long-term memory. Unlike working memory, the storage capacity of long-term memory is unlimited. The long-term memory of the experienced therapist might be envisioned as a cerebral library consisting of data files. These files contain knowledge obtained from formal occupational therapy education, patient care, and life experience. As clinical experience is accumulated, the cerebral library is arranged for clinical use. Certain cues and hypotheses are associated with certain files. Over time, the files are indexed and an extensive system of cross-referencing develops. Thus, when the appropriate cues are recognized in a clinical situation, the experienced therapist can readily and efficiently locate and retrieve a volume of knowledge applicable to that patient. Strong linkages between cues and knowledge stored in long-term memory probably account for the difficulty therapists experience in articulating their clinical reasoning. As a consequence of the data management strategies used by therapists, specifically, selective cue acquisition, hypothesis generation, cue organization, and retrieval of stored knowledge, data chunks in working memory are enlarged to accommodate more cues, diagnostic hypotheses, and relevant clinical knowledge.

Although early hypotheses are essential for data management, they can introduce errors into the reasoning process (Rogers & Masagatani, 1982). For example, although erroneous, early hypotheses may control the therapist’s thinking. They may also narrow the data search so severely that attention is directed away from relevant cues and toward irrelevant ones (Elstein & Boradge, 1979). Thus, hypotheses should be used cautiously. The incorporation of standardized protocols into the data collection plan partially safeguards against premature narrowing of the data field. Protocols generally control the range of data regarded as relevant by accepted occupational therapy practice. Protocols, therefore, remind therapists to collect data they might not otherwise collect (Elstein, Shulman, & Sprafka, 1978; Rogers, 1983). These data, in turn, may suggest additional hypotheses.

Just as cue acquisition is influenced by the limited storage capacity of working memory, so too is hypothesis generation. Only a small number of hypotheses (approximately four or five) can be considered simultaneously. However, by developing relationships between hypotheses, we have available to us more clinical data for use. One strategy that diagnosticians use to relate hypotheses is to formulate competing explanations for the same phenomenon. For example, the diagnosticians may question whether an elderly, depressed patient with arthritis lacks the skill or the motivation to do a particular activity. This strategy assists in reducing cognitive strain because cues that are incompatible with one hypothesis are often supportive of an alternative one. Hence, the use of competing hypotheses allows the diagnosticians to organize more of the cues acquired.

**Cue Interpretation**

As the data field is searched, a myriad of cues are acquired. Cues are not processed mindlessly. Rather, they are evaluated in terms of their relevance to the hypothe-
eses under consideration. Cues indicative of function or normalcy are grouped into one category and those indicative of dysfunction or abnormality into another. Cues that do not contribute to the emerging picture of occupational status are placed in a third category.

In the clinical situation, the diagnostician often feels pressured to put forth a diagnosis. At the same time, there is the sense that, given more time, more data could be collected, and a better decision could be made. Research suggests some interesting relationships between accuracy of diagnosis, accuracy of cue interpretation, and thoroughness of cue acquisition. Diagnostic accuracy improves as cue interpretation becomes more accurate and cue acquisition becomes more thorough. However, the thoroughness of cue acquisition and the accuracy of cue interpretation are not related (Elstein et al., 1978). Hence, the acquisition of more cues does not necessarily increase the accuracy of cue interpretation. In fact, it may merely increase cognitive strain. The more cues one has, the more one has to interpret. Unless the diagnostician has developed good skills in data management, more cues may result in overload, and a rise in inaccurate cue interpretations may follow.

Hypothesis Evaluation

At some point in the cue acquisition process, the diagnostician stops to review all of the evidence in an attempt to come to a diagnostic conclusion. The evidence supporting each hypothesis is weighed against the evidence rejecting it. For each proposed occupational therapy diagnostic hypothesis, the pros and cons are added up. The hypothesis supported by the preponderance of evidence is chosen as the basis for planning intervention. If the available evidence fails to support one hypothesis over the others, cue acquisition resumes and continues until hypothesis verification is achieved. A major weakness of the weighing technique used in diagnosis is that the human data processor tends to discount the value of evidence that contributes to hypothesis rejection and to overestimate the value of evidence that substantiates hypothesis confirmation (Agnew & Pyke, 1969; Koester, 1954; Sober, 1979).

In formulating diagnostic conclusions, the therapist evaluates the reliability and validity of all cues. Reliability refers to the consistency of the cues. For example, if the same attribute is being measured at more than one level of occupational status, the cues indicative of this attribute should contribute to a consistent image of a patient. If upper extremity strength is evaluated through the lifting of weighted bars from the floor (a component of occupational performance) and the picking up of equally weighted cartons from a dock (occupational performance), the results of these two tests of upper extremity strength should not be contradictory. Any inconsistencies discerned in the data need to be resolved.

Checking the validity of the data involves an evaluation of whether the purpose of data collection has been achieved. Validity may be checked against several standards. A primary criterion is the reason for referral for occupational therapy services. Other criteria include consonance with an occupational therapy theoretic model or frame of reference, a body of knowledge like neuropsychology, or the classic functional implications of the specific pathologic condition.

Clinical Image

The clinical image of a patient becomes sharper and more realistic with the accumulation of accurate and appropriate cues. Hence, it progresses from a theoretical image of the patient's performance to a more perfect likeness of actual performance. Diagnostic reasoning pursues an analysis of deficits with the aim of elucidating the problems to be targeted for occupational therapy intervention. In occupational therapy assessment, however, assets as well as deficits are tracked with the aim of understanding the patient's occupational status. In occupational therapy, an understanding of what patients can do is as critical as an understanding of what they cannot do. The emphasis is on the nature of occupational status, not just on performance deficits. Assets are often used to compensate for deficits. The clinical image then seeks to reflect the patient's occupational status holistically. Diagnostic reasoning as discussed in this article is only one type of clinical reasoning embodied in occupational therapy assessment.

Although the clinical image of a patient's occupational status becomes ever clearer through the occupational therapy assessment, it is still only a likeness, or representation, of a patient's true performance in the environment in which the life tasks are routinely performed. At some point during the occupational therapy assessment, the therapist must decide that a sufficient configuration of appropriate cues has been gathered. The decision occurs when the therapist is able to construct a portrait of the patient's performance, in the form of the occupational therapy diagnosis, that is clear enough to guide intervention. The therapist's clinical image is never a mirror image of the patient. Decision making always takes place under conditions of missing data and uncertainty.

Diagnostic Reasoning in Action

The cognitive operations enabling the progression from problem sensing to problem definition have been specified as cue acquisition, hypothesis generation, cue interpretation, and hypothesis evaluation. These diagnostic concepts will now be applied to occupational therapy practice, as we follow an experienced therapist through the occupational therapy diagnostic reasoning process.
Case Example

Bea is a 56-year-old woman who has been a homemaker for all of her adult years. She lives with her husband, an account executive who travels frequently. About 6 months ago, he noticed that his wife would forget "little things" and seemed to be "absent-minded." She had recently lost 30 pounds and appeared almost emaciated, although she seemed to enjoy eating out, which they tended to do more frequently. Upon his return from a recent business trip, he found Bea in bed; she was unsure of the day or date or of how long he had been gone. He reported to the family physician that his wife may not have eaten during the entire 4 days that he had been away. Bea was subsequently hospitalized in an inpatient psychiatric unit for an evaluation.

As part of the occupational therapy assessment, the therapist assessed home management skills, which included a meal preparation task. Because the patient's husband indicated that the patient was accustomed to fixing frozen food items, a frozen potpie was selected as a test task. A typical interaction between the therapist and the patient follows.

The therapist places the frozen potpie in the middle of a cookie sheet on the counter next to the stove. The therapist asks Bea to read aloud the directions on the package, and then to proceed with preparing the potpie according to the directions. Bea immediately picks up the package and looks at the picture of the potpie that appears on the front of the package. She stares intently at it for more than 2 min and then asks the therapist, "What did you say?"

The therapist then repeats the directions, "Please read aloud the directions printed on the package, and then proceed with preparing the potpie according to the directions." Bea turns the package over twice, squinting as she looks, and then haltingly reads aloud, "Important: Keep solidly frozen until ready to use. If contents become thawed, use immediately. Do not refreeze." She then places the container on the counter and moves toward the stove, surveying the dials. She turns on the right front burner and returns to the package, picks it up, appears to reread the directions, and then turns to the therapist and asks, "Is there anything else I should do?"

The therapist hands the package back to Bea and asks her to read the setting for the oven temperature and points to the words on the box. Bea stares intently, reads aloud "425°," and moves back to the stove, waving her hand about 6 in. above the active burner. She touches each of the dials and then returns to the box, picks it up, and repeats, "425°." The therapist then asks Bea if she has turned on a burner or the oven. Bea rechecks the box and reads aloud, "Set the oven temperature at 425°." She then moves back to the stove and states, "The stove is on, but I don't know what I am supposed to do," and immediately bursts into tears. The therapist then directs Bea to place a trivet on the active burner so that they can have tea. At the same time, the therapist puts the frozen potpie in the freezer, stating, "This can wait until another day. Let's sit down and have a cup of tea while you tell me what you like to do during the day."

The task requirement, verbalized by the therapist, was to "read aloud the directions printed on the package, and then proceed with preparing the potpie according to the directions." The therapist summarizes Bea's task performance as, "Able to read the directions on the food package with continuous prompts. Unable to implement the directions on the package in order to bake a frozen potpie."

Case Analysis

Besides the admitting physician's medical chart notation of "rule out presenile dementia" and the social worker's initial notes from the interview with Bea's husband, several critical cues are available to the therapist based on the initial observation of the meal preparation task (see Table 1). A review of these cues could yield several explanations about why Bea was unable to prepare the frozen potpie. In an attempt to bring meaning to the cues, the therapist conducts a quick review of the long-term memory pathology file labeled presenile dementia, the accompanying explanatory file labeled cognitive components, and the related descriptive file entitled presenting behaviors (all of which are in the therapist's cerebral library). This review enables the therapist to generate an initial hypothesis. The therapist's first hypothesis proposes short-term memory deficit as the reason why Bea was unable to implement the directions on the frozen food package and bake the potpie. The therapist then reviews the cues to identify patterns that match the data stored in the three cerebral files that were retrieved. As shown in Table 2, 6 of the 10 cues were consistent with a short-term memory deficit as described in the three retrieved cerebral files. The therapist decides that Cues 1 and 5 may also fit Hypothesis 1, but that the goodness of fit with short-term memory deficit is not as good as for Cues 2, 3, 4, 6, 7, and 8. On the basis of the therapist's knowledge and experience, Cues 9 and 10 could also fit Hypothesis 1, but competing hypotheses must first be nullified (see Table 3). Competing hypotheses that would be plausible for different configurations of cues might be anxiety (Hypothesis 2), hearing impairment (Hypothesis 3), or visual impairment (Hypothesis 4).

The next step in the diagnostic reasoning process is to interpret the cues in light of the hypotheses generated.

Table 1

<table>
<thead>
<tr>
<th>No.</th>
<th>Critical Cues from the Occupational Therapy Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>When asked to read the directions on the package aloud, Bea reads the directions aloud.</td>
</tr>
<tr>
<td>2</td>
<td>When asked to read the directions on the package aloud, Bea reads the directions aloud.</td>
</tr>
<tr>
<td>3</td>
<td>Therapist gives same directions twice, without eliciting a correct response.</td>
</tr>
<tr>
<td>4</td>
<td>Bea reads warning label on package instead of directions for preparing the frozen food.</td>
</tr>
<tr>
<td>5</td>
<td>Bea turns on right front stove top burner instead of oven.</td>
</tr>
<tr>
<td>6</td>
<td>&quot;Is there anything else I should do?&quot;</td>
</tr>
<tr>
<td>7</td>
<td>Bea reads oven temperature setting aloud 3 times, but does not locate the oven dial or set the temperature.</td>
</tr>
<tr>
<td>8</td>
<td>&quot;The stove is on, but I don't know what I am supposed to do.&quot;</td>
</tr>
<tr>
<td>9</td>
<td>Bea turns the package over twice, squinting as she looks at it.</td>
</tr>
<tr>
<td>10</td>
<td>Bea waves her hand about 6 in. above the active burner.</td>
</tr>
</tbody>
</table>
Table 3
Critical Cues That Could Support Alternate Hypotheses

<table>
<thead>
<tr>
<th>Cue No.</th>
<th>Critical Cues</th>
<th>Interpretation of Cues for Alternate Hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>When asked to read the directions on the package aloud, Bea stares at the package for more than 2 min without responding.</td>
<td>Bea’s anxiety about the assessment causes her to read and re-read the label to herself three times before she is willing to read it aloud.</td>
</tr>
<tr>
<td>2</td>
<td>“What did you say?”</td>
<td>Bea didn’t hear what the therapist said; Bea wasn’t attending.</td>
</tr>
<tr>
<td>5</td>
<td>Bea turns on right front stove-top burner instead of oven.</td>
<td>Bea was anxious and reached to the spot corresponding to her own knob at home.</td>
</tr>
<tr>
<td>9</td>
<td>Bea turns the package over twice, squinting as she looks at it.</td>
<td>Bea has a visual impairment; she forgot her glasses; her medications affect her vision.</td>
</tr>
<tr>
<td>10</td>
<td>She waves her hand about 6 in. above the active burner.</td>
<td>Bea cannot read the small print on the dial, and is trying to determine what she has turned on.</td>
</tr>
</tbody>
</table>

An example of how each of the cues considered relevant to Hypothesis 1 could be interpreted consistent with Hypothesis 1 is shown in Table 2. One must also determine if the cues can be interpreted in more than one way, thereby supporting more than one hypothesis. For example, Cue 5 can be interpreted to support Hypothesis 1, but it could also support Hypothesis 2 along with Cue 1. Cue 2 supports Hypothesis 1 but could also be interpreted to support Hypothesis 3. Likewise, it is plausible to interpret Cues 9 and 10 in support of Hypothesis 1, but not unless Hypothesis 4 has been ruled out.

Hypothesis evaluation follows cue interpretation. Although at least three alternative hypotheses (2, 3, and 4) were generated for the critical cues gathered during the meal preparation, after weighing the evidence, the therapist decides to proceed based on Hypothesis 1. The reliability of Hypothesis 1 is confirmed because the cues are consistent and reiterated for many behaviors (e.g., Cue 2 = Cue 3; Cue 6 = Cue 8). One can confirm the validity of Hypothesis 1 by comparing it to several standards, including the attending physician’s medical chart notation of “rule out presenile dementia”; the behaviors reported by the husband; the psychologist’s notes in the medical chart citing deficits in abstract thinking, judgment, and mild apraxia; and the criteria for presenile dementia listed in the DSM-III-R (American Psychiatric Association, 1987).

Occupational Therapy Diagnosis as Product

The occupational therapy diagnosis is a summary of the therapist’s diagnostic reasoning. Generally, the occupational therapy diagnosis consists of four structural components: descriptive, explanatory, cue, and pathologic. The first component describes the deficit in occupational status (e.g., “Unable to implement the directions on the package in order to bake a frozen potpie”). This component reflects a problem in task performance.

The second part of the occupational therapy diagnosis is the explanatory component. This indicates the therapist’s hypothesis about the probable cause of the deficit. The therapist might reason, for example, that short-term memory deficit accounts for the problem in meal preparation. More than one explanation may be given for the task dysfunction. In Bea’s case, for example, anxiety, hearing impairment, low vision, or impaired visual acuity might be plausible alternative explanations. The explanatory component is a critical feature of the functional diagnosis because intervention strategies vary according to presumed explanatory factors.

The third component of the occupational therapy diagnosis identified the cues (i.e., signs and symptoms) that led the therapist to conclude that there was a functional deficit and to hypothesize about the nature of the deficit. Cues gathered during a meal preparation task indicative of short-term memory deficit might include, “Reads warning label on package instead of directions for preparing frozen food” and “Reads oven temperature setting aloud three times, but does not locate the oven dial or set the temperature.”

The fourth component of the functional diagnosis identifies the pathologic agent causing the deficit. The influence of the pathologic component on function is more indirect than that of the explanatory component. It provides intervention parameters based on the course of the pathology, prognosis, and contraindications and guidelines for occupational performance. If, for example, short-term memory deficit was a consequence of depression rather than of head trauma or presenile dementia, then problem resolution would differ.
Summary and Conclusion

The occupational therapy process involves the sensing, defining, and resolving of problems in occupational status as well as the sensing and defining of assets. Diagnostic reasoning is the component of clinical reasoning that results in the occupational therapy diagnosis. From an information-processing perspective, diagnostic reasoning proceeds from cue acquisition to hypothesis generation to cue interpretation to hypothesis evaluation. The end product, the occupational therapy diagnosis, summarizes the therapist’s perceptions of the patient’s occupational deficits. Ideally, the occupational therapy diagnosis names the problem, provides an explanation for its advent, specifies the cues indicative of the problem, and names the pathologic agent. Through assessment, the therapist also creates a clinical image of the patient, which embodies the patient’s assets and deficits and, along with the occupational therapy diagnosis, provides the foundation for resolving problems in occupational status and capitalizing on assets.

The view of clinical reasoning presented in this article is drawn largely from studies of clinicians who are not occupational therapists. The validity of this approach rests on the generic nature of the diagnostic process. The cognitive processes underlying clinical diagnosis are not unique to a profession. They become unique only when they are applied to discipline-specific concepts, such as occupational role performance, occupational performance, and components of occupational performance. As occupational therapy practice develops and becomes more independent, and with direct access to occupational therapy services as opposed to referral to occupational therapy services or prescription of occupational therapy services, the need for one to assume greater responsibility for clinical decisions increases.

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References