Clinical Reasoning Process for Service Provision in the Public School

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Key Words: decision making • delivery of health care • pediatrics

This paper outlines the clinical reasoning process used to guide decisions on the provision of occupational therapy services in the Wake County Public School System in North Carolina. The process is based on a theoretical framework derived from occupational therapy theory and public law. Benefits of using the clinical reasoning process include (a) increased consistency of decision making among therapists; (b) increased appropriateness of decisions regarding whether a student needs educationally based occupational therapy services; (c) type of occupational therapy service would meet the student's need; and how often this service should be provided; and (d) improved ability of therapists to articulate to all those involved with a student the reasoning behind decisions to provide educationally based occupational therapy services. The schematic diagrams that depict this process provide a useful tool for therapists with varied work experiences entering school-based practice.

The practice of occupational therapy in the public school setting presents a number of unique challenges, including the establishment of a standard to determine which students need services and which type of service is most appropriate. Although the American Occupational Therapy Association (AOTA) provides guidelines for service decisions based on an interpretation of the Education for All Handicapped Children Act of 1975 (Public Law 94-142), therapists must "rely on their own understanding of these written interpretations and on their professional judgement to determine whether a student needs occupational therapy" (Carr, 1989, p. 503). Particular states can also expand the services mandated by the federal law. Carr (1989) presented criteria used in Louisiana to give therapists "standards by which to make clear-cut decisions" (p. 506). Although Carr (1989) reported numerous benefits from using the Louisiana criteria, other therapists claimed that the criteria discriminated against students with severe disabilities (Giangreco, 1990; Rainforth, 1990; Spencer, 1990). In our experience, therapists in public school systems still disagree on how to make decisions about service provision.

In struggling to develop justifiable, objective, and ethical eligibility criteria, occupational therapists in North Carolina's Wake County Public School System (WCPSS) realized that they had to focus on clearly articulating the clinical reasoning process used to make decisions about service provision. The purpose of articulating this process was to make the most appropriate decision about service provision for a particular student regardless of the pressures of practical considerations such as staff availability and district resources. Before any reasonable eligibility criteria can be effectively developed, the clinical reasoning process employed to make decisions must be examined, articulated, and agreed on. Decisions about occupational therapy treatment and service provision are the outcome of the clinical reasoning process (Rogers, 1983).

Since 1986, AOTA and the American Occupational Therapy Foundation (AOTF) have funded research to study clinical reasoning in occupational therapy (Gillette & Mattingly, 1987). This research, known as the Clinical Reasoning Study, was initiated to examine the reasons behind occupational therapy clinical decisions and thus to facilitate training of occupational therapy students in clinical reasoning. An initial impetus for this ongoing research was the realization that fieldwork clinicians teach more by action and frequently have difficulty articulating the reasoning behind these actions (Salz, 1991). Rogers and Masagutan (1982) reached the same conclusion about the 10 therapists in their descriptive study of the clinical reasoning process in occupational therapy. As Rogers (1983) pointed out, clinical judgments or decisions are not made on the basis of one or two test scores or an isolated observation, but are determined through the complex process of clinical reasoning.

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This article was accepted for publication May 1, 1992.
Clinical Reasoning

The clinical reasoning process is the problem-solving strategy used under conditions of uncertainty. The uncertainty can arise from an ill-defined problem that requires more information than is available at the outset to reach a solution. The nature of the problem changes over time as information defined by the practitioner's underlying philosophy and frame of reference is gathered. Rogers (1982) perceived functional independence, which is achieved through an interaction of personal and environmental factors, to be the philosophy that drives occupational therapy practice.

For occupational therapists in the schools, an ill-defined problem often faced is poor handwriting. To clarify the problem and to determine an intervention strategy, the therapist must investigate the student’s skills and environmental expectations and the interaction between these variables. The investigation or information collection process is structured and organized by multiple hypotheses beginning with broad, nonspecific hypotheses that are refined, supported, or not supported as information is gathered (Barrows & Feltovich, 1987). Barrows and Feltovich (1987) stated that “reasoning guided by multiple hypotheses is the appropriate and effective way to approach the resolution of poorly understood situations that require resolution” (p. 90). Some hypotheses related to poor handwriting are as follows: (a) student has inadequate visual-motor skills to meet classroom expectations, (b) environmental expectations are not appropriate for this student’s developmental level, or (c) poor handwriting is due to poor tactile and kinesthetic processing. Through the clinical reasoning process, therapists construct a picture of the student within the educational environment that decreases enough of the uncertainty surrounding the problem to enable them to formulate “prudent decisions” (Rogers, 1983, p. 614).

Methods to enhance the efficacy of the clinical reasoning process have been offered in the literature (Barrows & Feltovich, 1987; Mattingly & Gillette, 1991; Rogers, 1983; Rogers & Masagatani, 1982). One of these methods is a fixed or routinized approach to data collection to prevent a premature end to information gathering. The medical review of systems used by physicians is an example of a routinized approach (Barrows & Feltovich, 1987). The use of the Occupational Therapy Uniform Evaluation Checklist as recommended by Rogers (1983) and the Uniform Terminology Grid presented by Dunn and McGourty (1989) are examples specific to occupational therapy. Another strategy is to continually reassess all information collected in light of each additional piece of information so that data are not forced to fit a preset idea. Pelland’s (1987) Conceptual Model of Treatment Planning reflected this need for continual adjustment. A third strategy suggested in the literature is the use of peer and professional consultation (Rogers, 1983).

By sharing information and eliciting possible competing hypotheses, therapists can formulate a clearer and more complete picture of the problem. Mattingly and Gillette (1991) reported that the therapists involved in the clinical reasoning study found group viewing sessions that generated various interpretations of the same information beneficial to problem solving. These three methods were advocated to ensure that the outcome of the reasoning process, a clinical judgment, would be the most appropriate decision for the specific problem addressed.

Although the results of the clinical reasoning process (a particular treatment recommendation) are not generalizable, the process itself can be generalized and taught. At Wake County Public School System, through open discussion of each occupational therapist’s clinical reasoning, the therapists developed a schematic guide to provide structure for the clinical reasoning process used to make treatment and service determinations within the educational environment.

Frame of Reference

The nature and scope of questions posed during the data collection phase of the clinical reasoning process are defined by the underlying philosophy and frames of reference. The philosophy driving the clinical reasoning process presented is reflected in the Uniform Terminology for Occupational Therapy—Second Edition (AOTA, 1989b). Occupational therapy practice is defined in terms of occupational performance areas and occupational performance components. Occupational performance areas were activities of daily living, work activities, and play and leisure activities. Performance components are those abilities required for occupational performance and include sensorimotor, cognitive, and psychosocial and psychological components (AOTA, 1989b). Frames of reference consistent with the philosophy supporting the clinical reasoning guide include the occupational behavior model (Reilly, 1969) and the Model of Human Occupation (Kielhofner & Burke, 1980). The occupational behavior model describes children as “individuals who occupy particular life roles in their families, school and communities” (Takara, 1980, p. 11). Occupational therapy clients in the school system are therefore not observed solely in terms of their disability, but as persons who are experiencing difficulty with their life roles, primarily with the student role. This view involves the total child as he or she functions within the context of the school environment. The view that students cannot be observed in isolation from their school environment comes from the Model of Human Occupation, in which human beings are open systems that interact with their environments (Kielhofner & Burke, 1980). Occupational therapy in the public school works to establish or reestablish an occupational role for identified students within the school environ-
ment that includes work, play, self-care, and the underlying performance components.

Several assumptions underlie the clinical reasoning process used by occupational therapists in the Wake County Public School System. One of those assumptions is that occupational therapy services provided in the school environment differ from occupational therapy services provided in a clinical or medical setting. The medical model identifies dysfunction or disease and develops strategies to increase function or decrease dysfunction (Stephens, 1989). The underlying cause of the dysfunction is the focus of treatment (Ottenbacher, 1982). The educational model begins with a nondysfunctional person who is expected to gain skills and knowledge (Stephens, 1989). The cause of dysfunction is not of direct concern to educators (Ottenbacher, 1982). School-based occupational therapists are concerned with dysfunction and disease only in the context of their effect on the student's capacity to meet educational goals.

Another assumption is that occupational therapy differs philosophically from special education. Occupational therapy uses a developmental approach targeting sensorimotor development "within the context of the overall maturation of the central nervous system" (Rowen & Marsh, 1988, p. 714). Education tends to be more oriented toward skills acquisition with the emphasis on content, not on the underlying causes and processes. Occupational therapists working within the school system "must be able to explain how the occupational therapy services they recommend for a particular child are consistent with the intent of EHA" (Coutinho & Hunter, 1988, p. 711). Using an articulated clinical reasoning process, these therapists should be able to explain that educationally related occupational therapy services are not clinical services placed in a school building. It would then be clearer that "a student may need occupational therapy in the clinical setting (medical model), but would not be eligible for services in the educational setting" (Stephens, 1989, p. 597) if the dysfunction does not directly affect educational progress.

The mandates of Public Law 94–142 form another set of assumptions that guides this clinical reasoning process. Those mandates state that the term "related services" means transportation and such developmental, corrective, and other supportive services as are required to assist a child to benefit from special education, and includes occupational therapy (Reg. 300.13, p. 102–53). The definition of "special education" is a particularly important one under these regulations, "a child is not handicapped unless he or she needs special education. Therefore, if a child does not need special education, there can be no related services, and the child (because not 'handicapped') is not covered under the Act." (Comment 1 following Reg. 300.14, p. 102–54)

Public Law 94–142 has been amended and retitled Individuals With Disabilities Education Act (Public Law 101–476). All students are eligible for occupational therapy as a related service if they are identified as being in need of special education. This identification as needing special education does not mean that the student needs occupational therapy to function independently in the educational environment. Occupational therapy as a related service is provided only in cases when the student is not able to benefit from special education already provided for his or her specific educational disability. Occupational therapy as a related service "includes (1) Improving, developing or restoring functions impaired or lost through illness, injury, or deprivation; (2) Improving ability to perform tasks for independent functioning when functions are impaired or lost; and (3) Preventing through early intervention initial or further impairment of loss of function" (Gilfoyle & Farace, 1981, p. 811).

Public Law 94–142 describes educational environments as existing on a continuum from least restrictive (i.e., regular education classroom with consultative services) to most restrictive (i.e., residential placement) and mandates that students be served in the least restrictive environment. Occupational therapy services must be provided in a manner consistent with this mandate. Using three types of service (direct, monitoring, and consultation) and adjusting the frequency of service allows occupational therapy services to be provided along a continuum to best meet the student's educational needs.

The need to define educationally relevant occupational therapy services and methods of providing these services is critical to the practice of school-based occupational therapy. In this paper we present nor eligibility criteria but the reasoning process behind these service provision decisions. The term eligibility itself is misleading because, as explained above, any student identified as a special education student is eligible for occupational therapy as a related service. The issues are whether a student needs occupational therapy to function effectively in the school environment and what type of service best meets that student's needs. The phrase type of, as opposed to level of, service shifts the focus away from an implied differential value placed on direct, monitoring, and consultation services.

A Schematic Guide for the Clinical Reasoning Process

**Determination of the Need for Service**

According to Mattingly (1991), clinical reasoning in occupational therapy results in action. "It involves deliberation about what an appropriate action is in this particular case, with this particular patient, at this particular time" (Mattingly, 1991, p. 981). Determining a particular student's need for occupational therapy service is a complex, non-linear process in which many factors are considered. Rogers and Holm (1991) stated that "diagnostic reasoning is the component of clinical reasoning that results in the occupational therapy diagnosis" (p. 1053). Through this
reasoning the problem is defined, an explanation of the problem is provided, and signs and symptoms indicative of the problem are outlined.

Stage 1: Referral. The initial contact or referral may be initiated by parents or school personnel as per state guidelines. As mandated by Public Law 94–142, a child must be identified as having a disability requiring special education to be eligible for special programs and thereby to receive occupational therapy as a related service. Should the child not be identified as a special education student, the referral process ends with possible programmatic consultation or referral for private occupational therapy evaluation and services (see Figure 1).

Programmatic consultation, also referred to as colleague consultation, "addresses the needs of other professionals in the educational environment" (AOTA, 1989a, p. 20) to increase the skills and knowledge of other professionals. If the student is in the process of being identified or is already identified as a special programs student, the referral continues to the next stage.

Stage 2: Screening. Screening is an informal assessment of a student’s functioning based on observation, record review, and teacher and parent interviews. As defined by AOTA, this is a Type II screening (AOTA, 1989a). At this stage, three questions of equal importance are posed (see Figure 2). The first question is whether the referring problem seems to affect school performance. The teacher may be asked to fill out a functional performance questionnaire that was developed by occupational therapists in the Wake County Public School System to assess the student’s performance in the classroom in areas related to occupational therapy practice. This allows for a systematic review of students’ performance as previously discussed to enhance the efficacy of the clinical reasoning process.

The second question is whether the referring problem seems to be within the area of occupational therapy practice. Occupational therapists in the Wake County Public School System address visual motor, fine motor, gross motor, sensory processing, sensory perception, and neuromuscular components of the performance areas of school and work, play and leisure, and daily living skills as appropriate for that student’s functioning within the school environment. Usually the referring problem is affecting school performance; however, a child may be experiencing a clinical problem but be able to function in the classroom. For example, a child with cerebral palsy may benefit from clinical intervention to enhance the
quality of his or her movement but may be functioning effectively in the school environment.

The third question addresses the issue of developmental problems. A problem is considered developmental if the student's assessed abilities in the three performance areas are commensurate with the student's cognitive functioning and the student is following a typical and predictable developmental sequence of skill acquisition. This situation allows for the continuation of the information collection and referral process for the student with multiple disabilities who may exhibit fine motor skills commensurate with mental ability, but whose skill acquisition cannot follow a typical developmental sequence. For example, a student with cerebral palsy who is functioning in the profound range of mental retardation in cognitive, language, and fine motor areas may continue to benefit from occupational therapy intervention to develop fine motor or oral motor skills needed to meet the demands of the educational curriculum. If the information gathered in the screening stage is considered adequate to answer all three questions, then a decision can be made to end the referral process or to continue to Stage 3, full evaluation. If more information is needed to answer any of the questions, Stage 3 is necessary.

Stage 3: Evaluation. Evaluation continues the process of collecting information with a variety of testing tools, including criteria-referenced nonstandardized and standardized tests, clinical observations of neuromuscular and sensory functioning based on Ayres's (1976) clinical observations, and observations of functional skills (see Figure 3).

Stage 4: Outcome. The outcome is a judgment reached through the synthesis of all the information collected during the first three stages. The presence or absence of a discrepancy between tested skills and cognitive ability and the presence or absence of clinical issues determine whether the referring problem falls within the scope of occupational therapy practice. In a medical setting, the diagnosis is used as a prognosticator for current and future functioning. In an educational setting, IQ or mental age as determined by psychological testing is used to predict a student's potential for academic and vocational success and his or her rate of learning. To attempt to habilitate a child's fine motor or visual-perceptual skills beyond his or her ability to comprehend and conceptualize may be nonproductive and misleading because success in higher academic and skilled tasks depends heavily on cognitive skills such as symbolic reasoning, discrimination, analysis, memory, and the ability to make references (see Figure 4).

In the Wake County Public School System, the therapists have decided to use a psychometric approach in determining significant deviation. A significant discrepancy is thought to exist when a student scores lower than one standard deviation below his or her measured IQ or more than 12 months below his or her mental age on standardized testing tools measuring gross motor, fine motor, visual perception, perceptual motor, and sensory integrative functioning. Need for occupational therapy is determined when any area of occupational performance is significantly discrepant from a student's IQ and thereby prevents the student from accessing his or her

![Figure 4. Fourth stage of the determination of the need for occupational therapy. Note. OT = occupational therapy; IEP = individualized education program.](http://ajot.aota.org/pdfaccess.ashx?url=/data/journals/ajot/930260/ on 11/28/2018 Terms of Use: http://AOTA.org/terms)
education. The presence of clinical issues is determined by a cluster of behaviors or soft signs of neurological dysfunction, not by a single or isolated observation. For example, a child with Down syndrome who shows global delays in all areas tested and has skills commensurate with cognitive functioning may be unable to meet the fine motor demands of the classroom because his or her muscle tone is severely hypotonic, which interferes with the ability to develop fine motor skills in a normal and predictable sequence. This child would benefit from occupational therapy service to address the underlying neuromuscular dysfunction that is affecting classroom performance and contributing to abnormal developmental patterns. If no discrepancy exists and there are no clinical issues, the problem is not considered to be within the scope of occupational therapy practice and the student would not require occupational therapy as a related service. If there is a discrepancy or clinical issues and if the problems identified are affecting school performance, the student needs occupational therapy as a related service.

Determination of Type of Service

Once it has been determined that the student needs occupational therapy to function in the classroom, the type of service to meet the student's needs must be chosen (see Figure 5). As advocated by AOTA (1989a), the occupational therapy department of the Wake County Public School System is committed to offering a multiservice approach to occupational therapy service provision, including direct service, monitoring, and consultation. Direct service uses therapeutic techniques to remediate problems identified through the evaluation process and is carried out at least once weekly by an occupational therapist or certified occupational therapy assistant (AOTA, 1989a). Monitoring involves “teaching and direct supervision of other professionals or paraprofessionals who are involved with the implementation of intervention procedures” (AOTA, 1989a, p. 19), whereby the occupational therapist sets up the program but someone else carries it out. Case consultation is used “to develop the most effective educational environment for children with special needs” (AOTA, 1989a, p. 20). Research on the efficacy of different service types is very limited. When Dunn (1990) compared consultation and direct service in a pilot study, her results indicated that consultation services were as effective as direct services in meeting the student's educational goals when the same amount of time was spent in consultation as in direct treatment.

If the individualized education program (IEP) goals

![Figure 5](http://ajot.aota.org/pdfaccess.ashx?url=/data/journals/ajot/930260/)

Figure 5. Determination of type of occupational therapy service needed. Note. OT = occupational therapy; IEP = individualized education program.
require use of purposeful activities and other therapeutic techniques and there is no one else who can carry out the program safely, direct service is indicated. If purposeful activities and other therapeutic techniques are not required to meet the IEP goals, but the student needs skills training (i.e., a specific handwriting program) that is not part of the classroom's regular curriculum and someone other than the occupational therapist is available to safely and consistently carry out the skills training program, then monitoring is indicated. If no one is available to safely and consistently carry out the program, then direct service is again the most appropriate. If the IEP goals require skills training that is part of the curriculum but some adaptations are needed, then case consultation would be indicated. Additionally, if compensation strategies, changes in environmental expectations, or adaptive equipment is the only intervention required to meet the IEP goals, then case consultation would be indicated. Although the primary factor in determining service type is the treatment strategy employed, there is always an ebb and flow between service types with continual review of progress toward meeting the student's IEP goals. This allows for flexibility in adjusting service type as the student improves or as more intensive intervention is needed. The ultimate goal is for the student to gain functional independence and graduate from occupational therapy services.

**Determination of Frequency of Service**

The questions used to determine frequency for each service type are presented in Figures 6–8. As with type of service, research on the efficacy of frequency of service is limited. Jenkins et al. (1982) compared two levels of frequency of direct service: once a week versus more than once a week. Results showed a significant difference in outcomes only when the two experimental groups were compared with the control group, which received no direct service. No significant difference was found between the two experimental groups; therefore, the results of this study indicate that the only important factor was whether the child received direct services, not the frequency of the service.

Determination of the frequency of direct service depends partially on the number of IEP goal areas addressed by the occupational therapist (see Figure 6). A large number of goal areas may require more frequent or longer sessions. Traditionally, direct treatment is provided within 30-min sessions. If a child has difficulty making the transition to direct occupational therapy service, a longer treatment session may be more advantageous than an increase in the frequency of sessions. Alternatively, a student may not be able to tolerate longer treatment sessions because of attention deficits and therefore would need two shorter sessions. If the number of IEP goals requires at least one 30-min session, but an increase in frequency of services to twice weekly will expedite progress toward meeting those goals, then two weekly sessions would be indicated. For example, a student may be in an emotional crisis because he or she cannot keep up with the written demands of the classroom, so the occupational therapist may see the student twice weekly to provide more intensive intervention toward developing a functional means of written communication. Another example would be a child who is on the verge of developing a critical skill and requires a little extra push for the emerging skill to become functional.

Determination of the frequency of monitoring service depends on the student's expected rate of progress in meeting the IEP goals (see Figure 7). Expected rate of progress is related to the difficulty of the skill being taught and the child's ability and motivation to acquire the skill. These elements determine how much and how often the occupational therapist needs to reevaluate the program.

Determination of the frequency of consultation service depends on the particular environmental (human and nonhuman) adaptations needed to meet the IEP goals, the education staff's skill in implementing these adaptations, and the student's ability to use these modifications to be functionally independent (see Figure 8). Adaptations to the human environment may include altering the education staff's expectations of the student or frequency of the student.
working with the education staff on developing and implementing strategies to allow the student to be functionally independent. Adaptations to the nonhuman environment may include providing adaptive equipment including typewriters, laptop computers, and feeding equipment; recommending the use of study carrels, breaks in schedule, or a specific type of paper or writing instrument; or adapting the format of tests and work sheets.

Discussion and Implications

The decision-making process presented reflects an initial attempt by the occupational therapists of the Wake County Public School System to look at how they think about service provision decisions. The process is not a criterion of eligibility for service determination, but an attempt to develop a consistent and justifiable approach to making decisions regarding occupational therapy service provision. As public funding becomes less available, occupational therapists are being further pressed to define and justify occupational therapy services. With the expansion of services to the 3- to 5-year-old population mandated in the Education of the Handicapped Act Amendments of 1986 (Public Law 99-457), occupational therapists must present a clear picture to administrators and parents as to what occupational therapy can realistically do for children in the educational setting (Roveen & Marsh, 1988). The use of specific criteria, such as the 12-month discrepancy between mental age and skills tested by occupational therapists, may not be a sensitive enough guideline for preschoolers, but the clinical reasoning process used for service determination will be the same for preschool and school-age children. The questions will always return to the child’s ability to function in the educational environment.

Many practical factors can influence a therapist’s decision of whether to place a student on the caseload. However, allowing services to be determined by staffing, schedules, and space can lead to provision of token services, long waiting lists, angry parents, and dissatisfied administrators (King, 1988). Parents who have had to cope with the stress of having a child with special needs and who have had to fight for services may push for more services than needed, because they believe that more services will mean greater progress toward a nondysfunctional child (Huebner, 1990). Dunn (1988) pointed out that “the intent of Public Law 94–142 is that the type and amount of service provision may not be determined by parental wishes or district resource limitations such as space or personnel shortages, but by the student’s needs” (p. 718).
Following an articulated clinical reasoning process will increase consistency in decision making among staff therapists and among a particular therapist’s cases. Reaching occupational therapy service decisions through a clinical reasoning process enables the therapist to explain these decisions to parents, teachers, area therapists, and outside agencies. Another reason to develop a clearly articulated clinical reasoning process related to school-based services is its value as a training tool for newly graduated therapists and for those entering school-based practice from other practice areas.

The assumptions underlying this clinical reasoning process need further research to determine efficacy and validity. Some assumptions that need further testing include the following: (a) Does the use of an articulated clinical reasoning process increase consistency of decision making among staff? (b) Is use of discrepancy criteria a valid measure for determining the need for occupational therapy services? (c) Is the multiservice provision approach a valid means of providing occupational therapy service in the public schools?

The use of an articulated clinical reasoning process enables occupational therapists working in public schools to define their role as providers of a related service separate from other disciplines. Implementing this process ensures the development of educationally relevant, not clinically based, occupational therapy goals on the IEP. As teachers, parents, and administrators are better able to see a direct link between occupational therapy services and educational progress, the value of all types (direct, monitoring, and consultation) of occupational therapy service provision in the school system will increase.

Acknowledgments

This paper was made possible through the collaborative efforts of the occupational therapists of the Wake County Public School System; the guidance and support of Ai Li Lee, MS, OTR, Ruth Humphrey, MS, OTR, and Jane Rourk, OTR, FAOTA; and the support of Juanita Van Liere.

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