

■ The ICIDH-2: Theoretical and Clinical Implications for Speech-Language Pathology

■ La CIH-2 : Incidences théoriques et cliniques pour l'orthophonie

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Abstract

The International Classification of Impairments, Disabilities, and Handicaps (ICIDH)¹ was proposed by the World Health Organization (WHO) in 1980 as a tool for classification of the consequences of disease and the effects of those consequences on the lives of individuals. Recently, an updated draft entitled the *International Classification of Functioning, Disability, and Health* (World Health Organization, 2001), was proposed in an effort to explain some of the deficiencies associated with the original document. Widespread implications for the use of the ICIDH-2 include: (a) establishing a common language across rehabilitation disciplines, (b) formulating a generic coding of health information, (c) promoting a scientific base for understanding the functional states associated with health conditions, and (d) allowing the comparison of data across countries. Because of the international importance of the ICIDH-2 to the future state of health care, it is vital that speech-language pathologists understand its basis and direct application. This will become especially relevant if, as planned, third-party payers and governmental agencies use this classification system to evaluate the therapeutic services offered to people with disabilities. The purpose of this treatise is three-fold: firstly, to summarize and examine the ICIDH-2, including the theoretical model upon which it is based; secondly, to specifically apply the ICIDH-2 to the field of speech-language pathology, as well as to demonstrate how discipline-specific measures can be applied to the model; and thirdly, to ensure a comprehensive view of communicative functioning by examining implications for both research and clinical practice.

Abrégé

En 1980, l'Organisation mondiale de la santé a proposé la Classification internationale des handicaps: déficiences, incapacités et désavantages (CIH) comme moyen de classer les conséquences d'une maladie ainsi que les effets de ces conséquences sur la vie des gens. Récemment, une ébauche mise à jour intitulée Classification internationale du fonctionnement, du handicap et de la santé (CIH-2, ébauche finale, 2001) a été proposée pour expliquer certaines lacunes contenues dans le document original. Parmi les incidences de grande envergure qui découleront de l'utilisation de la CIH-2, on compte : a) l'établissement d'un langage commun entre les disciplines de réadaptation, b) la formulation d'un code générique pour l'information sur la santé, c) la promotion d'un fondement scientifique pour comprendre les états de fonctionnement associés aux états de santé, et d) la possibilité de comparer des données entre pays. Compte tenu de l'importance de la CIH-2 à l'échelle internationale pour l'état futur des soins de santé, il est crucial que les orthophonistes en comprennent les fondements et les incidences directes. Cela revêtira une importance toute particulière si, comme il est prévu, les tiers payants et les organismes gouvernementaux utilisent ce système de classification pour évaluer les services thérapeutiques offerts aux gens atteints d'une incapacité. Le présent article vise trois buts : d'abord, résumer et examiner la CIH-2, y compris le modèle théorique sur lequel elle est fondée; ensuite, utiliser expressément la CIH-2 dans le secteur de l'orthophonie et montrer comment des mesures propres à une discipline peuvent être utilisées pour ce modèle; enfin, tracer un portrait détaillé du fonctionnement de la communication en examinant les répercussions tant pour la recherche que pour la pratique clinique

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In an era of fiscal constraint and competition for health care and education dollars, it is imperative to prove the value of all (re)habilitation disciplines, including speech-language pathology, in both academic and clinical settings. Speech-language pathology (re)habilitation refers to services provided to all individuals with phonology, language, voice, resonance, fluency, and/or swallowing disorders. As research funding is implemented by the newly formed Canadian Institutes of Health Research (CIHR), and as the government, public, and industry demand measurement to ensure efficient health services, it is necessary that service providers develop systems to measure clinical outcomes and costs associated with service delivery. Moreover, it is essential that a common language for researchers and clinicians is established. A unified language will allow data to be compared within and across the interdisciplinary teams who serve clients with health-

related conditions, including those individuals with communication disorders.

The focus of the Tri-Joint Congress held in May 2000 in Toronto, Ontario was to promote a better understanding among (re)habilitation disciplines. Instead of holding individual conferences for each professional association (Canadian Association of Occupational Therapists [CAOT], Canadian Physiotherapy Association [CPA], and the Canadian Association of Speech-Language Pathologists and Audiologists [CASLPA]), the Tri-Joint Congress sought to integrate information pertinent to (re)habilitation in general, as well as to each specific discipline. For example, Janice Miller and colleagues (Canadian Institute for Health Information; Miller, 2000; Miller, Stewart, & Garcia, 2000) presented information pertaining to the World Health Organization's (WHO) International Classification of Functioning and Disability (World Health Organization, 1999). Miller and her colleagues explained the WHO's concept of functioning, disability and health, and the implications for each of the disciplines (occupational therapy, physical therapy, speech-language pathology, and audiology). By doing so, the conference provided a forum to increase understanding among the

Table 1
Current definitions of dimensions of the ICDH-2 final version (WHO, 2001, p.8)

Dimension	Definition
Body Functions	Physiological functions of body systems (including psychological functions)
Body Structures	Anatomic parts of the body such as organs, limbs, and their components
Impairments	Problems in body functions and/or body structures such as significant deviation or loss
Activity	An individual's execution of a task or action
Activity Limitation	A difficulty experienced by an individual in executing an activity (Previously called "Disability", ICIDH, 1980)
Participation	Involvement in a life situation
Participation Restriction	A problem experienced by an individual in life situations (Previously called "Handicap", ICIDH, 1980)
Environmental factors	Composed of the physical, social and attitudinal environment in which people live and conduct their lives

(re)habilitation disciplines, and to clarify terminology and issues commonly experienced by (re)habilitation professionals. The WHO terminology clearly provided this integrated model.

The ICDH-2: Origins and Development

The WHO created the International Classification of Impairments, Disabilities, and Handicaps (World Health Organization; 1980) to provide a tool for the classification of the consequences of disease and the effects of those consequences on the lives of individuals. Since its inception, the ICDH has been the target of a growing amount of professional attention and criticism (cf. Bickenbach, 1993; Bickenbach, Chetterji, Badley, & Ustun, 1999). Most of this criticism focused on the terminology of the ICDH, as well as the conceptual model upon which it was based (i.e., a biomedical model). Recently, the WHO proposed an alternative to the biomedical model in order to address growing concerns among the younger generation that "health needs are not being met and that biomedical research is not having a sufficient impact in human terms" (Engel, 1981, p. 601). The basis of the WHO's classification system is a "biopsychosocial" model that not only takes into account biological factors contributing to health, but also psychological and social factors. This model is the basis of a newly drafted International Classification of Functioning, Disability and Health (World Health Organization, 2001), the classification system used by the WHO to describe an individual's health and health-related states. The ICDH-2 provides a unified language and framework for the description of health and health-related states at the level of body function and structures, individual activities, and societal participation. Terms from the ICDH-2 final draft are defined in Table 1.

All levels of functioning and disability including body structures and functions, activities, and participation can be related to the functioning of an individual associated with specific areas of health (re)habilitation, including the ability to communicate. Advantages and implications of applying the ICDH-2 to speech-language pathology are examined throughout this paper.

The ICDH-2: Implications for Speech-Language Pathology

Unified language. A common language is not only required across health-related disciplines, it also is vital within each field of (re)habilitation. Unified terminology ensures that diagnoses, assessment variables (and hence outcome variables), and interventions can be effectively compared. Despite the imperative assump-

tion of a unified language within each specific field, ambiguous terms abound in all (re)habilitation sciences, including speech-language pathology. Different terms are used to represent similar meanings. For example, in describing voice disorders, clinicians have used a variety of terms including, but not limited to: hoarse, raspy, rough, whiny, weak, unpleasant, dysphonic, creaky, unnatural, breathy, etc. (Colton & Casper, 1996; Perkins, 1971). Therefore, in order to decrease the ambiguity among clinicians, it is essential that terminology is defined so that assessment and outcomes are comparable. Within the broader scope of (re)habilitation, consensus among clinicians is important in acknowledging what is a "barrier" to social participation, or a "limitation" in activity. Further, it is necessary that diagnostic and outcome measures are reliable and valid. A broad approach to speech-language pathology, therefore, requires a model of (re)habilitation with consistently defined variables. These variables must be comprehensive enough to include all aspects of daily functioning, including the ability to communicate. The ICDH-2 has the potential to provide such a tool.

Comprehensive classification and outcome measures. Discipline-specific assessment tools in speech-language pathology (e.g., Peabody Picture Vocabulary Test-III [PPVT-III], Dunn & Dunn, 1981, rev. 1997; Western Aphasia Battery [WAB], Kertesz, 1982; etc.) often measure existing speech or language impairments. However, typical assessment tools, with a few exceptions, do not measure overall communicative ability, nor how an individual's quality of life is affected by a communication disorder. One way of overcoming the narrow definition of a speech/language/voice/swallowing/fluency/hearing "impairment" (i.e., a disruption in a body function or structure related to speech, language or hearing) includes adoption of the WHO's ICDH-2.

Functioning and disability associated with health conditions can be applied to all (re)habilitation sciences, including speech-language pathology. For example, the ICDH-2 currently is being field-tested by speech-language pathologists and audiologists who are members of the American Speech-Language-Hearing Association (ASHA; Boswell, 2000). In Canada, the Canadian Institute for Health Information (CIHI) organizes ongoing trials. The applications of the ICDH-2 include gathering statistics, measuring outcomes, developing policy, and determining reimbursement levels for (re)habilitative intervention. The importance of the document is highlighted in its potential use by third-party payers and governmental agencies to classify and evaluate therapeutic services offered to people with disabilities.

The ICDH-2:

Why should S-LPs become familiar with this model?

Widespread use of the ICDH-2 will allow for a basic understanding of the functional states associated with health conditions and establish a common language across (re)habilitation disciplines. Use of the ICDH-2 also allows comparison of data internationally, across services, and provides a manner for coding health information for statistical purposes. Because of the international importance of the ICDH-2 to health care, it is vital that speech-language pathologists understand its basis and direct application. Therefore, the primary purpose of this paper is to provide an explanation and subsequent examination of the ICDH-2. Firstly, the theoretical "biopsychosocial" model upon which the ICDH-2 is based is presented. Secondly, the ICDH-2 is applied to the field of speech-language pathology. This application includes an examination of the ICDH-2 classification system relative to communication disorders. The analysis also includes a broader application of discipline-specific measures to the WHO model of functioning and disability in order to ensure a comprehensive view of communicative functioning. Finally, implications for both research and clinical practice are presented.

The Basis of the ICDH-2: Understanding the Biopsychosocial Model

In order to understand the model of functioning and disability, it is important that its basis is understood. The model proposed by the ICDH-2 is termed a "biopsychosocial" model. This is so-named because of the integration of two conceptual models, one that is the medical model and the other that is social. Individually, these models are limited due to constraining definitions and causal relationships. For example, the medical model views disability as a personal problem, directly caused by a disease, trauma, or health condition that requires medical care provided in the form of individual treatment by professionals (Brandt & Pope, 1997). Management of the disability is aimed at cure, or the individual's adjustment and/or change in behaviour. In this way, social factors are essentially ignored, as are the interactions between the underlying medical problem and environmental influences. For example, rehabilitation in this context aims at direct therapy with the individual, as well as offering individual assistive aids (e.g., wheelchairs, hearing aids, bathroom devices, etc.). Under the medical model, societal attitudes, legal systems discriminating against those with disabilities, and promoting an individual's overall well being are factors which are not explained, but can impact a person's functioning and disability.

A weakness of the ICDH (World Health Organization, 1980) was its basis in a medical model that assumed that an "impairment," "disability," or "handicap" arises from a biomedical cause. Under this framework, "impairment" represented any loss or abnormality of psychological, physiological, or anatomical structure or function. "Disability" was defined as "any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner... considered normal for a human being" (World Health Organization, 1980). "Handicap" was described as a disadvantage for a given individual as a result of an impairment or disability that caused a limitation in the fulfillment of a role considered normal for that individual. That is, it was assumed that impairments caused disabilities that caused handicaps (i.e., I caused D caused H). Thus, under the "assumption of biomedical grounding," disabilities could be traced back to the medical basis of the problem.

One difficulty with this interpretation was that it did not allow for the possibility of a "disability" or "handicap" without a concomitant impairment. For example, the WHO defines health as "state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 1999). The original ICDH, based on a biomedical model, could not explain how an individual could be treated medically and "cured" of his or her impairment, and yet could be limited in activities of daily living. For example, consider an adult who has had a malignant tumour surgically removed and has lived this way for five years. In most medical circles, this individual is considered to be "disease-free," and thus, medically "cured" and "healthy." However, that person may also live with the scarring and stigma associated with a change in physical appearance, as well as other psychosocial factors related to cancer treatment. These factors may limit the individual's full participation in social activities. The medical model does not consider this aspect of an individual's functioning a "disability," despite the fact that the consequences continue to affect the psychological and social well being (and hence WHO-defined "health") of the individual. The ICDH-2 (World Health Organization, 2001) uses its multidirectionality to explain more conditions of functioning and disability associated with health domains. The medical model, however, fails to account for disabilities and handicaps which arise purely from social causes (e.g., failure to participate in an outing with friends and/or family because of the social stigma associated with smoking and laryngeal cancer).

On the other hand, a social model of disability delineates the issue in social terms, principally as a matter of the full integration of individuals into society

(Bickenbach, 1993; Bickenbach et al., 1999). A social description of disability would be defined not as an attribute of an individual, but rather, as a complex collection of conditions, many of which are created by the social environment. This aspect is particularly important when considering communicative impairments since communication is an interactive process that influences and is influenced by the social environment. Thus, a model that ignored this influence (i.e., biomedical model) is insufficient in describing comprehensive health functioning. The "biopsychosocial" model is a combination of the biomedical and social perspectives. The ICDH-2, a "biopsychosocial" model, therefore represents the clearest conceptual model to date and acts to best explain disruptions in functioning associated with health conditions.

ICIDH-2 Classification

According to the ICDH-2 model, daily functioning and disability are inherently related to the interaction among a variety of factors, including the individual's functioning at the body function and structures level, activity level, and the participation in society level. In addition, "contextual" factors such as the environment and personal characteristics interact on the levels of functioning such that one level can affect another. For example, societal attitudes or physical barriers in an environment may interact with a person's functioning

and limit his or her participation in an activity. Personal factors such as age, sex, and personal motivation also may affect functioning in certain contexts.

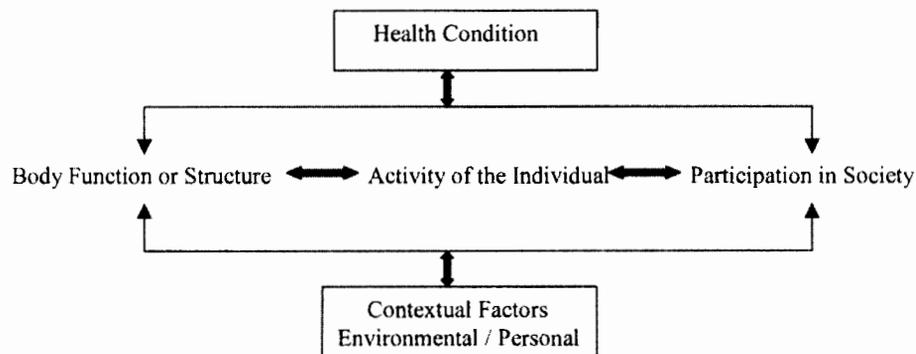
The ICDH-2 represents a potential tool in classifying health consequences in terms of the two levels of disablement and functioning. The coding system is explained in Table 2. To illustrate this coding process, an example from speech-language pathology will be used. Speaking (coded by "d330") can be seen as both an activity (from an individual's perspective) and as participation (from societal perspective). A person who has undergone a total laryngectomy is missing the larynx and vocal folds, but can speak with the use of an assistive device (e.g., an electrolarynx). Using "performance" (how an individual functions in his or her current environment) and "capacity" (how an individual functions in his or her typical environment) qualifiers, "this person has: (a) moderate difficulty in performance due to other peoples' attitudes and personal stress (coded by "2"), (b) severe difficulty in capacity without an assistive device (coded by "4"), and (c) mild difficulty in capacity with an assistive device (coded by "1"; World Health Organization, 2000, p. 189). According to the ICDH-2 system, this individual's situation should be coded as "d330.241." Therefore, the ICDH-2 offers the potential for quantitatively measuring a person's health state relative to his or her communicative functioning and disability.

Table 2

Codes and qualifiers from the classification system of functioning and disability from the ICDH-2 final draft (WHO, 2001, p.22)

Term (Code)	First Qualifier	Second Qualifier
Body Functions (b)	Qualifiers represent numerical representations to indicate severity (e.g., "0" - Mild problem, "1" - Mild problem, "2" - Moderate problem "3" - Severe problem, "4" - Complete problem) e.g., b168.3 to indicate a severe impairment in the specific mental functions of language	N/A
Body Structure (s)	Qualifiers as above for example, s340.4 to indicate a complete problem in structure of the larynx	Indicates the nature of the change in the body structure for example, s340.42 - partial absence of the larynx (after conservation laryngectomy)
Activities and Participation (d) to indicate overlap OR (a) or (p)	PERFORMANCE Generic qualifier Problem in the individual's current environment for example, d330.2 to indicate a moderate problem speaking in the presence of strangers who are unfamiliar with the individual	CAPACITY Generic qualifier Limitation without assistance d330.241 to indicate a severe problem (4) without an assistive device, and a mild (1) problem speaking using an assistive device
Environmental factors (e)	Generic qualifier with negative and positive scale to denote extent of barriers and facilitators respectively for example, e355.+2 to indicate a health professional such as a speech-language pathologist is a moderate facilitator	N/A

Figure 1
Current understanding of the interactions among the dimensions of the ICDH-2.



Note. From the International Classification of Functioning, Disability and Health (ICDH-2; World Health Organization, 2000, p. 21), copyright 2000 by the World Health Organization. Adapted with permission of the author.

The ICDH-2 Conceptual Model of Functioning, Disability and Health

In order to clarify the ICDH-2 as a classification tool, it is necessary that its conceptual model be outlined so that relationships among the three levels of functioning (body functions and structure, activity, and participation), as well as contextual factors (environment, personal factors) are clearly delineated. This will help both clinicians and researchers in the field of speech-language pathology to understand how the ICDH-2 can be applied as a classificatory tool. The model and the interaction among the various components may be visualized by the conceptual model shown in Figure 1.

The ICDH-2 is organized into two levels of functioning and disability. These levels include the health dimensions of: a) body functions and structure, and b) activities of the individual and societal participation (World Health Organization, 2001). Each level of functioning must individually be examined and compared with the other levels in order to establish each as an independent, but interconnected state of being². First, the level of "body functions and structure" will be examined. This discussion will be followed by a summary of the "activity" and "participation" levels.

Body Functions and Structures

The first dimension of ICDH-2 (World Health Organization, 2001) functioning includes that of body functions and structure. Impairments are problems in body function or physical structure that constitute a deviation from a set of biomedical norms, as defined by qualified individuals and noticeable to the affected person (see Table 1 for definitions). An example from speech-language pathology illustrates the meaning of impairment. An individual has a polyp on a vocal fold as identified by an otolaryngologist. The polyp affects the regularity of the vibration of the vocal folds (i.e., a biomedical norm in a particular culture) thereby affecting that person's voice quality. Etiology and permanence are not important in the body function or system for purposes of classification (i.e., how this individual developed the polyp, or whether it exists permanently or can be "cured" are not factors in classification). The open definition permits an impairment to be defined when it is asymptomatic. For instance, a person may have a voice "impairment" when there is no physically observable basis for the problem, called a functional voice disorder. The definition also allows for a disruption in a body structure or function when it is within the norm for a population (e.g., bowing of the vocal folds associated with aging). Effects of disability, environmental, and

personal factors contribute to the functioning at the body functions and structure level (see Figure 1). For example, the interaction among factors may help explain how coping styles and attitudes of the individual may affect healing rates or intervention success (e.g., extroverted personality types contribute to "impairments" such as vocal nodules; Roy, Bless, & Heisey, 2000).

Although not necessary for a limitation in activity, impairments often contribute to an individual's functioning at this next level. Two examples illustrate this principle. First, consider a person who is in great pain due to the presence of a laryngeal tumour. Because of the pain associated with speaking, this individual may not be able to carry on conversations at work or perform his or her duties. Secondly, consider the situation of a ten-year-old boy who stutters. Because of his difficulty with speaking, this boy may not offer to read in class, thereby decreasing his educational opportunities and societal participation. Despite this causal relationship, there also exist many examples where each level (i.e., body functions and structures vs. activity/participation) remains highly distinguishable. These situations will be further delineated in the next section describing the "activity" and "participation" levels.

Activities and Participation

Activities at the individual level. The activity dimension deals with individual activities that are associated with all aspects of human life (World Health Organization, 2001). Activity limitations are those difficulties experienced by an individual, in the context of a health condition, which may affect the performance of an activity (i.e., that which is considered the 'norm' for most individuals in a society, for performing such 'activities' as bathing, speaking, eating, dressing, etc.). Potential exists for the presence of a disability, without a concomitant impairment within the context of the ICDH-2. Unlike the former ICDH model, the current draft version of the ICDH-2 explains how an individual can be treated medically and "cured," and yet still have limitations in activities of daily living. For instance, a person may have recovered range of motion for lips, tongue, and speech musculature after a stroke, but that individual still cannot produce intelligible speech. Thus, the new construction of the model uses its multidirectionality to explain more conditions of functioning and disability associated with health states. These interactions more comprehensively define functioning at all levels, including the associated participation in society level.

Participation in society. Participation may be characterized as the outcome or result of a complex relation-

ship between an individual's health condition and personal factors, and of the external factors that represent the circumstances in which the individual lives. A "participation restriction" may result directly from the social environment, even when the individual has no impairment or limitation in activity. Again, this represents an amendment to the prior classification (World Health Organization, 1980) in which a handicap had to be a result of the underlying impairment and disability. This current change can classify the consequences of a condition such as mental illness or a diagnosis of laryngeal cancer, which then may result in discrimination or social stigma. These social consequences may occur without any visible impairment (e.g., may be symptomless) or limitation in activities of daily living (e.g., that individual can still feed him or herself; cf. Bickenbach, 1993).

Contextual Factors

Factors external to the individual also play a role in the conceptual model. For instance, environmental factors include the physical, social, and attitudinal environment in which people live and conduct their lives. For example, the environment may include no physical access for wheelchairs. A social policy may discriminate against a particular population (e.g., lack of funding for hearing aids or hearing assessments) or a discriminatory attitude may exist against an aging population with increased hearing loss. These environmental factors may represent barriers or assistance (i.e., in the case of positive attitudes) to those individuals with disabilities.

Personal factors interact with an individual's functioning at the level of body functions and structure, activity, and participation. Factors include age, sex, race, education, fitness, lifestyle, coping styles, social background, profession, past and current experience, etc. Contextual factors and their effects on the abilities of individuals to perform certain tasks are considered when functioning is coded by the ICDH-2 instrument (see previous section entitled ICDH-2 Classification). The relationships among the variables (e.g., contextual factors interacting with body functions and structures, activities, and participation, etc.) are conceptualized in the ICDH-2 model (see Figure 1).

The ICDH-2 Model: Relationship Among Variables and Implications for Rehabilitation

As can be seen by the conceptual model (Figure 1), the interaction of functioning and disability works in two directions (World Health Organization, 2001), where functioning and disability are seen as a dynamic interaction or complex relationship between the health condition and the contextual factors (i.e., the environ-

Table 3
Selected codes and definitions from the ICDH-2 relating to cognition, communication and swallowing at the level of Body Functions (b) and Structures (s), Activities / Participation (d), including Environmental Facilitators/Barriers (e). (WHO, 2001)

Code	Definition
<i>Body Functions (b) and Structures (s)</i>	
b1680	Reception of language - specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning
b3101	Quality of voice - functions of the production of characteristics of voice including pitch, resonance, and other features
b320	Articulation functions - function of the production of speech sounds
b3300	Fluency of speech - functions of the production of smooth, uninterrupted flow of speech
b5105	Swallowing - functions of clearing the food and drink through the oral cavity, pharynx and oesophagus into the stomach at an appropriate rate and speed.
s32020	Structures of the hard palate
s3400	Structure of the larynx - vocal folds
<i>Activities and Participation (d).</i>	
d1641	Organization and planning - mental functions of coordinating parts into a whole, of systematizing; the mental function involved in developing a method of proceeding or acting
d330	Speaking - producing words, phrases and longer passages in spoken messages with literal and implied meaning, such as expressing a fact or telling a story in oral language
d3500	Starting a conversation - beginning a dialogue or interchange, such as by introducing oneself, expressing customary greetings, and introducing a topic or asking questions
d730	Relating with strangers - engaging in temporary contacts and links with strangers for specific purposes, such as when asking for directions or making a purchase
d910	Community life - engaging in all aspects of community social life, such as engaging in charitable organizations, service clubs or professional social organizations
<i>Environmental barriers or facilitators</i>	
e310	Immediate family - individuals related by birth, marriage or other relationship recognized by the culture as immediate family, such as spouses, partners, siblings, children, foster parents, adoptive parents and grandparents
e420	Individual attitudes of friends - general or specific opinions and beliefs of friends, about the person or about other matters (e.g., social, political, and economic issues) that influence individual behaviour and actions
e580	Health services, systems and policies - services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a health lifestyle

mental and personal factors [currently not classified in the ICDH-2]). Because of the interconnectedness of the person's functioning at the levels of body functions and structure, and activity/participation, it is clear that intervention affecting any one of these levels may therefore impact an individual's performance at any other level. Interventions affecting one element have the potential to modify other related elements. Moreover, the interactions among factors are specific and not always in a predictable one-to-one relationship with one another.

Rehabilitation is the restoration or optimization of one's participation in activities that are considered limitations by persons who have impairments in particular contexts (Gagne, McDuff, & Getty, 1999). Therefore, it could be proposed that the ICDH-2 is a tool that has the potential to comprehensively measure rehabilitation and its impact on health domains. (Re)habilitation is achieved not only through functional changes in the person (e.g., increasing oral-motor muscular strength) but also through changes in the physical and social environments that surround that individual (e.g., wheelchair-accessible buildings) and attitudinal barriers against people with disabilities (e.g., social isolation experienced by individuals who have poor intelligibility or a physical disfigurement [Brandt & Pope, 1997]). By adopting the ICDH-2 classification system, one could propose that a holistic approach to rehabilitation would necessarily include two dimensions of functioning, including: a) body functions and structure, and b) activities and participation. In order to clarify how the ICDH-2 classification tool can be applied, selected examples from speech-language pathology now will be examined.

A Speech-Language Pathology Guide to the ICDH-2

The ICDH-2 can serve as a framework for viewing the health consequences of a communication disorder, for assessing the outcome of treatments, and for improving the understanding of the nature and impact of communication disorders. A number of authors have explored this relationship with ICDH models (Doyle, 1999; Gagne, McDuff, & Getty, 1999; Nelson, 1993; Prins, 1999; Threats, 2000; Yaruss, 1998; Yaruss, 1999), although none has offered a comprehensive application for speech-language pathology. Recently, Ma and Yiu (2000) used the ICDH-2 as the basis for creating a profile of self-perceived voice problems. The reader is referred to Threats (2000) for a summary of the ICDH-2 and classificatory coding related to communication disorders.

The following discussion provides a guide to how the WHO's ICDH-2 (World Health Organization, 2001)

can be used to classify and measure the severity of functioning and disablement in the field of speech-language pathology. It also is emphasized how this tool may be applied to speech, language, voice, fluency, and swallowing disorders that occur across the age spectrum. Thus, it is meant for clinicians and researchers who are interested in all areas of communication. All primary examples will be from the area of vocal pathophysiology. Secondary examples will illustrate the universal application to the broader field of speech-language pathology.

Impairments, or Disruptions of Body Functions and Structures

Classification. Impairments affecting speech-language pathology are found in the ICDH-2 section entitled, "Body Functions - Mental Functions" (World Health Organization, 2001, chapter 1). The reader is referred to Table 3 for selected examples relative to cognition, communication, and swallowing. Other impairments from speech-language pathology are found in the ICDH-2 "Body Functions - Voice and Speech Functions" (World Health Organization, 2001, chapter 3) and "Body Structures - Structures Involved in Voice and Speech" (World Health Organization, chapter 3).

For example, a voice disorder is one that may stem from an "organic" cause (e.g., vocal nodules, polyps, etc.) or as a functional disorder (i.e., that which arises from no observable cause). The disruption in physiological functioning may affect the regularity with which the vocal folds function when producing a voice, resulting in a "noisy" voice, that is, one that calls attention to itself (Van Riper, 1978). This is represented in the ICDH-2 by a disruption in "Voice functions" (b310; i.e., at the level of body functions "b" and coded "310"). Structural changes to the vocal folds are coded "s3400" (i.e., at the level of body structures "s" and coded 3400; Table 3).

Other examples of "impairments" from the field of speech-language pathology include the inability to articulate a particular sound (b320) or sounds due to a motor disturbance (e.g., dysarthria), stuttering (b330), disruptions in the melody of speech (b3303), a specific language impairment (b168; e.g., aphasia; impairment of language in childhood), apraxia of speech (b176), difficulties with manipulating food in the mouth (b5102), or disruptions in swallowing (b5104). These impairments may arise from a variety of causes, including, but not limited to, disruptions in the actual structures of the mouth (s320), tongue (s3203), lips (s3204), pharynx (s330), or larynx (s340).

In the instance of the ICDH-2, one may have impairment without a disability (i.e., where the individual does not see impairment as limiting or nonnormal). This

may vary by culture or context in which norms are established. For example, in North American culture, an individual with a cleft palate (s3202; e.g., a unilateral isolated cleft of the hard palate) may want surgery to overcome difficulties associated with producing intelligible speech secondary to hypernasality (b3101) and to prevent nasal regurgitation when eating (b5104). Additionally, this individual may suffer discrimination from peers that limits the person's ability to establish relationships (d7500) and participate in a variety of activities (see Table 3 for selected examples). In this environment, an impairment stemming from a difference in a biomedical norm appears to affect the individual's ability to perform activities and participate fully in society (I causes D/H).

However, impairment in one culture may not be considered as such in another culture due to different biomedical or cultural norms. For example, McGregor, Williams, Hearst, and Johnson (1997) outlined a procedure that was designed to help identify true speech-language errors in cases where there was a mismatch between the linguistic community of the clinician and the client. McGregor et al. described how "contrastive analysis" could differentiate a language/phonological *disorder* versus a language/phonological *difference*. Basically, where the clinician identified an error in linguistic/phonological skills in her language (the second language or dialect of the client; e.g., Standard American English), she also examined whether this was considered an "error" in the client's first language or dialect (e.g., African American English). The linguistic/phonological pattern was deemed a "disorder" only where the "errors" were considered difficulties in both languages; otherwise, it was only considered a "difference."

Likewise, in some cultures, stuttering may not be seen as "abnormal" or disruptive, particularly in cultures that place less emphasis on verbal communication. Perhaps also the production of a certain phoneme (e.g., a lisp) is not uncommon. In this way, impairment may be seen as a neutral trait. Thus, the ICDH-2 also allows for a multicultural perspective of certain health conditions in that norms are established by the context in which a person lives. When such a trait is considered outside the norm for that culture and it bothers that individual, intervention is warranted.

Intervention approaches. Speech-language pathologists provide intervention to those individuals who have a variety of communication disorders. In most instances, the disorder is defined in terms of its impairment level. In order to make an impact upon the severity of the classified impairment, rehabilitation at this level involves medical management such as surgical excision of

vocal nodules, or the use of an assistive device. A palatal lift is an example of assistive device used for an individual who has velopharyngeal incompetence, the inability to control and lift the soft palate such that speech sounds are hypernasal. Other devices include electrolaryngeal devices used for producing an external source of voice for individuals who have undergone a total laryngectomy, or alternative and/or augmentative communicative (AAC) devices used with individuals with verbal communication difficulties. For example AAC devices may be used with children with developmental apraxia of speech, late talkers, children with Down syndrome, as well as adults who suffer from degenerative diseases (e.g., amyotrophic lateral sclerosis), or exhibit difficulties with motor control (e.g., Parkinson's disease).

Using the ICDH-2 to classify the disruptions in health relative to specific speech, language, voice, fluency, or swallowing function may represent an ideal way to quantitatively define communicative functioning. Direct intervention targeting the impairment is appropriate at this level of rehabilitation. This would include, for example, counseling and education to promote vocal hygiene, and providing therapeutic approaches to easy voice production. In other areas of speech-language pathology, intervention for targeting impairment includes articulation therapy (accurate production of certain phonemes), oral-motor exercises, therapy to improve word finding, learning to activate a communication device, etc. In other words, intervention is targeted towards the functioning of speech structures that may have caused or contributed to the impairment. Both use of assistive devices and direct intervention, and the skills thereby acquired, may accommodate the impairment so well that no or minimal disability results. Disability may occur in a variety of contexts as a result of various health conditions (e.g., autistic spectrum disorders, cerebral palsy, cerebral vascular accident (i.e., stroke), multiple sclerosis, Parkinson's disease, etc.). Again, this highlights the universality of the ICDH-2 in its application to speech-language pathology.

The ICDH-2 also may allow measurement of outcomes due to intervention at this level (i.e., by providing a method of quantifying the severity of the impairment in a body function or structure from one time to the next). One must, of course, be cautious about the exclusive use of this tool for determining change as it may mask specific problems that can be more easily defined by discipline-specific assessment tools (see section entitled *Generic vs. discipline-specific measures*). It is also important to consider that difficulties at the body functions and structure level of functioning do not automatically mean a disruption in that individual's performance

during daily tasks. The discussion in the following section illustrates this principle.

Activity Limitations and/or Participation Restrictions

Classification: Individual activities. The ICDH-2 (World Health Organization, 2001) defines a limitation of activity performance when, in the context of a health condition, one either has difficulty performing the activity in an expected manner, or cannot perform it at all. The functional domains for the Activity and Participation levels are included in a single list and coded by the domain "d" (see Table 3). This overlap occurs because functioning and disability in activities and social participation often interact relative to the full range of life areas. For example, for the activity/life situation of communication, one could propose that it always involves societal participation because communication is an interactive process, and therefore has an environmental context.

Communicative functioning and limitations/restrictions are found mostly in the ICDH-2 section entitled Communication Activities (World Health Organization, 2001, chapter 3). For example, using voice disorders as a basis, this may translate into the limitations a lawyer or teacher exhibits when he or she cannot produce a consistent voice in court or the classroom due to vocal nodules (d330). Thus, the voice disorder becomes a disruption in that individual's life activities.

Further examples highlight how limitations are imposed on communicative activities (see Table 3). For instance, an individual with expressive aphasia may have difficulty asking another person for help dressing because he or she cannot pose a question (d330), either verbally or in writing (d245). An individual with a closed head injury may be unable to share in a joke with another because he or she has difficulty understanding humour or figurative language (d310). An individual with a fluency disorder may experience difficulty using a telephone (d360) or ordering food in a restaurant. These examples illustrate how a difficulty in communication may functionally disrupt an important activity in a person's life.

Intervention approaches: Individual activities. Interventions affecting functional limitations involve incorporation of activities such as practicing use of the telephone, sustaining a conversation (d350), and requesting information, into rehabilitation practice. In the case of a voice disorder, intervention may focus on both practices with the individual in everyday contexts (e.g., practising a presentation or lecture by salesperson or teacher), as well as including the use of communication

strategies for a spouse or other family member. For instance, family members may aid the person with a voice or speech difficulty by encouraging easy voice production, vocal rests, use of a communication board, or by adapting the environment (e.g., removing or avoiding competing noise).

The ability of an individual to sustain a conversation in an environment with unfamiliar listeners versus a spouse can be differentiated using the ICDH-2 system. For example, an individual with dysarthria may have moderate difficulty in performance due to other peoples' attitudes against that individual for a reduced speaking rate and intelligibility. The individual may also have severe difficulty in capacity without the use of adaptive strategies and cues used by knowledgeable listeners (e.g., verbal cuing, pointing to the first letter of each word spoken on an alphabet board to promote pacing, etc.). However, with a reduction of background noise, his spouse providing cues, and by observing the first letter of each word on his alphabet board, the individual with dysarthria may have only mild difficulty. According to the ICDH-2, this person's situation is coded "d330.231": disruptions in speaking "d330"; moderate performance ability "d330.2"; severe capacity limitation with strangers "d330.23"; and a mild capacity limitation with his spouse "d330.231."

Intervention programs that explicitly involve caregivers and incorporate everyday contexts directly target an individual's performance in society. There are several programs that help families and professionals cope with and provide intervention strategies for those children with delayed (e.g., late talkers) or disordered language skills (e.g., children with autistic spectrum disorders). At this level, the ICDH-2 measures performance of everyday activities and life situations. Provided the ICDH-2 meets criteria for validity and reliability, it also may represent a functional tool for outcome measurement.

Classification: Social participation. The ICDH-2 also includes measurement of participation restrictions (formerly called handicaps), which may exist without concomitant "impairments" or "activity limitations." For instance, an individual who has been medically treated for a disease may still be discriminated against because of the stigma associated with the initial diagnosis, thereby creating a participation restriction in the absence of impairment. The ICDH-2 allows for a quantitative measure of this social stigma. For example, individuals with laryngeal cancer may have a total laryngectomy, and may survive and learn a new adaptive (alaryngeal) method of speaking. Although the cancer is removed and that individual is said to be "cured," he or she may still

suffer the stigma of being treated for cancer, contributing to a handicap (Doyle, 1994; cf. Goffman, 1963). Additionally, the physical disfigurement associated with laryngectomy may lead to some isolation due to societal attitudes, as well as attitudinal barriers against the individual's unique approach to postsurgical verbal communication (Doyle, 1999; Myers, in press).

Further examples illustrate a how a difficulty in communication imposes a societal penalty on individuals. A woman who has suffered a stroke or has Down syndrome may suffer discrimination that limits participation in social activities because of physical differences, or slowness in conversation (d355). A man who has no difficulty communicating with his spouse or family members may feel socially isolated because in large crowds he cannot hear well enough to interact with others (e.g., presbycusis or hearing loss due to age; b230). This also may happen to others who cannot respond quickly in groups (e.g., a person with Parkinson's disease, a person who stutters, a child with apraxia of speech, etc.). This disrupted functioning then may lead to a lack of participation in social events such as religious activities (d930), participating in community life (d910), family relationships (d760), and/or participation in educational experiences (d820; see Table 3). Difficulties in multiple life situations and activities may be coded as such, thereby measuring the comprehensive impact of the health domain in a variety of life situations. Disability influences an individual's social role and his or her well-being. Because the coding of participation in life activities/situations is a reflection of the attitudes and situations of the society in which one lives, the ICDH-2 classifications represent a multicultural perspective of how communication and swallowing disorders impact the quality of life for all people.

Intervention approaches: Social participation. Rehabilitation and intervention at the level of restrictions in societal participation focus mainly on social constructs (i.e., laws, policies, culture, common attitudes, and those factors constructed by the population in which one lives; see Table 3 for examples of environmental barriers and facilitators). By focusing on the societal level, however, one must always be aware of the potential effects at the other levels (i.e., how a societal restriction can affect an individual's functioning, etc.). Rehabilitation may also involve the promotion of those individuals with communicative disorders in social relationships and participation in society through community-based programs. Direct group therapy may also promote participation in social activities. For example, several programs in current practice are based upon such a premise (e.g., aphasia centre programs that are based in "Supported Communication"; e.g., Podolsky, 1998). It is important to

remember that involvement in these everyday situations and activities affect the quality of the lives of individuals with communication disorders. Thus, measuring the rehabilitation outcome at this level is most important. In order to understand the success of an intervention, the interaction among contextual factors (e.g., social attitudes, social policies/laws, and physical barriers such as wheelchair access, etc.) with the functioning of an individual in a particular situation must be better understood. The interrelationships, as defined within the context of the ICDH-2, are explained in the next section.

Interrelationships with Contextual Factors

Societal participation is influenced by environmental and personal factors; thus, rehabilitation may also involve removing environmental barriers (coded by "e") by promoting awareness of those individuals affected by communication handicaps (e.g., e460, societal values). For example, social attitudes can be affected by using public service announcements, mall displays, and printed educational materials, and by providing support to one's family (e410, e415) and friends (e420; see Table 3).

These responsibilities already exist in the Canon of Ethics for speech-language pathologists. The Canon of Ethics of the Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA) includes responsibility for "education of the public regarding speech, language, and hearing problems" (Canadian Association of Speech-Language Pathologists and Audiologists, 1995, no. 5) and ensures "through reasonable advocacy and other intervention activities that [clients'] dignity, individuality, and rights are safeguarded" (Canadian Association of Speech-Language Pathologists and Audiologists, 1995, no. 6).

Educational and advocacy activities directly impact quality of life at the levels of activity and participation. Contextual factors, as well as societal participation, often are not included in outcomes research and do not affect funding strategies because these factors are not obvious biomedical impairments. Classification by the ICDH-2, therefore, would help legitimize worthy approaches such as advocacy and public education that are already the focus of speech-language pathologists. Using the ICDH-2 as a tool to measure the impact that barriers/contextual factors (e.g., social attitudes and policies, access to aids such as interpreters, educational assistants, or basic access to health services, etc.) have on communicative functioning, would prove the worth of activities often ignored by third-party payers and government agencies that fund (re)habilitation.

The ICIDH-2 has widespread implications as a potential tool for measuring "disablement" in communicative functioning and disruption of self-worth associated with health conditions. This includes the consideration of environmental and personal factors such as motivation, age, learning style, etc. However, it must be remembered that ICIDH-2 was not meant to take the place of very specific tools designed by each rehabilitative discipline to diagnose disorders and evaluate specific outcomes. Because of this, the role of the ICIDH-2, used in conjunction with so-called "discipline-specific tools" is examined in the subsequent section.

Generic Versus Discipline-Specific Measurement Tools: Complementary roles

Two types of measurement tools are commonly employed by researchers and clinicians in (re)habilitation sciences. These tools include: (a) discipline-free measures, transcending disciplines and generically defining a problem (e.g., quality of life), and (b) discipline-specific measures, which explicitly define difficulties in terms of the discipline involved by using theoretical framework and language specific to each discipline (e.g., a receptive language difficulty in vocabulary; Lux, Chiaromonte, & Johns, 1997). Discipline-free and discipline-specific measures have advantages and disadvantages relative to the assessment user, the population under study, and the purpose of the assessment. The subsequent discussion highlights strengths and weaknesses of these measures through the use of specific examples. The analysis begins with discipline-free measures, and is followed by common discipline-specific tools of measurement in speech-language pathology.

Discipline-free measures provide an indicator of an individual's overall functional performance from an interdisciplinary perspective. One attempt to categorize the outcome of rehabilitation interventions is the Functional Independence Measure (FIM). The FIM was developed to capture discipline-free outcomes information and is used widely in acute care settings in North America to operationally define function (Hamilton, Granger, Sherwin, Zielezny, & Tashman, 1987). Based on the WHO's original ICIDH (World Health Organization, 1980), the FIM (1995) is meant to measure overall performance in activities of daily living (ADL) and to provide a concrete index of functional independence. However, while the FIM is useful for rehabilitation providers who want to demonstrate patient performance from an interdisciplinary perspective (as is the ICIDH-2 classification), it needs supplemental information such as that offered by discipline-specific measurement tools.

One weakness of using generic tools such as the FIM (or possibly the ICIDH-2) alone is that by providing a global measure of functioning, discipline-free tools may obscure the specific deficit profile of an individual relative to each discipline. That is, generic, discipline-free measures may not be as sensitive as discipline-specific measures. Two clients may have the same global functioning score, but may represent individuals with very different problems. Therefore, discipline-specific outcome measures (e.g., those measures used by speech-language pathology such as the Goldman-Fristoe Test of Articulation – 2nd edition, Goldman & Fristoe, rev. 1999; the Western Aphasia Battery, Kertesz, 1982; etc.) should offer a more sensitive and specific approach to each individual's impairment, disability, and handicap. These discipline-specific measures are meant to determine the nature and degree of impairment and to provide targets for intervention. Unfortunately, many assessment tools also are used to document change associated with rehabilitation, despite the fact that this was not their initial purpose when created and validated (McCauley & Swisher, 1984).

Both discipline-free and discipline-specific measures can play complementary roles in developing research on rehabilitation outcomes. For example, both types of measurement tools can be validated, one with the other (i.e., demonstrate criterion-related validity), such that overall severity level is consistent across tools. However, use of a discipline-free measurement system like the FIM or the ICIDH-2 will only carry speech-language pathology so far. Discipline-specific measurement tools and subsequent intervention strategies that target all three levels of communicative functioning (i.e., the levels of body functions and structure, activity, and participation) are required. In order to investigate this further, the WHO model of functioning and disability may now be applied to the field of speech-language pathology. This application and analysis will evaluate how comprehensively speech-language pathologists typically approach (re)habilitative practice. This issue will be addressed in the following section.

A Broader Approach to Rehabilitation: Implications for Speech-language Pathology

Perhaps by outlining the field of speech-language pathology in the context of the ICIDH-2 model, new targets for assessment and subsequent rehabilitation/intervention approaches will be given fair consideration. For example, instead of focusing upon one level of functioning (e.g., assessing functioning of the vocal folds through endoscopy or videostroboscopy), a typical assessment should include measurement tools from all

three levels of functioning (i.e., body functions and structures, activities, and participation). First, this may involve the detection of physiological functioning and structural integrity via "objective" methods (e.g., direct visualization of vocal fold functioning or indirect measurement of vocal fold functioning through aerodynamic or acoustical measures). Secondly, it involves assessing how the person with the communication disorder views the difficulty and how it affects daily activities via "perceptual" methods. Thirdly, functioning can be measured by how others might perceive the difficulty, as well as attitudinal and other barriers the communication difficulty may create via "qualitative" inventories. Considering all three levels (body functions and structure, activity, and participation) will serve to strengthen

and better the lives of those individuals affected by communication disorders.

Presently, most measurement tools and intervention strategies in speech-language pathology focus on the WHO model's body functions and structure level, as well as some at the activity level. Table 4 lists examples of some of the common assessment tools that can be applied to the WHO model. The assessment measures found in Table 4 are not meant to be a comprehensive list of all of those available in speech-language pathology. Rather, this information highlights the insufficient number of assessment tools at the activity/participation level for the field of speech-language pathology³.

Although extensive assessment tools exist at the level of body functions and structure (i.e., outlining the spe-

Table 4
Current assessment tools in speech-language pathology and application to the WHO model of functioning and disability

Body Function and Structure	Activity	Participation
Articulation measures (e.g., GFTA-2, etc.)	Communication abilities (e.g., FCP, CADL, CETI, etc.)	Questionnaires (e.g., VHI, Northwestern Otolaryngology Communication Profile for Head and Neck Patients)
Language/phonological measures for children (e.g., CELF-R, PLS-3, TACL-R, APP-R, PPVT-III, etc.)	Comprehensibility measures Perceptual rating measures (e.g., voice quality, fluency)	
Fluency measures (e.g., WPM, repetitions, etc.)	VAPP Pragmatics (e.g., PP)	
Nasendoscopy; Videofluoroscopy	ASHA - FACS	ASHA - Quality of Communicative Life Scale (in development) Interviews
Intelligibility measures (e.g., AIDS, etc.) Language/Aphasia measures for adults (e.g., BDAE, WAB, BNT, etc.) Acoustic, aerodynamic measurements	Clinical bedside evaluations	
↓	↓	↓
Traditional Instrumental and Behavioural Diagnostic Measures	Functional Status Measures	Quality of Life Scales, Handicap Inventory

cific impairment in voice, resonance, language, phonology, fluency, or swallowing), there is an obvious trend for a diminished number of tools and thus, intervention strategies, as the impairment becomes less biomedical in nature. As the level of functioning becomes more of a problem of societal attitudes that limit an individual's participation, there are smaller numbers of tools available for measurement. This is also related to the nature of the problem (i.e., it is much easier to measure the regularity of vocal fold movement and relative size of vocal nodules than it is to measure the impact of the stigma associated with having laryngeal cancer). However, if the WHO model of functioning demonstrates anything, it stresses the importance of all levels, and how factors affecting one level may impact functional performance at another. As stated by Bickenbach et al. (1999), "the theory of disablement promoted by the ICIDH-2 attempts to dislodge the assumption that the body level dysfunctioning, classified as impairments, is the fundamental, or conceptually prior, dimension of disablement. Quite the contrary, the three dimensions are co-equal in significance and indeed are intended as different facets or manifestations of a single emergent phenomenon – disablement" (p. 1184). Therefore, it is critical that (re)habilitation in speech-language pathology focuses on all levels in order to evaluate comprehensively the functioning/disablement of an individual who has a communication disorder.

Despite the predominance of assessment tools and subsequent intervention approaches targeting an individual's "impairment," the past 20 years have seen growth in functional approaches to speech-language pathology, especially highlighting ADLs. For example, Yorkston, Strand, and Kennedy (1996) argued how comprehensibility, rather than intelligibility, was a measurement of the adequacy of a speaker's performance in natural communication settings. Comprehensibility is a measure of intelligibility that includes how well a given dysarthric speaker *and his or her partner* use compensatory communication strategies. This means that performance in context includes the semantic and syntactic context, as well as gestures, and situational cues. Thus, comprehensibility includes the contribution of the impact of the communication partner.

The direction in all areas of speech-language pathology has veered towards functional approaches aimed at increasing the client's reception, processing, and use of information germane to conducting daily activities, interacting socially, and expressing physical and psychological needs. Some approaches to aphasia intervention have been well ahead of their time, thanks to some very insightful individuals. For example, approaches to aphasia intervention such as Davis and Wilcox's (1981) tech-

nique, Promoting Aphasics' Communicative Effectiveness (PACE), emphasize communicative effectiveness rather than delineating specific language or naming goals. Assessment tools such as the Functional Communication Profile (FCP; Sarno, 1969), The Communicative Abilities in Daily Living (CADL; Holland, 1980), and the Communicative Effectiveness Index (CETI; Lomas et al., 1989), among others, offer tools to measure these functional changes.

In other areas of speech-language pathology, functioning at the level of activity/participation also is considered. For example, activities promoting carry-over of speech and language goals for preschool and school-aged children incorporate everyday vocabulary and school curriculum materials into therapy. Collaborative consultation within the classroom encourages intervention in a naturalistic environment, thereby impacting a child's communicative functioning in meaningful situations. Obviously, this focus needs to be strengthened in all areas of speech-language pathology. In order for a discipline-free tool like the ICIDH-2 to make a contribution to measuring outcomes at the activity/participation level, it obviously needs to be tested such that its functional activity measures are validated with functional assessment tools already available in speech-language pathology. That is, the role of the ICIDH-2 may become complementary to measures that already exist in the field.

Quality of life. Although measurement and intervention of communicative behaviours have grown toward the level of "functional activities," there often is not a predictable relationship between how a client functions in daily life and the values that the client reports for quality of life (QOL). QOL is a subjective, multidimensional, and dynamic (i.e., it changes over time) construct. Dimensions that influence QOL include: physical concerns, functional abilities, family well being, emotional well-being, spirituality, treatment satisfaction, sexuality, social functioning, and occupation (Cella & Tulsky, 1990). In fact, it could be argued that the WHO definition of health as a "state of complete physical, mental, and social well-being ..." is closest in relation to the definition of QOL. As such, promoting health at all levels of functioning (i.e., at the level of body functions and structures, activities, and participation) influences one's overall QOL.

Individuals with major disabilities often report higher life satisfaction than an outsider would assume and it is often not much lower than that of the population at large (Tam, 1998). Therefore, functional status shares a special relationship with QOL. Most applied research assumes that it is changes in the objectively

observable, external reality (e.g., improved ADL function, resumption of valued leisure time activities, etc.) that underlie an increase or decrease in QOL ratings. These are the basis of objective QOL measures. However, an alternative explanation is that people with disabilities may change the criteria and standards with which they evaluate their lives after they have undergone a physical change or experienced the consequences of a health problem or its treatment. For example, after a stroke an individual may no longer put as much emphasis on physical accomplishments, but rather may find satisfaction in strengthening relationships with family. This would mean that subjective measures are more reflective of QOL as they represent the interaction between the item evaluated and the meaning that the person attributes to that item (cf. Weymuller et al., 2000 for a discussion relative to QOL measures and individuals with head and neck cancer).

In this spirit, the American Speech-Language-Hearing Association (ASHA) is currently focusing on the extension of the ASHA Functional Assessment of Communication Skills for Adults (FACS; Frattali, Thompson, Holland, Wohl, & Ferketic, 1995) to develop a scale to assess the quality of communication life of adults with various communication disorders from a variety of cultural groups. Field-testing for the ASHA Quality of Communication Life Scale is ongoing. Subjects include adults who have suffered a right-hemisphere stroke, Alzheimer's disease and related dementias, TBI, dysarthria, or aphasia due to a left-hemisphere stroke. This is a very important project since the individuals who experience the communication disorders perform the ratings; these rating values may be more representative of QOL than those measures determined by external raters (e.g., family members or clinicians). This finding has been demonstrated in other populations affected by communication disorders such as those affected by laryngeal cancer (Myers & Baird, 1992).

Measurements used by (re)habilitation specialists (e.g., Western Aphasia Battery [WAB score; Kertesz, 1982]), The Assessment of the Intelligibility of Dysarthric Speech [AIDS; Yorkston & Beukelman, 1981], etc.) often have minimal correlation with outcomes that are of interest to clients, despite being useful indicators of "impairment." Under the WHO framework, typical "impairment" measurements are necessary but insufficient measures of overall "health" and "functioning." Measures of "quality of life" are real-life outcomes that impact individuals most in their everyday lives. By developing QOL measurement tools, rehabilitation specialists may be able to better determine which changes (brought about by intervention) are most meaningful to their clients. Shetzline and Bisset (2000) performed a

study to determine if there was a relationship between a subjective assessment of QOL and an objective measure of language ability following acquired aphasia secondary to stroke. The findings of their study indicated that there was no relationship between an individual's perceived QOL, as measured by a Stroke-Specific QOL scale (SS-QOL; Williams, Weinberger, Harris, Clark, & Biller, 1999), and the individual's objective language ability measured by the WAB Aphasia Quotient (AQ; Kertesz, 1982). Moreover, Shetzline and Bisset (2000) noted that individuals with WAB AQ scores as low as 52 comprehended the items on the SS-QOL. The WAB AQ score is a measure of the severity of language impairment where 100 is the score expected for a nonaphasic population and 93.8 is the arbitrary cut-off AQ for those with impaired language skills. A score of 52, therefore, is consistent with severe language impairment. Data from Shetzline and Bisset's (2000) study provide support for projects that aim to validate QOL measures that are self-rated (e.g., ASHA Quality of Communication Life Scale) by individuals with neurological involvement and perhaps other disorders.

QOL measures can be achieved quantitatively using a subjective, multidomain approach, but perhaps the best way to tease apart the dynamics of multiple domains, the standards used to evaluate them, and the calibration of those standards, is through qualitative analysis (Dijkers, 1999). Both clinicians and researchers often use an interview to collect information that reveals the most meaningful goals and feelings of the client, as well as those of family members. One technique used by researchers to analyze this information is that offered by phenomenology (e.g., Peters, 1995), an approach that, through validation measures, can help identify themes of importance for individuals affected by a disability. When themes do emerge, they can be used to help predict both outcomes of rehabilitative success and failure. Additionally, questionnaires can be used to collect this type of data. The results can then help determine which methods are most effective such that new interventions produce the most meaningful outcomes. Perhaps a future draft of the ICIDH-2 will include a system of reliably and validly incorporating the clients' self-ratings into determining functional levels. These and other issues are explored in the next section.

Directions for Future Research

Two examples from the area of vocal pathophysiology illustrate the direction for future research and clinical practice consistent with the themes of the WHO's model of functioning and disability (World Health Organization, 2001). The Voice Handicap Index (VHI;

Jacobson et al., 1997) measures the “psychosocial handicapping” effect of voice disorders, as perceived by the clients. It is statistically robust, has a high internal consistency, and the test-retest stability is strong (Jacobson et al., 1997). Using this instrument along with objective (e.g., acoustic measures) and auditory-perceptual measures can help determine the relationship between the client’s perception of his or her voice problem and the clinician’s perception, as well as with instrumental measures (i.e., providing face validity). Since changes at one level may not affect those at another level (i.e., changes at the level of impairment do not guarantee that the individual will perceive that change as meaningful), it is critical that these relationships are determined such that clinically meaningful values are established.

Wuyts et al. (2000) described the vocal quality of a client by means of a Dysphonia Severity Index (DSI), which outlined the weighted combinations of selected acoustic measurements, and their ability to predict perceptual voice quality. The DSI was found to have a high correlation with the Voice Handicap Index score, indicating that changes in instrumental values were reflective of perceived difficulties by the clients themselves. This illustrates one way of effectively combining assessment tools from all levels of functioning. The example also demonstrates how modeling outcomes after a comprehensive model of functioning and disability can holistically affect those with communication disorders.

A second example illustrates the independence of functioning at the levels of body functions and structures and activities/participation (World Health Organization, 2001). Ma and Yiu (2001) investigated the relationships among acoustically and perceptually measured voice “impairments” with self-perceived voice problems as measured by a Voice Activity and Participation Profile (VAPP). The VAPP was developed and based upon the ICIDH-2 Beta-1 (World Health Organization, 1997) and designed to recognize difficulties experienced by individuals with voice difficulties in everyday situations. Ma and Yiu (2001) found that the scores on the VAPP had little correlation with the degree of voice quality impairment measured acoustically and perceptually by speech-language pathologists. That is, functioning at the levels of activities/participation did not relate to impairments at the level of body functions and structures.

Although combined objective measures were found to relate to self-perceived difficulties with voice for the VHI (Wuyts et al., 2000), there was little correlation between independent objective measures and a subjective instrument (i.e., the VAPP) based upon the ICIDH-2 (Ma & Yiu, 2001). Despite these apparently contrast-

ing results, both studies support the need for comprehensively assessing voice disorders at all levels of functioning, as well as illustrating how the ICIDH-2 can provide the framework for assessing the functional impact of voice problems.

QOL measures, like the VHI or VAPP, also can help health care providers determine which interventions are most cost-effective, thereby increasing accountability. Unfortunately, although an extensive number of questionnaires and indices that measure QOL and participation in society exist, they are often untested and, thus, remain questionable in terms of reliability and validity. Perhaps the validation of the ICIDH-2 will offer a new method of testing and evaluating disability and functioning at this level, indicating which intervention strategies are most meaningful to our clients. Perhaps also validating (re)habilitation approaches at this level will help redistribute research dollars into developing many promising tools and intervention strategies which most meaningfully impact the QOL of those individuals receiving service from speech-language pathologists.

The ICIDH-2 does its best to include all levels of health states associated with communicative functioning and clearly offers promise over more narrow definitions – the presence of a specific speech, language, hearing, or swallowing impairment. Rather, a communication “disability” exists where it affects functioning not only at the level of body functions and structures, but also at the individual and societal level. Future direction for the ICIDH-2 measurement tool may include validation with subjective or self-reported measures of health consequences since the very definitions of disability and handicap include the perspective of the persons whose lives are shaped by disablement (Peters, 1995). Clearly, this initiative will strengthen the ICIDH-2 by defining outcomes that are most meaningful to individuals affected by their health.

Summary

This paper has outlined the basis of the ICIDH-2, a potential tool for classifying health and health-related states. Implications for the field of speech-language pathology have been examined through the specific examples. Current assessment tools in speech-language pathology have been applied to the WHO’s model of functioning and disability to highlight the insufficiencies in the area(s) of activity/participation. Analysis of the ICIDH-2 and its direct implications for speech-language pathology suggests an approach for rehabilitation that ensures a comprehensive view of communicative functioning. By using a tool as comprehensive as the ICIDH-2, we are not apt to forget the multidimen-

sionality of disablement and how it influences the lives of those with communication disorders. This includes clients of all ages, diagnoses, etiologies, cultural backgrounds, sex, religions, etc. Therefore, it has universal application to all clients served by speech-language pathologists. By strengthening the reliability and validity of the ICIDH-2 in field trials, we may have the opportunity to establish a method of diagnosis, outcome measurement, and statistical gathering which transcends (re)habilitation disciplines, countries, and cultures. Furthermore, by applying the model offered by the ICIDH-2 more widely to the field of speech-language pathology, we are provided with a direction for comprehensively evaluating all levels of communicative functioning. This will lead to new and exciting evaluation of all areas of speech-language pathology, and will ultimately aid in validating the important role that comprehensive (re)habilitation plays for all individuals to whom we provide clinical service.

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Endnotes

1. The ICIDH-2 is now known as the ICF, the International Classification of Functioning, Disability and Health. The name was endorsed by the 54th World Health Assembly for international use on May 22, 2001 (resolution WHA 54.21).

2. Note: the domains of activity and participation often overlap and, therefore, can be coded under one heading or domain, "d."

3. A complete reference of assessment tools and authorship is provided in the reference list.

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