

## Special Article

# Diagnosis to Function: Classification for Children and Youths

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**ABSTRACT.** This article provides an overview of a newly approved World Health Organization framework and classification system for human functioning. The International Classification of Functioning, Disability, and Health (ICF) identifies dimensions of human functioning and describes a common language for clinical practice, research, and policy development across disciplines and service systems. This presentation highlights the development of a version of the ICF for children and youths (ICF-CY) and its potential utility in developmental and behavioral pediatrics. Clinical, research, and policy dimensions are described. Limitations related to scope and clarity of the framework are also outlined. The article proposes that serious consideration be given the ICF-CY as an integrated system to clarify constructs, improve communication, and encourage coordination of health services for children and youths. *J Dev Behav Pediatr* 26:323–330, 2002. Index terms: *function, classification, children, youths, International Classification of Functioning, Disability, and Health.*

Children with chronic conditions ranging from asthma and autism to attention-deficit hyperactivity disorder and obesity are increasing in absolute prevalence as well as a proportion of the general population. The most recent national survey of children with special health care needs indicates that approximately 13% of children and youths live with a chronic condition and are in need of intervention.<sup>1</sup> Although most of these conditions are not fatal, they are associated with compromised or altered functional status that may be indicative of more significant health problems. Assessment of function is therefore essential as the base for interventions to reduce functional limitations and improve well-being.

Developmental and behavioral pediatric specialists are aware that assigning a diagnosis may reveal little about the functional characteristics of a child or adolescent. Diagnoses are associated with symptomatology, often unrelated to function.<sup>2,3</sup> Diagnosis does not predict function. Often characteristics among children with the same diagnosis may differ more than those between children with different diagnoses.

Although diagnoses are important for defining cause and prognosis, identifying limitations of function is often the

pivotal information on which interventions are planned and implemented. Among children with chronic conditions, variability occurs in their ability to perform individual activities as well as in the ways that they participate in society. Moreover, the contexts in which children live, that is, their physical, social, and psychological environments, influence their functioning. Recognition of the role of environmental factors in functional status of children is important as professionals and families seek ways to provide support and intervention for children and youths.

Assessment of functional characteristics often reveals needs beyond the health condition and calls for the inclusion of other disciplines in treatment planning including therapies, education, and social welfare. Further, improvement in function is often the litmus test that society uses to evaluate the effectiveness of programs and treatments. Whether they are frequent diagnoses such as attention-deficit hyperactivity disorder, obesity, and asthma or less frequent conditions such as autism, spina bifida, and muscular dystrophy, assessment and classification of function are instrumental for characterizing the young person's lived experience.

With the expansion of multidisciplinary teams in the care of children with chronic conditions and disabilities, each discipline (physical therapy, occupational therapy, social work, for example) or sector (education, social welfare, or justice), introduces a new set of concepts, perceptions, and terminology. On behalf of the child and his or her family,

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it is important that communication is clear across the different languages of the team. A framework is needed that provides a common conceptual approach and congruent terminology across disciplines and service systems. This article advances the World Health Organization (WHO) International Classification of Functioning, Disability, and Health (ICF) as that framework and terminology and describes the development of a derived version for conceptualizing, classifying, and coding functioning among children and youths (ICF-CY).

### CLASSIFICATION OF FUNCTION

The World Health Organization (WHO) has been the conservator of the International Classification of Diseases (ICD),<sup>4</sup> the diagnostic classification system used globally to identify causes of morbidity and mortality. In 1980, the International Classification of Impairment, Disability, and Handicap (ICIDH)<sup>5</sup> was published by WHO as a research document. The ICIDH was not widely used, and a decision was made in the early 1990s to revise it in response to changing views of disability. That revision process culminated in the approval by the World Health Assembly in 2001 of a second classification system to describe function as it relates to health—the International Classification of Functioning, Disability, and Health (ICF).<sup>6</sup>

### Description of the International Classification of Functioning, Disability, and Health

The purpose of this article is to provide an overview of the concepts of the International Classification of Functioning, Disability, and Health for children and youths (ICF-CY). This framework provides developmental and behavioral specialists a systematic approach for understanding functioning in children and youths. The aim of the ICF is to provide a unified and standard framework and language for the description of health states. Its applications include both research and clinical uses. The ICF framework addresses the limitations of earlier models of disability (Nagi,<sup>7</sup> ICIDH,<sup>5</sup> National Center on Medical Rehabilitation Research<sup>8</sup>) and reflects current conceptions of disability summarized in the following key contributions:

1. The classification describes components of health, thereby creating a health rather than a disease perspective. This moves the model away from the traditional deficit approach in medicine to a more positive health emphasis.
2. The framework assumes the universal nature of disability—the integration of the disability as a natural experience of living. The experience of living with a disability has traditionally been presented as negative, with the assumption that disability equals illness. This framework suggests not only that disability is commonly experienced but that disability need not be conceptualized from a deficit or medical orientation.
3. The language proposed is value neutral and cause neutral. Terms do not engender negative connotations, and the functional elements cross etiologies—physical, emotional, and cognitive, for example. The terms

functioning and disability are used as general terms that cover the breadth of the concepts. Functioning includes the positive end of the spectrum, and disability refers to impairments, activity limitations, and participation restrictions.

4. The ICF conceptual framework is based on a model of interactions among dimensions of human functioning at body, personal, and societal levels. Earlier models, based on a linear approach, assumed that diagnosis led to impairment, resulting in personal limitations that in turn created disadvantage in living in society. In contrast, the ICF framework assumes that there is substantial interaction among dimensions.
5. The role of the environment is acknowledged as integral to the manifestation of disability. Environmental codes have been created to identify factors that constitute barriers to functioning and participation. The disability community has long pressed for professional acceptance that the environment often affects the person with a physical impairment more than the actual physical condition. The ICF framework affirms that core concept.

The ICF is based on a framework of dimensions of human functioning as presented in Figure 1. The interaction among the dimensions is made apparent by bidirectional arrows reflecting the ongoing influence of environmental factors on body functions, activities, and participation. Personal factors such as age, education, and socioeconomic status are also identified as contextual factors in the conceptual framework and encompass “features of the individual that are not part of health conditions or health states.”<sup>6</sup> Although the influence of personal factors is recognized in the conceptual model, there are no corresponding codes for classifying the factors. Key dimensions of the conceptual framework are described below.

Body functions and body structures encompass physiological functions, including psychological and anatomical parts of the body. Impairments describe problems in body function or structure as a significant deviation or loss and are often labeled as signs and symptoms. Codes for body

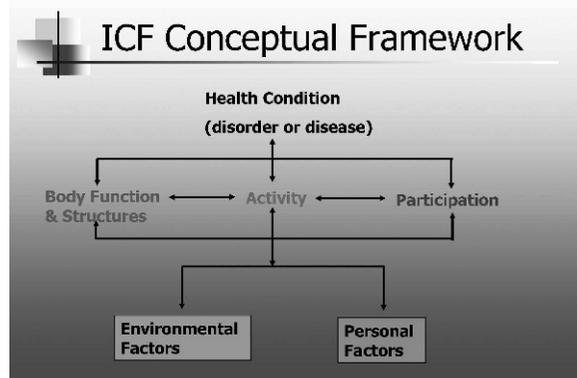


FIGURE 1. Conceptual framework for International Classification of Functioning, Disability, and Health (ICF).

function begin with a “b,” body structure with an “s,” followed by numeric codes of one to four digits.

The next dimension encompasses the concepts of activities and participation, and although they are given unique definitions in the taxonomy, the same codes are used for documentation. Activity is defined as the execution of a task or action by an individual. Activity limitations are problems that an individual may have in carrying out a task. Participation is defined as involvement in a life situation, although participation restrictions are difficulties that a person may experience in a life situation. Both activity and participation are preceded by a “d” followed by numerals.

Environmental factors are the physical, social, and attitudinal settings in which people conduct their lives,<sup>6</sup> and codes begin with an “e” followed by numeric codes.

Central to the ICF coding system are universal qualifiers that are consistent across the dimensions (body function and structure, activities and participation, and environment). Standard numeric codes are assigned after the decimal point to characterize severity of a condition on a scale from none (0) through mild, moderate, severe to complete (4). An additional qualifier is available to distinguish the concepts of capacity and performance for activities/participation dimension. Capacity is defined as an individual’s ability to execute a task or action within a standardized environment, and performance is defined as what an individual does in his or her current environment.

### **Development of the International Classification of Functioning, Disability, and Health for Children and Youths**

The publication of the ICF represented an important advance in the classification of disability; however, it did not adequately capture the functional characteristics specific to the developing child. Manifestations of disability in children are different in nature, intensity, and consequences from those of adults. The child is a moving target; therefore, any classification for children and youths must include developmental changes in function. A report from the Workgroup on Children’s Issues for the 1995 WHO North American Collaborating Center meeting identified several major areas for consideration by the revision process.<sup>9</sup> These included:

1. Making the system user friendly by promoting the use of the system by parents and caregivers.
2. Revising or adding items, or both, to reflect the role of development in defining the nature or expression of functioning and disability as well as reviewing items in which age is a factor affecting expected abilities.
3. Reviewing items to ensure documentation of the role of the family, peers, and caregivers.
4. Incorporating learning and behavior as two domains essential to the documentation of childhood and developmental problems.
5. Including elements of environments of children and youths, with particular emphasis on the home and school.

Building on earlier contributions of the Children’s Task Force in the preparation of the ICF, an international work group was formed by WHO in 2001 to develop a version of the ICF for children and youths (ICF-CY).<sup>10</sup> The work group, co-led by Dr. Rune Simeonsson, a psychologist from the University of North Carolina, and Dr. Matilde Leonardi, a neurologist from the Italian National Neurological Institute, was charged to develop the ICF-CY to be structurally consistent with the main ICF volume. Development activities began with an exhaustive item-by-item analysis of the main ICF volume. New content to be added and existing content to be deleted or modified were identified to cover aspects related to function in children and youths. Adaptations took the form of expanding generic qualifiers to include developmental aspects, revising or expanding descriptions of codes, assigning new content to previously unused codes and changing inclusion and exclusion criteria for codes. The most global change was the recommendation of a qualifier change to include developmental problems not readily apparent in the ICF. The addition of the term delay into the generic qualifiers (alongside problem, deviation, or loss) allows any of the codes to be used to characterize more clearly the extent of magnitude in child function across the levels of body, activity, or participation.

The need to capture developmental characteristics was achieved with the addition of new content. With regard to dispositions, codes were added to document such characteristics as adaptability, responsiveness, predictability, persistence, and approachability. The unique nature of functions in the very young child was captured through expansion of codes for sensing and exploration of objects through mouthing, touching, smelling, and tasting. The importance of learning was expanded with codes for younger children with regard to play, such as solitary play, onlooker play, parallel play, and cooperative play. For later stages, additional codes and subcodes were written to define the function of learning language, learning to read, learning to write, and learning to calculate.

The first draft of the ICF-CY was completed in 2003. The draft included the addition of 125 new classes, addressing developmental and child- and youth-specific functional areas, exemplified in the sections above (disposition, sensing, levels of play). Some differences in rubrics were made in 225 of the 1349 classes present in both versions. These differences included changes in description, class name, and inclusion and/or exclusion criteria. Field trials were implemented in 2004 with data collected in the United States, Europe, and countries in Africa, Asia, and Latin America. The field trials involved the completion of age-specific questionnaires to examine the utility of the ICF-CY to encompass characteristics of children. The questionnaires included the most prevalent functional codes among each age group: 0–3, 4–6, 7–12, 13–18 year olds allowing parents or professionals to indicate concerns using applicable codes. In addition, input from providers, practitioners, researchers, and policymakers was also obtained through the use of a survey on the modifications made to the ICF-CY. Findings from the field trials will be used to prepare the final version of the ICF-CY for submission to WHO by the end of 2005.

**UTILITY OF INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY, AND HEALTH FOR CHILDREN AND YOUTHS**

The publication of the International Classification of Functioning, Disability, and Health (ICF) has provided a framework and taxonomy responsive to the multidisciplinary approach and practices that have emerged in the health care of individuals with chronic conditions and disabilities. The ICF and the ICF for children and youths (ICF-CY) can inform clinical practice, policy, research, and training for adults and children across various care settings. Although at present, the number of applications developed with the ICF have been greater for adults, applications of the ICF-CY are likely to increase as the issues for children and youths are similar.

**Clinical Practice**

The main ICF and the ICF-CY are new to developmental and behavioral specialists. It may be useful to illustrate the application of the framework and coding with children seen in pediatric settings. In the context of a child diagnosed with an attention-deficit hyperactivity disorder, Figure 2 illustrates the way in which the various dimensions of the ICF conceptual framework are captured to code functional characteristics. Included under each set of problems are the qualifiers attached to each code within a dimension. The qualifiers are crucial for establishing severity, for example, or capacity to complete a task or to perform in societal situations.

For a child presenting with ADHD, impairments might include difficulty with attention (b1400) or poor control of impulses (b1304). Activity limitations might include difficulty focusing attention (d160) and carrying out multiple tasks (d2200). Restrictions in participation could include being excluded from social activities (d750) and receiving poor grades (d820). Underlying each of these elements are environmental factors. Environmental factors can be facilitators or barriers in each dimension and can be mediators between different dimensions. For example, access to health care (e5800) is an element of the environment that can hinder or help the diagnosis and treatment of attention-deficit hyperactivity disorder. This can provide a link between the health condition and the impairment. Medication (e1101) could well mediate the impairment so that the personal activities of doing homework or waiting one’s turn, for example, are not limited. Likewise, an able teacher in a classroom setting (e330) might reduce the labeling of a

child and provide an atmosphere in which any activity limitations do not create social exclusion.

A second example highlights the use of functional status in relationship to diagnosis. Autism spectrum disorder includes manifestations that are diverse, stretching the traditional categories used for typing. There is variability across cognitive and intellectual levels as well as in social, emotional, communication, and behavioral appearance. Figure 3 shows the core domains of autism spectrum disorder with applicable ICF codes. The potential for using a single model for conceptualizing, classifying, and coding ASD is found in the ICF system.

Another aspect in the clinical sphere is the relationship between measurement tools and the ICF-CY classification and coding scheme. An important requirement for the use of any classification system is the availability of measures and procedures to assess the specific characteristics to be classified by the system. Just as the results of blood tests or scanning procedures provide the data for assigning International Classification of Diseases (ICD) diagnostic codes, measures of functioning are needed to assign ICF-CY codes. Behavioral and pediatric practice already includes a range of functional measures, including adaptive behavior instruments and pediatric functional independence tools. Of course, ICD codes often were available before the tool was developed to assess its characteristics, and tools were available to measure medical conditions before codes were available. So, also, the ICF-CY has codes without tools and tools that cover several or numerous codes. A review of outcome measures for use with children and youths was delineated by ICF dimensions.<sup>11</sup> The review indicated that of the 13 global measures reviewed, all included personal level limitations, seven included societal participation, four addressed body function/structure, and four included environment. This analysis shows the utility of the ICF-CY for clarifying what measures are available and where gaps need to be filled.

Finally, clinicians have always been aware of the influence of environmental factors on human functioning but may have been hesitant to address the issue in the absence of a coherent framework. Although developmental and behavioral specialists have led the way by including environmental elements in treatment plans, no unifying framework has been present. The ability to describe the impact of these settings on child functioning can be a significant contribution to the practice and science of work with children and youths. Whether the assessment is completed by parent, child, or practitioner, the opportunity for classifying and

Impairment	Activities	Participation	Environment
Attention b1400	Focusing d160	Excluded from social activities d750	Access to health care e5800
Impulse control b1304	Carrying out multiple tasks d2200	Poor grades d820	Medication e1101 Classroom e330

**FIGURE 2.** Attention-deficit hyperactivity disorder International Classification of Functioning, Disability, and Health (ICF) dimensions and codes.

Functional characteristics of Autism Spectrum Disorder/Pervasive Developmental Disorder  
with applicable ICF dimensions and codes

<u>Impairments/delays</u>	<u>ICF codes</u>
Social interaction	d710-729 interpersonal interactions
Communication	d310-329 communication
Rigidity	d235 managing one's behavior
Repetitive, stereotyped behavior patterns	b147 psychomotor functions
Intellectual level	b120 cognitive functions
Attention	b140 attention functions

**FIGURE 3.** Functional characteristics of autism spectrum disorder/pervasive developmental disorder with applicable International Classification of Functioning, Disability, and Health (ICF) dimensions and codes.

coding environmental factors on functioning opens another crucial clinical dimension.

### Policy

The National Committee on Vital and Health Statistics recently concluded that health care and health policy must broaden their focus from a disease base to include an emphasis on the health and well-being of the population, including minimizing loss of function.<sup>12</sup> This committee represents issues across the age spectrum, including children and youths. The committee acknowledged that there is currently no common language or framework for addressing functional differences or changes in health settings. If the transition toward function and health is to occur, health practitioners, teachers, and therapists will need a common framework and language with which to communicate. The ICD serves that function for disease cause and medical issues. The ICF provides a second language for all frontline professionals to adopt to communicate effectively about functional status and changes. At this juncture, it would be foolhardy to believe that each discipline will change its idiosyncratic terminology—medicine, physical therapy, psychology, and occupational therapy, for example. It is reasonable, however, that a second language be a part of the interaction among professionals across settings so that intervention efficiency can be increased. With a common language, professionals would know that their colleagues might be working on interventions addressing functioning in the same or different dimensions as themselves. In the example of attention-deficit hyperactivity disorder, a pediatrician might be prescribing medication to affect the impairment of inattention, whereas a psychologist might be using behavior therapy to improve in-seat behavior and a teacher is focusing on social integration in the classroom. Although these interventions might be concurrent, communication among the professionals may be lacking. Using a common framework and language can substantially improve clinical efforts. Using the ICF-CY will allow professionals and parents to frame problems and identify potential interventions. Using a common language may

allow gaps in service to be identified more readily and treatment plans can be more readily generated.

The same National Committee on Vital and Health Statistics report noted that the ICF is the most viable candidate for classifying and coding functional information for patient encounters. Clinicians from several countries have begun to examine the use of the ICF in clinical settings, cross-referencing commonly used ICF codes to ICD codes in various adult medical specialties. Stucki et al<sup>13</sup> have applied the ICF in rehabilitation medicine. Stucki et al<sup>14</sup> have recommended the development of ICF condition-specific core sets. The goal of this approach is to select sufficient ICF codes to cover the major functional descriptors associated with a specific condition, balancing comprehensiveness with practicality. With the movement toward electronic records, the opportunity to include functional status during routine health, education, and social service encounters is imminent. More importantly, electronic records will make ICD and CPT coding easier, opening the possibility of ICF coding. ICF classification and coding can provide integrated data across systems.

The American Psychological Association is currently working with the World Health Organization (WHO) to create a clinical manual for the ICF.<sup>15</sup> This is a multidisciplinary effort, meticulous in its content, but in the developmental stage. Recommendations have been completed for six chapters, with the remaining activities and participation chapters in process.

### Research

The utility of the ICF as a foundation for research is only beginning. A recent volume of the international journal *Disability and Rehabilitation* was dedicated to articles highlighting the use of the ICF in various research and clinical settings, including the development of the ICF-CY.<sup>16</sup> Ceiza et al<sup>17</sup> have linked health-status measures to the ICF, developing rules for linkage and providing examples. The SF-36 was chosen as the health status measure, showing that 51 concepts are embedded in the 36 items, and 11 of the items were not definable using strict ICF codes.

These items were associated with general health issues, such as self-reported health or those addressing personal factors. The authors concluded that since the ICF “provides a common language for clinical practice, teaching and research, it will probably become the cardinal reference for existing health-status measures, as well as for health-status measures to be developed in the future.” Simeonsson et al<sup>18</sup> have indicated the need for measures to evaluate functioning among children for use globally. Given the disproportionate prevalence of disability in developing countries, with childhood disability presenting the significant challenge, brief tools for the purpose of screening are particularly important.

In addition to the work in other countries described earlier, several projects have been implemented in the United States. Coster and Haltiwanger<sup>19</sup> at Boston University are developing measures of personal and societal functioning of children. Latham and Haley<sup>20</sup> have reported the challenges of developing outcome systems to measure function across post-acute settings. Simeonsson et al<sup>18</sup> have developed measures of two dimensions of the ICF for children and youths—societal participation and environment, specifically focusing on school participation and the school environment.

Public health use of the ICF is highlighted by several efforts. In a report of the Australian Institute of Health and Welfare, the role of the environment and the use of technical aids are explored, indicating that children younger than 15 years of age use mostly medical, self-care, and communication aids.<sup>21</sup> Fedeyko and Lollar<sup>22</sup> used the ICF to organize prevalence rates of activity limitations from the National Health Interview Survey, 1994–1995. Learning limitations were found to have the highest prevalence (9.4%) among children 5–17 years of age, followed by communication (4.8%) and behavior limitations (4.6%). A second survey from the Maternal and Child Health Bureau addressing the needs of children with chronic conditions will include a list of ICF functional impairments and activity limitations. The pilot findings suggest that the functional descriptors will increase our understanding of important characteristics of children with special health care needs and chronic conditions.

Finally, integrating the ICF terminology into other frameworks, such as Systemized Nomenclature of Medicine Clinical Terms or the National Library of Medicine’s Unified Medical Language System is a continuing effort that will facilitate the capturing of functional status data for both clinical and public health activities.

### Training

Essential to the adoption and broader use of the ICF are dissemination of the system and training of potential users. A number of efforts are already under way in this regard. The WHO North American Collaborating Center with US and Canadian members has instituted online training housed at the University of California, Irvine. CodeICF provides an introduction to the conceptual, classification, and coding conventions of the system.<sup>23</sup> This program can be accessed at <http://westernu.edu/icftraining/>.

The Italian Disability Network has implemented nationwide training with a basic 8-hour course and a 3-day advanced course with distance learning during the following 3 months, ending with a 1-day evaluation and examination. Each student codes 10 preassigned cases as well as completes coding of five cases with whom the practitioner works (M. Leonardi, personal communication, 2004).

Two projects in The Netherlands are linking the ICF to the ISO9999, the international classification of technical aids. The goal of the projects is to study the relationships between the two classification systems so as to highlight the importance of assistive technology as disability policy evolves globally. Thus, the ICF will provide functional description, and the ISO9999 provides the coding for prostheses and orthoses, for example, of lower limb impairments.<sup>24</sup> Of course, this activity includes devices for children and youths.

Over time, inclusion of the ICF as part of clinical training experiences in addition to classroom exposure to the concepts, classification, and coding will be the litmus test of its potential. Just as each discipline acculturates its students into the assessment regimens (including the ICD), interventions, mores, and folkways associated with its profession, the ICF-CY will need to be integrated into this process. Students have the capacity to learn and assimilate much material. It is the mature professionals who must begin to experiment with this new system to faithfully transmit it to younger professionals in training.

### LIMITATIONS AND DIRECTIONS

The development of the International Classification of Diseases (ICD) began in the mid-1800s. Its original conceptual framework was debated from the 1850s until the 1880s—decisions about describing causes of death by nature of the disease (e.g., herpetic, gouty) versus the kind of disease (general, violence related, specific anatomical site). It continued primarily as a classification of causes of death until the mid-1900s when it was broadened to include morbidity and then became a system for health care information. The ICD has been developing and maturing during the past 150 years. One limitation of the International Classification of Functioning, Disability, and Health (ICF) and ICF for children and youths (ICF-CY) is that it has only begun the maturation process. The ICF complements the ICD by classifying dimensions of health and providing substantial conceptual strengths, including neutrality of terms, applicability across cause and age, documentation of environmental influence, and an emphasis on functioning and disability as universal phenomena.

Although these conceptual strengths are substantial, the ICF and the ICF-CY are not without limitations. The conceptual notions and coding guidelines for capacity and performance as qualifiers need to be clarified. The meaning and numeric values of the qualifiers for activities/participation are not clear and may need revision as experience with the classification continues.

A second limitation relates to the use of established terms in new ways, leading to confusion about the use of basic terms impairment and disability in the paradigm. These

terms are often used quite differently clinically. Impairment and disability are analogous terms in the DSM and ICF. That is, the intent is that their use be generic, covering dimensions reflective of the totality of a person's experience. Too often, however, impairment is used by mental health practitioners to describe the societal outcomes of a condition. An impaired psychologist connotes one who is unable to work effectively due to a problem related to drug use, alcohol, or emotional problems. This societal restriction is termed participation in the ICF, although impairment in the ICF indicates body function or structure problems only. Although the World Health Organization (WHO) coordinating centers are working to resolve the different use of terms for the WHO family of classifications (including ICD and ICF), it is important for researchers to clearly identify their use of the terms in research.

Two problems with application of the ICF-CY in clinical settings are currently being addressed. First, there will need to be a clear cross-referencing of current measures of child function with the codes in each ICF dimension. This activity was referenced earlier but will require substantially more effort to align codes with tests. Ogonowoski et al<sup>25</sup> recently completed a study of 60 children to determine the reliability of activity/participation codes using standard instruments such as the Vineland Adaptive Behavior Scales, the Pediatric Evaluation of Disability Inventory, and the School Function Assessment. Data indicated that self-care items showed the highest reliability across tools, followed by the domains of learning and mobility, using the Vineland Adaptive Behavior Scales. The authors concluded that items that are based on developmental milestones and attached to a single ICF code provided the highest reliability.

Other instruments, for example, the 18 items of the Functional Independence Measure, can be coded cleanly in the activities/participation domains. Social interaction/cognition, on the other hand, might require several codes crossing dimensions—body function, for example, coding for memory and activities/participation for social interaction. Problem solving can be coded using either a body function or an activities/participation code. The Wechsler scales measuring intelligence, as another example, can be coded globally in the body function dimension, but codes for many of the subscales in that dimension are lacking. Indeed, coding these subscales might most clearly be covered under the activities/participation dimension, for example, the arithmetic subscale.<sup>26</sup> Conventions for these problems are being developed but will need continuous attention for the foreseeable future.

A second issue is the extent of coding for each dimension. For the purpose of research, all difficulties experienced by an individual across ICF dimensions (body structure, body function, activities/participation, and environment) may be of interest for coding. In settings where a team is present, there may also be the potential for each discipline to focus on specific domains and complete an entire profile of functioning. Most clinicians in the United States, however, clearly do not have the time or resources to carry out such pervasive coding. It may be that only the most salient dimensions and codes will need to be coded. To fulfill this task, it will be

important for disciplines and specialties to decide the most useful dimensions of information to have collected and by whom. For example, a starting point might be that independent clinicians code only ICF-CY person-level activities and their qualifiers associated with specific ICD or DSM codes. Those might be combined with other evaluations to provide a full profile. In addition, standardized questionnaires completed before the encounter by parents could capture information on the child's level of societal participation and environmental barriers and facilitators and provide important information for the interaction. Certainly, electronic records will make this exercise easier, especially as information can be relayed directly from a waiting room questionnaire into a clinician's laptop computer or personal digital assistant. Of course, reimbursement will also be a pivotal issue in the clinical utility of the ICF-CY in the United States, different from other countries. Just as payment was tied to codes, not written descriptions of diagnoses and procedures beginning about 25 years ago, so the inclusion of functional codes must be tied to reimbursement. The utility of function codes on patient encounter forms, in addition to diagnosis and procedures, for risk adjustment and treatment effectiveness will soon be piloted by clinicians and third-party payers.

In summary, several directions can be projected for further work. It will be important to balance progress with naturally occurring expectations for a newly evolving system. Overall, it is important to educate professional organizations (e.g., nurses, social workers, physicians, psychologists, educators), government agencies (e.g., Health and Human Services, Health Resources and Services Administration, Substance Abuse and Mental Health Services Administration, National Institutes of Health), and advocacy groups, such as Family Voices and Consortium of Citizens with Disabilities about the utility of the ICF-CY on behalf of children and youths. Specific directions include (1) using ICF-CY terminology in cross-discipline interactions, continuing to develop comfort with the new language; (2) mapping existing functional measures and surveys to ICF-CY codes, with particular attention to how the exercise may affect psychometric properties of the tools; (3) developing valid and reliable measures that more closely correspond to ICF-CY functional dimensions; (4) implementing ICF-CY training in professional programs across disciplines; (5) determining the most salient dimensions and codes for use by discipline and/or condition and/or setting to improve coherence.

## CONCLUSION

*Children's Health, the Nation's Wealth: Assessing and Improving Child Health* is the recent report of the National Research Council and the Institute of Medicine.<sup>27</sup> The report suggests a need for a broader range of data on functioning across physical, cognitive, emotional, and social domains. The report recommends that these data elements "would be enhanced by adoption of the ICF, as it becomes better known by practitioners and survey organizations." It further suggests that the system is able to identify elements of participation in daily activities and evaluate environmental

barriers that facilitate or hinder functioning. The report suggests that International Classification of Functioning, Disability, and Health (ICF) needs to be adapted for use in

clinics and surveys. For pediatric applications, the ICF for children and youths will address the same possibilities and challenges.

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