

# Application of the ICF in Aphasia

**Nina Simmons-Mackie, Ph.D., BC-NCD,<sup>1</sup> and Aura Kagan, Ph.D.<sup>2</sup>**

## ABSTRACT

The aim of this article is to describe aphasia using the framework provided by the World Health Organization's International Classification of Functioning, Disability and Health (ICF). The key constructs of ICF are described in relation to the ultimate goal of intervention in aphasia—maximizing quality of life. Aphasic impairments as well as activity limitations and participation restrictions are discussed. In addition, the impact of contextual factors on the experience of aphasia and participation in life are addressed. Finally, a case example is presented to depict the use of the ICF as an organizational framework for approaching management of impairments and consequences of aphasia.

**KEYWORDS:** Aphasia, ICF, assessment, intervention, outcome

**Learning Outcomes:** As a result of this activity, the reader will be able to discuss how the ICF can organize and improve the understanding, assessment, and management of adult aphasia.

Adult aphasia is an acquired language disorder that affects about one million people in the United States.<sup>1</sup> The most prevalent cause is stroke, although there are other causes of aphasia, such as brain trauma or tumor. Conceptions of aphasia have been influenced by the World Health Organization's International Classification of Functioning, Disability and Health (ICF).<sup>2</sup> This classification defines disability in terms of multiple dimensions including Body Structure and Function, Activities

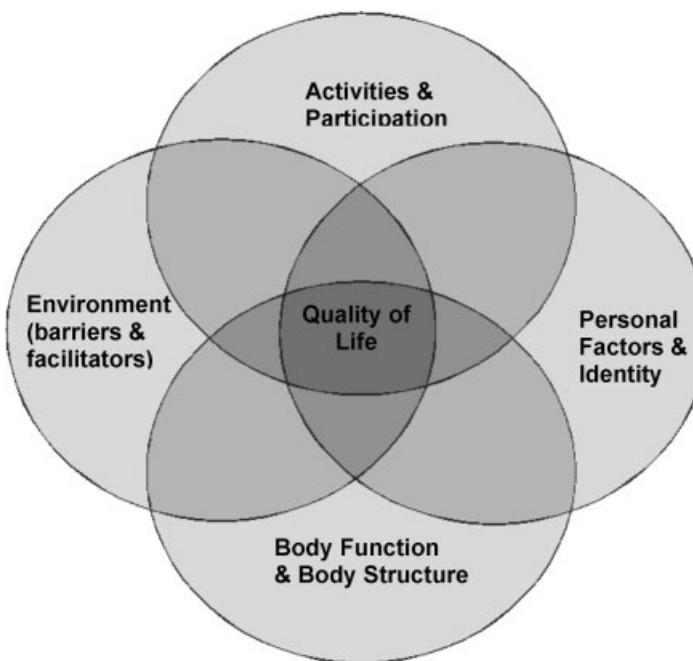
and Participation, and Personal and Environmental Context. Kagan et al<sup>3</sup> have adapted the ICF into a schematic that highlights quality of life (QoL) as a central feature for people affected by aphasia (Fig. 1). The schematic, called the Framework for Outcome Measurement (FROM), illustrates the way ICF domains dynamically interact and overlap to create QoL. This article discusses applications of the ICF in assessment and intervention geared toward maximizing QoL with aphasia.

<sup>1</sup>Professor and Scholar in Residence, Department of Communication Sciences & Disorders, Southeastern Louisiana University, Hammond, Louisiana; <sup>2</sup>Executive Director and Director of Education and Applied Research, Aphasia Institute, Toronto, Ontario, Canada.

Address for correspondence and reprint requests: Nina N. Mackie, Ph.D., 580 Northwoods Dr., Abita Springs, LA 70420 (e-mail: nmackie@selu.edu).

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**Figure 1** Framework for Outcome Measurement (FROM).<sup>3</sup> (From the Aphasia Institute, Toronto, Ontario, Canada, with permission.)

## DESCRIBING APHASIA ACCORDING TO THE ICF

### Aphasia and Impairments

Traditionally, aphasia has been defined in terms of impairments of body function and structure. For example, Darley<sup>4</sup> defined aphasia as a multimodality impairment of the

capacity for interpretation and formulation of language symbols, due to brain damage, and disproportionate to impairment of other intellectual functions. Thus, impaired language processing or related cognitive functions have been central to defining aphasia (coded under Mental functions as b16, Language; b14, Verbal memory; and b140, Attention). Aspects of impaired language within the Body Functions domain might include difficulty in naming, difficulty in producing correct and complex syntax, or difficulty in reading or writing single words (Table 1). The brain is the involved Body Structures component (coded under Structures of the nervous system as s110, Brain). Aphasia is associated with specific sites of brain damage (with specific codes available for relevant brain regions), and aphasia classifications are often linked to observable impairments as well as particular lesion configurations (e.g., left superior temporal gyrus for Wernicke aphasia).

**Table 1 Examples of Impairments of Body Function Associated with Aphasia**

Behavior	Impairment label
Difficulty with word finding	Anomia
Difficulty constructing syntactically accurate sentences	Agrammatism/paragrammatism
Difficulty comprehending written words or sentences	Aphasic alexia
Difficulty writing words, phrases, or sentences	Aphasic agraphia
Difficulty attending to auditory-verbal information	Attentional deficit
Difficulty understanding spoken words, phrases, or sentences	Auditory comprehension deficit

### Aphasia and Activities and Participation

Given that communication is required for most daily activities, the impact of aphasia

on functions of everyday life can be significant. Researchers have described activity limitations in aphasia and noted that individuals vary in the types of activities in which they engage.<sup>5</sup> Similarly, participation in life situations and social roles is affected by aphasia. For example, social isolation, loss of employment, and reduced leisure activities have been reported.<sup>6,7</sup> Table 2 provides hypothetical examples of activity limitations and participation restrictions in aphasia. Participation restrictions occur for caregivers of people with aphasia as well.<sup>8</sup> Most importantly, social participation is related to subjective QoL.<sup>9</sup> For example, relationships, autonomy in self-care, leisure, and family roles appear to be important to life quality. In fact, in a study of QoL in aphasia, Ross and Wertz<sup>9</sup> concluded that, "Therapy that focuses on situation-specific communication and societal participation appears to be most appropriate for enhancing the QoL of people with chronic aphasia."

### Aphasia and Contextual Factors

The ICF has raised awareness of environmental factors that facilitate or impede body function as well as participation.<sup>10</sup> Access and inclusion for people with aphasia have received considerable interest, and physical, psychological, and communicative access figure prominently in current conceptions of QoL in

aphasia.<sup>11</sup> Environmental Factors influence access to services, opportunities, and information.<sup>11-13</sup> For example, availability of Products and Technology (e1) such as augmentative communication resources, appropriately designed signage, internet design, and printed material can markedly affect communicative access for people with aphasia.<sup>13</sup> In the realm of Support and Relationships (e3), skill of conversation partners and Attitudes (e4) regarding aphasia can markedly affect communication of people with aphasia.<sup>14</sup> Services, Systems, and Policies (e5) also affect participation. For example, policies and organizational culture influence inclusion or exclusion of people with aphasia from participation and decision making.<sup>15,16</sup>

Personal Factors are defined in the ICF as inherent aspects of the individual, including demographic factors such as age, gender, or culture as well as nondemographic traits such as personality, identity, and self-esteem.<sup>10</sup> Factors such as age, education, and general intelligence are relevant when considering prognosis in aphasia. Nondemographic personal traits are not attributable to pathology (i.e., not health conditions)<sup>10</sup>; yet, these factors constitute important influences on life after the onset of aphasia. For example, personal identity or self-esteem can be negatively impacted by aphasia and affect one's willingness to engage in communication.<sup>17-19</sup>

**Table 2 Examples of Activity Limitations and Participation Restrictions in Aphasia**

ICF Categories	Examples of Activity Limitations	Examples of Participation Restrictions
General tasks and demands (d2)	Difficulty calling for help in an emergency	Does not manage daily tasks under stress
Communication (d3)	Difficulty asking questions; difficulty saying what you feel	Minimal engagement in social life via conversations
Self-care (d5)	Difficulty understanding medication schedule	No longer manages own health care
Domestic life (d6)	Difficulty following a written recipe; difficulty reading laundering instructions	Does not fulfill role as homemaker
Interpersonal interactions and relationships (d7)	Difficulty initiating contact with a friend	Restrictions in making and keeping friends
Major life areas (d8)	Difficulty filling out job applications	Does not hold a job
Community, social, and civic life (d9)	Difficulty bidding in a bridge game	No longer participates in preferred leisure activities

## ASSESSMENT OF APHASIA AND THE ICF

Aspects of Body Functions including various language modalities and tasks have been the prevailing targets of traditional aphasia assessment.<sup>20</sup> Aphasia tests such as the Western Aphasia Battery<sup>21</sup> or the Psycholinguistic Assessment of Language Processing in Aphasia<sup>22</sup> provide information on the pattern and severity of aphasic impairments. Traditional aphasia tests cover components of language considered vulnerable in aphasia, such as word finding, auditory comprehension, reading, and writing. Assessment at the level of Activities and Participation often entails observation of the individual in actual life situations or interviews with the person with aphasia or others. Functional assessment in aphasia has traditionally involved consideration of daily tasks such as exchanging greetings or calling for help. An example of a functional assessment tool that measures aspects of activities is the American Speech-Language-Hearing Association Functional Assessment of Communication Skills.<sup>23</sup> Assessment at the level of Activities also might involve various measures of discourse used to quantify and describe components of daily communication such as production of speech acts, narratives, jokes, or stories. Assessment of Participation requires appraisal of a person's fulfillment of life habits or relevant life roles. As yet there are few measures designed for participation assessment in aphasia.<sup>24</sup> Qualitative assessment (e.g., observation, interviews, informant diaries) has been used to obtain information on life participation including who a person interacts with, what they do, and where they go.<sup>25</sup> This information helps to determine disparity with desired levels of participation, changes in participation due to aphasia, and targets for participation-focused intervention.

Interviews and observations can also provide information on barriers and facilitators within a person's environment; these can be documented using the ICF checklist of Environmental factors.<sup>2</sup> Information from interviews or social histories help document sociodemographic Personal Factors, whereas a variety of tools assess socioemotional Personal Factors in aphasia, such as the Visual Analogue Self-Esteem Scale<sup>26</sup> and the Burden of Stroke

Scale (BOSS) Communication-Associated Psychological Distress scale.<sup>27</sup>

## Assessment of QoL

Although the authors of the ICF have urged that links be established between the ICF and QoL measurement,<sup>2</sup> QoL is not captured in the current ICF framework. However, the FROM<sup>3</sup> explicitly includes QoL as an important outcome realm. Examples of measures of QoL or related constructs that have been used in aphasia include the BOSS<sup>28</sup> and the Stroke and Aphasia Quality of Life Scale-39.<sup>29</sup> A tool that is currently in development, the Assessment for Living with Aphasia,<sup>30</sup> is an aphasia-friendly self-report measure that assesses ICF domains in relation to QoL in aphasia.

## APHASIA INTERVENTION AND THE ICF

The following sections describe interventions that fit within the key constructs of the ICF. Although an intervention might involve work within a particular domain, outcomes are not necessarily restricted to the category of intervention. For example, Elman and Bernstein-Ellis<sup>31</sup> studied participation-oriented intervention (group conversation therapy) and found that treated group members improved on measures of body function (language impairment). Thus, interventions within one realm might affect outcomes in other realms, suggesting the need for cross-domain assessment.

### Intervention for Aphasic Impairments

Most of the aphasia intervention literature addresses the level of Body Functions. Aphasia treatment research suggests that people with aphasia who receive treatment designed to reduce language impairments improve to a greater extent than untreated individuals.<sup>32,33</sup> Treatments targeting Body Functions impairments include language stimulation therapies<sup>34</sup> and treatment based on psycholinguistic or cognitive neuropsychological models of language.<sup>35,36</sup> In addition, aphasia treatments targeting specific processes or modalities have been offered (Table 3). Computers have also

**Table 3 Examples of Interventions Targeting Body Functions**

Intervention	Body Functions Targeted
Multimodality language stimulation <sup>34</sup> ; cognitive neuropsychological treatments <sup>36</sup>	To improve language processing in general
Semantic therapy <sup>47</sup> ; semantic feature analysis <sup>48</sup> ; contextual priming <sup>49</sup> ; semantic complexity training <sup>50</sup>	To improve word finding
Verb treatments <sup>51</sup>	To improve word finding and sentence production
Syntax training <sup>52</sup> ; mapping therapy <sup>53</sup>	To improve sentence production
Melodic intonation therapy <sup>54</sup> ; constraint-induced language therapy <sup>55</sup>	To improve spoken language
Model based treatment of reading and writing <sup>35</sup>	To improve reading and/or writing

been used to improve language in aphasia.<sup>37</sup> Treatment timing and intensity have been identified as critical outcome variables affecting outcome in aphasia.<sup>38</sup> Table 3 provides examples of treatments designed to ameliorate aphasic impairments.

Although direct procedures for modifying brain structures (e.g., aneurysm repair) are not within the purview of the speech-language pathologist, many aphasia therapies are based on research suggesting that treatment helps reorganize brain function, promote dendritic branching, and enhance brain recovery.<sup>32</sup>

### **Intervention for Activity Limitations and Participation Restrictions**

Functional communication treatment in aphasia originated with the early work of Sarno<sup>39</sup> and Holland,<sup>40</sup> who advocated for attention to relevant daily activities. Since then, social and life participation approaches<sup>8,41-43</sup> have gained increasing visibility. These approaches target all ICF domains and are designed to promote engagement in relevant life situations, and often include explicit and direct work on Activities and Participation. For example, a participation-based intervention designed to facilitate return to teaching for a college professor with aphasia involved working directly on methods of delivering lectures and employing various augmentative supports within the classroom.<sup>44</sup> Table 4 provides examples of a variety of intervention approaches that focus explicitly on promoting performance of activities and engagement in life.

### **Intervention for Contextual Factors**

The purpose of intervening at the level of the external Environment is to remove barriers to participation and provide a context that facilitates individual function, autonomy, and well-being. The ICF framework and FROM<sup>3</sup> adaptation have helped organize and clarify treatment approaches. For example, arguments in favor of communication partner training are clarified when we explain that this therapy targets the communicative environment (external support) to improve communication of the person with aphasia.<sup>14</sup> Environmental intervention might target the immediate environment of a person with aphasia (including physical, attitudinal, and social factors), or the environment at large (e.g., increasing communicative access in health care, employment, or government for all people with aphasia). Table 5 provides examples of environmental interventions across the ICF environment categories.

It is unlikely that one can change Personal demographic traits; nevertheless, recognizing factors that influence function help to provide insight into external factors that might be adjusted. For example, a 19-year-old male with aphasia posttrauma who resides in a nursing home with elderly individuals will find limited access to satisfying age-appropriate social interactions. Although intervention might involve changing residential placement (i.e., the environment), awareness of Personal Factors helps to orient management and demonstrates the interaction of Personal and Environmental Factors.<sup>10</sup> Thus, factors such as culture, ethnicity, religion, age, and gender might affect communication and social participation for

**Table 4 Examples of Interventions at the Level of Activities and Participation**

Intervention Approach	Intervention Targets	Example of ICF Category
Compensatory training	Learn strategies for engaging in communicative interactions	Increase participation in conversation (d350)
AAC; supported conversation for adults with aphasia <sup>56</sup>	Learn to use resources, devices, or other communication supports	Increase participation in employment (d850); Increase participation in conversation (d350)
Conversation therapy <sup>31,41,57</sup> ; scaffolding <sup>58</sup>	Improve conversation and other communication genres (e.g., story telling, joking, instructing)	Increase participation in conversations (d350); Increase friendships (social relationships) (d750)
Context based treatment <sup>59</sup> ; script training; conversational coaching <sup>60</sup> ; activity-focused intervention <sup>41,42</sup>	Practice elements of specific activity or event (e.g., reading scorecard, bidding in bridge)	Increase participation in a favored leisure pastime (d920)
Reciprocal scaffolding <sup>61</sup>	Work on performance within a natural context	Increase job performance (d850)
Aphasia book club <sup>62</sup>	Engage in scaffolded and supported reading activities	Increase participation in reading for pleasure (d920)
E-mail training	Work on functional use of E-mail with spell check	Increase communication (d3) with friends and relatives

AAC, augmentative and alternative communication.

people disabled by aphasia. In addition, aspects such as personal identity or self-esteem can markedly affect one's willingness to engage in communicative encounters or participate in life situations. Psychosocially oriented interventions such as counseling,<sup>45</sup> working on identity or self-advocacy,<sup>8,19</sup> or using group therapy to

enhance self-esteem<sup>46</sup> have gained increasing attention in the aphasia literature.

### Intervention to Enhance QoL

Given that QoL is a dynamic interaction of multiple factors, intervention to enhance QoL

**Table 5 Examples of Intervention Focused on Reducing Environmental Barriers and Increasing Environmental Support for Communication in Aphasia**

Intervention	Category of Environmental Factors
Designing AAC devices <sup>63</sup> or communication resources <sup>56</sup>	Products and technology: products for communication (e125)
Eliminating distracting noise during conversations	Natural and human-made environment: sound (e250)
Training communication partners to facilitate and support communication	Support and relationships: Immediate family (e310); Friends (e320)
Training of hospital personnel to facilitate decision making with people with aphasia <sup>16</sup>	Support and relationships: health professionals (e355)
Sensitivity training and education regarding aphasia for nursing home personnel	Attitudes: Health-related professionals (e450), Personal care providers and assistants (e440)
Working with representatives of the Bar Association to insure legal procedures facilitate justice for people with aphasia	Services, systems, and policies: Legal services, systems, and policies (e550)

AAC, augmentative and alternative communication.

is likely to involve a holistic approach that focuses on aspects of Impairment, Activities and Participation, Environment, and Personal Factors that most affect the individual's well-being. For example, training a person with aphasia to use total communication often requires partner training to support communication. In addition, education of others might be necessary to promote positive attitudes that in turn affect the communicative confidence of the person with aphasia. Thus, appreciation of the multiple interdependent domains contributing to QoL is more likely to ensure a successful treatment outcome.

### CASE EXAMPLE

Ellie, a 55-year-old, right-handed, African American woman, began therapy at a university clinic 1 year after stroke. She had moderate impairments (Broca's aphasia and apraxia of speech) based on assessment with the Western Aphasia Battery<sup>21</sup> and motor speech evaluation. Interviews revealed that Ellie lived at home with her husband. Prior to onset, Ellie ran a small home business using computer publishing software and was active in her church choir. However, since the onset of aphasia, Ellie experienced severe activity limitations and participation restrictions. Ellie's husband and friends protected her by removing responsibilities and avoiding activities. Thus, overprotection and attitudes of others proved to be significant environmental barriers to life participation. Assessment of personal factors (including socioemotional factors and identity as per the FROM model) revealed a recurring theme: Ellie's feelings of incompetence and dependence. Emotional issues such as these are often socially relative; that is, innate levels of confidence, optimism, and personal identity are influenced by social environment and performance. When confidence and self-esteem diminish, as in Ellie's case, personal barriers to participation are created. For example, Ellie's friends warned her that singing in the choir might be too difficult for her; she began to question her own ability to sing and avoided this favored activity.

Ellie's activity limitations and participation restrictions appeared greater than one

might expect given her impairment (e.g., Western Aphasia Battery scores). This mismatch appeared to be due in part to Ellie's environment—particularly the knowledge and attitudes of those around her, as well as internal personal barriers in the form of low self-esteem and fear of failure. Therapy for Ellie focused on (1) improving expressive speech and language, (2) gaining requisite communicative skills to undertake specific household duties, (3) learning compensatory strategies to engage in interactions, (4) returning to choir activities, and (5) reducing barriers to participation. Intervention included melodic intonation therapy to address expressive impairments, partner and dyad training and counseling to help eliminate attitudinal and skill barriers imposed by her husband and close friends, and aphasia group therapy to build conversational skill and confidence. In addition, a music student at the university was recruited to work on professional voice training with Ellie as a first step toward gaining confidence to return to her choir.

After 9 months of intervention, Ellie had improved, but she continued to demonstrate mild to moderate impairments. However, Ellie no longer avoided communication. She readily initiated topics and repaired breakdowns when interacting with her husband and friends. She returned to choir activities and took charge of domestic activities at home. In fact, Ellie discharged herself from therapy because she was too busy. Although she no longer participates in therapy, Ellie returns to the university to sing for the aphasia class and describe her experiences. She no longer experiences significant activity limitations or participation restrictions, and her identity and socioemotional personal factors (self-esteem and confidence) have improved markedly. She reports that she feels engaged in life despite residual aphasia and apraxia of speech.

### CONCLUSION

People affected by aphasia (including caregivers) deserve intervention that promotes meaningful and positive life changes. The ICF and the FROM<sup>3</sup> adaptation highlight the interdependence of each person and his or her unique

context, and increase our appreciation of the need to approach aphasia management from a holistic perspective. By considering the dynamic interaction of key ICF constructs on life quality, we move toward more effective outcomes for those affected by aphasia.

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