

Right Hemisphere: Communication and Cognitive Issues

1. <https://www.righthemisphere.org/cognitive-thinking-deficits> newest site. I think dependable – 2 college professors
2. http://www.medlink.com/article/right_hemisphere_language_disorders more in depth look -
3. <https://www.sralab.org/academy/bookstore/ric-evaluation-communication-problems-right-hemisphere-dysfunction-3-rice-3> the RICE assessment
- 4.

Here is the info for #4. Above :

For most people, the right hemisphere is the non dominant hemisphere for speech and language. Individuals who are right hemisphere dominant are usually left handed or ambidextrous. (Only about 15% of left handed persons are right hemisphere dominant for speech and language). Because the right hemisphere usually plays only a secondary role in language processing, patients were not routinely treated by speech-language pathologists until recently. It is currently recognized that, while RHD patients do not typically have the types of language problems seen in aphasia, they frequently have both communicative and cognitive deficits which can be addressed in speech/language therapy. There are some similarities between closed head injury and right hemisphere lesions.

It should be noted that fewer statements about site of lesion can be made concerning the impairments associated with right hemisphere damage (RHD) than in regard to the aphasic syndromes caused by left hemisphere damage. This is the case because relatively little is known about localization of function in the right hemisphere. According to Brownwell et al. (1995), some believe that the right hemisphere is "less focally organized" than the left.

Deficits Associated with Right Hemisphere Damage

According to Myers (1994), impairments of **perception** and **attention** are the underlying causes of the extra-linguistic, linguistic and nonlinguistic deficits manifested by patients with RHD. According to Love and Webb (2001), neglect, inattention and denial are three major characteristics of right hemisphere syndrome. They are also characteristics of executive function difficulty. Marshall et al., 1998.

Linguistic Deficits

As stated above, right hemisphere patients typically do not have the kinds of language problems seen in aphasia. However, as some do have specific linguistic problems, RHD patients should be given an aphasia battery like the Boston. RHD patients might display deficits on the following Boston subtests: Responsive naming-patients give one word answers to spoken questions. Difficulty with auditory comprehension may effect results. It is important that naming is tested using several modalities. The following sub-tests may be useful also:

Visual confrontation naming is used on the Boston naming test. e.g. patients are asked to name pictures.

Body Part Naming

Auditory Comprehension of Complex Material

Word Fluency

Writing (RHD patients may substitute or omit graphemes)

Auditory comprehension of difficult material

Oral sentence reading

(Myers and Mackisack, 1990, in LaPointe, 1990)

Extralinguistic Deficits

Again, RHD patients are unlikely to display the kinds of phonological, syntactic or semantic problems associated with aphasia. However, although they do not typically have many specific language problems, they definitely have difficulty communicating. This impairment seems to follow from an inability to integrate information; RHD patients apparently do not make adequate use of context in their interpretations of linguistic or nonlinguistic messages. They have difficulty distinguishing significant from unimportant information. For example a patient of mine when asked to describe the "Cookie Theft" picture card from the Boston focused on irrelevant features without describing the overall picture. Some aphasics with typical left hemisphere lesions present with executive function disturbance similar to right hemisphere syndrome.

Literal Interpretations

RHD patients may be able to comprehend only the literal meaning of language. Thus, they will often fail to understand many jokes, metaphors, irony, sarcasm, and common sayings that include figurative language. For example, if an RHD patient hears someone say that they are about to "hit the ceiling," he might assume that the person is really about to begin striking the ceiling. Such a patient may also have trouble understanding indirect requests. For example, if he is asked if he "could open the window," he may fail to identify this as a polite request and simply answer "yes" rather than opening the window.

These problems with figurative language may be viewed as one manifestation of the inability to base interpretations on context.

Difficulty identifying relevant information

When listening to a conversation or reading, an RHD patient may fail to abstract the main point contained in the information being shared. This happens in spite of the fact that, unlike an aphasic, the patient can understand all the individual words and grammatical structures used. For RHD patients, it appears that their comprehension of everyday language is impaired by a failure to distinguish important information from irrelevant detail and also by an inability to integrate. According to Blake 2007, RH patients have difficulty comprehending non-literal language, humor, and multiple interpretations. Furthermore, Blake says that their difficulty with language production includes: impulsivity, inefficiency, and egocentricity. She also says that the same problems are seen in traumatic brain injury.

Inability to interpret body language and facial expressions

In a conversation, RHD may miss out on important cues that should tell them about the emotional state and true intention of the person with whom they are interacting. This inability to interpret body language and facial expression may be related to an overall failure to use context in the interpretation of individual pieces of information. Problems with the interpretation of facial expression may also be due to the fact that RHD patients often fail to maintain eye contact with their conversation partners.

Flat affect

RHD patients may fail to display a wide range of facial expressions themselves. Also their speech is frequently aprosodic, or lacking variations in pitch and stress. Some patients will sound "robot-like," and thus be unable to express emotion or changes in meaning via changes in intonation. These patients will no longer be able to vary pitch to signal the difference between a question and a statement or use word stress changes within a sentence to signal a difference in meaning.

Problems with Conversational Rules

RHD patients may fail to follow conversational rules, including those governing turn-taking, the initiation and closure of a conversation. RHD patients may tend to dominate conversations, as they are frequently verbose. They may also fail to properly estimate levels of shared knowledge, failing to give the listener enough background information to understand their statements. According to Myers and Mackisack (1990), RHD patients appear to not care about the needs of the listener. They, like children in an early developmental phase, may assume too much knowledge on the part of the listener; or not enough. They appear to answer without adequate search for the right answer. They also may fail to pick up on non verbal cues that signal listener's reactions.

Impulsivity

RHD patients may exhibit poor judgment and problem solving abilities. They may require constant supervision due to a tendency to attempt tasks of which they are no longer physically capable. This may be related to anosognosia. They may also exhibit impulsivity in the sense of failing to censor the statements they make to other people.

Confabulation

RHD patients may make untrue statements. These do not usually seem to be deliberate lies. According to Brownwell et al. (1995), this may be the patient's way of responding to his own confusion rather than attempts to mislead the listener

RHD patients may occasionally have hallucinations.

Nonlinguistic Deficits

Disorientation to Time and Direction

RHD patients may exhibit **disorientation to time and direction**. They are usually oriented to person and to place, however. Many hospital patients are somewhat disoriented to time. They may be unable to give the date, time of day, or day of the week accurately. Note that it is important to be reasonable when assessing orientation. It is perfectly normal to miss the day of the week or date by one day and such errors should not be taken as an indication that the patient is disoriented. Sometimes when I am on vacation I may not know the day or the date. We shouldn't expect more of our patients.

RHD patients may also have difficulty following directions or finding their way around a building. They will know where they are in a general sense (e.g., in the hospital), but have trouble finding their way to specific locations (e.g., the dining room).

This deficit, known as [topological disorientation](#), is a product of their general inability to process spatial information. Some patients with left hemisphere parietal lobe lesions have similar problems

Left side neglect

Neglect is a syndrome in which the patient fails to recognize one side of the body and the environmental space surrounding this side of the body in the absence of paralysis and visual problems. Neglect is considered a **deficit in directed attention**. This means that patients demonstrate an inability to be **aware** of stimuli, **attend** to stimuli or **recognize the significance** of stimuli. Neglect may also be described as the inability to orient to stimuli with the purpose of acting upon them. According to Myers (1994, in Chapey, 1994), although neglect may occur with left hemisphere damage (LHD) it is more severe, longer lasting and common with RHD. It can occur with [frontal](#), [temporal](#), and [parietal lobe](#) lesions as well as with some sub-cortical lesions (Myers, 1994).

Patients with neglect may fail to eat food on the left side of their plates, begin reading in the middle of sentences and in other ways seem to completely ignore the neglected side. Some may even cease to identify their left side as part of their own bodies. RHD patients have been known to give their paralyzed left arms names like "the baby" or "the dead one." They might also request that someone remove the other person from their bed, referring to their left side. RHD patients with left neglect may also have difficulty with left side detail in **visuo-constructional tasks**. For example, if drawing a picture or building a model, they might leave out details on the left side. The severity of neglect is usually an indication of the size of lesion and the overall severity of the patient's condition.

Note that RHD patients may have visual deficits including left hemianopsia. This may occur along with neglect or might exist alone and be mistaken for neglect. Scanning behavior may be used to differentiate between left neglect and left hemianopsia. A patient who has hemianopsia without neglect will have difficulty seeing things in his left visual field, but will not ignore his left side. For this reason, such a patient may be observed turning his head to scan the left visual field. On the other hand, a patient who does have neglect will generally make few or no spontaneous efforts to look at things in the left area of his visual field. According to Myers (1994), most theories of neglect consider it a deficit in attention.

At this time, the site of lesion that causes neglect is not known. However, the syndrome is frequently associated with parietal lobe lesions.

As mentioned above, **right side neglect** does sometimes occur in patients with left hemisphere damage. However, it is fairly uncommon. (Right side neglect occurs in approximately twenty percent of patients with left hemisphere damage.) It is also less severe and usually of shorter duration than left side neglect.

Anosognosia

This term first used by Babinski is the failure to recognize the symptoms of one's own illness. RHD patients may deny that they have had a stroke. They may appear to be unaware of their hemiplegia or their cognitive deficits (Love and Webb, 2001). It is not uncommon for right hemisphere patients to state that they are perfectly capable of walking, driving and returning to work immediately despite all evidence to the contrary. Anosognosia may be described as severe denial. The source of this denial appears to be cognitive rather than emotional; it seems as though patients are unable rather than unwilling to recognize their deficits.

Because RHD patients do not fully comprehend the extent of their impairment, they are frequently less depressed than those with left hemisphere damage. This type of executive function difficulty can also appear in aphasic patients with left hemisphere lesions.

Visuospatial Deficits

RHD patients have difficulty processing many types of visual stimuli. These problems are apparently due to an inability to integrate information. RHD patients have trouble with **figure-ground problems, recall of visual forms and mental rotation**, or the ability to imagine how a figure would look if its orientation in space were changed. Constructional apraxia can also be present in patients with RHD. Their drawings tend to be scattered, fragmented, and spatially disorganized (Myers, 1994, in Chapey, 1994). According to Swindell (1988, in Myers, 1994), the drawings of RHD patients may not benefit from a model or from cueing and are not likely to improve over time.

Prosopagnosia, or the inability to recognize familiar faces, is one of the most striking visuospatial processing deficits manifested by RHD patients. This does not represent a difficulty with vision itself. A patient with prosopagnosia is able to describe the features of familiar faces, including eye and hair color, type of nose, etc. An artistic patient will even be able to draw the faces of family members and friends accurately yet be unable to recognize them. Rather, the problem seems to be related to the integration of visual perceptions and their association with information stored in memory. According to Love and Webb

(2001), patients with this disorder usually have lesions in the right occipital-temporal lobe region. Color agnosia is often seen with prosopagnosia.

Here is a longer article on RHemi Problems :

The right hemisphere of the brain participates in many communication skills, primarily at the semantic (word and discourse) and pragmatic levels.

Right hemisphere damage (RHD; also known as “right hemisphere disorder” and “right hemisphere brain damage”) is an acquired brain injury—usually secondary to stroke or TBI—that causes impairments in language and other cognitive domains that affect communication.

Syntax, grammar, phonological processing, and word retrieval typically are not affected. However, RHD can affect

- semantic processing of words;
- discourse processing (including narratives);
- prosody; and
- pragmatics.

RHD can also cause impairments in other cognitive domains—including attention, memory, and executive functioning—that can interfere with communication abilities. Impairments can include **anosagnosia** (reduced awareness of deficits) and **visual neglect** (aspects of visual stimulus are ignored), both of which can significantly affect spoken and written language.

Deficits associated with RHD may be more evident during the performance of multidimensional, complex tasks such as conversation (Ferré, Ska, Lajoie, Bleau, & Joannette, 2011) and can have a significant impact on functional performance in social and vocational settings (Blake, 2006; Lehman & Tompkins, 2000).

In a very small proportion of right-handed individuals, the language centers are located in the right hemisphere of the brain, rather than in the left hemisphere. In these individuals, damage to the right hemisphere may result in symptoms of [aphasia](#) similar to those normally associated with a left hemisphere lesion. This condition is known as **crossed aphasia** (e.g., Coppens, Hungerford, Yamaguchi, & Yamadori, 2002).

The incidence of RHD has been reported most frequently following strokes. Several hospital-based studies have reported frequency of right hemisphere strokes ranging from 42% to 49% (Foerch et al., 2005; Hedna et al., 2013; Portegies et al., 2015). In addition, studies have reported that approximately 50%–78% of individuals with RHD exhibit one or more cognitive deficits that affect communication (Benton & Bryan, 1996; Blake, Duffy, Myers, & Tompkins, 2002; Ferré et al., 2009; Heweston, Cornwell & Shum, 2017; Joannette & Goulet, 1994; Nys et al., 2007).

RHD results in a collection of symptoms that vary in severity and in domains affected, depending on the site and extent of injury to the underlying neural substrate. For a detailed

discussion of signs and symptoms associated with RHD, see, for example, Blake (2018). Below are examples of symptoms grouped by domain. Individuals may not present with all symptoms.

Language

RHD does not typically affect word retrieval, syntax, and/or repetition, as seen in aphasia. However, if the left hemisphere language centers are also damaged (e.g., in TBI), RHD symptoms can co-occur with classic aphasia symptoms. Occasionally, RHD may result in the [classic aphasia subtypes](#) [PDF] in individuals with crossed hemispheric dominance.

Language deficits typically affected by RHD include the following:

- Discourse comprehension deficits marked by
 - difficulty understanding abstract language, figurative language, lexical ambiguities, or information that can be interpreted in multiple ways (Lundgren & Brownell, 2016);
 - difficulty making inferences and understanding the global meanings of discourse such as topic, gist, and big picture (Tompkins, Scharp, Meigh, & Fassbinder, 2008; Tompkins, Fassbinder, Blake, Baumgaertner & Jayaram, 2004);
 - difficulty understanding jokes, irony, and sarcasm; and
 - difficulty understanding others' emotions.
- Discourse production deficits marked by
 - verbosity;
 - egocentric, tangential comments and digressions from the topic;
 - focus on irrelevant details;
 - disorganized thoughts; and
 - impulsive, poorly organized responses (see Minga, 2016, for a review).
- Pragmatic communication deficits, including reduced eye contact, poor turn taking, and decreased conversation initiation.
- Semantic processing deficits, particularly at higher levels of functioning such as understanding the metaphorical meaning of words (e.g., “a sea of grief” and “roller coaster of emotions”).
- **Aprosodia**—reduction or absence of normal variations in pitch, loudness, intonation, and rhythm of speech to express meaning or emotion.
- **Flat affect**—severely reduced emotional expressiveness; individual may speak in a monotonous voice (**aprosodia**) and have diminished facial expressions.

Other Cognitive Impairments

Cognitive impairments are not exclusive to RHD. For example, memory deficits are often associated with any injury to the brain, including stroke and TBI.

Cognitive deficits typically associated with RHD that can affect communication include

- reduced sustained attention;
- reduced selective attention (easily distracted);
- reduced attention to detail;

- unilateral visual neglect—typically, the left side (Kwasnica, 2002; Salvato, Sedd, & Bottini, 2014);
- decreased or no awareness of deficits (anosognosia);
- reduced reasoning and judgment;
- difficulty with sequencing and problem solving;
- impaired executive functioning skills;
- reduced inhibition; and
- reduced recognition of facial expression.

Other Deficits

Other deficits that may be associated with RHD include

- emotional disorders such as *emotional lability* (e.g., crying or inappropriate laughing), difficulty interpreting and conveying emotions, and reduced empathy;
- dysphagia;
- dysarthria; and
- hemiparesis/hemiplegia.

Speech-language pathologists (SLPs) play a central role in the screening, assessment, diagnosis, and treatment of persons with RHD. The professional roles and activities in speech-language pathology include clinical/educational services (diagnosis, assessment, planning, and treatment); prevention, counseling, and advocacy; and education, administration, and research.

See [ASHA's *Scope of Practice in Speech-Language Pathology*](#) (ASHA, 2016b).

Appropriate roles for SLPs include, but are not limited to, the following:

- Screening individuals who present with cognitive and communication difficulties that suggest RHD and determining the need for further assessment and/or referral for other services.
- Conducting a culturally and linguistically relevant, comprehensive assessment of language, communication, and cognition.
- Diagnosing cognitive and communication disorders resulting from RHD, the characteristics of these disorders, and their functional impact.
- Making decisions about the management of disorders related to RHD in collaboration with the patient, family, and interprofessional treatment team. See ASHA's resources on [interprofessional education/interprofessional practice \[IPE/IPP\]](#) and [person- and family-centered care](#).
- Developing person-centered treatment plans, providing intervention and support services, documenting progress, and determining appropriate dismissal criteria.
- Educating and counseling persons with RHD and their families regarding communication-related issues and facilitating participation in family, vocational, and community contexts.
- Consulting and collaborating with other professionals to facilitate program development and to provide supervision, evaluation, and/or expert testimony, as appropriate.

- Providing prevention information to individuals and groups known to be at risk for conditions associated with RHD (e.g., stroke and traumatic brain injury).
- Advocating for individuals with RHD and their families at the local, state, and national levels.
- Educating other professionals on the needs of persons with RHD and the role of SLPs in diagnosing and managing deficits associated with this disorder.
- Remaining informed of research in the area of RHD and helping advance the knowledge base related to the nature and treatment of RHD.

As indicated in the [Code of Ethics](#) (ASHA, 2016a), individuals who hold the Certificate of Clinical Competence shall engage in only those aspects of the professions that are within the scope of their professional practice and competence, considering their certification status, education, training, and experience.

The clinician considers the following factors that may have an impact on screening and comprehensive assessment:

- Language(s) spoken
- Concurrent motor speech impairment (e.g., dysarthria)
- Hearing loss and *auditory agnosia* (inability to recognize or differentiate between sounds; neurological inability of the brain to process sound meaning)
- Visual acuity deficits, visual agnosia, and visual field cuts
- Upper extremity hemiparesis (may affect ability to write)
- Presence of chronic pain from either preexisting or new conditions
- Endurance and fatigue (testing may need to be broken into shorter sessions)
- Potential impact of prescription drugs on the individual's presentation and test performance (e.g., excessive drowsiness; exacerbation of cognitive problems secondary to polypharmacy)
- Poststroke depression
- Premorbid functional status (literacy, level of education, profession, cultural background, interests, family support, etc.)
- Anticipated/preferred discharge setting

If the individual with RHD wears prescription glasses and/or hearing aids, these should be worn during assessment.

If additional hearing and/or visual deficits resulted from the neurological event—and physical or environmental modifications (e.g., large-print material, attention to placement of test stimuli, modified lighting, amplification devices) are not sufficient to compensate for these changes—then the individual should be referred for complete audiologic and/or vision assessments prior to testing. If there are signs or reports of depression, then the individual should be referred for a psychological or psychiatric evaluation.

Screening

Screening does not provide a detailed description of the severity and characteristics associated with RHD but, rather, identifies the need for further assessment. Screening is conducted in the language(s) used by the person, with sensitivity to cultural and linguistic diversity.

Screenings may be completed by the SLP or another appropriately trained professional. Standardized and nonstandardized methods are used to screen oral motor functions, speech production skills, comprehension and production of spoken and written language, pragmatic language skills, and other cognitive skills (attention, memory, and executive function) as they relate to communication, swallowing, unilateral visual neglect, and hearing.

Screening often incorporates the use of targeted questionnaires with the individual and family members. Keep in mind, however, that changes post RHD are not always recognized by the individual or family members.

Screening may result in

- recommendation for comprehensive speech, language, swallowing, cognitive-communication assessments and/or
- referral for other examinations or services (e.g., complete audiologic assessment and/or vision testing; assessment by a psychiatrist or neuropsychologist).

Comprehensive Assessment

Consistent with the World Health Organization's (WHO) *International Classification of Functioning, Disability and Health* (ICF) framework (ASHA, 2016b; WHO, 2001), comprehensive assessment is conducted to identify and describe

- **impairments in body structure and function**, including underlying weaknesses in spoken and written language that might affect communication performance;
- **co-morbid deficits** such as other health conditions and medications that can affect communication performance;
- the individual's **limitations in activity and participation**, including changes in, and impact on, functional status in communication, vocation, and interpersonal interactions;
- **contextual (environmental and personal) factors** that serve as barriers to, or facilitators of, successful communication and life participation; and
- the impact of communication impairments on **quality of life**, functional limitations relative to the individual's premorbid social roles, and the impact on his or her community.

See the ASHA resource titled [Person-Centered Focus on Function: Traumatic Brain Injury](#) [PDF] for an example of assessment data consistent with ICF.

Assessment can be static (i.e., using procedures designed to describe current levels of functioning within relevant domains) and/or dynamic (i.e., an ongoing process using hypothesis-testing procedures to identify potentially successful interventions and supports).

Assessment protocols can include both standardized and nonstandardized tools and data sources. The choice of assessment tools and procedures is based on a variety of factors, including the

needs of the person with RHD, the clinician's professional judgment, the complexity of impairment, payer guidelines, and facility policy. See ASHA's resource on [assessment tools, techniques, and data sources](#) for additional information.

There are few standardized communication assessments for use with patients with RHD (see, e.g., Joannette et al., 2015) and few standardized assessments of cognition normed on individuals with RHD. Functional nonstandardized assessments are particularly valuable for individuals with RHD, whose performance on activities of daily living (ADLs) and more complex tasks may be disproportionately better or worse than their performance as predicted by standardized test scores.

Typical components of a comprehensive assessment of deficits associated with RHD include following:

Case History

- Relevant medical history (history of previous strokes or other neurological disorders)
- Patient interview (educational, social, and occupational history)
- Input from family members or others close to the patient, to identify changes
- Impact of deficits on ADLs and overall daily functioning
- Input from other medical professionals (e.g., physical and occupational therapists, neurologist, neuropsychologist, social worker, etc.)
- Cultural and linguistic backgrounds

Self-Report

- Functional communication struggles and successes
- Communication difficulties and impact on individual and his or her family/caregivers
- Contexts of concern (e.g., social interactions, work activities)
- Language(s) used in contexts of concern
- Goals and preferences of the individual

Oral Mechanism Evaluation

- Strength, speed, and range of motion of components of the oral–motor system
- Sequential/alternating movement repetitions (i.e., diadochokinetic rates)
- Steadiness, tone, and accuracy of movements for speech and nonspeech tasks
- Motor speech abilities (see the Assessment section of ASHA's Practice Portal page on [Dysarthria in Adults](#))
- Phonation, including pitch and volume

Language Assessment

- Language comprehension and production—specifically in discourse-level tasks
- Reading decoding and comprehension—specifically at the paragraph level or longer
- Use of prosody to express feelings, emotion, and tone

- Interpreting prosodic features in the speech of others
- Social communication/pragmatics (see the Assessment section of ASHA’s Practice Portal page on [Social Communication Disorder](#))

Assessment of Other Cognitive Skills (in the Context of Communication)

The focus of the cognitive assessment is to determine the impact of cognitive deficits on communication (e.g., Blake, 2018). SLPs may conduct these assessments in collaboration with neuropsychologists. Areas assessed include the following:

- Attention (selective, sustained, divided, and alternating; Lezak, Howieson, & Loring, 2004)
- Memory (verbal and nonverbal; short-term, episodic, and working)
- Problem solving and reasoning
- Judgment and safety awareness
- Executive functioning
- Impulsivity
- Visuospatial awareness in one’s environment (e.g., navigating, finding items on left side; Azouvi et al., 2002)
- Awareness of deficits
- Facial recognition

Feeding and Swallowing Assessment

See assessment section of ASHA’s Practice Portal page on [Adult Dysphagia](#).

Factors affecting the assessment of neurogenic dysphagia following RHD include

- level of arousal and cognitive status;
- impairments in trunk positioning and motor control that may impact swallowing;
- visuospatial deficits;
- respiratory status, including presence of tracheostomy and/or use of mechanical ventilation;
- ability to follow commands;
- level of motivation; and
- related neurobehavioral impairments (e.g., perseveration, poor initiation, impulsivity, impaired sequencing, impaired awareness of deficits, reduced self-awareness, reduced attention, confusion).

Audiologic Assessment

If the RHD is a result of TBI, then hearing and vestibular testing may be indicated, depending on the individual’s presenting needs. Referral to an audiologist is made, as appropriate. For details, see the Assessment sections of ASHA’s Practice Portal pages on [Hearing Loss – Beyond Early Childhood](#), [Balance System Disorders](#), and [Tinnitus and Hyperacusis](#).

Assessment Results

Assessment may result in one or more of the following:

- Diagnosis of a cognitive-communication disorder and other deficits associated with RHD
- Description of the characteristics, severity, and functional impact of the disorder
- Prognosis for improvement (in the individual and in relevant contexts)
- Recommendations for intervention, support, and community resources
- Referral for other assessments or services (e.g., neuropsychologist, physical therapist, occupational therapist, vocational counselor, neuro-ophthalmologist, audiologist)

Cultural and Linguistic Considerations

When selecting the language of assessment for individuals who speak more than one language, it is important to consider the languages spoken, age of acquisition of each language, pre-morbid use of each language, and language(s) needed for return to daily activities. Clinicians should gather data in all languages used in order to determine degree of impact.

Pragmatic and social norms (e.g., eye contact, turn taking, nonverbal cues, etc.) vary from culture to culture. Cultural differences should not be interpreted as pragmatic deficits. See ASHA's Practice Portal page on [Cultural Competence](#) for more information.

Treatment for RHD is individualized to address areas of need identified in the assessment, taking into account the goals identified by the individual and his or her family.

Treatment occurs in the language(s) used by the individual with RHD—either by a bilingual SLP or with the use of trained interpreters, when necessary. See ASHA's Practice Portal page on [Collaborating With Interpreters, Transliterators, and Translators](#).

Consistent with the WHO (2001) ICF framework, the goal of intervention is to help the individual with RHD achieve the highest level of independent function for participation in daily living.

Intervention is designed to

- capitalize on strengths and address weaknesses related to underlying structures and functions that affect communication across partners, activities, and settings;
- facilitate the individual's activities and participation by teaching new skills and compensatory strategies to the individual with RHD and to his or her communication partner(s); and
- modify contextual factors that serve as barriers and enhance those that facilitate successful communication and participation, including adjusting the environment; informing listeners about the individual's cognitive/communication needs; and encouraging the speaker to use strategies in everyday interactions.

See the ASHA resource titled *Person-Centered Focus on Function: Traumatic Brain Injury* [PDF] for an example of functional goals consistent with ICF.

Treatment Approaches

Treatment can be **restorative** (i.e., aimed at improving or restoring impaired function) and/or **compensatory** (i.e., aimed at compensating for deficits not amenable to retraining).

Treatment approaches—whether restorative or compensatory—can focus on specific functional skills (e.g., composing and sending emails) or underlying processes (e.g., attention, memory, executive function) that affect a range of skills.

Treatment Options and Techniques

Below are brief descriptions of treatment options for addressing RHD, grouped into broad categories. This list is not exhaustive, and the inclusion of any specific treatment does not imply endorsement from ASHA. The majority of the treatments below are based on theories of RHD and treatments designed for disorders caused by brain injury.

Treatment selection depends on the communication needs of the individual, the preferences of the individual and his or her family, and the presence of co-occurring conditions that might affect the individual's insight into limitations or ability to implement some compensatory strategies.

For a detailed discussion of treatment of RHD, see, for example, Blake (2018), Myers (1999), and Myers (2001).

Language

Treatment for language deficits associated with RHD typically focuses on **narrative and conversational discourse, understanding and managing alternate meanings, and pragmatics**.

Narrative and conversational discourse skills include the ability to make inferences and understand global meanings of discourse (e.g., topic, gist, big picture). Treatments that target these skills include the following:

- Guided inference-generating tasks in which the individual labels items in scenes or stories, identifies the relevant or significant items, and explains the relationship among items in an effort to arrive at an inference.
- Macrostructure tasks such as
 - identifying the “big picture” of news stories, picture scenes, or conversations by generating headlines for the news stories, titles for the pictures, or the gist of a conversation and
 - organizing printed sentences into a narrative, placing pictures into a logical sequence, or arranging pieces of a puzzle—sentences, pictures, and puzzles can vary in degree of complexity, explicitness, or amount of detail.

Understanding and managing alternate meanings involves the ability to understand lexical ambiguities, generate alternate meanings, and understand nonliteral language. Treatments that target these skills include

- grouping words according to their connotative meaning (e.g., positive or negative associations);
- providing multiple meanings for homographs (e.g., left = direction vs. left = went) or homophones (e.g., “son” vs. “sun”);
- resolving lexical (word) ambiguities based on contextual cues;
- interpreting figurative language such as metaphors and figures of speech (Lundgren, Brownell, Cayer-Meade, Milione, & Kearns, 2011);
- generating alternative meanings to ambiguous sentences; and
- adding a “next sentence” (after being given a sentence with several possible interpretations) to disambiguate the intended meaning.

Treatment for pragmatic deficits focuses on improving skills to support successful social communication in a variety of settings. Techniques used to practice these skills include coaching, one-on-one rehearsal, role play, group practice, visual and verbal feedback, and video modeling.

Some approaches focus specifically on conversational skills and include

- increasing appropriate use of conversational conventions such as head nods (to indicate understanding or agreement) and eye contact (to indicate attention to and interest in content) and
- decreasing use of barriers to successful conversation such as poor turn taking, interruptions, tangential comments, and abrupt beginnings and endings.

Other approaches target the skills that underlie and support all social communication. These skills include the ability to

- communicate one’s thoughts effectively and in an organized manner;
- be assertive when necessary;
- actively listen to communication partners;
- use and interpret nonverbal communication cues;
- regulate one’s own emotions;
- respect social boundaries; and
- adopt a theory of mind by
 - understanding other peoples’ beliefs, attitudes, and emotions and using that understanding to navigate social situations;
 - understanding that one’s own beliefs may differ from the beliefs of others; and
 - inhibiting one’s own beliefs in order to understand the beliefs of others.

Pragmatic and social norms (e.g., eye contact, turn taking, nonverbal cues, etc.) vary from culture to culture. It is important to consider the individual’s background and cultural needs when determining deficits and addressing goals related to pragmatics. See ASHA’s Practice Portal page on [Cultural Competence](#) for more information. See also ASHA’s Practice Portal page on [Social Communication Disorder](#).

Prosody

Treatment for prosodic deficits focuses on variations in pitch, loudness, and rhythm—the suprasegmental features of communication that convey meaning. Treatment may address *expressive deficits* (i.e., difficulty using prosody to express feelings, emotion, and tone) or *receptive deficits* (i.e., difficulty interpreting prosodic features in the speech of others). See, for example, Leon et al. (2005), Rosenbek et al. (2004), and Rosenbek et al. (2006).

Direct treatment approaches to improve prosody include

- prosodic production drills to improve conscious control of prosody such as
 - asking the person to imitate or read printed sentences and vary prosodic contours to convey different emotions (e.g., happiness, sadness, surprise) and
 - using contrastive stress tasks to practice manipulating prosodic features to alter meaning—the person is asked to repeat a sentence multiple times, each time in answer to a question that requires a different stress pattern;
- imitation/modeling tasks using a hierarchical approach that begins with in-unison production of a target, then repetition (imitation) of the target, and, finally, production of the target with cues but no model; and
- tasks to improve the person’s ability to recognize prosodic features of spoken targets such as
 - listening to sentences with prosodic contours that convey different emotions (e.g., anger, surprise, sadness) and then identifying the emotion and
 - judging whether two target items (e.g., words, phrases, or sentences) differ from one another in pitch, loudness, and/or pattern of stress.

Treatment can also involve the use of **compensatory strategies**, including

- identifying cues other than prosody that convey emotions (e.g., word choice, facial expression, body language, verbal cues);
- asking communication partners to explicitly state their emotions at the beginning of a conversation to help avoid misinterpretation (e.g., “I’ve been really upset today.”); and
- encouraging the person with RHD to explicitly state his or her emotional state or intent at the beginning of a conversation.

Attention, Memory, and Executive Function

Treatment for cognitive deficits that have an impact on language following a right hemisphere injury focuses on **attention**, **memory**, and **executive functioning** (see, e.g., Tompkins, 2012).

SLPs engage in professional practice in all areas that impact communication, including cognition (ASHA, 2016b). The cognitive treatments listed in this section utilize language-based materials and tasks and focus on the ultimate goal of improving communication.

Attention

Direct approaches are aimed at improving one or more types of attention (sustained, selective, alternating, and divided). These approaches include

- computerized attention training programs (e.g., monitoring a computer screen for a target that appears in one of four quadrants);
- cancellation tasks that require the person to selectively attend to one or more target type within an array of targets; and
- cancellation tasks that switch targets one or more times during the completion of the task requiring an alternate response each time the target changes.

Metacognitive and compensatory strategies help the person sustain attention to a task or goal until it is completed. They include

- using systems, tools or strategies (e.g., graphic organizers or charts) that facilitate successful completion of a goal, such as breaking the goal into smaller steps, developing a timeline to complete each step, self-monitoring (often with use of an external timer), and evaluating performance at regular intervals; and
- writing down thoughts and ideas that can potentially distract from the task at hand—then returning to the list after the task is completed.

Environmental modifications are changes to the environment aimed at minimizing distraction. They include

- avoiding or modifying problematic or distracting settings (e.g., turning off or moving away from the TV; avoiding noisy restaurants);
- choosing the best time of day to complete important tasks (e.g., early in the day when the person is least tired); and
- organizing work space and removing items that are distracting.

Memory

Treatment for memory deficits typically are compensatory in nature. They include the use of **external reminders** and **internal strategies**.

External reminders include

- to-do lists;
- note-taking (e.g., during phone calls or meetings);
- calendars to keep track of appointments and important events;
- alarms and timers that can serve as medication reminders or that signal an upcoming appointment;
- journals to document details of events or activities;
- labels (e.g., on cabinets and drawers) to indicate content; and
- photographs (e.g., representing a sequence of steps in a tasks).

Internal strategies include

- mnemonics (e.g. creating an acronym or phrase using the first letter of each item in a list);

- visualization and rehearsal (e.g., repeatedly visualizing a task being performed and completed);
- repetition and rehearsal of information (e.g., a grocery list or phone number); and
- semantic elaboration (e.g., identifying and describing as many salient features as possible of the information to be remembered; associating/linking the information with preexisting knowledge).

Executive Function

Treatments for executive functioning deficits are functional in nature and typically focus on skills like solving problems, thinking flexibly, setting and completing goals, staying on task, and keeping organized. They include the use of **metacognitive and compensatory strategies** (see, e.g., Sohlberg & Turkstra, 2011) and **environmental modification**.

Metacognitive and compensatory strategies include

- problem-solving systems (e.g., identifying and describing a problem; brainstorming solutions and possible outcomes; choosing and trying the best solution; evaluating the outcome; and selecting an alternate solution, if necessary);
- systems to set and accomplish goals (e.g., breaking goal into smaller steps, developing a timeline to complete each step, evaluating progress at regular intervals); and
- devices to serve as reminders to stay on task or return to task (e.g., timers set to take a break or return to work from a break).

Environmental modifications to facilitate organization include

- making sure that items and materials are stored near where they will be used (e.g., paper is near printer; pens and pencils are on desk);
- labeling boxes, drawers, cabinets, and so forth, to indicate content; and
- color-coding tabs in a file drawer to identify categories (e.g., medical records or bills).

Other

Unilateral Neglect

Unilateral neglect is considered to be an attention disorder, and it frequently occurs with anosagnosia. Unilateral neglect can affect visual, auditory, tactile, and olfactory modalities as well as movement. This treatment section focuses on left *visual* neglect, particularly as it affects language processing and communication.

Treatments include

- completing tasks that require scanning across the entire visual field emphasizing the left side (e.g., reading text passages, describing a picture, and locating and picking up objects in the environment, given verbal instructions);
- providing verbal or physical cues (e.g., “start at the red line” or “look to the left”) to encourage leftward gazing or scanning when reading;

- completing tasks that encourage leftward scanning by virtue of the stimulus itself—for example, presenting a sentence or paragraph that spans both the neglected and the non-neglected space and that requires the person to read the words in the neglected space in order to understand the sentence; and
- engaging in virtual reality experiences using computer programs that allow the person to practice three-dimensional navigation of an environment (e.g., interacting with a group of people during a meeting; noticing and reading signs while driving, crossing the street, or taking a walk in a crowded city).

Awareness

Treatments to increase awareness and consequences of deficits include

- providing feedback (e.g., verbal and visual) when an error occurs *during completion of a task* and reviewing performance before proceeding with the task;
 - providing verbal and visual feedback *after completion of a task* (e.g., by video recording the performance and then reviewing the recording afterward);
 - asking the person to plan how to complete a specific task (e.g., using a graphic organizer or chart), predict how well they will perform the task, and then evaluate their performance by comparing it to the earlier prediction;
 - increasing awareness by discussing deficits with the person, having him or her predict how these deficits might affect day-to-day functioning, and then talking about ways to minimize any negative consequences;
 - increasing awareness as it relates to safe swallowing (e.g., being aware of residual food in oral cavity); and
 - incorporating family members, loved ones, co-workers, and employers, when appropriate, into treatment to reinforce changes and increase awareness.
- [Clinician’s Guide to Cognitive Rehabilitation in Mild Traumatic Brain Injury: Application for Military Service Members and Veterans \[PDF\]](#)
 - [Evaluating and Treating Communication and Cognitive Disorders: Approaches to Referral and Collaboration for Speech-Language Pathology and Clinical Neuropsychology](#)
 - [Interprofessional Education/Interprofessional Practice \(IPE/IPP\)](#)
 - [Person- and Family-Centered Care](#)
 - [Person-Centered Focus on Function: Traumatic Brain Injury \[PDF\]](#)
 - [Right Hemisphere Brain Damage \[Consumer Information\]](#)
 - [SIG 2 Neurophysiology and Neurogenic Speech and Language Disorders \(2016\), 1\(Part 2\)](#)
 - [Traumatic Brain Injury \[Consumer Information\]](#)
 - [Traumatic Brain Injury: A Primer for Professionals](#)

Other Resources

This list of resources is not exhaustive and the inclusion of any specific resource does not imply endorsement from ASHA.

- [Brain Injury Association of America \(BIAA\)](#)
- [Defense and Veterans Brain Injury Center \(DVBIC\)](#)
- [Brain Injury: A Guide for Educators \[PDF\]](#)
- [Social Communication and TBI : A Guide for Professionals \[PDF\]](#)
- [National Stroke Association](#)
- [American Stroke Association](#)
- [Right Hemisphere Brain Damage](#)
- [RHDBank](#) (for student and video links: User Name = student; Password = access)