Implementation Barriers and Facilitators for Alternative and Augmentative Communication Use in Intensive Care Units: Comparing Differences Across Physical Therapists and Occupational Therapists

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Communication partners with AAC training are known to increase the ability of a person with aphasia to understand language and participate in everyday social interactions (Genereaux et al., 2004; Hickey, Bourgeois, & Olswang, 2004; Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001; Lyon et al., 1997; Rayner & Marshall, 2003; Rose, Worrall, & McKenna, 2003; Simmons-Mackie, Kearns, & Potechin, 2005). Healthcare providers, when trained in AAC strategies, serve as important communication partners in the acute care setting. Given more effective communication, they increase involvement in treatment planning by individuals with communication impairments (Kagan et al., 2001; Legg, Young, & Byer, 2005; Simmons-Mackie et al., 2007). Previous studies have identified barriers and facilitators to AAC support use in acute care settings for nurses (Baker & Melby, 1999; Bergbom-Engberg & Halajämä, 1993; Hemsley et al., 2001, Leathart, 1994; Simmons-Mackie et al., 2007). While knowledge of nursing-specific is valuable,
because nurses spend a substantial amount of time with patients, nurses are one of many healthcare professionals that interact with patients during their stay in the acute care unit. There is little research investigating possible communication barriers between patients and other healthcare staff. The aims of this study were to identify potential barriers and facilitators physical therapists and occupation therapists encounter when implementing AAC strategies in an acute care setting and to determine if or how the barriers and facilitators differ by disciplines. Five healthcare providers participated in individual semi-structured interviews. This study identified 18 different barriers and 19 different facilitators. Results indicated that physical and occupational therapy disciplines felt most challenged by using AAC strategies to support individuals with severe communication impairments. Healthcare providers identified their own knowledge of and skill using AAC, the availability of AAC resources, and the patient health status and ability as the most substantial barriers to using AAC supports with patients with severe impairments. Likewise, they identified colleague AAC knowledge and skill as an important facilitator to enhancing their own AAC knowledge and skill. Findings from this study support the need for additional opportunities for training and information sharing between healthcare providers. Both of these recommendations will increase healthcare providers' AAC knowledge and skill, which in turn will help the providers feel more competent and confident implementing communication supports.
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CHAPTER ONE

INTRODUCTION

Aphasia as a barrier

Aphasia is a multimodal language disorder, characterized by impairments to one’s ability to express or understand communication. Interacting with persons with aphasia is challenging for healthcare providers, along with the challenges it presents to family members. Since healthcare providers represent many of the primary interactants in a person with aphasia’s early recovery, healthcare providers need supports to ensure effective communication. Several barriers exist, which may compromise a provider’s ability to interact successfully. Those include knowledge and skill barriers, attitudinal barriers, resource barriers, policy and practice barriers, environmental barriers, and patient-related barriers (Beukelman & Mirenda, 2013; Garrett, Happ, Costello, & Fried-Oken, 2007). Knowledge and skill barriers relate to a provider’s ability to facilitate communication, based upon training and personal abilities. Attitudinal barriers can include perceptions that an individual is not capable of communicating, has nothing meaningful or worthwhile to communicate, or that it is not healthcare provider’s job to provide communication supports. Resource barriers relate to the availability of supports in the form of communication tools, human resources, and resource accessibility/proximity. Policy and practice barriers include policies that prohibit or constrain cross-disciplinary interventions, time constraints, or length of stay (i.e., harder to implement when there is less time to troubleshoot strategies). Environmental barriers include challenges within the physical environment (e.g., lighting, sound level, visual complexity) and partner environment (i.e., skills of other staff and visitors interacting with an individual). Patient- and family-related barriers may relate to attitudes,
motivation, beliefs, outside demands, finances, and patient ability (i.e., communication, cognition, and physical status or endurance). A healthcare provider's ability to address these barriers is crucial in their ability to support an individual with aphasia or other complex communication needs.

**Linguistic Consequences**

Brookshire defines aphasia as a neurogenic communication disorder in adults that is “characterized by impaired comprehension and production of language, usually caused by a pathology affecting the language-competent half of the brain” (Brookshire, 2003, p.1). This definition focuses on what language has been lost and the brain injury that caused the loss. A variety of other definitions exist. For the purposes of this paper, we will follow the alternative and augmentative communication (AAC) definition of aphasia. This definition focuses on everyday consequences, identifying aphasia as “a loss of ability to comprehend and use language that results in reduced ability to communicate or understand information, establish and maintain relationships, and fulfill social roles in life” (Lasker, Garrett, & Fox, 2007, p.163). By focusing on consequences, rather than impairment and etiology, this definition is solution-oriented. An important distinction in this definition is the emphasis on social outcomes for persons with aphasia.

**Social consequences—social isolation in aphasia**

Communication breakdowns between people with aphasia (PWA) and their communication partners can result in social isolation (Cruice, Worrall & Hickson, 2006; Parr, 2007; Vickers, 2010). Simmons-Mackie (2000) discusses that social isolation is caused by extrinsic barriers (i.e., factors outside the PWA) and intrinsic barriers (i.e., personal factors of the PWA). Extrinsic barriers are factors such as negative partner
attitudes, limited partner knowledge of how to facilitate communication, lack of awareness of aphasia, or lack of aphasia-friendly social opportunities. Intrinsic factors include language deficits, lacking confidence in his/her conversation skills, and developing negative emotions (e.g. shame, anger, frustration, feeling foolish) because their ability to participate in conversations is compromised by their language deficits (Dalemans et. al., 2010; Howe, Worrall, & Hickson, 2008; Johansson, Carlsson, & Sonnader, 2012; Parr, 2007). Several factors contribute to the social isolation risk in PWA, and should be addressed in rehabilitation.

Recovery Continuum

Intervention for PWA occurs in a variety of settings and at various times over the course of their recovery. Therapy can occur in hospitals, rehabilitation programs, nursing homes, outpatient settings, residential facilities, and/or at home. Where and when a person receives therapy services and the focus of intervention depends on severity of aphasia, the individual’s location on the recovery continuum, insurance coverage, the healthcare provider’s prerogative, and the individual’s choice.

Two main foci of communication management that exist across the health care continuum are 1) working directly with PWA to improve his or her communication, and 2) creating an accessible environment for communication. When deciding how to address these two foci, the following factors must be considered: how the aphasia is currently affecting the PWA’s life, how it will affect him or her in the future, what the current and future needs/wants of the individual are, what barriers and facilitators exist, what factors can be changed, what resources are available that can promote change, and who is responsible for supports (Simmons-Mackie, 2013).
The following paragraphs discuss general emphases of intervention along the continuum of aphasia recovery (see figure 1). Each PWA progresses through stages of the recovery continuum uniquely. Their journey is impacted by the healthcare setting, values of the practitioners, impairment severity, rate of recovery, and numerous other factors. As such, emphases for each stage of recovery vary by setting and personal values. For example, a focus on social engagement is more typical in the late sub-acute or chronic phase of recovery in a rehabilitation setting than at the acute stage of recovery in a hospital setting because social engagement is not an overriding concern at that stage. Although, for some PWA social engagement may be a more important focus at the acute stage, so it may be targeted in an acute hospital setting.

![Diagram of Recovery Continuum and Needs](image)

**Figure 1.** Recovery continuum and needs. Modified from Simmons-Mackie, 2013
In the acute stage of recovery, PWA are typically treated in hospital acute care units (e.g., Intensive Care Units [ICUs], critical care units). Acute care focuses on managing the illness and/or injuries and helping the PWA become medically stable enough to transfer to another level of care. Duration of stay in such settings is typically short and is largely dependent on the type, location, and severity of the stroke along with rate of spontaneous recovery. Spontaneous recovery makes gathering information about the current level of language skills challenging because levels of patient performance often vary day-to-day (Holland & Fridriksson, 2001). Communication in acute care is needed to fulfill four main goals: 1) receiving appropriate healthcare; 2) providing and receiving information; 3) participating in decision making; and 4) limiting the amount of fear, stress, and emotional upset experienced by the patient (Simmons-Mackie, 2013). The patient’s aphasia may limit his or her ability to understand what medical staff and family members are communicating and limit his or her ability to express his or her thoughts. To strengthen communication between the PWA and partners, the speech language pathologist (SLP) often introduces communication supports (e.g., communication board, written choice, communication books) and trains the partners how to communicate with the PWA using the supports.

A PWA will eventually transition from the acute phase into a sub-acute phase and into rehabilitative care settings. Rehabilitative healthcare can occur in a variety of settings such as inpatient rehabilitation centers, outpatient care, or in the PWA’s own home. Even though the PWA is making language gains as he or she recovers, communication may still be frustrating for them as expressing his or her thoughts to others may be challenging. At this stage of recovery in these various rehabilitation
settings, the PWA need to be able to: 1) give and understand information; 2) participate in rehabilitation services and decision making for the future; 3) participate in social relationships; and 4) begin adjusting to communication changes caused by his or her aphasia (Simmons-Mackie, 2013). SLPs often teach the PWA how to use communication supports such as compensatory communication strategies. The compensatory strategies encourage the PWA to use multiple modalities of communication such as gesturing, writing, or drawing to supplement his or her verbal language skills when communicating with other people. Along with working with the PWA, the SLP works with the PWA’s close communication partners. The SLP trains the communication partners how to use communication supports, helps them understand aphasia, and helps nurture positive, supportive attitudes towards using the communication supports (Cunningham & Ward, 2003; Kagan, 1998; Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001; Sorin-Peters, 2004; Turner & Whitworth, 2006; Turner & Whitworth, 2006b). Lastly, the SLP collaborates with the PWA and their families on how to create a supportive environment for communication and how to modify activities to help the PWA participate (Simmons-Mackie, 2013).

The last phase of recovery is the chronic phase. Therapy for this stage is focused on long-term planning for either a residential care setting (e.g., assisted living, nursing home) or outside a healthcare setting in the PWA’s own home and community. A focus of therapy in this stage of recovery is ensuring the PWA’s communication partners have enough training in communication supports and opportunities to participate in social activities to help the PWA successfully live with his or her aphasia. “Living successfully means the person has satisfactory high-quality social relationships, engaging activities,
and sufficient autonomy, purpose, and hope for the future” (Simmons-Mackie, 2013, p. 131). Therapy focuses on providing opportunities for the PWA and communication partner to apply what they learned in therapy in real-world settings (e.g., grocery stores, restaurants, or social events. It also focuses on locating support services (e.g., university clinics, aphasia support groups, outpatient services) for current communication needs and future communication needs (Simmons-Mackie, 2013).

**Our Focus: Acute Recovery**

**Intervention Models: Impairment vs. Social Models**

The focus of this paper is working with PWA in the acute stages of recovery and in the setting where acute therapy typically occurs, in-hospital acute care units. There are two main models of aphasia intervention: impairment-based and social models. The impairment-based approach derives its principles from cognitive neurology. Cognitive neurology states that cognitive functions and language can be broken down into smaller interrelated, yet discrete components (e.g., Wernicke’s area is responsible for language comprehension). Knowing which language component(s) were damaged and the language functions affected determine which discrete language domains need to be targeted (Basso, 2010). Interventions target strengthening or improving functions in each of those discrete language domains (e.g., naming, syntax, auditory comprehension, reading comprehension, etc.).

The following case, presented by Basso in 2008 and summarized here, is an example of treating a fluent aphasia following the impairment-based treatment model. The PWA’s speech is unintelligible due to his frequent and pervasive phonological errors, which are caused partially by damage to the phonological buffer. To increase
overall intelligibility, therapy focuses on improving the damaged system by starting at the basic word level and eventually progressing up through the hierarchy. High dosages of repetitive practice at the word level is required before moving on to the phrase level. The PWA is trained to plan the phonological and articulatory movements of the word before speaking it. Then, the PWA is required to write the word dictated to him in order to concentrate on the phonological form and spelling of the word. The goal of treatment is to make social interactions easier by improving intelligibility through the reduction of phonological errors (Basso, 2008)

The second model of aphasia intervention is the social-based (functional or psychosocial) approach. The social approach focuses on the principle “that aphasia does not only disrupt language, but its consequences also have significant impact on people’s lives” (Basso, 2010, p. 467). A language impairment often affects a PWA’s personal relationships, professional relationships, and ability to participate in everyday activities such as work, social events, or family activities. Instead of focusing therapy on improving specific language skills, therapy focuses on broader functional communication therapy by developing life participation goals and social relationships.

The following example, presented by Holland in 2008 and summarized here, is how treatment of the previous case of the person with fluent aphasia and highly unintelligible speech would look under the social model. When choosing therapy goals and activities to improve the PWA’s intelligibility, the PWA’s end desire of returning to social activities he participated in before his stroke is the main focus. Therapy would include some opportunities to practice intelligibility-improving strategies at the single-word level, but therapy would focus more on providing opportunities to practice strategy
use at the conversation level. The single target words are chosen from words that are personally relevant to him and his family (i.e., highly functional words that are commonly used). The PWA is moved to a higher level of complexity quickly to target both speed and accuracy of response. Then the PWA is given social opportunities in group therapy with the support of his spouse to practice using the strategies to facilitate generalization to real-world settings (Holland, 2008).

A therapy approach that stemmed from the principles of the social model is the “Life-Participation Approach to Aphasia” (LPAA).” LPAA is a consumer-driven service delivery approach that supports individuals with aphasia and others affected by it in achieving immediate and long term life goals [...] (Chapey, et. al., 2000, p. 279). LPAA follows the principle that the concerns of those affected by aphasia should be at the center of all decision making. The PWA should be an active participant in selecting therapy goals and designing intervention, during all stages of recovery. Goals should address initial acute care needs, such as communicating basic physical wants/needs with hospital staff, as well as chronic recovery needs, such as being able to participate in social groups or return to work. The LPAA emphasizes reengaging the PWA in their life by encouraging them to participate in personally relevant activities (Chapey, et. al., 2000).

WHO-ICF

The LPPA treatment philosophy supports the idea of focusing on the long-term consequences of aphasia on a person’s life as much as the language impairment caused by the disorder. Treatment should emphasize revealing competence and encouraging inclusion in everyday life (Chapey, et. al., 2000). This shift from focusing on remediating deficits to fostering inclusion and participation follows the principles of the World Health
Organizations (WHO)- International Classification of Functioning, Disability, and Health (ICF) framework for describing and organizing information for functioning and disability (WHO-ICF, 2001; see figure 1). In its original 1948 constitution, the WHO defines health as a “state of physical, mental, and social well-being and not merely the absence of disease or infirmity”. This definition of health identifies the individual’s level of functioning as an essential component of his or her overall health.

The ICF has two components: Functioning and Disability factors and Contextual factors. Functioning and Disability includes the body functions/structures and physiology/psychology of the individual’s body and activities/participation. Body function/structures describes the anatomy of the individual. Physiology/psychology describes the person’s functional status (i.e., actions of the individual and behaviors in relationship to their individual lives). Problems caused by damage or deficits in body structure and body functioning are called impairments. For example, speech, language, and communication impairments would include voice/speech impairments, expressive/receptive language impairments, and swallowing function impairments. Contextual factors include environmental factors (i.e., partner interaction style, attitudes of others, cultural beliefs, physical environment) and personal factors (i.e., background, feelings, attitudes, intrinsic states) (WHO, 2001). The relationship between the impairments (e.g. physical, communication, and/or cognitive), environmental factors, and personal factors of the individual is multi-faceted. How these factors affect a person’s ability to communicate varies from person-to-person.

The WHO-ICF framework emphasizes the idea that the individual’s impairments (e.g. physical, communication, and/or cognitive) are not the only factors that can affect a
person's ability to participate in everyday activities. The factors in a person's environment (e.g. physical and communication partner factors) and personal factors (e.g. intrinsic states, personal feelings, attitudes) can affect a person's ability to participate just as much as his or her impairment. To help understand to what extent factors related to the impairment, environment, and person impact a person's ability to communicate and participate, the WHO-ICF framework implements a coding system.

![WHO-ICF model for classification of disability and functioning](image)

Figure 2. WHO-ICF model for classification of disability and functioning

The ICF expands upon the concept of a classifying disability and functioning by attaching qualifiers to codes. These qualifiers act as a means of indicating severity or deviation from normal functioning. The qualifiers represent levels of limitation or restriction on a scale where 0 indicates no problem or within normal limits and 4 indicates complete or profound limitation/restriction. Body functions use qualifiers after the code to indicate severity of the dysfunction. Activity and Participation codes have "performance qualifiers" and two "capacity" qualifiers. The performance qualifier
describes how a person performs a task in his or her real life and the capacity qualifiers describe the person’s ability to perform the task in a standardized environment (e.g., therapy room). One capacity qualifier describes the ability to perform the task with assistance and the other describes the ability to perform the task independently. The Environmental factors codes use qualifiers to indicate if certain factors (e.g., communication partner) are barriers or facilitators to participation in the person’s life. For example, conversation support from a spouse could be rated as a moderate facilitator to conversation participation for the PWA (e.g. +2) or rated as a moderate barrier to conversation participation for the PWA (e.g. 2). A third possibility exists where an environmental factor such as a communication partner is neither a facilitator nor barrier, but rather a neutral factor with no effect (Threats, 2007; Threats & Worrall, 2004.).

**WHO-ICF and Goal-setting**

All components of the WHO-ICF classification and coding system have been shown to directly link to the recovery goals of the PWA (Simmons-Mackie & Kagan, 2007; Worrall et. al., 2011). The majority of goals chosen by the PWA were linked to the category of Activities and Participation, followed by Environmental Factors, Body Functions and Structures, and Personal Factors (Worrall et. al., 2011).

Determining what goals are most important to a PWA requires successful communication between the PWA and their healthcare provider. The PWA and healthcare provider must work collaboratively to develop appropriate therapy goals that meet the short-term acute care environment communication needs of the patient and the long-term recovery goals of the patient. Downing and Roat (2002) emphasize that effective communication between providers and patients is critical for successful
healthcare provision. When patients feel more involved in their own healthcare decisions, they are more likely to support the treatment options that are selected.

Despite a growing body of research identifying the importance of effective communication between healthcare providers and patients to successful treatment, other studies demonstrate limited communication participation in healthcare decision making for PWA (Byng, Farrelly, Fitzgerald, Parr, & Ross, 2003; Law, Bunning, Byng, Farrelly, & Heyman, 2005; Tomkins, Siyambalapitiya, & Worrall, 2013). Tomkins, Siyambalapitiya, and Worrall (2013) explored factors influencing healthcare satisfaction and dissatisfaction among people with aphasia. They found that Information, Communication, and Knowledge, followed by Control and Independence were the most prominent areas of care that influenced levels of satisfaction and dissatisfaction with their health care. PWA reported that the manner in which information was presented and communication style of the healthcare providers sometimes caused feelings of anxiety, stress, and confusion. PWA also reported that they felt excluded from the decision making process and lacked free will because they did not have control of their treatment.

To help PWA feel included in their own treatment planning and feel a level of control and independence in decision making, healthcare providers must establish effective communication as soon as the treatment planning begins. Effective communication fosters collaborative relationships in which PWA feel like a valued member of the decision making team. An important piece to establishing communication is implementing appropriate communication supports to facilitate the PWA’s participation.
How to facilitate choice making and participation in healthcare decisions, competency?

Having accessible healthcare information is an important piece in successful health care. Accessible healthcare refers to more than just simple presenting the information to the patient. It refers to presenting the information in a format the patient easily understands. Presentation formats can include information presented in written-form using words and pictures and/or verbal-form. Presenting patients with healthcare information in a format the patient can easily understand has been shown to increase their involvement in rehabilitation and making healthcare decisions (Vahabi & Ferris, 1995), increase compliance during treatment (Ley, 1988; Philipp et al., 1990), increase their feelings of control (Dennis, 1990; Parr, Byng, Gilpin, & Ireland, 1997; Wilson-Barnett & Osborne, 1983), and enhance the patients' relationships with their healthcare providers (Farrell-Miller & Gentry, 1989; Philipp et al., 1990). Along with oral presentation of information, alternative forms of communication such as printed education materials (e.g., brochures, pamphlets), videos, and electronic sources are used to present information. A study by Draper and Hill (1995) found that patients' preferred method of information presentation was the non-oral sources of information. Other studies found that printed educational materials helped reinforce and supplement verbal information (Farrell-Miller & Gentry, 1989; Myerscourch, 1989) Printed health education materials also have been shown to be effective communication supports and increase accessibility of healthcare information for PWA (Rose, Worrall, & McKenna, 2003). Effective education and learning is an important prerequisite to collaborative
interventions. Persons with aphasia in acute care settings are particularly challenged to understand healthcare information and be involved in choices, unless they have effective communication supports. Such supports fit broadly under the frameworks of AAC and multimodal communication techniques.

**Acute interventions and supports**

**AAC and Aphasia**

Many communication supports used with PWA fall in the realm of AAC. According to Lasker and Garrett, “AAC strategies are essentially external representations of meaning. People with aphasia must refer to information supports that are ‘outside of their heads’ – that is not a part of the automated network of memories, associations, and language that allowed them to communicate with minimal effort before onset of aphasia” (Garrett & Lasker 2013; p. 406). A substantial number of adults who experience sudden-onset aphasia have complex communication needs that either remain unmet or require the use of compensatory strategies or alternatives to natural speech (Laska et al., 2001; LaPointe, 2005). AAC compensatory strategies or alternatives to natural speech can either be no-technology, low-technology, or high-technology. AAC supports serve a variety of functions for PWA some of which are providing a means of expressing basic needs and wants, preferences, or personal information and supplying a specific technique to enable participation, with more independence, in an important life activity (Garret & Lasker, 2013).

**No to Low Technology AAC**

AAC strategies can fall into three groups: no-technology, low-technology, and high-technology. While definitions of these groups vary, this paper follows the
definitions found in Beukelman, Garrett, and Yorkston (2007). No-technology (no-tech) strategies involves no technology of any kind and only relies on the human body. Gestures (e.g. yes or no head movements), attention-getting noises (e.g. grunting), or manual signs are included in this group. Low-technology (low-tech) strategies are supports that do not produce speech or print. Examples of low-tech strategies include picture-based strategies (e.g. boards or Talking Mats), drawings, rating scales, written choice, writing, eye-gaze and/or alphabet boards. High-technology (high-tech) strategies utilize devices that can produce speech output. Examples of high-tech strategies include, but are not limited to iPad, Vantages, and Dynavox devices. It is important to note that some AAC strategies can be included in more than one group depending on the support’s design. An example of one of these strategies that will be discussed later on is Visual Scene Displays.

No-tech and low-tech strategies are more commonly used to aide communication for PWA because they are simplistic and require minimal specialized materials. No-technology and low-technology interventions focus on using multimodal supports, rating scales, symbols, pictures and written communication to increase engagement in conversations and improve communication effectiveness (Fox, Sohlberg, & Fried-Oken, 2001; Garrett & Beukelman, 1995; Lasker, Garrett, & Fox, 2007; Lasker, Hux, Garrett, Moncrief, & Eischeid, 1997; Lyon, 1995a, 1995b). Multimodal communication supports encourage PWA to use natural communication modalities like residual speech, gestures, and writing in conjunction with externally represented messages, or AAC (Lasker & Garrett, 2013). Multimodal communication strategies can help PWA repair communication breakdowns as they occur.
Pairing multimodal communication with externally represented messages such as pictures, drawings, and words is an effective way to facilitate conversation with PWA. Examples of low-tech strategies utilizing pictures and symbols included Talking Mats, Activity Card Sort, and Visual Scene Displays. Speech language pathologists use Talking Mats to facilitate conversation with PWA. Talking Mats (Boa, S., & Murphy, J. (2003) uses picture symbols representing topics, options related to each topic, and a visual scale to help PWA communication their wants and ideas. A communication support Occupational Therapists use, which is similar to Talking Mats, is Activity Card Sort (ACS) (Baum, & Edwards, 2001).

Both communication supports can be used to help PWA describe their social, instrumental, and leisure activities. Talking Mats and ACS have been shown to increase participation in goal setting of PWA (Bournman & Murphy, 2006; Doney & Packer, 2008; Murphy & Boa, 2012). A low-tech Visual Scene Displays (VSDs) is a picture or photograph that represents a situation, place, or an experience. Elements of the VSD include people, actions, and objects within the scene (Blackstone, 2004). A low-tech VSD would have a fixed display that cannot change.

Other examples of low-tech AAC strategies include rating scales and written choice. Rating scales require a communication partner to produce a rating scale about a specific topic or question. The partner asks the PWA to indicate their response to the question or topic by referencing the scale (Presto, 2009). Written choice requires a communication partner to record a list of key words from conversation about a chosen topic and from the list the PWA can select his/her desired response. Written choice allows the PWA and his/her communication partner to develop a co-constructed message.
in a shared communication space (Garrett & Beukelman, 1995; Lasker et al., 1997). Co-constructing messages by incorporating context or pictures helps PWA visualize the conversation’s topics and map the conversation’s flow.

**High-tech AAC**

The third group of AAC strategies includes high-tech communication devices. These devices allow the person with the communication impairment to program in a message and have the device speak the message out loud. Devices that can speak the message aloud are called speech generating devices (SGD). The spoken message can be generated through letter-by-letter spelling, word-level retrieval, and/or phrase-level retrieval. Examples of SGDs include, but are not limited to, iPads, Vantage, and Dynavox devices.

VSDs in their high-tech forms can be incorporated into these SGDs. In the VSD display, an element in the scene may have a pre-recorded message linked to it. When the user selects the element, the device speaks the message. The use of VSDs to support conversation has shown to increase the PWA level of engagement and participation in conversation (Beukelman et. al., 2005; Dietz, McKelvey, Hux, & Beukelman, 2009; Hux, Buechter, Wallace, & Weissling, 2010; Seale, Garrett, & Figley, 2007). VSDs create a shared communication space between the PWA and his/her communication partners. VSDs, as well as other AAC communication supports, can be used to provide low levels of support or high levels of support depending on the needs of the communicator. Understanding the needs of the communicator, his or her communication skills, and how much partner support is needed helps determine what AAC device(s) is/are the most appropriate communication support option.
Communicator Types

Selection of the appropriate AAC communication support and/or device depends on communicator type. The PWA’s communicator type is determined by their need for a partner to communicate and the types of skills they possess. There are two general types of communicators who benefit from AAC strategies: independent communicators and partner-dependent communications (Garrett & Lasker, 2005a). Independent communicators can learn to use a variety of AAC strategies and/or devices to independently formulate and express messages. These types of communicators do not need additional support from conversation partners to aide in co-constructing messages; rather they can receive and encode messages on their own. Partner-dependent communicators have severe linguistic and/or motor speech impairments that hinder independent message expression and formulation. These communicators rely on partners to supply them with a finite set of semantic information and help them ask or answer questions and provide information to supplement the conversation (Lasker, Garrett, & Fox, 2007). Table 1 lists the types of communicators in these two categories.
<table>
<thead>
<tr>
<th>Communicator Type</th>
<th>Communication Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Communicator</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Storied message communicator</strong></td>
<td>Independently find stores messages in advance by others and use message in specific contexts (e.g. ordering food)</td>
</tr>
<tr>
<td></td>
<td>Independently initiates communication</td>
</tr>
<tr>
<td></td>
<td>May symbolize stored messages with pictures, symbols or other words</td>
</tr>
<tr>
<td></td>
<td>May intentionally supplement augmented communication with meaningful speech, writing, or gestures</td>
</tr>
<tr>
<td></td>
<td>Can manipulate and navigate through communication system independently or with minimal assistance</td>
</tr>
<tr>
<td></td>
<td>May demonstrate ability to repair communication breakdowns using multiple modalities</td>
</tr>
<tr>
<td><strong>Generative Communicator</strong></td>
<td>Independently combines a variety of modalities and/or message components to construct message</td>
</tr>
<tr>
<td></td>
<td>May utilize multiple steps to construct a message (e.g. symbol sequences)</td>
</tr>
<tr>
<td></td>
<td>Independently navigates to multiple locations in system to retrieve desired message</td>
</tr>
<tr>
<td></td>
<td>Primary mode of communication may be a natural, unaided communication modality or linguistic-level symbol selections on a voice-output system</td>
</tr>
<tr>
<td></td>
<td>Independently use stored message in predictable communication routines where rapid responses are necessary</td>
</tr>
</tbody>
</table>
| **Special Need Communicator** | Primarily communicate using unaided communication strategies (ex. speech, gestures, writing), but in specific situations, chooses to use AAC strategies/systems to communicate  
Uses alternative modalities in some contexts |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Partner-dependent communicator</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **Emerging Communicator** | Looks up when greeted  
Uses vocalizations and/or expression to communication pleasure or displeasure  
Uses facial expression, pointing, or vocalizations to communicate he/she recognizes familiar items or people  
Uses Facial expressions, vocalizations, or gestures to show awareness of familiar names/words or general conversation topics with familiar partners |
| **Contextual Choice Communicator** | Can point to written word choices or pictures to answer moderately complex questions  
Can recognize and understand photographs, pictographic symbols, and sight words, and contextually presented text  
Sometimes points to items or symbols in environment to request  
Sometimes answers contextual, personally relevant yes/no questions by accurately nodding or shaking head  
Aware of daily routines |
| **Transitional Communicator** | Aware of external symbols and strategies can aide in communication and sometimes initiates communication using these strategies  
| | Gestures or speaks to initiate interaction with partners  
| | Shows relatively strong comprehension and can consistently answer yes/no questions accurately  
| | Can utilize stored phrase-length messages to participate in familiar, contextualized activities with cues from a communication partner |

*Note.* Information for Table 1 adapted from Lasker, Garrett, and Fox (2007)
Partner-training

The majority of people with severe aphasia fall into the partner-dependent communicator category (Lasker, Garrett, and Fox, 2007). Research has demonstrated that trained partners who use AAC communication supports and appropriate communication resources can increase conversation participation for PWA (Genereaux et al., 2004; Hickey, Bourgeois, & Olswang, 2004; Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001; Lyon et al., 1997; Rayner & Marshall, 2003; Rose, Worrall, & McKenna, 2003; Simmons-Mackie, Kearns, & Potechin, 2005). Studies have also shown that using communication supports increase the participation of PWA in decision making about their health care (Byng et al., 2003; Kagan & LeBlanc, 2002). A PWA will interact with many communication partners during their time in an acute care setting. The communication partners will have different relationships with the PWA and will support the PWA through the recovery process in different ways. Since the communication partners will have differing support roles, they will have different communication training needs so they can use the appropriate communication support strategies to effectively accomplish their role.

Discussion of players/partners by discipline

While the patient is in acute care, communication partners not only include close communication partners (e.g., spouse, family, close friends), but also include acute care unit staff like nurses, occupational therapists (OTs), and physical therapists (PTs), and doctors. Some professionals, like nurses, spend a large amount of time with the patient and have a substantial role in implementing the treatment. Some professionals like SLPs, OTs, PTs and other rehabilitation specialists spend a moderate amount of time with the
patient and have an important role in the recovery of the client. Lastly, there are some professionals like doctors who spend a relatively small amount of time with a client, but have a crucial role in treatment planning and implementation for the patient (Lincoln, Willis, Phillips, Juby, & Berman, 1996; Wit, et al., 2005). Along with healthcare professionals, the PWA’s family members have an important role in the decision making process and therapy implementation process.

Effective communication between patients and healthcare professionals is an important requisite to receiving high quality medical care (Stewart et al., 1995). To effectively communicate with a person who relies on AAC techniques, the nurse, doctor, or other healthcare professionals need to have the competence and knowledge of the AAC techniques the patient utilizes. If the healthcare professional does not have sufficient competence supplementing communication with AAC strategies or chooses not to implement the strategies, communication barriers between the patient and professional will develop.

A limited number of studies have shown that training health care providers to use AAC communication support strategies can improve communication with patients with aphasia. Legg, Young, and Byer (2005) demonstrated that when residential medical students were trained how to use supported communication techniques (Kagan, et al., 2001), the level of communication between the students and patients with aphasia increased. The trained residents made significant improvements during mock medical interviews in the areas of amount of information exchanged, the quality of interactions rated by the PWA with aphasia who served as the patients. In another study by Simmons-Mackie and colleagues (2007), a training seminar was conducted for multidisciplinary
healthcare providers in three different healthcare settings (e.g., acute care, rehabilitative care, and long-term care. The training focused on increasing the team members’ skill and knowledge in using communication supports and developing team goals designed to improve communicative access. The results indicated that training healthcare providers increased the PWA access to healthcare information and increased participation in decision-making at all three facilities. Although there were improvements, the study also revealed that implementing the strategies was most challenging for the acute care team and barriers to implementing AAC communication support strategies were identified.

**Barriers to Implementing AAC**

**Broad discussion of barriers**

There are many potential barriers to implementation of AAC devices and communication strategies in acute care settings. When AAC devices and strategies cannot be used effectively, this creates participation barriers for individuals who rely on AAC to support communication. To identify which participation barriers exist, Beukelman and Mirenda (1988) presented *The Participant Model* as a framework for carrying out AAC assessments and interventions. *The Participation Model* provides a systematic process for conducting AAC assessments and designing interventions. The goal of this process is to identify the individual’s communication status, what participation barriers are limiting communication effectiveness, and implement interventions to increase participation.

Participation barriers can be divided into two types: *opportunity barriers* and *access barriers*. *Opportunity barriers* are imposed by people other than person with CCN and cannot be eliminated by simply employing an AAC system or intervention. The five
opportunity barriers are knowledge, skill, attitude, policy, and practice (Beukelman & Mirenda, 2013). Knowledge barriers are caused by the lack of facilitator information and knowledge. Skill barriers are caused by facilitators who, despite having extensive knowledge, have difficulty with implementation of AAC with the person who uses AAC. Attitude barriers are caused when an individual’s attitudes or beliefs impact AAC users. Policy barriers happen when the policy of organization or family impacts the ability of AAC users to procure and/or use AAC. Hospitals which lack provision of devices due to expense or confidentiality concerns are examples of policy barriers. Practice barriers are procedures or practices that have become common, but are not official policies, which can inhibit or make AAC systems more challenging to use. Access barriers are caused by limitations in current capabilities and attitudes of the individual with CCN or limitations of his/her current system.

Garret, Happ, Costello, and Fried-Oken (2007) discussed two additional implementation barriers that can exist in the acute care setting. These barriers are technology and environment barriers and availability of resources. Technology and environment barriers are caused by additional medical equipment in the patient’s room, which limits the ability of the healthcare provider or patient to use AAC strategies. An example of this barrier could be IV lines limiting the patient’s mobility. The availability of resource barrier can be caused by a lack of AAC equipment available in the unit or insufficient device quantities.

Specific Barriers

A growing body of research has examined communication barriers between nurses and patients (Baker & Melby, 1999; Bergbom-Engberg & Halajämäe, 1993;
Hemsley et al., 2001, Leathart, 1994; Simmons-Mackie et al., 2007). Common barriers to implementing AAC communication strategies identified by ICU nurses included are listed in Table 2. It is interesting to note the barriers listed in Table 2 were also identified as facilitators to communication between CCU nurses and patients with communication impairments (Baker & Melby, 1999; Bergbom-Engberg & Halajamäe, 1993; Hemsley et al., 2001; Leathart, 1994).

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Research Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse’s lack of knowledge of AAC</td>
<td>Bergbom-Engberg &amp; Halajamäe, 1993; Hemsley et al., 2001; Leathart, 1994</td>
</tr>
<tr>
<td>Lack of training and experience</td>
<td>Hemsley et al., 2001</td>
</tr>
<tr>
<td>Nurses negative attitudes:</td>
<td>Hemsley et al., 2001</td>
</tr>
<tr>
<td>Feel patient has no need to communication</td>
<td>Leathart, 1994</td>
</tr>
<tr>
<td>Not their job to provide communication tools</td>
<td></td>
</tr>
<tr>
<td>Limited time with patient</td>
<td></td>
</tr>
<tr>
<td>Perception using AAC strategies is too time consuming</td>
<td></td>
</tr>
<tr>
<td>Access to communication tools</td>
<td>Hemsley et al., 2001</td>
</tr>
<tr>
<td>Communication interactions with patients are more task-focused than communication focused</td>
<td>Baker &amp; Melby, 1999; Bergbom-Engberg &amp; Halajamäe, 1993; Leathart, 1994; Simmons-Mackie et al., 2007</td>
</tr>
<tr>
<td>Patient’s cognitive, physiological, and language ability</td>
<td>Baker &amp; Melby, 1999; Hemsley et al., 2001; Leathart, 1994; Simmons-Mackie et al., 2007</td>
</tr>
<tr>
<td>Family involvement</td>
<td>Bergbom-Engberg &amp; Halajamäe, 1993; Leathart, 1994</td>
</tr>
<tr>
<td>Limited patient length of stay</td>
<td>Simmons-Mackie et al., 2007</td>
</tr>
</tbody>
</table>
Research focusing on barriers between PWA and nurses identifies *implementation barriers* of using AAC communication strategies that must be addressed. While knowing nursing-specific barriers is valuable because they spend a substantial amount of time with patients, nurses are one of many healthcare professionals that interact with patients during their stay in the acute care unit. There is little research investigating possible communication barriers between patients and other healthcare staff.

The purpose of this study is to answer a two-part question: 1) What types of *implementation barriers* and *facilitators* affect use of AAC strategies by acute care providers (specifically occupational and physical therapy) for patients with aphasia? and 2) How do the *implementation barriers* and *facilitators* differ between healthcare providers on the acute care team? Specifically, this study seeks to make comparisons between occupational therapy, physical therapy, and prior research about nurses. Identifying which opportunity barriers exist and how they differ by discipline may help SLPs tailor communication training to those professions.

**CHAPTER TWO**

**METHODS**

**Participants**

Qualitative research methods were employed to investigate barriers to healthcare providers’ implementation of AAC strategies by occupational and physical therapy with individuals with aphasia. Five participants were recruited for the study including occupation and physical therapists (see Table 3) who work on an acute care team at regional hospitals in the Eau Claire area. Years of total work experience ranged from 5 - 35 years, with a range of 5-32 years in the acute care setting.
Acute care facilities in the Eau Claire area include one facility which houses 344 total beds, 22 acute care beds (including critical and intensive care units), and 24 rehabilitation beds (on the CARF accredited unit); and another facility which houses 204 total beds, 32 acute care beds (critical care and NICU), and serves as a level I trauma center for the region & area stroke certification unit. Smaller regional hospitals were not included in this study because they did not meet desired patient acuity levels. Those smaller regional hospitals send more acute/critical patients to the larger regional facilities. Participants were required to have experience serving PWA during the acute phase of recovery in an acute care hospital setting.

The professions of physical therapy and occupational therapy were included because they spend a moderate amount of time with the patients, have an important role in planning the patient’s intervention, and implementing the treatment plan (Magnus & Turkington, 2006). Additionally, previous research fails to address potential barriers and facilitators to implementation of AAC in acute care settings by these professions.

TABLE 3

Participant Characteristics and Disciplines

<table>
<thead>
<tr>
<th>Participant Profession</th>
<th>Years of Experience Total</th>
<th>Years of Experience in Acute care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational Therapists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupational Therapist 1</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>Physical Therapists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Therapist 1</td>
<td>21</td>
<td>13</td>
</tr>
<tr>
<td>Physical Therapist 2</td>
<td>32</td>
<td>21</td>
</tr>
<tr>
<td>Physical Therapist 3</td>
<td>16</td>
<td>9.5</td>
</tr>
<tr>
<td>Physical Therapy Assistants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Therapist Assist. 1</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
Procedures

A semi-structured interview, following frameworks developed by Simmons-Mackie et al. (2007) and Magnus and Turkington (2006), was used to guide the conversation (see Appendix A). Interviews were conducted in a private treatment room in the University of Wisconsin-Eau Claire, Center for Communication Disorders clinic. Video and audio recordings of the interviews were captured for later review and coding.

Interviews were conducted by a speech-language pathologist, training in implementation of qualitative interviewing and blinded to the hypotheses of this investigation. The interviewer was selected because of her knowledge of AAC and previous background working in a hospital. Her knowledge allowed her to more effective conduct of the interviews because she understood the environment where the participants worked and was familiar with the roles of their professions. Further, her prior knowledge enabled her to ask pertinent follow-up questions, beyond those identified in the semi-structured interview. The participants were blinded to the interviewer’s profession as a speech language pathologist.

Following a script to assure equivalence across interviews, the interviewer was encouraged to use follow-up questions to clarify or expand upon participant comments. The primary researcher observed the interviews from the observation deck. During observation, the primary researcher recorded field notes including observations about nonverbal cues, emotive behaviors, and participant responses. Prior to the interviews, participants completed a questionnaire, including demographic open-ended questions (see Appendix B). Demographic questions addressed overall years of experience, experience in acute care, and experience with individuals with communication impairments for each
team member. The remaining interview questions were open-ended in order to collect perspectives of the participants (Spradley, 1979; Westby, 1990). The full questionnaire is included in Appendix A. Follow-up questions were flexible, based upon information provided by the participant. This allowed the researcher to gather specific information about possible barriers to AAC implementation.

**Data Analysis**

Several forms of qualitative data were derived from the interviews including manually-coded thematic analyses and field notes. Manual coding followed a technique designed to classify dichotomous data described by Granenheim and Lundman (2004). See Appendix C for the manual coding scheme template and Appendix D for an example of a coded transcript. Note that the coding document has the following headings: a) meaning units (i.e., complete transcribed statements, segmented by a common central meaning), b) condensed meaning units (i.e., abbreviated statements with mazing, restarts, and circumlocutions removed while retaining core meaning), and c) possible codes (i.e., a dichotomous decision of ‘barrier’ and/or ‘facilitator’). Potential codes were further divided into types of barriers and facilitators. Only statements made by the participants were coded. Statements made by the interviewer were highlighted in grey. Coders were able to review interviewer questions and statements in order to understand the context of participant statements. The manual coding process involved several steps: 1) primary investigator transcribed the interviews into meaning units; 2) primary investigator and two coding assistants independently coded the transcripts; 3) primary investigator and coding assistants compared codes to negotiate group consensus; and 4) validating and
triangulation of manual-, consensus-coding by comparing the results to the researcher’s field notes. See Figure 3 for manual coding process.

The primary researcher transcribed the interviews and segmented the transcript into meaning units and condensed meaning units. Mazes, interjections, incomplete thoughts, and embedded irrelevant information were removed from the verbatim transcript. The meaning units were further condensed into words and short phrases that represented the core meaning of the participant’s responses. The primary researcher completed an inter-rater reliability check on 15-20% of each participant’s transcript. Interview transcripts were read several times before the data was divided into three broad content areas by the primary researcher: 1) content related to facilitators to AAC strategy use, 2) content related to barriers to AAC strategy use, and 3) content that included irrelevant information. Irrelevant statements were not analyzed.

Coding assistants were trained in the coding scheme by the primary investigator. The primary investigator and coding assistants used the ‘Possible codes’ column to independently identify statements as either a potential ‘barrier,’ ‘facilitator,’ or both. Secondly, coders identified the type of ‘barrier’ and/or ‘facilitator’ each statement represented. “A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data” (Saldana, 2009, p. 3).

Consensus coding was completed through direct review of written transcripts. At this point, the two blinded coders and the primary investigator negotiated consensus on each of the dichotomous codings (i.e., barrier or facilitator) and each of the barrier/facilitator types. Consensus addressed whether the code was correct, should be
reassigned to another code, warranted creation of a new code, or if codes could be combined. Discrepancies in coding were resolved through negotiation between the primary researcher, research mentor, and coding assistants. All coders reached consensus on rationale for assigning of specific codes.

The primary researcher and research assistants then grouped the codes into categories. The categories were negotiated between the researcher and assistants and an agreed upon label was assigned. After the categories were determined, the primary researcher, faculty mentor, and research assistants determined if a hierarchical relationship existed between the categories. A consensus was reached that no hierarchical relationship existed between the categories. After the manual coding process was complete, the total number of statements within each category was calculated, the number of participants making a statement within each theme, and which themes were common to specific healthcare provider categories.

![Diagram of manual coding process]

**Figure 3. Manual coding process.**
Validation of data

Triangulation is a method for validating the data collected and verifying it by cross-referencing two or more sources. Validation and triangulation of the data was achieved by comparing the results of the manual, consensus-coding and extrapolated categories to the field notes taken by the primary researcher (see Figure 4). One step of triangulation had already been achieved by having the primary investigator and research assistants independently manually code the transcripts and then meet to negotiate a group consensus on the assigned code and categories. Upon comparison of initial code and category assignments, the inter-rater reliability was 90%. After discussion of rationale and negotiation of coding assignments and category placement, the primary researcher and research assistants reached 100% consensus.

After the group reached consensus on the codes and categories, the primary researcher compared the manual, consensus coding results to her field notes. The primary researcher’s field notes were written while observing the recorded interviews and included the primary researcher’s thoughts and impressions about the participants’ answers. The primary researcher compared the codes determined through consensus coding of the interviews transcripts to the field-notes to determine if the codes also were evident in the field notes. Upon comparison, 86% of the codes identified in the semi-structured interview through consensus coding were also present in the primary researcher’s field notes.
CHAPTER THREE

RESULTS

The research questions investigated in this study were 1) What types of implementation barriers and facilitators affect use of AAC strategies by acute care providers (specifically occupational and physical therapy) for patients with aphasia? and 2) How do the implementation barriers and facilitators differ between healthcare providers on the acute care team? During the process of answering these questions, the study identified 8 broad barrier categories, which were further divided into 18 barrier subcategories. It also identified 6 broad facilitator categories, which were further divided into 19 facilitator subcategories.

A total of 310 statements were coded. 147 of the total statements (47%) were classified as barriers. Of the 147 barrier statements, barriers related to communication partner knowledge and skill contained 40 statements (27%), barriers related to resources
contained 35 statements (24%), barriers related to practice contained 18 statements (12%), barriers related to environment contained 6 statements (4%). barriers related to policy contained 2 statements (1%), barriers related to communication partner’s attitude included 6 statements (4%), barriers related to patient health status and ability contained 39 statements (27%) and other barriers contained 5 statements (4%). The percentage of incidence for a barrier category were calculated by dividing the number of barrier statements in that category by the total number of barrier statements. The percentages were used to determine which barrier categories were more substantial in terms of frequency of mention by the participants. It’s important to note that the percentage of incidence for a code does not necessarily correspond to its importance or relative value. The percentage of incidence was one mean of objectifying relationships between variables. For further data analysis of the barrier data see Appendix E.

One hundred sixty three of the total statements (53%) were classified as facilitators. Of the 163 facilitator statements, facilitators related to communication partner knowledge and skill accounted for 88 statements (54%), facilitators related to resources accounted for 33 statements (20%), facilitators related to practice accounted for 2 statements (2%), facilitators related to communication partner’s attitude accounted for 22 statements (13%), facilitators related to patient health status and ability accounted for 10 statements (6%) and other facilitators accounted for 5 statements (3%). The percentage of incidence for a facilitator category were calculated by dividing the number of facilitator statements in that category by the total number of facilitators statements. The percentages were used to determine which facilitator categories were more
substantial in terms of frequency of mention by the participants. For further data analysis of the facilitator data see Appendix F.

**Barriers**

Eight broad categories of barriers were identified including barriers related to: a) *communication partner knowledge and skill*, b) *communication partner’s attitude*, c) *resources*, c) *facility policy*, d) *practice*, e) *environment*, f) *patient status and ability*, and g) *other barriers*. One hundred forty seven out of 310 (47%) total statements were coded as barriers. A summary of the barriers in each core group and exemplars is provided in Table 4.

**Barriers related to communication partner knowledge and skill**

Barriers related to *communication partner knowledge and skill* involved the healthcare provider’s knowledge of and skill using AAC strategies, determining at what level the communication breakdown was occurring, and their ability to gain more knowledge and skill through training. This broad category paralleled the knowledge and skill barriers discussed by Beukelman and Mirenda (2013) and Garrett, Costello, and Fried-Oken (2007).

The *communication partner knowledge and skill* barrier category included 40 out of 147 (27%) total barrier statements. This category accounted for the most barrier statements and consisted of four sub-categories: a) *healthcare provider knowledge and skill*, b) *colleague knowledge and skill*, c) *training availability*, and d) *healthcare provider knowledge of determining at which level the communication breakdown was occurring*. Descriptions of subtypes are provided below. Additional information about broad categories and sub-categories are presented in Table 4.
1. Healthcare provider knowledge and skill. This sub-category contained 25 of the 147 (17%) total barrier statements and was the second most frequently mentioned barrier overall. Types of statements in this sub-category described: a lack of skill using AAC strategies, a lack of knowledge of AAC strategies available to use, and a lack of knowledge of AAC resources in the facility. An example a participant provided when asked what factors limited her ability to use communication supports was, "...not being comfortable with something that might be available. If there is something available, it's like, 'wow I've never used that and I don't know how to.'"

2. Colleague knowledge and skill. This subcategory included 2 of the 147 (1%) total barrier statements. This sub-category included examples of how a colleague’s lack of knowledge and skill hindered the use of AAC strategies in the acute care unit.

3. Training availability. Training availability included 10 of the 147 (7%) total barrier statements. Statements in this sub-category described how a lack of training available affected the healthcare provider’s ability to use AAC strategies. Participants felt if they had more opportunities for training, their knowledge of AAC strategies would increase. An example of a barrier was, "We rely on the speech therapists to give us some really good tips, but it would be helpful to have more training in that regard."

4. Healthcare provider knowledge of determining at which level the communication breakdown was occurring: language-communication processing level, physical ability/motor planning level, or cognitive ability level. This sub-category included 3 of the 147 (2%) total barrier statements. Barriers in this sub-category described how the healthcare provider lacked the knowledge to determine if the patient was not responding to a question because linguistically the patient did not
understand/could not respond, they could not motor plan the response, or the patient was being limited by their cognitive status.

**Barriers related to communication partner’s attitude**

Barriers related to the *communication partner’s attitude* included 6 of the 147 (4%) total barrier statements. Attitude barriers involved feelings and the resulting actions that hindered AAC strategy use in acute care units. This broad category paralleled the attitude opportunity discussed by Beukelman and Mirenda (2013). Three sub-categories related to the communication partner’s attitude were discovered: a) *not feeling responsible to manage patient communication needs*, b) *personal choice to not learn more about AAC*, and c) *lack of motivation to take time to communicate*. Descriptions of sub-categories were provided below. Additional information about broad categories and sub-categories were presented in Table 4.

1. *Not feeling responsible to manage patient communication needs*. All the participants were asked the question “who do you think is primarily responsible for assessing and managing the communication needs of your patients?” Some participants responded by saying the job was the speech therapists’ responsibility since that was their area of expertise. This sub-category included 3 of the 147 (2%) total barrier statements.

2. *Personal choice to not learn more about AAC*. This sub-category included 1 of the 147 (1%) total barrier statements. Participants were asked if they felt additional training and/or resource would enhance their abilities to communicate with patients. One participant responded by saying, “I don’t think I would need something like that.”

3. *Lack of motivation to take time to communicate*. This sub-category included 2 of the 147 (1%) total barrier statements. Participants were asked to provide examples of
situations where they were not successful in helping a patient express his or her wants and needs and why it wasn’t successful. An example statement from this sub-category was, “Sometimes you can’t understand what the patient is saying and you have to move on. That’s just the way it is.”

Barriers related to resources

Barriers related to resources involved the availability, accessibility, and usability of AAC resources. This broad category paralleled the technology and equipment barrier category discussed by Garrett, Happ, Costello, and Fried-Oken (2007). Four sub-categories were included in this broad category: a) availability, b) accessibility, c) resource design, and d) equipment breakdown. Thirty-five of the 147 (24%) barrier statements were classified under this broad category. It was the third most frequently mentioned broad category behind communication partner knowledge and skill and patient health status and ability broad categories respectively. Descriptions of sub-categories are provided below. Additional information about broad categories and sub-categories are presented in Table 4.

1. Resource availability. Ten of the 147 (7%) total barrier statements were included in this category. Barriers relating to the availability of resources included resources not being present in the facility or resources being in-use by other departments. One participant stated, “There’s availability of some things, but I wish there were more things available to us.”

2. Resource accessibility. Seventeen of the 147 (12%) total barrier statements were included in this category. Barriers included resources being present in the facility, but not in an easily accessible location from the patient’s room or acute care unit. One
participant shared this example of a barrier, “I’m out of luck if it isn’t right there [in the patient’s room] where I would be able to reach it.”

3. Resource design. Resource design included barriers related to resources interfaces not being user-friendly, tools not individualized to the patient’s or the profession’s needs, or not being age-appropriate. This sub-category included 6 of the 147 (4%) total barrier statements. One participant stated, “If the design isn’t quick and easy for me and the patient to understand, I won’t have enough time to teach it”.

4. Equipment breakdown. This sub-category included 2 of the 147 (1%) total barrier statements. Barriers included in this category involved statements about equipment not functioning properly and therefore not being useable to facilitate communication.

**Barriers related to policy**

Barriers related to policy referred to how the organization’s structure and policies hindered the use of AAC strategies. This broad category related to policy paralleled the policy barrier category discussed by Beukelman and Mirenda (2013). One sub-category related to policy barriers was identified in this broad category. It contained 2 of the 147 (1%) total barrier statements. Descriptions of the sub-category were provided below. Additional information about broad categories and sub-categories were presented in Table 4.

1. Change to the hospital structure. This sub-category included statements describing how changes to hospital structure limited healthcare provider’s opportunities to learn about AAC. A participant described how changes in hospital structure in terms of patient acuity level affected the amount of co-treating providers did. The participant felt
when the hospital limited the neurology/trauma unit to acute care and began sending patients to other facilitates for rehabilitation services, the amount of co-treating decreased.

**Barriers related to practice**

Barriers related to *practice* included procedures or practices common to the acute care facility that hinder the use of AAC strategies. The broad category paralleled the *practice barrier* category discussed by Beukelman and Mirenda (2013) and Garrett, Happ, Costello, and Fried-Oken (2007). Fourteen of 147 (10%) of the total barrier statements were included in this broad category. One sub-category was identified: barriers related to *time*. A description of this sub-category was provided below.

Additional information about broad categories and sub-categories were presented in Table 4.

1. *Time*. This sub-category included examples of how limited time with patients and/or limited time to search for materials affected the healthcare provider's ability to use AAC strategies. An example of a time barrier statement was, "*We don't always have the time to say, 'you know what, I'm going to quit not and walk across the entire hospital to get what I need,' and make it back on time. It's not reality.*"

**Barriers related to environment.**

Barriers related to *environment* included distractions or equipment in the patient’s room that impeded the patient’s ability to utilize AAC strategies. This broad category paralleled the *environment barrier* discussed by Garrett, Happy, Costello, and Fried-Oken (2007). Two sub-categories were identified: a) *medical equipment present in room* and b) *environmental distractions*. Descriptions of sub-categories are provided below. Six
of 147 (4%) of the total barrier statements were included in this broad category. Additional information about broad categories and sub-categories are presented in Table 4.

1. Medical equipment in the room. This sub-category included examples of situations where the medical equipment present in the room hindered the use of AAC strategies. An example of a medical equipment barrier was when a patient has I.V.s attached to his or her arms the patient’s mobility is limited, therefore the ability to point and write is compromised. This sub-category included 2 of the 147 (1%) total barrier statements.

2. Numerous distractions. Examples included in this category described how distractions such as sounds or interruptions to therapy sessions affected communication between provider and patient. This sub-category included 4 of the 147 (3%) total barrier statements.

Barriers related to patient health status and ability

The patient health status and ability broad category included barriers describing how the patient’s health status and ability level hindered the healthcare provider’s ability to use AAC supports or the patient’s ability to use the AAC supports. The patient’s health status and ability included factors such as the severity of patient’s language, cognitive, and/or physical impairment and the patient’s endurance levels. This broad category paralleled the access barrier category discussed by Beukelman and Mirenda (2013). One sub-category was included in this broad category. Patient health status and ability contained 39 of the 147 (26%) total barrier statements and was the most frequency mentioned barrier sub-category. It was the most frequently mentioned barrier overall.
1. *Patient health status and ability.* Barriers related patient status and ability include the patient’s physical strength, motor ability, concentration, stamina, and cognitive abilities. One participant stated, “*in the ICU if patients have had a severe stroke, they’re usually so wiped out and tried and heavily medicated.*” Participants responses also showed that patients with the most severe limitations were the patients they felt least comfortable using AAC to support conversation.

**Other barriers**

The *other barriers* broad category included 5 of the 147 (4%) total barrier statements. Two sub-categories were identified: a) *family involvement* and b) barriers related to *setting*. Descriptions of sub-categories were provided below. Additional information about broad categories and sub-categories were presented in Table 4.

1. *Family Involvement.* This sub-category included statements describing situations where family members hindered communication between healthcare providers and patients. One way family members did this was inserting their own wants over the wants of the patient. One of the 147 (1%) total barrier statements were included in this sub-category.

2. *Setting.* Four out of 147 (3%) barrier statements were included in this sub-category. This sub-category involved barriers relating to acute care setting limitations. An acute care setting limitation was the short length of stay patients have in the acute care unit before transitioning onto rehabilitative settings. Because patients did not remain long in the acute care unit, the number of treatment sessions were limited. This meant healthcare providers had fewer opportunities to troubleshoot communication related problems and trial strategy use with patients.
Discipline-Specific Differences in Barriers

Differences and similarities in barriers mentioned by the various healthcare providers were identified. The percentage of incidence for a barrier category within a discipline was calculated by dividing the number of barrier statements in that category by the total number of barrier statements mentioned by each discipline. The percentages were used to determine which barrier categories were more substantial in terms of frequency of mention by discipline.

Similarities in the most frequently mentioned barriers existed between the disciplines. The most frequently mentioned barrier sub-category across all the professions was barriers related to the patient’s status and ability. Twenty-four of the 101 (24%) total barrier statements mentioned by PTs, 9 of the 26 (35%) total barrier statements mentioned by the PTA, and 6 of the 27 (22%) total barrier statements mentioned by the OT were included in this sub-category.

The second most frequently mentioned barrier sub-category across all the disciplines was barriers related to resource availability and accessibility. Twenty-one of the 101 (21%) total barrier statements mentioned by PTs, 4 of the 26 (15%) barrier statements mentioned by the PTA, and 9 of the 27 (33%) total barrier statements mentioned by the OT were included in the resource availability and accessibility sub-category. The third most frequently mentioned barrier sub-category across all the professions was barriers related the healthcare provider knowledge and skill. Sixteen of the 101 (16%) total barrier statements mentioned by PTs, 5 of the 26 (19%) total barrier statements mentioned by the PTA, and 5 of the 27 (15%) total barrier statements mentioned by the OT were included in this sub-category.
Differences in barrier sub-categories and their frequency of incidence existed across disciplines as well. A frequently mentioned barrier subcategory by the OT. was barriers related to *time*. Four of the 27 (19%) total barrier statements made by the OT. mentioned how limited time available to work with the patient hindered her ability to use AAC supports. However, only 2 of the 101 (2%) total barrier statements made by PTs and 1 of the 26 (4%) total barrier statements made by the PTA were related to time barriers.

Another disciplinary difference was how often barriers related to *training availability* were mentioned. Three of the 26 (12%) total barrier statements made by the PTA mentioned how a lack of training affected her ability to use AAC supports. Only 7 of the 101 (7%) total barrier statements mentioned by PTs and 0 of the 27 (0%) total barrier statements mentioned by the OT were related to training availability.
### TABLE 4

**Summary of Barriers to AAC Use in the Acute Care Setting**

<table>
<thead>
<tr>
<th>Barrier categories and code descriptions</th>
<th>Percent of total barrier statements</th>
<th>Identified in semi-structured interviews</th>
<th>Identified in field notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barriers to related to communication partner knowledge and skill</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Healthcare provider knowledge/skill of and with AAC.</em> One participant</td>
<td>27%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>commented, “ [...] even if they do have [the resources], I don’t know how to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>use them all that well.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Colleague knowledge/skill of and with AAC.</em> One participant shared,</td>
<td>17%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>“[Doctors] do not always understand where the patient’s language skills are</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[...] if they would read the notes or ask the therapists about how to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>communicate with the patient and the best way to do it. That would be</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>helpful.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Lack of training about AAC strategies available.</em> When asked what factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>limit your ability to use communication supports, one participant</td>
<td>1%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>responded, “A lack of training.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Lack of knowledge of determining at which level the communication breakdown</td>
<td>7%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>is occurring.* One participant stated, “If I say, ‘can you stand up?’ and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>they don’t do it. Is it because they didn’t understand me? Or because they</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>have receptive aphasia or because they know what the words mean, but can’t</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>motor plan it...”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Barriers related to communication partner’s attitude</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Don’t feel responsible to manage patient’s communication needs.</em> When</td>
<td>2%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>asked who is primarily responsible for assessing and managing a patient’s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>communication needs, one participant stated, “I would say that’s speech</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>therapy’s responsibility.”</td>
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<td></td>
</tr>
</tbody>
</table>
Personal choice to not learn more about AAC. When asked to describe a situation when the participant was not successful helping a patient express his wants and needs and why, the participant responded, “That’s just the way it is.”

Barriers related to resources

Lack of availability (e.g. not in facility, in use by other departments). One participant commented, “We do have an iPad. Unfortunately it’s not available for us to take down to CCU because rehab it using it. There is some availability of [resources], I just wish there were more.”

Lack of accessibility (e.g. location not convenient). One participant stated, “I ask the nurse, ‘do we have anything here?’ They’ll always say, ‘we’ll call speech and see if they have something for us’. So there is not something that’s readily available for us to grab when we are in that situation.”

Design of resources (e.g. user-friendly). One participant commented, “The boards are designed more for nursing and don’t always fit my profession’s needs.”

Equipment breakdown. One participant reported, “Sometimes the equipment isn’t working, so I have to scrounge for another one.”

Barriers related to policy

Less co-treating due to hospital structure and billing structure. One participant states, “The neuro unit had more co-treating. We still have the ability to co-treat. It’s just less frequent because we don’t see as many sub-acute patients as before. We used to.”

Barrier related to practice

Limited time. One participant stated, “You don’t quit what you’re doing and lay them back down and come back. You don’t have time when you have full patient caseloads.”
<table>
<thead>
<tr>
<th>Barriers related to environment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical equipment in room.</td>
<td>4%</td>
</tr>
</tbody>
</table>
| One participant reported, "[The patient has I.V.s all over. It just ends up being lots of things that get in the way."
|                               | 10%| Yes | Yes |

| Distractions to patient.       | 3%| Yes | Yes |
| One participant commented, "There’s lots of interruptions. That makes it difficult sometimes for [the patient] to focus enough on that alternative means to get a good answer."
|                               | 3%| Yes | Yes |

| Barrier related to patient health status and ability | 26%|
| Patient’s health status and ability level. One participant stated, "Sometimes the patient is just too weak to communicate."
|                               | 26%| Yes | Yes |

| Other barriers                  |   |
| Family involvement.             | 4%|
| One participant shared, "Family members can sometimes have their own agenda [...] in which case have a family member there can impede the patient getting ideas out."
|                               | 1%| Yes | Yes |

| Setting (e.g. length of patient stay). One participant commented, "I’m not in a rehab setting where people are here for 3 weeks. You’re seeing them a few days. Sometimes only one day."
|                               | 3%| Yes | No |
Facilitators

Six broad facilitator categories were identified, including facilitators related to: a) communication partner knowledge and skill, b) communication partner’s attitude, c) resources, d) practice, e) patient health status and ability and f) other facilitators. One hundred sixty-three out of 310 (53%) total statements were coded as facilitators. For further data analysis of the facilitator data see Appendix F.

Facilitators related to communication partner knowledge and skill

The communication partner knowledge and skill broad category included 88 of the 163 (54%) total facilitator statements. It contained the high percentage of total facilitator statements across all facilitator broad categories. It also had the highest percentage of total statements. Six facilitators relating to communication knowledge of AAC and skill using AAC were identified: a) healthcare provider knowledge and skill (20%), b) colleague knowledge and skill (24%), c) colleague accessibility (2%), d) training availability (6%), e) amount of experience treating acute patients with communication deficits (2%), and f) healthcare provider knowledge of determining at which level the communication breakdown was occurring (1%). Descriptions of sub-categories were provided below. Additional information about broad categories and sub-categories were presented in Table 5.

1. Healthcare provider knowledge and skill. The healthcare provider knowledge and skill sub-category included 88 of the 163 (54%) total facilitator statements. Facilitators in this sub-category were related to knowledge of AAC strategies, knowledge of resources available in facility, and skill using AAC strategies and resources with patients. When asked to give examples of how she supported a patient’s communication,
a participant stated, “Sometimes we used communication boards or hand gestures, I also feel I’m more successful when I don’t make some feel rushed.”

2. Colleague knowledge and skill. The colleague knowledge and skill sub-category included the highest percentage of facilitator statements, 39 out of 163 (24%), and was the most frequently mentioned facilitator sub-category across all the professions. Statements included in this sub-category described situations where colleagues’ knowledge of and skill using AAC strategies enhanced another communication partner’s knowledge and skill. An example statement was, “when I’m unsure of what to do next, I go asked speech therapy, ‘what are you using with this patient?’ or ‘what works best with this patient?’”

3. Colleague accessibility. Four of the 163 (2%) of the facilitator statements were included in this sub-category. Statements related to colleague accessibility included examples of how being in close proximity to professionals with AAC strategy expertise like SLPs or being in close proximity to other professionals who could share information about a patient increased the healthcare provider’s knowledge and/or skill. One participant stated, “I’m fortunate enough to have my office right next to the speech therapists, so whenever I have a question I can ask them.”

4. Training availability. The training availability sub-category included statements describing how opportunities for training, whether formal or informal, increased the communication partner’s knowledge and skill. One participant shared what she learned about AAC strategies from a book, “I learned the importance of not finishing someone’s sentences for them and giving them time. One of the techniques I’ll use is
simplifying responses required.” Nine of the 163 (6%) total facilitator statements were included in the sub-category.

5. Amount of experience treating acute patients with communication deficits. The experience sub-category included 2 of the 163 (1%) total facilitator statements. It include statements describing how experience with using AAC strategies and tools with patients has increased the healthcare provider’s knowledge and skill. One participant stated, “Sometimes you learn things through trial and error over a period of time.”

6. Healthcare provider knowledge of determining at which level the communication breakdown was occurring. Two of the 163 (1%) were included in this sub-category. This sub-category included examples of skills or techniques healthcare providers used to determine at what level the communication breakdown was occurring.

Facilitators related to communication partner’s attitude

The communication partner attitude category contained 22 of the 163 (13%) total facilitator statements. Five facilitators related to the communication partner’s attitude were identified, including: a) facilitator of feeling responsible for managing the patient’s communication needs (2%), b) motivation to take time to communicate (2%), c) highly valuing AAC supports (4%), d) desire to facilitate patient involvement (4%), and e) feeling patients need to be treated as individuals (1%). Descriptions of sub-categories are provided below. Additional information about broad categories and sub-categories are presented in Table 5.

1. Feeling responsible for managing the patient’s communication needs.
Participants were asked the question “who do you feel is primarily responsible for assessing and managing your patients communication needs?” Three of the five
participants shared they felt everyone on the acute care team should share the responsibility. The participants thought the SLP had the most expertise in this area, but every team member should contribute ideas and carry through with the communication plan. Four of the 163 (2%) total facilitator statements were included in this sub-category.

2. Motivation to take time to communicate. Four of the 163 (2%) total facilitator statements were included in this sub-category. Statements included in this category described how the participants acknowledged communicating with patients with communication impairments using AAC strategies occasionally required extra time. However, the participants still wanted to take the time and put in the effort to communicate. One participant stated, “I personally want to try to take time to communicate with people. It might be hard, but I stick with it even if it’s hard.”

3. Highly valuing AAC supports. All participants were asked to rate how much they personally value AAC strategies and supports (1-don’t value and 10-highly value). All participants rated their value of AAC as a 10. Six of the 163 (4%) total facilitator statements were included in this sub-category. One participant stated, “Sometimes you can’t do with them [AAC supports].”

4. Desire to facilitate patient involvement. Seven of the 163 (4%) total facilitator statements were included in this sub-category. Statements included in the category related to the healthcare provider’s positive attitude towards patient involvement in treating planning. One participant shared, “I think all patients should be involved in their own healthcare planning [...]. You can offer choices in ways that are appropriate for their communication abilities.”
5. Feeling patients need to be treated as individuals. This sub-category included a statement in which the healthcare provider recognized patients have individual preferences and those preferences should be honored. One of the 163 (1%) total facilitator statements was included in this sub-category.

Facilitators related to resources

The resource facilitator category included 33 of the 163 (20%) total facilitator statements. The resource facilitators included a) resource availability (14%), b) resource accessibility (4%), and c) resource design (2%). It contained the second highest number of facilitator statements. Descriptions of sub-categories are provided below. Additional information about broad categories and sub-categories are presented in Table 5.

1. Resource availability. Twenty-three of the 163 (14%) total facilitator statements were included in this sub-category. Statements described how the presence of AAC resources in the facility and having the quantity of resources available to meet usage demands enhanced the participant’s ability to use AAC supports. One participant shared the types of resources she had seen in the facility, “I have seen communication boards, pens and paper with clipboards, and an iPad with communication applications.”

2. Resource accessibility. This sub-category contained statements relating to examples of situations where resource location either in the patient’s room or on the acute care unit facilitated the use of AAC strategies. An example statement was, “It’s rare to walk into a room that didn’t have paper and a pen.” Four of the 163 (2%) total facilitator statements were included in this sub-category.

3. Resource design. Four of the 163 (2%) total facilitator statements were included in this sub-category. Statements related to design included user-friendliness,
age-appropriateness, and individualized design to meet the user needs. One participant shared an example of when an individualized resource enhanced communication, "It might be helpful—I’ve seen speech therapists with books with pictures to match the different needs the patient might have."

**Facilitators related to practice**

The practice facilitator category included 5 of the 163 (3%) total facilitator statements. Three facilitators related to practices common to the acute care facility were identified: a) knowledge gained from more time with patient (1%), b) setting (1%), and c) maintained balance between task-oriented communication and social-oriented communication (2%). Descriptions of sub-categories are provided below. Additional information about broad categories and sub-categories are presented in Table 5.

1. **Knowledge gained from more time with patient.** This sub-category included 1 of the 163 (1%) total facilitator statements. The example discussed how healthcare providers learn more regarding what AAC strategies might best serve the patient’s communication needs as they have more time to work with patients.

2. **Maintained balance between task-oriented communication and social-oriented communication.** This sub-category included examples of how a healthcare provider maintained a balance between task-oriented communication and social-oriented communication. One participant described how there is certain information that must be gathered and tasks that need to be completed. In order to do this, the participant constrained the length of responses the patient could use to communicate. The participant recognized doing this did not provide many opportunities for the patient to practice communicating. To create balance, the participant provided time for more open
communication practice. This sub-category included 4 of the 163 (2%) total facilitator statements.

**Facilitators related to patient health status and ability**

The *patient health status and ability* facilitator category contained facilitators describing how patient status and ability (e.g., the patient’s physical strength, motor ability, concentration, stamina, and cognitive abilities) enhanced overall communication and AAC strategy use. Participants noted that it is easier to use AAC strategies to support patients with mild limitations to the previously mentioned areas. This sub-category included 10 of the 163 (6%) total facilitator statements.

1. *Patient health status and ability.* Statements included in this sub-category were related to patient status and ability (e.g., physical strength, motor ability, concentration, stamina, and cognitive abilities) and how mild impairments made communication easier. An example provided by a participant was “*when they are able to write either on a white board or a regular pad of paper is typically successful for those people who are actually able to write.*”

**Other Facilitators**

The *other facilitators* category contained 5 of the 163 (3%) total facilitator statements. The sub-categories were a) *family involvement* (2%) and b) facilitators related to *setting* (1%). Descriptions of sub-categories were provided below. Additional information about broad categories and sub-categories were presented in Table 5.

1. *Family involvement.* Statements in this category described situations in which family members’ presences in the room and involvement in decision-making enhanced the healthcare provider’s ability to communicate. An example of a statement was “*If*
family is in the room, they can read non-verbals and know how the patient communicates better than I do.” This sub-category included 4 of the 163 (2%) total facilitator statements.

2. Setting. This sub-category included statements describing time-related opportunities. Participants identified that the more sessions a patient had, the more opportunities there were to troubleshoot communication barriers. More opportunities to troubleshoot meant healthcare providers could better select an appropriate communication tool, which met the patient’s needs. One participant identified that when her facility had a rehabilitation unit, provider’s had more sessions with the patients and more opportunities to use AAC communication tools. This sub-category included 1 of the 163 (1%) total facilitator statements.

Discipline-Specific Differences in Facilitators

The disciplines involved (i.e., OT and PT) shared some similarities but also demonstrated facilitators that were unique to their respective disciplines. The percentage of incidence for a facilitator category within a discipline was calculated by dividing the number of facilitator statements in that category by the total number of facilitator statements mentioned by discipline. The percentages were used to determine which facilitator categories were more substantial in terms of frequency of mention by discipline.

Similarities in the most frequently mentioned facilitators existed between the disciplines. The most frequently mentioned facilitator sub-category across all the professions was facilitators related to colleague knowledge and skill. Twenty-nine of the 115 (25%) total facilitator statements mentioned by PTs, 5 of the 20 (25%) total
facilitator statements mention by the PPTA and 4 of the 27 (15%) total facilitator statements mentioned by the OT were included in this sub-category.

The second most frequently mentioned facilitator sub-category across all disciplines was facilitators related to healthcare provider knowledge and skill. Twenty-six of the 115 (23%) total facilitator statements mentioned by PTs, 2 of the 26 (10%) facilitator statements mentioned by the PTA., and 4 of the 27 (15%) total facilitator statements mentioned by the OT. were include in the healthcare provider knowledge and skill sub-category. The third most frequently mentioned facilitator sub-category across all disciplines was facilitators related resource availability and accessibility. Nineteen of the 115 (17%) total facilitator statements mentioned by PTs, 4 of the 20 (20%) total facilitator statements mentioned by the PTA, and 5 of the 27 (19%) total facilitator statements mentioned by the OT were included in this sub-category.

Differences in facilitator sub-categories and their frequency of incidence existed. A frequently mentioned facilitator subcategory by the PTA was facilitators related to patient status and ability. Four of the 20 (15%) total facilitator statements made by the PTA mentioned how the patient’s status and ability enhanced her ability to use AAC supports. However, only 7 of the 115 (6%) total facilitator statements made by PTs and 0 of the 26 (0%) total facilitator statements made by the OT were related to patient status and ability.

Another disciplinary difference was how often facilitators relating to positive attitudes towards patient involvement were mentioned. Three of the 27 (11%) total facilitator statements made by the OT and 2 of the 20 (10%) of the total facilitator statements made by the PTA described their desire to facilitate patient involvement in
care planning. Only 2 of the 115 (2%) total facilitator statements mentioned by PTs were related to this sub-category.
<table>
<thead>
<tr>
<th>Facilitators categories and code descriptions</th>
<th>Percent of total facilitator statements</th>
<th>Identified in Semi-structured interviews</th>
<th>Identified in field notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare provider knowledge/skill of and with AAC. One participant shared, “I try different strategies like gestures or written choice. Written choice is something I defer to quite often. I have had some good success with patients being to point for written choice or circle when you break it down very simply to one word answers.”</td>
<td>54%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Colleague knowledge/skill of and with AAC. One participant commented, “If I know that speech therapy is working with a patient which most often they would be in those situation. I will ask them, “what do you think is the best [way to communicate]?”</td>
<td>24%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Colleagues with AAC knowledge/skill accessibility (e.g. colleagues office location is close, colleagues work in same unit). One colleague stated, “I’m fortunate in the setting I work that we work very closely in location to speech therapists, so very often I will just seem them out.”</td>
<td>2%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Training to increase knowledge helps increase AAC knowledge/skill available. When asked what skill sets or materials would help them communicate more effectively, one participant states, “I guess more training in any other techniques that would be helpful to aide people who have communication issues.”</td>
<td>6%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Experience supporting patients with AAC. When asked to rate how at ease they feel communicating with a patient with significant communication impairments, one participant states, “I feel quite at east treating any patient with a communication disorder because I feel like I have some place to start. I think that’s because I’ve worked in this field a long time.”</td>
<td>1%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Possess knowledge of determining at which level the communication breakdown is occurring. One participant shared, “If I can gesture or demonstrate. Find another way to get them to understand what I want them to do. If it’s a language reception problem, then the patient watches me it and they realize ‘oh, I see what you need me to do’. Then that gives me a heads up on that.”

**Facilitators related to communication partner’s attitude**

*Feel responsibility to manage communication needs.* When asked who is primarily responsible for assessing and managing a patient’s communication needs, one participant responded, “I think it’s a responsibility of the entire care team, the interdisciplinary team.”

*Motivation to take time communicate.* One participant stated, “I personally want to try to take time to communication with people. It might be hard, but I stick with it even if it’s hard.”

*Highly value AAC supports.* When asked to rate how much they value AAC supports, all participants responded by saying they highly value AAC supports.

*Desire to facilitate patient involvement.* One participant stated, “Everybody should be involved in their own decision and care planning.”

**Facilitators related to resources**

*Availability (e.g. present in facility, not in use by other departments).* One participant stated, “I have seen communication, pen and paper on clipboards, and iPads in the facility.”

*Accessibility (e.g. convenient location on unit).* One participant commented, “Typically there are pens, paper, and clipboards on the unit.”

*Design of resources (e.g. user friendly).* When asked what communication supports would help you communication more effectively, one participant responded, “It might be helpful—I’ve seen speech therapists with books with pictures to match the different needs the patient might have.”

**Facilitators related to practice**

*Time with patient.* One participant stated, “Things usually come to light after you have worked with a patient for awhile.”
Facilitators related to patient health status and ability 6%

Patient’s status/ability level. One participant stated, “When they are able to write either on a white board or a regular pad of paper is typically successful for those people who are actually able to write.”

Other Facilitators 3%

Family involvement. One participant shared, “Family members can be a great resource for involving [patients].”

Setting (e.g. length of patient stay). When asked how the participant acquire skill with AAC strategies, one participant responded, “I learned by observing the speech therapist during co-treatment […] Just the way the hospital was set up we were able to more patients for rehab.”
DISCUSSION

Summary of Present Findings

The aims of this study were to: 1) identify potential barriers and facilitators healthcare providers encounter when implementing AAC strategies in an acute care setting and 2) determine if and how the barriers and facilitators differ by provider disciplines. While barriers and facilitators were presented separately in results, they will be discussed together here, in order to highlight relationships between them. This study identified 18 different barriers and 19 different facilitators.

When comparing barrier categories in terms of most frequently mentioned, relationships between the broad categories and sub-categories emerged. Communication partner knowledge and skill, availability and accessibility of AAC resources, and patient status and ability were considered more substantial because these categories contained highest percentages of the total barrier statements. It should be recognized that while frequency of incidence is one way to weight relative importance, care was taken to recognize the relative weight of less frequent codings as well. Communication partner attitude, practice, policy, environment, and family involvement barriers were mentioned less frequently, but still have a notable influence on AAC strategy use in the acute care setting. Attitude, practice, and policy barriers were related to the more frequently mentioned communication partner knowledge and skill barrier category. Environment and family involvement barriers were related to the more frequently mentioned patient status and ability barrier category. See Figure 5 for a visual illustration of the existing relationships between identified barriers.
When comparing facilitator categories in terms of most frequently mentioned, relationships between the broad categories and sub-categories emerged. Communication partner knowledge and skill and resource availability and accessibility, were considered more substantial because these categories contained highest percentages of the total facilitator statements. Communication partner attitude, practice, task-oriented vs. social-oriented communication, patient status and ability, environment, and family involvement facilitators were mentioned less frequently, but still have a notable influence on AAC strategy use in the acute care setting. Attitude, practice, and task-oriented vs. social-oriented communication facilitators were related to the more frequently mentioned communication partner knowledge and skill facilitator category. The patient status and ability facilitator was not as frequently mentioned as compared to when it was a barrier, but it was mentioned with enough frequency it was determined it should remain a stand alone category. Environment and family involvement facilitators were related to the
patient status and ability facilitator category. See Figure 6 for a visual illustration of the existing relationships between identified facilitators.

Figure 6. Relationships between facilitators organized by percentage of incidence

Understanding how barrier and facilitator categories relate to one another may help healthcare providers understand how to eliminate the barriers to AAC support use that exist in the acute care settings. To address a more substantial barrier, such as healthcare provider knowledge and skills, a person must also understand how other related barrier such as communication partner's attitude and the facilities policy impact the larger barrier. The same principle is true if a healthcare provider wishes to use the identified facilitators to increase AAC support use in the acute care unit. An example of this would be if a healthcare provider has a positive attitude towards AAC supports, he or she would be more likely to want to increase his or her knowledge and skill.

Categories that were substantial barriers and facilitators included healthcare provider knowledge and skill, and availability and accessibility of AAC resources. Other studies investigating barriers and/or facilitators to ICU nurses also identified these
barriers and facilitators (Bergbom-Engberg & Halajamäe, 1993; Hemsley et al., 2001; Leathart, 1994). The presence or lack of skills and access to AAC supports determined whether these factors served as barriers or facilitators. Lack of knowledge and skills represented a potential need for training opportunities. Access to resources may involve either time or fiscal/material resources.

Patient status and ability level was identified as a substantial barrier. Previous research by Baker & Melby (1999), Hemsley et al. (2001), Leathart (1994), and Simmons-Mackie et al. (2007) also identified the patient’s status and ability level in terms of a cognitive, psychological, and/or language impairment as a barrier to effective communication between nurses and patients. Interestingly, although participants expressed openness to using AAC to support communication with patients with severe limitations (e.g., communication, physical, and/or cognitive impairments), they also shared they felt using AAC strategies with this type of patient to be extremely challenging. While this is somewhat intuitive, it should be noted that these patients are in the greatest need of this support.

One participant stated, “[The patient] gets frustrated because they are verbalizing complete jibbersih. They look at you like 'why aren't you answering me?' [...] They get angry and shut down because they don’t understand us. They just lockdown and quit participating. That makes it very difficult to get any therapy done when they’re not able to understand us.”

Colleague knowledge and skill was identified as a substantial facilitator. Participants identified expert colleagues, with AAC knowledge and skills, as beneficial in two respects: 1) expert colleagues can advise them regarding implementation of
techniques and 2) collaborating with expert colleagues provides models for implementation. The following sections discuss the findings in relation to literature and examine the clinical implications of the findings. The important barriers and facilitators identified in this study were similar across all the professions.

The present study identified resource availability and accessibility as both a barrier and facilitator. This is consistent with Hemsley et al. (2001), who found that access to AAC resources could serve as a barrier and facilitator for acute-care nurses. Factors addressing resource availability included whether or not resources were in the facility and whether or not the quantity of resources matched the demand (e.g., "We do have an iPad. Unfortunately it's not available for us to take down to CCU because rehab is using it. There is some availability [of resources], I just wish there were more."). Factors addressing accessibility included whether or not AAC resources were available in the patients' rooms and whether or not resources were located on the acute care unit (e.g., "I ask the nurse, 'do we have anything here?' They'll always say, 'we'll call speech and see if they have something for us'. So there is not something that's readily available for us to grab when we are in that situation."). Whether access to AAC resources represents a real or perceived barrier, practitioners should provide clear information about where to find these resources.

The present study also identified healthcare provider's knowledge and skill as both a barrier and facilitator. Factors related to the healthcare provider's level of knowledge were training availability and years of experience. Previous studies by Bergbom-Engberg & Halajamäe (1993), Hemsley et al. (2001), and Leathart (1994) also identified knowledge of AAC as a potential barrier and facilitator to communication for
acute care nurses. These previous studies also supported the relationship between training and years of experience and the nurse’s knowledge level. Providing training opportunities would increase healthcare providers’ knowledge of AAC and in turn, increase their comfort using AAC with patients with severe limitations impacting their ability to communicate. Training topics would range from broad education about AAC to discipline-specific training.

A less frequently mentioned sub-category relating to the communication partner’s knowledge and skill was the communication partner’s attitudes towards AAC use. This sub-category could be either a barrier or facilitator, depending on the communication partner’s attitude. Although this sub-category was not mentioned as frequently, it influenced factors like how motivated the healthcare providers were to learn more about AAC and how much time each healthcare provider was willing to spend on communicating during their therapy sessions. The healthcare provider’s willingness to spend time communicating was a difference that varied by attitude. One participant stated, “Sometimes you can’t understand what the patient is saying and you have to move on. That’s just the way it is.” While another participant stated, “I personally want to try to take time to communicate with people. It might be hard, but I stick with it even if it’s hard.” If a healthcare provider did not place value on time spent working on communication, it was noted that they spent more time focusing on task-oriented communication. Whereas, if the healthcare provider did place value on time spent communicating, they were more likely to maintain a balance between task-oriented communication and socially-oriented communication. One participant noted her challenge of gathering the information she needed to perform her job, while still allowing
time for the patient to communicate socially. She shared that when she limited the conversation to task-oriented topics, she would later allow time to facilitate socially-oriented communication.

Other studies also support the importance of the healthcare providers' attitudes towards AAC supports and the value placed on time reserved for communication (Baker & Melby, 1999; Bergbom-Engberg & Halajamäe, 1993; Leathart, 1994; Simmons-Mackie et al., 2007). Understanding the attitude- and value-differences that exist between healthcare providers of the same and different disciplines, can help training and education be tailored to help change the healthcare providers’ attitudes.

The patient’s status and ability was identified as a substantial, potential barrier to communication. Factors affecting the patient’s health status and current ability were severity of injury, severity of communication deficits, physical and cognitive stamina, and other medical concerns that affected ability to communicate. Patient status and level of ability has been reported as a barrier to ICU nurses by previous studies (Baker & Melby, 1999; Bergbom-Engberg & Halajamäe, 1993; Leathart, 1994; Simmons-Mackie et al., 2007). Identifying effective ways to counsel and educate staff about strategies for interacting with persons with severe communication, physical, and cognitive impairments is critical, as these are the patients who need and benefit most from such supports.

Colleague knowledge of and skill using AAC was identified as an important facilitator of AAC strategy use. Healthcare providers reported utilizing other professionals, such as SLP’s, knowledge of and skills using AAC to learn more about AAC strategies and to learn what AAC strategies would be benefit a patient on their caseload (e.g. “I ask speech therapy ‘what strategies are you using with this patient?’

and ‘what strategies are working best?’). Colleague knowledge and skill was mentioned as a potential barrier to AAC use as well. Although only a small percentage of statements (1%) identified this as a barrier, the fact this subcategory was the most frequently mentioned facilitator suggests that participants recognize this as an important factor in enhancing AAC use. Other studies investigating ways to support nurse-patient communication found when nurses were willing to ask for communication help from other professionals or family-members, and were willing to share communication strategies with other professionals, that nurses were more effective communication with patients (Bergbom-Engberg & Haljamäe, 1993; Hemsley et al., 2001). Promoting an open learning environment where professionals are encouraged to ask questions and identify efficient methods for inter-professional knowledge exchange will enable healthcare professionals to better share their expertise and apply this knowledge to new situations.

This study highlights an important question, “why were the patients with severe limitations identified as the most challenging to communicate with?” It was noted that participants identified the patients with severe limitations (e.g. cognitive, communication, and/or physical limitations) as the most challenging to interact with and use AAC strategies to support. The results of the study reveal three possible answers to this question, including causes related to 1) barriers external to the healthcare providers’ personal knowledge and skill, 2) internal barriers related to the healthcare providers’ knowledge and skill, and 3) both external and internal barriers impacting the healthcare providers’ ability to use AAC.

When communication became challenging, participants began to identify external barriers that hindered their ability to communicate effectively. Substantial barriers
external to the healthcare provider included the patient’s health status and ability-level, and resource availability and accessibility. Other barriers included time, practice, policy, environment, setting, and attitude barriers. Along with identifying external barriers when communication became challenging, some healthcare providers had the attitude that managing the communication needs of severely limited patients was not their responsibility.

The healthcare provider’s attitude barrier prompts the next possible answer to the question: patients with severe limitations are difficult to communicate with because the healthcare providers’ lack the knowledge and skill to support the patients using AAC. This idea is supported by results, indicating that the presence or lack of healthcare provider knowledge and skill determined whether that sub-category was a substantial barrier or facilitator to AAC use. If the participant lacked knowledge of and skill using AAC and did not know how to determine at what level the communication breakdown occurred, they felt communicating with severely limited patients was hard. On the other hand if they possessed the knowledge, the participant felt more confident in their abilities and felt communication was less challenging. Another related sub-category that was either a barrier or facilitator was the healthcare provider’s attitude. If the healthcare provider felt managing the communication needs of the patient was their responsibility, they were more likely to maintain balance between task-oriented communication and social-oriented communication and were more motivated to take the time to communicate.

The third possible answer to the question is the most likely answer. Patients with severe limitations are challenging to communicate with because of barriers related to
healthcare provider’s knowledge, skill and attitude and barriers related to factors outside of the healthcare providers. This study demonstrated the importance of understanding how barriers and facilitators in the acute care setting are related. When you understand the relationships between the findings, it is easier to identify solutions intrinsic and extrinsic barriers to AAC implementation. Potential solutions to the barriers identified in the discussion section are summarized in Table 6.

This study also showed that although there are strong similarities between the barriers and facilitators identified by physical and occupational therapists, there are also cross-disciplinary and within-discipline differences. The interdisciplinary similarities demonstrate that there are substantial barriers to AAC use in the acute-care setting that affect multiple professions. Both disciplines identified healthcare provider knowledge and skill, patients with severe limitations, and resource availability and accessibility substantial barriers. However, some disciplines identified other factors as specific barriers for their discipline. For example, the OT identified time available to spend with patient as a barrier, while the PTA identified a lack of training as a specific barrier. Individual differences also exist within disciplines. The barriers identified by the PT participants indicated differences in personal attitudes and values, knowledge of determining at what level the communication breakdown is occurring, and differences in beliefs regarding whose responsibility it is to manage the communication needs of patients with severe limitations. Assuming that no differences in perceived barriers exist between or within disciplines is dangerous because that assumption is untrue. Being aware of these disciplinary and individual differences is critical, as it may help SLPs to develop individualized, discipline-specific trainings.
Table 6. Important Barriers/facilitators Identified and Recommendations

<table>
<thead>
<tr>
<th>Barrier/Facilitator Category</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare provider knowledge and skill</td>
<td>Provide training opportunities</td>
</tr>
<tr>
<td>Patient status and ability</td>
<td>Provide communication training for patients with severe impairments</td>
</tr>
<tr>
<td>AAC resource availability and accessibility</td>
<td>Practitioners should provide clear information about where to find resources</td>
</tr>
<tr>
<td></td>
<td>Locate resources in a easily accessible location on the ICU floor</td>
</tr>
<tr>
<td>Patient health status and current level of ability</td>
<td>Identify effective ways to counsel/educate staff about strategies for patient</td>
</tr>
<tr>
<td></td>
<td>interactions</td>
</tr>
<tr>
<td>Colleague knowledge and skill</td>
<td>Identify efficient methods of exchanging information between colleagues</td>
</tr>
<tr>
<td></td>
<td>Promote an open learning environment</td>
</tr>
</tbody>
</table>

Clinical Implications

This study identified several important barriers and facilitators to AAC strategy use in the ICU. By identifying these important factors, potential recommendations for limiting the barriers and enhancing the facilitators were made. This study identified a need for more training and education about AAC strategies and how to implement the strategies with patients for healthcare providers. Training topics could range from broad, general training about AAC strategies and resources to discipline-specific training about strategies and resources. Training should also address what patient types should use and to need to use AAC supports. Previous studies have shown that training healthcare
professionals on AAC strategies increases their skills and knowledge (Radtke et al., 2012; Simmons-Mackie et al. 2007; Legg et al., 2005).

The barrier of resource availability and accessibility could be addressed by providing additional education including what AAC resources are available in the facility. Locating the resources in closer proximity to acute care unit would ensure that resources are easily accessible to healthcare professionals. Basic, low/no-tech communication supports such as communication boards, pens, and paper should be left in patients' rooms. A communication station stocked with AAC resource tools could be set-up on the acute care unit.

To enhance facilitation of colleague knowledge of and skills in using AAC, it may be beneficial to identify efficient ways for colleagues to share information with each other. One way information could be shared across disciplines everyday is by reporting a patient’s communication needs and effective AAC supports during rounds. Reporting in rounds will allow healthcare professionals to ask questions about AAC supports (e.g., how to use them, where materials are located, request training) and arrive at treatment sessions with the necessary AAC resources.

Limitations of the Study and Future Research Directions

This study was a preliminary study with a small number of participants from two regional hospitals. However, the semi-structured, qualitative interview format allowed for the exchange of detailed information from each of the participants. Beyond information prompted directly from the interview questions, participants provided additional information based upon their professional experiences and personal values. The participants represented two professions that typically spend a moderate amount of time
with patients and have an important role in the recovery of the patient. The roles of professionals within those disciplines (OT, PT, and PTA) share substantial overlap. However, the perceptions of these professions are under-represented in previous research about potential barriers and facilitators to implementation of AAC in acute-care contexts. Further, the rich, qualitative descriptions garnered by this study provide a foundation for future exploration in these disciplines.

Although the sample size was small, the volume of qualitative data gathered from the PTs provided substantial evidence of individual preferences. While there was substantive overlap in perceived barriers and facilitators, differences in values, attitudes, and perceptions of whether a factor was a barrier versus facilitator varied by individual. Due to the limited number of OTs participating, such comparisons could not be made across individuals. Future studies with more OTs could provide needed information about individual differences.

One could argue that all barriers are the reciprocal of facilitators and thus weighting them by frequency is unwise. However, it was the participant’s statements that directed the way a statement was coded. For example, participants only identified colleague knowledge and skill as a barrier 1% of the time, while identifying it as a facilitator 24% of the time. This denotes two points. Collectively, colleague knowledge and skill (particularly SLP knowledge and skill) is seen as a critical resource to effective implementation of AAC in acute-care. Secondly, it is more often thought of as a facilitator than barrier. Thus, the weighting of facilitators and barriers represents the perceptions of individuals within the study.
Future research recommendations include increasing the number of participants and increasing the number of disciplines interviewed, considering a focus-group methodology to encourage an interactive exchange within or across disciplines, and addressing other healthcare settings (e.g., rehabilitation, outpatient care, homecare, etc.). In addition, future research could investigate ways to address the significant implementation barriers identified by this study such as methods to improve the accessibility and availability of AAC resources.

Conclusion

This study aimed to identify the nature of potential barriers and facilitators to implementing AAC in an acute-care setting, by healthcare discipline (i.e., OT, PT). This was achieved by identifying 18 barriers and 19 facilitators to AAC strategy use in the ICU and by comparing discipline-specific results. Findings from this study identify the need for ongoing research into barriers and facilitators to AAC strategy use in the acute-care setting. Further these findings also prompt the investigation of potential solutions to address existing barriers, although these initial findings provide insight into several potential facilitative approaches. Several of the recommendations drawn from participant perspectives appear to be easily achievable. Provision of training and more ready access to AAC supports, while intuitive, may be overlooked for rehabilitation providers such as occupational and physical therapists or assistants. A focus on supports for persons with severe communication, cognitive, and physical impairments is highly valued by these disciplines. This in turn may enable patients with communication deficits to express their wants, needs, and wishes about their medical treatment.
Works Cited


Murphy, J., & Boa, S. (2012). Using the WHO-ICF with talking mats to enable adults with long-term communication difficulties to participate in goal setting. *Augmentative and Alternative Communication, 28*(1), 52-60.


Appendix A
Interview Questions
Thank you for agreeing to share your experiences about using augmentative and alternative communication supports and strategies with me today. We hope to learn more about patient communication challenges and successes you’ve experienced in your current positions.

1. Tell me about a situation where you were not successful helping a person with communication impairment to express their wants and needs. What would you do differently if you encountered that situation again?

2. What kinds of training/staffing supports would help you to communicate more effectively in this context?

3. What kinds of skillsets/material supports would help you to communicate more effectively in this context?

4. What kinds of skillsets/materials have you used in the past?

5. What kinds of material supports are available on your unit?

6. What kinds of training have you had to support communication?

7. What factors (if any) limit your ability to use communication supports?

8. What factors (if any) enhance your ability to use communication supports?

9. Do you think it is possible to involve people with aphasia in their own care planning and decision-making? If so, how?

10. Who do you think is responsible for assessing and managing the communication needs of your patients?

11. Can you rate your ease of communication with seriously ill patients? (1-10, easy-hard)

12. Rate (describe) the importance of communication with patients who are seriously ill – i.e., do you value strategies or supports for persons who are having trouble communicating? (1-10, don’t value-value)
APPENDIX B
Demographic Information
Demographic Information

Name: ________________________________

Profession: ________________________________

1. How many years of experience do you have in your profession? ______________________

2. How many years have you worked in an ICU unit? _________________________________

3. What is the composition of your typical case-load?

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________
APPENDIX C
Blank Coding Template
Red - barriers to service access; green - facilitators to service access; yellow-unsure Gray- not relevant

<table>
<thead>
<tr>
<th>Participants:</th>
<th>Transcript</th>
<th>Meaning units</th>
<th>Condensed meaning units</th>
<th>Possible codes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
APPENDIX D
Coded Transcript Example
<table>
<thead>
<tr>
<th>2:30 Interviewer (I)</th>
<th>Participant (p)</th>
<th>Transcript</th>
<th>Meaning units</th>
<th>Condensed meaning units</th>
<th>Possible codes</th>
</tr>
</thead>
</table>
|                       |                 | The first question is just about a situation in which you felt successful in supporting someone who had a communication impairment and their ability, their wants and needs. | There actually was one recently. It was a gentlemen and he was trying very hard to mouth a lot of word and he had a tracheostomy with a ventilator attached so he wasn’t able to speak. He could mouth words, but I’ll be the first person to admit I’m not the world’s best lip reader so you know kinda do the best hat you can and um you know I was kinda the first person that just happened to bring in—and I mean we’ve done this stuff dozens of times but to bring in the basic clipboard and pen and pencil and said do you want to try to write down what you want. and you know I kind of tried to get him to just give you know you don’t have to write this long give me a couple of words and see what I can—can pull out of that so you can give me some yes and no’s, so he didn’t get too tired trying communicate and he was able to let me know that he was cold and wanted a blanket. | He could mouth words, but I’ll be the first person admit I’m not the world’s best lip reader. The first person happened to bring stuff in. We’ve done this stuff dozens of times, but to bring in the basic clipboard and pen and pencil and said “do you want to try to write down what you want?” I tried to get him to just give—you don’t have to write this long—just give me a couple words and see what I can pull out of that, so you can give me some yes and no’s. So he didn’t get too tired trying to communicate. He was able to let me know that he was cold and wanted a blanket. | ...not the world’s best lip reader ....first person bring in stuff (2 codes from following statement) ...used clipboard and pen to have him write short answers, yes, and nos | • health care provider knowledge/skill (-)  
• Resource availability (+)  
• Healthcare provider knowledge/skill (+)  
• healthcare provider knowledge/skill (-) |
| I                     |                 | Oh, wow there actually was one recently um and it was a gentlemen and his was trying very hard to mouth a lot of word and he had a tracheostomy with a ventilator attached so he wasn’t able to speak. he could mouth words, but I’ll be the first person to admit I’m not the world’s best lip reader so you know kinda do the best hat you can and um you know I was kinda the first person that just happened to bring in—and I mean we’ve done this stuff dozens of times but to bring in the basic clipboard and pen and pencil and said do you want to try to write down what you want. and you know I kind of tried to get him to just give you know you don’t have to write this long give me a couple of words and see what I can—can pull out of that so you can give me some yes and no’s, so he didn’t get too tired trying communicate and he was able to let me know that he was cold and wanted a blanket. | | | |
| I                     |                 | So | | | |
| I                     |                 | Good and you were the first one to kinda bring that support into the room in that situation | | | |
APPENDIX E
Analysis of Barrier Data
## Analysis of Barriers to AAC Use in the Acute Care Setting

<table>
<thead>
<tr>
<th>Categories and Codes</th>
<th>Number of Codes</th>
<th>Percent of Total Codes</th>
<th>PT</th>
<th>Percent of total PT responses</th>
<th>OT</th>
<th>Percent of total OT responses</th>
<th>PTA</th>
<th>Percent of total PTA responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication Partner Knowledge/skill</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provider knowledge/skill</td>
<td>25</td>
<td>17%</td>
<td>16</td>
<td>16%</td>
<td>4</td>
<td>15%</td>
<td>5</td>
<td>19%</td>
</tr>
<tr>
<td>Colleague knowledge/skill</td>
<td>2</td>
<td>1%</td>
<td>2</td>
<td>2%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Training availability</td>
<td>10</td>
<td>7%</td>
<td>7</td>
<td>7%</td>
<td>0</td>
<td>0%</td>
<td>3</td>
<td>12%</td>
</tr>
<tr>
<td>Determine level of comm. breakdown</td>
<td>3</td>
<td>2%</td>
<td>1</td>
<td>1%</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Total Number of Codes in Category</strong></td>
<td>40</td>
<td>27%</td>
<td>26</td>
<td>26%</td>
<td>4</td>
<td>15%</td>
<td>10</td>
<td>38%</td>
</tr>
</tbody>
</table>

| **Resources** |                 |                       |    |                             |    |                               |     |                               |
| Availability | 10              | 7%                    | 2  | 2%                          | 5  | 19%                          | 3   | 12%                          |
| Accessibility | 17              | 12%                   | 19 | 19%                         | 4  | 15%                          | 1   | 4%                           |
| Design | 6              | 4%                    | 3  | 3%                          | 2  | 7%                           | 1   | 4%                           |
| Equipment breakdown | 2   | 1%                    | 2  | 2%                          | 0  | 0%                           | 0   | 0%                           |
| **Total Number of Codes in Category** | 35             | 24%                   | 26 | 26%                         | 11 | 41%                          | 5   | 19%                          |

| **Practice** |                 |                       |    |                             |    |                               |     |                               |
| Time | 14             | 10%                   | 9  | 9%                          | 4  | 15%                          | 1   | 4%                           |
| **Total Number of Codes in Category** | 14             | 10%                   | 9  | 9%                          | 4  | 15%                          | 1   | 4%                           |

<p>| <strong>Environment</strong> |                 |                       |    |                             |    |                               |     |                               |
| Medical equipment | 2              | 1%                    | 0  | 0%                          | 2  | 7%                           | 0   | 0%                           |
| Distractions | 4              | 3%                    | 4  | 4%                          | 0  | 0%                           | 0   | 0%                           |
| <strong>Total Number of Codes in Category</strong> | 6              | 4%                    | 4  | 4%                          | 2  | 7%                           | 0   | 0%                           |</p>
<table>
<thead>
<tr>
<th>Category</th>
<th>Policy</th>
<th>Attitude</th>
<th>Patient Health Status and Ability</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>Less co-treating</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Total Number of Codes in Category</td>
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<td>Responsibility</td>
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APPENDIX F
Analysis of Facilitator Data
### Analysis of Facilitators to AAC Use in the Acute Care Setting

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<th>Categories and Codes</th>
<th>Number of Codes</th>
<th>Percent of Total Codes</th>
<th>Physical Therapists</th>
<th>Percent of Total PT Codes</th>
<th>Occupational Therapists</th>
<th>Percent of Total OT Codes</th>
<th>Physical Therapy Assistant</th>
<th>Percent of Total PTA Codes</th>
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<tr>
<td><strong>Communication Partner Knowledge/skill</strong></td>
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<td>23%</td>
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<td>25%</td>
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<td>2%</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<td>3</td>
<td>3%</td>
<td>1</td>
<td>4%</td>
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<td>Setting</td>
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<tr>
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<td><strong>27</strong></td>
<td><strong>20</strong></td>
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</table>
APPENDIX G
Informed Consent
This document is to certify that I, ________________________________, hereby freely agree to participate as a volunteer in a research study as an authorized part of the educational and research program of the University of Wisconsin-Eau Claire under the supervision of Dr. Jerry Hoepner.

- The research project has been fully explained to me by ________________________________, and I understand this explanation, including what I will be asked to do. A copy of the procedures of this investigation and a description of any risks, discomforts and benefits associated with my participation has been provided and discussed in detail with me.

- I have been given an opportunity to ask questions, and all such questions and inquiries have been answered to my satisfaction.

- I understand that I am free to decline to answer any specific items or questions in interviews or questionnaires.

- I understand that all data will remain confidential with regard to my identity.

- I certify that to the best of my knowledge, I have no physical or mental illness or weakness that would increase the risk during participation in this investigation.

- I understand that participation in this research project is voluntary and not a requirement or a condition for being the recipient of benefits or services from the University of Wisconsin-Eau Claire or any other organization sponsoring the research project.

- I understand that the approximate length of time required for participation in this research project is 30-45 minutes.

- I authorize the research team to use audio footage of my interview for professional conferences. □ Yes □ No

- I authorize the research team to use video footage of my interview for professional conferences. □ Yes □ No

- I understand that receiving the gift card is not contingent on the content of my response only completion of the interview process, as a nominal thank-you for my time.

- I understand that if I have any questions concerning the purposes or the procedures associated with this research project, I may call or write:
Dr. Jerry Hoepner  
Department of Communication Sciences and Disorders, HSS 117  
University of Wisconsin-Eau Claire  
Eau Claire, WI 54702  
Telephone: 715.836.3980

I understand that it will not be necessary to reveal my name in order to obtain additional information about this research project from the principal investigator(s).

- I understand that if I have any questions or concerns about the treatment of human subjects in this study, I may call or write:

  Dr. Michael Axelrod, Chair  
  Institutional Review Board for Protection of Human Subjects  
  Schofield 17  
  University of Wisconsin Eau Claire  
  Eau Claire, Wisconsin 54702  
  Telephone: 715-836-2373

Although this person will ask my name, I understand that all inquiries will be kept in the strictest confidence,

- I UNDERSTAND THAT I AM FREE TO WITHDRAW MY CONSENT AND DISCONTINUE MY PARTICIPATION AT ANY TIME.

Signature of Subject Date

I, the undersigned, have defined and fully explained the investigation to the above subject.

Signature of Investigator Date
APPENDIX H
IRB Approval Letter
Notice of Completion of Review
Institutional Review Board for the Protection of Human Subjects
Federal Wide Assurance Number: FWA00001217

Please keep a copy of this e-mail for your records. The University of Wisconsin – Eau Claire Institutional Review Board Committee (IRB) has reviewed your proposal:

Approval Number: CLEMENKA26902.014
Project Title: Study of Implementation Barriers of Alternative and Augmentative Communication Use in Intensive Care Units: Comparing Differences in Barriers Between Healthcare Professionals

The IRB has considered the following factors:

- The rights and welfare of the individual(s) involved.
- The appropriateness of the methods to be used to secure informed consent.
- The risks and potential benefits of the Investigation.

Upon completion of its review, the IRB has taken the following action on this proposal:
Approved in the category of Expedited.

While the category of Expedited implies minimal risk to human subjects, the following responsibilities still apply:

1. All individuals on your research team should ensure the dignity, rights, and safety of all human subjects according to both UW-Eau Claire and federal guidelines.
2. UW-Eau Claire co-investigators must complete the Human Subjects Protection Tutorial (IRB Certification) in BLogix (https://eform1.uwec.edu).
3. This approval is good for 1 year, assuming the protocol is unchanged. If you desire to make any changes in your protocol, you must first complete an IRB Change Form in BLogix (https://eform1.uwec.edu). This same IRB form should be submitted annually and at termination of project.
4. Immediately report to the IRB any serious, adverse effects or problems experienced by study subjects.
5. Keep all research records, including signed consent forms, if used, for 6 years after the project is officially terminated with the IRB.
6. More information regarding the protection of human subjects can be found at www.uwec.edu/irsu/irb.

Research Participant Incentive, Level of Confidentiality of Payment:
Choose

Additional Notes:

The Institutional Review Board wishes you much success in your research endeavors.

Dr. Michael Axelrod
Chair, Institutional Review Board
axelromj@uwec.edu

cc: Torgerson, Kimberly Ann, Stadler, Marie A., Office of Research and Sponsored Programs (ORSIP)