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Developing a Culture of Successful Communication in Acute Care Settings: Part I. Solving Patient-Specific Issues

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Abstract

Purpose: Establishing services for hospitalized patients with complex communication needs requires identifying and addressing both patient-based and institutional barriers. In this 1st article, we focus on overcoming patient-based barriers. The companion paper (Marshall & Hurtig, 2019) addresses overcoming institutional barriers.

Method: We present a series of cases that illustrate both the challenges and some of the solutions that have emerged in addressing the specific needs of individual patients with complex communication needs.

Results: Each case illustrates how a dynamic assessment approach was used to allow patients with complex communication needs to more effectively communicate with caregivers and participate in their care.

Conclusion: Building a culture of improved patient–provider communication involves more than just providing patients with augmentative and alternative communication tools.

In that many hospitalized patients face barriers to effective patient–provider communication that can have negative impacts on health outcomes (Blackstone, Beukelman, & Yorkston, 2015; Hurtig, Alper, & Berkowitz, 2018; Hurtig, Czerniejewski, Bohnenkamp, & Na, 2013; Hurtig & Downey, 2009; Hurtig, Nilsen, Happ, & Blackstone, 2015). Specifically, barriers to patient–provider communication have been linked to a greater risk of preventable adverse events (Agency for Healthcare Research and Quality, 2013a, 2013b; Bartlett, Blais, Tamblyn, Clermont, & MacGibbon, 2008; Cohen, Rivara, Marcuse, McPhillips, & Davis, 2005). In addition to unnecessary patient suffering, the cost of treating preventable adverse events that hospitals must absorb is in excess of \$29 billion (Hurtig et al., 2018). Although many acute care hospitals have historically implemented generic communication boards and paper-and-pencil solutions, they have not embraced the utilization of a wider range of augmentative and alternative communication (AAC) strategies. In some cases, this is a

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function of the mistaken belief that the effort of implementing AAC would not be worthwhile because the patients are hospitalized for only a brief time and are only facing a transitory barrier to communication. Likewise, speech-language pathologists (SLPs), who provide AAC services for individuals who face ongoing barriers to communication, are faced with their own barriers (e.g., insufficient time, limited resources, training) to perform an evaluation and implement the appropriate AAC strategies for acute care patients. Sadly, these barriers often compound, leaving the most well-intending SLPs facing what can feel like insurmountable challenges in meeting the complex communication needs (CCN) of patients. Furthermore, overall hospital cultures do not always consistently embrace patient-provider communication as part of their core missions. When asked what SLPs do, many health care professionals respond, “they do swallow evaluations,” indicating a lack of awareness of the full scope of the speech-language pathology practice (American Speech-Language-Hearing Association, 2016, n.d.). Any successful implementation of AAC involves some level of training not only of the individual with CCN but also of others who interact with them. For the typical AAC implementation for an individual with a developmental disability or a degenerative disease, such training will involve a known set of individuals (e.g., family member, teachers, aides) and occur over many weeks and months until all stakeholders feel comfortable. In the hospital setting, the typical patient will be interacting with many nurses, physicians, other health professionals, and family members, and so a more extensive training component will need to be undertaken and at a much quicker pace.

To illustrate the process of expanding the services for hospitalized patients with CCN while working to create a culture of improved patient-provider communication, we present a series of cases that illustrate both the challenges and some of the solutions that have emerged in addressing the specific needs of the individual patients. In order to ensure patient confidentiality, we have assigned each patient a pseudonym and have modified portions of their stories. Presentation of these de-identified cases has been cleared by the University of Wisconsin-Madison Office of Compliance.

Background of University of Wisconsin Health/Communication Aids and Systems Clinic—Prior AAC Status

The University of Wisconsin Health (UWH) includes the University Hospital (UWUH), which is a 505-bed Level 1 adult and pediatric trauma center. It also includes the American Family Children’s Hospital (AFCH), a nationally ranked 111-bed facility. For patients at UWUH and AFCH with CCN, there are a range of no-tech and low-tech AAC supports available (e.g., picture and alphabet boards, white boards, paper and pencil). For patients who were unable to access the standard nurse call, a host of alternative call pendants are also available (e.g., Presscall, E-Z Call). The inpatient speech-language pathology and occupational therapy team provides assessment and implementation of these AAC and assistive technology (AT) supports.

Housed across the street from UWUH and AFCH is the Waisman Center Communication Aids and Systems Clinic (CASC). The CASC is an outpatient specialty clinic composed of

SLPs and occupational therapists (OTs) who provide both AAC evaluation and treatment services to children and adults experiencing significant communication difficulties. The clinic maintains an extensive library of high-tech AAC tools, including dedicated speech generating devices, iPads and applications, and an array of switches, mounting solutions, and other alternative access options (e.g., alternative mice, head pointers, eye gaze modules).

The CASC has a long-standing partnership with the Rehabilitation Department of the UWH. The equipment library and expertise of the CASC staff are an expensive service to maintain and one that is not easy to replicate. Fortunately, the relationship between the CASC and the UWH has created opportunities for the CASC staff to provide inpatient consultations and equipment access for patients at UWUH and AFCH. Most commonly, these consultations are initiated by the inpatient speech-language pathology team. Consults are typically requested when additional expertise is desired to support patients with CCN or when high-tech solutions would be more appropriate for a patient and equipment setup and training is desired.

Role of Partnerships

Addressing the needs of patients and improving patient-provider communication require more effective collaboration between SLPs, nurses, and other members of the care team (Altschuler & Happ, 2019). Over the past 5 years, a concerted effort has been made to expand AAC consultations and services by CASC at UWUH and AFCH. CASC and inpatient SLPs have established more consistent communication, set shared goals, and developed plans for nurse training and staff education to increase identification of and provide services for hospitalized patients with CCN. However, as the number of consults and request for AAC tools increased, the impact of a shortage of equipment was quickly felt. Although the CASC's equipment library is robust, it is used daily for patients seen for outpatient evaluation and treatment. Despite having multiples of some equipment (e.g., switches, iPads), more specialized equipment (e.g., eye gaze systems) is often unavailable for use in the inpatient setting for an extended time period.

Approximately 2 years ago, a partnership was formed between CASC and Voxello. Voxello was formed in 2013 as an outgrowth of work done at the University of Iowa's Assistive Devices Laboratory, as a project of the Iowa Medical Innovation Group program. Voxello developed the noddle smart switch and the noddle-chat communication tool to provide patients access to the nurse call systems and to communicate with caregivers when their medical condition precludes their use of oral and written modes of communication. The noddle uses patented technology to allow patients to use a voluntary gesture, such as a tongue click, or a minimal movement, such as a head nod or shoulder shrug, to access the nurse call systems and utilize a speech-generating devices, such as the noddle-chat tablet, to communicate. The noddle was designed to be a plug-and-play device that could be deployed at the bedside and would be intuitive, easily set up by nurses, and easily used by patients. Voxello has developed a family of sensors for the noddle in order to make it possible for patients to get help and communicate, regardless of what voluntary gesture they are able to produce. The noddle has been cleared as a Class II medical device (powered communication device) by the Food and Drug Administration and is now being used at 12 medical centers

around the country. Utilizing feedback from hundreds of patients, their caregivers, and family members, Voxello created a set of communication templates for the noddle-chat communication tool. This tool was designed to allow patients who are unable to speak to make their needs known and to more effectively interact with caregivers and family members. It also includes message templates to support participation in medical decision making.

UWUH serves as a test site in an ongoing clinical trial of Voxello's technology. Having access to the noddle and noddle-chat had two major impacts on the state of AAC service provision at UWUH and AFCH. First, it provided a tool for patients with the most CCN who previously were unable to use other AAC/AT options. Second, it drastically expanded the CASC's loaner library of tools dedicated to the inpatient setting. Having access to needed high-tech tools sparked excitement in some areas of the hospital, resulting in increased consults and improved patient-provider communication.

Overview of Barriers

Through increased consults, the CASC and inpatient SLPs began identifying common barriers to effective implementation of AAC/AT supports at UWUH and AFCH. Ultimately, these barriers could be categorized into one of four types: (a) patient specific (e.g., physical, language, cognitive, end of life), (b) system specific (e.g., physical location of the CASC, consult identification, scheduling, discharge planning), (c) training and implementation related (e.g., shift changes, staff time and knowledge, room and unit changes, and positioning changes), (d) technology related (e.g., role of low technology, availability of equipment, and equipment management). Through a series of highlighted cases over the past 18 months, the CASC and UWUH-AFCH team has begun to identify solutions to start overcoming barriers in each of these four areas. Resolutions offered within the presented case studies are not intended to be "one-size-fits-all" solutions. Instead, they are offered as suggestions with descriptions of the critical thinking and problem solving that occurred in each case and which continues to occur at UWH today. In this article, the cases presented illustrate the problem solving and solutions arrived at to address each individual patient's AAC/AT needs and in-the-moment provider training required to overcome the barriers to patient-provider communication.

Case Studies

Jason

Jason is a 28-year-old man admitted for severe Guillain-Barré syndrome. He presented with total body paralysis requiring prolonged mechanical ventilation. Although cognitively intact, Jason was unable to communicate or open his eyes to engage with his surroundings. He spent 2 months in the intensive care unit (ICU), followed by 2 months in a step-down unit, prior to discharging to a rehabilitation facility. Jason's parents and wife alternated being at his bedside, ensuring that a loved one was present at all times.

An AAC evaluation was requested by Jason's primary SLP. Initial assessment focused on identifying any consistent and reliable gesture that Jason could produce with as much ease

and efficiency as possible. Jason was unable to produce movement of his upper or lower extremities, control oral motor movements, or vocalize. Ultimately, a very slight head tilt to the right side was identified as Jason's only reliable gesture. Through use of this gesture, it was confirmed that Jason was alert, oriented, and cognitively intact.

To maximize the use of this gesture for both communication and signaling the nurse, the noddle and the noddle-chat speech-generating tablet were introduced. An AbleNet Specs Switch was mounted at Jason's right temple via a ModularHose switch mount and connected to the noddle. Auditory scanning was enabled on the noddle-chat, and Jason was instructed to activate the switch one time to scan through the noddle-chat page content, two times to produce his selected utterance, and three times to activate his nurse call. Jason quickly learned how to use the system. He displayed a preference for creating his own messages using the noddle-chat's on-screen keyboard and saving those messages in topic categories for more efficient use when interacting with caregivers and family members.

After identifying and addressing the physical barriers to communication with the aforementioned communication solution, the focus of intervention shifted to training and implementation of the system across communication partners. Although Jason was in the ICU, the nurse-to-patient ratio was 1:1, and his nurse was often involved directly with therapy sessions. Jason's nurse learned both how the system worked and how to effectively communicate with Jason when he was using the noddle and the noddle-chat. Family and nursing staff developed an understanding of the content of Jason's communication system and supported the increased efficiency of communication—by helping him navigate to the appropriate topic category based on the conversation or coconstructing messages while Jason was spelling out his message.

However, Jason's transition to the step-down unit meant that his nurses would have more patients to care for, and as such, the nurses' availability for training and implementation was significantly reduced. Furthermore, as Jason's physical status began to improve, he started spending more time in different positions throughout his day (e.g., bed vs. cardiac chair). The reduction in staff time and training coupled with frequent positioning changes resulted in the noddle and the noddle-chat tablet often being inaccessible (e.g., not charged, incorrectly positioned) to Jason. Additionally, reduced staff time often led to staff speaking directly with Jason's family, anticipating his needs, or restricting communication to yes/no questioning as opposed to providing Jason with the additional time needed to generate his own messages. As use of the communication device went down, so did Jason's independence and autonomy with regard to his care.

To begin overcoming these newly identified barriers to effective communication, solutions started directly with Jason. Jason agreed to the use of bedside signage to help increase his ability to advocate for himself and his communication needs. A sign stating "Please speak directly to me and involve me in decision making" was placed above his bed (see Figure 1). His family was encouraged to continue their advocacy for Jason by directing providers back to Jason when needed. Through empowering Jason and his family to advocate for their needs, Jason quickly became re-involved in his care plan. However, barriers associated with the slow nature of linear auditory scanning persisted. To maximize efficient use of time,

Jason was encouraged to construct his messages prior to signaling his nurse in order to allow him to immediately communicate his entire message as soon as the nurse entered the room.

However, positioning barriers persisted, and it was common for Jason's switch to be positioned out of reach or to have not been moved between his bed and chair. Although not always an option, the clinic had enough equipment available to provide two systems for Jason to use simultaneously, eliminating the need for continued repositioning. However, even with the support of bedside photographs (see Figure 2) illustrating appropriate positioning of the noddle, Jason was still facing positioning challenges with less familiar staff or during particularly busy times. Self-advocacy again became an effective solution, and Jason established use of a signal (repeatedly turning his head to the right) to communicate to staff that his switch was not in reach.

Although some of the solutions helped overcome some barriers with staff, challenges persisted. At times, Jason was left without access to his communication system for no apparent reasons. In these situations, reports of these incidents were escalated. Physician involvement, team meetings, and use of nursing communication orders were all resources tapped over the 4-month course of Jason's admission. Ultimately, the strongest driving force in consistent implementation and use of the system was Jason's own advocacy.

Not only did Jason's self-advocacy change the course of his own intervention but it paved the way for lasting changes on the ICU unit that Jason was on. Prior to the order for an AAC/AT consult for Jason, a similar consult order had not been placed from that ICU for several years. However, within the 6 months following Jason's discharge from that unit, consult orders were placed for an additional four patients—including the patient whose case study appears next.

Ted

Ted is a 65-year-old man admitted following a cerebral arteriovenous malformation. Ted emigrated to the United States and had limited English proficiency; he also had few family members in the United States. Unfortunately, complications from Ted's cerebral arteriovenous malformation resulted in blindness from optic nerve damage and total body weakness that required mechanical ventilation. He presented with inconsistent orientation and responding to commands. He exhibited increasing delirium over the course of his stay. Ted's only intentional and consistent gesture was a tongue click he produced around his endotracheal tube.

Ted was fortunately cared for by the same ICU nursing staff who had received training on the noddle during Jason's admission. The nursing staff were excited by their success in implementing AAC tools that worked so well for Jason. They recognized Ted's communication barriers and placed an AAC consult the same day that Ted was being weaned from sedation. Upon initial consult, Ted was oriented and demonstrated emerging understanding of the concept of auditory scanning using the noddle and the noddle-chat with a J-mic switch mounted via a headband. However, the use of auditory scanning in this case presented another barrier, as Ted was unable to understand the English auditory cues.

Although the hospital did not have an onsite language interpreter for Ted's native language, an iPad remote-linked interpreter through Pacific Interpreter Service was used for all of Ted's therapy sessions. The concept of auditory scanning and role of the J-mic sensor were reviewed with the interpreter prior to the session to provide her with time to translate this concept to support Ted's understanding. Prior to Ted's sessions, the therapist worked with the interpreter to begin translating all the auditory cues into Ted's language while leaving the device's primary message voice output in English so that his nurses could understand the messages produced on the noddle-chat.

Unfortunately, before Ted could establish functional use of the noddle-chat, his delirium increased, and he was unable to independently and consistently use the noddle-chat for communication. Although Ted remained able to produce a tongue click, he was no longer able to coordinate the timing of his tongue clicks to control both the nurse call and the noddle-chat. To ensure that Ted continued to have access to the nurse call system, the noddle was un-paired from the noddle-chat tablet and used exclusively to give him the ability to call his nurse.

To be able to provide Ted with the ability to continue to communicate with his nurses, the unit nurses were provided education on how to use low-tech communication strategies. Ted's noddle-chat pages were printed and made into low-tech boards for partner-assisted auditory scanning (PAAS; see Figure 3). Nursing staff and the language interpreter worked together to implement these boards consistently with Ted. When interacting with Ted, his nurse would read each message on the board one-by-one, pausing to allow the interpreter to translate the auditory cue into Ted's language. After Ted received the auditory cue, his nurse would provide wait time to allow Ted the opportunity to signal "yes, that's my choice" by clicking his tongue. If Ted did not signal "yes, that's my choice," his nurse would then present the next option via the interpreter. The use of PAAS allowed his nurses to continue supporting Ted's communication while removing some of the cognitive and physical demands required to control scanning and utterance selection independently. This commitment ensured that Ted continued to have a role in his cares and was provided with the same questions in a consistent order to support learning and execution of the PAAS technique. Taking a multimodal approach to communication that values the role of both low- and high-tech tools enabled sustaining Ted's communication with his caregivers when changes in his cognitive status precluded his use of the noddle-chat speech-generating device.

Ted's intervention highlighted that it truly takes a village to support communication for patients with CCN. Ted's nurse and the language interpreter took on a more critical role in the development of his communication system than the SLP and the OT. This speaks to the emerging "culture of communication" on the unit and the importance of ensuring that nurses are provided training on using a range of tools to support the communication needs of their patients.

Although the noddle-chat was initially developed for English-speaking patients, Voxello has recently developed a bilingual version to support bedside interactions between patients who have limited English proficiency and their nurses. In this version, each template provides

options for the patient and the nurse. The patient's "buttons" are labeled in the patient's preferred language and when selected produce the equivalent utterance in English. The nurse's "buttons" are labeled in English and when selected produce the equivalent message in the patient's language. Patients who have use of their hands can access messages using the noddle-chat's touch screen, whereas more physically limited patients can navigate through the message options using the noddle switch. The noddle-touch has been designed to include communication rate enhancing features like row-column scanning to allow patients to more quickly get to the desired message.

Jax

Jax is a 14-year-old boy admitted for treatment of a malignant brain tumor. Surgical resection resulted in cerebellar edema and partial posterior fossa syndrome requiring endotracheal intubation and, ultimately, placement of a tracheostomy. Jax spent many months at the children's hospital for chemotherapy and radiation treatment, during which two of those were spent on the CASC service. A consult for an AAC evaluation was placed by his inpatient SLP the day Jax was being weaned from sedation.

Initial evaluation began with a parent interview and explanation of the role of the AAC for Jax. His mother shared that Jax was a "tech wiz" and had peers at school using switches, so this concept would not be foreign to him. Upon meeting Jax, it was important to re-assure him that his communication barrier was temporary. Time was spent explaining to Jax, with his parents' guidance, why he was in the hospital and why he needed help breathing. His parents, nurse, and inpatient SLP and the CASC SLP participated in Jax's evaluation and treatment plan. The team explained to Jax that the tools being introduced would support his communication while he worked to increase his strength and while he still needed help breathing.

Upon initial assessment, Jax was unable to open his eyes but had been communicating with his parents using a thumbs up for "yes" and thumb in fist for "no." Use of this clear yes/no response confirmed that Jax was alert, oriented, and able to follow basic instructions. Like Jason and Ted, Jax was an excellent candidate for use of auditory scanning on the noddle-chat. The concept of switch scanning was introduced to Jax using a computer game analogy. The use of switches was likened to computer mouse clicks where a single, double, or triple click of the mouse could be used to control different features of a computer game. Together, Jax and the therapist worked to identify the gesture that Jax could optimally control to activate a switch so that he could execute the equivalent number of mouse clicks.

Jax's most reliable gesture involved a right-hand squeeze, and the best switch would have been the AbleNet Grasp switch. Unfortunately, our Grasp switch was already on loan with another patient. However, together with Jax's parents and the CASC OT, an AbleNet Trigger switch was adapted by connecting it to a Velcro strap, wrapping it around Jax's right hand, and positioning it in his palm. The Velcro strap held the switch in place, allowing Jax to rest when not communicating (see Figure 4). Additionally, using this switch allowed Jax to still use his thumbs up/in fist for yes/no communicating when appropriate. Ultimately, this adapted switch turned out to be an even better match for Jax. The switch was connected to

the noddle input jack to activate both the nurse call system and the noddle-chat communication device.

Jax, his family, and the intervention team worked together to customize the preloaded noddle-chat pages for Jax's developmental level and interests (see Figure 5). Specifically, the medical questions, pain scale, and leisure pages were customized to support Jax's language understanding and expression. Jax's parents worked with the palliative care and health psychology team to determine what information would be shared with Jax and the best way to use the noddle-chat to support this.

Jax's interest in technology and love of video games led to quick learning and efficient use of the system. The interdisciplinary model implemented in the assessment continued throughout Jax's treatment, and his entire team exhibited an outstanding commitment to maximizing Jax's use of the communication tools. Some of the technology problems identified with Jason's implementation (e.g., positioning, charging ports) also surfaced with Jax; however, they were immediately identified and allowed for a team approach to solve the problem. All team members took responsibility for management of the equipment and ensured that Jax always had access to his communication device.

In spite of the exceptional team commitment, access to the noddle and the noddle-chat was not possible in all environments. For example, when Jax went to radiation therapy, the system could not be transported with him for his treatments. This barrier resulted in increased anxiety associated with an already stressful treatment. Like Ted, it was necessary to take a multimodal approach to communication that also involved use of low-tech communication strategies. Jax and his mother worked together to create a one-page PAAS sheet using the most important noddle-chat vocabulary for Jax's use during his radiation treatments (see Figure 6). Jax's adapted switch was connected to an AbleNet Step-By-Step switch that produced the message "I have something to say," which signaled his communication partner to initiate PAAS. Jax continued use of his yes/no response to participate in this PAAS technique.

Over the course of Jax's stay, his communication needs changed, his strength and vision improved, and the AAC strategies appropriate for him needed continual modification. He transitioned from auditory scanning on the noddle-chat to auditory fishing on his noddle-chat boards recreated on an iPad with the GoTalk Now! application and keyguard. Ultimately, Jax was able to use direct selection within the GoTalk Now! application, up until decannulation and return of his verbal communication. However, regardless of where Jax was in his recovery, he utilized a wide range of strategies to support his communication, including mouthing, gestures, and signs over the course of his stay. His mother reported that providing Jax with so many "tools in his toolkit" allowed him the flexibility to meet his communication needs regardless of the time of day, his fatigue, or where he was. Table 1 provides a general description of each of the cases, and Table 2 provides a description of the intervention and charges associated with each case.

Institutional Changes/Next Steps

Each of these three patients left a lasting impact on the ongoing development of AAC services at UWUH/AFCH. They showcased that AAC is not a “magic bullet,” and often solutions are not straightforward. Each of the aforementioned cases required multiple diagnostic sessions with a team of specialists to determine the optimal solution for supporting their CCN. Furthermore, each patient’s needs rapidly changed, and modifications were crucial to continued success. Although a high-tech solution was appropriate, at times, for each of these individuals, intervention could not stop there. Additional education must occur surrounding the continued need for SLP and OT consultations and intervention throughout a hospitalization. It is crucial to not have staff deem patients “unable to use” or “inappropriate for” AAC solutions based on performance with tools presented without a specialized evaluation.

All the cases described above shared a need for increased caregiver training throughout their intervention (e.g., consult identification, device implementation, discharge planning). The AAC consult team has set as a priority providing nurses and other care providers with more education on how AAC strategies can be used to support patient–provider communication. These patients highlighted that a patient-by-patient approach to nurse training can be effective for meeting the needs of a single patient, providing education at a basic level, and perhaps even initiating a culture shift for a single unit. However, this approach is inefficient and slow and will take too long to achieve widespread system change. Working on an expanded number of units with a diversity of patient populations suggests that achieving a high-fidelity implementation of AAC strategies will require a combination of e-learning modules, in-person training, and participation in staffing rounds and unit huddles. This is consistent with the call for an interdisciplinary approach to meeting patient needs (Altschuler & Happ, 2019).

Impact of Implementing an AAC/AT Consult Services

Since the inception of the collaborative efforts between CASC and UW Health, the number of inpatients receiving AAC/AT has steadily increased. In 2017, before the active engagement of CASC staff with patients at UWUH/AFCH, there were only four to eight consults request per year. In the first year of the project (2018), AAC/AT consult request rose to two new consults a month and, in 2019, the new consults have been averaging four per month. The success in improving patient–provider communication for successive patients on the inpatient units has increased the staff’s awareness of available resources and that has triggered the rise in AAC consults.

Conclusion

We know that overcoming communication barriers is critical to improving patient outcomes and reducing unnecessary costs associated with preventable adverse events. However, we also know that even the most motivated SLPs are faced with patient, training, institutional, and equipment barriers challenging the common goal of improved patient–provider communication. Although expanding your toolbox is important, the solution is not as simple as securing the right equipment. Ultimately, a hospital-wide culture of communication must

be built and sustained. Although barriers may be unique and the journey to building a culture of communication will be different, the desired goal should be supporting patients with CCN so that they can be active agents in their own care. The next paper (Developing a Culture of Successful Communication in Acute Care Settings: Part II. Solving Institutional Issues) presents additional cases to illustrate the process of overcoming the institutional barriers that need to be overcome in order to support the widest range of patient communication needs.

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Please talk directly with me to include me
on my medical care plan.

I am capable of my own decision making
and would like to be involved in discussions
surrounding my care.

Figure 1.
Bedside signage indicating how patient communicates.

Figure 2.
Example of bedside mounted pictures illustrating switch mounting.

To assist patient in making choices:

- Establish a consistent Yes/No response.
- First, point to each row in turn asking, "Is it in this row?"

- When the patient makes a row selection, point to each successive box in the row and ask, "Is it this one?"

- Be sure to modify your speed according to the individual patient's needs.

Figure 3.
Instructions for partner-assisted auditory scanning.

Figure 4.
Switch mounting using Velcro strap.

Figure 5.
Customized messages noddle-chat page.

XXX'S CHART

XXX signals "yes" with a hand squeeze.

Point to and say the first word in each row.

When XXX signals his row choice, point to and read items in the selected row.

If XXX signals an answer with a superscript, provide follow up questioning using the row corresponding to the superscript/color.

DO YOU HAVE PAIN?	NAUSEOUS	PAIN ¹	TINGLY					
HOW ARE YOU FEELING?	HAPPY	SAD	SCARED	TIRED	HOT	COLD	WORRIED ²	
DO YOU NEED HELP WITH SOMETHING?	BATHROOM	MOUTH SUCTION	TRACH SUCTION	HEAD UP	CHAIR			
IS SOMETHING BOTHERING YOU?	I MISS SOMEONE	CHANGE THE LIGHT	I AM BORED	I WANT TO BE LEFT ALONE				
¹ WHERE IS YOUR PAIN?	HEAD	THROAT	STOMACH	CHEST	BACK	MOUTH	LEG	EAR
DO YOU NEED SOMETHING IN THE ROOM CHANGED?	LIGHTS ON	TV ON	LIGHTS OFF	TV OFF	WARMER	COLDER		
² WHAT ARE YOU WORRIED ABOUT?	FAMILY AND FRIENDS ³	WEATHER	MY DAY	SOMETHING ELSE				
³ FAMILY AND FRIENDS	DAD	MOM	XXX	GRANDMA & GRANDPA	XXX	XXX	TEACHERS	FRIENDS

Figure 6.

Communication board for use during Jax's radiation therapy.

Table 1.

General description of each case.

Patient	Age (years)	Admitting condition	Cognitive status	Language/literacy status	Prior experience with technology	Length of intervention during hospitalization
Jason	28	Guillain-Barré syndrome	OK	OK	Yes	4 months total with frequency changing based on need
Ted	65	Cerebral AVM	Not consistently oriented	Non-English speaker	Unknown	1 week of CASC services, length of stay for IP SLP
Jax	14	Malignant brain tumor	OK	OK	Yes	2 months total with frequency changing based on need, longer for IP SLP

Note. AVM = arteriovenous malformation; CASC = Communication Aids and Systems Clinic; IP = inpatient; SLP = speech-language pathologist.

Table 2.

General description of the intervention for each case.

Patient	CASC session frequency	CASC session length	CASC % of session spent on caregiver training*	CASC billing codes for evaluation	CASC billing codes for treatment	Other billing codes ^a	Inpatient SLP visit frequency
Jason	3–5 ×/week during initial setup and toward d/c; 1 ×/week for ongoing troubleshooting	60 min	50	92607	92609	Speech assist	4–5/week
Ted	Daily for 3 days to set up	15–20 min	50	92607	92609	Speech assist	3–4/week
Jax	Daily for 4 days to set up for each new communication system (total of three treatment periods)	60 min	50	92607	92609	Speech assist	4–5/week

Note. CASC = Communication Aids and Systems Clinic; SLP = speech-language pathologist.

^a Only direct patient care was billed under codes 92607 and 92609. Caregiver training and technical assistance was captured via an unbilled “speech assist” code that is used to track time spent on nonbillable services.