Topics in Adaptive Technology
JOURNAL OF NURSE LIFE CARE PLANNING

Spring 2011
Contributing Editor Barbara Bate

Table of Contents

316 Technology and Medication Management
Danielle Mayer RN LNCC MSCC CNLCP

321 Talking To Yourself: Using Voice Recognition Software
Peggy Dellea MS OT/L

329 Smartphones as Adaptive Technology for the Disabled
Victoria Powell RN CCM LNCC CNLCP MSCC CEAS

345 High-Frequency Chest Wall Oscillation in Life Care Planning
Cheryl Kaufman RN BScN CLCP CNLCP

353 Tools of the Trade: LCP Resources in Adaptive Technology
Compiled by Barbara Bate RN-BC CCM CNLCP LNCC MSCC

Departments

312 Editor’s Note
Wendie A. Howland RN-BC MN CRRN CCM CNLCP

313 Information for Authors

314 Contributors to this Issue

315 Letters to the Editor


367 Author index, 2008, 2009, 2010

Journal of Nurse Life Care Planning is the official publication of the American Association of Nurse Life Care Planners. Articles, statements, and opinions contained herein are those of the author(s) and are not necessarily the official policy of the AANLCP℠ or the editors, unless expressly stated as such. The Association reserves the right to accept, reject, or alter manuscripts or advertising material submitted for publication.

Journal of Nurse Life Care Planning is published quarterly in Spring, Summer, Winter, and Fall. Members of AANLCP℠ receive the Journal subscription electronically as a membership benefit. Back issues will be made available in electronic (PDF) format on the association website. Please forward all email address changes to AANLCP℠ marked “Journal-Notice of Address Update.”

Contents and format copyright by the American Association of Nurse Life Care Planners. All rights reserved. For permission to reprint articles, graphics, or charts from this journal, please request to AANLCP℠ headed “Journal-Reprint Permissions” citing the volume number, article title, author, and intended reprinting purpose.

Neither the Journal nor the Association guarantees, warrants or endorses any product or service advertised in this publication nor do they guarantee any claims made by any product or service representative.
Editor’s Note

Sitting down to write this, I have only to look out my window here on Cape Cod to remember that much of the country has been slogging through one of the snowiest winters in recent memory. Thank goodness that most of us can continue serving our clients and maintaining normal business operations via our email, websites, FTP sites, telephone, and fax. What would we do without technology? Well, we’ve seen those research findings showing how our brains give us a little shot of dopamine when we open an email (or score big on that beguiling solitaire program), and while this registers as pleasurable and reinforces us for doing it again and again, maybe we should be happier when the power goes out and frees us to unplug, go for a walk, and get away from it all guiltlessly. If only for a little while. We know it’s healthier.

But technology marches on. As we begin our third year of electronic publishing, much of this issue is devoted to technology and related issues. Barbara Bate has done a terrific job as contributing editor for this issue getting authors to share their expertise; thank her when you see her! As with our issue on amputation (vol. IX, no. 4, December 2009), I anticipate getting many requests for permission to distribute individual articles for particular populations; indeed, I have already had one, from a visually-impaired man who heard me talk about the great smartphone apps I learned about reading Victoria Powell’s comprehensive review.

One thing I love about this position is that I get to read about so many new things I can use in so many ways. Judging by the enthusiastic peer reviews on the article on high-frequency chest wall oscillation, technology for medications, and voice-recognition software, I know others feel the same. And so many members have contributed resources on all sorts of topics for this issue, from service dogs to custom-made gadgets-- we can be proud we nurses are such a collaborative, collegial group!

Please send your favorite resources along, and we promise to print an addendum in a later issue. Maybe we could make it a regular feature! What else would you like to see in these pages? Photographs, like other professional journals, to show us your non-work self? Think about it … when you go out for your walk today. Take your camera.

Cordially,
Wendie Howland
Editor, Journal of Nurse Life Care Planning
whowland@howlandhealthconsulting.com

American Association of Nurse Life Care Planners
3267 East 3300 South #309
Salt Lake City, UT  84109
Phone: 888-575-4047
Fax:  801-274-1535
Website: www.aanlcp.org
Email: info@aanlcp.org

2011 AANLCP℠ Executive Board
President
Jackie Morris RN BSN CRRN CNLCP CLNC
President Elect
Anne Sambucini RN CCM CDMS CNLCP MSC-C
Treasurer
Chris Daniel RN BSHS CCM CNLCP MSCC LNC
Secretary
Nancy Zangmeister RN CRRN CCM CLCP MSCC
Past President
Barbara Bate RN-BC CCM CNLCP LNCC MSCC

The American Association of Nurse Life Care Planners (AANLCP℠) promotes the unique qualities the Registered Nurse delivers to the Life Care Planning process. We support education, research, and standards related to the practice of Nurse Life Care Planning.
Information for Authors

AANLCP℠ invites interested nurses and allied professionals to submit article queries or manuscripts that educate and inform the Nurse Life Care Planner about current clinical practice methods, professional development, and the promotion of Nurse Life Care Planning within the medical-legal community. Submitted material must be original. Manuscripts and queries may be addressed to the Editorial Committee. Authors should use the following guidelines for articles to be considered for publication. Please note capitalization of Nurse Life Care Plan, Planning, etc.

Text

Manuscript length: 1500 – 3000 words

- Use Word® format only (.doc)
- Submit only original manuscript not under consideration by other publications
- Put the title and page number in a header on each page (using the Header feature in Word)
- Set 1-inch margins
- Use Times New Roman, or Arial font, 12 point
- Use double-spacing, using the Word formatting feature
- Place author name, contact information, and article title on a separate title page, so author name can be blinded for editorial review
- Use APA style (Publication Manual of the American Psychological Association)
- We publish with live links; please be sure to give the full URL for any website or other link you reference

Art and Figures

All photos, figures, and artwork should be in TIFF, EPS, JPG, or PDF format. Line art should have a minimum resolution of 1000 dpi, halftone art (photos) a minimum of 300 dpi, and combination art (line/tone) a minimum of 500 dpi.

Each table, figure, photo, or art should be on a separate page, labeled to match its reference in text, with credits if needed (e.g., Table 1, Common nursing diagnoses in SCI; Figure 3, Time to endpoints by intervention, American Cancer Society, 2003)

Editing and Permissions

The author must accompany the submission with written release from:

- any recognizable identified facility or patient/client, for the use of their name or image
- any recognizable person in a photograph, for unrestricted use of the image
- any copyright holder, for copyrighted materials including illustrations, photographs, tables, etc.

- All authors must disclose any relationship with facilities, institutions, organizations, or companies mentioned in their work.
- All accepted manuscripts are subject to editing, which may involve only minor changes of grammar, punctuation, paragraphing, etc. However, some editing may involve condensing or restructuring the narrative. Authors will be notified of extensive editing. Authors will approve the final revision for submission.
- The author, not the Journal, is responsible for the views and conclusions of a published manuscript.
- Submit your article as an email attachment, with document title article name.doc, e.g., wheelchairs.doc

All manuscripts published become the property of the Journal. Manuscripts not published will be returned to the author. Queries may be addressed to the care of the Editor at: whowland@howlandhealthconsulting.com

Manuscript Review Process

Submitted articles are peer reviewed by Nurse Life Care Planners with diverse backgrounds in life care planning, case management, rehabilitation, and the nursing profession. Acceptance is based on manuscript content, originality, suitability for the intended audience, relevance to Nurse Life Care Planning, and quality of the submitted material. If you would like to review articles for this journal, please contact the Editor.

AANLCP℠ Journal Committee for this issue

Shelly Kinney RN MSN CCM CNLCP
Editorial Committee Chair
Wendie Howland RN-BC MN CRRN CCM CNLCP LNCP-C
Journal Editor
Shelly Kinney RN MSN CCM CNLCP
Newsletter Editor
Barbara Bate RN-BC CCM CNLCP LNCC MSCC
Contributing Editor
Linda Husted MPH RN CNLCP LNCC CCM CDMS CRC MSCC
Cheryl Mathis RNC CLNC CNLCP
Danielle Mayer RN LNC MSCC CNLCP
Patty Nowak MS RN CDMS CCM LNC CNLCP
Kathy Pouch RN-BC BSN CCM CNLCP LNCC
Victoria Powell RN CCM LNCC CNLCP MSCC CEAS
Contributing To this Issue

Barbara Bate ("LCP Resources in Adaptive Technology") is President of Northeast Life Care Planning-Holden, Inc. providing medical case management services, life care plans, Medicare Set-Aside allocations, file reviews and medical cost projections. Barbara has over 27 years experience as a registered nurse and holds certifications in Nurse Life Care Planning, Legal Nurse Consulting, Case Management, and Medicare Set-Aside Consulting. She is presently Past President of AANLCP℠, a member of the National Alliance of Medicare Set-Aside Professionals (NAMSAP) Board of Directors.

Peggy Dellea ("Talking to Yourself: Voice Recognition Software") has worked at the Assistive Technology Center at Spaulding Rehabilitation Hospital in Boston MA for 15 years, focusing on adaptive computer use, electronic aids to daily living, and adaptive activities of daily living. Past experience includes work with long-term rehabilitation of people with traumatic brain injury and severe neurological deficits. She earned a Bachelors of Science in Occupational Therapy from Boston University and a Masters of Science in Biomedical Engineering from Boston University. She has presented numerous times to various organizations, colleges, and hospitals regarding the use of assistive technology in rehabilitation.

Cheryl Kaufman ("High Frequency Chest Wall Oscillation") is owner and principal of CK Medical-Legal Consulting Services in Massachusetts. She has more than 25 years of nursing experience to Legal Nurse Consulting and Life Care Planning. In addition to her early clinical experience in neonatal intensive care, pediatrics and caring for patients who suffered a stroke, her career path predominantly focused on infectious diseases, oncology and biotechnology and nursing education with emphasis on oncology disease management with specific chemotherapeutics and biological response modifiers, drug-drug interactions and patient safety issues.

Danielle Mayer ("Technology and Medication Management") has been an RN for 35 years, with clinical, supervisory and case management experience in pediatrics, catastrophic injuries, traumatic brain injuries, spinal cord injuries, neurological disorders and acute physical rehabilitation. She is a certified nurse life care planner, certified legal nurse consultant and certified Medicare Set-Aside consultant. She is the owner and sole proprietor of Mayer Consulting, LLC (AKA: Mayer Medical Legal Consulting), providing Life Care Planning, medical record review, and MSA services to plaintiff and defense firms and insurance carriers.

Victoria Powell ("Smartphones and Adaptive Technology") is CEO/President of VP Medical Consulting in Central Arkansas. She is a Nurse Case Manager, Nurse Life Care Planner, Medical Set Aside Allocator, Legal Nurse Consultant, and Ergonomic Assessment Specialist, blogger; and self-described gadget geek. Her article on comparisons of smartphones appeared in the last issue of the JNLCP.
This white space serves as a reminder that letters on any topic are welcome and may be sent to the Editor at whowland@howlandhealthconsulting.com. Letters may be edited for brevity.

Photographs are also welcome. Show us your view! Credit will be given.

Salt-box woodshed
Technology and Medication Management

Danielle Mayer RN LNCC MSCC CNLCP

As a Nurse Life Care Planner, I was recently consulted in a case where an individual, aged 63, who had sustained a traumatic brain injury several years prior. He had short term memory deficits and organizational deficits. He needed medication reminders every day. He lived alone and was able to drive; he could manage other aspects of his daily life with calendars and daily planners for medical appointments and social events. He was proud of the fact that he was self-sufficient and did not wish to have “outside help” coming into his home for medication set-up or reminders. However, he was on anti-seizure, cardiac, and hypertension medications, and his adult children were concerned that he was not maintaining his medication schedule. However, they were reluctant to insist that he accept help (or intrusion, as they saw it).

I presented this individual and his family with four twenty-first century technology options for medication reminders: alarm watches/clocks, telephone-based medication reminders, medication management integrated with personal emergency response systems, and automatic pill dispensers.

This article discusses examples from various companies I found while researching these services.
There are other companies who offer similar services. Costs may vary depending on the services available in different areas.

**Alarm Watches/Clocks**

The Cadex 12 Alarm Watch has an alarm that beeps and provides large printed text with the name and dosage of the medication that is due. It can be programmed for up to twelve daily alarms. It will beep for up to four hours, until the medication is taken and the alarm is reset.

These devices can be very helpful for individuals who can live independently or semi-independently, but need daily medication reminders.

Danielle Mayer is a certified nurse life care planner, certified legal nurse consultant and certified Medicare Set-Aside consultant. She is the owner and sole proprietor of Mayer Consulting, LLC (AKA: Mayer Medical Legal Consulting), providing Life Care Planning, medical record review, and MSA services to plaintiff and defense firms and insurance carriers. She can be contacted at Mayer Consulting, LLC, POB 7237, Bloomfield Hills, Michigan 48302, DanielleMayerRN@aol.com.

Disclaimer: Ms. Mayer has no association with any of the companies mentioned in this article. The mention of companies and services in the article are not intended to be advertisement or endorsement for any of the companies, services or products.
can obtain and store medications but need reminders to take them. They must also be able to read the text and hear the alarm. This watch/alarm is not suitable for the hearing impaired. The watch is not waterproof and should not be worn in the shower or a swimming pool.

This product comes with a 30-day money back guarantee and a one-year manufacturer’s warranty. The replaceable battery (a standard CR2032) is included and lasts up to 12 months. This watch is offered at [www.cadexwatch](http://www.cadexwatch) and retails for $139.95. A video with instructions on how to program and use the watch can be found at [http://www.youtube.com/watch?v=q6dKQTOibbQ](http://www.youtube.com/watch?v=q6dKQTOibbQ)

Cadex also offers a 12-Alarm Pediatric watch. The watch comes with an easy set-up manual or can be set up by following the E-pill online directions. A parent or teenager can easily follow these. The watch, like the adult Cadex, can be programmed for up to twelve daily medication alarms. This is a good option for a child or adolescent with Type I diabetes who might forget to check blood sugar levels during the day. The alarm can be set for reminders, e.g., “Check blood sugar.” The Cadex pediatric watch retails for $139.95 and comes with the same 30-day money back guarantee and one-year warranty as the adult Cadex watch.

**MedCenter Systems** offers a talking alarm clock. This is a table, desk, or nightstand alarm clock that costs $34.95. It can be programmed for up to four medication reminders per day. It has an alarm, a voice reminder that can be set on “loud” or “extra loud” for the hearing impaired, and a large digital read-out for the visually-impaired. The alarm will sound until the acknowledgement button is pressed.

**Telephone-Based Medication Reminders**

This is another option for individuals who can obtain and store their medications but need reminders to take them. Telephone calling services do not require any special phone or equipment. **Database Systems Corporation** is one company that offers this service. This is a service for land lines only. The telephone reminder service is set up online by going to [www.CallingCare.com](http://www.CallingCare.com) or [www.Medication-Reminders.com](http://www.Medication-Reminders.com). The service is available in the U.S and Canada. When the medication is due, it makes an automated call. If the recipient does not answer, the system calls the person’s emergency contact person(s). This service is offered for $14.95 per month.
There is also a telephone-based reminder app for mobile or wireless phones, because many people have cancelled land lines due to their high costs and the convenience of cell phones. The service is available through Verizon Wireless, Sprint/Nextel, and AT&T. Once the carrier is notified, an individual or family member can go to www.pillphone.com to set up the reminder schedule. An automated call provides audible prompts and visual text information about the medication and dose. The system tracks and stores pill-taking records. The recipient has the option of indicating that the medication was taken or skipped, then can re-set the phone for the next reminder. As with the land line services, if the recipient does not respond the service will call an emergency contact. In addition, this service provides information on over 1,800 prescription and over-the-counter drugs, dosages and side effects, by offering online information found in “The Pill Book.” This service costs $3.99 per month. A video demonstration is available at https://www.pillphone.com/demos/pillphonedemo.html

Medication Management Integrated With Personal Emergency Response Systems

Many people are familiar with the “Help, I’ve fallen and I can’t get up!” commercial. There are many personal emergency response systems, usually offered with wearable pendants or watches and requiring a special land line speaker phone. Some of these companies now offer medication reminders; ResponseLink and Phillips LifeLine Systems are two. Response Link (left) can be set up by going to www.ResponseLink.com and navigating to the Safety Link Plus Service. This service offers up to six reminders per day for $49.95 per month.

At www.LifeLineSys.com a caregiver or family member can record up to six reminders per day (so the recipient hears a familiar voice). With the LifeLine Care Partner telephone, (right) the recipient uses the speakerphone to answer incoming calls by pressing the personal help button, typically worn around the neck as a pendant or on the wrist as a bracelet. There is a hearing aid-compatible handset option for the hearing impaired. The cost of this service is $29.99 per month.

Automatic Pill Dispensers

These systems work are best used in private homes or in assisted living residences for people who have a family member, attendant or caregiver who can load their pills into the system. InforMedix makes the Med-eMonitor, a programmable system that combines a pill box and docking station with a web-based connection to a drug database. It can be pro-
grammed via the internet by the attendant, family member or caregiver and costs $60 per month plus a $40 one-time set-up fee. When it dispenses the medication it gives an audible signal and dose and drug information on a screen. The system can dispense up to twenty-five medications per person. The system can specifically track up to five most important medications, then time- and date-stamp when they are accessed.

This system also allows data input, e.g., glucose levels, blood pressure, or pain levels. Family members or caregivers have online access to these patient adherence, medication compliance, and health status data, sent automatically over a phone line to a secure, customer-specific site.

Another system is the E-pill MedSmart Plus System, a lockable, monitored electronic dispenser system that costs $789.95. A variety of dispensers are available at www.E-Pill.com, including the E-pill MedSmart for $489.95, a stand-alone, unmonitored, locked personal automatic pill dispenser (left).

The MedTime XL ($289.95) is an automatic pill dispenser that can dispense up to 28 times per day (top, next column) A round, carousel shaped dispenser rotates to bring the dose into position, and sounds an alarm when medication is due. The user turns the dispenser upside down with one hand, which allows the medication to fall into the other hand and turns off the alarm. The alarm is loud and accompanied by a blinking red light, helpful for the hearing-impaired; these alerts are active for up to 60 minutes. All other medications in the system are not accessible. The dispenser has 28 compartments that hold up to 15 pills each. The system works with 4 AA batteries. There are no monthly fees for this dispenser.

As previously mentioned, automatic dispenser systems may be too complex to set up by individuals who require medication reminders and are most appropriate where family members or caregivers are available to load, monitor, program and lock, them.

E-pill also offers the CompuMed for $844.95, a locked, tamper proof system. When selecting a medication reminder tool, equipment, or service, consider the individual’s ability to understand and properly use the equipment, willingness to co-operate, and availability of family members or caregivers, if indicated. These devices and services can be very helpful for individuals who are able to live independently or semi-independently, but require daily medication reminders. This technology allows many individuals to continue living full and
satisfying lives, without feeling dependent on their families, friends, neighbors or outside caregivers. The use of this technology can often ease the worry of individuals and their family members while preventing medication errors such as overdose or missed doses.

More links:
- www.Epill.com
- www.CallingCare.com
- www.Medication-Reminders.com
- www.Pillphone.com
- www.ResponseLink.com
- www.LifeLineSys.com
- www.InforMedix.com
- www.CompuMed.com
- www.AutoPills.com

Nursing Diagnoses to Consider

- **Ineffective Health Maintenance** Inability to identify, manage, and/or seek out help to maintain health (Domain 1, Health Promotion; Class 2, Health Management)

- **Readiness for Enhanced Self-Health Management** A pattern of regulating and integrating into daily living a therapeutic regimen for treatment of illness and its sequelae that is sufficient for meeting specific health-related goals and can be strengthened (Domain 1, Health Promotion; Class 2, Health Management)

- **Ineffective Family Therapeutic Regimen Management** Pattern of regulating and integrating into family living a program for treatment of illness and its sequelae that is unsatisfactory for meeting specific health goals (Domain 1, Health Promotion; Class 2, Health Management)

- **Ineffective Self-Health Management** Pattern of regulating and integrating into daily living a therapeutic regimen for treatment of illness and its sequelae that is unsatisfactory for meeting specific health goals (Domain 1, Health Promotion; Class 2, Health Management)
Talking To Yourself: Using Voice Recognition Software

Peggy Dellea, MS, OT/L

When I first began working in the field of assistive technology 15 years ago, voice recognition software was the “latest thing.” It promised ease of computer use for people who found it difficult to use a keyboard and mouse. Early versions involved training individual words, had a limited vocabulary and were very costly. They required the user to dictate in discrete speech, speaking one word at a time, with a noticeable pause between each word. A skilled user of this type of software could “type” at a rate of about 25 to 30 words per minute. For obvious reasons, users were primarily people with difficulty using a keyboard. Voice recognition software was in no position to change the way a good typist used computers.

In 1997 continuous speech dictation became available, allowing natural, faster speech, and at lower price. The marketing campaign was aimed at the general public: “You talk – it types.” Although it was faster, there were still serious limitations in word recognition and program interfaces. Each new version has offered improvements in recognition accuracy and ease of use. Today, voice recognition is used not only by people who have difficulty using a keyboard, but also by people who are slow typists, have a large amount of typing to complete, or just think it sounds like fun. (Fig. 1)

Despite the hype, speech recognition software is not a magic wand and does require effort to learn to use well. For the right person, though, this software can be a powerful tool for efficient and effective use of the computer. In her submission to National Public Radio’s “This I Believe,” Catherine Royce (2008) wrote the following:

*I believe that I always have a choice. No matter what I’m doing. No matter where I am. No matter what is happening to me. I always have a choice. Today I am sitting at my computer, speaking these words through a microphone. Although I have spent my life typing on a keyboard, I can no longer use my hands. Every day I sit at my computer speaking words instead of typing. In 2003, I was diagnosed with ALS, Lou Gehrig’s disease... When I could no longer type with my hands, I knew I could give up writing entirely or go through the ar-*

Peggy Dellea has worked at the Assistive Technology Center at Spaulding Rehabilitation Hospital in Boston MA for 15 years, focusing on adaptive computer use, electronic aids to daily living, and adaptive activities of daily living. Past experience includes work with long-term rehabilitation of people with traumatic brain injury and severe neurological deficits. She may be reached at the Assistive Technology Center, Spaulding Rehabilitation Hospital, Boston MA 02114, 617-573-2927, MDellea@partners.org
duous process of learning how to use voice recognition software. I’m not a young woman. This took real work. Interestingly, I write more now than ever before. (Royce 2008)

The assistive technology clinic at Spaulding Rehabilitation Hospital assesses people for voice-recognition software who have difficulty using the keyboard for a variety of reasons: paralysis, weakness, ataxia, problems with sensation, coordination problems, repetitive strain injury, and even learning disabilities like dyslexia. It is important that the user have a good foundation of computer experience before attempting to change computer use so drastically. Voice recognition commands and functions are based on common computer executions, so they are more easily executed if one is first familiar with computer tasks. For someone with no computer experience, it is difficult enough to learn a computer’s features and programs without adding the extra task of learning to use a computer in an adaptive manner.

How It Works
It is important to understand how voice recognition programs work. The user pushes air out of his lungs, through his vocal cords, and out come sound waves. The microphone converts them into an electrical signal that travels to the computer. Voice recognition software “sees” this signal and compares it to signals from vocabulary that computer programmers entered, looking for a match. The software then puts the best match onto the computer screen.

With this in mind, it is obvious that if you dictate a word that is not in the pre-stored vocabulary, the software will not type it. Additionally, if you pronounce a word in a manner not anticipated by the programmers, such as using an alternate or nonstandard pronunciation, strong accent, or mumbling or slurred speech, the software will not be able to make an accurate match and will type an incorrect word.

(continued next page)
How to Use It  When using voice recognition software, the user must learn to *dictate*. One is not “talking to the computer,” but rather dictating in clear, crisp, relaxed voice. It is common for a user to repeat a misrecognized word by over-enunciating in an attempt to get the computer to understand correctly. This is beneficial for a human listener, but the computer cannot think about the input. The electrical signal of the over-enunciation is different from the signal programmers anticipated. Thus, this attempt to make the software understand backfires and reduces accuracy.

Additionally, the software will process any and all input it receives. The program cannot distinguish between the user talking to the computer and the user talking to someone else or the user thinking out loud. If it hears, “Members present at the meeting include, um… let me think… Sarah Jones, Steve Smith, and oh I am trying to remember… oh yeah Charlie Robinson,” that is what will be typed. The input “oh yeah Charlie Robinson” and “Charlie Robinson” are different input and will produce different output. When dictating, it is wise to remember GIGO: Garbage In, Garbage Out.

The computer has no information about the meaning of the words on its list. *Homophones* (words that sound alike but are spelled differently, e.g., pear, pair, and pare) pose a problem as their electrical signals are identical. Rather than pick between choices at random, the software uses statistical information about which words occur together to determine the most likely requested word. Consequently, the software is likely to type, “Sam wore a pair of socks” correctly, but may falter on, “Paul wants to pare the pear.” Therefore, if dictation includes longer speech with full phrases and sentences, the software has more information to work with, which maximizes accuracy.

This can take some practice because many new users stumble with dictation, thinking as they talk. With time, users can generally learn to speak more smoothly, thinking of what they wish to type before actually speaking.

**Breath Support**  The exception to this rule is users who have poor breath support, such as people using respirators or with respiratory or neurological illness. When dictating beyond one’s breath support, the words...
at the end of the sentence are soft and barely audible, generating an electrical signal that does not match a well-spoken word. This type of user should dictate in short utterances, a length that allows the user to clearly speak each word, but at a length that provides as many words as possible for the computer to analyze. For example: “Yesterday (pause) I went to (pause) the movies period (pause).” The trade-off of fewer words for more consistent pronunciation will maximize the software’s ability to accurately transcribe dictation. Users with poor breath support may find that the software does not achieve the high rates of accuracy enjoyed by people with good breath support.

Dysarthria  People with dysarthria (weakness of the muscles that produce speech, resulting in slurred speech that is difficult to understand) will have difficulty using speech recognition software. Dysarthria is often seen with cerebral palsy, brain injury, MS, and other neurological disorders. Dysarthric speech does not match the clear speech expected by the software. People with severe dysarthria may find it impossible to use this software functionally, but there are some strategies that help to improve software recognition. Again, using shorter utterances can boost performance by improving the consistency of pronunciation. Consciously relaxing and monitoring the volume of speech also helps to improve the quality of input. People with dysarthric speech need to be vigilant about not over enunciating as this typical strategy to improve intelligibility with human listeners will backfire when used with the computer.

**Optimizing for Imperfect Speech**  There are several software features that improve word recognition that may be useful for non-perfect speakers; however, implementing them can be labor-intensive, especially if using the computer hands-free. The process of teaching software how an individual speaks should be completed with the assistance of someone who knows the software well and can assist in implementing its recognition-enhancing features. Depending on the level of intelligibility of speech, this process can take many hours to achieve a comfortable level of software recognition. For example, most programs have a “training mode,” in which the word is typed into a window and then the user speaks it three times. The software then learns how this user says this word and recognizes it in the future. The
assistance of an able-bodied typist will speed up this process.

**How Fast Will It Work?** New users will often find that dictating documents takes longer than expected. With software capable of transcribing speech at well over 100 words per minute, expectations are high. But the software can transcribe only what it receives for input. Conversational speech generally falls into the over 100-words-per-minute speed, but when dictating documents there is a significant time delay while thinking about what words to use. People who have been typing for a long time are accustomed to “thinking through your fingers.” The transition to “thinking through your mouth” can be unexpectedly difficult. It is a good idea to practice by creating documents of no significance, where choice of words or accuracy of statements is not important. A short document about the weather or the latest sports events, for example, will provide an opportunity to get used to dictation techniques and to the program-specific commands. Email and short notes offer a good transition to more thought-intensive documents.

**Internet and Computer Navigation** In addition to typing dictation, speech recognition software offers built-in commands for editing text and navigating the computer and Internet. Many of these commands are based on often-used computer functions, such as the command “copy that” to copy selected text or “paste that” to place the text someplace else. On the desktop, the command, “Open [program]” will click on an icon and open the program. Although typical users will use only a fraction of them, the program offers literally hundreds of such commands. It is beneficial to start with a professional who can review the specific commands and train each user in the commands the user finds most useful. “Cheat sheets” of common commands should be customized for each person; a general list of available commands is too long to be of any use.

**Advanced Commands and Macros** The premium and professional versions of Dragon NaturallySpeaking can create custom text, graphic, or advanced commands. This allows the user to speak a phrase and have the software input different text, e.g., the words “my email” to type “JohnSmyth@email.com.” This comes in handy for typing strings of text that are not necessarily words, such as email addresses, website addresses, and passwords. It is also useful for typing frequently-used words. (continued next page)
phrases and paragraphs, such as headings, signatures, addresses, or even closing paragraphs.

Text and graphic commands, as the name suggests, insert text and graphics. They do not send keystrokes. Therefore, they are not able to use ctrl or alt keys to execute actions such as ctrl+p to bring up the print menu, or tab to move between text boxes.

Professional versions offer advanced custom macros with this capability. They not only input text and graphics, but can add commands to move around programs and choose options from drop-down menus. For example, speaking “Check my emails” will result in the computer opening Internet Explorer, clicking in the address bar, typing “www.yahoo.com,” typing a username into the username box, moving the cursor to the password box, typing the password, and then clicking the sign-in button. This ability to execute keyboard shortcuts and to string together steps as well as typing text can greatly improve the productivity of computer use. This is especially important for users with minimal or no control of the keyboard and mouse.

(continued next page)
and voice as their primary means of computer control. Again, a professional’s services will be helpful to identify and program possible custom commands.

**A Tool for Every Job?** Voice recognition software should be viewed as a tool for computer use. Like all tools, it is well designed for certain tasks, in this case, typing. It should be noted that while the software is designed for typing text documents, it is ill-suited for typing programming code in which actual words are not used and in which all keystrokes have meaning. It is also not well designed for mouse control.

The software contains features for mouse control such as voice commands for mouse movement and mouse grid. However, users should explore other, more efficient cursor control devices to determine their best option. Many people find a good alternative mouse device to be faster than the built-in voice mouse controls. Thus combining a device for cursor control with voice recognition software for typing yields an efficient and effective method of doing most computer tasks.

There are many other software features beyond the scope of this article. Individual users with disabilities should consult a knowledgeable professional to best customize the program. Ideally, initial training should be intensive (two to three times per week), then spread out as the user becomes more independent. Follow-up sessions every few months are beneficial to fine-tune and update customization. The amount of training required will vary, but 10 hours is a good starting point, with follow-up as needed.

Life care planners should know that this complex software requires a complex computer to run it. A request for a new computer to replace a 3-year-old computer in order to run the software is not unreasonable. Attempting to run the software on a computer that is not equipped for the task will result in both poor recognition and delay between dictation and text appearance. These will make the program difficult and frustrating to use. Popular voice recognition software available today runs well on a Windows operating system (XP, Vista, or Windows7), at least 2.6 GHz processing speed and 4 GB RAM. The current Mac version of the software requires Mac OS X 10.6, Snow Leopard.

---

**Nursing Diagnoses to Consider**

<table>
<thead>
<tr>
<th>NANDA International Nursing Diagnosis,</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Readiness for Enhanced Communication</strong> (Domain 5, Perception/ Cognition; Class 5, Communication)</td>
</tr>
<tr>
<td><strong>Ineffective Role Performance</strong> (Domain 7, Role Relationships; Class 3, Role Performance)</td>
</tr>
<tr>
<td><strong>Impaired Social Interaction</strong> (Domain 7, Role Relationships; Class 3, Role Performance)</td>
</tr>
<tr>
<td><strong>Readiness for Enhanced Coping</strong> (Domain 9, Coping and Stress Tolerance; Class 2, Coping Responses)</td>
</tr>
</tbody>
</table>

(continued next page)
Many people upgrade their voice recognition software with each new version that is released; others stick to the old adage, “If it ain’t broke, don’t fix it,” and use the same software until the computer dies. Bear in mind that any software upgrade will need more computer power than its predecessor. It is not unusual to upgrade voice recognition software only to find that it becomes sluggish on an old computer. The decision to upgrade must be based on the individual’s abilities, software use, and needs. For users with cognitive disabilities, buying the latest version may mean a new set of difficult training sessions to adjust to new features and looks. Power users will likely make the transition smoothly and benefit from improved recognition and features offered with new versions.

**Summary**

Voice recognition software is a strong tool allowing efficient computer use for people who have difficulty using the keyboard and mouse. It is not, however, without its challenges. Learning to dictate to maximize recognition and navigating the many functions and features can be difficult. Training and customization will make the difference between frustration and function and can be the key to productive computer use for leisure, home, and work tasks.

**References**


*Cape Cod Canal at sunset, Massachusetts Maritime Academy*
The terms adaptive technology or assistive technology refer to any product, device, or equipment used to maintain, increase or improve functional capabilities of individuals with disabilities: any type of technology that helps one work around limitations. This article provides a reference for nurse life care planners as they determine the best use of available smartphone technology for the sensory- or cognitively-impaired.

Nearly one in ten cellphone users own smartphones (Droid X Adds to the Challenge, n.d.) and as prices fall and function increases, the numbers continue to rise. A smartphone offers advanced capabilities with PC-like functionality such as email and internet browser capabilities and most have a built in keyboard. What makes the phone “smart” is its ability to handle data in addition to voice calls. Many smartphones integrate the use of a personal digital assistant (PDA) with calendars, tasks lists, reminders, and the like.

Smartphone are phones, of course. To make it “smart,” a phone requires a data plan, from $15-70 per month. Additional costs can add extra storage space and Wi-Fi (wireless) hotspot access. Replacement insurance is recommended for smartphones against risk of loss or damage. All can be purchased through the cellphone wireless carrier. These costs are important considerations when developing a life care plan.

As smartphone technology evolved this opened the door for developers working in adaptive technologies for the blind, deaf, and brain injured in particular. Some platforms such as Android are open source, meaning that anyone can develop an application using that platform. While this means more applications, the reliability, security, and support may not be there for some. Always read the reviews, positive and negative, and seek out what information is accessed on the phone before recommending applications in a life care plan.

This article will cover several disabilities with the applications that make the smartphone a piece of adaptive technology. Many applications that cell...
phone owners use every day can be useful for those with disabilities. Applications such as speech-to-text as well as text-to-speech are used by many for convenience, but they can be essential for the disabled. Pinch and push technology to enlarge images is entertaining to play with, but also enables the low-vision user to see details.

**Options for the Hearing-Impaired**

Ever thought about how a hearing-impaired individual might use a phone? Smartphone technology can be very useful for the Deaf and hard-of-hearing community. The iPhone has an enormous library of applications, and a number facilitate communication and make it possible to place and receive audio and/or video calls, among other things.

The hearing-impaired often use closed-captioning when watching television or movies. The iPhone supports open- and closed-captioning and subtitling. Captions appear on the cellphone just as they would on television. One can rent or purchase captioned movies to play on the iPhone while on the go.

There is often no distinction made between subtitles and captioning, but they do have different meanings. A subtitle assumes a viewer can hear, but perhaps does not understand the language, accent, or the speech is not clear. The subtitle is a transcription of the dialogue. Many individuals with English as a second-language use subtitling decoders heavily. Captioning, on the other hand, assumes the viewer cannot hear. All audible content is transcribed, including speech and non-speech information. For example, the speaker is identified, and sometimes their manner of speaking such as loud, boisterous, or whispering. Some music or sound effects might be given for the viewer to better understand the scene.

An iPhone app, **Subtitles**, available at the iTunes App Store, hosts a library of subtitles in multiple

(continued next page)
languages to use when visiting the movie theater (Walker, 2010). The application's content is user-generated, however, so the quality of subtitles may vary. The subtitles will play like a video without pictures, a black screen and the subtitles on the screen in white text timed to the content. The user plays it along with the show or movie and reads the subtitles on the phone screen.


The hearing-impaired more frequently use instant-messaging (IM) options. Most smartphones have some form of IM capability. IM services are available through AIM, MobileMe, ICQ, Yahoo, Google Talk, MSN, and others. Other services such as Trillian, www.trillian.im, or Pidgin, www.pidgin.im, combine the user’s accounts on all of these services into one user interface.

A popular multi-functioning message application is fring, www.fring.com. fring makes it possible to make free voice and video calls, as well as live IM chats from an iPhone or iPod Touch over either WiFi or 3G connection. It interfaces with many services, e.g., MSN Messenger, Google Talk, Twitter, and AIM like Trillian or Pidgin. Consolidating all one’s messaging options into a single application can be quite useful (Hall, 2010).

Chat using the Multimedia Message Service (MMS) on the iPhone is called Messages. This MMS service allows the user to send text messages with attachments (photos, videos, and music) to one or more recipients simultaneously. A comfortable thumb-texting keyboard would be an important feature of the phone’s hardware for the hearing impaired.

If hearing loss is limited to only one ear, some smartphones, including the iPhone, will allow the option of changing the stereo output to mono. Stereo sound is typically sorted into a right and left channel. With this option the sound from the left and right channels are combined into one and pushed to both ear buds.

Also for the hard of hearing, an application called Tap Tap is designed to produce alerts so the user can respond to the audio environment around them (Vondracek, 2010). When loud noises occur around the phone, Tap Tap vibrates and flashes. This provides information such as someone is speaking, there is a knock at the door, a horn is honking, an intercom an-

(continued next page)
nouncement or alert system has gone off, and so on, that might otherwise go unnoticed.

Music Link offers those with a hearing loss an inductive ear loop that provides clear audio without feedback and distracting background noise (Hearing Assistance Technology Consultants, 2010). It works with any audio device with a standard 3.5-mm headphone socket. TecEar, found at http://www.tecear.com/Music_Link.htm, also has hearing aid compatible ear loops. Oticon, http://www.oticonusa.com/Oticon/Consumers/Products.html, offers multiple products for the hearing impaired including Streamer, a gateway between a Bluetooth-capable phone and hearing aid instruments.

Vibrating alarms are useful for the hearing impaired as well. This option is standard on most all phones.

Most smartphones allow for TTY (teletype) support. Most require an adapter, sold separately. For those with Apple products, support for TTY customers can be reached at 1-800-SOS-APPL (767-2775) via standard relay service. i711Wireless is Blackberry’s wireless internet-based communications service. A Communications Assistant relays the conversation between the deaf and hearing parties by converting text to voice. It is free for BlackBerry smartphones available for US users at http://appworld.blackberry.com/webstore/?lang=en.

Like TTY or TDD systems, the IP-Relay app, at http://itunes.apple.com/us/app/ip-relay/id351385414?mt=8, allows a user to make phone calls by connecting the caller to an operator who reads the message to the recipient and transcribes their messages back to the hearing-impaired user. It interfaces with the phone’s existing contacts, and restores the function of being able to make phone calls.

IWRelay VRS is a video relay application that, unlike others, allows users to make video relay service calls via FaceTime, iPhone 4's video conferencing feature. Other apps have promised this feature, but this first available app has been particularly valuable for early adopters to this technology. Found at http://itunes.apple.com/us/app/iwrelay-vrs/id381347695?mt=8

The Sorenson Video Center app allows users of their relay service to take videos from a videophone and view them on an iPhone or an iPod Touch. It connects to one's Sorenson account, which accesses videos, IP Relay services, and provide easy ways to respond to SignMail videos. It also interfaces with the iPhone's contacts system and many instant messaging services. Found at http://itunes.apple.com/us/app/sorenson-video-cente
r/id358815145?mt=8

(continued next page)
tional CapTel phone call, but any phone can be used, and rather than captions on the CapTel display, they appear on the browser window on an internet-connected computer. It is a free service available at (http://www.sprintrelay.com/sprint_webcaptel/index.php) and there is nothing to install.

With soundAMP R users can instantly improve hearing. This application for iPhone and iTouch uses the built-in microphone (or headset with mic) to amplify nearby sound. The user can adjust volume, tone, and background sound levels. This app also captures the last 30 seconds if the user needs to replay them, and allows for enhanced recordings of things like doctors' appointments and lectures. (http://itunes.apple.com/app/soundamp-r/id318126109?mt=8)

For those conversing with the hearing-impaired, there is an app for that, too. Who could forget the iPhone 4’s commercial featuring the phone’s two-way video chat, “FaceTime,” being used for ASL communication. Android Market as well as the iTunes store hosts applications for ASL translation.

There are multiple “basic” American Sign Language (ASL) apps such as HandSpeak by Imagine Software, (http://appsto.com/handspeak). For the more advanced user, SignSmith ASL by Vcom3D (http://www.vcom3d.com/signsmith.php) has three different versions: Lite has only 20 signs, but could be a start for those just learning ASL. Essential increases this to 100 signs while Ultimate contains 1,200 signs. The 3D application provides easy-to-follow instruction, allowing you to learn basic words and greetings and continuing to full conversations. They also offer signing avatars (graphical images that represent persons), which would be useful for social media.

Zoosware’s ASL, an iPhone app (http://itunes.apple.com/app/asl-pro/id286261176?mt=8) (screen shot, below) also offers three levels. Lite contains 50 words, Pro has 700, and Ultimate contains 1,400 signs. This ASL app is easy to use, lets you learn at your own pace, and tracks your progress. Version 2.0 includes quizzes and words are listed in categories for quick reference.

A great companion for a large screen like the iPad is iASL (screen shot below), available at (http://itunes.apple.com/us/app/iasl-translate-english-to/id364176106?mt=8) This app is a comprehensive (continued next page)
American Sign Language application including a video dictionary, translators, automatic spelling correction, and a number of resources for study. It is a large application (large quantity of video content), but as an ASL teaching resource, it is considered to be highly valuable. It is also available on the iPhone and iTouch.

The iTunes Store includes **Sign 4 Me** (right), an app in which you control an animated 3D character who demonstrates ASL. This app includes 11,500 words. You can type a sentence, word or phrase and see the character sign it.


Because hearing-impaired users heavily rely on texting rather than voice, the life care planner should consider how to choose the phone’s wireless service. **AT&T** and other providers often have special reduced-price text-accessibility plans. These plans allow unlimited texting, increased web access, and visual voicemail (AT&T).

Another consideration for this text-heavy group is the use of **Swype** [http://swypeinc.com/](http://swypeinc.com/) or **SlideIT** [http://www.mobiletextinput.com/index.php](http://www.mobiletextinput.com/index.php) These apps allow for a faster input for text on a phone’s touchscreen keyboard. With one continuous finger motion, the technology allows the user to input words faster than other input methods. The Swype screenshot above spells, “quick.” Swype boasts input up to 40 words per minute. It works for phones, but also on tablets, game consoles, televisions, virtual screens, and more.

**Options for the Visually-Impaired**

There are more than 25 million blind/visually impaired individuals in America, and as with most areas of health related conditions, the population of those with serious vision impairment is predicted to grow exponentially in the coming years due to the aging of the population (American Federation for the Blind, n.d.)

In fact, for those with low vision due to conditions such as glaucoma, macular degeneration, etc. the **BioOptic Telescope** allows many patients to drive again. At this time, 39 states allow the use of these devices, which require collaboration between patient, physician specializing in low vision, and the particular state Department of Motor Vehicles.

[http://www.viewfinderlowvision.com/driving.html](http://www.viewfinderlowvision.com/driving.html)

(continued next page)
Like their sighted counterparts, the blind and visually-impaired are able to use their phones to make life easier and communicate with others. By using a few simple touches of a button they are able to use their phones for other functions, such as entertainment and obtaining useful information.

Most smartphones have some built-in features which allow for increased use for the low-vision user. These individuals might start by using the options to increase the default font size to large, extra-large, or giant to improve email readability.

Smartphones, such as the iPhone and Motorola Droid series, include visual scalability or the ability to zoom in and out, helpful for those with low vision. Most smartphones include decent text-to-speech capability.

For those who need or prefer higher contrast, iPhone 4 and iPhone 3GS provide an option to change the display to White On Black (example, above right). This reverse video effect also works in all applications.

If the user still can’t see email, K-9 Mail by K-9 Dog Walkers is an Android-based e-mail program. It is a complete and full-featured email program which allows the blind to obtain their mail.

Digit-Eyes, found in the iTunes store (http://itunes.apple.com/us/app/digit-eyes-audio-scanner-labeler/id376424490?mt=8), enables the visually impaired to read barcode labels (below). Using the phone, a quick scan of the UPC code allows the user to hear the name. The blind shopper can now pick out yarn or locate the ingredients to make their favorite dish. Digit-Eyes also allows the user to make specially coded quick-response (QR) barcode labels. Affix these labels to file folders or CDs, and the user can locate important files, or flip through and locate the appropriate music for the day. Affix them to a box of leftovers and the user can keep the refrigerator clean. Pre-printed washable labels sewn them into clothing can assist the user in matching outfits or sorting the laundry.

The Eyeglasses app for iPhone, found at

(continued next page)
While many of these apps are iPhone- or iOS-specific, other platform users are not left out. Two engineers with Google, Charles Chen and TV Raman, have developed software that makes Android touchscreen phones more accessible to blind and low vision users. (Helft, 2009). Raman, blind since the age of 14 from glaucoma, understands the struggles.

The two created a “shell” application for Android which they title **Eyes-Free Shell**. This is a touch home screen replacement. It launched in April 2009 and originally targeted those with busy eyes like those driving or unwilling or unable to look at the visual display. There are five videos on YouTube ([http://www.youtube.com/user/EyesFreeAndroid](http://www.youtube.com/user/EyesFreeAndroid)) to demonstrate the applications that work in this shell. The Eyes-Free Shell application has an interesting location function that combines GPS or cell tower location data with Google Maps and the HTC G1 phone’s compass. “You just touch it, and it tells you which direction you are heading in, the location you are close to, and the cross streets,” Raman says. (Helft 2009)

Mr. Raman created a telephone dialer that works links you to a live assistant who can verbally describe exactly what’s in front of you. (Looktel, 2010)

(continued next page)
based on relative positions. It interprets any place where he first touches the screen as a 5; the center of a regular telephone dial pad. To dial any other number, he simply slides his finger in its direction — up and to the left for 1, down and to the right for 9, and so on. If he makes a mistake, he can erase a digit simply by shaking the phone, which detects motion (Helft 2009).

The applications themselves are available in the Android Marketplace. Surprisingly, based on comments, there are more sighted people than blind using the applications. This further validates Mr. Raman’s approach in developing technologies not just for the blind, but for anyone who cannot look at the screen, like those who are driving. (Helft 2009)

The Computer Science & Engineering department of the University of Washington is building a “bridge to the world for blind, low-vision, and deaf-blind people.” (University of Washington, 2011) They are currently working on a variety of projects on the Android platform to make smartphone technology more accessible for the disabled as well as creating all kinds of new uses for the phone. A list of their current projects is provided here:

- **Talking Barcode Reader:** uses the camera to "scan" barcodes and provide product information
- **Color Namer:** determines the color of an object, by pointing the phone's camera at it and tapping the screen
- **Location Orienter:** uses text-to-speech software and location services to determine the user’s current location and approximate address
- **LocalEyes:** allows a blind user to navigate to a specific address by telling the user what businesses are ahead of and behind them
- **ezTasker:** assists people with cognitive disabilities through daily activities with visual and audio cues
- **MobileOCR:** optical character recognition (OCR) engine to provide low vision and blind individuals with a way to read printed text on the go
- **Braille Buddies:** a fun and educational game used to teach Braille to blind and low vision children at a young age in order to increase their chances of obtaining education and employment in the future
- **LinkUp!:** allows blind and low-vision users to know where they are, as well as query the locations of friends in the area and store favorite places

(continued next page)
• **Appliance Reader**: takes a picture of the digital display on a household appliance (e.g., an oven) and receive the information in speech or Braille vibration.

The **Intersection Explorer** Android app allows one to explore a neighborhood on the phone before going outside. Use touch to move around a virtual map listening to the names of the streets and intersections. It provides a compass direction, too, so as the user explores and builds a mental map of the neighborhood.

**Walkie Talkie** is another voice-activated navigational app that announces a location as the visually impaired person walks by it. It allows users to specify a location or pick from a favorite destination and then it announces turn-by-turn walking directions, announcing street names and other landmarks along the way. (Torpey, 2010) Both apps are interchangeable with the spoken direction of Google Maps, making the blind world easier to travel.

Who would have thought a smartphone would include Braille? A new form of Braille called **V-Braille** has been developed. V-Braille, also known as Haptic Braille Perception, is a way to present Braille characters on a smartphone touch screen using the phone’s built in vibration alert. (University of Washington 2011) It might be possible for deaf-blind users to rely solely on tactile perception on a standard smartphone to receive information. According to the University of Washington, with minimal training, people can use V-Braille to read individual characters and sentences. They are currently testing this with Braille games with blind and low-vision children in elementary and middle school. (Perez, 2010)

The iPhone offers a similar reader as the Google Eyes-Free Project in **VoiceOver** (screen shots below). This is a gesture-based screen reader. Instead of memorizing keyboard commands, or repeatedly pressing the tiny arrow keys to find what you need, VoiceOver allows the user to simply touch the screen and hear an audible description of the item under the touch. The user can then gesture with a double-tap, drag, or flick. With VoiceOver, when a user touches the upper-left corner of the screen, they hear what is in the upper left corner of a web page, and as they drag their finger, they hear what is nearby. It includes descriptions of every item on the screen, such as battery level, Wi-Fi and cellular network signal levels, cellular network provider, and time of day. It even announces display

(continued next page)
changes (landscape or portrait orientation), and when the screen is locked or unlocked. VoiceOver works with many different languages. (Apple, 2011)

Voice commands are also available on many smartphones. Just by saying the correct command, a user can play music or make a phone call. Just press and hold the appropriate voice button, listen for the audio prompt, then speak the name of the artist, album, or playlist you want to hear or the name of the contact you wish to call. This feature is helpful for many people, but the visually-impaired or persons with cognitive or motor deficits find it especially useful.

**Options for People with Motor Deficits**

Most smartphones include several physical buttons and a touchscreen. Many cellphones provide some form of tactile identification with these standard buttons such as size, shape or on occasion, a small raised nub. Many smartphones including the iPhone have QWERTY (standard typewriter layout) keyboards which magically appear only when needed for the task at hand and can also display the keyboard appropriate to the task such as typing words or dialing the phone. These smartphones also help those with motor deficits by using advanced technologies to correct and prevent misspelled words. Most smartphone spell check programs also learn as you type, so speed increases almost immediately. Keying options like Swype also allow those with less fine motor control to input text.

Those with motor deficits can also enjoy the option for voice dialing. Just speak the name or telephone number of the person you wish to call and the phone starts dialing. If there is also a speech difficulty, most smartphones may also be dialed by either tapping a contact’s name (which can be displayed in a large font) or photo (if loaded onto the phone or connected to avatar images on social media sites) as well as by physically entering the caller’s number on the full-screen keypad. Some phones can be programmed to automatically answer in a certain number of rings. Most phones enable users to press one key to redial a telephone number. Most phones also allow users to press one button to dial a telephone number from the pre-programmed phone book. All of these dialing options can be helpful for those with diminished fine motor skills.

**Options for the Cognitively-Impaired**

Phones that provide standardized icons on the display screen and keys to indicate functions is a place to start. Those with cognitive impairments should not switch phones from one brand to another without considering the effect this might have.

(continued next page)
Smartphones in this population should also include menu prompts or cues to assist with complicated menu procedures or options. Picture dialing should also be considered. Many camera phones allow the user to attach a photo to be displayed with the name and number programmed into caller ID. Some even link to social media sites that include a contact’s photo or avatar. In receiving calls, distinctive ringtones can be set to individuals in the contact list. This can make the ringtone act as an audible caller ID. A cognitively impaired person could be taught to only answer calls with a particular ring to prevent confusion with wrong numbers, sales persons, etc.

All phones now allow alarms and reminder alerts. These text or audible alerts could be programmed for medication reminders. **ezTasker**, from the University of Washington project, assists people with cognitive deficits to complete daily activities with visual and auditory cues.

Photo-based GPS is available for those who easily forget or cannot read a map. There are GPS locators built in the phone and with an app the phone can be made to speak the directions from the user’s current location.

Shopping apps, such as **Good Guide** and **ShopSavvy** include scores for health and social responsibility. While these will not prevent a purchase, they might assist the cognitively-impaired to make a better selection based on available choices. It will also provide the nearest retailers for a product and pricing data.

**An Option for those with Communication Difficulties**

**Proloquo2Go** ([www.proloquo2go.com](http://www.proloquo2go.com)) is an augmentative and alternative communication (AAC) application for persons with difficulty speaking who might not be able to afford more elaborate systems. This application includes a vocabulary of more than 7000 items in a mobile option and offers natural-sounding text-to-speech voices. (Apple, 2011) Proloquo2Go has some weaknesses in visual supports, difficulty with setup, and small size, which may make it less usable for AAC users with vision or motor impairments. (Sennott & Bowker, 2011) Currently the cost for the app is about $200. Even added to an iPhone or iPad service plan, this is thousands of dollars less than traditional AAC devices. Also note that the operating system does not allow adjustments to screen sensitivity, activation-on-release, averaged activation, or any other adjustments to touch input, all common features on other communication devices to adjust for tremors or to minimize accidental activations. (Sennott & Bowker, 2011)

Android offers a similar product in **iAugComm** by Ideal Group. It turns the Android-based phone into a

(continued next page)
low-cost AAC device. It is limited by the comparatively low number of symbols and words offered. It is only available in English and Spanish languages at this time. This app costs $4.99. (http://www.androidzoom.com/android_applications/communication/iaugcomm_tey.html).

The iTunes store also includes Assistive Chat, designed to be simple and efficient in allowing the user to communicate at the fastest rate possible (below). Traditional AAC devices require multiple key strokes to construct sentences and, therefore, significant time to carry out a conversation. Assistive Chat uses a small screen with word prediction. It also features a favorites list which saves the users commonly used sentences. A recent list provides quick access to previously spoken sentences. It comes with three naturally sounding voices to choose from. The app from the iTunes store costs $24.99. (http://itunes.apple.com/us/app/assistive-chat/id379891874?mt=8)

Other Helpful Aids
Using Smartphone Technology
This technology is rapidly changing. In order for a disabled user to know what is available for his or her particular need, there is Disabled World Updates app for the iPhone. Disabled World Updates (http://www.disabled-world.com/assistivedevices/iphone-apps.php) delivers the latest news on overcoming disabilities, new technologies, and applications for the disabled (Shaikh, 2010).

Tell My Geo (www.tellmygeo.com) is an application available on Android. It is a personal health record app that allows a medical provider or emergency responder to access the user’s medical history via their smartphone (Moore, 2010). Tell My Geo costs $9.95 per month. Notably, it includes a GPS locator that enables caregivers to track a lost loved one (the app must be installed on the caregiver’s phone). Initially the app was designed to help seniors with early signs of Alzheimer’s disease, but it was soon recognized as helpful for those with autism, mental illness or other ailments that can cause confusion.

ThinkContacts is a new mobile application being developed by Nokia which would allow a disabled person to select a contact from a list and place a phone call to that person using only their mind. The app, which is designed for Nokia’s N900 Maemo platform, works with an accompanying Bluetooth headset that reads the user's brainwaves to measure attention levels. If the attention level is higher than 70%, the (continued next page)
software scrolls to the next contact in the list. If the attention level is higher than 80%, the software makes a phone call to the selected contact (Perez, 2010). A video demo is available at http://tinyurl.com/66pf4qm

Summary
Smartphones have opened up new worlds to the disabled. Open source platforms, e.g. Android, make it possible for developers to write applications for specific user groups such as the visually- or hearing-impaired. Today’s smartphones are both adaptive and assistive and can be used to maintain, increase or improve the functional capabilities of individuals with disabilities. A blind or deaf individual should no longer be excluded from cellphone use. Nurse Life Care Planners have many considerations to make when using adaptive technologies in their plans and a smartphone provides many choices they might not have previously considered.

References


American Federation for the Blind
http://www.afb.org/section.asp?SectionID=40


(continued next page)


Spring tide, Atlantic beach
High-Frequency Chest Wall Oscillation in Life Care Planning

Cheryl Kaufman RN BScN CLCP CNLCP

What do neuromuscular and neuromotor disorders, obstructive pulmonary conditions, restrictive airway disorders, higher spinal cord injuries, functional airway deformity disorders, immunological impaired disorders, post organ transplant complications, and primary pulmonary infectious diseases all have in common?

Many of these diseases, including cystic fibrosis (CF), cerebral palsy (CP), traumatic brain injuries, spinal cord injuries, chronic obstructive pulmonary disease (COPD), scoliosis, kyphoscoliosis, tracheomalacia, lung cancer, sarcoidosis, hematologic malignant conditions, pneumonia, tuberculosis (TB), mycobacterium avium complex (MAC) are all examples of conditions with impaired airway clearance. In addition, retained mucus is a problem in intubated patients and those in whom lung mechanics are disrupted as a result of immobilization and surgery.

The Nurse Life Care Planner often makes proactive recommendations in the life care plan to minimize the occurrence frequency, severity, and duration of complications throughout life expectancy. While incorporating services in the Life Care Plan to prevent infectious respiratory diseases, atelectasis, and pneumonias is often done, inevitably many catastrophically-injured individuals fall victim to pulmonary diseases and recurrent bouts of pneumonia, often resulting in repeated hospitalizations. Impaired airway clearance has a profound impact on daily functioning and quality of life and often requires frequent daily respiratory therapy to prevent worsening pulmonary status. The commonality in the conditions noted above are retained secretions and a common pathway to progressive, irreversible lung disease, increased disability, and other sequelae.

Normal Airway Clearance

It is important to understand normal physiology of airway clearance to appreciate what happens when excessive mucus production or impaired airway clearance...
clearance results in airway disease. Normal airway clearance consists of two basic processes: the *mucociliary clearance system* and an effective cough.

Mucus-producing cells lining the respiratory system produce a mucus blanket, a protective barrier for the entire respiratory tract which traps impurities in inhaled air. The mucus blanket lies upon hair-like follicles called cilia that line the airways. The cilia beat in a unified direction to propel the mucus and embedded debris towards the larger airways. It is the interaction between normal mucus, cilia, and associated structures which make up the mucociliary clearance system. (Rubin, 2002; Fahey, 2010)

Bacteria, viruses or other irritants such as allergens prompt the normal inflammatory and immune system to stimulate increased mucus production. The loosened secretions can then be removed by effective coughing, or suctioning if necessary. However, decreased competence in one or more structural, sensory, or neuromuscular components of the clearance system may be lead to mucus retention and plugging, due to the combination of overproduction and decreased clearance. (Rubin, 2002; Fahey, 2010) Persistent accumulation can lead to a vicious cycle of infection and inflammation by providing an environment for microbial growth. (Cole, 1986) This often leads to airway obstruction, increased infection, inflammation and ventilation/perfusion complications.

**CPT and HFCWO**

The standard treatment for impaired airway clearance has been chest physiotherapy (CPT), postural drainage, manual percussion and vibration. CPT requires a caregiver to clap and vibrate the chest wall to loosen secretions with the patient in Trendelenburg (head-down) position so that secretions will drain from the airway by gravity. (AARC, 1991) It is often necessary to perform CPT multiple times during the day for the best possible outcomes. It is relatively easy for caregivers to deliver in acute care or at home, but it is rigorous, time-consuming, and often inconsistent between caregivers.

Unlike manual CPT, high frequency chest wall oscillation (HFCWO), also known as high frequency chest compressions, works by rapidly compressing and releasing the chest wall repeatedly, creating a gentle and very rapid squeeze-and-release action. This is accomplished with an inflatable vest or binder wrap attached to an air-pulse delivery system. (Figures 1, 1a)

(continued next page)
HFCWO is very different from CPT, positive expiratory pressure, or other airway clearance methods in that it does not involve striking the chest. HFCWO squeezes the thorax, inducing repetitive airflows throughout the lungs, acting much like mini-coughs, at five to twenty times per second. (Electromed, Inc.) These bursts of air shear pulmonary mucus from the airway walls, decrease their viscosity, and move them upward, where they can be cleared with suctioning or cough without burdensome repositioning. (Cheng, 1988; Giarraffa, 2005)

Study Results
HFCWO has been studied extensively since 1988 and has consistently been shown to be as a safe and effective alternative to manual percussion and postural drainage in the treatment of retained secretions. (Electromed, Inc., Hill-Rom Co. Inc., RespirTech)

In an earlier study of cystic fibrosis patients who were admitted to a hospital for acute exacerbation and received either CPT three times a day or HFCWO, significant improvement in clinical status and pulmonary function testing occurred in both groups after 7 and 14 days of treatment. Both methods were deemed safe and effective for airway clearance. (Arens, 1994) In a subsequent study Majaesic demonstrated a reduction in sputum viscosity with the use of high frequency chest compressions compared to conventional chest physiotherapy. (Majaesic et al., 1996)

Multiple subsequent studies comparing CPT to HFCWO have consistently demonstrated improvements seen in pulmonary function with HFCWO in both hospital and home. The consistency of HFCWO treatments eliminates inconsistencies in clapping or cupping by different caregivers. It does

(continued next page)
not require Trendelenburg positioning and is portable, making this method more convenient to patients.

**Cost Savings**
The life care planner can demonstrate clear long-term cost benefit of HFCWO with an overall decrease in healthcare costs for those individuals who have experienced the consequences of retained secretions. HFCWO has been shown to increase mucus mobilization, resulting in improved pulmonary function, decrease in infection frequency, decreased medication use, and decreased hospitalizations. (Ohnsorg, 1994, Piloplys, 2002) The patient can self-administer treatments, an attractive option to all age groups, especially the teenager and working individual, resulting in cost savings over attendant or therapist care. The units are portable so the patient can use HFCWO anytime, anywhere, consistently, effectively, and safely.

The first cost comparison study published by Blue Cross (Ohnsorg, 1994) demonstrated a 50% reduction in total health care costs with HFCWO. Pulmonary infections are especially common in children with cerebral palsy and tracheostomy. A 2002 study by Piloplys et al demonstrated effectiveness and cost benefit with HFCWO in a difficult-to-treat population, children ages 7-28 (median age 19 years) with quadriplegic cerebral palsy living in pediatric skilled nursing facilities and had a history of frequent pulmonary infections. The treatments resulted in more effective suctioning of pulmonary secretions, reduced incidence of pneumonia, reduction in secondary complications associated with impaired mucus transport, reduction in the use of expensive antibiotics and reduced number of hospitalizations for pneumonia, all of which translate to overall cost savings. This study also found that in patients with epilepsy, HFCWO resulted in reduced seizure frequency and was well tolerated without complications or side effects.

HFCWO is prescribed by a physician, usually a pulmonologist. Regimen protocols vary in frequency and duration.

**Patient Options**
Three manufacturers make HFCWO airway clearance systems: The SmartVest® Airway Clearance System, made by Electromed, Inc. (http://www.electromed.com); The Vest® Airway Clearance System, made by Hill-Rom Services, Inc. (http://www.hill-rom.com); and the inCourage™ System, made by RespirTech

(continued next page)
Each has essentially the same mechanism of action, similar components, and similar costs. The reader is encouraged to review each model for suitability for the individual Life Care Plan, as each offers a slightly different size air generator, control panels, and vest styles.

For example, all three companies offer a vest, but varying number of air flow hoses and either Velcro® or buckle fasteners. (Fig. 2, 2a) Another decision is between wrap or vest style, depending on the individual’s mobility, dexterity, and comfort. The wrap covers the patient’s back then wraps each side around the patient’s chest. If the adult fit is too snug, both models allow easy adjustment to increase the chest circumference by up to 14-inches by extending the length of the buckle fasteners or an extender with Velcro® patches. For patients who are wheelchair- or bed-bound or have difficulty getting their arms through an armhole, a wrap style may be a better option.

**Components** Each model includes a generator that creates air pulses transmitted to the chest via the
connecting hose(s) and the inflatable vest. Other components include air filters, fuses and a power cord, programming controls, cleaning instructions, and user’s manual. Simplicity of use varies by manufacturer but all are user-friendly and can be used in the home.

Programming The digital screen on the generator allows easy visibility and user-friendly programming. The prescribed treatment protocol(s) can be preset into the air pulse generator and saved. Multiple different protocols can be programmed in if necessary. This can help prevent young children from skipping their treatments; older users do not need to remember the prescribed protocol for each treatment. The programs are easily changed by the patient or caregiver as prescribed in a physician plan of care. Each manufacturer offers a slightly different control panel but all are easy to operate. (Figs. 3, 3a)

In general, most prescribed protocols use several different frequencies for approximately 10 minute periods, with a period of active huffing and coughing between periods of compression. Recall the goal of HFCWO: to shear pulmonary secretions from the airway walls, thin viscosity, and mobilize them upward, so the patient can expel the secretions or a caregiver can suction a non-participatory patient. The pulsation frequency and duration will vary depending on the condition of the patient and the degree of airway clearance needed.

Once the individual has adjusted to the feel of HFCWO, the pressure of the vest can be increased until voice sounds break up. Think about how the

(continued next page)
word “hum” sounds during CPT, like, “hh-hh-hu-uu-uu-mm-mm.” The same principle is used when adjusting HFCWO pressure. This quick test checks to see that it is creating the desired repetitive airflows in the airways. (Electromed, Inc. 2010) A fun video of a teen using her vest that illustrates this effect can be seen at:
http://tinyurl.com/4f578fz

Maintenance Manufacturers service these units at no additional charge to the user. The units come with an electrical power cord that can be removed for transportability. Filters are provided and require routine replacement, based on the total number of hours used or every 6 months, whichever comes first. Fuses are supplied by each of the manufacturers for replacement as needed.

Warranty Each manufacturer offers a lifetime warranty, shipping a replacement if notified of breakage or failure. The vests are replaced as needed at no additional cost. This is more common with the younger populations due to growth and changes in weight over the years, but applies to adults and seniors as well. All components (i.e., power cord, fuses, filters, air hoses) are replaced by each of the respective companies as needed at no additional charge to the owner.

Cost List price for airway clearance systems varies slightly between companies and ranges between $14,000 to $16,500. This is a one-time only charge. Each unit includes a wheeled carry case, in addition to the replacement of all components, lifetime warranty, and maintenance noted above. Deciding factors between models should therefore be ease and simplicity of programming and operation of the unit, vest style, and components, not necessarily the price, as a model that is not easy to use will not be used as prescribed.

Summary HFCWO is a therapeutic option as an airway clearance treatment for all age groups in individuals with disorders complicated by retained lung secretions. Its efficacy and safety has been demonstrated in evidence-based research in the peer-reviewed medical literature as an effective standard of care. Unlike CPT which cannot always be done due to caregiver availability and Trendelenburg positioning, HFCWO therapy can be administered in the upright or supine

(continued next page)
position; many individuals are able administer it independently. It offers a consistent easy and safe method of chest therapy in the presence of respiratory muscle weakness, weak cough, or compromised thoracic anatomy, e.g., scoliosis.

The nurse life care planner should consider including HFCWO in the Life Care Plan when collaborating with the treatment teams for clients who require improved mucus mobilization to improve pulmonary function. The benefits include ease of administration and consistency; reduced pulmonary infection frequency, medication use, hospitalizations and overall healthcare costs; and improved quality of life.

References
AARC Clinical Practice Guideline (1991): Postural Drainage Therapy Respiratory Care 36 (12) 1418-1426
Electromed, Inc. New Prague, MN (2011) makers of the SmartVest® Airway Clearance System http://www.electromed.com
Rubin, BK Physiology of Airway Mucus Clearance (2002 Jul); Respir Care 47(7): 761-8

Nursing Diagnoses to Consider

- **Ineffective Health Maintenance** (Domain 1, Health Promotion; Class 2, Health Management)
- **Ineffective Self-Health Management** (Domain 1, Health Promotion; Class 2, Health Management)
- **Ineffective Family Therapeutic Regimen Management** (Domain 1, Health Promotion; Class 2, Health Management)
- **Readiness for Enhanced Self-Health Management** (Domain 1, Health Promotion; Class 2, Health Management)
- **Impaired Gas Exchange** (Domain 3, Elimination and Exchange; Class 4, Respiratory Function)
- **Ineffective Breathing Pattern** (Domain 4, Activity/Rest; Class 4, Cardiovascular/Pulmonary Responses)
LCP Resources in Adaptive Technology

Compiled by Barbara Bate RN-BC CCM CNLCP LNCC MSCC
with submissions by Patricia Brock, Glenda Evans-Shaw, Sharon Fasnacht, Reg Gibbs, Rebecca Gordon, Shelly Kinney, Valerie Knafelc, Kelly Lance, Victoria Powell, Kathy Smith, and Lora White

Albert M. Cook and Jan Miller Polgar
Mosby Elsevier 2008

This is a textbook with a wealth of resources: discussions about specific assistive devices, professional practice issues, case studies, service delivery in assistive technologies, cognitive augmentation, communication systems, mobility technologies, transportation, environmental controls and the use of assistive technologies in classroom and work. There are test questions and references at the end of each chapter. A comprehensive glossary and resources are also provided.

The authors provide a working definition of assistive technologies, a historical perspective of devices and services, where the industry is today, and professional practice in Assistive Technology: Standards of Practice, the RESNA* Code of Ethics, Quality Assurance, and Overview and Outcomes of Assistive Technology delivery.

This book gives valuable information about specific technologies, sample questionnaires as to interview/assess clients, and strategies to help match the person with the appropriate device. The authors discuss psychosocial impact and quality of life issues for the disabled person. Understanding the language of assistive technologies, the physical and/or occupational therapists roles, the goals of the technology and the individual who will use the technology is essential for the nurse as we make recommendations for care and the purchase of an appropriate assistive device. I highly recommend this text.

…Glenda Evans-Shaw BSN RN-BC PHN CCM CNLCP

*RESNA: Rehabilitation Engineering and Assistive Technology Society of North America

(continued next page)
Imagine living without the use of one, both or even several limbs. Think about having low or no vision or hearing. How would one cope with having a spinal cord injury or a traumatic brain injury? The people living with Multiple Sclerosis, Lou Gehrig’s disease, failed back syndrome and other chronic physical and mental illnesses all need help finding available resources, medical care and services to enhance and improve their quality of life.

Service dogs can enhance accessibility and independence. These animals help disabled people obtain optimal level of functional independence in activities of daily living. They also provide a venue for participation in society. The dogs can pull wheelchairs, open doors, turn on light switches, fetch the telephone and pick up dropped objects. They can even be trained to find keys. Hearing assist dogs will alert their owner to sounds such as alarm clocks, doorbells, smoke, fire alarms and approaching vehicles (Rintala, Matamoros and Seitz, 2008). Seizure response dogs and psychiatric assist dogs learn a minimum of 90 commands.

The average waiting period to receive an assistance dog is five years. If a local trainer can be found, the waiting period can be 6 to 24 months depending on dog availability (American Dog Trainers Network, n.d.)

In addition to the dog’s main duties, it provides a social conduit for the owner. People tend to approach and accept disabled people with dogs more easily than those who are disabled and do not have a dog. Someone who is noticeably disabled is often avoided or ignored because able-bodied individuals feel uncomfortable and awkward around them. Assistance dogs increase social acknowledgement of the disabled, which helps to overcome some of the social rejection that is experienced. An assistance dog counteracts many of the negative social responses to a disability by creating a focus other than the disability itself. The dog also provides comfort, a sense of safety, recreation, companionship and is able to hug and kiss its human. Additionally, the dog is a source of choice and independence (Shaughnessy, 2008).

http://www.assistancedogsinternational.org/

Patriot PAWS Service Dogs
254 Ranch Trail
Rockwall, Texas 75032
Office: 972.772.3282
E-mail: PatriotPaws@aol.com

... Patricia Brock MSN RN CLCP LNCC

http://www.neads.org

(continued next page)
Say It With Your Eyes

The DynaVox EyeMax System is the newest, most advanced access method available to communicators who use the DynaVox Vmax. It is comprised of two parts: a DynaVox Vmax+/Vmax and a DynaVox EyeMax Accessory. The EyeMax System allows augmented communicators to access their Vmax+/Vmax with a simple blink, or by dwelling on a desired area of the screen.

I have had a run on kids (age 19-23) involved in MVA and sustaining C-3 injuries. I have been able to order this for 2 of my clients and it has changed their lives! The machine is an eye gaze system to control their environment and computer system by using their eyes when they do not have use of their hands/arms. It does require speech therapy to help coordinate all the functions that the person needs. I have a 19 year old that has been able to go to school using the machine. I have also used it on a patient with neurotoxicity that cannot speak and can only blink.

http://www.dynavoxtech.com/products/eyemax/

.... Kelly Lance

Over My Head by Claudia Osborn

and the “Yak Back”

My son has a TBI with memory problems, as many persons with TBI do. Some years ago I read a book, "Over my Head" by Claudia Osborn. The author is a physician who sustained a TBI in a bicycling accident. One of the strategies she recommended was a "Yak Back." (These small recording devices are known by many names now.)

I recorded one to three tasks that he needed to do, like, “Empty the garbage and come back to the house.” When my son would get outside to empty the garbage he would become distracted. Then he would listen to the recording and return to the house. It took some time to get him used to listening to the device, but it worked like a charm.

... Rebecca Gordon RN CLNC CLCP

(continued next page)
T.K. Martin Center at Mississippi State University- This center specializes in adaptive technology in many areas. The one I am most familiar with is visual impairments, but I know they also customize wheelchairs, vehicles, and many other things to help students and others throughout our state.

I have recently seen the Permobil C300 Corpus wheelchair and was very impressed.

Something I had not seen before was an 8 inch seat elevator which allows you to drive while the seat is elevated. Very cool for eye to eye contacting while "walking" with another person. It has many options including a neat light package option mounted to the wheel base.

Most of the products that you'll find on this web site are unique, hard to find, or individually handmade.

Unique daily living products that promote a convenient, comfortable and safe home environment for people of all ages. Great for seniors, busy parents and people with arthritis, low vision and other physical challenges.

EnableMart is the worldwide leader in assistive technology distribution. With customers in all 50 states and over 45 foreign countries, EnableMart provides over 3,000 assistive technology and assistive living devices from over 200 manufacturers.

Tobii Assistive Technology, Inc. (Tobii ATI) is a developer of innovative hardware and software solutions for people with disabilities. They provide augmentative and alternative communication (AAC) products and are located in Boston MA.

Provider of assistive devices including medical supplies.
This guide is published annually and is broken down into four separate geographic specific editions (Eastern, Southern, Midwestern, and Western). There is a section titled “Medical Equipment Providers & Product Distributions/Manufacturers”. Resources listed include, but are not limited to, aids for daily living, assistive communication & computer applications, assistive standing devices, bath fixtures, elevators, lifts, ramps, emergency alert systems, environmental controls and specialty beds. This resource guide is offered free to members of CMSA (specific to their region) or can be purchased directly through Dorland Health. [http://store.dorlandhealth.com/Case-Management-Resource-Guide/](http://store.dorlandhealth.com/Case-Management-Resource-Guide/)

http://www.saje-tech.com
SAJE Technology is a manufacturer of and resource for Home Automation Products designed to promote independence and accessibility for people who are facing aging or disability. SAJE products, commonly known as Environmental Control Units or Electronic Aids for Daily Living (EADL), operate hands free using voice control.

http://www.design.ncsu.edu/cud/
The Center for Universal Design (CUD) is a national information, technical assistance, and research center that evaluates, develops, and promotes accessible and universal design in housing, commercial and public facilities, outdoor environments, and products.

http://www.mouthstick.net
Extensions for Independence-The Mouthstick Connection! Designer and manufacturer of home and office related equipment for the disabled. Functional independence and life as seen by Arthur Heyer, who is a C-3,5 quadriplegic. Many other useful links at this site.

(continued next page)
AbleData

http://www.abledata.com
AbleData provides objective information on assistive technology and rehabilitation equipment available from domestic and international sources to consumers, organizations, professionals, and caregivers within the United States. We serve the nation's disability, rehabilitation, and senior communities.

Patterson Medical

http://www.pattersonmedical.com/
Provider of rehabilitation, assistive and splinting products

SpinLife.com

http://www.spinlife.com
Provider of assistive devices including wheelchairs, scooters, lifts.

The Alliance for Technology Access (ATA) is a growing national and international network of technology resource centers, community-based organizations, agencies, individuals, and companies.

The Assistive Technology Industry Association (ATIA) is a not-for-profit membership organization of manufacturers, sellers and providers of technology-based assistive devices and/or services. Able to search for providers by name, state, country and/or disability.
Demand for Nurse Life Care Planners is growing. Are you?

Majority of Life Care Planners are nurses in independent practice. Studies show several Nurse Life Care Planners will retire within the next 5-10 years, which leaves the field open for great opportunities. FIG offers current resources/references in course materials, professionalism in a relaxed learning environment, and hands-on teaching for retention.

As a professional who wants to expand your knowledge, marketability and income, shouldn’t you contact FIG?

Online Education for Nurse Life Care Planning and Medicare Set-Asides

NLCP course approved by North Carolina Nurses Association for 120 contact hours

To learn more visit FIGservices.com or call (828) 698.9486

The Knowledge of Human Healing

FIG
Nursing Education and Consultancy

FIG Services, Inc.
AANLCP Annual Conference

October 21-24, 2011
Kansas City, MO

Our exciting educational conference will be held October 21-24th in the “city of fountains” at the InterContinental of Kansas City At The Plaza. The Plaza is a 15 block district with more than 150 shops and dozens of fine restaurants. Kansas City is a great place for fabulous steaks and BBQ, jazz and blues music, and you will also find more than 200 fountains dating back to 1889. So get out your calendar and mark these dates now! You don’t want to miss out.

American Association of Nurse Life Care Planners
aannlp.org (800) 575-4047

AANLCP Journal of Nurse Life Care Planning
ISSN 1942-4469 361
Certified Medicare Secondary Payer Professional CMSP Program

The Certified Medicare Secondary Payer Professional (CMSP) credential is designed to identify those professionals who work within the workers’ compensation and liability insurance industry such as insurance claims adjusters, attorneys, personal injury and special needs attorneys, life care planners - nurse life care planners, disability and rehabilitation management specialists, structured settlement professionals, and case managers who have demonstrated extensive knowledge regarding the development and application of the Medicare Set-Aside Allocation (MSA) process.

The Certified Medicare Secondary Payer Professional Program is a three-part designation - workshop, exam and practicum. The program is offered in a three-day, 20-hour workshop taught by experts in the field of Medicare Set-Aside Allocation. The exam on materials taught in the workshop will be administrated on the third day. To earn the Certified Medicare Secondary Payer Professional designation, a passing exam score and a take-home case study will need to be successfully completed.

Visit www.cmspprogram.org for more details.

2011 Schedule

Friday, March 25 - Sunday, March 27, 2011
Marriott San Mateo
San Mateo, CA

Friday, August 5 - Sunday, August 7, 2011
Baltimore Airport Marriott International
Baltimore, MD

Wednesday, April 13 - Friday, April 15, 2011
Dallas/Addison Marriott Quorum by the Galleria
Dallas, TX

Monday, Sept. 26 - Wednesday, Sept 28, 2011
Loews New Orleans Hotel
New Orleans, LA

Wednesday, June 22 - Friday, June 24, 2011
St. Louis Station Marriott
St. Louis, MO

Louisiana Association of Self Insured Employers
P: (225) 338-0705 F: (225) 383-6414
251 Florida Street, Ste. 314 Baton Rouge, LA 70801
Website: www.cmspprogram.org
### Issue Index

#### 2008

<table>
<thead>
<tr>
<th>Issue</th>
<th>Page</th>
<th>Author</th>
<th>Title</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIII.2</td>
<td>3</td>
<td>Reid, Pauline</td>
<td>A Brief Description of Various Complementary Therapies / Modalities</td>
<td>complementary, alternative,</td>
</tr>
<tr>
<td>VIII.2</td>
<td>10</td>
<td>St. Martin, Rhonda</td>
<td>T’ai Chi Chih- Joy Through Movement</td>
<td>T’ai chi, movement, energy balance, gerontology</td>
</tr>
<tr>
<td>VIII.3</td>
<td>3</td>
<td>Ireland, Thomas R.</td>
<td>Questions for the Economists</td>
<td>forensic economist, costs, range</td>
</tr>
<tr>
<td>VIII.3</td>
<td>3</td>
<td>Rizziardi Pearson, Stephanie</td>
<td>Questions for the Economists</td>
<td>forensic economist, costs, range</td>
</tr>
<tr>
<td>VIII.3</td>
<td>6</td>
<td>Pouch, Kathy</td>
<td>Preparing for Deposition</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>VIII.3</td>
<td>10</td>
<td>Holakiewicz, Liz</td>
<td>Lessons from the Stand</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>VIII.3</td>
<td>17</td>
<td>Lefevre, Adrienne</td>
<td>Know Your Audience</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>VIII.3</td>
<td>9</td>
<td>Babitsky, Steven</td>
<td>Expert Witness Cross-examination Questions and Areas of Inquiry</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>VIII.3</td>
<td>9</td>
<td>Mangraviti, James J</td>
<td>Expert Witness Cross-examination Questions and Areas of Inquiry</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>VIII.4</td>
<td>4</td>
<td>Herbst, Eugenia</td>
<td>Equipment Needs for Home and Community: IADLs for the ABI patient</td>
<td>OT, DME, equipment, safety, wandering, falls, technology</td>
</tr>
<tr>
<td>VIII.4</td>
<td>7</td>
<td>Mayer, Danielle M</td>
<td>Pricing and the Life Care Plan: Physician Office Visits</td>
<td>costs, coding, CPT, charges, usual and customary, UCR, billing, RVU, payments, fees, office visits</td>
</tr>
<tr>
<td>VIII.4</td>
<td>9</td>
<td>Maniha, Ann</td>
<td>Research to Another Level: Medical Coding and the Life Care Planning Process, part 1</td>
<td>costs, coding, CPT, charges, usual and customary, UCR, billing, DRG, ICD-9, HCPS, MDC, ASC, APC</td>
</tr>
<tr>
<td>VIII.4</td>
<td>21</td>
<td>McDaniel, Helen Heather</td>
<td>The Nurse Life Care Planner as Testifying Expert</td>
<td>Testimony, legal, trial, deposition</td>
</tr>
<tr>
<td>VIII.4</td>
<td>28</td>
<td>Pettengill, April</td>
<td>CNLCP Examination Test Item-Writing Information and Guide</td>
<td>certification, CEUs, recertification, test,</td>
</tr>
</tbody>
</table>

#### 2009

<table>
<thead>
<tr>
<th>Issue</th>
<th>Page</th>
<th>Author</th>
<th>Title</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>IX.1</td>
<td>7</td>
<td>King, Barbara</td>
<td>Medicare Future Care Allocation: A Coder's Perspective</td>
<td>MSA, Medicare, CMS, coding, allocation</td>
</tr>
<tr>
<td>IX.1</td>
<td>12</td>
<td>Giles, Shelene</td>
<td>Costing and Submitting Medicare Set-Asides</td>
<td>MSA, Medicare, CMS, coding, allocation</td>
</tr>
<tr>
<td>IX.1</td>
<td>17</td>
<td>Hindert, Patrick J</td>
<td>Structured Settlement and Medicare Set-Aside Arrangements</td>
<td>MSA, Medicare, CMS, coding, allocation, structured settlement</td>
</tr>
<tr>
<td>IX.1</td>
<td>23</td>
<td>Gonzalez, Rafael</td>
<td>MSA Professional Administration: Introduction to the Role of the Custodian</td>
<td>MSA, Medicare, CMS, coding, allocation, administration, custodian</td>
</tr>
<tr>
<td>IX.2</td>
<td>39</td>
<td>Pateracki, Paul</td>
<td>Life Care Planning for the Spinal-Injured: A Personal Perspective</td>
<td>SCI, skin care, mobility, employment</td>
</tr>
<tr>
<td>IX.2</td>
<td>46</td>
<td>Villa, Judy</td>
<td>The Wright Mask: Nebulizing Made Easier</td>
<td>tracheostomy, humidification, nebulizer, technology, equipment</td>
</tr>
<tr>
<td>IX.2</td>
<td>51</td>
<td>Mayer, Danielle M</td>
<td>Functional Electronic Stimulation for Foot Drop in Spinal Cord Injury</td>
<td>electronic stimulation, foot drop, SCI, technology, equipment</td>
</tr>
<tr>
<td>IX.2</td>
<td>54</td>
<td>Klemme, Karen L</td>
<td>Life Care Planning References in Adult Spinal Cord Injury</td>
<td>SCI, Life Care Planning, equipment, resources, books, texts, online, websites</td>
</tr>
<tr>
<td>IX.3</td>
<td>70</td>
<td>Mason, Diana</td>
<td>Guest Editorial: Consider the Source</td>
<td>research, editor, fact-checking, publishing, nurse author</td>
</tr>
<tr>
<td>IX.3</td>
<td>72</td>
<td>Howland, Wendie</td>
<td>Speaker Intro: Writing for Publication</td>
<td></td>
</tr>
<tr>
<td>IX.3</td>
<td>74</td>
<td>Marquesen, Jane</td>
<td>Speaker Intro: Lung Transplantation</td>
<td></td>
</tr>
<tr>
<td>IX.3</td>
<td>76</td>
<td>Butts, Lester</td>
<td>Speaker Intro: Treatment Withdrawal; Suicide in SCI</td>
<td></td>
</tr>
<tr>
<td>IX.3</td>
<td>78</td>
<td>Pettengill, April</td>
<td>Speaker Intro: CNLCP Certification Board, History and Responsibility</td>
<td>(continued next page)</td>
</tr>
</tbody>
</table>
### Issue Index, continued

<table>
<thead>
<tr>
<th>Issue</th>
<th>Page</th>
<th>Author</th>
<th>Title</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>IX.4</td>
<td>89</td>
<td>McGill, David</td>
<td>Waking Up In A Small Room</td>
<td>amputation, amputee, patient, first person</td>
</tr>
<tr>
<td>IX.4</td>
<td>90</td>
<td>Phillips Otto, Judith</td>
<td>ADL Challenges and Solutions for Prosthetic USers</td>
<td>amputation, lower extremity, prosthetic, ADL, adaptive technology</td>
</tr>
<tr>
<td>IX.4</td>
<td>95</td>
<td>Phillips Otto, Judith</td>
<td>Concepts in Lower Extremity Prosthetics</td>
<td>amputation, lower extremity, prosthetic, ADL, adaptive technology, rehabilitation</td>
</tr>
<tr>
<td>IX.4</td>
<td>103</td>
<td>Ackerman, William E III</td>
<td>Phantom Limb Treatment Options</td>
<td>amputation, phantom pain, medication, neurological, analgesia, therapy, pain management</td>
</tr>
<tr>
<td>IX.4</td>
<td>108</td>
<td>Powell, Victoria</td>
<td>Keeping Current in Orthotics and Prosthetics: A Resource for Life Care Planners</td>
<td>PrimeCare, seminar, continuing education, amputation, prosthetics, orthotics, C-Leg, Dynamic Arm, iLimb, LivingSkin TouchBionics, Ossur Proprio, imPress conference, research findings</td>
</tr>
<tr>
<td>IX.4</td>
<td>123</td>
<td>Phillips Otto, Judith</td>
<td>Caring for the Upper Extremity Amputation Patient</td>
<td>amputation, upper extremity, prostheis, rehabilitation</td>
</tr>
<tr>
<td>IX.4</td>
<td>132</td>
<td>Powell, Victoria</td>
<td>Partial Hand Amputation: A Case Study</td>
<td>amputation, amputee, patient, hand, prostheses, cosmesis, function, rehabilitation, case study</td>
</tr>
<tr>
<td>IX.4</td>
<td>135</td>
<td>Lang, MacJulian</td>
<td>Upper Limb Prosthetic Rehabilitation: What and When</td>
<td>amputation, upper extremity, prostheses, rehabilitation, critical pathway</td>
</tr>
<tr>
<td>IX.4</td>
<td>140</td>
<td>Ebersbach, Suzi</td>
<td>Life Care Planning for UE iLimb Aftercare: Maintenance, Repair, and Replacement</td>
<td>amputation, upper extremity, prostheses, rehabilitation, cost, life care planning, replacement, maintenance, repair</td>
</tr>
<tr>
<td>IX.4</td>
<td>142</td>
<td>Steven, Sandy</td>
<td>Acute Rehabilitation for Bilateral Upper Extremity Amputee: Anna, A Case Study</td>
<td>amputation, upper extremity, prostheses, rehabilitation, case study</td>
</tr>
<tr>
<td>IX.4</td>
<td>144</td>
<td>Wagner, Nathan</td>
<td>iLimb for Adolescent with Congenital UE Loss</td>
<td>amputation, upper extremity, prostheses, rehabilitation, iLimb</td>
</tr>
<tr>
<td>IX.4</td>
<td>147</td>
<td>Radocy, Robert</td>
<td>Advances in Upper Limb Prostheses for Sports and Recreation</td>
<td>amputation, upper extremity, prostheses, rehabilitation, sports, recreation, suspension, socket</td>
</tr>
<tr>
<td>IX.4</td>
<td>162</td>
<td>Smith, Justina, Shipley, Robert W.</td>
<td>What Can Silver Do For You? Use of Silver in Prosthetic Applications</td>
<td>amputation, antibacterial, socket, liner</td>
</tr>
<tr>
<td>IX.4</td>
<td>163</td>
<td>Powell, Victoria</td>
<td>Amputation Resources and Glossary</td>
<td>resources, education, glossary</td>
</tr>
<tr>
<td>IX.4</td>
<td>184</td>
<td>Tata, John A</td>
<td>Immobility, Not a Great Idea; Leg Sim</td>
<td>amputation, lower extremity, prosthetic, ADL, adaptive technology, rehabilitation, immobility, arthritis, falls, DVT, embolus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Issue</th>
<th>Page</th>
<th>Author</th>
<th>Title</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>X.1</td>
<td>198</td>
<td>Pettengill, April</td>
<td>Developmental Screening in Nurse Life Care Planning</td>
<td>child, development, screen, pediatric, brain injury, PEDS, early intervention,</td>
</tr>
<tr>
<td>X.1</td>
<td>204</td>
<td>Mulcahey, MJ, Anderson CJ, et al</td>
<td>Pediatric Spinal Cord Injury: Evidence-Based Practice and Outcomes</td>
<td>pediatric, child, SCI, evidence-based practice, outcomes, costs, research, rehabilitation,</td>
</tr>
<tr>
<td>X.1</td>
<td>213</td>
<td>Shipley, Justina S., Shipley, Robert W.</td>
<td>Orthotic Considerations for Pediatric Pathologies</td>
<td>pediatric, child, SCI, orthotics</td>
</tr>
<tr>
<td>X.1</td>
<td>218</td>
<td>Greenfield, Barbara</td>
<td>Determining Costs for a Pediatric Patient with Cerebral Palsy: Case Study</td>
<td>cerebral palsy, child, pediatric, life care plan, cost, case study</td>
</tr>
<tr>
<td>X.1</td>
<td>224</td>
<td>Seidmeyer, Judy</td>
<td>Bathing Challenges from Pediatric to Adolescent to Adult</td>
<td>bathing, hygiene, pediatric, adolescent, adult, bathroom modifications, costs, ADL, independence</td>
</tr>
</tbody>
</table>

**Spring 2010**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Page</th>
<th>Author</th>
<th>Title</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>X.2</td>
<td>236</td>
<td>Vermillion, Christine</td>
<td>Life Care Planning and Case Management for the Elderly: Introduction to Geriatric Medicine and Geriatric Specialists</td>
<td>life care planning, case management, elder, geriatrics, geriatrician</td>
</tr>
<tr>
<td>X.2</td>
<td>243</td>
<td>Jones, Douglas R</td>
<td>Legal Issues in Elder Care</td>
<td>legal, elder, guardianship, living will, power of attorney, health care proxy, estate planning</td>
</tr>
<tr>
<td>X.2</td>
<td>249</td>
<td>Shipley, Darryl and Howland, Wendie</td>
<td>Reverse Mortgage Overview</td>
<td>elder, finances, mortgage, contract,</td>
</tr>
<tr>
<td>X.2</td>
<td>242</td>
<td>Howland, Wendie</td>
<td>Book Review: Life Care Planning and Case Management Handbook, 3rd Ed., Weed and Berens</td>
<td>textbook, research, case management, life care planning,</td>
</tr>
</tbody>
</table>

(continued next page)
### Issue index, continued

<table>
<thead>
<tr>
<th>2010 Fall</th>
<th>Issue</th>
<th>Page</th>
<th>Author</th>
<th>Title</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>X.3</td>
<td>237</td>
<td>Caragonne, Penelope</td>
<td>Automated Assessment Protocol, Case Management Support Needs: A Form for Use by Life Care Planners</td>
<td>case management, life care planning, assessment, tool, care projection, cost</td>
<td></td>
</tr>
<tr>
<td>X.3</td>
<td>244</td>
<td>Gergis, George</td>
<td>Resources for Searching</td>
<td>websites, search criteria, government, organization,</td>
<td></td>
</tr>
<tr>
<td>X.3</td>
<td>248</td>
<td>Kosar, S, Seelen HAM, Hemmen B, Evers SMAA, and Brink PRG</td>
<td>Study Protocol: Cost effectiveness of an integrated fast-track rehabilitation service for multitrauma patients</td>
<td>costs, trauma, multiple trauma, rehabilitation, study protocol, research, outcome measures,</td>
<td></td>
</tr>
<tr>
<td>X.3</td>
<td>262</td>
<td>Leskin, GA and Bleiberg J</td>
<td>PTSD and Traumatic Brain Injury: Implications for Life Care Planning</td>
<td>TBI, PTSD, life care planning, psychiatric comorbidity, depression, nicotine, behavior, neurobehavioral, mTBI, nursing diagnosis</td>
<td></td>
</tr>
<tr>
<td>X.3</td>
<td>275</td>
<td>Brock, Patricia</td>
<td>Speaker Intro</td>
<td>research, scholarly writing, scholarship,Paymentforwork tools,smartphone,</td>
<td></td>
</tr>
<tr>
<td>X.3</td>
<td>276</td>
<td>Giles, Shelene</td>
<td>Speaker Intro</td>
<td>burns, life care planning,</td>
<td></td>
</tr>
<tr>
<td>X.3</td>
<td>276</td>
<td>Seidmeyer, Judy</td>
<td>Speaker Intro</td>
<td>becoming a caregiver, hygiene,</td>
<td></td>
</tr>
<tr>
<td>X.3</td>
<td>276</td>
<td>Yudkoff, Mona</td>
<td>Speaker Intro</td>
<td>identifying help for business</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Winter</th>
<th>Issue</th>
<th>Page</th>
<th>Author</th>
<th>Title</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>X.4</td>
<td>285</td>
<td>Brock, Patricia</td>
<td>From Clinical Nurse to Entrepreneur: Becoming a Life Care Planner</td>
<td>role, life care planner, research, first-person</td>
<td></td>
</tr>
<tr>
<td>X.4</td>
<td>292</td>
<td>Howland, Wendie</td>
<td>Editor’s Choice: NANDA-I 2009-2011</td>
<td>life care planning, role, nursing diagnosis, NANDA</td>
<td></td>
</tr>
<tr>
<td>X.4</td>
<td>294</td>
<td>Powell, Victoria</td>
<td>Smartphone Comparison for the NCLP</td>
<td>role, technology, work tools, smart phone, iPhone, Droid, Blackberry</td>
<td></td>
</tr>
<tr>
<td>X.4</td>
<td>306</td>
<td>Lamar, Laura</td>
<td>Using Video in Legal Cases</td>
<td>role, tool, assessment, documentation, video, videography</td>
<td></td>
</tr>
</tbody>
</table>

### Advertiser index

<table>
<thead>
<tr>
<th>Advertisers</th>
<th>Issue</th>
<th>Page</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessible Systems, Inc.</td>
<td>IX.2</td>
<td>45</td>
<td>architectural modifications, lifts, bathroom, elevator, barrier-free</td>
</tr>
<tr>
<td>Advanced Arm Dynamics</td>
<td>IX.4</td>
<td>146</td>
<td>upper extremity amputation, prosthesis, hand, arm</td>
</tr>
<tr>
<td>Amputee Coalition of America</td>
<td>IX.4</td>
<td>102</td>
<td>Amputee, amputation, limb loss, education, support</td>
</tr>
<tr>
<td>Barr Foundation</td>
<td>IX.4</td>
<td>116</td>
<td>amputation resources, support, teaching</td>
</tr>
<tr>
<td>Bayada Nurses</td>
<td>X.1</td>
<td>229</td>
<td>home care</td>
</tr>
<tr>
<td>Center for Comprehensive Services</td>
<td>VIII.3</td>
<td>19</td>
<td>acquired brain injury, neurorehabilitation, residential care, day treatment, outpatient care</td>
</tr>
<tr>
<td>Center for Medicare Set-Aside Administration</td>
<td>IX.1</td>
<td>29</td>
<td>MSA, administration, custodian</td>
</tr>
<tr>
<td>Center for Neuro Skills</td>
<td>IX.4</td>
<td>107</td>
<td>Brain injury, therapy, education</td>
</tr>
<tr>
<td>CNLCP Certification Board</td>
<td>IX.2</td>
<td>37</td>
<td>certification, CNLCP</td>
</tr>
<tr>
<td>CNLCP Certification Board</td>
<td>IX.4</td>
<td>158</td>
<td></td>
</tr>
<tr>
<td>Comfort Products</td>
<td>IX.4</td>
<td>162</td>
<td>shrinkers, liners</td>
</tr>
<tr>
<td>Comfort Products</td>
<td>IX.4</td>
<td>116</td>
<td>silver sheath liner, socket, prosthesis</td>
</tr>
<tr>
<td>Competent Care</td>
<td>VIII.2</td>
<td>20</td>
<td>home care</td>
</tr>
<tr>
<td>Covington Healthcare Associates LLC</td>
<td>X.1</td>
<td>203</td>
<td>pharmacy case management</td>
</tr>
<tr>
<td>Craig Hospital</td>
<td>IX.2</td>
<td>61</td>
<td>SCI, rehabilitation, inpatient, outpatient, nurse advice line</td>
</tr>
<tr>
<td>Economy Transport LLC</td>
<td>VIII.2</td>
<td>9</td>
<td>transportation services</td>
</tr>
<tr>
<td>FAWSit</td>
<td>X.1</td>
<td>227</td>
<td>fold-away wheelchair shower, hygiene, independence, bathroom modification, ADL</td>
</tr>
<tr>
<td>FAWSit</td>
<td>X.3</td>
<td>279</td>
<td>hygiene, bathing, bathroom modification, ADL</td>
</tr>
<tr>
<td>FIG Services</td>
<td>IX.3</td>
<td>68</td>
<td>MSA, MSA preparation course, webinar</td>
</tr>
<tr>
<td>Flexiciser</td>
<td>VIII.2</td>
<td>17</td>
<td>exercise equipment</td>
</tr>
<tr>
<td>FormPro, BrightSun Technologies</td>
<td>IX.1</td>
<td>21</td>
<td>life care planning, forms, research</td>
</tr>
<tr>
<td>FormPro, BrightSun Technologies</td>
<td>X.1</td>
<td>212</td>
<td>life care planning, media</td>
</tr>
</tbody>
</table>

(continued next page)
### Advertiser index, continued

<table>
<thead>
<tr>
<th>Advertisers</th>
<th>Issue</th>
<th>Page</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hartford Walking Systems, LegSim</td>
<td>IX.4</td>
<td>188</td>
<td>LegSim, walking aid, amputation</td>
</tr>
<tr>
<td>Investigative Support Unit</td>
<td>X.3</td>
<td>245</td>
<td>investigation, surveillance</td>
</tr>
<tr>
<td>Kelynco</td>
<td>VIII.2</td>
<td>15</td>
<td>life care planning courses</td>
</tr>
<tr>
<td>Kelynco</td>
<td>VIII.3</td>
<td>16</td>
<td>life care planning courses</td>
</tr>
<tr>
<td>Legal Nurse Systems LLC</td>
<td>VIII.2</td>
<td>15</td>
<td>record analysis, software, life care planning software</td>
</tr>
<tr>
<td>Mobility4Kids</td>
<td>X.1</td>
<td>228</td>
<td>pediatric power wheelchair</td>
</tr>
<tr>
<td>NAMSAP</td>
<td>VIII.2</td>
<td>12</td>
<td>Medicare Set-Aside</td>
</tr>
<tr>
<td>NAMSAP</td>
<td>VIII.3</td>
<td>8</td>
<td>Medicare Set-Aside</td>
</tr>
<tr>
<td>NAMSAP</td>
<td>IX.1</td>
<td>22</td>
<td>MSA, education</td>
</tr>
<tr>
<td>NRCSHHM, University of Southern California</td>
<td>X.3</td>
<td>278</td>
<td>home modification certificate training</td>
</tr>
<tr>
<td>PrimeCare</td>
<td>IX.4</td>
<td>152</td>
<td>orthotics, prosthetics, education, symposia</td>
</tr>
<tr>
<td>Professional Case Management, Inc</td>
<td>VIII.2</td>
<td>19</td>
<td>case management</td>
</tr>
<tr>
<td>Progressive Health</td>
<td>VIII.3</td>
<td>20</td>
<td>acquired brain injury, neurorehabilitation</td>
</tr>
<tr>
<td>Rainbow Rehabilitation Centers</td>
<td>IX.4</td>
<td>119</td>
<td>brain, SCI, TBI, rehabilitation</td>
</tr>
<tr>
<td>ResCare</td>
<td>VIII.2</td>
<td>8</td>
<td>home care</td>
</tr>
<tr>
<td>SEAK</td>
<td>VIII.3</td>
<td>19</td>
<td>directory of expert witnesses &amp; IMEs</td>
</tr>
<tr>
<td>Snell Prosthetics and Orthotics Laboratory</td>
<td>IX.4</td>
<td>107</td>
<td>prosthetics, orthotics</td>
</tr>
<tr>
<td>Strategic Marketing</td>
<td>IX.4</td>
<td>152</td>
<td>trade association meetings, marketing, public relations</td>
</tr>
<tr>
<td>SureHands Lift &amp; Care System</td>
<td>IX.1</td>
<td>16</td>
<td>lift, transfers, ADLs, bathing</td>
</tr>
<tr>
<td>SureHands Lift &amp; Care Systems</td>
<td>IX.2</td>
<td>53</td>
<td>lifts, bathing, transfers, hygiene</td>
</tr>
<tr>
<td>University of Colorado Hospital</td>
<td>IX.3</td>
<td>77</td>
<td>inpatient, outpatient, lung transplantation</td>
</tr>
<tr>
<td>White Mountain Naturals</td>
<td>IX.4</td>
<td>188</td>
<td>skin care products</td>
</tr>
<tr>
<td>William E. Ackerman III MD</td>
<td>IX.4</td>
<td>106</td>
<td>pain management</td>
</tr>
</tbody>
</table>

*White pine*
## Author Index

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Issue</th>
<th>Page</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ackerman, William E III</td>
<td>Phantom Limb Treatment Options</td>
<td>IX.4</td>
<td>103</td>
<td>amputation, phantom pain, medication, neurological, analgesia, therapy, pain management</td>
</tr>
<tr>
<td>Babitsky, Steven</td>
<td>Expert Witness Cross-examination Questions and Areas of Inquiry</td>
<td>VIII.3</td>
<td>9</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>Brock, Patricia</td>
<td>Speaker Intro</td>
<td>X.3</td>
<td>275</td>
<td>research, scholarly writing, scholarship</td>
</tr>
<tr>
<td>Brock, Patricia</td>
<td>From Clinical Nurse to Entrepreneur: Becoming a Life Care Planner</td>
<td>X.4</td>
<td>285</td>
<td>role, life care planner, research, first-person</td>
</tr>
<tr>
<td>Butts, Lester</td>
<td>Speaker Intro: Treatment Withdrawal; Suicide in SCI</td>
<td>IX.3</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>Caragonne, Penelope</td>
<td>Automated Assessment Protocol, Case Management Support Needs: A Form for Use by Life Care Planners</td>
<td>X.3</td>
<td>237</td>
<td>case management, life care planning, assessment, tool, care projection, cost</td>
</tr>
<tr>
<td>Ebersbach, Suzi</td>
<td>Life Care Planning for UE iLimb Aftercare: Maintenance, Repair, and Replacement</td>
<td>IX.4</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Gergis, George</td>
<td>Resources for Searching</td>
<td>X.3</td>
<td>244</td>
<td>websites, search criteria, government, organization,</td>
</tr>
<tr>
<td>Giles, Shelene</td>
<td>Costing and Submitting Medicare Set-Asides</td>
<td>IX.1</td>
<td>12</td>
<td>MSA, Medicare, CMS, coding, allocation</td>
</tr>
<tr>
<td>Giles, Shelene</td>
<td>Speaker Intro</td>
<td>X.3</td>
<td>276</td>
<td>burns, life care planning</td>
</tr>
<tr>
<td>Gonzalez, Rafael</td>
<td>MSA Professional Administration: Introduction to the Role of the Custodian</td>
<td>IX.1</td>
<td>23</td>
<td>MSA, Medicare, CMS, coding, allocation, administration, custodian</td>
</tr>
<tr>
<td>Greenfield, Barbara</td>
<td>Determining Costs for a Pediatric Patient with Cerebral Palsy: Case Study</td>
<td>X.1</td>
<td>218</td>
<td>cerebral palsy, child, pediatric, life care plan, cost, case study</td>
</tr>
<tr>
<td>Herbst, Eugenia</td>
<td>Equipment Needs for Home and Community: IADLs for the ABI patient</td>
<td>VIII.4</td>
<td>4</td>
<td>OT, DME, equipment, safety, wandering, falls, technology</td>
</tr>
<tr>
<td>Hindert, Patrick J</td>
<td>Structured Settlement and Medicare Set-Aside Arrangements</td>
<td>IX.1</td>
<td>17</td>
<td>MSA, Medicare, CMS, coding, allocation, structured settlement</td>
</tr>
<tr>
<td>Holakiewicz, Liz</td>
<td>Lessons from the Stand</td>
<td>VIII.3</td>
<td>10</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>Howland, Wendie</td>
<td>Speaker Intro: Writing for Publication</td>
<td>X.3</td>
<td>72</td>
<td>textbook, research, case management, life care planning,</td>
</tr>
<tr>
<td>Howland, Wendie</td>
<td>Editor’s Choice: NANDA-I 2009-2011</td>
<td>X.4</td>
<td>292</td>
<td>life care planning, role, nursing diagnosis, NANDA</td>
</tr>
<tr>
<td>Ireland, Thomas R.</td>
<td>Questions for the Economists</td>
<td>VIII.3</td>
<td>3</td>
<td>forensic economist, costs, range</td>
</tr>
<tr>
<td>Jones, Douglas R</td>
<td>Legal Issues in Elder Care</td>
<td>X.2</td>
<td>243</td>
<td>legal, elder, guardianship, living will, power of attorney, health care proxy, estate planning</td>
</tr>
<tr>
<td>King, Barbara</td>
<td>Medicare Future Care Allocation: A Coder’s Perspective</td>
<td>IX.1</td>
<td>7</td>
<td>MSA, Medicare, CMS, coding, allocation</td>
</tr>
<tr>
<td>Klemme, Karen L</td>
<td>Life Care Planning References in Adult Spinal Cord Injury</td>
<td>IX.2</td>
<td>54</td>
<td>SCI, Life Care Planning, equipment, resources, books, texts, online, websites</td>
</tr>
<tr>
<td>Kosar, S, Seelen HAM, Hemmen B, Evers SMAA, and Brink PRG</td>
<td>Study Protocol: Cost effectiveness of an integrated fast-track rehabilitation service for multitrauma patients</td>
<td>X.3</td>
<td>248</td>
<td>costs, trauma, multiple trauma, rehabilitation, study protocol, research, outcome measures,</td>
</tr>
<tr>
<td>Lamar, Laura</td>
<td>Using Video in Legal Cases</td>
<td>X.4</td>
<td>306</td>
<td>role, tool, assessment, documentation, video, videography</td>
</tr>
<tr>
<td>Lang, Mac Julian</td>
<td>Upper Limb Prosthetic Rehabilitation: What and When</td>
<td>IX.4</td>
<td>135</td>
<td>amputation, upper extremity, prosthesis, rehabilitation, critical pathway</td>
</tr>
<tr>
<td>Lefevre, Adrienne</td>
<td>Know Your Audience</td>
<td>VII.3</td>
<td>17</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>Leskin, GA and Bleiberg J</td>
<td>PTSD and Traumatic Brain Injury: Implications for Life Care Planning</td>
<td>X.3</td>
<td>262</td>
<td>TBI, PTSD, life care planning, psychiatric comorbidity, depression, nicotine, behavior, neurobehavioral, mTBI, nursing diagnosis</td>
</tr>
</tbody>
</table>

(continued next page)
### Author Index, continued

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Issue</th>
<th>Page</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangraviti, James J</td>
<td>Expert Witness Cross-examination Questions and Areas of Inquiry</td>
<td>VIII.3</td>
<td>9</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>Maniha, Ann</td>
<td>Research to Another Level: Medical Coding and the Life Care Planning Process, part 1</td>
<td>VII.4</td>
<td>9</td>
<td>costs, coding, CPT, charges, usual and customary, UCR, billing, DRG, IC9, HCPS, MDC, ASC, APC</td>
</tr>
<tr>
<td>Marquesen, Jane</td>
<td>Speaker Intro: Lung Transplantation</td>
<td>IX.3</td>
<td>74</td>
<td>research, editor, fact-checking, publishing, nurse author</td>
</tr>
<tr>
<td>Mason, Diana</td>
<td>Guest Editorial: Consider the Source</td>
<td>IX.3</td>
<td>70</td>
<td>costs, coding, CPT, charges, usual and customary, UCR, billing, RVU, payments, fees, office visits electronic stimulation, foot drop, SCI, technology, equipment</td>
</tr>
<tr>
<td>Mayer, Danielle M</td>
<td>Pricing and the Life Care Plan: Physician Office Visits</td>
<td>VIII.4</td>
<td>7</td>
<td>costs, coding, CPT, charges, usual and customary, UCR, billing, RVU, payments, fees, office visits electronic stimulation, foot drop, SCI, technology, equipment</td>
</tr>
<tr>
<td>Mayer, Danielle M</td>
<td>Functional Electronic Stimulation for Foot Drop in Spinal Cord Injury</td>
<td>IX.2</td>
<td>51</td>
<td>costs, coding, CPT, charges, usual and customary, UCR, billing, RVU, payments, fees, office visits electronic stimulation, foot drop, SCI, technology, equipment</td>
</tr>
<tr>
<td>McDaniel, Helen</td>
<td>The Nurse Life Care Planner as Testifying Expert</td>
<td>VIII.4</td>
<td>21</td>
<td>Testimony, legal, trail, deposition</td>
</tr>
<tr>
<td>McGill, David</td>
<td>Waking Up In A Small Room</td>
<td>IX.4</td>
<td>89</td>
<td>amputation, amputee, patient, first person</td>
</tr>
<tr>
<td>Mulcahey, MJ, Anderson CJ, et al</td>
<td>Pediatric Spinal Cord Injury: Evidence-Based Practice and Outcomes</td>
<td>X.1</td>
<td>204</td>
<td>pediatric, child, SCI, evidence-based practice, outcomes, costs, research, rehabilitation</td>
</tr>
<tr>
<td>Pateracki, Paul</td>
<td>Life Care Planning for the Spinal-Injured: A Personal Perspective</td>
<td>IX.2</td>
<td>39</td>
<td>SCI, skin care, mobility, employment</td>
</tr>
<tr>
<td>Pettengill, April</td>
<td>CNLCP Examination Test Item-Writing Information and Guide</td>
<td>VIII.4</td>
<td>28</td>
<td>certification, CEUs, recertification, test,</td>
</tr>
<tr>
<td>Pettengill, April</td>
<td>Speaker Intro: CNLCP Certification Board, History and Responsibility</td>
<td>IX.3</td>
<td>78</td>
<td>child, development, screen, pediatric, brain injury, PEDS, early intervention, amputation, lower extremity, prosthetic, ADL, adaptive technology</td>
</tr>
<tr>
<td>Pettengill, April</td>
<td>Developmental Screening in Nurse Life Care Planning</td>
<td>X.1</td>
<td>198</td>
<td>child, development, screen, pediatric, brain injury, PEDS, early intervention, amputation, lower extremity, prosthetic, ADL, adaptive technology, rehabilitation</td>
</tr>
<tr>
<td>Phillips Otto, Judith</td>
<td>ADL Challenges and Solutions for Prosthetic Users</td>
<td>IX.4</td>
<td>90</td>
<td>amputation, lower extremity, prosthetic, ADL, adaptive technology, rehabilitation</td>
</tr>
<tr>
<td>Phillips Otto, Judith</td>
<td>Concepts in Lower Extremity Prosthetics</td>
<td>IX.4</td>
<td>95</td>
<td>amputation, lower extremity, prosthetic, ADL, adaptive technology, rehabilitation</td>
</tr>
<tr>
<td>Phillips Otto, Judith</td>
<td>Caring for the Upper Extremity Amputation Patient</td>
<td>IX.4</td>
<td>123</td>
<td>amputation, upper extremity, prosthetic, rehabilitation</td>
</tr>
<tr>
<td>Pouch, Kathy</td>
<td>Preparing for Deposition</td>
<td>VIII.3</td>
<td>6</td>
<td>expert, testimony, deposition, legal</td>
</tr>
<tr>
<td>Powell, Victoria</td>
<td>Keeping Current in Orthotics and Prosthetics: A Resource for Life Care Planners</td>
<td>IX.4</td>
<td>108</td>
<td>PrimeCare, seminar, continuing education, amputation, prosthetics, orthotics, C-Leg, Dynamic Arm, iLimb, LivingSkin TouchBionics, Ossur Proprio, imPress conference, research findings, amputation, amputee, patient, hand, prostheses, cosmesis, function, rehabilitation, case study</td>
</tr>
<tr>
<td>Powell, Victoria</td>
<td>Partial Hand Amputation: A Case Study</td>
<td>IX.4</td>
<td>132</td>
<td>resources, education, glossary</td>
</tr>
<tr>
<td>Powell, Victoria</td>
<td>Amputation Resources and Glossary</td>
<td>IX.4</td>
<td>163</td>
<td>role, technology, work tools, smart phone, iPhone, Droid, Blackberry</td>
</tr>
<tr>
<td>Powell, Victoria</td>
<td>Smartphone Comparison for the NCLP</td>
<td>X.4</td>
<td>294</td>
<td>amputation, upper extremity, prosthetic, rehabilitation</td>
</tr>
<tr>
<td>Radocy, Robert</td>
<td>Advances in Upper Limb Prostheses for Sports and Recreation</td>
<td>IX.4</td>
<td>147</td>
<td>amputation, upper extremity, prosthetic, rehabilitation</td>
</tr>
<tr>
<td>Reid, Pauline</td>
<td>A Brief Description of Various Complementary Therapies / Modalities</td>
<td>VIII.2</td>
<td>3</td>
<td>complementary, alternative,</td>
</tr>
<tr>
<td>Rizziardi Pearson, Stephanie</td>
<td>Questions for the Economists</td>
<td>VIII.3</td>
<td>3</td>
<td>forensic economist, costs, range</td>
</tr>
<tr>
<td>Seidmeyer, Judy</td>
<td>Bathing Challenges from Pediatric to Adolescent to Adult</td>
<td>X.1</td>
<td>224</td>
<td>bathing, hygiene, pediatric, adolescent, adult, bathroom modifications, costs, ADL, independence</td>
</tr>
<tr>
<td>Seidmeyer, Judy</td>
<td>Speaker Intro</td>
<td>X.3</td>
<td>276</td>
<td>becoming a caregiver, hygiene</td>
</tr>
<tr>
<td>Shipley, Darryl and Howland, Wendie</td>
<td>Reverse Mortgage Overview</td>
<td>X.2</td>
<td>249</td>
<td>elder, finances, mortgage, contract,</td>
</tr>
</tbody>
</table>

(continued next page)
### Author index, continued

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Issue</th>
<th>Page</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipley, Justina S.</td>
<td>Orthotic Considerations for Pediatric Pathologies</td>
<td>X.1</td>
<td>213</td>
<td>pediatric, child, SCI, orthotics</td>
</tr>
<tr>
<td>Shipley, Robert W.</td>
<td>What Can Silver Do For You? Use of Silver in Prosthetic Applications</td>
<td>IX.4</td>
<td>162</td>
<td>amputation, antibacterial, socket, liner</td>
</tr>
<tr>
<td>Smith, Justina</td>
<td>T’ai Chi Chih- Joy Through Movement</td>
<td>VIII.2</td>
<td>10</td>
<td>T’ai chi, movement, energy balance, gerontology</td>
</tr>
<tr>
<td>Shipley, Robert W.</td>
<td>Acute Rehabilitation for Bilateral Upper Extremity Amputee: Anna, A Case Study</td>
<td>IX.4</td>
<td>142</td>
<td>amputation, upper extremity, prosthesis, rehabilitati-</td>
</tr>
<tr>
<td>St. Martin. Rhonda</td>
<td>Immobility, Not a Great Idea; Leg Sim</td>
<td>IX.4</td>
<td>184</td>
<td>amputation, lower extremity, prosthesis, ADL, adaptive technology, rehabilitation, immobility, arthritis, falls, DVT, embolus</td>
</tr>
<tr>
<td>Steven, Sandy</td>
<td>Acute Rehabilitation for Bilateral Upper Extremity Amputee: Anna, A Case Study</td>
<td>IX.4</td>
<td>142</td>
<td>rehabilitation, case study</td>
</tr>
<tr>
<td>Tata, John A</td>
<td>Life Care Planning and Case Management for the Elderly: Introduction to Geriatric Medicine and Geriatric Specialists</td>
<td>X.2</td>
<td>236</td>
<td>life care planning, case management, elder, geriatrics, geriatrician,</td>
</tr>
<tr>
<td>Vermillion, Christine</td>
<td>The Wright Mask: Nebulizing Made Easier</td>
<td>IX.2</td>
<td>46</td>
<td>tracheostomy, humidification, nebulizer, technol-</td>
</tr>
<tr>
<td>Villa, Judy</td>
<td>iLimb for Adolescent with Congenital UE Loss</td>
<td>IX.4</td>
<td>144</td>
<td>amputation, upper extremity, prosthesis, rehabilitati-</td>
</tr>
<tr>
<td>Wagner, Nathan</td>
<td>Speaker Intro</td>
<td>X.3</td>
<td>276</td>
<td>identifying help for business</td>
</tr>
<tr>
<td>Yudkoff, Mona</td>
<td></td>
<td></td>
<td></td>
<td>Norway spruce</td>
</tr>
</tbody>
</table>
Information for Advertisers
Any submission electronically with photos, art, and text is acceptable. Advertisers can submit any ad in a high-resolution PDF or JPEG. PDF format is preferred. We reserve the right to reject any advertising deemed to be in poor taste, libelous, or otherwise unacceptable. Please submit any ad for consideration to the Editor, Wendie A. Howland RN-BC MN CRRN CCM CNLCP LNCP-C whowland@howlandhealthconsulting.com

Rates
Quarter page, $100 per appearance
Half page, $190 per appearance
Full page, $375 per appearance
Submit copy 3 weeks before publish date, invoiced and paid before publishing. Mail checks payable to AANLCP to AANLCP, 3267 East 3300 South #309 Salt Lake City, UT 84109