

# The impact of technology on nephrology social work practice

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## Introduction

Nephrology social workers are faced with myriad tasks and responsibilities that require the ability to delegate, prioritize, and multitask. While technology available to nephrology social workers, such as assessment tools, electronic medical records, and Internet applications and referral options have helped with task-centered social work practice, many social workers continue to look for ideas of how to use the Internet and technology in their clinical practices. Following is a discussion regarding the increased access and use of the Internet by patients and social work standards of practice for the use of technology in practice. Best practice guidelines and research are considered and reviewed in the context of potential interventions with nephrology patients.

## Objectives:

Readers will identify three standards of technology in practice in relationship to patients with CKD.

Readers will identify three features of best practices for using technology in medical and clinical social practice.

Readers will identify two strategies for using existing resources in clinical practice.

## The digital experience

A tour of any hospital or dialysis clinic will demonstrate the increased availability of electronic devices. Patients use their tablets, phones, and laptops to provide entertainment, garner support, and establish communication with employment and loved ones during treatment. The anecdotal awareness of technology in the dialysis center is validated by research from the Pew Internet Project which reported that 88% of American adults now have a cell phone, 57% have a laptop computer, 19% own an e-book reader, and 19% have a tablet.<sup>20</sup> Of adults with these devices, 63% go online wirelessly.

Barriers to Internet use are attributed to demographics, disability status, and a sense of relevance. People who

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preferred to respond to the Pew Internet Research interviews in Spanish rather than English, adults with less than a high school education, and those in households earning less than \$30,000 per year were less likely to have Internet access. Adults with disabilities and senior citizens were also less likely to use the Internet. Almost half of the participants in the Pew study who did not use the Internet reported feeling as though the information available on the Internet was not relevant to their experience.<sup>20</sup>

Despite these barriers, the majority of adults with a disability (54%) do use the Internet. According to a study by Schatell et al.,<sup>15</sup> Internet use among respondents on in-center hemodialysis was similar to national data for people with disabilities. Ande et al. reported that 58% of dialysis patients in Canada used the Internet to access medical information.<sup>1</sup> Caregivers, such as family and friends, report Internet access and use to obtain health information more frequently than end-stage renal disease and chronic kidney disease patients themselves.<sup>17</sup>

The adults with access to the Internet are using it to manage more elements of their lives. Beyond using the Internet for communication, users access it for banking, social networking, shopping, and to search for information. In fact, 80% of Internet users look for health and medical information online.<sup>6</sup> Practitioners therefore have a unique opportunity to “meet patients where they are” by using tools that are familiar to the patient to provide individualized education via the Internet and interactive computer-based programs.

## Standards for technology and social work practice

The prevalence of the use of the Internet for education by adults with disabilities, and the promising research suggesting the benefit of computer-based education and intervention, demonstrate the important potential for technology in nephrology social work practice. In 2005, the National Association of Social Workers (NASW) and



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the Association of Social Work Boards (ASWB) developed standards for technology and social work practice with goals to “guide social workers incorporating technology into their services” and “to help social workers monitor and evaluate the ways technology is used in their services.” The standards include expectations for access, cultural competence, technical competency, and practice competencies. The standards emphasize the responsibilities of social workers to become proficient in technological skills and tools and to advocate for client access to technology.

Given the barriers demonstrated for access to the Internet by persons with disabilities, “social workers shall have access to technology and appropriate support systems to ensure competent practice, and shall take action to ensure client access to technology” offers significant directions to nephrology social work practice.<sup>12</sup> The NASW standards encourage social workers to advocate for clients as well as to resolve access problems. Further, the standards remind social workers to ensure that access for people with disabilities is provided in an appropriate manner.

Wofford et al. describes patient sentiments that clinicians should be technologically competent; Standard 4 reaffirms this expectation by stating “Social workers shall be responsible for becoming proficient in the technological skills and tools required for competent and ethical practice and for seeking appropriate training and consultation to stay current with emerging technologies.”<sup>18</sup>

Standard 9 of the Standards for Technology and Social Work Practice emphasizes the potential for new and emerging technology in improving advocacy and social action. Using Internet resources, social workers can help patients access online applications that streamline processes, such

as disability applications or applications for community resources. With Internet resource tools, the social worker can assist, and therefore empower, the patient in navigating systems of care. A social worker who is competent in integrating technology into practice will further meet the standards by utilizing technology that may facilitate community well-being.<sup>12</sup>

### **Benefits and best practice: Patient satisfaction and health outcomes**

According to Trisolini et al., dialysis patients felt they were too dependent on their professional caregivers for information about the quality of care they received and treatment options for end-stage renal disease.<sup>17</sup> Patients wanted direct information, and when they received it, in this case through Medicare’s Dialysis Facility Compare website, they felt they were better able to work collaboratively with their doctors and professional caregivers.<sup>17</sup> Wofford et al. suggests that the use of computer office-based education has the potential to improve office efficiency, help overcome functional health literacy, and meet patient expectations that their physicians and treatment teams are technologically sophisticated.<sup>18</sup> Wofford et al. continues to suggest that the use of computer-based education extends the educational process beyond the allotted time available for clinic visits.<sup>18</sup>

Computer-based education also offers opportunities for patients to personalize their education, leading to increased control over material presented, and a potential increase in satisfaction with the quality of education. The increased availability of wireless Internet connections and smartphone/tablets allows patients to have access to Internet education with interactive hyperlink capabilities that allow individualized information tailored for their needs or questions.

With Internet or computer-based education, patients are able to access the information “just-in-time” with content that is relevant to their experience with the disease.<sup>17,11</sup>

The ability to personalize education according to need and readiness is a component of constructivist learning theory that emphasizes the learner as an active participant in the learning experience.<sup>5</sup> This active participation and the integration of auditory, visual, and interactive learning strategies may increase the transfer of knowledge, interest, and recall.<sup>5</sup> A review by Lewis found that most research demonstrated increased knowledge for patients with access to computer-based learning programs.<sup>11</sup> Fox also identified 22 studies that demonstrated knowledge gains for patients who used interactive computer-based education.<sup>5</sup>

Health IT tools have been shown to positively impact patient self-management through improved medication and appointment management.<sup>3</sup> In a comprehensive review of computer-based learning programs, Lewis concluded that self-management and self-care behaviors can be enhanced for patients with chronic diseases.<sup>11</sup> These results are relevant to social workers in dialysis centers who are responsible for tracking and reporting patient measures of quality of life, as higher levels of knowledge and self-management have been significantly associated with improved functioning and well-being.<sup>2</sup>

### *Best practices*

Despite the benefits documented for knowledge acquisition and improved self-management, however, researchers and practitioners have struggled to identify best practices for the use of interactive computer-based education and health IT in chronic care. Wofford et al. identified several reasons for limited guidelines for best practice, including the fast pace of develop-

ment, which makes it difficult to test strategies and to prove causality with improved outcomes.<sup>18</sup> Disagreements surrounding ownership of education, reimbursement issues for computer-based education, and the potential for expense with implementation has also slowed the development of best practices.<sup>18</sup>

Despite these challenges connecting technology with best practices, social workers should continue to pursue or consider best practices using technology. As Hill and Shaw state, “Best practice does not mean that the process or outcomes are perfect, nor that there are not constraints on what can be accomplished, but it should indicate the best that could be achieved in a specific situation, with a specific set of people and circumstances.”<sup>9</sup> Fox identified best practices for the development of computer-based materials.<sup>5</sup> These suggestions have been modified to include questions social workers can ask when reviewing potential materials for patient education:

1. Does the program/website/

material take advantage of technological and multimedia capabilities?

2. Does the program use voice-over and script messaging to accommodate low literacy levels and patients with visual deficits?
3. Does the program design allow for easy access and manipulation?
4. Does the program allow patients to view material in a place and time where they are comfortable?
5. Does the program incorporate questions and answers to reinforce important constructs and promote learner interaction?
6. Does the program allow patients user-control over the sequence and depth of information provided?
7. How will using this program interact with existing education and company policy and procedure?

Once a program or tool has been identified by social workers as relevant

to patient experiences, it is important to use the program intentionally and thoughtfully. Wyatt described the importance of using educational models and learning theory to enhance patient outcomes and increase effectiveness of education.<sup>19</sup> Following are two tables that describe instructional strategies with computer-based education and the theoretical basis for those strategies. (see tables 1 & 2)

**Resources and use in practice: Health information**

In “The Social Life of Health Information,” the Pew Research Center reported that 59% of adults (or 80% of people using the Internet) have used the Internet for health research.<sup>7</sup> Internet-mediated learning in the home may help with more complex learning issues and allow for just-in-time learning.<sup>18</sup> This is consistent with the adult education principle that adults learn best the information that is most relevant to their lives at a given moment.<sup>4</sup>

*Multi-media education*

Programs with multimedia fea-

Table 1. Theoretical-based instructional strategies for patient education based on review of literature	
Patient empowerment and patient value systems	
Instructional strategies	Theoretical basis
Assist learner in assessing individual needs and preferred learning style: <ul style="list-style-type: none"> <li>• Assess patient’s ability and readiness to learn</li> <li>• Offer learning options</li> <li>• Provide menu options if computer technology is preferred</li> </ul>	Adult learning theory Health belief model Self-efficacy Stages of readiness
Encourage learner to identify his/her own risks to determine the motivation of learning: <ul style="list-style-type: none"> <li>• Apply these risks to concrete learning situations and arrive at own conclusions</li> <li>• Provide concrete examples and rationale for risks</li> <li>• Reinforce the responsibilities of the patient</li> </ul>	Health belief model Adult learning theory Locus of control
Create content that is relevant to patients’ needs based on their perceptions and interest: <ul style="list-style-type: none"> <li>• Decision support systems, Intelligent support systems to identify a patient’s needs</li> <li>• Establish dissonance within patients through role modeled behavior via group activity, videos, web-based instruction</li> </ul>	Adult learning theory Health belief model Locus of control Cognitive dissonance theory
Reinforce, and reward learned behaviors and provide contact points: <ul style="list-style-type: none"> <li>• Establish email, listservs, Facebook discussion groups, message boards</li> </ul>	Self-efficacy Cognitive dissonance theory Stages of readiness Adult learning theory

Wyatt, T (1999). Instructional technology and patient education: Assimilating theory into practice. *Int Electronic J Health Educ*, 2(3) 85-93. Used with permission.

tures have been rated more highly by patients than other educational tools.<sup>5</sup> Computer-based education using multimedia features have also been compared favorably to traditional face-to-face teaching.<sup>5</sup> Ralston et al. reported that patients found value in Internet-based diabetes disease management programs that included enhanced email communication, educational resources, and interactive feedback on self-management activities.<sup>14</sup> Ogozalek and

**Table 2. Theoretical-based instructional strategies for patient education based on review of literature**

Retention and levels of cognition	
Instructional strategies	Theoretical basis
Establish the patient's baseline knowledge and build on baseline from familiar to unfamiliar information: <ul style="list-style-type: none"> <li>• Reinforce the baseline knowledge</li> <li>• Progress from simple to complex topics with frequent reinforcement through key points, mini quizzes, and integrated multimedia in instruction</li> </ul>	Elaboration theory Conditions-based instruction Cone of experience
Establish patient contracts with patient input, to include: <ul style="list-style-type: none"> <li>• Objectives, timeline, and rewards based on what the patient feels he/she needs to know</li> <li>• Develop modules that build on one another</li> <li>• Organize objectives with content, recall, and feedback to directly follow before progressing to more difficult objectives</li> </ul>	Component display theory Conditions-based instruction Elaboration theory Cone of experience
Create a teaching moment by utilizing down time: <ul style="list-style-type: none"> <li>• Provide instruction in waiting rooms and reception areas with tutorials, KIOSK-based decision support systems</li> <li>• Create impromptu group discussions and learning in waiting or reception areas</li> <li>• Provide information about on-line group discussions</li> </ul>	Elaboration theory Component display theory Conditions-based instruction
Establish a phased educational plan: <ul style="list-style-type: none"> <li>• Embed case scenarios of health promotion and risk behaviors</li> </ul>	Cone of experience elaboration theory

Instructional technology and patient education: Assimilating theory into practice.<sup>19</sup> (Used with permission from IEJHE)

**Table 3. Health information patient intervention – sample evaluation**

Identify goal	Patient and MSW to identify and address barriers to pursuing desired treatment modality
Identify potential tool	Home Dialysis Central (homedialysis.org)
Review tool for best practice characteristics	<ol style="list-style-type: none"> <li>1. Does the program/website/material take advantage of technological and multimedia capabilities? <i>Yes; there are options for webinars, message boards, links to social networking sites, email contact, and links to videos.</i></li> <li>2. Does the program use voiceover and script messaging to accommodate low literacy levels and patients with visual deficits? <i>No, but users can adjust the text size to read the articles better. Articles can also be printed for easier reading if necessary.</i></li> <li>3. Does the program design allow for easy access and manipulation? <i>Users can explore multiple educational components, but easily return to the home page to restart.</i></li> <li>4. Does the program allow patients to view material in a place and time where they are comfortable? <i>Patients are able to access the website using a computer, tablet, or smartphone.</i></li> <li>5. Does the program incorporate questions and answers to reinforce important constructs and promote learner interaction? <i>No; the website does not include questions and answers.</i></li> <li>6. Does the program allow patients user control over program sequence and depth of information provided? <i>Users are able to explore different elements of home dialysis options.</i></li> <li>7. How will using this program interact with existing education and company policy and procedure? <i>The site provides un-biased material that can supplement existing materials.</i></li> </ol>
Possible intervention strategies	<ol style="list-style-type: none"> <li>1. Before, during, or after treatment, invite patient to look at the website in your office, using a clinic laptop or their smartphone or tablet.</li> <li>2. Demonstrate features of the website, including exploring basic educational information and patient stories.</li> <li>3. Show patient the Modality Comparison Chart (or print and review with patient prior to introduction of the website).</li> <li>4. Identify 1-2 minuses the patient identifies as the greatest barriers to considering home dialysis.</li> <li>5. Encourage the patient to explore the website for one week.</li> <li>6. Follow up with the patient in one week: discuss patient's experience, material learned, and patient opinion regarding barrier to pursuing home dialysis.</li> </ol>

Lewis both found that elderly patients with limited computer experience were successful with multimedia computer-based training and learning tasks with interactive videos.<sup>13, 11</sup>

*Social networking*

The increase in social networking has been well documented in the public sector. Through “The Social Life of Health Information,” the Pew Research Center found that this trend is consistent with those seeking and managing health information.<sup>7</sup> The center reported that 20% of adults have tracked some health indicators online and 4% have posted comments on discussion boards. Another 11% of adults have followed friends’ health experiences on networking sites and 7% have obtained health information from those sites. Fox suggests that use of social networking in health information and

management is driven by the availability of the tools and the motivation of those living with chronic conditions to connect with each other.<sup>7</sup> Jain, Goyal, Fox and Shrank refer to this as bonding capital, or the “social connectedness that follows when individuals from within a particular group relate closely to another.”<sup>10</sup> The use of bonding capital might, the authors suggest, allow the medical practice to become a source of disease group management, where patients serve as supporters, teachers, and advocates for one another. As a result, patients who participate within such a network may be more likely to participate in shared decision-making and follow care recommendations.<sup>10</sup> Diamantidis et al. report that for younger ESRD patients, with the instantaneous receipt of information, interaction and dialogue, and availability of social media, the use of tradition-

al websites may become less prominent.<sup>3</sup> In a review of Internet-based programs, Lewis identified social support as an important component of computer-based patient interventions. Patients who used these programs described increased connectedness, improved social support, and perceived improvement in health outlook.<sup>11</sup>

Health information, multimedia, and social networking resources can be found with the following websites:

- American Association of Kidney Patients: [www.aakp.org](http://www.aakp.org)
- American Kidney Fund: [www.kidneyfund.org](http://www.kidneyfund.org)
- DaVita (dialysis provider): [www.davita.com](http://www.davita.com)
- Dialysis Patient Citizens: [www.dialysispatients.org](http://www.dialysispatients.org)
- Fresenius Medical Care (dialysis provider): [www.ultracare-dialysis.com](http://www.ultracare-dialysis.com)

Identify goal	Patient will describe basic function of the kidney
Identify potential tool	Kidneyschool.org
Review tool for best practice characteristics	<ol style="list-style-type: none"> <li>1. Does the program/website/material take advantage of technological and multimedia capabilities? <i>The site includes options to listen to modules in “audiobook” format.</i></li> <li>2. Does the program use voiceover and script messaging to accommodate low literacy levels and patients with visual deficits? <i>The site includes voiceover script messaging and the opportunity to view online or to print. The material is also in Spanish.</i></li> <li>3. Does the program design allow for easy access and manipulation? <i>Yes, the program is easy to navigate with clearly-marked tabs and Table of Contents</i></li> <li>4. Does the program allow patients to view material in a place and time where they are comfortable? <i>Users are able to access the material using a personal computer, laptop, tablet, or smartphone.</i></li> <li>5. Does the program incorporate questions and answers to reinforce important constructs and promote learner interaction? <i>Yes. The program includes questions and answers within the modules and quizzes at the end of each module.</i></li> <li>6. Does the program allow patients control over program sequence and depth of information provided? <i>Yes, the user can explore the module that is most relevant and navigate through the module at his or her own pace.</i></li> <li>7. How will using this program interact with existing education and company policy and procedure? <i>The information in Kidney School is unbiased and can supplement corporate materials or stand alone.</i></li> </ol>
Possible intervention strategies	<ol style="list-style-type: none"> <li>1. Before, during, or after treatment, invite the patient to look at the website in your office, using a clinic laptop or their smartphone or tablet.</li> <li>2. Demonstrate features of the website, including exploring basic educational information and patient stories.</li> <li>3. Review the Table of Contents with the patient to identify an interest level.</li> <li>4. Encourage the patient to review the module as many times as he or she desires in the next week.</li> <li>5. Ask the patient to bring in a post-test in one week.</li> <li>6. Review patient responses, discuss experience using the site, and review the Table of Contents again.</li> <li>7. Document patient participation under results in the Plan of Care.</li> </ol>

**Table 5. Multimedia patient intervention example**

Identify goal	Patient to identify key features of a fistula, including surgery, coping with needles, and appearance.
Identify potential tool	Let's Talk About...Fistulas ( <a href="http://lifeoptions.org/letstalk/">http://lifeoptions.org/letstalk/</a> )
Review tool for best practice characteristics	<ol style="list-style-type: none"> <li>1. Does the program/website/material take advantage of technological and multimedia capabilities? <i>The material can be viewed on the website or on YouTube with mobile devices.</i></li> <li>2. Does the program use voice-over and script messaging to accommodate low literacy levels and patients with visual deficits? <i>The video includes script messaging to supplement voice-over. The information is provided at 6<sup>th</sup> grade level.</i></li> <li>3. Does the program design allow for easy access and manipulation? <i>The user is able to access the movie from the website and plays when the hyperlink is selected.</i></li> <li>4. Does the program allow patients to view material in a place and time where they are comfortable? <i>The user is able to view the movie using a laptop, personal computer, or mobile device.</i></li> <li>5. Does the program incorporate questions and answers to reinforce important constructs and promote learner interaction? <i>The video does not incorporate questions and answers, but the website, lifeoptions.org, includes links to other programs that do offer question/answer components.</i></li> <li>6. Does the program allow patients control over program sequence and depth of information provided? <i>No, the information provides basic information about vascular access.</i></li> <li>7. How will using this program interact with existing education and company policy and procedure? (Modified from Fox, 2009) <i>The information is consistent with Fistula First initiatives, is un-biased and can supplement existing corporate material or stand alone.</i></li> </ol>
Possible intervention strategies	<ol style="list-style-type: none"> <li>1. Collaborate with nursing staff to create a vascular access lobby day.</li> <li>2. Set-up a laptop or computer in the lobby.</li> <li>3. Explain to patients in the lobby the resources available to help consider vascular access options.</li> <li>4. Demonstrate features of the website lifeoptions.org.</li> <li>5. Start the movie "Let's Talk about...Fistulas."</li> <li>6. Lead a discussion in the lobby about information that is surprising, personal experiences, fears, how others have coped.</li> <li>7. Demonstrate other resources for reviewing vascular access options.</li> </ol>

**Table 6. Social networking patient intervention example**

Identify goal	Patient to report increased sense of connectedness/decreased sense of isolation
Identify potential tool	Home Dialysis Central Facebook discussion board ( <a href="http://facebook.com/groups/122326728212/">http://facebook.com/groups/122326728212/</a> )
Review tool for best practice characteristics	<ol style="list-style-type: none"> <li>1. Does the program/website/material take advantage of technological and multimedia capabilities? <i>The discussion board includes the benefits and limits of Facebook.</i></li> <li>2. Does the program use voiceover and script messaging to accommodate low literacy levels and patients with visual deficits? <i>No, the information/experience is patient driven, so the information is easily accessible.</i></li> <li>3. Does the program design allow for easy access and manipulation? <i>Yes, the discussion board includes the benefits and limits of Facebook.</i></li> <li>4. Does the program allow patients to view material in a place and time where they are comfortable? <i>Yes, patients have access to Facebook with their computer, laptop, tablet, and mobile devices.</i></li> <li>5. Does the program incorporate questions and answers to reinforce important constructs and promote learner interaction? <i>The learner/user can interact in a way he or she is comfortable with. Users are able to ask questions and respond to other user questions.</i></li> <li>6. Does the program allow patients control over program sequence and depth of information provided? <i>Yes, patients are ultimately able to participate or not; they are in complete control of their participation.</i></li> <li>7. How will using this program interact with existing education and company policy and procedure? (Modified from Fox, 2009) <i>Patient participation in the discussion can support individualized plan of care goals to increase social support and address kidney disease quality of life concerns.</i></li> </ol>
Possible intervention strategies	<p>Introduce the discussion group to patients who demonstrate a high level of competency in managing their disease and are looking for opportunities to reach out.</p> <p>Introduce the discussion group to patients who describe feeling alone, or who ask questions, such as "How do other patients do this?"</p> <p>Follow up with patients whom you know participate in the group. Ask what they have learned or shared. Inquire as to interesting information they have learned that can be shared with peers. Invite the patient to collaborate in creating a bulletin board with information learned through participation in the group.</p>

- Medline Plus: [www.medlineplus.gov](http://www.medlineplus.gov)
- National Kidney Foundation: [www.kidney.org](http://www.kidney.org)
- National Kidney Disease Education: [www.nkdep.nih.gov](http://www.nkdep.nih.gov)
- NIDDK: [www.niddk.nih.gov](http://www.niddk.nih.gov)
- Renal Support Network: [www.rsn-hope.org](http://www.rsn-hope.org)
- Transplant Navigator: [www.kidney-link.org](http://www.kidney-link.org)
- Fistula First: [www.fistulafirst.org](http://www.fistulafirst.org)
- Kidney School: [www.kidneyschool.org](http://www.kidneyschool.org)
- Life Options: [www.lifeoptions.org](http://www.lifeoptions.org)

### Conclusion

The increase in the use of electronic devices and Internet access in adults with disabilities and chronic kidney disease has increased patient access to health information. The medical community has explored the benefits of Internet and computer-based education for promoting chronic disease knowledge and self-management. Standards of practice and best practice guidelines for the development of computer-based education program and health information websites are available to help social workers integrate technology into practice.

Wofford et al. identify the computer as a symbol of patient empowerment.<sup>18</sup> With the reported benefits and potential of online health information, multimedia education, and social networking in health care, the symbol of patient empowerment can be extended to collaborative education between the nephrology patient, the treatment team, and technology. NN&I

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