RHEUMATOLOGY NURSE
PRACTICE

Accredited education for registered nurses and advanced practice providers

THE RISE OF TELEMEDICINE IN RHEUMATOLOGY

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ISSUE **10** / VOLUME **4**

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RELEASE: SEPT 30, 2019 / EXPIRES: SEPT 30, 2020

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Support for this activity has been made possible through educational grants from Lilly, AbbVie, and Pfizer

Release date: **September 30, 2019**
Expiration date: **September 30, 2020**
Activity URL: **rnsnurse.org/rnpce**

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ACTIVITY DESCRIPTION

This issue of *Rheumatology Nurse Practice* will review how telemedicine has evolved in the last decade; how this communication and healthcare delivery modality is being used in today's healthcare environment to solve access-to-care problems; the evidence for the efficacy of telemedicine; and what the future of telemedicine in rheumatology holds.

LEARNING OBJECTIVES

After participating in the activity, learners should be better able to:

- Differentiate between the terms "telemedicine" and "telehealth"
- Identify reasons for the likely growth of telemedicine in the United States
- Assess the pros and cons of telemedicine patients visits as compared to face-to-face encounters
- Analyze potential opportunities to introduce/expand the use of telemedicine in your current practice

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THE RISE OF TELEMEDICINE IN RHEUMATOLOGY

The growing prevalence of rheumatologic diseases, rheumatology workforce shortages, and limited access to specialist rheumatology resources in many areas of the United States make telemedicine a particularly attractive modality for delivering healthcare services to patients. Telemedicine also offers an approach that has the potential to reduce healthcare and patient costs, by, for instance, limiting hospital visits and reducing patient travel time to specialist clinics.[1] Indeed, an emerging body of research underscores the feasibility and patient satisfaction for telemedicine in rheumatology (or telerheumatology), and points to several possible applications of telemedicine as an effective healthcare delivery modality in this specialty.[2] However, barriers to the widespread implementation of telemedicine are many.

Term Definitions

Telemedicine or Telehealth?

The American Telemedicine Association (ATA) defines telemedicine as "the exchange of medical information from one site to another through electronic communication to improve patient health."[3] Although telemedicine and telehealth are often used as interchangeable terms, historically, telemedicine more specifically denotes bilateral communication between clinicians via, for instance, interactive, videoconferencing or electronic transmission of radiographic and other images from one clinician to another.[4] The three most common methods that support telemedicine are synchronous, asynchronous, and remote monitoring (Figure 1).[5]

Figure 1
Telemedicine Communication Modalities[5]

1. **Synchronous telemedicine** communication occurs simultaneously in real-time, via radio, telephone, or videoconferencing systems.
2. **Asynchronous communication** involves delayed electronic consultation, for instance via electronic health records (EHR) or store-and-forward technology, such as transmission of still images and clinical data (e.g., x-rays).
3. **Remote monitoring** can be either synchronous or asynchronous via technologies such as wearable health monitors (e.g., Holter monitors or other devices) or symptom-tracking applications.

Telehealth is generally considered a broader term than telemedicine that, in addition to telemedicine, includes a wide range of technologies, tools, platforms, and services (e.g., patient portals, wearable monitors, smartphones, clinical decision support tools). The expansion of high-speed Internet, satellite-based systems, and high-definition cameras, virtual stethoscopes, fiber optic clinical instruments, and remote ultrasound have supported the growth of telehealth services.[5] Therefore, in practice, telemedicine-based communication now typically includes not only clinician-to-clinician communication, but also clinician-to-patient exchanges in the context of remote diagnosis and management, as well as patient-to-mobile health technology in the context of disease self-management (Figure 2).[3]

The Growth of Telemedicine in the United States

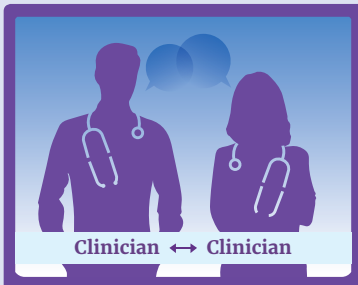
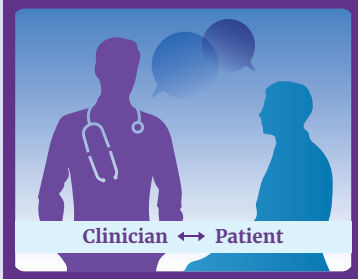
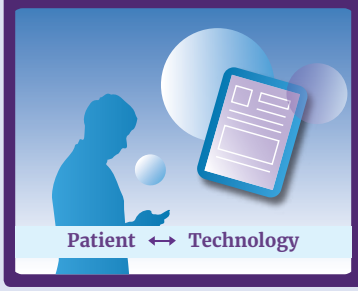
Telemedicine in the United States has existed since at least the 1980s, mostly in the form of store-and-forward technologies that allow clinicians to share information, and has long been seen as a potential modality for efficient delivery of healthcare services to patients in remote geographic areas. More than a decade ago, the World Health Organization published a report on e-health (i.e., the use of mobile devices, digital technologies, and web-based applications) that unequivocally described telemedicine as a valuable tool for diagnosis, treatment, rehabilitation, and follow-up monitoring of patients with a range of diseases, including rheumatologic conditions.[6] This promise has been boosted in the last 30 years. The ubiquity of Internet-linked mobile computers, laptops, and communication platforms (e.g., Skype) has expanded the potential for telemedicine and enabled improved virtual, direct communication between providers and patients. Health policy reform in the last decade (e.g., the 2009 Health Information Technology [HITECH] Act) also boosted telemedicine through funding designed to reduce health disparities and modernize information infrastructure. As a result, telemedicine has grown to meet the needs of patients who live in regions that are underserved or lack sufficient access to medical specialties such as oncology, as well as populations that have high mortality rates and high rates of unnecessary hospitalization.[4] In addition, telemedicine has grown in response to the demand for reducing healthcare costs and, according to a recent Evidence Map developed by the Agency for Healthcare Research and Quality (AHRQ), is likely to have the widest applicability as a care delivery modality in the context of chronic disease and behavioral health management.[7]

The Healthcare Information and Management Systems Society (HIMSS) estimates that at least two-thirds of U.S.-based healthcare organizations and almost half of U.S. hospitals currently use some form of telemedicine.[4] The AHRQ Evidence Map provides more color as to the form of telemedicine services being used in clinical practice. Approximately half of telemedicine encounters currently use video links or asynchronous communication (e.g., email); <5% involve the use of a mobile phone, and approximately 25% of telemedicine services involve the sharing of images or other diagnostic output (e.g., electrocardiography) between clinicians for consultation purposes.[7]

Who Uses Telemedicine?

Although there is, to date, little published data on the experience of telemedicine adoption in the United States, health systems that service defined patient populations or patients in rural areas appear to have

Figure 2
Uses of Telemedicine[3]

	Telemedicine Tools	Telemedicine Services
	• Clinicians often communicate through email, video, or both	• Dermatology • Radiology • Surgical Peer Mentoring • Emergency Trauma • ICU Care
	• Video • Phone • Email • Remote Wireless Monitoring • Internet	• Care for Chronic Conditions • Medication Management • Wound Care • Counseling • Postdischarge Follow-up • Mental Health
	• Wearable Monitors • Smart Phones • Mobile Apps • Video • Email • Web Portals • Games	• Health Education • Monitoring of Physical Activity • Monitoring of Diet • Medication Adherance • Cognitive Fitness

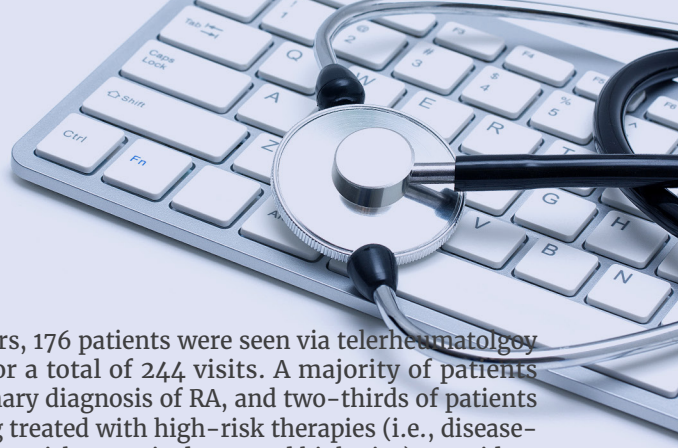
been most effective in capitalizing on its promise. Notably, the U.S. Department of Veterans Affairs (VA) is the largest provider of telemedicine services in the United States, using it extensively for several years. In 2014, the VA reported more than 2 million telemedicine encounters with just under 50% involving veterans living in rural parts of the country.[4] Many other large health systems are using telemedicine to deliver at least some healthcare services. For instance, Northern California–based Kaiser Permanente reported that its virtual communications (email, telephone, video) exceeded its in-person encounters in 2016.[3] Other healthcare systems, including Geisinger Health System, Intermountain Healthcare, and Partners Healthcare all report using telemedicine services to address challenges such as provider shortages, reducing patient travel burden, and providing access after normal clinic hours.[3]

A recent *Lancet* report identified five key trends that are likely to accelerate the wider adoption of telemedicine services in healthcare.[3] These trends include the following:

1. Projected shortages in the clinical workforce
2. The growth of consumerism in healthcare
3. Continuous development in consumer technologies (e.g., wearables and other health technologies)
4. Continuous development in clinical decision-support systems (e.g., electronic health records)
5. The ongoing reorganization of the delivery and financing of healthcare

Other trends also point to the likelihood of steady growth in telemedicine. Changes in health policy, such as the Medicare Access and CHIP (Children's Health Insurance Program) Reauthorization Act (MACRA), also encourage the use of remote monitoring or telehealth to support care coordination, even though direct reimbursement for some services may not yet be available.

A Telerheumatology Case Study



Background

Telemedicine is increasingly viewed within rheumatology as a strategy to close the workforce disparity gap and as a modality to bring specialty care to patient populations in underserved and rural areas. Dartmouth-Hitchcock Medical Center (DHMC) is a non-profit academic health system that developed telerheumatology services to bring specialty care to the states of New Hampshire and Vermont.[15] Approximately two-thirds of the population of these states lives in rural areas with limited resources and access to specialist rheumatology care. The telerheumatology services were provided by three attending physicians in two sites and evaluated as part of a quality improvement (QI) initiative to better understand patient experiences with telemedicine and identify areas for improvement.

Intervention

Telemedicine clinics were offered monthly or twice-monthly on a half- or full-day basis. Clinicians connected to remote sites using their own office computers via HIPAA-compliant software, with a telephone landline as backup should their Internet connection fail or waiver. Patients used a computer on wheels (COW) at the patient site that was augmented by several assistive devices to support clinical examination such as a remote-controlled camera, a dermoscope for skin and nail evaluation, and a digital stethoscope. Presenters participated in web-based training focused on targeted musculoskeletal (MSK) examination skills for targeted rheumatic diseases.

Methods

Evaluation consisted of manual chart review; web-based assessment of physician satisfaction of their experience, including the presenter's ability to convey information about physical findings; and semi-structured interviews with physicians, patients, and presenters (nurses and a medical assistant). Data analysis focused on cost savings.

Results

In two years, 176 patients were seen via telerheumatolgoy services for a total of 244 visits. A majority of patients had a primary diagnosis of RA, and two-thirds of patients were being treated with high-risk therapies (i.e., disease-modifying antirheumatic drugs and biologics). Providers were satisfied with 57% of telemedicine encounters; however, they viewed 19% of patients as inappropriate candidates for telemedicine for various reasons. For instance, in some cases it was challenging to determine the disease etiology from patient symptoms, or physical examination for inflammatory conditions was challenging to conduct via the telemedicine modality. The overall patient satisfaction rate for the telemedicine experience was 66%; the areas of strongest satisfaction included the friendliness of local clinical site staff, the ease of accessibility of video-conferencing equipment, and the perceived competence of offsite physicians. It was estimated that the program saved patients a total of $26,938 on travel for specialist consultations.

Conclusion

Telerheumatology can be an effective modality for managing various rheumatologic conditions for patients living in rural areas; however, despite the use of standardized, high-definition equipment to visualize skin and joints, there was a learning curve for both presenters and physicians to become skilled at handling the equipment. Moreover, the level of presenter skill in conveying information about physical examination findings represented a major barrier to effective and accurate telerheumatology outcomes. As a result of this study, the researchers proposed a triage tool to more accurately and effectively identify patients who are appropriate candidates for telerheumatology.

Glossary[5,37]

Telemedicine	Exchange of medical information from one site to another via electronic communication to improve a patient's health status
Telehealth	The use of telecommunication methodologies to enhance health care, public health, and health education delivery
Telerheumatology	Rheumatology care delivered via telemedicine
Spoke/Originating Site	Physical location of patient at time of service
Hub Site	Physical location of provider at time of service
Presenter	Person who is with the patient during the telemedicine visit, facilitates the physical examination, and manages remote equipment
Store and Forward	The means by which patient information is gathered, stored and forwarded to consulting provider for review.
eConsult	Asynchronous provider-to-provider consult.

Telemedicine in Rheumatology

The Need for Telemedicine in Rheumatology

In rheumatology, increasing attention has been paid to telemedicine as a means to target underserved populations and alleviate issues related to the workforce shortage.[8] A 2015 American College of Rheumatology Workforce Study calls attention to demographic and other changes as factors that are likely to accelerate the adoption of telemedicine in rheumatology. Notably, not only is the population aging but the number of people affected by rheumatologic conditions is also growing. According to the Centers for Disease Control and Prevention, 22.7% of the adult population currently suffers from physician-diagnosed arthritis, with even higher prevalence among adults with other conditions such as heart disease, diabetes, and obesity.[9] Millions of adults are also afflicted with a range of other non-inflammatory rheumatic conditions, and it is estimated that by 2040, 78 million patients could be affected by arthritis and other rheumatologic conditions.[10]

By 2030, the increasing prevalence of rheumatologic conditions will be compounded by high levels of retirement among Baby Boomers, resulting in a shortfall of adult rheumatologists and rheumatology providers. In 2015, there were 6,013 healthcare providers working in rheumatology, or 5,415 full-time equivalent (FTE) providers; this number is anticipated to shrink to 4,882 providers by 2030 (4,133 FTEs).[11]

The distribution of rheumatology providers varies geographically. While 21% of rheumatologists practice in the Northeast, only 3.9% practice in the Southwest.[12] Many rural parts of the United States are located more than 200 miles from the nearest rheumatologist.[13] This distance deficit often has dire consequences for patients. For instance, rates of diagnosis for rheumatoid arthritis (RA) are lower and the likelihood of receiving appropriate therapies is reduced for Medicare beneficiaries the further they live from specialized rheumatologic care.[14] The hesitancy of primary care providers to initiate treatment for patients with rheumatologic diseases exacerbates delays in treatment initiation and also poses a persistent barrier to the goal of tight disease control and achievement of disease remission, especially in patients with RA and systemic lupus erythematosus (SLE).[8]

Additional Applications of Telemedicine in Rheumatology

Not all telemedicine encounters in rheumatology actually require a physical examination. In addition to live, virtual interactions between clinician and patient, telemedicine in rheumatology has been proposed as a modality to support remote self-assessment of disease activity in patients with stable disease, telemonitoring of treatment targets, and delivery of disease management programs.

Remote Monitoring and Self-Assessment of Disease Activity

Remote monitoring of disease activity via smartphones is emerging in certain disease states such as cardiovascular disease, oncology, and psychiatric conditions as a more cost-effective, real-time approach to using telemedicine as a care delivery strategy. Smartphones and use of digital channels (i.e., email, short message service [SMS], social media) for remote monitoring have stronger appeal and are more readily used among younger than elderly people,[16] especially younger people living with long-term conditions, including rheumatologic conditions. A large, mixed-methods study in the United Kingdom found that younger people with long-term conditions variously used digital channels to communicate with their clinical teams in ways that supported self-management as an adjunct to clinic visits and fostered better patient engagement.[17] In rheumatology, one study is currently ongoing to investigate remote monitoring via smartphone and SMS in patients with early RA.[18] The study hopes to identify patients who need medication reassessment in real-time prior to scheduled follow-up visits.

A different approach to remote monitoring in rheumatology was explored in a study that assessed the accuracy of a hand dynometer in assessing RA disease activity. The device measured handgrip strength and transmitted assessment data to a specialist via a smartphone.[19] Investigators found that measures of handgrip strength correlated well with the Disease Activity Score 28 (DAS28) and suggest that this kind of self-assessment could be used in ambulatory settings to aid remote assessment of disease activity. Another study using smartphone technology investigated the accuracy of a modified version of DAS28 as a means to calculate and self-report tender and swollen joint counts.[1] This study found good correlation between self-report with modified DAS28 and clinician-assessed DAS28. Research is ongoing to explore the applicability of digital assessment and smartphone feedback for other patient-reported outcomes (e.g., pain, fatigue).[20] Such research involves assessing the utility of smartphones with built-in sensors such as accelerators and gyroscopes to measure disease activity and support self-management.

Treatment Target Telemonitoring

Telemonitoring of tight therapeutic control has also been studied in patients with RA. The Remote Tele-monitoring for Managing Rheumatologic Condition and HEalthcare programs (RETE-MARCHE) trial provided a website to which patients could upload RA Impact of Disease (RAID) questionnaire data based on symptoms and disease activity.[21] If preset thresholds were not met within a specific time period, the system alerted a clinical case manager and triggered a request to the patient to return to the clinic for a follow-up visit. Patients in the

intervention group achieved their therapeutic target faster than patients in the control group and reported a high satisfaction rate with the telemonitoring experience.[21]

Disease Management Program Delivery

The use of telemedicine to deliver self-management programs has also been investigated in RA and other rheumatic diseases such as systemic sclerosis, fibromyalgia, and osteoarthritis. Many telemedicine self-management programs in rheumatology are delivered asynchronously via web-based platforms that allow home-based access to content and do not require clinicians and patients to interact in real-time. However, a recent systematic review of these studies concluded that while web-based telemedicine programs have high feasibility and patient satisfaction rates, their effectiveness in achieving health status outcomes is variable.[1]

Assessing the Evidence for the Efficacy of Telemedicine in Rheumatology

Improving Access to Specialized Care and Patient Outcomes

A small number of studies show that telemedicine can be an effective modality for expanding patient access to specialized care, improving health status, and reducing costs in rheumatology. For instance, the University of Pittsburgh Medical Center (UPMC) uses telemedicine to bridge the gap in patient access to rheumatologists. Patients can attend a regional UPMC facility and connect with one of 133 telemedicine providers via video conferencing. This approach has increased access to specialist care for patients who otherwise are often unable to travel to see a rheumatologist.[22] Similarly, a study of pediatric rheumatology patients in Missouri found that patients and their families using telemedicine at a remote outreach site reduced their travel distance by almost two-thirds, incurred less time off work and school, and spent less money on food than they would if they had traveled to the main site for care.[23]

There is also some evidence that telemedicine can improve patient outcomes. In a small study, a higher percentage of patients (N=21) who received intensive treatment via telemonitoring achieved remission after one year compared to 20 patients who received conventional care (38.1% vs 25%, P <.01). These patients also reached remission more quickly (median time 20 weeks vs. 36 weeks), had greater improvements in functional impairment (71.4% vs. 35%) and comprehensive disease control (19.4% vs. 5%). In addition, a greater proportion of patients in the intervention group had lower progression of radiological damage from baseline (23.8% vs. 10%).[21]

Is Telemedicine Cost-Effective?

Telemedicine is typically viewed as a strategy to reduce overall healthcare costs and specifically travel costs for patients. A recent systematic review concluded that there is some evidence to support the cost-effectiveness of telemedicine,[5] and a long-term follow-up comparison of telemedicine vs. usual care among patients with inflammatory arthritis in a federal health system reported that care delivered via telemedicine significantly reduced costs and travel distance.[24] In this follow-up, patient satisfaction with telemedicine encounters was high, and outcomes, which were assessed by Routine Assessment of Patient Index Data 3 (RAPID-3) scores, were similar between both groups.[24] However, upfront investment for telemedicine equipment and personnel can be considerable and needs to be considered when accounting for cost savings. Methods for tracking telemedicine modalities and cost outcomes are currently lacking, and, therefore, it is challenging to deduce the potential cost-effectiveness of telemedicine in rheumatology.[25,26] Moving forward, economic evaluations of telemedicine in rheumatology will be required to inform decision-makers about its efficiency and cost-effectiveness.[1]

Patient Satisfaction and Experience of Telemedicine

Many studies on telemedicine in rheumatology have focused on evaluating patient and physician satisfaction with the experience of this care delivery modality.[27] For instance, an evaluation of a VA Rheumatology Clinic in Palo Alto, CA, surveyed patients (N=37) immediately following their telemedicine encounter with a nurse practitioner (NP) and a rheumatologist.[28] All patients had a subsequent, in-person visit with the same rheumatologist at the primary community-based outpatient clinic. This encounter was followed by a telephone survey to evaluate satisfaction with both the virtual and in-person encounter. All patients rated the telemedicine encounter as highly effective (10/10). Some differences emerged in preferences for in-person encounters. Among patients with chronic inflammatory conditions or crystal arthropathies, 66% preferred the in-person over telemedicine visit, and 42% of patients with non-inflammatory conditions preferred the in-person visit. Nonetheless, 81% of all patients surveys remained highly satisfied with the NP/rheumatologist telemedicine encounter when questioned in a follow-up telephone survey immediately following the second in-person encounter.

Most satisfaction studies show that patients who receive healthcare via telemedicine are generally satisfied with their experiences and outcomes; however, some studies suggest that in order for telemedicine to be effective, the first patient-provider interaction should be face-to-face and patients should see the same provider at follow-up telemedicine visits.[29]

Despite the promising results of these and other small studies, the evidence to support telemedicine in rheumatology remains limited in scope, and the effectiveness of telemedicine may vary by disease, phase of care, and methods of telemedicine employed.[5] A systematic qualitative analysis of the published and informal literature on the use of telemedicine for the diagnosis and management of inflammatory and/or autoimmune rheumatic disease found that telemedicine was most commonly used for the diagnosis and management of inflammatory arthritis. Studies included in the review frequently cited improving access to rheumatology care as a goal of using telemedicine. Video-teleconferencing (VTC) and telephone were the telemedicine methods most commonly used by physicians, nurses, and patients, although levels of training for using telemedicine varied. Most studies were observational vs. randomized in design, baseline patient demographic data were often absent from the published results, and cost savings data were seldom included. However, post-intervention participant surveys described in these studies reported high levels of patient satisfaction with telemedicine (range: 75-80%) and most providers found telemedicine to be an effective diagnostic and management modality.[5]

Potential Challenges with Telemedicine

Diagnostic Accuracy

There are several potential challenges associated with using telemedicine for diagnostic purposes in rheumatology. A telemedicine diagnosis relies on a proxy physical examination by the onsite presenter (often a community health worker, medical assistant, or nurse) who needs to be sufficiently trained to capture all the parameters required in a full rheumatologic physical examination, as well as be able to accurately convey that information to the telemedicine rheumatologist. To date, studies have mostly found acceptable correlation between telemedicine and face-to-face diagnostic accuracy. A nonrandomized study investigated this challenge by comparing rheumatologist diagnostic accuracy by telephone, followed by VTC, and in person.[30] The researchers found that diagnostic accuracy was poor by phone alone but improved considerably with VTC. The evaluation of a VA Rheumatology Clinic described elsewhere in this article found an overall diagnostic correlation between the telerheumatology and face-to-face visits of 79%;[31] other studies have similarly found an acceptable degree of diagnostic accuracy associated with telemedicine.[5]

Reimbursement for Telemedicine

Insurance coverage and provider reimbursement play a significant role in determining the viability of telemedicine in clinical practice. Coverage and reimbursement policies for telemedicine vary considerably across payers and are currently considered a primary barrier to more widespread adoption of telemedicine in rheumatology and other specialties. Although a survey of large employers by the National Business Group on Health suggests that by 2020 almost all large employers will cover telehealth for their employees,[3] Medicare is notably more restrictive than commercial payers or Medicaid for telemedicine services. Currently, Medicare plans limit the use of telehealth services to rural Health Professional Shortage Areas (HPSAs) and generally require that patients using these services be physically located in outpatient offices/clinics, hospitals, Federally Qualified Health Centers, or Skilled Nursing Facilities.[4] Medicare also provides a list of procedures that are reimbursable if the required conditions are met—including arthritic pain—and sets limitations on the kinds of technology that can be used, as well as on the type of provider that is covered (Figure 3). If a telemedicine service is covered, Medicare pays the consulting clinician for professional services at the distant site, pays a smaller facility fee to the originating site (where the patient is located), and pays for store-and-forward services (e.g., digital image review).

Figure 3
Distant Site Practitioners Who Can Receive Payment for Covered Telehealth Services[38]

- Physicians
- Nurse practitioners
- Physician assistants
- Nurse-midwives
- Clinical nurse specialists
- Certified registered nurse anesthetists
- Clinical psychologists
- Clinical social workers
- Registered dietitians or nutrition professionals

Medicare Advantage (MA) plans are required to provide Medicare-covered telehealth services, and many commercial plans also offer access to remote technology services for MA enrollees.[4] The Center for Medicare and Medicaid (CMS) is currently testing coverage models for telehealth via the Next Generation Accountable Care Organization Demonstration program, which enables patients to receive telehealth services in their home whether or not they are located in an HPSA area. A majority of Medicaid and many employer-based health plans currently provide some level of coverage for telehealth services, including telemedicine consultations,

and, in the case of Medicaid, home health services via video-calling or conferencing apps such as Skype™, FaceTime™, or Google Hangouts™.[32,33] In addition, 32 states have telehealth parity laws, which require that commercial payers reimburse telehealth services at the same rate as in-person consultations.[3]

A recent Department of Health and Human Services report to Congress emphasized the critical necessity of payment reform to support the deployment and use of telehealth modalities. Such reform is likely to require that Medicare coverage and reimbursement is more comprehensive; high-speed broadband connections to more rural hospitals and clinics expanded; and state licensing go through some changes.[4]

State Licensing Laws

Practice standards and state licensure laws constitute additional barriers to implementing telemedicine more broadly in the United States. For instance, definitions of what constitutes a provider-patient encounter may differ across states, and there is considerable variation in the rules governing the presence of an onsite tele-presenter, NP practice laws, and more. The Federation of State Medical Boards (FSMB) in 49 states currently requires that physicians who provide telemedicine services are licensed in the state in which the patient resides. In contrast, physicians working in the VA can maintain one active, unrestricted license to practice in any VA facility in any state, and other providers need be credentialed only once.[4] Although 14 states currently allow physicians to acquire a special purpose license to provide telemedicine services across state lines, this provision can be administratively burdensome. Therefore, the FSMB created the Interstate Medical Licensure Compact to ensure a more streamlined process that supports multistate licensing for physicians.[4] By 2016, 12 states had implemented this licensing process.

Broadband Connectivity and Privacy Concerns

In order to be effective and accurate, telemedicine clinical tools must work seamlessly together and integrate patient-generated data and other data streams with EHRs, yet many regions still lack access to broadband speeds that are compatible with advanced telehealth applications.[34] Moreover, more than half (53%) of people living in rural U.S. areas do not have access to basic broadband,[4] and the cost of broadband services is often higher in rural areas than in urban settings.[16] These deficits pose substantive barriers to the expansion of telemedicine.

Privacy and security issues are also growing areas of concern as patients generate more real-time location and biometric data, and interact more frequently with health data.[35] As with face-to-face consultations, the Health Insurance Portability and Accountability Act (HIPAA) regulates the health data generated via telemedicine encounters between providers and patients, as well as provider national identifiers. However, federal and state guidelines for telehealth security and privacy are not yet standardized, although many medical specialty and other organizations (e.g., HIMSS) have suggested an array of administrative, physical, and technical safeguards to enhance security and defray privacy concerns, including a comprehensive framework regulated by a single federal entity.[36]

Conclusion

Currently, few studies have investigated the impact of various telemedicine modalities on patient outcomes in rheumatology, although existing studies are relatively encouraging. Notably, telemedicine in rheumatology appears to have feasibility as a remote adjunct to in-person triage consultations and as a modality for monitoring tight control of disease activity and treatment. Nonetheless, there is an urgent need for research that evaluates the primary evidence for telehealth consultation in rheumatology, the effect of telemedicine on healthcare costs and utilization, and the potential for expanding the role of NPs, PAs, and other providers through telemedicine.

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Doing What We Do Best: *Listening*

by Iris Zink, MSN, NP, RN-BC

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One of my college professors once told me, "Iris, if you listen hard enough, the patient will tell you what is wrong with them." Apparently, I had been complaining a little too much about all of the potential diagnoses I was expected to keep in my head and was feeling unprepared and overwhelmed at graduation time. This was my professor's way of calming me down.

Turns out, her advice was spot on.

On a daily basis, we all encounter patients who we simply cannot help enough. Personally, I am particularly frustrated with my inability to help patients with hypermobile Ehlers-Danlos syndrome. And don't get me started about the challenges of our fibromyalgia patients, who desperately need us to do something although that "something" is rarely obvious.

It's times like these when I remember my professor's advice, take a deep breath, look my patient in the eye, and ask them to tell me their story. Nothing fancy, nothing complicated. They talk, I listen.

I can't tell you how many times, at the end of telling me their story, patients have come over, hugged me, and said, "I always look forward to seeing you. You always make me feel better." I often have to tell them, "But I didn't do anything. I haven't offered anything to fix what's wrong with you." Their response? "But you listen, and you care."

Let me give you an example.

JT was 26 years old when she first came to see me after having been to a number of previous healthcare providers and failing to obtain the relief she needed. She initially complained of persistent joint pain that was worst after exercise, a lifelong history of "clumsiness," unusual flexibility that always impressed her friends, and a 7-year history of dizzy spells and near syncope. I didn't rush to a diagnosis or a quick fix. I listened to JT's story and ordered a panel of lab tests. Then I thought about the information I had collected. It all helped me reach a diagnosis of benign joint hypermobility syndrome with features of positional orthostatic tachycardia syndrome.

I initially set JT up with a physical therapist I trusted and referred her to a cardiologist who specialized in the treatment of autonomic neuropathy. She was relieved to receive a comprehensive plan of care and a formal diagnosis to explain her unusual collection of symptoms.

Then there was KW, a 60-year-old female with recurrent sleep problems, chronic widespread pain, headaches, paresthesia, and irritable bowel syndrome. During our initial conversation, KW told me that she had recently been suicidal due to the constant battery of healthcare appointments and tests she had been through with no conclusive answers provided to her. I eventually diagnosed KW with fibromyalgia. Again, she was relieved to

What we really need to do more than anything else is to listen to our patients, and that can be done regardless of whether they are sitting directly in front of us or in front of a computer 250 miles away.

finally have a name to attach to her symptoms, even if I couldn't offer any immediate relief.

These are just two recent examples of patients who I helped more by listening than anything else.

There has been considerable discussion about how telemedicine can never work in a specialty such as rheumatology where we traditionally have relied upon touching our patients and evaluating their joints. I disagree, and as shown throughout this issue, the data is there to support me.

What we really need to do more than anything else is to listen to our patients, and that can be done regardless of whether they are sitting directly in front of us or in front of a computer 250 miles away. By listening to our patients, we'll be able to tell if they are struggling with their current treatment regimen or if they perhaps have an additional undiagnosed or misdiagnosed autoimmune disease that we need to address.

Certainly, there are issues that need to be solved—as an example, there have been lengthy discussions about MIPS and MACRA and how a telemedicine visit can be coded to make it financially viable. I'm hopeful that we'll figure out some of those things in the near future.

While telemedicine won't allow me to hug my patient, it will allow those individuals who live 3 hours away or who work full time and can't afford another day off to "see me" while sitting in their home or place of business. Maybe I won't be able to bill as much as I would for a traditional face-to-face visit, but as long as there is reasonable financial remuneration, I can certainly see telemedicine playing a vital role in our future.

I recently read a study report that drove home the need to be more flexible with my patients. The takeaway from the study was that fibromyalgia patients are less likely to commit suicide if they see their healthcare provider more often.[1] It was the kick in the butt I needed not to ignore my patients who need the most care. How often have we all been tempted to postpone a follow-up visit for 6 months or a year in someone who we don't feel we can help with a pharmacologic solution? It's at these times that we need to remember one thing—nursing is about caring and listening to our patients, even if there is no quick fix. Sometimes, a compassionate ear is what our patients need most of all.

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Improving Our "Webside" Manners

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In a very general sense, telemedicine is the practice of diagnosing and treating of patients through means of telecommunication. Recognizing the likely future growth of telemedicine, the American Telecommunication Association was formed 4 years ago to encourage medical training programs to incorporate telemedicine training into their curriculum. From my perspective, this is an idea that certainly seems timely, yet there are a number of short-term hurdles in our way.

The first is that a reliable computer or mobile device and high-speed Internet access are essential both for providers and patients to make telemedicine work. This is rarely an issue on the provider side, but are our patients truly ready?

Data show that less-affluent seniors with lower levels of education have an improving relationship to technology, though there is still progress to be made. According to a Pew Research Center report, in 2000, only 14% of Americans ages 65 and older were Internet users. In 2017, it was up to 67%. That still leaves a good chunk of older adults who are unconnected, but the gap between "haves" and "have nots" is certainly trending in the right direction.[1]

We all know that many of our older patients live at or below the federal poverty level and receive their care through Medicare and/or Medicaid. For them, technology is often a luxury instead of a necessity. Even today, I see hospitalized patients who ring for a nurse and speak into the television remote expecting it to talk back to it. Yes, it still happens.

At the 2018 American College of Rheumatology meeting, I attended a lecture that provided a glimpse into the future of medicine in 2030. The presenters predicted an environment where lab results and X-rays could be uploaded immediately into the patient record and a patient could receive a diagnosis and be prescribed medications without any actual input from a healthcare professional.[2] While this may sound like a "doomsday" scenario for many of us, the purpose of the presentation wasn't to scare the audience, but rather to help us realize that the art of medicine is evolving quickly. Don't forget that it wasn't so long ago that we were updating paper charts of our patients by hand and had huge files cabinets full of individual records. Not anymore.

As a rheumatology nurse, I see many advantages and disadvantages to the predicted evolution of our profession. Certainly, I recognize that most of us have patients who travel for hours for an in-office visit, which is a huge burden for someone in chronic pain. Many of us also see patients who are homeless, living in a broken-down car, bus station, or homeless shelter. For them, getting any sort of transportation to reach us is a huge challenge, and finding a better system where they could "report in" from somewhere more convenient would be a tremendous benefit.

Then there are the downsides. Certainly for those of us who work in rheumatology, but with other specialties as well, there are some things that we find out only upon a face-to-face examination or discussion with a patient. For instance, I had a recent patient, LT, who had a 20-year history of RA but was regularly nonadherent to her medication regimen for a variety of reasons, including her weight (about 350 pounds), lack of nearby public transportation, and others. LT has been prescribed several biologics during the course of her disease, but due to frequent infections, rarely lasts longer than a few months on any of them.

Last month, LT arrived in my office for a scheduled check-in. She was in terrible pain, with only one DMARD being taken to control

her pain. I greeted her like a long-lost friend ("You are here! So nice to see you!), trying to start the visit on a positive note. Despite insurance hurdles, our in-house authorization department was able to get permission to perform lab tests and X-rays while LT was in our office—she's a patient who almost never will follow up for these once she leaves our walls.

I began my physical exam, not surprisingly finding more than a dozen tender and swollen joints. While LT's lungs were clear, I noticed a distinct, unpleasant odor coming from her abdomen. Lifting up her belly fold, I found a large abdominal wall infection measuring approximately 18x10 inches with a purulent discharge. I asked LT about this, and she said that while she was aware of the odor, she thought it might have simply been her urine. She then admitted to me that her feet are so painful that she is rarely able to bathe.

I was afraid what I would see when I removed LT's shoes. She protested vehemently, but eventually let me take a look. Her feet were edematous, and, to my horror, there was one toe nail that had been unattended for so long that it had grown into the nail on the adjoining toe. Not surprisingly, both toenails were infected.

Things got worse (OK, maybe not worse, but still pretty bad). LT's labs came back showing an albumin of 1.0 g/dL, significantly low. She explained this result by saying her diet consisted mostly of cookies because they were cheap and required no preparation. Needless to say, her white count and acute phase reactants were extremely elevated as well. It didn't take a highly-qualified medical professional to figure out what was immediately needed—wound care, antibiotics, a nutritional consult, and Meals on Wheels through LT's church were all ordered.

Here is my question to you—if this is a patient who had been limited to telemedicine visits, how many of her issues would I have missed? Of course, I realize that LT isn't a typical RA patient, but then how many "typical" patients do we see any more? There are so many patients of mine who have layers of defenses or excuses built up that I need to break down to get to the crux of their current issues. I simply don't think that is something you can replicate through technology.

There are currently 46 states that reimburse telemedicine visits in some capacity.[3] I do believe that telemedicine has its place, but it cannot be a replacement to a hands-on physical exam. I look back at all of the advances we have made in rheumatology in the last decades that have moved our practice forward and improved the lives of our patients—things like self-injections and same-day arthroscopic surgeries—but I also hold dear the personal, 1-on-1 time with my patients. That is one thing I hope never goes away.

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Taking a Different Bite Into the Telemedicine Debate

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Ten years ago, our office had not even implemented an electronic health record (EHR) system, let alone started to think about telemedicine and its potential impact on practice. Today, though, with a shortage of rheumatologists and a growing problem with patient access to care, we are indeed starting to see the potential benefits of utilizing telemedicine in our practice. In some ways, in fact, we are already using it on a daily basis. Through the patient portal linked to our EHR, we are able to communicate with patients from afar, helping a patient who may be flaring while out of town who is in too much pain to travel into the office. I have also had several patients send me pictures of rashes or swollen fingers so that we are able to quickly assess their immediate problems and treat them as necessary. This is just the tip of the iceberg when it comes to the potential of telemedicine, but it's been an important toehold for us and our patients.

In a small handful of our patients, telemedicine has already made a major difference.

(Note to reader: This story kind of meanders a bit before coming back around to telemedicine, so just bear with me. I promise it'll be worth it!)

There are a variety of subjects we are taught about growing up that are considered to be somewhat taboo, icky things that most people are uncomfortable talking about except with very close family and friends. Things like lice. Or tapeworms. Or bedbugs. Yes, those creepy, crawling things that can mysteriously show up in your bed without warning and cause a lot of problems.

For some reason, for an unusually high percentage of patients in our practice, bedbugs are a big problem. They are difficult to eradicate and often require expensive treatments that are unaffordable for many of my patients.

My first encounter with bedbugs took place several years ago in a patient who was receiving infusions to help manage her rheumatoid arthritis. During one of our regularly-scheduled appointments, this patient admitted to me that she thought she had bedbugs in her house, which alone was a courageous thing to admit. A brief physical assessment showed that she did indeed have active bites on her arms and legs.

So what to do? There was no "bedbug protocol" to follow within our practice, so we made the

"In a small handful of our patients, telemedicine has already made a major difference."

decision to hold her infusion until there was no evidence of actual bites to avoid the risk of infection. While I believed (and still do) that it was the right decision, the patient was embarrassed and felt we were punishing her because of something beyond her control. Fortunately, this was a patient who could afford an extermination, and she was able to get her infusion the following week.

This experience prompted our office to begin working on a "bedbug" protocol. Previously, with any known bedbug exposure in our office, we would close off any exam room or waiting area that had been exposed and call in an exterminator. Obviously, this came at a cost to the practice and was inconvenient for patients and providers. Upon further research, though, we learned that there was a local company who had a dog trained to locate bedbugs. This dog could signal to its owner whether there was an infestation or not—yes, a bedbug-sniffing canine! Who knew? Our research in finding this company saved our practice money since we now only exterminate if the dog-sniffing canine tells us that we need to.

So then how exactly does this story tie into telemedicine, our topic for this issue of *Rheumatology Nurse Practice*?

I recently had a different patient, a 37-year-old woman who has suffered three previous strokes, leaving her with some mental deficits that forced her live at home with her parents. She was diagnosed with psoriatic arthritis several years ago and required appointments every 3-4 months mainly to monitor her labs (her disease was stable).

Approximately 6 months ago, this patient came in for a routine visit and told our staff without prompting that there were bedbugs in her home. The family had been trying a variety of natural remedies without much success since they could not afford the approximately $1,500 cost of a professional exterminator. We were, of course, sympathetic and offered some suggestions, but it also raised immediate alarm bells for our staff and prompted a call to the "bedbug dog."

How might telemedicine have helped in this patient? Remember, she's someone with stable disease who mainly comes in for lab testing. There is little need for any sort of physical exam during her routine visits. A telemedicine consult would have been more convenient for her and her family, of course, but it also would have spared our practice of possible bedbug exposure. This would have had benefits to our many patients with contagious diseases who already come into our office immunocompromised and at increased risk of an infection.

We all hear a lot about the potential "big picture" benefits of telemedicine, but this is an example of a smaller yet important case where it could have had an large impact. It's important when we consider whether telemedicine is a good fit for our practice to investigate how it will impact all of our patients—not just the ones who take part in a virtual visit—as well as the team of providers.

Giving Our Patients' Lives Some Normalcy Through Telemedicine

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As I sit here to write this article in a very Zen-like environment, gazing at the ocean being warmed by the sun, it makes me think about the peace and tranquility I yearn for in my daily life. Don't get me wrong—my life is fairly normal. I'm a full-time working woman in America with a spouse, children, elderly parents, and a dog. There are the usual stressors that throw me off, like that emergency visit to the veterinarian during the work week. Or managing the day-to-day for aging parents who need significant physical, financial, and emotional assistance. There are even the positive stressors that can throw me off balance, such as planning a wedding for one of my children. Juggling all that life throws at me, like anyone else, can feel like quite the challenge.

Then I start thinking of my patients and am quickly brought back to reality. My personal stressors are nothing compared to our patients with rheumatic diseases and their families who would love to be able to deal with those "normal" stressors of everyday life. And so I ask myself, "What could we as rheumatology providers do to help our patients and their families achieve just a small piece of normalcy?"

Telemedicine may be a good place to start.

Just think about the things that bring patients to our office. There are ongoing symptoms that require minor medication adjustments, straightforward management decisions that involve another specialty such as ophthalmology, follow-up for a stable patient who may only need to have lab tests ordered, and many more. Every one of our practices sees patients every day who need little more than minor adjustments and a "Thanks for coming in. See you in 3 months."

I ask you to honestly think about these patients—do you really feel like you need to physically touch them for any other reason than to satisfy insurance billing requirements? How often do you simply run through a battery of routine questions during the office visit because you need to "check all the boxes?" Don't you ask patients to send you photos of swelling, rashes, or skin issues prior to their office visit? Don't you routinely order labs before the office visit or shortly thereafter? Don't you adjust medications for patients with ophthalmic issues based on letters from their eye doctor?

And now the big question—how would telemedicine visits affect any of these? You shouldn't have to think long and hard to conclude that they wouldn't.

The majority of the general public has grown accustomed to the expanded use of FaceTime, Facebook Live and other real-time video-based technologies in various parts of their lives. How many of our older patients revel in telling us how they talked to their grandchildren through one of these platforms?

It was my own adult daughter who got me to seriously think about telemedicine years ago. She "FaceTimed" me after she took a dish out of the oven and spilled hot juice from the pan down her leg and into her shoe. Being the daughter of a nurse, she

My No. 1 goal for all of my patients is to create as much normalcy as possible in their lives. Could telemedicine help? Absolutely.

knew without needing to consult me that the first thing to do was to immediately remove her shoe and run the affected areas under cold water. Yet she became concerned when an area developed a large blister almost immediately, and so she sent me a FaceTime invitation. She was able to use her phone to show me images of all of the affected areas both up close and more distantly. It took some navigating to figure out the right angles so that the camera would focus appropriately, but once we figured that out, the vibrancy and color of the images were terrific. And so once our conversation concluded, I thought to myself, "If I could diagnose the severity of this burn, know what medication to prescribe and which wound care supplies were needed, and explain how to apply the dressing, what services could I provide to my patients using this or a similar platform?"

Now don't get me wrong. There are many good reasons why it is preferential to see patients face-to-face in our offices. Nonetheless, there are patients whose quality of life would be improved without a significant impact on quality of disease management through the expansion of telemedicine in rheumatology.

We all see many, many patients who live an hour or more from our office. With travel time, reporting for lab tests, waiting in our office, and more, that's 4 hours or more away from home. That's 4 hours of time off work and/or time when they need to pay a babysitter to look after the kids, money for gas, parking fees, takeout meals, and more. There are a lot of "hidden" costs that we do not always think about when a patient comes to us.

Now take away everything but the time required for our actual consultation with the patient. That's essentially the telemedicine visit. No more need for reliable transportation, no more money for gas or parking, no babysitter or significant time off from work. Far less lost productivity. Could this lead to more stable employment, a better chance at a job promotion and higher pay, and the Holy Grail for us all, reliable health insurance?

My practice is focused primarily on children, for whom the in-office visit has an added layer of complexity. We have to deal with issues such as parenting, discipline, school, social stigma, sibling relationships, sleep patterns, and many others. But my No. 1 goal for all of my patients is to create as much normalcy as possible in their lives. Could telemedicine help? Absolutely.

Hasn't a parent seen you perform a joint count hundreds of times in the office? Couldn't you teach them how to do it and then monitor them remotely during a telemedicine visit?

Most kids like to be on video. It's still a "cool" thing for them. There are certainly challenges related to access—not all of our patients have the resources or technological know-how to be able to acquire and then set up a camera so that it provides enough light for us to be able to adequately see them as clearly as we need to—but that's something you can almost guarantee will get better in the future. Practice and patience will persevere.

We give our patients so much as healthcare providers. Telemedicine gives us a chance to empower our patients and see how much of their lives they can take back to reach a step closer to normalcy, which is what we all want them to attain.

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