CVCR
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Value Added

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Telemedicine and Patient Satisfaction

People increasingly rely on technology to serve a variety of their daily needs, and healthcare is no exception. Telemedicine is medical care delivered via computer or mobile phone applications, where patients connect with physicians over a secure video platform, similar to Skype or FaceTime. Health systems and employers, alike, are interested in the expansion of telemedicine, as it has the potential to increase access to care and decrease costs, by keeping some patients out of the emergency room and other higher cost settings. Yet despite the rapid uptake of telemedicine by many health systems, much remains unknown about who is most likely to use telemedicine, for what purpose, and where telemedicine patients might have otherwise accessed care. Dr. Kathryn Martinez recently conducted a study assessing a large nationwide direct to consumer telemedicine service, and is currently studying use of telemedicine for a number of common conditions, including urinary tract infections, anxiety/depression and lower back pain.

Why did you choose to study telemedicine?

Telemedicine is care provided "at a distance," often through mobile phone applications. Seeking care at the doctor's office or urgent care can take a lot of time, and may be difficult for people who don't have flexible schedules. Telemedicine allows patients to access medical care from the comfort of their home or office at the time that is most convenient for them. Unsurprisingly, it's a rapidly expanding healthcare setting, growing from approximately 2 million primary care consultations in 2015 to more than 5 million projected by 2020. Yet, despite the increasing popularity of telemedicine, very little research has assessed patients, physicians, and use of this platform in the real-world.

How does telemedicine work?

Direct to consumer telemedicine connects patients with physicians through computers or smartphones. Patients can use the telemedicine service 24 hours a day for any health issue or concern. Typically, upon accessing the telemedicine platform, patients are asked for some personal information, including their reason for seeking care. They are then prompted to indicate past diagnoses, allergies, and current medications before being placed in a queue to talk to a physician. Patients can either select a physician from a list or choose the first available physician. After what is, typically, a very short wait, patients are connected with physicians and engage in an otherwise typical healthcare encounter. Patient receive medical consultation and advice, prescriptions, if warranted, and may be directed to follow-up with an in-person care provider for further testing or monitoring.

What are the key differences between telemedicine and in-person care?

The main difference is the inability of telemedicine physicians to do physical exams or run laboratory tests. For instance, in traditional urgent care, a patient could have immediate testing for strep throat or a urinary tract infection, while in telemedicine that is not currently possible. Another difference is that most patients will have no pre-existing relationship with their telemedicine physician, and patients could be paired with a physician practicing from a totally different region of the country. Finally, you don't need to be insured to access some direct-to-consumer telemedicine platforms. The one we studied offers appointments for $49 out of pocket. Patients can also use coupons offered by various employers to access the telemedicine system for free.

What was your research about?

Because so little prior research on telemedicine exists, my research aimed to understand the types of patients who use telemedicine and for what types of health conditions. Almost nothing is known about the telemedicine physician workforce, so I also characterized providers of a large direct-to consumer telemedicine service. Finally, I looked at what aspects of the telemedicine experience were most influential in patient satisfaction ratings, and where patients would have sought care if they hadn't used the telemedicine system.

What did you find?

Telemedicine users were young– 65% were under 40 years old, which is not surprising since younger patients probably have more comfort and familiarity using smart phone applications. About a third of patients were uninsured. The most common reason for calling the telemedicine system was for acute respiratory infections, although many also called for eye/ear problems, urinary tract issues, or dermatological conditions. Patient satisfaction with the telemedicine system was high overall, but satisfaction was highest for patients who received a prescription or those who used a coupon for the visit. Had they not used telemedicine, almost half would have gone to urgent care or a retail clinic, 30% would have gone to their regular doctor's office, and 15% would have done nothing.

How will findings from your research impact clinical care at the Cleveland Clinic?

Cleveland Clinic is seeking ways to harness patient and physician excitement about telemedicine to optimize care delivery. Express Care Online is Cleveland Clinic's telemedicine platform and early evaluation indicates patients are highly satisfied with it. As I continue my work in telemedicine, my research will investigate quality of care for specific conditions, including acute respiratory infections and mental health. Findings from my research will inform continuous quality improvement for Cleveland Clinic's telemedicine services to ensure patients receive equivalently superior care through their smart phone and in their doctor's office.

Featured Publication

JAMA Internal Medicine

Cost-effectiveness of the Adjuvanted Herpes Zoster Subunit Vaccine in Older Adults

Phuc Le, PhD, MPH; Michael B. Rothberg, MD, MPH

Spotlight: Recent Awards

Kathryn Martinez, PhD was awarded a career development award (K01) from NHLBI, titled "Improving Outcomes in Atrial Fibrillation Through Patient-Centered Decision Making." This grant will provide Dr. Martinez with 5 years of support to conduct research and participate in career development activities.

Matt Pappas, MD was awarded the Milton W. Hamolsky Jr. Faculty Scientific Presentation Award at SGIM for the presentation "Resuming warfarin following upper gastrointestinal bleeding among patients with nonvalvular atrial fibrillation — A microsimulation analysis."

Featured study-in-progress:

Improving Antibiotic Prescribing for Community-Acquired Pneumonia using Large Observational Datasets

Principal Investigator: Abhishek Deshpande, MD, PhD

Co-Investigator: Michael Rothberg, MD, MPH

Community-acquired pneumonia (CAP) is a leading cause of hospitalizations and death in the United States and constitutes a significant economic burden. While the pathogens responsible for CAP have been known for decades, there are large gaps in our knowledge regarding etiological variation by hospital and evolving antibiotic resistance patterns. Because bacterial cultures take several days to produce results, physicians treat most cases of CAP empirically. Increasing antimicrobial resistance nationally complicates the selection of an appropriate empirical therapeutic regimen. Physicians must ensure that patients with CAP caused by resistant organisms receive adequate treatment, while minimizing overuse of broad-spectrum antibiotics, which can contribute to further antimicrobial resistance. Dr. Abhishek Deshpande, an investigator in the Center for Value-Based Care Research, has received a 5-year K-08 award from the Agency for Healthcare Research and Quality to investigate this question and help physicians make better antibiotic choices when treating CAP.

Does targeted antimicrobial prescribing using local antibiograms leads to better clinical outcomes?

"While treatment guidelines encourage physicians to consider local antimicrobial resistance, actionable information, such as resistance patterns for CAP, is rarely available. Furthermore, it is not known how physicians consider antibiotic resistance in practice and whether initial choice of regimen affects outcomes" says Abhishek Deshpande, a researcher and Assistant Professor of Medicine at Cleveland Clinic's Medicine Institute. "Our analysis will use three large and exceptionally rich data sources, including > 400,000 CAP patients from more than 600 US hospitals, to understand local antibiotic resistance patterns and examine whether treatment according to local antibiograms leads to better outcomes."

Limiting the use of intravenous antimicrobials

The initial route for antibiotic therapy depends on the severity of pneumonia and the site of care. For hospitalized patients, guidelines generally recommend the intravenous (IV) route. While the optimal duration of antibiotic treatment remains unclear, current guidelines emphasize shorter courses to prevent prolonged antibiotic. Another way to limit antibiotic exposure is by switching from intravenous (IV) to oral antibiotics. However, no large studies have evaluated the effectiveness or safety of an early switch from IV to oral antibiotics. Dr. Deshpande's analysis will determine whether early switch therapy is associated with decreased length of stay and costs or perhaps increased risk of treatment failure. "Because of its size, our analysis should be able to establish the effectiveness and safety of early switch therapy as well as the impact on antibiotic exposure" says Dr. Deshpande.

This research, using a rich dataset derived from 3 large databases, will generate important new knowledge about CAP management practices and associated patient outcomes. This speaks directly to current federal initiatives including the "National Strategy for Combating Antibiotic-Resistant Bacteria."

Recent Publications

Characteristics of Successful Internal Medicine Resident Research Projects: Predictors of Journal Publication Versus Abstract Presentation. Atreya AR, Stefan M, Friderici JL, Kleppel R, Fitzgerald J, Rothberg MB. Acad Med.

Predicting 30-Day All-Cause Readmission Risk for Subjects Admitted With Pneumonia at the Point of Care. Hatipoğlu U, Wells BJ, Chagin K, Joshi D, Milinovich A, Rothberg MB. Respir Care.

Comparative Antimicrobial Efficacy of Two Hand Sanitizers in Intensive Care Units Common Areas: A Randomized, Controlled Trial. Deshpande A, Fox J, Wong KK, Cadnum JL, Sankar T, Jencson A, Schramm S, Fraser TG, Donskey CJ, Gordon S. Infect Control Hosp Epidemiol.

Cost-Effectiveness of Competing Treatment Strategies for Clostridium difficile Infection: A Systematic Review. Le P, Nghiem VT, Mullen PD, Deshpande A. Infect Control Hosp Epidemiol.

Cost-effectiveness of the Adjuvanted Herpes Zoster Subunit Vaccine in Older Adults. Le P, Rothberg MB. JAMA Intern Med.

Are Providers Prepared to Engage Younger Women in Shared Decision-Making for Mammography? Martinez KA, Deshpande A, Ruff AL, Bolen SD, Teng K, Rothberg MB. J Womens Health (Larchmt).

Effect of Health Plan Financial Incentive Offering on Employees with Prediabetes. Misra-Hebert AD, Hu B, Le PH, Rothberg MB. Am J Med.

Patient Characteristics Associated With Severe Hypoglycemia in a Type 2 Diabetes Cohort in a Large, Integrated Health Care System From 2006 to 2015. Misra-Hebert AD, Pantalone KM, Ji X, Milinovich A, Dey T, Chagin KM, Bauman JM, Kattan MW, Zimmerman RS. Diabetes Care.

A risk prediction model to allow personalized screening for cervical cancer. Rothberg MB, Hu B, Lipold L, Schramm S, Jin XW, Sikon A, Taksler GB. Cancer Causes Control.

PCI for stable angina: A missed opportunity for shared decision-making. Rothberg MB. Cleve Clin J Med.

Thromboembolic and Major Bleeding Events With Rivaroxaban Versus Warfarin Use in a Real-World Setting. Russo-Alvarez G, Martinez KA, Valente M, Bena J, Hu B, Luxenburg J, Chaitoff A, Ituarte C, Brateanu A, Rothberg MB. Ann Pharmacother.

Correlates and Outcomes of Physician Burnout Within a Large Academic Medical Center. Windover AK, Martinez K, Mercer MB, Neuendorf K, Boissy A, Rothberg MB. JAMA Intern Med.