

2014

Can Clinical Decision Support Improve Medication Safety in the Ambulatory Setting?

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Family Doctor

A JOURNAL OF THE NEW YORK STATE ACADEMY
OF FAMILY PHYSICIANS



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Ultrasound in the
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Family Doctor, A Journal of the New York State Academy of Family Physicians, is published quarterly. It is free to members of the New York State Academy and is distributed by mail and email. Non-member subscriptions are available for \$40 per year; single issues for \$20 each.

New York State Academy of Family Physicians

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Technology in Medicine

By Vito Grasso, MPA, CAE

This month's issue addresses technology, and the breadth of content chosen by our contributing authors reflects a sample of the most current issues in medical technology, and the broader implications which the proliferation of technology has on the practice of medicine.

Technology is generally associated with progress. This assumption leads to generalizations about whether we should facilitate, encourage and even compel adoption of the latest technology to achieve outcomes that are perceived to be in the public interest. This may be the case in health care.

We have become accustomed to technological advancements in medicine and expect that technology will provide better and more effective treatments for disease and injuries. The success of imaging equipment, robotic procedures, implanted devices and new drugs and drug delivery systems have inspired a level of confidence in technology when applied to therapy. It is good for people faced with serious illness to have hope, and the continuing potential of new technology to provide better treatment options is a major source of hope for patients.

There seems to be consensus that payment for technology that is applied to therapy, or which enhances our knowledge of disease,

should be incorporated into the fees we pay for health care services including what we pay for insurance.

Technology has also been embraced as a means of containing costs in health care. Electronic medical records, registries, integrated clinical records and practice management systems contribute to a more efficient administrative environment. It appears, however, that there is less agreement about who should bear the cost of technological advancement within this health care environment.

Much of the public policy debate surrounding technology is focused on the cost and how to measure the associated return on investment. Many practices have adopted and benefitted from technology including hospitals and health systems to improve clinical and administrative capabilities. From a systemic perspective, however, the benefit of using technology is limited unless the provider community is linked and can share data as the patient moves through the health care system. When

the investment in technology is considered from this point of view it is not clear who should pay for it and how or whether the cost should be assessed among all participants in the health care community.

Technology is exciting. The variety of articles in this issue of Family Doctor illustrates the breadth of the topic and the expertise and interests of our contributing authors. Whether it is learning about the most popular medical apps for smart phones and tablets, understanding the potential of technology to enhance the skills and capabilities of physicians, or hearing about how apps from other fields such as art can be applied in medicine, we feel the content of this issue will satisfy a variety of needs and interests. As always, I hope you will enjoy this issue and I invite your comments and suggestions regarding other topics we should consider addressing.

Vito Grasso, MPA, CAE, is the Executive Vice President of the New York State Academy of Family Physicians.

From a systemic perspective, however, the benefit of using technology is limited unless the provider community is linked and can share data...



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President's Post

By Mark Josefski, MD, FAFP

I have a love / hate relationship with technology. I suspect that many of the older readers of this journal have similar mixed feelings about the changes that are occurring in our practices, and acknowledging this dichotomy is both healthy and important. We've learned to adapt to technology throughout our lives, as most of society has done in all fields. Within medicine, this has always been how we advance; cutting edge technology has produced life-saving breakthroughs as well as more mundane changes in healthcare delivery. Scientists, inventors and forward thinkers lead the way; the professionals follow.

While recognizing that this is paramount to advancement, the problem seems to be the pace at which things change; it has accelerated dramatically in the last two decades as computers have become more powerful and more dominant in our everyday lives. Dr Keber's article addresses the issues of the electronic health record in the office; the EHR has been a game-changer, and led to vast improvements in practice for most of us. Charts that are legible and available in real time improve efficiency, communication and care delivery. Prompts within the HER are amazingly helpful in reminding us that a patient is due for their Pneumovax or Tdap, that their mammogram or colonoscopy is overdue or that they're at risk for a particular disease process on the basis of demographic information. Issues can occur when the computer is not available in a clinical situation and we are required to return to a low-tech visit! When available,

the various prompts and reminders for health maintenance are time consuming, and it can be difficult to address all of the issues that could conceivably arise in a visit. And of course, do we lose track of the patient's priorities as we're focusing on our computer-driven, incentive-based prompts in the "patient centered" medical home? We need to remember that the importance of the visit for the patient is in our attentiveness; maintaining that relationship and connectivity to our patients is critical.

Much of the technology that we use in medicine has not been developed by doctors, but rather by computer engineers and program designers. In this system, the opportunities for error have changed; protocol-driven messages may lead to errors that come from a data entry perspective rather than from a knowledge perspective. They may happen by inadvertently copying old data or of working from incorrectly populated medication lists or other information, escalating the risk for medical errors; learning how these occur and avoiding them is every provider's responsibility.

In my practice, I have found many applications of technology to be of great benefit to ensuring quality patient care and engagement. The patient portal is an invaluable means of communication; it allows me to be away from the office and still track what I need to do for my patients. This technology allows doctors the freedom to respond on our own time and to communicate directly with our patients, without the hassles of telephone messaging

and intermediaries that create frustration for doctors and patients alike. I would urge everyone who has access to this technology to try it and take advantage of the potential.

Within this issue, our contributors demonstrate that helpful applications for patient education and point of care knowledge are abundant. There are applications that allow us to monitor our patients' exercise regimen and the daily weights of our CHF patients from home. Josh Steinberg has a very helpful article in this journal to describe a wealth of smart phone apps to assist in our clinical decisions. Other articles by Rebecca Stetzer and Matt Devine describe electronic resources for teaching and improving learning opportunities for students and residents, including situations that may not be frequently encountered but that are important skills to learn.

For medical educators, the development of New Innovations and other data collection tools in residency and medical student education has made the process of evaluating and measuring learners a much easier task. As the Milestones Project of the ACGME is rolled out and we begin to implement it in residency education, we will become increasingly dependent on the collection of electronic information to monitor what residents and students have done, to measure their progress, and assess their competencies throughout the learning process.

CONTINUED ON PAGE 10

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Current Technology Trends: Wearable Medical Devices

By Anthony Chu, DO and Venis Wilder, MD

In 1957, an electrical blackout at the University of Minnesota Hospital changed the trajectory of technology in medicine. Dr. C Walton Lillehei, a pediatric cardiac surgeon who specialized in the surgical correction of Tetralogy of Fallot in children, approached electrical engineer Earl Bakken to develop a portable device to overcome post-operative heart block.¹ The goal was for this device to be able to operate without an external power source. Within a month, Bakken had developed the first battery-powered cardiac pacemaker. What initially began as a metronome circuit consisting of a 9-volt battery, 2 transistors and an oscillating transformer diagrammed in the previous year's *Popular Electronics* magazine², eventually launched the beginnings of one of the most significant advances in medical technology of the 20th century. There are now approximately 400,000 pacemakers implanted each year in the United States, and there are more than 3 million patients living with implanted cardiac devices today.³

As technology continues to become smarter and smaller, it has also become more wearable. By definition, wearable medical devices are tools that are “autonomous, noninvasive, and perform a specific medical function such as monitoring or support over a prolonged period of time.”⁴ Current medical devices face strict and lengthy regulatory restrictions from the United States Food and Drug Administration (FDA) under The Medical Device Amendments of 1976, enacted to protect the public against faulty medical equipment.^{5,6} However, by marketing the gadgets directly to consumers as “health and wellness devices,” and in turn sidestepping hospitals

and physicians, companies are able to bring these devices quickly to market. Consequently, doctors are seeing more of this wearable technology in their offices. Companies such as Fitbit (*Figure 1*), Jawbone, Nike, Google and Apple have either announced or introduced “health and wellness” devices to the consumer market with much success. An estimated 42 million health and fitness wearable devices are expected to ship in 2014 alone, with an additional 57 million units expected in 2015.⁷ These technologies range from accelerometers that monitor daily physical activity and sleep patterns, to iPhone cases that interface with a patient's smartphone to provide real time ECG analysis.⁸

Historically, physicians have embraced implantable and wearable technologies as a way to quantify patient data and improve medical outcomes. Traditional medical devices such as cardiac pacemakers, cochlear implants, Holter monitors, and insulin pumps not only guide physicians in diagnostic capacities, but aid directly in improving patients' quality of life. In 2007, *Wired* magazine writers Gary Wolf and Kevin Kelly spawned a worldwide phenomenon when they coined the term “quantified self” in an attempt to find “clever ways to extract streams of numbers from ordinary human activities.”^{9,10} Now data from physical activities, sleep patterns, mood, and caloric intake are quantified by wearable trackers and shared in local group settings in an attempt to achieve a method of self-knowledge and improvement. With this plethora of self-quantified data readily accessible, the question for primary care physicians is how can we decipher and utilize this data to improve patient health?



**Figure 1. (L-R) Withings Pulse, Striiv Touch, Garmin Vivo Fit, FitBit Flex
Photo by Michael Kachuba 2014**

As our medical culture continues to become less paternalistic and more partnership based, there is an opportunity to develop new methods to improve and encourage patient health. By using technology as a method of encouraging behavioral modification, patients empower themselves by taking responsibility for their health through “a program of self-monitoring, personalized feedback, and self-selected goal-setting.”¹¹ Patients are then able to share this information with their providers. Step diaries⁹ and online social networks¹² have the ability to connect and motivate patients outside clinic visits for long-term lifestyle change. Wearable technology provides a patient tailored experience for health awareness and improvement, and accommodates the needs of the patient.¹³

The most well studied “quantified self” technologies and currently the most popular, include accelerometers - devices that include the Fitbit Flex, Jawbone Up and Nike Fuelband, which track daily physical activity and movement by measuring changes in direction and speed. By offering data in a straightforward and basic output, pedometers can be used as a direct measurement of movement based on behavior and lifestyle changes.⁹ Research using accelerometers first began in the 1960’s¹⁴ and have been used in fields such as sports medicine and rehabilitation to monitor long term patient progress; however, only recently has this technology become small and affordable enough to market to consumers.¹⁵ The measurement of steps using pedometers and accelerometers has been well studied and correlated with improved health outcomes with reductions in body mass index, decreased systolic blood pressure by almost 4 mm Hg and increased physical activity by 26.9% over baseline with over 2000 extra steps per day recorded.¹⁶ More recently, physicians have found more novel ways to implement accelerometers to monitor and differentiate Parkinson’s disease and essential tremor.¹⁷

As the industry of wearable technology continues to grow, we have seen an increase in the development of devices that integrate information directly into paired smartphones. Apple recently announced its iWatch, a device that combines accelerometry, pulse



Figure 2. Oculus Rift (Oculus Rift Image [Online image]. (2014). Retrieved October 6, 2014 from <https://dbvc4uanumi2d.cloudfront.net/cdn/4.0.16/wp-content/themes/oculus/img/order/dk2-product.jpg>)

measurements, and global positioning systems (GPS) to more accurately measure a person’s daily activity.¹⁸ Google had previously introduced its eye-glass like device Google Glass, with “capabilities of central processing, touchpad, display screen, high-definition camera, microphone, bone-conduction transducer, and wireless connectivity,”¹⁹ allowing physicians to verbalize commands to the device and recall and record images and medical charts relevant to patient health. On June 20, 2013, Dr. Rafael Grossmann made history when he performed the first surgery using Google Glass and streamed the procedure live on the internet through a video chat room.²⁰ Most recently, Google announced a partnership with Swiss healthcare company Novartis to develop a “smart” contact lens with a micro-sensor to help diabetics non-invasively measure glucose levels based on tear glucose levels, as well as aid individuals with presbyopia vision correction in the form of an accommodative contact lens.²¹

One of the most popular technologies at 2014’s Consumer Electronics Show was Oculus Rift (*Figure 2*), a virtual reality simulator which has enormous potential in its therapeutic ability to improve motor function and increase neuroplasticity after stroke by facilitating cortical reorganization in patients.²² Virtual reality devices have also demonstrated promise in aiding amputee patients in rehabilitation by decreasing phantom limb pain²³ and training patients to use prosthetic limbs.^{24,25}

No longer just abstract science fiction, the future of wearable medical devices is here. It is astonishing to reflect back on the genius, innovation, and revolution that Earl Bakken’s wearable cardiac pacemaker inspired half a century ago and the progress we have since made. As physicians look forward to the future of technology in healthcare, it is helpful to consider what has made the current revolution in wearable technology so appealing and successful to the general public in the first place: convenience and choice.

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Venis Wilder, MD, is a faculty physician at the Institute for Family Health-Harlem Residency in Family Medicine in New York City.

PRESIDENT'S POST CONTINUED FROM PAGE 6

Additionally, Lorinda Parks presents the difficulty of dealing with the internet and what healthcare information is available to patients on a daily basis. We need to be aware of what the general public is accessing and of the drivel that may mislead patients, while also understanding the resources that are available to them which can actually be helpful in their medical decision making.

Technological skills are vital to every Family Physician. We can utilize these new tools to our advantage, and in combination with our inherent interpersonal skills, maintain and enhance our relationship and connection with our patients. I'll keep trying to "love" the opportunities that the technology offers!

Mark Josefski, MD, FAAFP, is the President of the New York State Academy of Family Physicians for 2014-2105.



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Can Clinical Decision Support Improve Medication Safety in the Ambulatory Setting?

By Barbara Keber MD, FAAFP

Introduction

Can the safety of prescribing medications be improved with the utilization of clinical decision support (CDS) embedded into electronic health records? Various electronic health records (EHR) have differing capabilities in this regard. Enhanced capabilities with the use of clinical decision support can improve medication safety, especially for high-risk medications. Different levels of CDS in various EHRs might range from simple support, alerting the prescriber to allergies or problematic doses for children or geriatric patients, to more complex alerts involving drug-drug interactions. Other highly complex alerts can include those which act as reminders for laboratory testing for various complications and for monitoring dose adjustment.

There are many high-risk medications that we routinely use in family medicine. In accordance with evidence-based guidelines there are certain parameters in place for the monitoring, dosing and continuation of many of these medications in a safe manner. These medications include warfarin, various forms of insulin, oral hypoglycemic agents, ACE inhibitors, narcotics, and digoxin, to name just some of the important drugs which are high-risk. In many electronic health records there is currently no way to easily follow the appropriate labs, blood levels or related laboratory testing. The use of labor intensive patient chart reviews or registry functions for patients on certain medications, or with certain diagnoses are not realistic methods for tracking the required labs. A system for alerting a prescriber that a patient is due for laboratory work related to a medication, has a lab value requiring adjustment or discontinuation of a medication, or is overdue for refills would be extremely helpful for practitioners. Patient adherence to their medication regimen would also be able to be tracked, thus improving outcomes for the subset of patients who may have been non-adherent.

In addition, this would greatly enhance patient safety. The development of programs that will automatically create an alert for the practitioner when medication related labs are due or are



abnormal would assist physicians in their ability to improve monitoring with better efficiency. The IHI Triple Aim of improved patient outcomes and experience, improving the health of populations and reducing cost of healthcare would be well served by improved CDS for medication management.

There have been several studies looking at the use of CDS in the ambulatory setting. Studies show

varying degrees of improvement in process and patient outcomes with the use of clinical decision tools related to medication alerts.

Several decisions would need to be made prior to instituting such a process. What has become known as the “CDS Five Rights” includes 5 specific items which are required to implement a CDS system that will be successful and sustainable¹ (Table 1). Alerts must be evidence-based and able to be updated as the evidence changes. Alerts must be sent to the appropriate team member, including other members of the medical team for triage when appropriate. Clinical pharmacists and nurses are members who might assist in this process. Workflows can be designed in most EHRs to accommodate some of these options and are worth exploring to improve medication safety and adherence.

One should also remember that the patient is a member of the care team and could be the person to receive the alert.

The format of the alert should be appropriate to enable the reader to act on the alert. The alert should come via the correct channel, meaning via the electronic health record in this particular instance.

The patient portal or other secure messaging (email/text) could be utilized to notify patients about refills, or to direct a patient to obtain laboratory testing when indicated. The placement of the alert in the workflow is also crucial. For alerts going to the physician or other provider it is important to determine whether an alert is interruptive or non-interruptive and place it accordingly in the workflow. Some alerts could be non-interruptive and able to be acted upon at a later time.

A system for alerting a prescriber that a patient is due for laboratory work related to a medication, has a lab value requiring adjustment or discontinuation of a medication, or is overdue for refills would be extremely helpful for practitioners.

Table 1: CDS Five Rights

Evidence based alerts with easy updates
Sent to appropriate team member (including the patient)
Appropriate format to allow for response
Appropriate channel for the alert
Workflow design to accommodate a variety of options for receiving and acting on alerts

Risks/Barriers

Adverse events are not regularly evaluated as part of instituting CDS for medication management.² Most studies have not incorporated this aspect into their design, so potentially are not evaluating a possible harm or risk.² Alert fatigue can occur with the institution of many alerts within a system. This could be detrimental to safe medication management and is one reason that multiple team members should be included in this process.

Another consideration for this type of alert system is the rapidly changing guidelines related to the use of certain medications, as well as new FDA warnings which become available for certain drugs. A process must be in place to update these guidelines on a regular basis and assure the latest are available for clinicians. This is a costly and somewhat burdensome addition to the process, but updates must be a part of the implementation of such a project.

There are few studies to evaluate the economic benefits or risks associated with implementation of CDS for medication management.³ It is difficult to study this particular parameter because of the multi-factorial nature of the issue. Costs for the institution including the necessary HIT, the possibility of increased utilization of laboratory services, and costs related to medication errors may all have an impact on the total loss or savings with the initiation of such a program. With the increasing pressures of value based care, this will become an absolute necessity for competitive organizations. Regardless of the costs involved, quality, safe patient care is the

intent of this process. The jury is still out on the best methods to accomplish this.

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Barbara Keber, MD, FAAFP, has been a family physician in Long Island for the last 30 years. She is Chair of Family Medicine at Glen Cove Hospital and Vice Chair of Family Medicine for NSLIJ-Hofstra School of Medicine. Prior to her current roles, she served as the Associate Program Director for the Family Medicine Residency Program at Glen Cove Hospital for 10 years. Her interests include clinical informatics, diabetes, the PCMH model of care, and care of uninsured populations.

Call for Authors:

We are looking for writers for future issues of *Family Doctor*:

Due to the popularity of the topic, our winter issue in January will be **Controversies II**, which can include clinical, policy and political topics that impact your practice as family physicians. Potential topics might include medical marijuana, equality in health care, the impact of health care reform on practice, treatment, etc. The deadline for submission will be in early December.

Our spring 2015 issue in April will focus on the topic of **Medical Education**. Possible topics could include: changes in medical education, medical school admissions, student, resident and mentor perspectives, technology or other unique strategies in medical education, application of learning theory, etc. The deadline for submission will be announced.

Contact our journal editor with topic ideas, for additional information or guidelines at journaleditor@nysafp.org.



ALBANY REPORT

By Bob Reid



As the calendar turns to fall and the leaves change to colors across our state, in Albany, thoughts of New York's statewide officeholders (Governor, Lt. Governor, Attorney General and Comptroller and the entire State Legislature (150 Assemblypersons and 63 Senators) turn to the pending elections. As *Family Doctor* goes to print, the primary election was September 9th with the general election on November 4th. While we understand time is a valuable commodity in your lives, we urge you to take the time to reach out to the candidates in your local Assembly and Senate districts and let them know the importance of family medicine in New York! We will, of course, keep you updated on the election results both on the state and federal level.

Governor Cuomo and legislative leaders announced a number of big deals in the final days of the session. These include agreements on a measure to allow for the limited use of medical marijuana, a package of bills to address the state's opioid/heroin addiction epidemic, changes to existing teacher evaluations and Common Core requirements, and an agreement on facility closures under the Office of Mental Health (OMH) and the Office for People with Developmental Disabilities (OPWDD) to set up community services before the facilities close.

While the Governor and state leaders hailed these and other successes, including the fourth on-time state budget in a row as the

session came to a close, there has been public criticism for leaving significant work undone. This includes failure to approve the package of bills included in the Women's Equality Act, the Dream Act, reform of the state's Brownfield tax credit program which expires next year, campaign finance reform, and others.

During the 2014 session, we worked with NYSAFP leadership and members to pursue a number of Academy priorities. We successfully secured changes to a bill that would have authorized long term antibiotics for "chronic Lyme disease" and provided blanket OPMC protection for such treatment and all related care. The bill that passed both houses provides a broader physician protection (not just for Lyme) which more narrowly focuses on treatment decisions only. Together with others in organized medicine, we beat back a major push to require physician CME in pain management, ISTOP, palliative care and other areas with attempts to tie the proposal to the enacted heroin/opioid bill package. We also successfully defeated a proposal to change the current statute of limitations in medical liability cases, and working with other impacted physician specialties we defeated a bill to create midwifery birthing centers without any physician oversight/involvement, among other initiatives.

Below, find our list of legislation that passed both houses in several relevant sections during the 2014 session. For summaries of the bills listed below, as well as those listed in other sectors of the

health and human services agenda, go to: http://www.nysafp.org/images/uploads/misc/1411496957_2014FallRMS.docx

PHYSICIANS/ OTHER HEALTH CARE PRACTITIONERS

Hepatitis C Testing S6871 (Hannon)/A9124-A (Zebrowski)

Maternal Depression Education, Screening and Treatment S7234-B (Krueger)/A9610-B (Gottfried) [Signed Into Law](#)

Expanded Users of Adult Immunization Registry S7253-A (Hannon)/A9561-A (Paulin)

NYS Palliative Care and Education and Training Council S7601-B (Hannon)/A9966 (Rules) Gottfried [Signed Into Law](#)

Medical Professional Misconduct S7854 (Hannon)/A7558-B (Barrett)

PUBLIC HEALTH

Eating Disorders Awareness and Prevention Program S2530-A (Hannon)/A5294-A (Gunther)

Women's Health Website S3817 (Hannon)/A4465-A (Galef)

NYC Cigarette Tax Violations S6349 (Lanza)/A364 (Dinowitz)

Expiration Dating on Sunscreens S6403-B (Carlucci)/A2727-B (Weisenberg)

Speed Cameras Demonstration Program S6918 (Klein)/A9206 (Silver) [Signed Into Law](#)

NYS Physical Fitness and Activity Campaign S7000 (DeFrancisco)/A9403 (Cusick)

Concussions and NYS Traumatic Brain Injury Program S7004-A (Young)/A9651-A (Benedetto) Signed Into Law

Liquid Nicotine Sales S7027-C (Hannon)/A9299-D (Rosenthal)

CPR in Schools S7096 (Grisanti)/A9298 (Weisenberg)

Administration of Epinephrine Auto-Injectors in Schools S7262-A (Hannon)/A7791-A (Abinanti)

Health Services in Schools S7758 (Flanagan)/A9334-B (Nolan)

Authorized Use of Medical Marijuana S7923 (Savino)/A6357-E (Gottfried) Signed Into Law

BEHAVIORAL HEALTH

Workers' Compensation Coverage of Licensed Clinical Social Workers S2360-A (Klein) /A5299-B (Pretlow)

Security Hospital Treatment Assistants in OMH S3600-A (Lanza)/A1500-A (Gunther)

Whistle Blower, Mental Hygiene Employees S6183 (Carlucci)/A7909 (Gunther)

Materials on Problem Gambling S6251 (Carlucci)/A8345 (Crespo) Signed Into Law

Continued Education for Licensed Mental Health Counselors and Other Professionals S6300 (LaValle)/A8228-B (DenDekker) Signed Into Law

Use of Opioid Antagonists S6477-B (Hannon)/A8637-B (Dinowitz) Signed Into Law

Naturally Occurring Retirement Communities (NORCs) S6858 (Golden)/A9067 (Millman) Signed Into Law

Outpatient Mental Health and Substance Abuse Services Provided by Hospitals S7481-A (Hannon)/A9768-A (Gunther) Signed Into Law

Mental Health Treatment Plans for Inmates S7818 (Young)/A10071 (Rules) O'Donnell

Opioid/Heroin Package (All Bills in this Package S7902-7912 are Signed into Law)

- Criminalizing the Sale of a Controlled Substance by a Practitioner or Pharmacist S7902 (Hannon)/A10154 (Rules) Hennessey
- Heroin/Opioid Addiction Wraparound Services Demonstration S7903 (Carlucci)/A10160 (Rules) Gunther
- Opioid Treatment and Hospital Diversion Demonstration Program S7904 (Hannon)/A10159 (Rules) McDonald
- Opioid Antagonist Information Cards S7905 (Marchione)/A10156 (Rules) Dinowitz
- BNE Access to Criminal History Information S7906 (Martins)/A10158 (Rules) Cymbrowitz
- Prescription Medication Fraud & Deceit S7907 (Marcellino)/A10155 (Rules) Peoples-Stokes
- Criminal Sale of Controlled Substances S7908 (Hannon)/A10157 (Rules) Stirpe
- Youth Assessment Services S7909 (Felder)/A10162 (Rules) Lupardo

- Drug Instruction in Health Education Courses S7910 (Martins)/A10163 (Rules) Cymbrowitz
- Heroin and Opioid Addiction Awareness Program S7911 (Boyle)/A10161 (Rules) Cymbrowitz
- Expanded Insurance Coverage for Substance Abuse Disorders S7912 (Seward)/A10164 (Rules) Cusick

We will keep you apprised of new developments with bills of interest. The status, sponsor's memo and full text of the legislation listed above is available by entering the bill number in the search field included at the top of the following page: <http://www.assembly.state.ny.us/leg/>

We look forward to working with you to prepare for the 2015 session and the challenges that lie ahead.

Bob Reid is a partner from Reid, McNally & Savage, LLC in Albany, NY. Reid, McNally & Savage has been working with the Academy for nearly two decades providing its legislative, regulatory and budget representation before state government.



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Technology and the Art of the Difficult Conversation

By Rebecca J. Stetzer, MD

As family physicians we sign up for a lifetime of difficult conversations. We bring up difficult topics such as sex, obesity and self-destructive habits. We guide patients through diseases for which we can modify the progression but can't hope to cure. We tell patients their illness is terminal. We tell their loved ones there are no further disease-modifying interventions available. We ask patients how they want to die.



In medical school and residency we spend our time learning about disease process, and have practice on diagnosis and treatment, with supervised patient care. We practice how to conduct a physical exam, how to interpret laboratory numbers, how to read an x-ray. However, practicing the art of having a difficult conversation, including code status discussion, is more challenging. Furthermore, it is underemphasized. Traditionally, we have learned how to conduct these conversations by watching attending physicians and more senior residents, and end up modeling their good – or bad – techniques.¹ Ultimately, we blunder through these conversations ourselves. Many a fine physician has trained and developed under this model, but many also feel their training was insufficient or skills inadequate, and patient experiences and outcomes reflect this to be true.²⁻⁴ As an attending focused on caring for, and feeling protective of our patients, it can be difficult to allow a learner to take lead in a difficult conversation. This is especially the case when delivering bad news, discussing end of life decisions or in socially or emotionally complicated cases.

Technology adds additional challenge to these conversations, in both focus and content, and can impact the doctor-patient relationship. Various forms of technology now accompany us into the exam room. A computer screen may present a physical barrier between us and our patient, dividing attention and weakening our connection. Phones distract us with notifications of new information or interrupt conversations when patient or doctor answers a call. Time with patients is cut shorter and shorter, and more of our time is spent interacting with the computer as demands for documentation increase. Additionally, technology has changed the content of our conversation. Life-extending interventions such as cardiac pacemakers and hemodialysis have reshaped our concept of normal aging. The extent to which technological advances enter

our difficult conversations depends on where they are located – rural or urban, community or academic. The decision to have an intervention is largely driven by the culture and practice patterns of the institution.⁵

The tide is turning away from the idea that rising physicians are inherently good communicators. It is difficult to be empathetic and kind, yet honest and direct, to avoid being overly optimistic without destroying hope. Hospital-based palliative care

teams are becoming more common and are frequently relied on to help physicians handle difficult conversations about diagnosis and prognosis.⁶ Medical schools and residencies are devoting more time on how to have these conversations. Intensive interventions have been shown to improve code status discussion skills, skills that were retained a year later.^{7,8} Notably, residents who did not receive the intervention did not acquire the skills despite a year of training.⁷ This reinforces the importance of teaching and practicing difficult conversation skills, rather than learning by observation and practice alone.

Simulation-based education has been increasing, and has been shown to improve clinical skills.⁸ Locally, The Patient Safety and Clinical Competency Center (PSCCC) at Albany Medical College offers students and residents the opportunity to practice many skills that previously were only possible to do on live patients, from interpreting obstetric ultrasounds to running codes with interactive mannequins. The facilities also offer the chance to develop the art of the difficult conversation.

Standardized patients are used within the PSCCC to teach how to apply textbook knowledge to live people, and medical students have become familiar with them as they are now a standard part of board exams. Patients and their family members are portrayed by staff members trained extensively in the specifics of the patient history, background and prognosis. The set up at the Simulation Center allows for the learner to further enter into a more realistic patient encounter by removing the dynamic-changing observer within the room. Mock exam rooms equipped with a camera and a microphone feed into a central observation room so instructors can watch students conduct interviews and exams without interfering. Learners can practice not just the skill of making the diagnosis, but also the

skill of delivering the diagnosis, exploring with patients the impact of that diagnosis on their lives, and how they will choose to live – or die – with it. They can practice with the safety of knowing that a wrong word or misinterpreted body language will not dominate a patient's experience of how they found out about their cancer, or alienate a family trying to make an end of life decision. Learners can try different techniques, see what works and what doesn't, and get mentor and patient feedback on their performance. Having multiple learners work independently on the same case can stimulate rich discussion afterward, of techniques and phrases used, and allow them to learn from each other.

A difficult conversation curriculum for family medicine residents is currently under development, with the first session planned for October. We will start with delivering bad news and end of life conversations, but hope to expand to a series reflecting the broad nature of family medicine – difficult conversations in obstetrics, pediatrics, cardiology, etc. The structure of observed one-on-one conversations should allow all learners to further develop their skills, whether drawing upon one previous interaction or hundreds. Indeed, many seasoned physicians would welcome the opportunity to participate in such a program and further deepen their own skills.

Family physicians know that perhaps the most important part of treatment is the therapeutic relationship with the patient. Having that relationship allows patients to trust that someone knows and understands them, and will help guide them to treatment decisions that are not just right, but right for them. These relationships are built on a foundation of shared difficult conversations over a lifetime. It is crucial that our teaching efforts include development of this skill.



SIM Center photo by Albany Medical Center Patient Safety and Clinical Competency Center

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Rebecca Stetzer, MD is a family physician with the Albany Medical Center Family Medicine Residency Program. She is a core faculty member and serves as the director for geriatric education. To read more about the simulation program and the curriculum on difficult conversations, check out future editions of NYSAFP's Family Doctor Journal.

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Candy Crushing Speech Delay: A Case Study

By Paul Cohen, DO

The funny thing about being in primary care is that one is expected to be a jack-of-all trades. I have treated everything from severe trauma to the common cold, from pregnancies to psychiatry. One thing that I have come to appreciate, especially since becoming a parent myself, is the vast field of knowledge regarding children and all of the potential ways our wonderful reproductive systems can go off the rails. I remember hearing the following phrase often: “It takes a lot to derail a healthy pregnancy” and for the most part, I believe this is a valid statement. What has also become apparent is the ever expanding ways that the children from these pregnancies can suffer from any number of afflictions and maladies. I would like to believe that most of these are easily and readily diagnosed and diagnosable. However, I also come across a fair number of patients that are encountering a more elusive issue with their children, which we can term a “delay”.

As time has progressed and more study of these delays has occurred, we have learned of all sorts of ways that the expression of our DNA can go astray. Conditions such as autism, cerebral palsy, fragile x syndrome, and numerous intellectual disabilities which historically, were relatively fringe diagnoses when compared with the overall population, have been creeping into the forefront in the past decade or two. Having had the pleasure to care for a good number of these individuals I can attest to the difficulties that are present when working with these populations. There are many modalities in place to assist in the ongoing care of these individuals including physical, occupational, and mental health therapies. When used collectively as part of a team approach, we have found success in addressing some of these issues to varying degrees. With the progression of technology, also comes the advancement of various treatments that we can offer across the therapeutic spectrum. One particular area which I feel deserves more consideration and discussion is childhood speech delay.

I came across a nice couple that had given birth to a male. Both prenatal history and pregnancy were unremarkable and uncomplicated with resultant Apgar’s of 9 and 10. The child made great eye contact from birth. He had been fine both physically and developmentally until he was brought to me because he had

stopped making progress with eating. A complete work-up and set of evaluations were done, and all were unremarkable. It was suggested that the child had a variety of developmental delays/disorders, but since he did not fit into the criteria of any one specific condition, none had been concretely diagnosed. Upon further inquiry the feeding issues had been determined to have been insidiously progressive, but again, not specific enough to provide an “a-ha moment” when I could tell the parents something definitive and provide a straightforward diagnosis and treatment plan.

Another befuddling aspect here was that although the child could vocalize and say “ma”, he had not made additional progress with his speech. I wondered if the two could be conveniently connected. I had done my research and spoken with colleagues, both officially and unofficially, to gather information in an effort to help this child. So began the trek into the world of the vague and uncommon!

From what one might consider a small subset of fringe diagnoses, there are a vast number of individuals offering a full spectrum of services for feeding and speech delay, and they ranged from the learned to the ludicrous. In this case, the common ground for both sanity and focus among this group was a local early childhood center called Building Blocks Developmental Preschool. The child was evaluated and determined to be a candidate for local early intervention services and began receiving treatment. The approach was multi-disciplinary and included speech therapists both in and outside of school, as well as at home. The parents had even video recorded their child during meals to show the therapists exactly what was transpiring at feeding time. As the parents participated in the program and reported their progress, they seemed to be on the road to success. I took particular interest when that progress appeared to have a lot to do with the computer equipment that was used during therapy and with one app in particular.

I consider myself somewhat of a techie, and was fascinated as the parents sat down with me to review what their child was going through. I was impressed that the development of a relatively new piece of technology, the Android Tablet/iPad could have a central role in the treatment of children with speech and feeding delay. Gone were the days of cut-out pictures in a board book and here to stay,

apparently, were numerous apps serving the same functionality - prompting with tone and voice reinforcement. When using Android's Animal Farm app on the tablet, the child would see a picture of a cow and when asked to identify it, the device would produce either the name for the animal depicted, or the typical nursery rhyme associated sound- in this case, the "moo". If the app's setting was changed it could produce a variety of tones and sounds which would greatly expand its range and functionality. Other similar apps were used for shape identification and color recognition as well. It was very exciting to me to witness the apparent progress of a child based on this technology, but what truly amazed me, was when the child I was working with very clearly said the word "sweet".

As his mother and I were going back and forth about his progress, his father began playing the game called "Candy Crush". Upon hearing the child speak I asked his dad what he was doing and he simply turned his device toward me and showed me. Watching the interaction was impressive. The child not only accompanied the device verbally but he also knew how to use it. Furthermore, when he accomplished one of the goals of the game and it produced one of various reward phrases (as it was explained to me) the child echoed it perfectly. I inquired further and his dad explained to me that since the therapists began using the tablet as a tool, he decided to get one to use at home with his child as well. Since he didn't have access to the same tools that the therapists had been using, he decided to use one of the free ones – Candy Crush.

I asked if they would let me observe their child playing the game and was impressed as he could not only operate the device, but could also play the game. Since some of the maneuvers of the game were complex, his dad would help him, but every time there was a spoken reward the child would look lovingly at his dad and echo "sweet" or "divine" or whatever the appropriate word was. His parents were absolutely over the moon by the progress that their son was making. I recently saw the family and the child continues to make progress on all fronts; he is expected to be fine and is on track to start kindergarten next year.

It was working with this family that was the impetus for this article. I am appreciative of the difficulties that families whose children suffer from speech delay encounter, but am happy to share that there are plenty of tools and technologies out there to assist in treatment, including perhaps some newer forms of technology not necessarily considered developmental aids. Hopefully, you will consider helping other families with this "Candy Crushing" approach to speech delay with "sweet" results!

Dr. Paul Cohen, DO, DABFM, FAAFP is a board certified family medicine specialist who practices in the Smithtown area through St. Catherine of Sienna Medical Center of the Catholic Health Services of Long Island. He is one of the recipients of the HealthTap NYS Family Medicine Provider of the Year award. He holds the title of Clinical Instructor at the SUNY Stony Brook School of Medicine and has an extensive background in the field of intellectual and developmental disabilities.



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There will be a brief application form to complete prior to acceptance into the program. Prior experience with contemplative practices and teaching experience are desirable. Early applications are encouraged, as workshops often fill several months in advance.

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Congratulations to two New York state recipients of AAFP Tar Wars Awards:

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The poster submitted by **Alina Gilmore from Kenmore, New York** was the third place winner of the 2014 Tar Wars student poster contest. Alina's poster, pictured below, was selected from participating state winners from fourth and fifth classrooms from across the US.

Tar Wars is a tobacco-free education program for fourth- and fifth-grade students. The program is designed to teach kids about the short-term, image-based consequences of tobacco use, the cost associated with using tobacco products, and the advertising techniques used by the tobacco industry to market their products to youth.



Denise McGuigan, MS Ed, the Associate Director of the Office of Undergraduate Medical Education for the Department of Family Medicine at the University at Buffalo, was recipient of the "Tar Wars Star Award" which honors individuals and organizations who have significantly contributed to the Tar Wars program. Denise has been coordinating Tar Wars presentations in Buffalo-area elementary schools for over 15 years and through her work with students in the

University's allied health professional programs, has brought the Tar Wars curriculum to 1163 Buffalo- area elementary school students in 17 schools! She has gone to countless classrooms and mentored hundreds of medical students in presenting Tar Wars.

NYSAFP Receives AAFP 2014 Leadership in State Government Advocacy Award

In recognition of NYSAFP's advocacy efforts to defeat legislation that would have authorized long-term antibiotic treatments for Lyme disease, the AAFP Commission on Governmental Advocacy (CGA) Subcommittee on State Government Affairs has selected the NYSAFP as a 2014 recipient of the Leadership in State Government Advocacy Award. This award, as well as the opportunity to share details of this winning effort, will be presented at the AAFP 2014 State Legislative Conference in November.

NYSAFP Advocacy Chairman Marc Price, DO, and EVP Vito Grasso, MPA, CAE, will attend the State Legislative Conference to accept the award and present on the chapter's activities in lobbying this bill. Dr. Price, Mr. Grasso, NYSAFP Past-President Ray Ebarb, and government relations counsel Marcy Savage led the NYSAFP effort on this issue. The bill would have exempted physicians who prescribe long term antibiotic treatment for Lyme disease from disciplinary oversight. NYSAFP argued that doing so would prevent patients who may be harmed by such treatment from pursuing disciplinary action against a treating physician. The bill was amended to provide, instead, a broader physician protection (not just for Lyme) which more narrowly focuses on treatment decisions only. The bill, which ultimately passed, prohibits investigation and professional disciplinary actions by the State Board for Professional Medical Conduct or Office of Professional Medical Conduct based solely on the recommendation or provision of a treatment modality by a licensee that is not universally accepted by the medical profession, including that used in the treatment of Lyme disease. It does not exonerate the licensee from otherwise applicable professional requirements.

ULTRASOUND IN THE ORTHOPEDIC EXAM BY MICHAEL KERNAN, MD AND KAMYAR NABEGH, MD

An Intra-articular joint injection is a technique that is used in the treatment of a variety of inflammatory joint conditions and musculoskeletal diseases including, but not limited to, overuse tendinitis and chronic tendinosis, bursitis, carpal tunnel syndrome, osteoarthritis, psoriatic arthritis and rheumatoid arthritis. A hypodermic needle is penetrated into the diseased joint where it delivers a dose of any one of many anti-inflammatory agents, the most common of which are corticosteroids. The technique is also occasionally employed to draw excess fluid from the joint space when indicated for therapeutic results. Throughout the years, this form of therapy has evolved to employ the ultrasound machine for better precision and accuracy in delivering medicine to the affected joint.

Medical ultrasonography is a diagnostic imaging technique employed by healthcare professionals that allows them to visualize internal body structures including tendons, muscles, joints, major organs and vessels. Physicians refer to “ultrasound” as sound waves with a frequency too high for human ears to appreciate. Sonograms, or ultrasound images, are made by sending a pulse of ultrasound into human tissue via a probe which is then reflected off of internal structures and recorded by a transducer. The echoed ultrasound waves are then recorded and displayed as an image for the healthcare professional to appreciate. This technological dynamic forms the basis for the familiar ultrasound machines that litter hospital wards, emergency rooms and clinics throughout the world.

The technique of injection therapy is well studied and relatively uncomplicated. Specifically, the use of corticosteroids in the treatment of muscle, joint and soft tissue

injury and inflammation is quite popular.³⁻⁵ Intra-articular and joint injections are technically more difficult to perform than muscle and soft tissue injections, yet they can be of great benefit to the athlete or injured patient in terms of recovery and symptom reduction. The goal is to inject a steroid or anesthetic preparation into the affected area with as little pain and complication as possible.

A solid understanding of human anatomy and anatomical landmarks is essential in accurately delivering therapeutic modalities into affected joints. For example, a patient with elbow tendinopathy may benefit from an injection in the lateral or medial epicondyle. An injection in the lateral epicondyle is relatively straight forward and easy, while an injection at the medial epicondyle requires avoidance of the ulnar nerve. Injections in the vicinity of known nerves, arteries, or other delicate anatomical structures must be carefully attempted. Prior to the use of ultrasound guidance for joint and soft tissue injections, the performing physician relied completely on his or her knowledge of human anatomy to avoid these structures. There exists great phenotypic variation among humans, and a generalized anatomical schema is often insufficient in avoiding these delicate entities. Thus, the use of ultrasound machines for improving the accuracy, precision and reducing the side effect profile of therapeutic intra-articular joint injections has gained increasing popularity among practicing physicians, and with good reason; accurate delivery of medicine leads to a greater prevalence and improvement of joint function.^{2,6-7}

An increasing amount of evidence is beginning to surface favoring the use of

ultrasound guidance for therapeutic intra-articular joint injections. In one randomized, double-blind, controlled study, it was found that ultrasound-guided intra-articular joint injections performed by a training physician were more accurate than the physical-exam/anatomically guided injections performed by a more senior doctor.² Another study concluded that ultrasound guidance “assists in the rapid and accurate delivery of local anesthetic injections prior to sporting events.” Hence, patients receiving joint injections for pain benefited from the use of ultrasound guidance in their therapy modality as well.¹ The same study concluded that “ultrasound guidance of cortisone injections immediately after sporting events maximizes the available recovery time of the injured athletes.” Some studies cite ultrasound guidance as providing the benefit of 100% accuracy as compared to anatomical and experience dependent approaches.⁷ Intuitively this makes perfect sense, as having the benefit of visualizing the target provides an advantage in delivering medicine to the affected tissue.

The advantage of using ultrasound guidance in the treatment of joint pathology is supported by mounds of evidence. The foundation of this evidence lies in the inherent benefit of visualization. Traditional exam and anatomically-guided techniques are supplemented by this luxury, and it is the combination of these tools that will maximally benefit the patient. The overall benefit and outcome is centered around a less painful and more advantageous technique for joint injections that incorporate the use of ultrasound machines.⁶ Thus, patients experience better outcomes overall with respect to

CONTINUED NEXT PAGE

pathological signs, symptoms and quality of life. Ultrasonic guidance, in combination with anatomical-guidance, enhances needle placement for a multitude of procedures that extend beyond the realm of simple steroid or anesthetic injections. These include diagnostic biopsy and aspiration in addition to the above mentioned indications. As always, there is room for improvement, and modern medicine is just scratching the surface of the potential provided by diagnostic and therapeutic ultrasonography.

Endnotes

- 1 The match day use of ultrasound during professional football finals matches. Phillip James, Tim Barbour, Ian Stone. *Br J Sports Med* 2010;44:16 1149-1152.
- 2 A randomized, double-blind, controlled study of ultrasound-guided corticosteroid injection into the joint of patients with inflammatory arthritis. Cunningham J, Marshall N, Hide G, Bracewell C, Isaacs J, Platt P, Kane D. *Arthritis Rheum* 2010 Jul;62(7):1862-9.
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- 6 Does sonographic needle guidance affect the clinical outcome of intraarticular injections?
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CME POST-TEST

- 1 The use of ultrasound machines in guiding joint injections improves accuracy, precision and reduces the side effect profile of these procedures.**
 - a. True
 - b. False
- 2 Accurate delivery of medicine leads to a greater improvement of joint function.**
 - a. True
 - b. False
- 3 An increasing amount of evidence exists favoring the use of ultrasound guidance for therapeutic intra-articular joint injections.**
 - a. True
 - b. False
- 4 Some studies found that ultrasound-guided joint injections performed by a trained physician were less accurate than the physical-exam/ anatomically guided injections performed by a more senior doctor.**
 - a. True
 - b. False
- 5 When using an ultrasound machine, a solid understanding of human anatomy and anatomical landmarks is not essential in accurately delivering therapeutic modalities into affected joints.**
 - a. True
 - b. False
- 6. An intra-articular joint injection is a technique that is only used for the delivery of corticosteroids to affected tissue.**
 - a. True
 - b. False

To complete the test, please go to: www.nysafp.org > Publications > Journal and select the current edition 'Post Test'.



Must Have Medical Apps for Family Physicians

By Joshua Steinberg, MD

Fhink back. When you were a student and resident, remember how the pockets of your white coat sagged with pamphlets, handbooks, and scribbled notes? Did you carry a Harriet Lane Manual on pediatrics, a Washington Manual on medicine, a pocket pharmacopeia, a Sanford Antibiotic Guide, maybe an OB wheel? In your pockets or on a nearby office shelf, maybe you still keep these around. Why?

Because a doctor can't possibly remember enough by heart to take care of every question which comes up in the course of practice every day. Family doctors know this more than any others because we try to do everything, yet long ago recognized we can't know it all. This is not just a statement of humility; it's backed up by the literature. In the late 1990's, researchers followed busy community family physicians and tallied up 3.2 questions for every 10 patients seen. The clinicians most commonly pursued answers from paper resources or other people and spent less than 2 minutes for any pursuit.¹ The problem of not knowing something the moment you need it in patient care, is not unique to family physicians, as a similar study was done 15 years earlier among internists.²

These days, the productivity pressures are no less than those of 20 years ago, but we do have a new advantage. Nearly all of us carry a powerful computer in our pocket, loaded with reference information, and connected to vastly more on the web. If you collect good resources and know how to get what you're looking for efficiently, you should be able to answer a great number of questions at the point of patient care with but a few clicks, in less than 20 seconds!

Here are reviews of several iPhone apps useful to family medicine clinicians spanning both inpatient and outpatient care. A longer list, noting Android OS availability, is freely available at the Family Medicine Digital Resources Library here: <http://fmdrl.org/index.cfm?event=c.beginBrowseD#2423>

ePocrates

Questions about medications are the number one type of question that arises during clinical care.¹ The ePocrates free drug reference lists all the things a clinician might look up about a medicine, such as pill sizes, FDA indicated dosing, renal and hepatic insufficiency

dose adjustments, safety and tolerability cautions, typical out-of-pocket pricing, pharmacology, and more. ePocrates and other drug references also typically have a computerized drug interaction checker. Anyone can remember that quinolones mess up Coumadin. But when a patient feels lousy can you gaze at a list of 14 meds and pick out the four that might interact with each other? ePocrates will do this for you. Enter in the meds and ePocrates reports all the interactions it can find.

Others like it: Medscape, Micromedex. These resources are good but don't list drug prices, which is a serious oversight, as we need to be stewards of our patients' limited financial resources.

Vaccine Schedules

You probably know how many DTaPs to give a child and when. But what about a child who disappeared from care from 3 months old until 14 months old and now needs catch-up dosing? How about the vaccines appropriate for an asplenic patient or ones to give (and not give) a fairly advanced HIV patient? For these cases you need a good immunization resource and there are some great apps which put this information at your fingertips. Two excellent ones are the CDC's Vaccine Schedules app and family medicine's own Shots Immunizations 2014 app. Both give you all the typical schedules for kids, teens, and adults. Both provide easy to use catch-up schedules. Both offer tables of vaccines by medical indication. Both let you drill down for much greater detail on any particular vaccine.

Others like it: There are lots of immunization apps out there, and most are fine, with the one caveat being that some are written for pediatrics or adults only. If you practice on the full age spectrum, then get an app which covers children, teens, and adults.

Infectious Disease Compendium (IDC)

Questions about bugs-n-drugs come up all the time. You've got the routine ones memorized. But what about an outpatient endometritis regimen? And what about alternate regimens when your patient is allergic to first line therapy? You need an antibiotic guide and IDC has everything you need. For a few dollars you get a first class, concise discussion of nearly any entity or microbe, with parenteral and oral regimens and alternatives which work around allergies.

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Two features make IDC a gem. First, it is peppered with hot-links to evidence in the literature to support numerous assertions. Second, it is hilarious! The tracts are peppered with wise-cracks, sarcasm, and all manner of humor. You will actually enjoy using this app.

Others like it: The Sanford Guide to Antimicrobial Therapy and the Johns Hopkins Antibiotic Guide have made it to the smartphone world, but the business models are not nice. In the old paper world a Sanford Guide, for example, would last a few years. Not true for the app. Sanford costs \$29.99 every year for a subscription to their app. IDC costs \$5.99 and you get free updates forever. Plus did I mention IDC is hilarious?

Qx Calculate

Do you have the formula for adjusting serum sodium for hyperglycemia memorized? Neither do I. But you've got a computer in your pocket so you should have a calculator app with a hundred or more various calculators at your fingertips. Need to calculate an A-a gradient, a Bishop score, a CHADS2 score, a BMI, a Framingham cardiac risk, a corrected QT interval, a fractional excretion of sodium, a Glasgow coma scale? They're all there and dozens more. Qx Calculate organizes their calculators and lets you create your own frequently used favorites set.

Others like it: MedCalc is great too.

DueDateCalc

Everyone should have an OB wheel in their pocket. But the moment I need one is the moment I can't find it. iPhones have solved this and there are a lot of OB wheel apps out there with varying degrees of functionality. I prefer DueDateCalc, but there are plenty more which are fine. Most calculator apps like Qx Calculate and MedCalc also include some obstetric due date calculators.

ePSS, the Electronic Preventive Services Selector

The ePSS organizes every screening and preventive service which the United States Preventive Services Task Force (USPSTF) has ever reported on. You can browse all the topics and drill into their discussions for as much detail and depth as you please, or you can search via ratings (just the A-rated services or D-rated or I-rated, etc.) or search via patient characteristics, e.g. 43 year old non-pregnant female. If you want to read in greater depth to appreciate the controversies on various screening and preventive topics, you probably want to go to the USPSTF website on a nice big screen. But if you want a concise summary, organized nicely, this app is outstanding.

What are smartphone apps really good for?

- Quick information during patient care within a few clicks and 20 seconds
- Questions that come up frequently in practice (example: drug dosing)
- The information is too complex to memorize (example: antibiotic regimens)
- The stakes are too high for educated guesses (example: Coumadin management)

What are smartphone apps not ideal for?

- Reading articles or chapters – do that on a tablet or laptop, not on a 3 to 4 inch cellphone screen
- Materials that require a lot of typing interaction like data or search phrase entry which is so much easier on PC or laptop with keyboard

PreopEval

What are those 5 steps in the American College of Cardiology's cardiac clearance algorithm? What levels of activity qualify as good functional capacity? Who needs bridging heparin while off their Coumadin before surgery? How do I handle clopidogrel and aspirin and metformin and Lantus around the time of surgery? PreopEval pulls together guidance on preoperative clearance and perioperative management from several authoritative guidelines to try to answer every question which might arise while prepping a patient for surgery.

Contraception Pocketcards

This outstanding reference made by our family doctor friends at ReproductiveAccess.org puts essentials at your fingertips. It shows all the doses of the many oral contraceptive pills on the market. It shows a table of contraceptive efficacy statistics for every method with both ideal and typical real world use. The app offers quick-start algorithms which enable a clinician to get a patient started and protected with contraception as soon as possible. It contains a selected subset of the common contraindications to various methods according to the WHO medical contraindications scheme.

Warfarin Guide

Although no single warfarin management scheme has been shown superior to any other in the literature, there is evidence that having a scheme and a system to implement it improves outcomes. Warfarin Guide presents the management scheme from American Family

Physician along with the American College of Clinical Pharmacy's guidance on indication, duration, and intensity of warfarin therapy.

BiliCalc

Do you do newborn care in the office or nursery? If so, you need those nomograms at your fingertips on newborn bilirubin levels, along with all the details about which infants are considered low, intermediate, and high risk for needing phototherapy. BiliCalc lets you enter age in hours after birth and bilirubin level, and then shows you where these data fall on the respective graphs. With several nice graphic and tabular presentations, it helps you see whether your newborn warrants phototherapy per the American Academy of Pediatrics guidelines.

STD 2010

Think of the search results you'll get if you Google "lesion on penis". That's why you need the CDC's STD 2010 app. It offers concise and detailed guidance on STD's whenever you need it.

If you have found other great apps for family physicians in practice, please let me know at jds91md@gmail.com so I can add more great apps to my online list.

Endnotes

- 1 Ely, et. al., "Analysis of questions asked by family doctors regarding patient care." BMJ VOLUME 319, AUGUST 1999.
- 2 Covell, et. al., "Information Needs in Office Practice: Are They Being Met?" Annals Internal Medicine volume 103, October 1985.

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ACCEPTING ELECTRONIC PRESCRIPTIONS FROM ALL EMR SYSTEMS

“Pinteresting” Approach to Patient Education: Social Media Platform Offers Patient Education at Point of Care

By Lorinda Parks, MD

I am sure you have been in the same exam room as I. Busy morning, and halfway through the hypertension visit, while I stop talking to calculate a patient's ASCVD Risk, he asks, “How does high blood pressure really cause a heart attack?” and then he wants to know what the orthopedist really means when she says his knee is “bone on bone.” The next man asks what a prostate is, and the woman in the afternoon cannot visualize what the shedding of her endometrium is doing during her menstrual cycle. These are the wonderful mysteries we try to bridle. After 13 years in family medicine, my chicken scratch drawings and stick figures have never really gotten the necessary points across.

The Hispanic diabetic patient doesn't know what a package of Splenda looks like, and I can't get on the floor to demonstrate “plank” for my high school athlete who needs core strengthening.

All of these clinical moments have one thing in common; they necessitate a picture to demonstrate the answer. Who could possibly carry around all of these pictures to pull out at just the right moment? I have wondered that for years.

Family Medicine is so diverse that we all face the dilemma of having a good handout available on every relevant topic. We need information on everything from how to avoid recurrent bacterial vaginosis, to lists of high fiber foods. From images which show symptoms of low blood sugar to what lung alveoli and the birth canal look like. Showing a patient a visual of the musculature of the spine might help dispel a patient's concern that their spine is broken when they really have muscular back pain. The graphic nature of recent smoking cessation ads has me re-thinking my wordy handouts. I loved Netter in anatomy class and those drawings have stuck with me. I also want to be able to show my patients the secrets that the body holds.

I have done at least five PDSA cycles (plan, do, study, act) trying to improve patient education in community health centers, using

various modalities from old school file folders, to iPhone apps with medical encyclopedias. I have tried using FamilyDoctor.org on my laptop and custom made PowerPoint presentations played on my iPad with endless pictures that I had formatted to fit. In the end,

they all failed because they were not facile enough- these strategies just didn't work in the “15-minute visit” environment. I couldn't carry along the right tool or technology. The folders never got refilled. The passwords for all the different apps were too clunky. Bottom line... these strategies weren't family medicine friendly.

So it was by random chance last year that a costume designer friend showed me her latest colonial era fashion creations using a free social media platform called Pinterest. What was this new slick tool? Although it was entirely new to me, I was immediately

attracted to the ease of use. Literally within a day, I started “pinning” medical images on my quest using this new technology for patient education. Here was a tool that was powered by people who were good at technology. The information could be customized to what I needed and minimized to get rid of irrelevance. It was accessible anywhere with internet access using the same tool as the EMR. I had the images at my fingertips and I could even distribute it electronically or on paper to my patient. This felt golden!

Before I go any further, I will give a brief overview for the Pinterest naïve. Pinterest is a company that provides an internet service that is described as a visual discovery tool. Over 70 million people use Pinterest to collect ideas for projects and interests.¹ Users create and share collections (called “boards”) of visual bookmarks (called “pins”) that they use to do things like plan trips, organize events or save items that they find interesting. The site was founded by Ben Silbermann, Paul Sciarra and Evan Sharp.²



Pinterest is a free website. Users can upload, save, sort, and manage images and other media content (e.g., videos and images) by “pinning” an item to their board using the “Pin It” button. Pinboards are typically organized by a central topic or theme and users can browse the content of other users via the main page. The limit of things that you can pin is as limitless as the internet.

All of that said I need to divulge that as far as social media goes I am a hard sell. I am decidedly not among the millions of people that use Facebook every day. Innovating new ways to educate patients however, is such an important goal for me that I decided to make some “pins” and “boards” and try this technology out in the prime time of my exam room.

To get started using Pinterest, you first create an account with your e-mail or a Facebook page, then add the symbol for Pinterest to your internet tool bar with just a few clicks. Now simply search the internet for great images, atlas pages, or patient education handouts. When you find something you like, you hit the fancy “P” which opens your Pinterest page and asks you what board you want to place the item on. I have organized my pins in medical fashion; OB, Dermatology, GI, Cardiology, etc. You can add and subtract pins at will, keeping in mind the goals for patient education – making things relevant, current and accessible. Using images gathered via Pinterest allows me to individualize patient education in an interactive way, while also addressing low literacy.

Here is how I use Pinterest: I am in a clinic visit and at the moment when I feel that what I am saying or doing is confusing my patient, I click onto the internet and open the tab to my Pinterest page which will bring up my 15 organized, full color boards ready to be used and printed in clinic, or sent home via e-mail. My patient can look at the image when they open the e-mail message or can choose to start their own Pinterest account, and then have access to all of the pins on my page. My entire page is public for use by anyone on Pinterest who is looking for images. Other medical systems large and small are using my boards and pins, and I can use any that I find on other boards as well - share and share alike!

The exciting thing for me is that Pinterest has thrown me into a whole new universe of education. I was originally looking for a way to show atlas photos and convey simple images, but the Pinterest format is so easy to use, I found myself adding in emotions to better convey my messages. Motivational interviewing for behavior change is part and parcel with family medicine. For complicated topics like a smoking cessation intervention, I now use a storyboard of photos to facilitate my cessation education. “How does this make you feel?” (picture of a child asking a parent why they smoke), or “Have you felt like this?” (money for laundry being smoked up in a pack of cigarettes). I have nature photos that may help someone doing meditation for depression or anxiety. I have pictures of how to make a cheap heating pad from rice. With photos, I can embrace the power that emotions can bring to changing behavior. I am able to allow others

with creative photography skills to capture thought provoking images which can get us talking.

There are a few requirements for this “Pinteresting plan”. You must have internet access which you can use while minimizing your EMR screen. You must have either an e-mail address or a Facebook page.

What are the costs of this? Pinterest, like most social media is free on the front end. It is the advertising and the fact that they keep track of what I post that is the “cost” in this case. It can present an ethical decision when you delve into social media. I am cognizant of this and use my Pinterest only for public things. I do not post pictures of the vacations I want to take or the chocolate dessert I want for my birthday. Annoying as it is, I get some e-mails saying that new people are following my pins, however, I do not get solicitations from Pinterest, or messages in my e-mail box from patients.

It is proof positive that I have been using this format consistently several times a day, and it has not gotten old, tired, or useless. Someone else is doing the upgrades and keeping it fresh looking and I can easily modify and change my topics at will. The format is not time consuming and it has never “crashed” right when I need it. It is not nurse-dependent, and perhaps most importantly, my patients respond favorably to this type of education.

So what is my favorite pin you ask? It changes from week to week. This week it is an image I use to screen for domestic violence showing a fist coming out of someone’s mouth to portray how damaging verbal abuse can be. Overall, I think the idea of using Pinterest for patient education is still in its infancy - I will report back when I graduate to an expert level pinner. But if you do happen to start using Pinterest for patient education, look up my board or send me your e-mail address and I will use your pins and you can use mine.

Endnotes

- 1 Horwitz, Josh. (2013-07-10) Semiocast: Pinterest now has 70 million users and is steadily gaining momentum outside the US. The Next Web. Retrieved on 2014-02-25
- 2 Carlson, Nicholas (May 1, 2012). "Inside Pinterest: An Overnight Success Four Years In The Making HI". Business Insider

Lorinda Parks, MD is passionate about providing medical care to underserved populations. Currently she is a family medicine physician with Anthony Jordan Health Care, a community health clinic in Rochester, NY. She speaks Spanish and enjoys providing health care to persons in their *lengua materna* or mother tongue. She is new to New York from 6 years serving undocumented farm workers in Washington State and 6 years doing residency education in Minneapolis, MN. Lorinda has practiced medicine in Bolivia and Nicaragua while living abroad with her children.



The New Frontier of Medical Apps: How They Can Help Your Primary Care Teams

By Mathew Devine, DO

Recent advances in technology and their increased use in medical facilities have led to one of the fastest growing areas in medicine: medical applications or apps. Since the launch of Android and Apple smart phones and tablets the use of medical health apps amongst clinicians has increased significantly. Primary care clinicians now practicing as patient centered medical homes are using technology like apps to help with the rigors of daily practice. Current estimates suggest over 40,000 medical apps available for use on these technology devices.¹ Most apps have the capability to work on Apple and/or Android platforms. For a family practice provider these medical apps can be quite helpful in providing point of care testing and reviewing important diagnostic testing while working in your clinical milieu. Using medical apps can also be quite helpful for clinician teachers and preceptors when they are overseeing medical students, residents, and other medical training professionals. It is also important to be aware of the growing field of medical apps that patients are using. These apps have the potential to help with patient self-management, motivation, and secure communication with medical offices and patients. Since medical apps are being used by both patients and clinicians, keeping a close tab on the app marketplace can help to improve your personal and career health.

With increased demands on medical practices to have “paperless” systems, the use of medical apps on a smartphone or tablet can create a learning environment that is present with the clinician at all times. Assuming that the medical app is up to date, this way of teaching and practicing medicine has a large upside. As the next generation of family practitioners embarks on their careers, they

are expected to be “tech savvy” or linked-in to the efficient use of technology and computers. After incentives were given to practices to use electronic health records, all clinicians have had to become more competent with technology, and since this time I have noticed significant improvements in the competency of the seasoned faculty at my residency practice, and across the general medicine community as well.

One challenge we are faced with is that most of the medical apps on the market do not have an overseeing body that ensures that the vendors of these applications are evidence-based, accurate, and up to date. Since most aspects of the medical industry have certification and/or quality oversight, this is currently what the field of medical apps is lacking. In the future it will be helpful to have an overarching body to provide meaningful review and information to app creators to ensure that their products can be used with confidence, reliability, and safety.

Since the emerging field of medical health apps is so large and overwhelming, the discussion of this topic will be broken down into the following categories: Medical Information/Referencing; Medical Devices/Diagnosis; Enterprise Applications; Communication; General Medical Education; Locating Health Care; Patient Reminders and Alerts and Patient Motivation. See Table 1 for further descriptions.

Medical Information/Referencing

Due to their portability, medical tablets and smartphones can be used for accessing resources and medical information. There have been many articles published on the most popular medical apps. It should be noted that there are some exceptional apps on the market that

Table 1: Categories of the Medical Health Apps Market

Category	Targeted Population	Examples of Category	FDA Oversight Required
Medical Information/ Referencing	Clinicians	Apps that can be accessed for patient care. Example: DynaMed	Occasionally
Medical Devices/ Diagnosis	Mostly by Clinicians	Apps that can be used to help in the diagnosis of medical conditions. Example: AliveECG (app that can obtain single lead ECG tracing)	Most of the time
Enterprise Applications	Clinicians	Apps that provide mobile access to enterprise programs most usually used on computers. Example: Mobile EHR apps	Most of the time
Communication	Patients & Clinicians	Opportunities for communication to staff, or patients through app portal. No current reimbursement model in place for this.	Occasionally
General Medical Education	Mostly Patients	Apps that inform and provide education about various health topics to the patient in non-medical terminology.	Occasionally
Locating Health Care & Insurance Coverage	Patients & Clinicians	Apps that locate medical facilities and clinicians.	Rarely
Patient Reminders, Alerts, and Patient Motivation	Patients	Apps that have built in reminders or can be used to encourage patients to take part in healthy lifestyle changes. Example: Reminder to take medications	Occasionally

are free to download and use. Some of these free apps do have an upgradable option that most of the time comes with a cost. Since this marketplace is always changing your favorite apps could suddenly become an app associated with a cost.

Please see Table 2 for a list of the most popular free and paid apps available on the marketplace.²

<p>Table 2: Most Popular Medical Information or Referencing Apps</p> <p>Most popular free apps:</p> <ol style="list-style-type: none"> <i>ePocrates</i> serves as comprehensive clinical reference that also has a paid version with more resources <i>Medscape</i> serves as a drug and medical condition reference, with medical news, and CME available <i>Micromedex</i> provides drug information. This has a more comprehensive version that is paid <i>Calculate QxMD</i> is a comprehensive medical calculator <i>AHRQ ePSS</i> has comprehensive USPTF recommendations <p>Most popular paid apps:</p> <ol style="list-style-type: none"> <i>Diagnosaurus DDx</i> is used as a diagnostic search tool in helping to formulate a differential diagnosis for medical conditions <i>DynaMed</i> is an evidence based medicine program that covers most medical disease; free app with subscription <i>Visual Dx</i> is a dermatologic reference app; free app with subscription <i>MedCalc 3000</i> is a medical calculator with over 200 formulas

Medical Devices/Diagnosis

This category focuses on apps that can be used with an add-on accessory that can turn your smartphone or tablet into a medical device. Due to some of the medical apps’ abilities to provide diagnostic information, the U.S. Food and Drug Administration (FDA) has created a Center for Devices and Radiological Health (CDRH) which is charged with regulating the safety of medical apps³. Some examples of medical devices that have been FDA approved that could be helpful to clinicians include²:

Withings Blood Pressure Monitor and app; FDA approved

AliveCor Heart Monitor one lead ECG accessory and app; FDA approved

CellScope Otoscope reports that it is not required to be FDA approved

ThinkLabs ds32+ Stethoscope; FDA approved

iHealth Body Analysis Scale; FDA approved

Enterprise Applications

Since most primary care practices are now using electronic records, mobile medical apps can now be used to access these databases outside of the medical office. If you are currently using an EHR, an enterprise app for it may be available depending on the platform and subscription/contract with your vendor. There are also over 19 apps that are on the market that can allow patients to store personal health records on their own mobile devices.⁴ There are also apps available that satisfy HIPPA encryption, with security settings that allow clinicians to communicate with text messaging, as well as to transmit images.

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Communication

The current fee-for-service model does not support or reimburse for patient contact outside of the medical office. There are however, a growing number of medical apps available that will inevitably lead us into this new frontier. There are apps that currently could be used in emergency care for real time assessment of acute stroke, or the evaluation of the acute cervical neck trauma.⁴ These types of “telemedicine” could greatly help remote areas facing resource limitations, and could also cut down on the demand that most primary care offices are currently facing. However, until there is a change in payment mechanisms, the power of these tools will not be able to be fully realized.

General Medical Education

This category of medical apps for patients and the general public is currently the largest of the applications that are available. There is a large spectrum of apps for almost any condition or problem that you can think of. Since patients are using them it would be helpful for clinicians to start inquiring if a patient has a smartphone/tablet device and if they use any medical apps. Some clinicians have started to “prescribe” apps to patients during office visits. The formation of an organized body that can provide unbiased certification of a credibility and accuracy will help to make sure that these “prescriptions” are put to good, safe use. Family practitioners are currently prescribing apps for sleep diaries, weight loss plans, and psychosocial conditions like anxiety, which provide behavioral modification techniques to the user.

Locating Health Care and Insurance Coverage

This category of medical apps can be very useful to help connect consumers to medical offices as well as providing patients with needed information regarding their insurance plans and coverage. With the passage of the Affordable Care Act, millions of Americans now have access to health care. These apps can also be helpful when a patient is traveling out of their network and is in need of medical care or treatment. Examples in this category include the Teens in NYC app, which locates sexual health services in NYC; and eHealth, a mobile app that can be used to locate a doctor, and manage one’s health insurance.

Patient Reminders and Alerts, and Patient Motivation

In the challenging arena of patient compliance and motivation for healthy lifestyle changes, there is a bright future for this category of medical applications. Since smartphones have become more affordable, they have allowed for lower socioeconomic groups to be able to access them and use medical apps. Adolescents are also

increasingly using smartphones. With more users, clinicians can advise patients to use medical apps to encourage healthy habits. There are popular medical apps out there like MyFitnessPal that could be very helpful with pediatrics and adolescents. Although the data to support this is still not available, the market for patient motivation and better self-management is promising.⁵

Conclusion

The growing field of medical applications for use by clinicians and patients has great potential to improve health and decrease health care costs. The caveat to this is the lack of restrictions and accountability for all medical apps, with the exception of the diagnostic apps which are currently monitored by the FDA. As certification measures are put in place to make technology reliable, the future of safe and accountable medical apps will be here before we know it.

Endnotes

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Sources Nutrition: A. Drewnowski, *Am J Clin Nutr*, 2010; USDA National Nutrient Database for Standard Reference SR25; 2010 *Dietary Guidelines for Americans*; Nutrients and reuse: Est. of human-edible and inedible materials computed from the avg. Midwestern lactating cow ration published by Thoma et al.; Greenhouse Gas Emissions of Fluid Milk, 2010; Erb, Kevin; Manure 101, University of Wisconsin Extension, 2010; Digester: Innovation Center, Case Study; Food Waste, 2013.



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