



AAPPO Accountability and Value for Improved Diabetes Care Issue Brief

Patient-Centered Technology and Its Potential to Improve Diabetes Care

This is the second Innovations in Value Based Approaches to Diabetes Care *Issue Brief* in a series by the American Association of PPOs. This *Issue Brief* looks at “Patient-Centered Technology and Its Potential to Improve Diabetes Care.” It specifically examines the potential for technology to transform how patients manage and improve their health. While many recent innovations have emerged from the health sector – including technologies such as wireless blood glucose monitors, new medication delivery systems, and devices for biometric testing – other technologies such as smart phone applications and games also have tremendous health potential.

One important advantage of new consumer technology is its ability to engage the attention of users. People increasingly love their phones, and they’ve always loved to have fun. The linkage between personal devices, fun, and health, may just be the secret sauce that achieves what every plan and provider seeks: patient engagement.

This *Issue Brief* is based on the premise that health plans, PPOs, and providers can capitalize on member interest in and engagement with technologies to improve health care outcomes. It focuses on emerging health technologies that may impact diabetes prevention and management. By understanding the changing landscape for members, PPOs will be better positioned to work with payers, plans and providers to push out information and capture data that will improve care for diabetes.

For more information on diabetes and Value Based Approaches to Diabetes Care, visit AAPPO’s Accountability and Value web site by following links at www.aappo.org. AAPPO’s web site includes downloadable *Issue Briefs*, along with presentations, toolkits and resources to assist PPOs in working with payers, providers and patients to identify value-added strategies to improve diabetes care.

About AAPPO

AAPPO is the leading national association of preferred provider organizations (PPOs) and affiliate organizations. More than 193 million individuals are enrolled in a PPO program, which means 69 % of Americans with health care coverage receive their health care services through a PPO delivery system. A PPO network of providers may be an embedded part of a traditional insurance program or it may be contracted as an element of a self-insured program that includes a third party administrator of claims and care management programs. PPOs also provide network services to newer types of insurance products such as consumer directed health plans.

Technology as a Value Added Approach to Diabetes Care

Other *Issue Briefs* in this series enumerated the importance of diabetes to health care providers, payers, and networks:

- 24 million people, or almost 8 % of the population, have been diagnosed with diabetes, and diabetes is the sixth leading cause of death in the U.S.

- In addition to diagnosed individuals, another 57 million people (or double that of those with diagnosed diabetes) have pre-diabetes, or blood glucose levels that are higher than normal but not high enough to yet be classified as diabetes.¹
- The price tag of diabetes is about \$174 billion in direct and indirect costs.²
- Diabetes is an underlying factor in multiple disabling complications such as heart disease, hypertension, depression, blindness, decreased circulation that can lead to amputations, and other conditions that can severely affect patients' quality of life.³

Treatment of diabetes requires control of blood glucose on a daily basis, along with prevention and control of multiple complications. Patients are strongly encouraged to “self-manage” many aspects of diabetes, which includes controlling weight and dietary intake, exercising, and monitoring blood sugar. Control of blood glucose usually necessitates either oral medications or injected insulin, and often requires frequent adjustments of medications to maintain normal blood glucose.

Patient adherence to recommended treatments for diabetes is low. Most Type 2 diabetic patients find it extremely challenging to lose weight, exercise regularly, and routinely check their blood sugar. Medication adherence is uneven, ranging from 36 -93% for oral hypoglycemic agents to around 63% for insulin.⁴ While health plans and PPOs have always invested in strategies to improve adherence, we may now be entering an era in which patients have the tools for and interest in taking control of prevention and self-management.

What Technology Means To PPOs

Health plans have many programs to improve adherence and healthy behaviors. These include wellness programs, disease management and case management, along with complex systems of reminders, incentives, and value added programs. These programs face serious challenges engaging patients and sustaining changes to health and diabetes self-management behaviors long term. In recent years, value based insurance design (VBID) strategies have been used to create incentives for members to increase actions most likely to influence good outcomes in health care.

Technology, whether it is acquired by the patient or promoted by the PPO, has the potential to dramatically impact the value of health interventions. Technology investments by patients can enhance treatments and promote health by engaging members' attention, managing information such as blood pressure and glucose levels that makes it easier to manage the condition, and by making adherence more interesting. Technology that promotes better communications with providers can increase efficiency, reduce duplication of tests, and even promote better outcomes such as helping to prevent rehospitalizations.

Technology is an additional element of “value” to be considered by PPOs. Adoption and promotion of personal health technologies may be part of the PPOs' portfolio of value enhancing or VBID approaches. Health plans are actively adopting technological innovations to engage members. For example:

- In 2010 Humana launched an aggressive mobile initiative to enhance the experience of members. Through mobile phone applications (apps), Humana offers a physician and hospital search tool, claims summaries, text messaging, an urgent care source finder linked to GPS and health related games.⁵
- WellPoint announced a partnership in 2010 to make Online Care services available to members of its affiliated health plans. Online Care enables individuals to have live interactions with physicians and clinicians via video, secure chat, or phone. Practitioners are able to recommend clinical interventions, including prescriptions, and access online medical records.⁶
- CIGNA signed on as an outreach partner of the text4baby™ program, a national initiative to deliver vital health information via free text messages to pregnant women and new mothers, with the goal of helping women have healthy pregnancies and deliver healthy newborns. Text4baby is a program of the National Healthy Mothers, Healthy Babies Coalition (HMHB).⁷

PPOs and other stakeholders in the system may want to consider the value of health care technologies to improve health outcomes as they design member engagement strategies, benefits, and programs.

Value-added Technologies for Health, Care Coordination, and Member Engagement

Patient-Centered Technologies and Diabetes Care

The term of “patient-centered technologies” describes an array of techniques and tools used by the patient but whose adoption may be prompted by a physician, payer or through direct consumer choice. In fact, the most promising consumer technologies such as smartphones were created outside the health sector for primary applications not related to health. Patient-centered technologies such as phones, games, and internet communications are “disruptive technologies” - innovations that disrupt an existing market and that improve a product or service in ways that the market does not expect, typically by lowering price or designing for a different set of consumers.”⁸

Health applications have been successfully integrated with mainstream consumer devices, which radically changes their usability, accessibility and even desirability! Progress and adoption in this area can facilitate patient empowerment, responsibility and active engagement in their own healthcare management.

Interactive Health Records

The **personal health record (PHR)** is a patient medical record that is managed by the patient rather than the provider. PHR’s are the foundation for many new technologies described in this *Issue Brief*. They house patient data such as blood glucose levels and have capability to interface with physician records and other self-management resources. PHRs simplify access to information and laboratory records. Increasingly the biometric devices available for monitoring blood glucose, blood pressure and other indicators can be synchronized with the PHR for a continuous electronic record. There is potential synergy for incorporation of the PHR information into the provider electronic health record (EHR), thus marrying the patient and provider information.

Adoption of PHRs has been supported by the payer community including organization such as WellPoint which offers a PHR to members.⁹ Several independent PHRs are also available from information technology giants such as Microsoft and Google. These PHRs are portable even if the patient changes health plans or employers. Microsoft HealthVault™, for example, is a free PHR maintained by the patient. It interfaces with other devices to upload patient health data. It can be linked to a provider’s website, and the user can grant access to the physician. The PHR also interfaces with patient education and engagement support - Microsoft offers self-management tools such as a blood glucose log and exercise program.

Biometric Monitoring

Numerous **biometric monitoring** devices are available, ranging from monitors for blood pressure, glucose and spirometry readings to devices that count steps and calories. Increasingly these are untethered to medical care – patients can buy devices online or through retail centers.

For diabetes specific monitoring, multiple glucose monitoring systems are available. Traditional monitors can now communicate results wirelessly with the PHR or mobile phone. **Continuous glucose monitoring devices (CGM)** are FDA approved systems that use a tiny sensor inserted under the skin. The sensor stays in place for several days before it is replaced and measures glucose levels in tissue fluid using a transmitter to send information about glucose levels from the sensor to a wireless monitor.¹⁰ These devices improve accuracy of recording and may reduce the burden on the patient. Not all health plans provide coverage reimbursement for CGM but it appears that number of national and regional plans that have adopted coverage, at least for type 1 diabetes, based upon individual plan criteria.¹¹

Mobile Phones

The power of **mobile phone and smart phone applications** is rapidly expanding – both by consumers and healthcare providers. Studies show that physicians have rapidly adopted mobile phones,¹² a contrast to the

slow adoption of office based HIT. Mobile phones also offer the opportunity to address health care and health information disparities. New findings from the Pew Internet and American Life Project¹³ found that minorities are closing the Internet access gap via mobile devices. In fact, minorities are more likely than whites to use social networking sites and mobile communications such as Twitter – opening the possibility of reaching and engaging populations that have traditionally been hard to reach by the health care sector.

Smart phone applications can help consumers manage the various behavioral and therapeutic elements of diabetes care.¹⁴ On any given day, multiple factors influence patients’ diabetes control: sleep, exercise, food and medications. Smart phone applications enable patients to record these variables and create a relevant diary record, along with their corresponding blood glucose results. Patients can simply record the data for their own use, or electronically transmit that information directly to a provider’s office. Smart phones are thus becoming a vehicle for improved shared decision-making between patients and providers.

While smart phones use may still represent early technology adopters, the California Healthcare Foundation¹⁵ found over 6,000 health related applications in the Apple AppStore. The majority - 73 %, are targeted to consumer purchase and use. This flood of health applications and the skyrocketing use of smart phones signals a vision of technology-enabled health management strategies for the future.

Medication Reminders

A survey conducted by the National Alliance for Caregiving and United Healthcare reports that medication support systems were among the top three health technologies favored by caregivers.¹⁶ **Automated reminders** come in multiple shapes and styles. Some reside with the patient and are personal memory jogs when it’s time to take medications; others are pharmacy generated and are outbound reminders to the patient to refill medications. Mobile phones can be programmed to generate a text message as a medication reminder.

The multiple types of reminders mean that strategies can be personalized to the preferences of the user. One type of communication will not work best for all audiences. For instance, some (though not all) older patients may be more receptive to traditional phone call reminders; middle-aged patients may prefer traditional e-mails, while younger patients may respond better to a text message.

Medication Delivery Systems

Smart pills blink, beep, or speak when it is time for the patient to take a pill, or can communicate with caregivers if the medication is not taken as prescribed. Smart pills and delivery systems are designed to plug gaps that lead medication non-adherence. These gaps include forgetting to take the medication, forgetting to refill the medication, deciding not to take medication when it is inconvenient, and forgetting whether or not the medication has been taken.

For example, Vitality™ Glow Caps™ are specialized caps that fit over medication bottles to track medication use. The GlowCaps can offer automated patient reminders, but then also connect the information to social networking, automated pharmacy refills notices, and a communication loop back to the physician.¹⁷ Testing is underway to embed microchips directly into medications as well as a tracking and monitoring device. Chips can also be included in the medication packaging. Some systems automatically record the time the lid was opened, creating a medication documentation system.

Insulin pens are simple technology that increase convenience of taking medications and reduce the potential for medication error. Ease of transporting and administering insulin in turn leads to greater adherence.¹⁸ The prefilled pens – shaped like writing pens - replace traditional syringes, needles and insulin vials.¹⁹ Insulin pens typically have a dial up dosage feature that decreases dosing errors and may be especially helpful for those patients with reduced sight or fine-motor skill impairment.

Social Networks

Despite skeptics who insist that social media is a passing fad, **discussion groups, blogs and social networks** are experiencing unfettered growth. Online communities dedicated to health promotion and specific health conditions are multiplying, and health care delivery organizations are rapidly developing their own social networking platforms.²⁰ Like the use of the Internet before it, use of social media and networking will continue to evolve in both the quality and sophistication of its use and users.

The American Diabetes Association (ADA) hosts a robust community web site that offers forums, tools, information, message and discussion boards. ADA has a moderated forum featuring diabetes technologies and equipment.²¹ Other web sites such as DiabetesMine™²² and TuDiabetes.org²³ are virtual places where consumers can share their personal experiences and results, including success and failures. These sites offer for a wide array of consumer communication on nutrition, recipes, exercise, technologies and provide information and sites for even more resources. Many health plans create their own user forums, as do hospitals and some large physician practices. These Forums promote engagement with the host organization along with promoting self-management engagement.

TeleHealth

Telemedicine (also known as **telehealth**) enables a virtual patient encounter through electronic medium, creating a time savings for patients and a potential financial savings to both patients and payers. The visit is real – there is patient-provider exchange of clinical information, typically followed by the provider’s recommendations for follow-up care (lab, prescriptions, follow-up visits, etc.), clinical documentation and billing. It is “virtual” in the sense that the provider and patient are not in the same physical proximity (no office; no paper gown) and the encounter is conducted via video, audio and/or text communications.

Telemedicine has taken time to gain traction and gain the trust of privacy conscious consumers and providers, but now seems to be gaining speed. Improvements in secure messaging and encounter systems and increased access to high speed internet have contributed to the growth in telehealth encounters. The National Business Group on Health (NBGH) provides guidance to members on purchasing telehealth that recommends clearly identifying reimbursable services and volume limitations. NBGH notes that telehealth can help to control costs and alleviate overcrowding at the primary care level: A 2007 study of Kaiser Permanente’s HealthConnect Online found a 7-10% decline in primary care office visits for patients who e-mail their physicians and a 15% decrease in patient phone calls to doctors’ offices.²⁴ Other studies have found cost savings in the range of \$70-\$120 per virtual visit costing \$50, attributed to both direct costs and less lost productivity.²⁵ A number of national payers, including Aetna and CIGNA, currently contract and reimburse for telemedicine visits.²⁶

Gaming

Until relatively recently, game technology was associated with countless hours sitting in front of a screen exercising only the thumbs – the polar opposite of healthy behavior. Nintendo may have been surprised when senior centers started buying up Wii’s to promote fitness. No more. Now “**exer-gaming**” has gone mainstream²⁷ with programs such as Dance Dance Revolution, WiiFit and other technology-supported games that promote fitness. **Facebook** offers a free diabetes improvement game called HealthSeeker™²⁸ designed to help users adopt healthier lifestyles and reach diabetes control milestones and the web site www.healthgamers.com lists multiple online games for adults and children with diabetes.²⁹ An advantage of web-based games is that they can be used from any location and can interface with other health devices such as calorie or step counters. Health plans such as CIGNA, Aetna and Kaiser have all launched health games, and it seems likely that games generated both by the health sector and technology industry³⁰ will continue to grow as a diabetes engagement strategy.

Conclusions: Considerations for PPOs

It is too soon to know which of the technologies outlined in this *Issue Brief* will fade and which ones will become part of the mainstream. But it seems clear that technology is an integral part of the toolkit to promote health and wellness. PPOs will need to consider which modalities will be a best fit with their business model and their customer's expectations. PPOs may also be involved in working with payers and employers to assess the value of a given technology. This value assessment will include return on investment information and factor into both coverage determinations and VBID incentive strategies.

For technology coming directly from the health care sector, the willingness of commercial and governmental payers to reimburse for specific health and biometric management products and services – such as glucose monitors, pumps and pens may drive uptake. However, the rapid adoption of health content in personal technologies such as phone, social networks, and videogaming shows that health management has gone retail. Consumers will adopt health devices on their own if they are engaging and useful – a factor that PPOs can capitalize on to improve health and health education. Even though some of these will likely not become part of a plan benefit design, there may still be creative opportunities for PPOs to incorporate the use of the technology and the subsequent data findings to enhance their chronic care management initiatives.

PPOs and health plans have a role incorporating the most high value personal technologies into benefit design and care management strategies. For instance, some PPOs report recent increases in trends of low-to-no co-payments for equipment like GCM devices or insulin pumps. If research findings support a positive return-on-investment as a result of particular technologies, it likely there will be wider incorporation of those in VBID design.

Increased use of patient centered technologies will impact both network and full risk PPOs. PPOs can anticipate the needs of payers, employers and members such as:

- PPOs may be asked to offer a network of “wired” providers – the ones that can demonstrate better diabetes care through use of EHRs and technological interactions with members.
- PPOs may need to develop new provider network models, such as contracted arrangements and rates for telemedicine or for virtual encounters.
- PPOs will need to develop policies and capabilities for interfacing claims and other data with member and provider devices such as EHRs and PHRs.
- PPO care management programs will need to develop a variety of ways to communicate with and engage members – including social networking, Tweeting, texting, and interactive web.
- PPOs may need to capitalize on members' technological interests develop their own phone and web apps for health and marketing purposes.
- PPOs will need to develop early warning procedures to identify emerging technologies and consider them in coverage decisions. PPOs that do not develop benefit plans can offer expert counsel to plans, employers and TPAs based on market intelligence. High value solutions – ones that improve outcomes or efficiency, can be considered for VBID incentives to increase uptake.
- PPOs will need to ensure privacy and security of HIPAA protected communications – and still stay on the cutting edge of engagement with members and payers.
- PPOs will need to consider what technological innovations can improve efficiency and reach their own workflow – and adopt those that work best.

Patient-centered technology will challenge the health care system and potentially make it better. Incorporating the appropriate use of patient-centered technologies into decision-making and workflow processes represents a key leadership opportunity for PPOs.

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