

SUPPLEMENT ARTICLE

Leveraging the Principles of Osteopathic Medicine to Improve Diabetes Outcomes Within a New Era of Health Care Reform

Carman A. Ciervo, DO

Jay H. Shubrook, DO

Paul Grundy, MD, MPH

From the Kennedy Health Alliance in Marlton, New Jersey (Dr Ciervo); the Touro University California, College of Osteopathic Medicine in Vallejo (Dr Shubrook); and IBM Corporation in Armonk, New York (Dr Grundy).

This supplement is based on a roundtable discussion held on January 9, 2015, and led by Dr Ciervo. This article was prepared with assistance from Impact Education, LLC (IE). The authors approved the article and all of its contents.

Disclosure of Unlabeled Use: This educational activity may contain discussion of published and/or investigational uses of agents that are not indicated by the US Food and Drug Administration. The American Osteopathic Association (AOA), IE, and Merck & Co, Inc, do not recommend the use of any agent outside the labeled indications. The opinions expressed in the educational activity are those of the faculty and do not necessarily represent the views of the AOA, IE, and Merck & Co, Inc. Please refer to the official prescribing information for each product for discussion of approved indications, contraindications, and warnings.

Disclaimer: Participants have the implied responsibility to use the newly acquired information to enhance patient outcomes and their own professional development. The information presented in this activity is not meant to serve as a guideline for patient management. Any procedures, medications, or other courses of diagnosis or treatment discussed or suggested in this activity should not be used by physicians without evaluation of their patient's conditions and possible contraindications and dangers in use, review of any applicable manufacturer's product information, and comparison with recommendations of other authorities.

Financial Disclosures: Dr Shubrook serves on advisory panels for AstraZeneca, Novo Nordisk Inc, and Eli Lilly & Company and receives grant and research support from Sanofi-Aventis US LLC.

Support: This activity is supported by an independent educational grant from Merck & Co, Inc.

Address correspondence to Carman A. Ciervo, DO, 1099 White Horse Rd, Voorhees, NJ 08043-4405.

E-mail: c.ciervo@kennedyhealth.org

Submitted February 13, 2015;
accepted March 11, 2015.



First introduced conceptually decades before the passage of the Patient Protection and Affordable Care Act, the patient-centered medical home (PCMH) has evolved as a foundational element within the larger health care system or medical neighborhood, highlighting a coordinated and comprehensive disease management approach centered on intensive primary care interventions. More recently, in the wake of health care reform, accountable care organizations (ACOs) have been established to help health plans, physicians, hospitals, home health care practitioners, and other health care providers better coordinate care through an incentive-based payment arrangement. Osteopathic medicine is poised to proactively capitalize on these emerging health care models, with the anticipated end result of improved quality of care and reduced health care costs. As such, osteopathic physicians involved in the prevention and care of patients with type 2 diabetes mellitus need to identify models, best practices, and solutions to advance the medical neighborhood.

J Am Osteopath Assoc. 2015;115(4 suppl 1):eS8-eS19

doi:10.7556/jaoa.2015.058

New Health Care Delivery Systems for Chronic Disease Management

How has the overall clinical approach, as well as the osteopathic medical approach, to type 2 diabetes mellitus (T2DM) evolved during the past several years with respect to management strategies?

Dr Shubrook: All of medicine has had to adapt from an episodic care perspective to a long-term care model. Osteopathic medicine specifically has long taken the holistic approach of treating the entire patient, including all organ systems, as well as the brain and behavior. Our philosophy stresses effective patient engagement as being paramount. Therefore, in many ways, we were already well aligned to these recent developments in the health care landscape.

One of the components to optimal management of T2DM is the implementation of a team-based approach. With a chronic and complicated disease such as T2DM, an interdisciplinary team must be involved in a single patient's care, coordinating their services to achieve the best outcomes. The needs of patients with T2DM are too great for a single clinician to address.

Dr Ciervo: In other words, medicine has traditionally focused solely on the patient-physician relationship. Diseases such as T2DM and other chronic conditions require a team-based approach to ensure that clinicians are communicat-

ing with one another and contributing their highest level of proficiency.

Dr Grundy: The concepts and principles of osteopathic medicine are important to refer to when managing disease. Osteopathic physicians inherently value the person as a unit, the connection between mind and body, and the body's ability to self-regulate and self-heal.

Our patient population comprises 3 populations: those who are acutely ill, those with clinically significant risk factors for disease, and those who are apparently well. With respect to managing these populations of patients with T2DM and other chronic conditions, we need to ask ourselves population-specific questions. How do we specifically manage the acutely ill population in a comprehensive care setting as opposed to an episodic care strategy? Furthermore, how do we do it effectively and in a manner that adds value? For patients with noteworthy risk factors, how do we reduce the accumulation of these precursors to disease as a means of preventing the disease? And with respect to those patients who are apparently well, how do we keep them well? The answer to all of these questions can be found in the principles on which osteopathic medicine has built its foundation, because it starts with a mutual trust and partnership between a patient and a physician. That partnership is the fundamental building block to optimal care, and it also aligns well with the principles of the PCMH (*Figure 1*).¹

What we know from our experience with the sickest of those patients—those who have complications of T2DM—is that we need to consider the resources and tools available. Furthermore, we need to consider how to engage those patients effectively. Populations under a PCMH model had a 60% reduction in complications of diabetes (60% fewer cases of blindness, 60% fewer amputations, and 60% fewer patients who have to undergo dialysis).² The key to improving outcomes is follow-up, maintenance, and understanding what needs to be done to effectively reach, manage, and engage that population.

What opportunities to improve the quality of care for patients with T2DM do you envision moving forward in the postreform era?

Dr Ciervo: Self-monitoring techniques and consultations with transition-of-care nurses constitute one opportunity. Also, patient engagement through the patient portal in the electronic medical record (EMR) offers promise for the management of chronic conditions such as T2DM.

Dr Shubrook: A greater focus on prevention is needed, especially with regard to T2DM; it has been estimated that one-third of people in the United States have prediabetes, but nearly 90% do not know it.³ The Diabetes Prevention Program showed that new-onset T2DM can be delayed or prevented in up to 60% of people with prediabe-

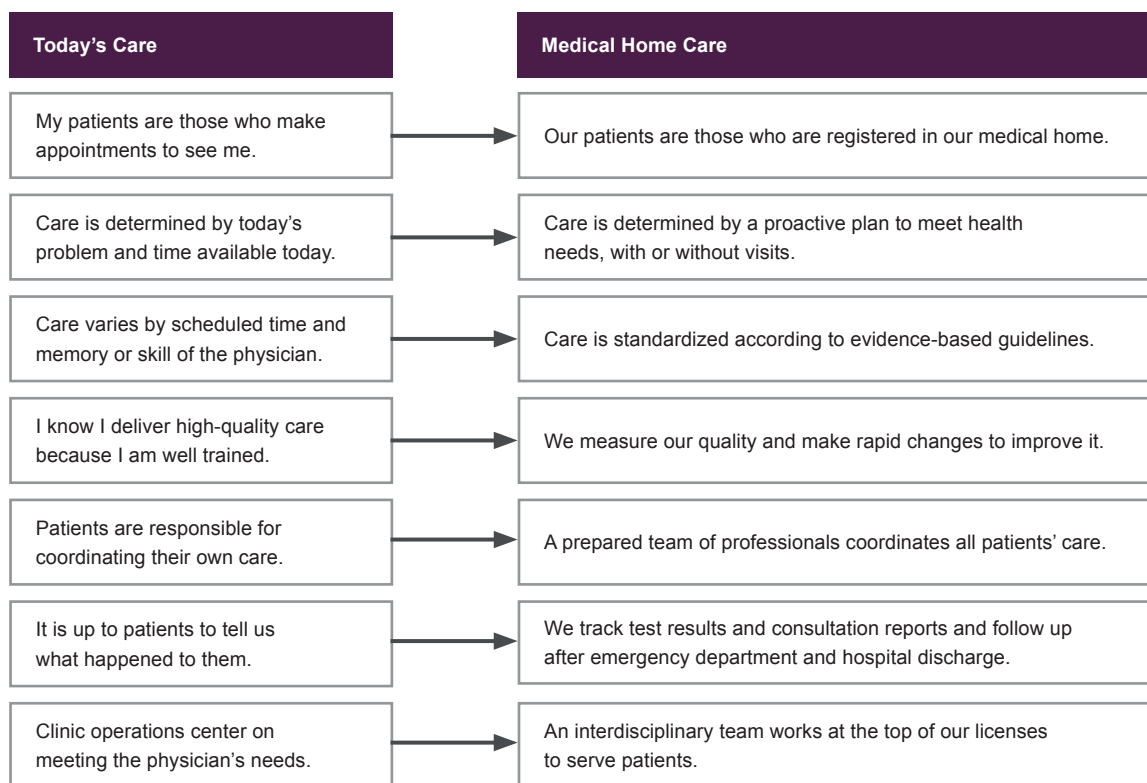


Figure 1.

Evolution of care toward the principles of the medical home.¹ Provided through the courtesy of the IBM Corporation.

tes.⁴ It is difficult to prevent a disease for which you do not know you are at risk.

The EMR and the patient portal provide opportunities to educate patients on the importance of glycemic control and to alert them to potential dangerous sequelae, such as hyperglycemia. It also provides patients with information about their disease management, including self-management tools and guidelines. The patient portal also gives patients the opportunity to review clinician notes and to ask questions if needed. The EMR allows physicians to better evaluate our care using metrics and to receive reminders for tests or interven-

tions that may otherwise be forgotten. By systematizing our records, we can monitor care provided outside the immediate office and evaluate the continuity of care.

Dr Grundy: When managing a population, physicians need to comprehend exactly what is happening with any member of that population at any given time through an analysis of the available data. The Comprehensive Primary Care Initiative pilot project⁵ launched in 2014 in Tulsa, Oklahoma, representing the combined efforts of the Office of the National Coordinator for Health Infor-

mation Technology and the Centers for Medicare & Medicaid Services (CMS) as a primary care initiative, is an excellent example.⁵ The physicians now have a computer application that allows them to see who is at risk for specific conditions, including T2DM, in their patient population. In addition, this technology allows physicians to prioritize—according to risk—which patients require immediate intervention and rank what should be done for these patients. Our use of such data and tools to manage a population is still in its early stages, but the tools and their applications are becoming increasingly more powerful.

The order of magnitude is logarithmic in scale. In my practice, we are beginning to think about changing the whole way we compute as we shift toward cognitive computing and develop tools to get at the data. Osteopathic medical students and residents will be able to do with data what the previous generation of physicians did with x-ray and imaging technology. The obtainment and application of the data will be clearer and will guide clinicians on how to manage their patient populations.

Clearly defined models in Europe demonstrate comprehensive, integrated, coordinated, and accessible care. The foundation of care delivery has been redefined in Spain and in Denmark, which boasts the highest patient satisfaction and lowest medical error rate. No party gets special treatment, and no confusion exists about how this care is managed.

What are some of the specific goals of these innovations in care models and practices? How will these changes individually affect clinicians and shape the roles of practicing physicians?

Dr Shubrook: All of our work is intended to improve the overall health of our patients and our patient populations. However, the health of the individual patient and the patient population are not always the same. Sometimes we have to look at the picture with 2 different lenses. Increasing awareness among patients and making them more informed consumers is a key component. Increasing awareness of specific

practice processes among physicians will also make a difference. First, physicians should continually review their performance according to the National Committee for Quality Assurance (NCQA) measures. It is important not to overestimate the quality of our care. Such self-assessment may point to areas that are lacking or deficient, so it serves as a good reminder to work on any areas that need improvement.

For population management, it is important to match the level of care to patients' needs. Patients whose illness is well controlled may not need to see their physician as often or will need to spend less time with their physician than those whose illness is more severe or who have trouble with risk behaviors.

When we look at hemoglobin A_{1c} (HbA_{1c}) control, the changing background of clinical studies has had an impact, and with each new updated guideline, we will see clinical practice adapting accordingly. The overly aggressive, 1-size-fits-all approach of the past is giving way to targeted interventions that are tailored to individual patients to maximize their glycemic control through minimized risk. Increasing awareness among patients and making them more informed consumers is a key component.

Dr Ciervo: Patient engagement and support, including bringing groups of patients with similar chronic disease processes together, even if on a virtual basis, will be an important responsibility of the osteopathic family physician. That support may create a certain level of accountability in patients

and in turn encourage more rigorous self-management.

Dr Grundy: The 3-legged stool metaphor is useful to describe the effect that all of these changes will have on physicians. The first leg is the most obvious one: meeting the NCQA standards and the resultant practice transformation. In no place is it happening faster than in osteopathic medical practices.

The second leg of the stool is the payment system. As physicians move away from episodic care, so must the payment system. It is unethical to deliver an episode of care to a patient with T2DM—these patients need to be intensively monitored. Diseases such as T2DM require lifelong management, and physicians need to be compensated for the comprehensive management of such a population.

The third leg of the stool is patient engagement. Patients are not stones that once cast will continue on in that direction. Like birds, they are free to fly in many different directions once they leave your office. Getting at the science around patient engagement is key. What is the evidence supporting rewards, for example? A graduated cost-sharing structure based on therapeutic adherence may make a difference in improving outcomes. However, we need further evidence to support such interventions.

Corporations are pretty good at getting people to drink unhealthy sugary drinks through clever marketing. The health care community is challenged with the task of cleverly marketing healthy behaviors to get our patients to adopt them.

Patient-Centered Medical Home

What are the key components of the PCMH model from both the conceptual and clinical practice perspectives?

Dr Shubrook: We have given a new name to an existing component of osteopathic medical care. The PCMH model provides clinicians with parameters in which to work and a greater level of care for patients with chronic diseases such as T2DM. However, many of us in family medicine—particularly osteopathic family medicine—have been providing patient-centered care or using the PCMH model for some time. Four visits per year or 1 hour out of the nearly 9000 hours in a year are not going to make a difference in patient disease status. As physicians, we need to think about how to best extend the messaging from the examination room to the daily lives of our patients, considering that 90% of T2DM management is self-administered. The PCMH model serves as a means of achieving this end.

As Dr Grundy mentioned, we need to see payment match the quality of care. Episodic care is paid by volume, but PCMH-delivered care is likely to decrease a physician's volume. To ensure that physicians provide high-quality care under the PCMH model, a system needs to be implemented to measure and compensate physicians in a way that is meaningful to all stakeholders.

In terms of the personnel integral to the PCMH, it is ideal to employ a variety of clinicians. My practice includes physicians, nurse practitioners, counselors, pharmacists, nurse diabetes educators, and dietitians. This diverse staff is a lux-

ury that many practices cannot afford, but having a comprehensive health care team has greatly improved the quality of care, and patient satisfaction seems to have increased as well.

One particular enhancement that could benefit the PCMH would be to make it more transparent among clinicians treating a given patient. All clinicians involved in the care of a given patient should be able to see what other clinicians are doing for this patient as well as query the care delivered outside the facility.

Dr Grundy: An important component of the fundamentals of the joint principles of the PCMH that were adopted by organized primary care is the medical home (*Table*).^{4,6} The term *medical home* dates back to the pediatric literature of the 1960s and early 1970s, and it refers to a home for the data.

Now that physicians are collecting and reporting data, where do those data go? Who is held accountable? The expectation in any industry is that 1 specific party is going to be accountable for the data, but that was not happening in health care. Furthermore, we were not being paid for that to happen in health care.

It was the transplant surgical specialty that first implemented a home for data. Transplant surgeons were dealing with a population of patients with severe disease and comorbidities who would not have survived without a home for their data. The specialty quickly came to understand that, for patients requiring the attention of a multidisciplinary team, every team member had to have access to the same data. Applying

these considerations in the context of analogous disease states, it is apparent that a home for the data is important for facilitating effective, high-quality T2DM management.

Another contributing factor in the evolution of the PCMH was the chronic care model by Wagner⁷ (*Figure 2*). This model posits that it takes a community effort and the coordination of the right resources around a patient with a chronic disease to affect long-term outcomes. Similarly, the work of Bodenheimer et al,⁸ who led the proactive advanced primary care revolution a decade or so ago, contributed to the evolution of the PCMH.⁶ These researchers thought that the term *comprehensivist* more accurately described the role of a primary care physician—one who manages a population with data and does so proactively.

These 3 elements—a medical home for the data, the chronic care model, and the advancement of primary care—were built into what is now known and accepted widely as a standard of care across the United States and Canada, including the US Department of Defense and Veterans Affairs, and in Australia. It is broadly accepted that we have to move toward the notion of managing the population rather than the individual.

The tools deployed in facilitating this paradigm shift include an understanding that clinicians must proactively adjust the interventions they apply in a population on the basis of what these newly collected data show. Another component is that the data must be in a place where everyone involved in the care process can access it. The concept that it takes a community to support a pa-

tient with chronic disease also plays an important role. The role of the primary care physician then becomes that of a specialist in population management. The Patient-Centered Primary Care Collaborative, an organization set up to support an alternate payment arrangement for primary care, is stepping up to provide comprehensive, population-driven interventions.⁹

Characterize the role of communication in the PCMH and some of the innovative ways that physicians communicate with this particularly challenging population of patients with T2DM.

Dr Shubrook: I take the time to discuss with patients their questions and concerns and make every effort to help them accept that this disease is chronic and will not always improve. Diabetes will wax and wane by nature, so I am careful to reinforce positive behavior when setbacks arise. This encouragement, in turn, will motivate patients to continually and proactively self-manage their disease. I also remind my patients that when their disease course improves, it is their own doing; it is not the result of anything that I have done. I am little more than a facilitator in the whole process. I give them the information and the tools but, ultimately, diabetes is self-managed. Providing patients with positive messages and listening to their individual concerns encourages them in their self-management efforts.

Many of our patients have shared that they feel heard and understood, and they leave our clinic feeling positive. In the overall population of patients with T2DM, it is not uncommon for pa-

Table. Joint Principles of the Patient-Centered Medical Home⁴	
Principle	Description
Patient centered	A partnership among practitioners, patients, and their families ensures that decisions respect patients' wants, needs, and preferences and that patients have the education and support they need to make decisions and participate in their own care
Comprehensive	A team of health care providers is wholly accountable for a patient's physical and mental health care needs, including prevention and wellness, acute care, and chronic care
Coordinated	Care is organized across all elements of the broader health care system, including specialty care, hospitals, home health care, and community services and support
Accessible	Patients are able to access services with shorter waiting times, after hours care, all day electronic or telephone access, and strong communication through health information technology innovations
Committed to quality and safety	Clinicians and staff enhance quality improvement to ensure that patients and families make informed decisions about their health

tients to end up feeling like they have been graded on their HbA_{1c} levels or the severity of their complications. This feeling could cause them to disengage, and the physician's opportunity to help them change their behavior would be lost. We should strive to turn a negative clinical finding into an opportunity to offer words of encouragement and also validation that it is hard work to manage the disease. Furthermore, we need to ask patients what is important in their lives. If we do not engage in a dialogue about personal priorities, we will have unhappy patients who feel unheard.

How does the PCMH model compare with other approaches to T2DM management in terms of documented outcomes or your own experience?

Dr Grundy: Rather than thinking of PCMH as a model, I look at it as a set of

principles surrounding how a population should be managed and how the data are collected and applied to this end that has been agreed on and adopted broadly by organized primary care in this country.

The results are positive in favor of PCMH in terms of the scope of available data. When we wrote the summary of documented PCMH outcomes for 2014, we found 3672 articles.¹⁰ We are seeing places where costs are decreasing.

Some of the results at the community level are encouraging. One example is the Native Alaskan community around Anchorage, which had the most poorly managed cases of T2DM in the country, but they were able to use a community approach to address the issue. They received a Malcolm Baldrige National Quality Award for their successful community-based approach to managing a population.

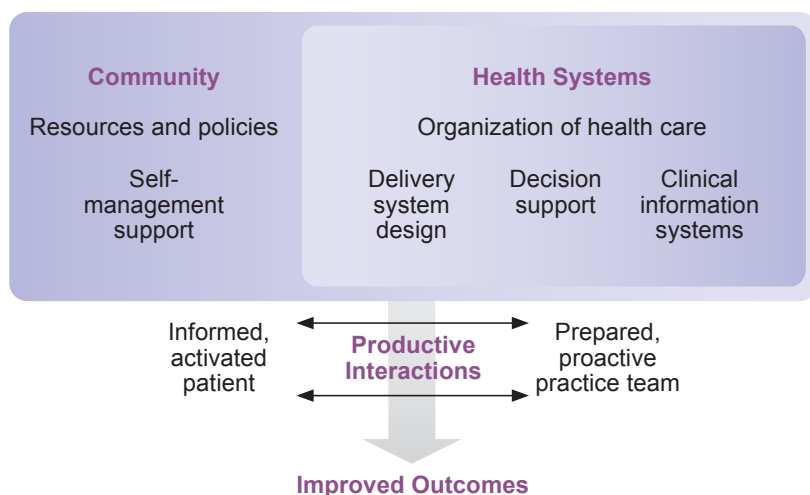


Figure 2. The chronic care model.⁵ Adapted from Improving Chronic Illness Care. ©1996-2015 The MacColl Center. The Improving Chronic Illness Care program is supported by The Robert Wood Johnson Foundation, with direction and technical assistance provided by Group Health's MacColl Center for Health Care Innovation.

Figuring out what it takes in a given community to support members at risk for or manifesting chronic disease is key. What are the skills, tools, and rewards that lead to successful outcomes? The Wagner Chronic Care Model is a framework that identifies the support matrices at the community level. For the Native Alaskan community, who did not have the active lifestyles of previous generations, in which hunting and fishing were part of daily life, their cultural traditions inspired change. A storytelling dance class is held every night, and drum talk, which is how the natives communicated, also provides a means of promoting physical activity and exercise.

Using the Blueprint for Health tool, communities in Vermont and in North Carolina are taking 2 cents out

of every health care dollar and using it to build community organizations targeted at patients with prediabetes. For example, a person with prediabetes may contact the community coordinator, who will introduce the patient to a hiking club made up of other patients with T2DM. Another method of outreach is a nutritionist conducting grocery store walk-throughs once per week. The community pharmacists, behaviorists, and religious leadership are being pulled in to support at-risk community members. The result has translated into fewer cases of prediabetes transitioning into T2DM.

Another example of a community gathering their resources to support disease management is in the Parish of St Brelade on the Island of Jersey off the coast of France, where the post-

al service employees perform what's known as a "Call & Check." Because postal delivery had changed in this community, the postal workers found themselves with less of their traditional work to do, so postal service employees stop at the homes of elderly islanders with T2DM or other chronic conditions and engage them in matters of health and wellness.

Dr Ciervo: One of the key PCMH components that I struggle with is patient engagement. You can give patients all of the information they need for self-management, but if you are not engaging patients, or patients are not invested in their well-being or care, it becomes extremely challenging to manage their disease. So, it is important to recruit spokespeople in the community who can better reach the patient population to garner a clinically significant impact. For example, we did a project in Camden, New Jersey, which is among the poorest cities in the country,¹¹ and what made an impact was reaching out to faith-based organizations and engaging them to get the community to trust us as health care providers.

Can you provide some examples of successful PCMH-based initiatives in action?

Dr Grundy: In Bethesda, Maryland, Sunny Ramchandani, MD, MPH, and Kevin Dorrance, MD, implemented a PCMH initiative approximately 6 years ago—the Navy Integrated Health Community—and saw notable improvement in patient satisfaction in terms

of outcomes and scores. A follow-up initiative called PCMH2.0 was integrated across a medical community by rewarding the specialists for their engagement, follow-up, follow-through, and coordination of care. The third phase of this project is being piloted at the community level in San Diego. The system integrator of the PCMH coordinates care across the hospital or specialty facilities. Participants in the community worked with the County of San Diego, Kaiser Permanente, the Veterans Administration, the Parks Department, and all of the service agencies in the county to provide support for the patient population.¹²

Also drawing on the principles of the PCMH, CareMore is a well-run, well-managed service providing for the ambulatory intensive care population.¹³ As in Camden, this program is identifying the places with the most vulnerable population and understanding the science of how to follow up with that population. For example, if we catch a tiny lesion in the skin of the lower extremities in a matter of hours vs days, we can reduce the number of amputations by 50%. This model is being deployed in many parts of the country, such as the Bon Secours Health System in Virginia. It is all based on the Danish “hospital at home.” Those patients with chronic disease never go back to the hospital; instead, they are managed intensively at home with robust home health care tools. For example, the patient can scan his or her lower extremities every morning, and that information is then reviewed remotely.

Accountable Care Organizations

If applicable, can you describe your own experiences practicing within an ACO framework?

Do you think that the T2DM-specific measures designated by the CMS for ACOs convey an accurate perception of the quality of care?

Dr Shubrook: My experience with ACOs is limited. When I was in Ohio, they were just starting to determine ACO designations in our region. The model aligns all of the decision making with the financial repercussions and benefits. However, I am concerned about who is controlling the pot of money and whether the proper incentives are going to be downstream enough for the primary care physicians to be properly incentivized for providing the necessary services.

The ACO measures parallel those of the NCQA in many ways. For example, a recommended HbA_{1c} level of less than 8% is probably a good place to be. It seems to be a middle road that will not result in much disagreement.¹⁴ Control of blood pressure, cardiovascular risk reduction with management of low-density lipoprotein cholesterol levels, and cessation of tobacco use are all important recommendations. Some of these measures are actionable immediately by the health care team. Others are outcomes affected by various factors, and outcomes require an engaged and participating patient. If we can risk adjust some of these factors, the measures are excellent tools.

Dr Ciervo: As a primary care provider, I feel that we need to take the step to create an integrated delivery system first. An ACO cannot be called such without the appropriate foundation.

Can you characterize the manner in which the emergence of ACOs has affected the quality of health care thus far?

Dr Grundy: The topic of ACOs brings in a couple of legs of that stool I mentioned earlier: practice transformation and payment reform. Health care practitioners are being asked to step up and manage risk. Understanding the tools required to manage risk, or to be accountable for risk, represents the foundation of a PCMH—a place where the data are managed at the level of the individual patient in a population. Ultimately, the model requires a broader delivery system with a community of primary care physicians to look at ways in which they can accept accountability.

About a year ago, I met with 32 ACO pioneers, all chief medical officers. Eight of them had made the decision to exclude CMS populations because they did not have the primary care base, nor did they have the clinical or financial data to understand what risks they were taking. No EMR gives physicians the data they need to manage a population; instead, they need a data warehouse that provides a source of information about their patients. Increasingly, I see systems implementing total risk management, or Medicare Advantage, for their CMS populations instead of just going halfway with the ACO bundled payment.

To manage risk, one must first know the risks to be managed as well as the platform from which to manage them.

What are the most noteworthy administrative challenges potentially associated with participation in an ACO?

Dr Ciervo: Where I practice in New Jersey, several large health systems have gone the ACO route, but there remains a breakdown in information connectivity. If EMRs lose the ability to communicate with each other, it defeats the purpose of having an ACO.

Dr Grundy: One fundamental element of accountability in an ACO is being able to obtain the data. Among the existing delivery systems, many could be defined as “unaccountable care organizations,” because they cannot obtain data. How can they possibly begin to manage risk without the data?

Another barrier to full adoption of the ACO model is that many delivery systems have not built the basic foundational elements of an infrastructure to contain the data or a way to hold clinicians accountable to the data via actual outcomes and corresponding payment. Those systems that have stepped up to the data-related challenges—the 9 Medicare Five Star Advantage integrated systems, for example—have demonstrated their ability to manage the data at the individual level.

Dr Shubrook: We need to make sure that the distribution of resources matches the most effective use of population-based medicine.

Osteopathic Medicine Under the New Health Care Systems

How do the tenets of osteopathic medicine apply specifically to the management of T2DM?

Dr Shubrook: In patients with T2DM, the effects of external and internal stimuli have coalesced to create an unhealthy environment in a body that up to that point may have been healthy. Behavioral risk factors such as sedentary behavior, excessive carbohydrate intake, and excessive ingestion of high-fructose corn syrup combine with internal risk factors, such as elevated free fatty acid levels and hyperglycemia, and contribute to T2DM, all of which links to the first tenet of osteopathic medicine. The mind and spirit out of which these behaviors arise need as much intervention as the body. I tell my patients that “motion is life.” It is an essential part of health. When the body is moving, it is a sign that the body is functioning the way it should.

The concept that the body and mind are interrelated applies not only to the development of disease but to the manifestation of disease and its management. For example, we know that having T2DM doubles a patient’s risk of depression.¹⁵ Conversely, having depression doubles the risk of developing T2DM.¹⁵ These factors are interrelated and critical, because if a patient has both T2DM and depression, his or her outcomes typically tend to be much worse.¹⁶

If a patient continues to partake in destructive behaviors, the likelihood of effective self-management declines severely. Much of T2DM-related morbidity can be managed with lifestyle

modification, such as regulating sleep, getting regular exercise, ingesting nutritious foods, and taking medications when appropriate. The factors that contribute to a healthy lifestyle for a patient with T2DM also contribute to a healthy lifestyle for the general population. To achieve health, a person must limit noxious stimuli and maximize the body’s functions through healthy behaviors.

In looking at these emerging models of care, do you find any apparent disconnects from the principles of osteopathic medicine?

Dr Shubrook: I suppose that the only way any sort of disconnect would occur is if we kept our vision too narrow.

Dr Ciervo: Many osteopathic physicians work in rural, remote areas of the United States, with the nearest hospital 50 to 100 miles away. That geographic barrier could be perceived as representing a disconnect from what we are trying to achieve with the PCMH and ACO models. Some osteopathic physicians are practicing independently from large institutions and not necessarily by choice.

Dr Grundy: On the other hand, the overrepresentation of osteopathic physicians in rural areas, where each provider presumably serves a small patient population, could potentially be viewed as a strength. I took the leadership of Kaiser Permanente to Denmark a couple of years ago to show them what had been done there, where the basic principles of osteopathic medicine are in play every day. Every patient knows the name

of his or her physician, and every physician knows every patient. There exists an authentic relationship of mutual trust. Trust is the most fundamental, core principle that health care delivery needs to create and build upon. Although it is difficult for a small practice to “get big,” it is just as difficult for an integrated system like Kaiser Permanente to “get small.” We are going to help the smaller practices get big over time by helping them create an infrastructure to capture their data and easily communicate with larger systems.

The Stanford Clinical Excellence Research Center just released a study looking at 60 practices that were recognized for delivering high-value care.¹⁷ The most important element was that the practitioners worked together very closely in a team-based environment. Furthermore, they respect and view a complaint from a patient as a learning experience and an opportunity for continued improvement in service. Smaller practices in tightly knit communities also performed well in terms of delivering high-value care, presumably because they are intimately familiar with their surrounding resources, such as specialists, social services, and behavioral health services.

What factors do osteopathic physicians need to take into account when adopting new health care models in terms of referrals, from both an independent practice and an integrated health system perspective?

Dr Shubrook: Before we had an EMR, we managed referrals through a case manager, who would regularly audit the

processes, making sure that all steps had been performed or at least scheduled. In the EMR, referrals are monitored and managed as a query. This mechanism ensures that physicians get reminders if actions have not occurred. Using the EMR to manage referrals improves communication among the treatment team members.

Dr Grundy: In some practices piloting the PCMH (eg, Tulsa, Oklahoma), the specialist is paid to answer the e-mail messages of the comprehensivist, or primary care physician, and then the comprehensivist is paid to follow up with the specialist. In this manner, we make the referral accountable to both physicians. Frequently, patients do not follow through with referrals, likely, because of a lack of accountability. However, if the primary care physician knows that the specialist is going to earn a reward for answering that e-mail, then the whole referral relationship changes, with an increased assumption of response and corresponding empowerment for the primary care physician. In my experience, one of the outcomes of this system of financial incentivizing is that the waiting list for the pediatric rheumatologist went from 6 months to 2 weeks.

What are the key considerations for osteopathic physicians when adopting new care models in terms of communication tactics, both among clinicians and between physicians and patients?

Dr Ciervo: A great way for our physicians to facilitate communication has

been through group visits, in which a group of patients with T2DM meets with 1 physician. Of course, patients must be open to the idea. We started with a test group, which went well, and the patients ended up developing their own support groups outside the group visit.

Dr Grundy: One of the aspects we need to think about is the “quadruple aim” by Bodenheimer et al¹⁸ and how to make clear, effective communication easier for physicians.

In terms of engaging patients, ViTel has developed tools to improve the patient-physician relationship. These tools use the EMR to send reminders or to let physicians know if their patients are not following up and following through with recommendations, for example.

In Denmark and other parts of Europe, the vast majority of patient encounters involve asynchronous communication.¹⁸ Under this form of communication, a click that goes into the patient’s personal health record can be registered every time the medication is pushed through the foil backing. Similar systems track physical activity via pedometers.

As a follow-up to these types of interventions, rewards systems can be used to incentivize patients to enact change. These changes in the way we communicate with our patients and with each other are important, because the so-called Millennial generation engages differently from the preceding generations. An increasingly automated approach to disease management and patient care makes it easier for physicians to engage and follow up with their patients.

What kinds of innovative patient self-management tools have you used to engage patients with T2DM?

Dr Shubbrook: Many tools exist, ranging from apps on phones, such as My Fitness Pal, Spark People, Lose It, and Fitbit, to online communities. The American Diabetes Association has a program called “Living with Type 2 Diabetes,” in which a physician and patient interact.¹⁹ The effectiveness of a tool depends on patient preference. In any case, there are ways patients can easily be connected to resources outside the physician’s office.

We have started a virtual Fitbit group at the university, where we track each other’s progress and help each other along the way. Now we have patients who request that we track the Fitbit to their EMR to get positive reinforcement for being active on the record.

Dr Grundy: The University of Michigan Health System also implemented a Fitbit initiative, in which they divided their obese population into 3 groups based on the intensity of the interaction.²⁰ The first group received the Fitbit for free without further interaction. In the second group, participants also received the Fitbit for free, but they were positioned with the notion that if they used the device, their benefit cost would decrease by half. The third group of participants received the Fitbit free of charge; however, these members were subsequently divided into teams that received psychological feedback, reminders, and incentives. The team approach, coupled with positive reinforcement and feedback, was intended to provide a high

level of encouragement from both teammates and the system administrators.

The project ran for 2 years and demonstrated that persistence in use of the device was noticeably higher among those who received the most intensive level of interaction compared with no interaction at all. Only 17% of those in the first group were still using the Fitbit after 2 years compared with 80% of participants in the third group. The feedback was also remarkably positive in the third group, with participants voicing appreciation for a healthier, more active lifestyle that many insisted would be a lifelong habit. The level of persistence of the second group was approximately 50%, revealing a gradient of the impact of interaction and incentives. Research into the effect of reward on behavior is important in many facets of human interaction, but findings will continue to be especially important for patient engagement.

I recently observed a system in which patients could look at their entire record, mapped out with measures such as blood sugar levels and physical activity. They could easily visualize the relationship between blood sugar levels and exercise. Could viewing this hard evidence help patients see how their behaviors affect their bodies and possibly influence their adherence to treatment?

What is the most important takeaway for the osteopathic medical community regarding the evolution of health care models and their ramifications for the management of T2DM?

Dr Shubbrook: The best thing an osteopathic family physician can do is

continue to practice according to the principles of osteopathic medicine. By continuing excellent patient-centered care and engaging in population management as part of an interdisciplinary team, osteopathic physicians can greatly benefit from the forthcoming changes to the health care delivery model. Most of these changes are likely to make the practice of medicine easier and more fulfilling and to ultimately allow physicians to provide better care.

Dr Grundy: The model that we all trained under—the Flexner model—is a master builder model, in which physicians were taught to deliver care just as a master builder would build a cathedral. We are beyond Flexner now. It is no longer about what is stored in your head—it is about the data that exist at the fingertips of stakeholders in every other industry, such as banking or engineering. For the first time, we are going to be able to have that kind of clarity, that kind of data, in medicine.

To no longer be the master builder represents an immense cultural change for the field of osteopathic medicine. It certainly does not mean that we have to abandon the tenets and principles of osteopathic medicine, but it may be one of the biggest stumbling blocks that we face as physicians. We have to transition from “I am the center of the universe” to “my patient is the center of the universe, and the data about my patient are what I act on.” Furthermore, physicians have to recognize that they will be operating in the framework of a supporting team with a like-minded proclivity toward the importance of the data. It is going to be a collaborative approach driven by the data.

References

- Adams J, Grundy P, Kohn MS, Mounib EL. *Patient-Centered Medical Home: What, Why and How?* Somers, NY: IBM Global Services; 2009.
- Institute of Medicine. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy of Sciences; 2000.
- Centers for Disease Control and Prevention. Awareness of preDM—United States, 2005-2010. *MMWR Morb Mortal Wkly Rep*. 2013;62(11):209-212.
- Diabetes Prevention Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2002;346(6):393-403.
- Taylor EF, Dale S, Peikes D, et al. *Evaluation of the Comprehensive Primary Care Initiative: First Annual Report*. Baltimore, MD: Centers for Medicare & Medicaid Services; January 2015. <http://innovation.cms.gov/Files/reports/CPCI-EvalRpt1.pdf>. Accessed April 1, 2015.
- American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. *Joint Principles of the Patient-Centered Medical Home*. Washington, DC: Patient-Centered Primary Care Collaborative; 2007.
- Wagner EH. Chronic disease management: what will it take to improve care for chronic illness? *Eff Clin Pract*. 1998;1(1):2-4.
- Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model, part 2. *JAMA*. 2002;288(15):1909-1914.
- Nielsen M, Langner B, Zema C, Hacker T, Grundy P. *Benefits of Implementing the Primary Care Patient-Centered Medical Home: A Review of Cost & Quality Results, 2012*. Washington, DC: Patient-Centered Primary Care Collaborative; 2012.
- Nielsen M, Gibson L, Buelt L, Grundy P, Grumbach K. *The Patient-Centered Medical Home's Impact on Cost and Quality, Review of Evidence, 2013-2014*. Washington, DC: Patient-Centered Primary Care Collaborative; 2015.
- Fahim K. Rethinking revitalization; in crumbling Camden, new challenges for a recovery plan. *The New York Times*. November 5, 2006. <http://query.nytimes.com/gst/fullpage.html?res=9C04E2DF113FF936A35752C1A9609C8B63>. Accessed April 2, 2015.
- Kowitz RE. Navy medicine initiative receives military health system innovation award [press release]. United States Dept of the Navy website. http://www.navy.mil/submit/display.asp?story_id=84729. December 5, 2014. Accessed March 12, 2015.
- Main T, Slywotzky A. The quiet health-care revolution. *The Atlantic*. October 3, 2011. <http://www.theatlantic.com/magazine/archive/2011/11/the-quiet-health-care-revolution/308667/>. Accessed March 12, 2015.
- RTI International, Telligen. *Accountable Care Organization 2014 Program Analysis Quality Performance Standards Narrative Measure Specifications*. Waltham, MA: RTI International; August 15, 2014.
- Golden SH, Lazo M, Carnethon M, et al. Examining a bidirectional association between depressive symptoms and diabetes. *JAMA*. 2008;299(23):2751-2759.
- Egede LE, Zheng D, Simpson K. Comorbid depression is associated with increased health care use and expenditures in individuals with diabetes. *Diabetes Care*. 2002;25(3):464-470.
- America's most valuable care: primary care. Stanford Clinical Excellence Research Center website. <http://cerc.stanford.edu/research/documents/2014-1203FINALMostValuableCare-PrimaryCareOverview.pdf>. Accessed April 2, 2015.
- De Jong CC, Ros WJ, Schrijvers G. The effects on health behavior and health outcomes of Internet-based asynchronous communication between health providers and patients with a chronic condition: a systematic review. *J Med Internet Res*. 2014;16(1):e19. doi:10.2196/jmir.3000.
- Living with type 2 diabetes program. American Diabetes Association website. https://donations.diabetes.org/site/SPageServer/?pagename=LWT2D_English&loc=db-slabnav. Accessed April 1, 2015.
- Zulman DM, Damschroder LJ, Smith RG, et al. Implementation and evaluation of an incentivized Internet-mediated walking program for obese adults. *Transl Behav Med*. 2013;3(4):357-369. doi:10.1007/s13142-013-0211-6.

© 2015 American Osteopathic Association