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An Integrated Framework For The Prevention And Treatment Of Obesity And Its Related Chronic Diseases

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ABSTRACT Improved patient experience, population health, and reduced cost of care for patients with obesity and other chronic diseases will not be achieved by clinical interventions alone. We offer here a new iteration of the Chronic Care Model that integrates clinical and community systems to address chronic diseases. Obesity contributes substantially to cardiovascular disease, type 2 diabetes mellitus, and cancer. Dietary and physical activity interventions will prevent, mitigate, and treat obesity and its related diseases. Challenges with the implementation of this model include provider training, the need to provide incentives for health systems to move beyond clinical care to link with community systems, and addressing the multiple elements necessary for integration within clinical care and with social systems. The Affordable Care Act, with its emphasis on prevention and new systems for care delivery, provides support for innovative strategies such as those proposed here.

The continued increase in the prevalence and cost of chronic conditions has led to the widespread recognition that the US health system is not producing the value needed to keep the country internationally competitive or to improve the health of its population. The Affordable Care Act (ACA) has provided the impetus to rethink how health is defined and how health care is structured and delivered, especially for prevention and management of chronic diseases. Several models for care delivery and coordination have been advocated to improve health outcomes, including the Chronic Care Model,[1] the patient-centered medical home,[2] accountable care organizations (ACOs), and community-centered health homes.[3] Each model has its virtues, but none has yet been able to fully deliver the Institute for Healthcare Improvement's Triple Aim—the simultaneous improvement of patient experience, population health, and reduced cost of care.[4]

A key premise of these and similar efforts is that improved chronic care management and structural changes in care delivery and financing, such as ACOs, are necessary but insufficient given the outsize role of social and environmental factors in driving health and health care costs. A new framework is required that extends and integrates existing chronic care and population health models and articulates the distinct and shared roles of care delivery and community systems to improve population health. The prevention and treatment of obesity offers an ideal example of how a transformation framework[5] can be applied to a specific disease.

Evolution Of The Chronic Care Model

The first iteration of the Chronic Care Model[1] focused on changes in the organization of the

health care system, including changes in the design of the care delivery system, clinical information systems, and decision support. Improved outcomes were an anticipated product of an informed, committed patient interacting with a prepared practice team. Patient self-management was included as an element within the health care organization. Community resources and policies were largely operating in the background rather than as an integral part of the model.

A second iteration applied this care model to obesity prevention and management.[6] In this model, patient self-management, or family self-management in the case of children, was seen as the primary outcome. Effective self-management required changes in the care delivery model but also supportive changes in the settings in which patients spent time. For example, clinical strategies to increase physical activity could not succeed unless there was a safe environmental infrastructure that supported physical activity.

We present here a new framework, depicted visually in the online Appendix,[7] that represents the third iteration of the Chronic Care Model, and one that is more appropriate to prevent and treat obesity specifically and chronic diseases more generally. The new model reflects an integrated system centered on patient and family engagement and empowerment. Restructured clinical services by providers who are sensitive to the stigmatization of patients with obesity and who use behavior change strategies to engage patients with obesity are more likely to help patients successfully change their diet, reduce inactivity, or increase physical activity. However, clinical efforts will not succeed without complementary community systems that make healthier choices the default or easier option. For example, patients cannot make healthful food choices without access to healthful food; nor can they become physically active without access to safe places for physical activity. Changes in both provider behavior and community systems are central to success. From the clinical side, patient behavior change is the product of the provider-patient interaction. From the community-system side, population behavior change is a product of policies, initiatives, and interventions that change environments and social norms. One cannot succeed without the other.

Empowerment And Engagement

Improved diet and physical activity require behavioral changes. Family and individual empowerment and engagement remain at the heart of the model. Behavior changes can occur as a result of decisions on the part of the individual, choices by the family, engagement with providers, prompts from social networks, or modifications of the environment that make healthier choices easier choices. The language providers use to initiate conversations about weight with their patients,[8] their sensitivity to weight bias, and how conversations about weight are conducted[9] all affect the quality of care delivered and the likelihood that patients with obesity will initiate efforts to control their weight. Social networks have been associated with obesity,[10] and recent data point to the impact of social networks on weight loss.[11] These observations indicate that such networks are also likely to play a role in empowering, engaging, and reinforcing decisions about weight maintenance and weight loss.

Care Delivery

Our model calls for changes in care delivery through an integrated mix of health care providers and practitioners—such as dietitians, nurse practitioners, social workers, and psychologists—with new provider skills and more effective ways to train these providers. Community health workers and community leaders, not typically considered health professionals, could play an important and sometimes leading role in effective integrated efforts to combat obesity and its related chronic diseases, such as type 2 diabetes mellitus.

A major challenge is that risk factors for obesity begin prior to conception, vary throughout life, affect every organ system, and therefore touch every medical specialty. Integrated training within medicine and across other health professions will require a clear and common set of competencies related to the prevention and management of obesity.[12] Although substantial efforts have been made by many health professions to document the skills relevant to their members, and many of the competencies overlap,[13] few have focused specifically on the skills necessary to address obesity.[14] Many competencies necessary for obesity prevention and control, such as appropriate language to engage patients and the ability to work collaboratively in interprofessional teams, will be shared across professions.

Effective care requires practitioners who can enable behavior change within and beyond medical treatment. Training in how to change behavior must become an essential element of provider education. Likewise, providers can play a key role in referring patients to community programs and advocating and strengthening community nutrition and physical activity resources that complement and reinforce clinical strategies. For example, HealtheRx, based in Chicago,

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Illinois, has mapped community resources and integrated them into a referral system for patients that augments clinical efforts.[15] Successful integration of clinical and community systems will require mutual awareness of the availability, strengths, and limitations of medical and community policies and systems that address diet and physical activity.

Equity

We define *health equity* as the assurance of the conditions for optimal health for all people. Health equity should shape the focus and functions of food and physical activity systems within communities and emphasize the clinical and community-based strategies and policies that explicitly address the health conditions that disproportionately burden communities of color, rural populations, and other groups with significant health disparities. Cultural competence is a critical behavior of providers that relates to their sensitivity to the bias and stigma associated with obesity, their understanding of the unique food systems and physical activity environments in their patients' communities, and the ability to incorporate these elements in the care of patients with obesity and its related chronic diseases.

Complementary Community Ecosystems

Community ecosystems are made up of age- and ethnicity-specific programs and systems such as public health, community- and faith-based organizations, and myriad other systems that constitute the nutrition and physical activity environments and contribute to or mitigate obesity. Care delivery and these multiple community systems must move beyond parallel activities to a more fully integrated interaction in which the person-centered goals of each system are mutually reinforcing and the respective roles and interdependencies of each system are clearly defined and agreed upon by key stakeholders. Stakeholders in the multiple systems include individuals, providers, and medical systems, as well as health departments, parks and recreation departments, civic organizations such as the United Way, nongovernmental organizations such as the YMCA and Boys and Girls Clubs, and the business community. Several examples illustrate emerging models of clinic-community integration.

PUBLIC HEALTH MODELS Mobilizing for Action through Planning and Partnerships, developed by the National Association of County and City Health Officials,[16] offers a public health counterpart to the Chronic Care Model. The program links all elements of a local public health system through the establishment of effective collaborations but does not focus on integrating clinical and community systems. *A Practical Playbook: Public Health and Primary Care Together*[17] moves a step further. Based on an integration definition and model developed in a 2012 Institute of Medicine (IOM) report on primary care and public health integration,[18] the *Playbook* provides a roadmap for integration, tools and resources for implementation, and multiple success stories demonstrating effective partnerships. It has been used by educators and public health and primary care practitioners to guide integration of clinical and community services. The model focuses on public health and primary care, and it identifies community resources beyond public health systems to optimize health outcomes.

KAISER PERMANENTE'S COMMUNITY HEALTH INITIATIVE To link clinical and community initiatives to prevent and control obesity, Kaiser Permanente has complemented its clinical strategies with an intensive focus on social and environmental drivers of chronic disease. At the core of Kaiser Permanente's comprehensive obesity prevention strategy are clinical interventions including documenting body mass index and exercise as vital signs in its electronic health records, counseling patients by using motivational interviewing techniques, and offering on-site weight management programs and bariatric surgery.

To augment its clinical efforts, in 2005 Kaiser Permanente implemented its community health initiative called Healthy Eating and Active Living, which fosters changes in policy, systems, and environments in underserved communities through multisectoral, place-based collabora-

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tives. In more than fifty communities, the initiative has improved population-level food and physical activity behaviors in communities where strategies of sufficient "dose" (the combination of reach of the program and strength of the intervention)[19] were implemented. Results have been particularly strong for physical activity interventions among youth in schools and in communities where investments were sustained over a longer period of time. Guided by these findings, Kaiser Permanente recently launched Thriving Schools, an initiative targeting food and activity environments in schools within Kaiser Permanente's service areas.

Integration

The delivery of care for obesity requires the integration of providers of that care and the integration of health care delivery systems and community services. Successful integration will require a trusted convener or integrator, who commands mutual respect and shares stakeholder values. Gary Gunderson, vice president of FaithHealth at Wake Forest University Baptist Medical, has said repeatedly, "Change moves at the speed of trust." The role of integrator (or integrators) can be assumed by a variety of trusted and respected entities or individuals who provide a wide variety of functions (Exhibit 1).[20] Integrators are central to the successful bidirectional engagement of clinical and social services. In addition, the multiple roles of the integrator in engaging clinical and community partners, coordinating efforts, effecting policy change, organizing and sharing data, identifying and accessing funding, and establishing open and ongoing communications are critical to the success of the model.

One example of an integrator is HealthPartners, an integrated health system based in Minneapolis, Minnesota. It has played a key role as a convener and integrator in the PowerUp program in the St. Croix River Valley in Minnesota and Wisconsin.[21] In addition to its mission to provide high-quality health care for its members, HealthPartners "plays a partnership role with others in the community to reduce socioeconomic and physical environmental barriers to better health."[22] HealthPartners and the Lakeview Health Foundation, based in Stillwater, Minnesota, convened a coalition of more than 130 stakeholders representing thirteen different sectors to address obesity in three-to-eleven-year-old children and the adults who influence their behavior. The activities of HealthPartners and the coalition reflect many of the elements shown in Exhibit 1. The group convened a multisectoral coalition of representatives from businesses, schools, health care providers, community and civic leaders, families, the faith community, and public health organizations. Less emphasis was placed on clinical obesity treatment, and the focus on community infrastructure was enhanced. The integrator employed a robust communications strategy including print, social media, advertising, and a website (http://www.powerup4kids.org) to build awareness and engage the community. An evaluation framework was developed, in collaboration with the steering committee, to assess the activities and impact of the program, including child and family behaviors, attitudes, and awareness. Community benefit funds from the Lakeview Health Foundation and HealthPartners provided financial support, and the two groups made a ten-year commitment to change, which reassured the community that their engagement would be sustained.

EXHIBIT 1

The Functions Of An Integrator

Serve as a trusted and accountable leader
Engage partners from multiple sectors
Facilitate agreement among multisector stakeholders on shared goals and metrics
Assess community resources, including workforce capabilities, and work with partners to make appropriate adjustments
Work at the systems level to make policy and practice changes in public and private sectors
Convey what works at the policy/systems practice levels to reach sufficient scale
Sustain change by impacting policies and practices in collaboration with institutions and community partners at the local, community, and state levels
Pursue financial sustainability including opportunities to employ multiple funding streams
Gather, analyze, monitor, integrate, learn, and share data at the individual and population levels
Identify and connect with system navigators who help individuals coordinate, access, and manage multiple services and supports
Develop a system of ongoing and intentional communication with affected sectors, systems, and communities

SOURCE Nemours. Integrator Role and Functions in Population Health Improvement Initiative (see Note 20 in text).

Data Exchange

Shared data are essential for communicating with providers about their patients' progress in community programs. The Diabetes Prevention Program was a randomized clinical trial that demonstrated that intensive dietary and physical activity counseling for weight reduction was more effective than a medication in the prevention of type 2 diabetes in patients with prediabetes.[23] The program was subsequently adapted to deliver the intervention in YMCAs (the YMCA's Diabetes Prevention Program) by trained and certified providers.[24] As it was scaled up, the YMCA's Diabetes Prevention Program was supported by an online, real-time, nationwide, Health Insurance Portability and Accountability Act (HIPAA)–compliant data system that allows for fidelity monitoring, claims processing, and communication with clinical providers. The data include attendance, weight, weight loss, and self-reported physical and nutrition behaviors. The YMCA's Diabetes Prevention Program uses all of these data for ongoing management and quality improvement purposes and for claims submission to approximately thirty commercial insurers that reimburse local YMCAs when participants achieve specified attendance and weight loss goals. The data system also generates periodic letters to primary care providers detailing the progress their patients are making in lifestyle changes. Although the YMCA's Diabetes Prevention Program represents a clinical intervention in a community setting, the data monitoring and communication systems provide a model for how such communications could occur between social and clinical systems.

Programs such as the Diabetes Prevention Program can be scaled up through interactive technologies to deliver customized programs for weight control. A recent review has shown that although Internet-based approaches are more effective than usual clinical care, they are less effective than interventions delivered in person. Nonetheless, the ability to personalize these approaches via the Internet as well as their potential reach and cost-effectiveness suggests that such interventions are highly promising and could be delivered in community settings. However, the inability to link community-based information systems with hospital EHRs can be an important barrier to data exchange.

Financing

Financial support and sustainability for the infrastructure, activities, and interventions described in the framework will require the alignment and coordination of funding from multiple traditional and nontraditional public and private sources. Effective prevention and control of obesity and its sequelae, such as cardiovascular disease, type 2 diabetes, and cancer, should yield long-term savings through reduced drug and other medical costs that can be reinvested to strengthen prevention resources. Because stakeholders such as payers, employers, and government are expected to accrue the savings of improved outcomes, the health care sector is an important and logical source of financing.

Multiple mechanisms within the ACA could provide support for improved clinical services and their integration with social systems.

Multiple mechanisms within the ACA could provide support for improved clinical services and their integration with social systems. The ACA requires insurers to cover certain clinical preventive services, including screening for obesity. The ACA also requires nonprofit hospitals, which spend in excess of $37 billion a year on community benefit activities,[25] to conduct community health needs assessments and to develop implementation strategies to address those needs through their community benefit programs. Recent Internal Revenue Service rules endorse community benefit investments that "address social, behavioral, and environmental factors that influence health in the community."[26] A recent survey of nonprofit hospitals' community health needs assessments found that 70 percent prioritized obesity in the first round of assessments mandated under the ACA.[27]

The ACA also provided funding for the Center for Medicare and Medicaid Innovation, which is testing new financing models that allow for savings from upstream interventions that address social determinants of health to be shared across health care providers and agencies delivering social services.

With changes in the health care marketplace, private investors are increasingly interested in new services, technologies, and products that span the border of care delivery and social systems. "Pay for success" approaches, for example,

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are being tested for asthma and other chronic diseases. This approach could also be applied to obesity and related conditions such as diabetes. Banks and other financial institutions are an additional potential source of revenue for integrated clinical and community systems to reduce obesity. For example, the San Francisco Federal Reserve Bank has pioneered efforts to identify upstream interventions such as healthy food retail and community physical activity resources that banks can invest in to satisfy their obligations under the Community Reinvestment Act of 1977. Finally, the impact of obesity and its associated conditions on costs and the productivity of the workforce may help engage corporate support through the design of health insurance plans for their employees and investments in workforce wellness.[28]

These potential sources of investment could, in the aggregate and if scaled up, provide a major share of the financing required for the integrated, comprehensive, and sustainable approaches to obesity prevention and treatment called for in our framework. The success of these novel financing models will depend on a number of factors. The first factor to address is fixing the "wrong pocket" problem, where documented cost savings from a successful intervention do not flow back to the sponsoring agency or organization.[29]

Governance

New revenue sources for integrated clinical and community systems to address obesity will necessitate creative novel governance and management structures. These new structures will have to ensure effective decision making and community accountability; represent the diversity of stakeholder interests; provide fiduciary, fiscal, and social responsibility; and provide control and management over funding and staff. Success will require maintaining the trust and confidence of multiple stakeholders to facilitate agreement on common goals and objectives, accountability to the mission as defined by the stakeholders and potential investors, sustaining flexibility in securing and deploying resources from multiple public and private sources, and creation of a sound process for managing funds and decision making. Additional investments in infrastructure and personnel to integrate disparate functions may be helpful, including opportunities for data sharing aimed at bridging the clinic-community divide. Elements of integrated systems exist in the Kaiser Permanente Community Health Initiative, the YMCA's Diabetes Prevention Program, and HealthPartners' PowerUp program. However, none of these examples reflects a fully integrated system that accomplishes all of the functions outlined above. The role of the trusted integrator(s) will be crucial to the negotiation of governance.

Metrics

Measures that are mutually acceptable to stakeholders provide the foundation for linkages between medical and social systems. The recent IOM publication, *Vital Signs: Core Metrics for Health and Health Care Progress*,[30] provides the basis for a robust yet concise set of measures for these linkages. The report notes that recommended metrics are not uniformly standardized or available, but current metrics include well-being, healthy communities, and individual and community engagement along with more traditional clinical and economic measures.

Novel data sources include the community health needs assessments required of hospitals, county health rankings,[31] geomapping,[32] and data provided by groups such as those engaged in HealtheRx, in order to assess baseline and changes in disease rates.

Additional measures could assess whether open and satisfactory channels of communication exist between community and clinical systems, and whether community benefit initiatives are invested in needs identified by the hospitals' community health needs assessments. The success of collaborations could be measured at baseline and over time using instruments such as the Wilder Collaboration Factors Inventory, which evaluates factors such as the purpose, structure, strength, and quality of relationships; level of trust; communication; and process for decision making.[33] Assessment of the quality of community food and physical activity ecosystems can be assessed by whether evidence-based policies have been implemented in such settings as early care and education centers or schools.

Policy Implications

The development and implementation of this framework depends on policy changes at institutional and community levels. On the clinical side, institutional policies and practices should address curriculum changes in provider training, referral processes to community resources, and new payment models that reward quality outcomes over volume. Governance will require financial accountability, HIPAA-compliant data exchange mechanisms, and elimination of barriers that limit input from community institutions to medical records. Integration of clinical and community services may require negotiation and explicit written agreements, especially when financial resources are exchanged. Effective application of the model will require government and payer policy changes that allow more effective use of community health data at the point of care; aggregation of patient-level data to guide community health strategies; new relationships between clinical and community-based providers, facilitated by easy-to-use referral processes; new payment arrangements and mechanisms that reward quality outcomes over volume; an expanded role of hospitals, health plans, and individual clinicians in supporting environmental and social norms change; new models of financing, governance, and accountability for population-level health outcomes; novel approaches to training and educating a diverse group of professionals who must collaborate in new, more effective ways; and a robust yet standardized set of metrics that can be used to assess the extent to which these systems are becoming more integrated, and whether that integration is achieving both the individual and population-health outcomes and efficiencies that are desired. Simulation models may help identify unforeseen effective interventions, and the integration of genotypic information into care delivery may increase the specificity of care.

Conclusion

We propose here a new model for the integration of clinical and community services for the prevention and control of obesity and its related chronic diseases, as well as suggestions for the policy changes needed to implement them. Although elements of the model demonstrate promise and have been associated with changes in diet and physical activity, the full model remains to be implemented. We anticipate that changes in diet and physical activity will be followed by changes in the prevalence of obesity and related chronic conditions. Although the challenges for implementing the model are substantial, the innovative programs and initiatives cited here, along with new mechanisms and policies supporting these approaches suggest that successful implementation can be achieved. It is abundantly clear that the current disease care system provides a poor return on investment and cannot be sustained. ■

All of the authors are members of the Integrated Clinical and Community Systems for the Prevention and Management of Obesity innovation collaborative of the National Academy of Medicine's Roundtable on Obesity Solutions. William H. Dietz led the development of the manuscript as a consultant to the roundtable. Loel S. Solomon oversees the Kaiser Permanente programs described in the text in his role as vice president of community health. Nico Pronk helped develop the PowerUp program in his capacity as vice president of health promotion at HealthPartners. As national health officer at the YMCA, Matt M. Longjohn oversees the YMCA's Diabetes Prevention Program.

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