Pediatric occupational therapy practitioners face a complex and ever-changing health care environment, creating many challenges and opportunities. P4 medicine is a systems approach to health care that emphasizes proactive wellness over reactive acute care disease management. The four Ps of P4 medicine stand for predictive, personalized, preventive, and participatory, concepts that align well with the practice of pediatric occupational therapy. P4 medicine offers a model for pediatric occupational therapy practitioners to demonstrate the value of occupational therapy services.

Andrew C. Persch, Brent H. Braveman, Christina A. Metzler

Pediatric occupational therapy practitioners face a rapidly changing health care environment. The Patient Protection and Affordable Care Act (ACA; Pub. L. 111–148) was passed in 2010 with the aims of extending health care to millions of uninsured Americans, improving the health care system, decreasing the growth of the cost of health care, and improving patient outcomes in terms of health and wellness. The ongoing implementation of the ACA presents new challenges and opportunities for occupational therapy practitioners working in primary care, preventive medicine, habilitation, and school mental health, among other practice areas (Braveman & Metzler, 2012).

The ACA will create a demand for health professionals who provide preventive services, emphasize health and wellness in their programming, and use holistic approaches because these approaches will be needed to achieve optimum outcomes in quality, cost, and experience. Realizing these opportunities will require occupational therapy practitioners to demonstrate advocacy, adaptability, and competence. The profession will likely experience the challenge of increased scrutiny by regulators and funders as we compete to provide services within new and existing models of care. Other professions (e.g., physical therapy, psychology) will be eager to take our place should we fail to adapt to these new demands.

The complexities of these challenges are increased for pediatric occupational therapy practitioners. The Individuals With Disabilities Education Improvement Act of 2004 (IDEA; Pub. L. 108–446), the No Child Left Behind Act of 2001 (NCLB; Pub. L. 107–110), state regulations, essential health benefit definitions and limits, and autism insurance mandates may complicate implementation of the ACA in pediatric settings. To address these challenges, pediatric occupational therapy practitioners must develop and demonstrate new competencies to meet the needs of medical and educational environments in the coming years.

For example, clinical data collection, analysis, and documentation are becoming increasingly important in educational and medical settings as stakeholders demand accountability and evidence of effectiveness (Jette, 2012). Practitioners must be diligent in their use of evidence-based interventions and clinically collected data to address this type of challenge (Schaaf & Blanche, 2012). Likewise, health and rehabilitation scientists must contribute to this process by conducting rigorous trials.
of intervention effectiveness, developing novel clinical data collection tools, and disseminating their work to practitioners in usable formats. Collaborative efforts among systems, practitioners, and scientists can contribute to the science-driven and evidence-based goals of the Centennial Vision (American Occupational Therapy Association [AOTA], 2007). Yet, even greater levels of advocacy are needed for the profession to fulfill all aspects of this vision and the opportunities created by the system’s current dynamic state.

New approaches are needed if occupational therapy is to realize the goals of becoming a powerful and widely recognized profession as stated in the Centennial Vision (AOTA, 2007). A key strategy should be to align the domain and process of occupational therapy with those of the larger health care community (AOTA, 2008). Doing so requires that occupational therapy practitioners communicate with other professionals using a common language that speaks to the complexities of the evolving health care environment.

Meet P4 Medicine

One approach to a common language is P4 medicine. P4 medicine is a systems approach to health care that emphasizes proactive wellness over reactive disease management (Weston & Hood, 2004). This perspective and model are aligned with the ACA and link well to occupational therapy’s history as a holistic, client-centered profession (Law, 1998). P4 medicine originated in 2004 in the field of systems biology, in which advances in nanotechnology and computational tools allowed researchers to analyze large amounts of biological data (e.g., genomic, proteomic, phenotypic; Tian, Price, & Hood, 2012; Weston & Hood, 2004).

The goal of P4 medicine is to systematically integrate information from multiple levels (e.g., genetic, behavioral, physical, environmental) of function and performance in ways that facilitate creation of proactive plans of care (Onate & Marsh, 2011). This idea is in harmony with the concepts of the occupational profile and occupational performance analysis (AOTA, 2008), which are critical components of optimum occupational therapy.

The four Ps of P4 medicine stand for predictive, personalized, preventive, and participatory (Hood & Friend, 2011). In using this language, P4 medicine provides a model for occupational therapy practitioners to communicate the value of our services for a wide range of clinical populations in medical, educational, and community practice settings. In the sections that follow, we demonstrate the alignment of P4 medicine with the practices of occupational therapy. For example, the practice of client-centered health promotion, as defined in the Occupational Therapy Practice Framework: Domain and Process (2nd ed.; AOTA, 2008), is congruent with the concepts of personalized and preventive medicine in the P4 model. These concepts are not new to the profession, nor are they foreign to the profession’s core. Rather, occupational therapy practitioners are already familiar with many of the approaches advocated by P4 medicine.

What is new, however, is the opportunity to use the model of P4 medicine as a common language to communicate the value of occupational therapy across a broad and diverse health care environment. P4 medicine also offers the added benefit of alignment with the ACA and its mandate to improve the quality, effectiveness, and costs of health care.

Predictive Medicine

Predicting future health or health problems is a daunting task yet is not out of reach. Weston and Hood (2004) suggested that technological advances in health care will soon allow providers to use huge amounts of data to make probabilistic predictions of future health. That is, given critical information (e.g., genetic, physiological, behavioral, environmental) about a client’s current health state, health care providers will soon be able to develop an individualized history of that client’s future health. Although occupational therapy practitioners are not likely to participate in predictive medicine by conducting genetic analyses or protein assays, they can use the data from such assessments to supplement the development of a fuller occupational therapy perspective on function, social context, mental health, and participation.

Personalized Medicine

All occupational therapy practitioners recognize and understand the concept of personalized medicine; we call it client-centered practice, a core pillar of occupational therapy. Personalized medicine is a systematic approach to integrating information from multiple sources in an effort to derive plans of care that are tailored to the unique needs and goals of a client.

Pediatric occupational therapy practitioners already use aspects of predictive medicine in several ways. First, as skilled analysts of research, practitioners are able to conduct evidence-based research reviews to identify and predict the interventions most likely to be effective for a specific pediatric population (Case-Smith & Arbesman, 2008). Second, practitioners contribute to interdisciplinary decision-making teams in medical and educational settings by sharing predictive expertise related to prognosis and treatment (Kolehmainen, MacLennan, Francis, & Duncan, 2010; Long, 2003). For example, an occupational therapist or occupational therapy assistant may help identify which classroom-based self-regulation strategies are most likely to benefit a cohort of elementary-age children with learning disabilities. Practitioners looking to contribute in this way should consider participating on school-based positive behavior intervention and support teams, individualized education program teams, clinic teams, or leadership teams (Case-Smith, 1994; Reynolds, 2008; Sholle-Martin & Alessi, 1990; Villeneuve, 2009).

Finally, occupational therapy practitioners may leverage their expertise in activity analysis to identify the individual and environmental factors that could support health and to distinguish and recommend the interventions that are most likely to improve occupational performance. Practitioners can also identify early signs of problems that, if addressed, can prevent their exacerbation. Practitioners who demonstrate the predictive value of the occupational therapy process help improve the quality and effectiveness of health care, which are key goals of the ACA.
Many examples exist in the pediatric literature of occupational therapy practitioners personalizing assessment and intervention for children. Client-centered pediatric evaluations draw from multiple sources of information in creating a holistic picture of a child’s occupational performance (AOTA, 2008). For example, a common pediatric evaluation encompasses an occupational profile, review of medical and educational records, interview of key informants, observation in natural settings, and administration of standardized and nonstandardized assessments (Case-Smith & O’Brien, 2010). Within this framework, occupational therapists customize evaluation procedures to the unique needs and goals of clients, caregivers, and other health care professionals. Incorporating data from diverse sources allows occupational therapists to personalize the evaluation process and provides a foundation for intervention.

In addition, multiple occupational theories and frames of reference promote interventions that are personalized. For example, the theory and practice of occupational therapy using a sensory integrative approach are based, in part, on personalizing treatment to facilitate an adaptive response (Schaaf & Miller, 2005). This principle, often called the just-right challenge, requires a therapist to grade activities to both challenge the client and allow him or her to succeed. Facilitating an adaptive response to the just-right challenge is no easy task. Practitioners must integrate their understanding of the person, environment, and occupation and negotiate these factors in a dynamic way to ensure success. The personalized method of the sensory integration approach is a good example of how to make each intervention appropriate to the client. In all contexts, use of such personalization will contribute to the goals of P4 medicine and the ACA.

### Preventive Medicine

A key component of the ACA is prevention of disease and disability. Similarly, P4 medicine aspires to shift the medical model from a reactionary system of acute care and disease management to a proactive paradigm that emphasizes ongoing health and wellness (Tian et al., 2012). To realize such a lofty goal, health care providers need to embrace a variety of preventive strategies across medical, educational, and community settings. Preventive medicine is a strategy for developing and maintaining clients’ health through proactive engagement in self-management techniques and therapies (Hood & Friend, 2011). The purpose of proactive engagement is to avert illness and disease before they occur or to minimize their negative effects. The changing context of health care and education offers occupational therapy practitioners many opportunities to contribute to preventive medicine. The following paragraphs describe three examples of how occupational therapy practitioners practice preventive medicine: (1) the Response to Intervention (RtI) approach, (2) the healthy habits initiative for children with bipolar disorder, and (3) mental health services for children.

#### Response to Intervention

RtI is a tiered approach for intervening with children struggling to learn and is an excellent example of how pediatric practitioners practice preventive medicine. The RtI approach emphasizes evidence-based instruction, progress monitoring, and data-based decision making as the active ingredients necessary for identification, prevention, and remediation of learning difficulties in children (Fuchs & Fuchs, 2006). Although RtI is not federally mandated, Hale, Kaufman, Naglieri, and Kavale (2006) stated, “The use of research-based instruction, regular student progress monitoring, single-subject experimental designs, and empirical decision making should be required of all schools” (p. 753). Such a requirement would enable all schools to identify children struggling to learn and to intervene early to remediate learning difficulties, practices aligned with the concept of preventive medicine.

As societal resources become more constrained, the RtI model becomes all the more important. Indeed, school districts may realize cost savings by addressing students’ issues early and well, thus preventing the need for costly or intense special education (VanDerHeyden, Witt, & Gilberston, 2007).

Related service providers, such as occupational therapy practitioners, have much to offer and are increasingly being asked to participate in the RtI process. Examples of RtI components provided by occupational therapy practitioners in the public schools include screening, providing parent or teacher education, offering universal ergonomics recommendations, developing intervention resources, recommending universally designed classroom tools, advocating for building accessibility, and consulting on the need for a referral to special education (Bazyk et al., 2009; Hanft & Shepherd, 2008; Reeder, Arnold, Jeffries, & McEwen, 2011). These proactive and preventive strategies enable students and special education teams to achieve higher levels of function and performance. School-based occupational therapy practitioners are urged to be on the lookout for new opportunities to collaborate on preventive strategies as the principles of the ACA are rolled out in the coming years; in this way they will have an impact not only on health systems but on educational and community systems as well.

#### Healthy Habits

Preventive medicine is also evident in the healthy habits initiative for children with bipolar disorder (Fristad, 2006). Within the field of psychoeducational psychotherapy, healthy habits refers to structuring a child’s diet, sleep, and physical activity in a way that optimizes health. The goal of this approach is to prevent negative symptoms by enabling proactive behaviors that facilitate health and wellness. The benefits of these healthy habits are not exclusive to children with bipolar disorder; indeed, the positive benefits of sleep, diet, and physical activity for all children are well documented (Lichtenstein et al., 2006; Sadeh, Gruber, & Raviv, 2003; Sallis, Prochaska, & Taylor, 2000).

As health care professionals trained to recognize the importance of self-care,
self-regulation, and exercise, occupational therapy practitioners are ideally positioned to share this message with children and families across a wide range of settings and for many conditions. By analyzing and modifying a child’s sleep, eating, and play routines, occupational therapy practitioners can create structures that facilitate health and prevent disability, key objectives of the ACA.

Mental Health Services

The need for children’s mental health services in the United States is recognized, growing, and unmet (Fulda, Lykens, Bae, & Singh, 2009; Knitzer & Olson, 1982; Patel, Flisher, Hetrick, & McGorry, 2007). Recently, occupational therapy practitioners have organized to reassert their unique expertise in this area of pediatric practice (Bazyk, 2011; Milliken, Goodman, Bazyk, & Flinn, 2007). This effort follows from occupational therapy’s long history in mental health practice and the fact that occupational therapy practitioners are trained in psychosocial interventions for children and adults with mental health disorders (Cara & MacRae, 2005; Dennis & Rebeiro, 2000). Gutman (2012) suggested that occupational therapy practitioners contribute to school-based behavioral health programs for children struggling with self-regulation (e.g., frustration tolerance, attention to task) and self-management (e.g., organization, time management) skills.

By working with other professionals in schools and other settings to support the mental and behavioral health of children, occupational therapy practitioners support the preventive mission of P4 medicine and the ACA. The central issue will be to ensure that occupational therapy is a critical component of all the systems, including mental health, that support children and families so that the benefits of occupational therapy can be delivered.

Participatory Medicine

Active engagement in the health care process is a key aspect of P4 medicine and the ACA. Participatory medicine challenges the client to shift perspective from that of a passive health care recipient to that of an active contributor (Tian et al., 2012).

Occupational therapy has innovated in this area for many years. Not only do occupational therapy practitioners emphasize active participation in the therapeutic process (i.e., being client-centered), they enable it more globally through engagement in occupation. As Law (2002) stated, “Occupational therapy focuses on enabling individuals and groups to participate in everyday occupations that are meaningful to them, provide fulfillment, and engage them in everyday life with others. Our focus is on enhancing participation” (p. 640). Thus, occupational therapists practice participatory medicine when they facilitate engagement in meaningful occupations to promote or restore function, remediate disability, and enable participation. This work is particularly rewarding in pediatric settings, in which breaking down performance barriers results in an increased ability to participate in the social, play, learning, and vocational activities of childhood and adolescence.

Participatory medicine is evident in the practice of occupational therapy practitioners who support adolescents with disabilities throughout the transition to adulthood. The transition years are a time of significant change for people with disabilities, their families, and support systems. Unfortunately, most people with disabilities experience low levels of employment in the years after transition to adulthood (Newman et al., 2011).

Occupational therapy practitioners working in school-based and community settings have an excellent opportunity to contribute to this important need by supporting a successful transition from educational to community systems of service. Specifically, practitioners can facilitate positive outcomes by targeting interventions at clients’ self-determination, self-management, and employment skills and by including the family in the education, planning, and decision-making processes (Stewart, 2011; Stewart, Stavness, King, Antle, & Law, 2006). These practices emphasize the active participation of clients and their families in occupational therapy and in the transition planning process and, ultimately, in their ability to live life to its fullest. By implementing these practices during clients’ transition to adulthood, occupational therapy practitioners have the opportunity to contribute to positive post-secondary education and employment outcomes for people with disabilities.

Conclusion

The practices of pediatric occupational therapy practitioners are well aligned with the tenets of P4 medicine. Occupational therapy practitioners’ skilled use of research and data contributes to the predictive mission of P4 medicine. The practice of client-centered occupational therapy is well aligned with the concept of personalized medicine within the P4 model. Occupational therapy practitioners use a variety of evidence-based practices to promote children’s health and prevent disability. Restoration of a physical skill or mental function is only one part of the therapeutic process; indeed, occupational therapy is unique in its appreciation of the meaningfulness and value of occupations. By facilitating engagement in meaningful occupations, including health and health care self-management, occupational therapy practitioners demonstrate the close alignment of the profession with the concept of participatory medicine.

Pediatric occupational therapy practitioners have the opportunity to demonstrate the value of occupational therapy services for a wide range of clients by practicing and communicating the four Ps of P4 medicine. Doing so will help position occupational therapy as a key player under the ACA and as health care continues to evolve in the coming years.

References


