

Advancing Value-Based Medicine Why Integrating Functional Outcomes With Clinical Measures Is Critical to Our Health Care Future

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Each year, millions of American workers develop health problems that may temporarily or permanently remove them from the workforce. Although most are able to work again after a brief recovery period, in approximately 10% of cases, workers incur injuries or illnesses severe enough to lead to prolonged or permanent withdrawal from the workforce. These conditions are both work- and nonwork related—and range from injuries in the workplace to illnesses such as cancer, heart disease, and diabetes. Although these illnesses may not be related to a person's job, they nonetheless impact workers' ability to function effectively in everyday life.

Functional impairment related to injury or illness is a condition in which individuals may have a loss of physical ability, limitations on their day-to-day living activities, or restrictions on their societal interactions. People who are functionally impaired often have a multidimensional condition, the collective impact of which is much greater than physical impairment alone. Those who are functionally impaired may not be able to drive, cook for themselves, or keep up with finances, household care, and other personal daily activities. In addition, there is the

intangible, yet powerful harm to the nation's societal fabric that occurs when individuals become isolated from their family, church, friends, community organizations, and other societal connectors.

The condition of functional impairment has enormous monetary costs for both individuals and society. For individuals, life disruptions caused by serious illness or injury are compounded by the economic impact of being out of work. Although workers' compensation and other programs assist injured and ill workers, these programs do not fully cover economic loss and the health care costs brought on by functional impairment, nor can they begin to ameliorate the personal costs and burdens of significant life-disruptions. For society, the loss of functional workers from our economy impacts overall productivity and output while adding to the long-term costs of our national disability benefit programs, such as sick leave, workers' compensation, short-term disability (STD), long-term disability (LTD), and Social Security Disability Insurance (SSDI). The current national cost of providing care for functionally disabled individuals totals some \$160 billion, and continues to rise at an unsustainable rate.^{1,2}

Although discussions of functional impairment among workers often focus on the needs of those who are severely disabled, the reality is that the impact of functional impairment is much wider. Vast numbers of Americans of working age have disabilities of some kind that could be more effectively managed, thus reducing their impact on the US health safety-net and economy. By adopting a new preventive strategy aimed at ensuring that workers who suffer some degree of functional impairment do not become severely disabled, the US could begin to decrease the upward curve of overall disability costs.

At the core of this strategy is a new emphasis on helping patients achieve functional ability as a measure of the overall quality of the health care they receive. New standards and measurements of the functional ability of patients would be closely integrated with current standards and measurements of the clinical processes used during their treatment, providing

health care practitioners with a new, more accurate and relevant assessment of individual health.

The challenge in arriving at this new vision for patient care is raising awareness of the role of functional ability as an important measure of health, an idea that is currently underdeveloped, and largely overlooked in traditional US medical care. The current health care system is focused largely on developing and adhering to clinical measures, many of which are related to processes—for example, testing for blood sugar in diabetic individuals—that are justifiable and must be retained if the US is to achieve higher standards of quality care. However, focusing on clinical process measures at the expense of developing functional outcome measures deprives the system of a much-needed gauge of the overall value it delivers.

A functional outcome is defined as maximizing the ability of an individual to function on multiple levels—including physical, cognitive, occupational, and social—after suffering an injury or illness regardless of cause. The US occupational health community, including occupational and environmental medicine (OEM) physicians, has long placed a strong emphasis on measuring functional outcomes in its approach to patient treatment, while the wider medical community has tended to focus on clinical process measures. Through decades of research and development of function-based treatment protocols, the OEM community has developed strategies designed to increase patient satisfaction, promote earlier return to work and daily activities of life, enhance personal productivity, and lower medical costs.³

The key to these protocols is placing functional-outcome measures side by side with clinical process measures as priorities in patient care. OEM physicians assist patients in identifying personal functional goals and developing a treatment or management plan that attempts to align the patients' goals with job requirements. These functional goals are considered vital corollaries to traditional clinical process measures. An increasing body of OEM research supports the effectiveness of this approach.^{4,5} At the same time, the only US

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insurance system that currently focuses on the integration and measurement of both clinical processes and functional outcomes is workers' compensation.

Lessons learned about the importance of functional outcomes in patient care form the basis for a new approach in medicine that could be applied more widely and could help advance true value-based care. The fundamental goal is for all physicians, regardless of specialty, to bring an increased focus in care to returning patients to satisfactory functional state—not simply treating their presenting illnesses or injuries.

This paper explores the benefits of integrating functional outcomes with clinical process measures as a basic approach to patient care in the US, while exploring the broad challenges to our health care system that make a transition to this new approach imperative. The paper also examines the connection between medical care and disability, cites research supporting a functionally based approach to health care, and describes a basic path that will make possible a shift of the US health care system toward the integration of functional and clinical process measures for patients.

Although these ideas are aimed at the US health care system, the dynamics of disability and workplace injuries and illnesses are similar throughout the world. The International Labour Organization and World Health Organization both estimate that each year, there are hundreds of millions of accidents and incidents or illness impacting worker productivity globally—and that the devastating toll of chronic disease is touching human populations around the world.^{6,7} The movement toward the integration of functional outcomes as an integral part of medicine has the potential to improve health conditions well beyond the US borders.

HEALTH CARE SYSTEM CHALLENGES THAT FUNCTION-BASED MEDICINE CAN HELP ADDRESS

The effectiveness and sustainability of the US health care system faces a range of serious challenges, but several in particular could be better addressed by placing a greater emphasis on functional outcomes in patient care, including:

- **Spiraling US health care costs, low health-status rankings**

The US spends more on health care than any other nation, but Americans' health status ranks below affluent European countries and Canada that spend considerably less.^{8,9} Overall, the US health

care system has poorer outcomes in life expectancy and prevalence of chronic health conditions than its peers.¹⁰ In 2014, US national health expenditures grew 5.3% to \$3 trillion, or roughly \$9523 per person, and accounted for 17.5% of the gross domestic product (GDP)—20% was attributable to Medicare costs and about 16%, or \$496 billion, was spent on Medicaid.¹¹ From 2014 to 2024, national health expenditures are projected to rise at an average annual rate of 5.8%, much higher than the projected GDP growth rate.¹¹ Research indicates that by focusing on functional outcomes in patient treatment, medical costs can be decreased and the quality of medical outcomes increased.^{12,13}

- **The rising cost of disability**

In addition to overall national health care expenditures, approximately \$60 billion is paid annually from state workers' compensation programs for job-related injuries or illnesses.¹ In addition to state workers' compensation, individuals may be eligible for compensation from STD and LTD programs, SSDI, and other sources. The estimated total annual cost of disability benefits paid under these systems exceeds \$100 billion annually. In 2014, SSDI paid out disability benefits to more than 10.2 million individuals, 90% of whom were disabled workers.²

As the US population ages, these trends are expected to continue upward and have significant economic impact. In 2014, 3 million nonfatal workplace injuries and illnesses were reported by private industry employers,¹⁴ half of which resulted in days away from work, job transfers, or job restrictions due to some level of disability. In addition to private employers, 722,300 injury and illness cases were reported among approximately 18.3 million US state and local government workers, including those who provide police and fire protection. The continuing rise in disabled workers, accelerating due to the aging Baby Boom generation, will exacerbate the increase in disability compensation and health care costs. One reason for the rise in disability costs is that medical treatment and disability treatment for disabled workers often have no central case-management and no integration of service provision. Adopting a patient-treatment system that incorporates functional outcomes in the approach to care would help address this disconnect.

- **A focus on short-term outcomes in treatment**

Health care measures of quality often focus on disease-specific care, such as

smoking cessation, and disease-specific care processes and condition-specific indicators, which may be geared toward the short-term.¹⁵ Disease-specific outcome measures may be somewhat effective for patients with single diseases or isolated health problems, but for patients who have multiple diseases, health issues, or disabilities, the status of a specific disease will not reflect how multiple treatments and/or lack of coordination of these treatments affect overall health.¹⁵ Leading medical organizations and the Centers for Medicare and Medicaid Services, the nation's largest health insurer, have endorsed medical care that is more patient-centered and responsive to individual needs.^{16,17} The National Institute for Occupational Safety and Health's Total Worker Health[®] program advocates for a holistic understanding of the factors that contribute to worker well-being by supporting research focused on safety and health protection and promotion in the workplace. A system focused on functional outcomes would, by its holistic and integrative nature, contribute more effectively to accomplishing this goal and achieving long-term results for patients.

- **An overreliance on the fee-for-service medical payment system**

Fee for service has not proven to be a cost-effective nor value-driven approach to medical care, lacking incentives to encourage providers to focus on return-to-function as a core component of treatment. Although the payment system in the US has recently begun to move away from the fee-for-service model, the performance-based reimbursement models are still heavily reliant on clinical process measures and laboratory values—lowering incentives for physicians to focus on functional outcomes.^{18,19} Although clinical process measures and laboratory values are supported by evidence showing they improve medical outcomes, they do not directly focus on an individual patient's final functional results. The functionally focused approach introduces incentives that are clearly compatible with performance-oriented patient-centered care and enables the measurement of outcomes in a way that benefits employers, payers, and patients alike.

The key in moving away from an overreliance on the current fee-for-service system is providing consistent, widely agreed upon outcome measures that provide clear-cut evidence of value. The current national dialogue about the use of opioids in medical treatment provides

an example of the tension between process and outcomes—with the discussion increasingly focused on the importance of functional outcomes as the best assessment measure for opioid effectiveness. The recent creation of new strongly outcome-oriented guidelines and standards for opioid treatment, offered by multiple organizations, is a signal of the importance of creating consistent, agreed-upon, outcome measures to achieve value. If more providers prescribing opioids were focused on similar functional outcomes as their treatment goal, the health system as a whole would be better equipped to reduce opioid abuse.^{20,21}

- **Lack of health care coordination**

One of the most common patient complaints in the current fee-for-service health care system is the lack of coordination among health providers. This view is increasingly held by health professionals as well: In a survey of a representative sample of 36,000 physicians in California, 40% indicated that health care was not well coordinated across sites and providers.²² The survey included doctors from solo, small/medium, and large practice groups. Uncoordinated care and a lack of focus on functional outcomes has contributed directly to a variety of US public health problems, including the recent opioid misuse and abuse crisis.^{21,23} For example, significant numbers of patients receive redundant prescriptions from multiple care providers, making it more difficult to track proper use of drugs. Prescription drug use and abuse among the elderly is also on the rise, often as a result of the lack of coordination across multiple providers.²⁴ Coordination issues related to the use of electronic medical records have exacerbated the problem. In a system that integrates clinical and functional outcomes, care coordination is essential. If all medical care was focused on the patient's ability to function on multiple levels—from physical capacity to navigating the daily activities of life—greater patient satisfaction and decreased disability would be anticipated.^{25–27}

In summary, the orientation of much of the current US health care system is not on functional, long-term outcomes and coordinated, patient-centered care. Instead, the system focuses to a large degree on uncoordinated care, putting a priority on treating disease or health-issue specific conditions, prompting rising costs and missing the opportunity to better address the increasing incidence of chronic disease and its sequelae.

SHIFTING MEDICAL PRACTICE TOWARD A FOCUS ON FUNCTIONAL OUTCOMES

Although a large number of “quality measures” are incentivized by Medicare, a minority of these measures evaluate the patient's ability to function in everyday life. Functional outcomes are not commonly used in the overall health care system and are not part of the required elements for medical treatment-reports.

This is not the case in some sectors of the health care system. For example, in peer-reviewed medical research studies for treatment of musculoskeletal and other conditions, the results of functional measures are a critical component.²⁸ Similarly, in the assessment of multiple sclerosis patients, clinicians use both physical and cognitive function in assessing outcomes.²⁹ Functional outcome measures are also starting to emerge in other areas of health care, as evidenced by the work of the American College of Cardiology College Foundation and the American Heart Association in conjunction with the American Medical Association Physician Consortium for Performance Improvement to develop performance measure for diagnosis, treatment, and outcomes—including functional outcomes—of patients with heart failure.³⁰ The International Consortium for Health Outcomes Measurement is developing outcomes for several medical circumstances, including prostate surgery, low-back pain, muscular degeneration, and lung cancer.³¹

How can these trends be magnified and leveraged to shift medical practice toward a wider adoption of functional outcomes as a core component of care? One place to start is with the nation's workers' compensation system, which is currently the only insurance model that focuses on both medical care and reduction of disability and integrates clinical process measures and functional outcomes in its approach to patient treatment. The workers' compensation model offers valuable structural features that could help the US build a more effective, function-oriented approach to patient treatment.

Functional outcomes are typically defined in relation to a patient's ability to work and live effectively and efficiently to the fullest capacity. In many cases, OEM physicians are retained by the workers' compensation system to address work-related illnesses and injuries and to assist those with impairments achieve a medically acceptable work position. When addressing workers' compensation patients, the OEM physician assists the patient in developing a treatment or management plan that attempts to align the patient's medical goals

with his or her job requirements, as well as the patient's ability to be fully engaged in society. The functionally based medical and behavioral treatment plans that are typically used in the process are based on scientific evidence that has demonstrated that adherence to these plans results in a significant improvement in the individual's ability to perform normal physical acts, such as lifting, longer tolerance for sitting, standing, or walking and, depending on the extent of injury or illness, the performance of cognitive tasks.

A number of research articles attest to the success of integrating the key principles of “early return to activity” and “early return to work” into medical treatment—both key concepts in the approach to patient care utilized by the workers' compensation system and OEM practitioners.^{32–38} The American College of Occupational and Environmental Medicine (ACOEM) has captured much of the scientific backing for functionally based treatment and RTW in the clinical guidelines it has developed over the last 2 decades.³ The main tenet of these guidelines is to teach providers to focus on return to function, activity and work using a model of integrated care and setting expectations.

Research shows that states which adopted functional-guideline concepts, such as those in ACOEM's *Practice Guidelines*, have seen significant improvement in reducing medical costs and returning individuals to function and work. An example is Colorado, which has served in recent years as a testing ground for functionally oriented guidelines. Colorado formally educates physicians on how to incorporate functionally based treatment and RTW into their everyday clinical practices, and these physicians are compensated by the state for following and documenting these principles. After the principles of functionally based treatment and RTW were more widely taught in the state, Colorado experienced a significant and continued decrease in disability rates and medical costs, in its workers' compensation system compared with national levels.⁴ Various other institutions are also beginning to view functionally based treatment and RTW in a new light. For example, the Agency for Healthcare Research and Quality acknowledged the importance of a focus on RTW with its formulation of the Center for Medicare and Medicaid Services' low back pain pay-for-performance elements.²⁹

A growing list of studies has also proven that these skills, when incorporated into institutional programs aimed at returning function to workers, can save medical costs and decrease disability. A good example is Navistar, which implemented a health and productivity management

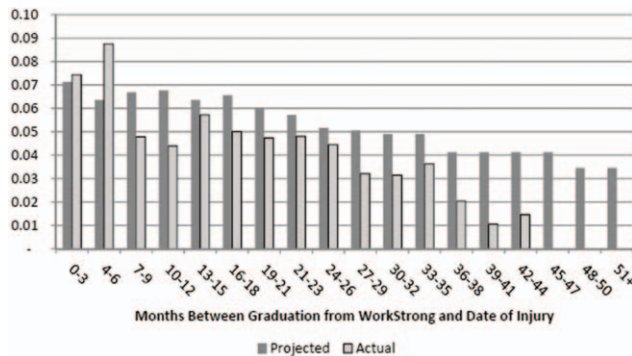


FIGURE 1. University of California's WorkStrong Program—actual versus projected workers' compensation claims 31 months after graduation.

strategy in 2000 focusing on primary, secondary, and tertiary prevention.¹² The overall threefold objective of the program was to 1) maintain and/or improve the health of the individual; 2) manage and reduce the impact of health costs on the organization; and 3) maximize the health benefits for employees. A study was conducted on the overall costs to Navistar for employee health benefits from 2001 to 2009. The study found that total direct costs—driven by transactions that employees have with the health care system—decreased by 16%. After adjustment for other factors, the drop remained significant at 8.5% or \$426 per employee. In addition, the average work limitation, the annual average number of absentee hours, and the annualized rates for workers' compensation and STD and LTD recorded drops that were highly significant when adjusted by relevant research factors.¹²

Another example is the University of California (UC), which launched a program in 2012 aimed at reducing its disability costs—2011 data from the UC Los Angeles campus showed that 4181 of its employees had multiple workers' compensation claims (15,944 injuries). Of these employees, 968 (23%) had filed five or more claims, and 223 (5%) had filed 10 or more claims.³⁹

In an effort to address workers' compensation costs and reduce multiple claims, UC launched WorkStrong, a program to lower employee health risks such as smoking, obesity, poor nutrition, and lack of exercise. Employees selected for the program participate in a variety of behavior modification activities, ranging from life coaching to smoking cessation, and other wellness services, including personal fitness coaching. A typical program includes 12 to 22 personal training sessions, 6 to 12 consultations with a dietitian, and a 6-month gym membership. This focus on function resulted in a decline of 29% in actual versus projected workers' compensation claims, based on prior experience for the population in the program (Fig. 1).

Participation studies and analysis of patient health data indicate that WorkStrong enrollees have reaped a wide range of benefits from the program—physical, mental, and spiritual—and that it has improved overall function at the same time it has reduced disability costs.

CHANGING HEARTS AND MINDS: HOW TO TRANSITION PHYSICIANS TO A SYSTEM INTEGRATING CLINICAL PROCESS MEASURES WITH FUNCTIONAL OUTCOMES

A fundamental truth about the enhancement of functional ability is that it can have a greater impact on a patient's quality of life than diagnosis and treatment alone. Even when some permanent limitations remain after diagnosis and treatment of a serious condition, health providers that focus on functional outcomes are more likely to have success in returning patients to work and to resuming normal life activities. This key realization is firmly embedded in the principles of OEM, and is a common driver in medical treatment in the workers' compensation system. But to date, it has not been comprehensively adopted by the wider medical community.

Although OEM has been a leader in promoting physical function as a measure of treatment success, the larger practice of general medicine in the US has only recently begun to consider physical function improvement as an outcome measure. The United Kingdom (UK) began to explore physical function as a measure of outcome a number of years ago. In 2010, the UK changed its "sick note," used to coordinate worker health care, to a "fit note," which forced a stronger emphasis on functionally based treatment and RTW.⁴⁰ The new fit-note system encourages physicians to provide advice to their patients about the effects of their health

conditions and how they might be able to return to work while they recover. It also incorporates training for primary care providers on how to formulate plans to return their patients to activity and to work. This single change has made significant improvements in UK disability rates and provides another model that could help the US transition to more functionally based care.

As an example, many patients with significant physical impairment from severe rheumatoid arthritis continue to work in demanding positions, while many workers with chronic lumbar strains may be deemed to be permanently disabled. However, OEM research demonstrates that the latter group of workers—those with low back pain—can almost always return to productive lives with functionally directed treatment. But many physicians outside of OEM are not aware of this finding. The average physician who treats working-age adults usually signs five or more work-related letters or notes to employers and payers per week—and is thus by definition a regular participant in decisions related to worker disability—but has received no training in disability prevention and management.³² As a result, he or she may allow workers to return to work who should not and may disable those who could be working. The recent growth of linkages of physicians' rankings and bonuses to patient satisfaction ratings can greatly influence how these letters and notes are written. One of the most important steps in integrating clinical process measures and functional outcomes as an approach to treatment in the US will be facilitating physician adoption of this philosophy—which must begin with medical schools—most of which have not integrated the evaluation of function into their curricula.

A 2006 ACOEM report on work disability addressed the failure of the medical school curriculum to train all physicians in disability prevention and management and called for the education of "all treating physicians in basic disability prevention/management."³² To help encourage adoption of functional approaches by currently practicing physicians, ACOEM has recommended that reimbursements and incentives should be made available to trained physicians, that functionally based treatment guidelines should be more aggressively promoted and disseminated, and that training curriculums in functionally based treatment should be expanded by physician organizations.³²

Although some specialty organizations, including the American Academy of Orthopedic Surgeons, have expanded access to courses on disability-related topics, and some workers' compensation

health care provider-networks now require training in disability prevention, a more wide-reaching effort is needed to raise the visibility of this new approach—and to begin training a new generation of health care practitioners in its tenets. To ensure consistency and quality as education expands, it will be important to reach consensus on how best to use existing tools and methodologies for measuring functional outcomes, along with new standards and updated guidelines. Many tools are available within the OEM/workers' compensation community, but these will need to be modified to ensure they can be feasibly used by wider group of stakeholders.

A second critical pathway to adoption of a functionally based treatment approach in the US is the alignment of the medical community with the payer community. Functionally based strategies will succeed only if spending on disability prevention is considered a priority rather than discretionary and only if incentives are realigned. Employers and disability insurers are currently not held responsible for helping people stay healthy and employed and are often able to shift the benefit costs of employees that have significant medical issues to public programs such as Medicare and SSDI, which, due to their benefit design and administrative procedures, frequently create disincentives to healing and healthful behavior.

In addition to aligning health care providers and payers, visibility and adoption of this concept by the employer community is essential to its success. Innovators such as Navistar and UCLA have proven that comprehensive disability management, integrated with clinical care, yields impressive benefits. Disease management, evidence-based quality care management and RTW programs can limit the destructive and disruptive impact of serious medical conditions on worker productivity—providing measurable bottom-line enhancements for employers.

It is predicted that the US medical student population will have grown by nearly 60% between 2002 and 2020. And, to address this growth, 30 new medical schools are already established. In the face of these trends, it is important to ensure that the next generation of physicians is educated about functional outcomes.⁴¹

Finally, functionally based care will also need to be more widely understood by policy makers and economists if it is to be widely adopted. In a 2008 paper, leading OEM practitioners suggested that disability management and functionally based treatment could have a profound impact on the nation's economy, noting that improving the health and function of workers and

returning them to work will “preserve employability and help relieve the strain on the federal programs such as Medicaid and SSDI.”⁴² Beyond its benefits for patients, treatment based on functional outcomes has been increasingly linked to better productivity, which, according to ACOEM, strengthens the overall competitiveness of the US in the global marketplace and advances beneficial societal outcomes.

RECOMMENDATIONS

To further the use of functional outcomes in all medical/health visits, the following is proposed:

1. Identify and validate a set of functional outcomes measures that can be readily adapted to all treatment protocols and included as part of the medical/health record.
2. Incorporate functional assessments/measurements into medical training as soon as feasible to leverage the surge of the number of physicians-in-training.
3. Better align incentives for all health care providers to assure adequate functional measurement.
4. Engage employers, insurers, and policy makers as to the value of and need for functional measurement in all medical/health care.
5. Establish systems to collect data to help quantify the incremental impact of a greater focus on functional assessments, and to utilize such data for continual improvement.

CONCLUSION

The health and productivity of the US workforce has become a vital policy issue, with a significant impact for the nation's future. Each year, millions of American workers develop health problems that may temporarily or permanently remove them from the workforce, and a variety of demographic, economic and health trends are exacerbating the impact of national work disability rates. The loss of function, whether temporary or permanent, has enormous costs for the individual as well as society as a whole.

The nation's current approach to disability management has focused on addressing the problem via patient care that is largely based on the use of clinical process measures. In today's dynamic and fast-changing environment, this singular focus has limitations that could be addressed by assimilating the tenets of functionally based care alongside such measures. Functionally based care complements clinical process measures by adding a strong emphasis on long-term outcomes and seeking to return patients

to work and the activities of everyday living as expeditiously as possible. This approach has demonstrated significant multiple-level benefits for patients, physicians, employers, the national economy, and society in general.

At the core of this strategy are tenets long-practiced by the nation's OEM providers and widely adopted within its workers' compensation system. Through a care approach that focuses on evidence-based, functional outcomes, OEM and workers' compensation have demonstrated the ability to return individuals to work, to maximize their capabilities and ability to function to their fullest, and to be contributing members of society. It is time to transition these well-established, successful tenets of care to mainstream medicine.

To achieve this goal, functionally based care must become more widely assimilated into the protocols of all treating physicians—requiring the expansion of disability management and prevention training in medical school curricula and in continuing medical education. Standardization and consistent use of tools for measuring functional outcomes will be needed and new standards and guidelines established and disseminated. In addition, the precepts and benefits of functionally based care must be understood and utilized by payers, employers, policymakers, and other stakeholders in health care. Incentives and systems will need structural adjustments, designed to promote the value of this new approach to care.

A 2013 *Harvard Business Review* article on health care noted that the overarching goal for providers as well as every other stakeholder must be improving value for patients, where value is defined as the health outcomes achieved that matter to patients relative to the cost of achieving those outcomes. Improving value requires either improving one or more outcomes without raising costs or lowering costs without compromising outcomes, or both.⁴³ There is a clear value in patient-care based on functional outcomes and the time is right to begin assimilating this well-established, results-oriented approach more widely into the US health care system.

REFERENCES

1. O'Leary P, Boden LI, Seabury SA, Ozonoff A, Scherer E. Workplace injuries and the take-up of Social Security Disability Benefits. *Soc Secur Bull.* 2012;72:1–14.
2. Social Security Administration Office of Retirement and Disability Policy Office of Research, Evaluation, and Statistics. Annual Statistical Report on the Social Security Disability Insurance Program, 2014. Washington, DC: SSA Publication No. 13-11826; November 2015.
3. ACOEM. Occupational Medicine Practice Guidelines, 3rd ed. In: Hegmann KT, editor.

- Elk Grove Village, IL: American College of Occupational and Environmental Medicine; 2011.
4. Bruns D, Mueller K, Warren PA. Biopsychosocial law, health care reform, and the control of medical inflation in Colorado. *Rehabil Psychol*. 2012;57:81–97.
 5. Kominski GF, Pourat N, Roby DH, et al. Return to work and degree of recovery among workers in California's workers' compensation system. *J Occup Environ Med*. 2008;50:296–305.
 6. World Health Organization. Workers' Health: Global Plan of Action. Sixteenth World Health Assembly. WHA 60.26. May 23, 2007.
 7. ILO. ILO Introductory Report: Global Trends and Challenges on Occupational Safety and Health. XIX World Congress on Safety and Health at Work; September 11–15, 2011; Turkey, Istanbul.
 8. Rubenstein G. New Health Rankings: of 17 Nations, U.S. is Dead Last. The Atlantic. January 10, 2013. Available at: <http://www.theatlantic.com/health/archive/2013/01/new-health-rankings-of-17-nations-us-is-dead-last/267045/>. Accessed October 18, 2016.
 9. Davis K, Stremkis K, Squires D, Schoen C. The Commonwealth Fund. Mirror, Mirror on the Wall, 2014 Update: How the U.S. Health Care System Compares Internationally. 2014 Update. The Commonwealth Fund; June 2014. Available at: <http://www.commonwealthfund.org/publications/fund-reports/2014/jun/mirror-mirror>. Accessed October 18, 2016.
 10. Squires D, Anderson C. U.S. Health Care from a Global Perspective: Spending, Use of Services, Prices, and Health in 13 Countries. The Commonwealth Fund; October 2015. Available at: <http://www.commonwealthfund.org/publications/issue-briefs/2015/oct/us-health-care-from-a-global-perspective>. Accessed October 18, 2016.
 11. Centers for Medicare & Medicaid Services. NHE Fact Sheet [CMS web site]. Available at: <https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nhe-fact-sheet.html>. Accessed October 18, 2016.
 12. Allen H, Rogers W, Bunn III WB, Pikelny DB, Naim A. Reducing total health burden from 2001 to 2009: an employer counter-trend success story and its implications for health care reform. *J Occup Environ Med*. 2012;54:904–916.
 13. Porter ME, Lee TH. The strategy that will fix health care. *Harvard Business Review*. October 2013. Available at: <https://hbr.org/2013/10/the-strategy-that-will-fix-health-care>. Accessed October 18, 2016.
 14. Bureau of Labor Statics. Employer-reported Workplace Injuries and Illnesses – 2014 [Press Release]. October 29, 2015. Available at: <http://www.bls.gov/news.release/pdf/osh.pdf>. Accessed October 18, 2016.
 15. Rueben DB, David M, Tinetti ME. Goal-oriented patient care: an alternative health outcomes paradigm. *N Engl J Med*. 2012;366:777–779.
 16. Centers for Medicare & Medicaid Services. Shared Savings Programs [CMS web site]. Available at: <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/shared-savingsprogram/index.html?redirect=shared-savingsprogram>. Accessed October 11, 2016.
 17. American Osteopathic Association, American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians. Joint Principles of the Patient-Centered Medical Home. [Web site]. March 2007. Available at: http://www.aafp.org/dam/AAFP/documents/practice_management/pcmh/initiatives/PCMHJoint.pdf. Accessed October 18, 2016.
 18. Fernandopulle R. Breaking The Fee-For-Service Addiction: Let's Move to a Comprehensive Primary Care Payment Model. HealthAffairs Blog [Web site]. August 17, 2015. Available at: <http://healthaffairs.org/blog/2015/08/17/breaking-the-fee-for-service-addiction-lets-move-to-a-comprehensive-primary-care-payment-model/>. Accessed October 18, 2016.
 19. Berenson RA, Rich EC. U.S. approaches to physician payment: the deconstruction of primary care. *J Gen Med*. 2010;25:613–618.
 20. Franklin G, Sabel J, Jones CM, et al. A comprehensive approach to address the prescription opioid epidemic in Washington State: milestones and lessons learned. *Am J Public Health*. 2015;105:463–469.
 21. Dowell D, Haegerich TM, Chou R. CDC Guideline for prescribing opioids for chronic pain: United States, 2016. *MMWR Recomm Rep* 2016; 65:1–49.
 22. California Health Care Foundation. Uncoordinated Care: A Survey of Physician and Patient Experience. [web site]. 2007. Available at: <http://www.chcf.org/~media/MEDIA%20LIBRARY%20Files/PDF/PDF%20U/PDF%20UncoordinatedCareSnapshot07.pdf>. Accessed March 16, 2017.
 23. Rontal R, Gabriel K, Udow-Phillips M, Dreyer T. Uncoordinated Prescription Opioid Use in Michigan. Center for Healthcare Research and Transformation [web site]. December 2015. Available at: <http://www.chrt.org/publication/uncoordinated-prescription-opioid-use-in-michigan/>. Accessed October 18, 2016.
 24. Culberson JW, Ziska M. Prescription drug misuse/abuse in the elderly. *Geriatrics*. 2008;63:22–31.
 25. Sorensen G, McLellan DL, Sabbath EL, et al. Integrating worksite health protection and health promotion: a conceptual model for intervention and research. *Prev Med*. 2016;91:188–191.
 26. Dugan AG, Farr DA, Namazi S, et al. Process evaluation of two participatory approaches: implementing total worker health® interventions in a correctional workforce. *Am J Ind Med*. 2016;59:823–918.
 27. CDC. NIOSH Total Work Health [Web site]. Available at: <http://www.cdc.gov/niosh/TWH/default.html>. Accessed October 18, 2016.
 28. Nyenwe EA, Jerkins TW, Umpierrez GE, Kitabchi AE. Management of type 2 diabetes: evolving strategies for treatment of patients with type 2 diabetes. *Metabolism*. 2011;60:1–23.
 29. Pay for Performance in Health Care: Methods and Approaches. Cromwell J, Trisolini MG, Pope GC, Mitchell JB, Greenwald LM, editors. Research Triangle Park, NC: RTI Press/RTI International; March 2011. Available at: <http://www.rti.org/sites/default/files/resources/bk-0002-1103-mitchell.pdf>. Accessed October 19, 2016.
 30. Bonow RO, Ganiats TG, Beam CT, et al. ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults with Heart Failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on performance measures and the American Medical Association-Physician Consortium for performance improvement. *J Am Coll Cardiol*. 2012;59:1812–1832.
 31. International Consortium for Health Outcomes Measurement (ICHOM). Why Measure Outcomes? [Web site]. Available at: <http://www.ichom.org/why-measure-outcomes/>. Accessed October 19, 2016.
 32. Stay-at-Work and Return-to-Work Process Improvement Committee. Preventing needless work disability by helping people stay employed. *J Occup Environ Med*. 2006;48:972–987.
 33. Bernacki EJ, Guidera JA, Schaefer JA, Tsai S. A facilitated early return to work program at a large urban medical center. *J Occup Environ Med*. 2000;42:1172–1177.
 34. Ostbye T, Dement JM, Krause KM. Obesity and workers' compensation. *Arch Intern Med*. 2007;167:766–773.
 35. Maniscalco P, Lane R, Welke M, Mitchell JH, Husting L. Decreased rate of back injuries through a wellness program for offshore petroleum employees. *J Occup Environ Med*. 1999;41:813–820.
 36. Musich S, Napler D, Edington DW. The association of health risks with workers' compensation costs. *J Occup Environ Med*. 2001;43:534–541.
 37. Thompson A, Bain D, Theriault ME. Pre-post evaluation of an integrated return to work planning program in workers' compensation assessment clinics. *J Occup Environ Med*. 2016;58:215–218.
 38. Franche R-L, Severin CN, Hogg-Johnson S, et al. The impact of early workplace-based return-to-work strategies on work absence duration: a 6-month longitudinal study following an occupational musculoskeletal injury. *J Occup Environ Med*. 2007;49:960–974.
 39. Hudson TW. WorkStrong. Presentation at the ACOEM Summit July 2015.
 40. UK Department of Works and Pensions. The Statement of Fitness for Work – From Sick Note to Fit Note. Available at: <https://www2.le.ac.uk/offices/hr/docs/policies/sick-fit-for-work.pdf>. Accessed October 19, 2016.
 41. American Association of Medical Colleges. Results of the 2015 Medical School Enrollment Survey. Washington, DC: AAMC; 2016.
 42. Healthy Workforce/Healthy Economy. The Role of Health, Productivity, and Disability Management in Addressing the Nation's Health Care Crisis. Special Committee on Health, Productivity and Disability Management. *J Occup Environ Med*. 2009;51:114–119.
 43. Porter ME, Lee TH. The Strategy That Will Fix Health Care. *Harvard Business Review*. October 2013. Available at: <https://hbr.org/2013/10/the-strategy-that-will-fix-health-care#>. Accessed September 3, 2016.