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Practical Strategies for Assessing Patient Physical Activity Levels in Primary Care

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Physical inactivity in the United States is a highly prevalent and pressing public health concern that is associated with increased risk of mortality, a broad range of chronic diseases, and substantial economic burden. Given the growing levels of physical inactivity seen in our society, its impact on adverse health outcomes, and its economic and societal cost, it is important that evidence-based approaches be implemented to increase physical activity (PA) among the US population. One such strategy may be to promote the adoption of large-scale routine PA assessment as a first step toward more comprehensive PA counseling during the primary care visit.

Burden of Physical Inactivity

Physical inactivity is an important public health problem that accounts for nearly 334,000 deaths annually in the United States.[1] Troubling trends of decreasing occupational, domestic, and leisure-time PA contribute to an overall physical inactivity prevalence conservatively estimated to be 35%.[2-5] Simultaneously, sedentary behavior, which confers health risks similar to those of smoking and obesity,[1] is increasing and has been independently linked to cardiovascular-specific and overall mortality.[6]

This decline in PA (defined as any bodily movement produced by skeletal muscles that results in energy expenditure[7]) and the concomitant increase in sedentary behavior have been attributed to poor community planning, a lack of infrastructure to facilitate PA, and modern technological advancements that have reduced the need for physical labor and daily leisure-time energy expenditure.[8] This trajectory toward greater levels of physical inactivity has increased the economic burden on US health care systems, resulting in estimated costs of $117 billion annually.[9] Extensive evidence indicates that increased levels of cardiorespiratory fitness, achieved through consistent exercise, significantly reduce risk for overall mortality[10] and that fitness-associated biological age prognosticates risk beyond chronological age.[11] In light of this abundance of information, PA should be considered a critical addition to the traditional vital signs used to determine patient risk.[12]

Given these adverse health outcomes and economic and societal costs, implementation of user-friendly, evidence-based approaches to increase PA at the population level is important. One strategy is to emphasize PA assessment as part of routine comprehensive counseling. However, feasible, acceptable, and sustainable methods to assess PA in clinical practice are currently not well described. We present pragmatic, validated strategies for assessing PA, based on observational and clinical research, that can be adopted by primary care physicians and their health care teams for use in routine clinical practice.

Opportunity for Action

Supporting the growing number of calls to incorporate PA assessment into primary care,[13-15] several synergistic movements are under way that are changing the primary care landscape. We are in the midst of a deliberate movement toward patient-centered approaches to enhance health care system quality.[16] The Robert Wood Johnson Foundation Commission to Build a Healthier America recently emphasized that the mindset, mission and incentives for health care institutions must be broadened beyond treating illness to helping people live healthy lives.[17] At the core of these changes is the "triple aim" of health care—to improve the individual experience of care, *improve the health of populations*, and reduce the cost of care.[18] Coordination of care across populations has the potential to

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TABLE 1. An Example of Physical Activity Assessment as Part of a Population Health Management Strategy Within an Accountable Care Organization

1. An urban accountable care organization serving a large segment of a city implements the physical activity vital sign assessment to identify at-risk patients (ie, those who are physically inactive)
2. The assessment of physical activity levels in the clinical setting leads to increased discussions about maintaining a healthy lifestyle among the patient, physician, and other members of the health care team
3. These discussions lead to more patients receiving advice to become physically active and a semicustomized exercise prescription based on their needs and limitations
4. The accountable care organization develops a referral network consisting of physical activity or lifestyle modification programs, which are supported and certified by the local health department and/or health foundation to ensure quality control
5. After receiving their semicustomized exercise prescription, patients receive a referral to these programs before leaving the physician's office

enhance disease prevention efforts and advance broader, population-wide health efforts.[19] Systematic PA assessment can be a cornerstone of these efforts by being integrated as a standardized tool into electronic medical records (EMRs) across practices, identifying physically inactive individuals as an at-risk population. Table 1 provides an example of how PA assessment may be incorporated within population health management strategies.

The movement toward incorporating PA counseling as a population health management tool in primary care was first realized in 2005 when the Healthcare Effectiveness Data and Information Set (HEDIS) adopted 2 measures of PA assessment to be used with Medicare beneficiaries.[20] Per HEDIS objectives, health care professionals were assessed on whether they (1) spoke to their patients about their level of exercise or PA and (2) provided advice on starting or maintaining their exercise programs. However, since its inception in 2004,[20] national adherence to these 2 measures has hovered around 50%.[21] Pay-for-performance models may work as a similar strategy by providing financial incentives to health care systems and teams for widespread use of PA assessment.[22] Per the Quality Bonus Payment Demonstration initiative, data are collected on 48 performance measures, and a quality rating score is given to Medicare Advantage Organizations that determines whether they receive bonus payments and/or rebates for their enrollees.[23] One of these measures is delivery of preventive health care involving "monitoring of physical activity."[24] In all these cases, systematic PA assessment increases the number of conversations between patients and health care professionals that include PA and leads to greater adherence to HEDIS objectives and related measures.

The broadening of health care toward a patient-centered, population health perspective has been further accelerated by the recent transformation to alternative payment models, such as bundled payment systems and accountable care organizations (ACOs).[25] The ACOs, which increasingly are promoting population-level approaches to care, have moved toward a value-based payment structure, often within a global or capitated model with fixed payments on a per-patient basis for a defined population of individuals. This approach has led to an emphasis on new strategies to reduce the total cost of care, improve quality, and increase population health management. The greatest source of savings often comes from medical conditions for which costs can be modified through behavior change, such as type 2 diabetes and cardiovascular disease.[25] Thus, assessing PA levels will provide ACOs with valuable data for identifying an at-risk population (ie, physically inactive individuals). Then, as a recognized health indicator, PA level can be monitored and tracked, and population health measures can be implemented.[26]

Primary care physicians and their teams are commonly being incentivized to reduce the total cost of care for these populations, reflecting yet another opportunity for PA assessment to be emphasized as a vital sign, catalyzing further PA counseling, and enhancing the broader preventive role of primary care physicians. At Intermountain

Healthcare in Utah, the proportion of adult patient visits at which PA levels are assessed and PA advice is provided more than doubles in clinics where physicians receive incentive payment for improving clinical quality (in this case for PA assessment and promotion) under a value recognition program (personal communication, Liz Joy, MD, Medical Director, December 2016). A recent article by Olmstead[27] provides further guidance on how PA assessment and counseling can be included under the current *International Classification of Diseases*, *Tenth Revision* billing codes.

Another US health care delivery model that has become more ubiquitous is the patient-centered medical home (PCMH), which emphasizes a team-based approach to improving patient access, quality of care, and disease prevention. The PCMH uses a "whole-person" orientation to offer comprehensive primary care, including preventive services.[28] By accepting financial risk for the health of large populations of patients, PCMHs must seek out new collaborations and innovative strategies for delivering services that can reduce preventable illness.[19] New models of diabetes care,[29] of breast, cervical, and colorectal cancer screening,[30,31] and of youth/adolescent preventive services[32] have all been successfully tested and incorporated into PCMHs. The systematic integration of routine PA assessment, using validated processes (discussed in the following section), into the health system technology and clinical workflow of a PCMH, accelerates the downstream promotion of PA counseling as part of a comprehensive disease prevention and/or treatment strategy. To further this process, many PCMHs have contracted with in-house wellness professionals to provide PA and nutrition counseling and with patient navigators to engage patients in culturally tailored interventions and monthly counseling sessions. Navigators oversee other PA-related approaches, such as encouraging weekly patient self-monitoring and providing gymnasium memberships.

Integrating Physical Activity Assessment Into Primary Care Settings

Given the expanding reach of primary care networks in the United States, a window of opportunity is open for regular PA assessment as part of a comprehensive counseling effort that can be systematically integrated into routine primary care practice.[33] Primary care physicians are particularly well positioned to address physical inactivity because they have the most frequent patient contact among health care professionals, comprising nearly half of patient ambulatory medical care visits annually.[34] Further, physicians and other health care professionals have been identified by patients as a preferred source of initial PA counseling.[35,36] A substantial proportion of these patients can benefit most from PA counseling, including those with low cardiorespiratory fitness levels[37] and those with a greater comorbidity burden.[38-40]

By incorporating PA as a recognized vital sign, health care teams rank the importance of this marker as equal to that of traditional vital signs, such as blood pressure and heart rate, highlighting maintenance of a favorable PA profile as a means to achieve optimal health.[12,41,42] As a vital sign, PA level can be tracked and monitored over time, facilitating more comprehensive and personalized counseling initiatives. A 2015 report by the Institute of Medicine recommended capturing PA levels in patient EMRs.[43] Systematic PA assessment in routine clinical practice has been found to increase the likelihood of exercise-related progress documentation and more thorough physician counseling efforts.[44] Although several models have been used successfully as part of PA counseling efforts in the clinical setting,[45,46] such counseling efforts have greater reach and are most effective when initiated through systematic PA assessment. An example of how PA assessment can be pragmatically integrated into the primary care setting is displayed in Table 2.

Physical Activity Assessment Tools

Although multiple PA assessment tools have been validated in a wide population range,[48-51] many are impractical for routine use in the clinical setting. These tools often are evaluated in tightly controlled research settings using ancillary staff, and they require time and resources that are impractical for implementation in current routine clinical practice in the ambulatory setting.[52] A similar comprehensive investigation of self-report PA questionnaires found that none of the tools

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TABLE 2. Summary of Pragmatic Recommendations for Integration of Physical Activity Assessment Into the Clinical Setting

1. Effective, large-scale physical activity assessment requires the awareness and cooperation of the entire health care team
2. A standardized tool must be utilized in a consistent fashion over time and across various clinical settings
3. Assessment tools must be quick and easy to use and require minimal training of clinic staff
4. The physical activity vital sign is a recommended and validated assessment tool for the clinical setting
5. Patient physical activity levels can be assessed by various members of the health care team at multiple points throughout the patient visit
6. Developing a checklist (or combining items with existing checklists) that provides clear guidance on activities to be completed, and by whom, in the clinical setting can increase the utilization of adopted physical activity assessment strategies[47]

reviewed were practical to implement in routine primary care, owing mostly to the length of time they require.[53]

More recently, efforts have focused on ways to incorporate PA assessment in the clinical setting using methods that circumvent typical barriers (eg, patient burden, limited resources, lack of reimbursement for assessment, timeliness, performance by clinic staff) and may be more likely to be adopted for routine use.[54-56] The acceptability of these assessment tools was attributed mostly to their brevity, ease and flexibility of use, and yield of clinically meaningful and actionable information. However, barriers to integration of these tools into EMRs remain, as evidenced by their relatively low rate of implementation.[56] Strategies to encourage widespread adoption of PA assessment as a catalyst to more comprehensive counseling must be brief, reliable, valid, and easy to use with little training. Further, given the limited time that physicians spend with patients, the entire clinic staff must be trained in and capable of using the selected PA assessment tools.

Use of an "Exercise or PA Vital Sign"

One acceptable and underutilized assessment method currently used in routine clinic practice is the "exercise vital sign" (EVS) developed as part of the Kaiser Permanente health care system. The EVS was designed for easy use and optimal acceptability, such that a medical assistant or any other clinic staff member may briefly assess PA, enter their findings into the EMR as part of routine patient intake, and alert health care professionals to a need for further counseling or intervention, as with traditional vital signs.[57] The EVS is ascertained by patient responses to 2 questions: (1) On average, how many days per week do you engage in moderate to strenuous exercise (like a brisk walk)? and (2) On average, how many minutes do you engage in exercise at this level? From these responses, a simple calculation yields the number of minutes per week of moderate to strenuous exercise, which can be compared quickly against national PA recommendations.[58] This information can be used by physicians for counseling and follow-up. The EVS takes less than 1 minute to administer and can be completed by assistant medical staff members as part of the patient intake process.

Coleman et al[59] tested the internal validity of the EVS and found it to have average face and discriminant validity compared with a national survey of PA data; comparison to accelerometer-derived PA estimates revealed modest sensitivity (59%) and specificity (77%) for identifying individuals who are not meeting recommended PA levels.[60] Another study revealed that individuals categorized as being more physically active, as assessed by the EVS, were significantly more likely to have improved cardiometabolic risk, as measured by body mass index, systolic and diastolic blood pressure, fasting blood glucose level, and HbA_{1c} level.[61] In addition, PA assessment via the EVS has been successfully implemented in more than 250,000 outpatient consultations and found to be well accepted by clinical professionals and patients.[44]

The "PA vital sign" (PAVS), a variation of the EVS, was developed for use in routine primary care settings and integrated into the EMR of the Intermountain Healthcare system.[62-64] The PAVS is comprised of 3 questions designed to assess the frequency (days per

week), duration (minutes), and intensity (moderate to vigorous) of PA undertaken in a typical week. Like the EVS, the PAVS can be administered before the patient sees the physician by a medical assistant or other clinic staff member at the first point of care in less than 1 minute. The data can be recorded in the EMR for interpretation by the physician. An initial cross-sectional investigation found that the odds of obesity are significantly lower as the number of days of PA in a typical week increases, as assessed by the PAVS.[62] A later study revealed a moderate correlation (r=.52) between accelerometry and the PAVS in assessing the number of days with at least 30 minutes of moderate to vigorous PA.[64] However, the study revealed that the PAVS had a high-level specificity (91%) for identifying patients who are insufficiently active (ie, those who are active but do not meet national PA recommendations) and would most benefit from PA counseling. More recently, researchers reported a strong association of the PAVS with patient body mass index levels and disease burden, as measured by the Charlson Comorbidity Index.[63]

Advantages of both the EVS and PAVS lie in their brevity, ease of use with little training, and integration with EMRs for documenting and monitoring temporal changes in PA levels. Information ascertained by these tools is collected in seconds during patient intake, in waiting rooms, or while traditional vital signs are being collected, circumventing the primary barrier to PA assessment, namely, lack of time during the formal consultation. Having this information available for health care professionals can serve as the basis for brief counseling and/or referral of patients with insufficient PA levels to appropriate third parties for comprehensive counseling and lifestyle intervention.

Use of Technology for Assessing Patient PA Levels

Although the EVS and PAVS provide health care teams with a quick and easy method of assessing patient PA levels in a clinical setting, both rely on self-report, which has been found to be less accurate and often contains overestimations compared with objectively measured PA.[65] Increased use of consumer wearable devices (mobile health [mHealth] technology) for regular daily monitoring of PA, integrated with smartphone applications, provides an opportunity to assimilate data collected by consumer-level devices into routine health monitoring.

Although PA tracking data are conveniently available for device wearers, methods to make real-time data available for storage and tracking within health care system databases are currently not established. With a growing market of PA monitoring devices and remote-sensing technologies, a lack of uniformity in data acquisition, representation, and uniformity across platforms poses a challenge for health systems to pragmatically acquire and interpret PA data.[66] Data from these consumer devices need to be transformed into clinically pertinent information that can be easily used and seamlessly integrated into patient EMRs for review by the health care team. Further, to facilitate the integration of these technologies into primary care, the health care reimbursement structure must address payment options for patient-generated data using mHealth platforms.[67] However, if these challenges can be addressed, mHealth technologies have the potential to be seamlessly integrated into the clinical setting for continuous tracking and storage of PA data, which can lead to more tailored activity prescriptions and improvement in patient health profiles and outcomes. Until advancements are made that allow for widescale deployment of mHealth technologies, pragmatic tools, such as the EVS and PAVS, should continue to serve as the foundation for PA assessment across all health systems.

Conclusion

This is an opportune time for primary care physicians and their health care teams to address the growing incidence of physical inactivity. The systematic integration of PA assessment into clinical settings can effectively identify a large population of at-risk patients and act as a facilitator for comprehensive PA counseling, referral, and follow-up as part of a broader-based strategy to increase adoption of healthy lifestyle behaviors at a population level.[68] Widescale adoption of PA assessment requires the use of valid, acceptable, and feasible tools specifically designed for use in the clinical setting. Finally, mHealth technologies, still in early

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developmental stages, offer promising potential to enhance PA assessment and counseling via objective measurement, real-time tracking, and automated motivational feedback as a facilitator of behavioral change.

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