2011 Compendium of Physical Activities: A Second Update of Codes and MET Values

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ABSTRACT

AINSWORTH, B. E., W. L. HASKELL, S. D. HERRMANN, N. MECKES, D. R. BASSETT JR., C. TUDOR-LOCKE, J. L. GREER, J. VEZINA, M. C. WHITT-GLOVER, and A. S. LEON. 2011 Compendium of Physical Activities: A Second Update of Codes and MET Values. *Med. Sci. Sports Exerc.*, Vol. 43, No. 8, pp. 1575–1581, 2011. **Purpose**: The Compendium of Physical Activities was developed to enhance the comparability of results across studies using self-report physical activity (PA) and is used to quantify the energy cost of a wide variety of PA. We provide the second update of the Compendium, called the 2011 Compendium. **Methods**: The 2011 Compendium retains the previous coding scheme to identify the major category headings and specific PA by their rate of energy expenditure in MET. Modifications in the 2011 Compendium include cataloging measured MET values and their source references, when available; addition of new codes and specific activities; an update of the Compendium tracking guide that links information in the 1993, 2000, and 2011 compendia versions; and the creation of a Web site to facilitate easy access and downloading of Compendium documents. Measured MET values were obtained from a systematic search of databases using defined key words. **Results**: The 2011 Compendium contains 821 codes for specific activities. Two hundred seventeen new codes were added, 68% (561/821) of which have measured MET values. Approximately half (317/604) of the codes from the 2000 Compendium were modified to improve the definitions and/or to consolidate specific activities and to update estimated MET values where measured values did not exist. Updated MET values accounted for 73% of all code changes. **Conclusions**: The Compendium is used globally to quantify the energy cost of PA in adults for surveillance activities, research studies, and, in clinical settings, to write PA recommendations and to assess energy expenditure in individuals. The 2011 Compendium is an update of a system for quantifying the energy cost of adult human PA and is a living document that is moving in the direction of being 100% evidence based. **Key Words:** EXERCISE, EXERTION, ENERGY EXPENDITURE, METABOLIC, OXYGEN UPTAKE, KILOCALORIE

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The Compendium of Physical Activities (Compendium) has received widespread acceptance as a resource to estimate and classify the energy cost of human physical activity (PA). The Compendium provides a five-digit coding scheme linking categories and types of PA with their respective MET intensity values. The Compendium was developed to provide a comprehensive list of PA and their associated MET values to facilitate the coding of self-reported behaviors obtained from PA questionnaires, logs, and records. Its use has since been expanded to include estimating the energy cost of individual PA for exercise and weight management programs (39), a guide in exercise rehabilitation settings (5), and use as a reference for quantifying the types of PA that characterize sedentary

behavior (i.e., 1.0–1.5 METs) (28,29) and light-intensity (1.6–2.9 METs) (28,38), moderate-intensity (3–5.9 METs), and vigorous-intensity (≥6 METs) activities (12). The Compendium has been translated into different languages (15) and is cited in the 2008 US physical activity guidelines report as a reference for quantifying the energy cost of PA (31). It also is the focus of a Wikipedia link discussing MET values (14). MET values from the 2000 Compendium were used to assign intensities to PA reported in the American Time Use Survey and thus form the basis for conclusions about how Americans spend their time (38).

The Compendium originated from a need to provide consistency in assigning intensity levels of PA captured from questionnaires used in epidemiological studies. The idea for a Compendium came from Dr. William Haskell and was developed during National Heart, Lung, and Blood Institute–supported multisite studies awarded to Dr. Arthur S. Leon, Dr. David R. Jacobs Jr., Dr. James Sallis, Dr. Henry Montoye, and Dr. William Haskell from 1987 to 1989. Dr. Ainsworth was a postdoctoral associate during the grant period and was the lead author of the original Compendium and has maintained subsequent versions (collectively called the compendia) since 1989.

The first Compendium was published in 1993 (1) and contained 476 five-digit codes and their associated MET values. The first two digits represent a major heading used to classify PA by its primary purpose or activity domain (e.g., bicycling, home repair, occupation, transportation, etc.). The subsequent three digits represent specific activities within each major heading. The complete code is then presented with an associated MET value. The MET values are defined as the ratio of the work metabolic rate to a standard resting metabolic rate (RMR) of 1.0 $kcal \cdot kg^{-1} \cdot h^{-1}$. One MET is considered the RMR or the energy cost of a person at rest (20). The MET values in the Compendium range from 0.9 METs for sleeping to 23 METs for running at 14.0 mph. In the 1993 publication, fewer than 15 citations were identified supporting assigned MET values. Most of the citations were textbooks that published compiled lists of a limited range of PA. Other activities in the 1993 Compendium were identified from PA records kept by research study participants (34). When published MET values could not be identified for specific activities, experts in the assessment of PA estimated MET values from similar types of activities already listed in the Compendium.

In 2000, the Compendium was updated to include two additional major headings (volunteer and religious activities) and 129 additional codes for specific activities identified from PA records kept by research study participants were added (2,3,21,40). In addition, selected codes were dropped to reduce redundancy of codes and/or specific activities, and some MET values were modified to reflect updated information about the metabolic cost of specific activities. As in 1993, efforts were made to identify a measured MET value for the new Compendium activities. However, the previous compendia did not identify which MET values were obtained from published sources and which MET values were estimated by expert opinion. In 2001, a tracking document was posted on a Web site to link the 1993 and the 2000 codes, clearly identifying changes from one version to the next (http://prevention.sph.sc.edu/tools).

The evolution and widespread availability of portable metabolic measurement systems in the past 10 yr have facilitated direct measurement of the oxygen cost and, thus, energy expenditure or MET values of a growing array of PA in field settings. At the same time, technology supporting many inclusive computer-based literature searches has evolved, enabling an exhaustive search of published measured MET values for inclusion in this second revision of the Compendium, called the 2011 Compendium. To emphasize, the 2011 Compendium reflects a major revision of past versions by providing published references for measured MET values representing an increased number of cataloged PA. We have created the 2011 Compendium (see Supplemental Digital Content, http://links.lww.com/MSS/A82) which presents the 2011 updated codes and specific activities) that can be used to identify the MET values for associated specific activities. New codes have been added that reflect technology-based activities (e.g., computer and video exercise), emergent sports and conditioning activities (e.g., X Games, Pilates, etc.), and specifically measured activities (e.g., household tasks such as child care) that have not been previously published. In addition, some existing codes have been modified to reflect current evidence. Modifications to some MET values were necessary to reflect the updated evidence by replacing estimated MET values with measured values. The 2011 Compendium also further clarifies the description of the specific activities contained within each code. The dedicated Taylor codes used for decades to score the Minnesota Leisure Time Physical Activity Questionnaire (37) are retained. Some codes for PA rarely performed (e.g., foundry and forestry occupations) have been combined to reduce the length of the 2011 Compendium. A final change in 2011 is the development of a Web site to provide an easy way to access the Compendium documents.

CODING SCHEME AND 2011 COMPENDIUM CHANGES

Organization. The 2011 Compendium uses the same organizational structure, described above, as past compendia to provide consistency in locating specific activities and their associated MET values. A brief example of the

TABLE 1. Example of the 2011 Compendium organizational scheme.[a]

Five-Digit Code	MET Intensity	(Major Heading Code) Description	(Specific Activity Code) Description
01008	*8.5*	01 Bicycling	(008) BMX
02045	3.5	02 Conditioning	(001) Curves™ exercise routines in women
03010	5.0	03 Dancing	(010) Ballet, modern, or jazz

[a] Italicized five-digit codes have estimated MET values; the remaining codes are based on measured MET values.

TABLE 2. Major types of physical activities in the 2011 Compendium.

1—Bicycling	8—Lawn and garden	15—Sports
2—Conditioning exercises	9—Miscellaneous	16—Transportation
3—Dancing	10—Music playing	17—Walking
4—Fishing and hunting	11—Occupation	18—Water activities
5—Home activity	12—Running	19—Winter activities
6—Home repair	13—Self-care	21—Religious activities
7—Inactivity	14—Sexual activity	21—Volunteer activities

coding scheme is presented in Table 1. References for measured MET values are available for viewing and downloading from the Compendium Web site described later in this report.

Major headings. The major headings are the same as those presented in the 2000 Compendium and are listed in alphabetical order to facilitate location of specific activities. The major headings provide an overall organized presentation of PA by purpose and include the domains of leisure (including recreational activities), transportation, occupation, home activities (including personal care and other care), inactivity, and volunteer activities. A list of the major headings is provided in Table 2.

Specific activities. Descriptions of the specific activities are designed to provide qualitative information about the intensity (e.g., described as "vigorous"), bicycling pedal cadence, walking or running speed (mph), or context for the specific activities. These detailed descriptions of specific activities help Compendium users to identify the most appropriate code and/or the MET value. Some specific activities need little description. For example, code 02101 (stretching), is described only as "mild." Other specific activities and their associated descriptions are very detailed. For example, code 11766 (truck driving) describes the various activities performed by a truck driver to include loading and unloading a truck, tying down a load, standing, walking, and carrying heavy loads. Descriptions for other specific activities may include types of activities that have the same MET value but differ in their form. For example, code 03040 (ballroom dancing) identifies slow types of ballroom dancing to include the waltz, foxtrot, tango, samba, etc. As with past Compendia, the specific activities and their associated descriptions may be very general to reflect the vague way that people report PA on questionnaires or records. For example, if a person writes that they "played tennis," the coder has no idea if the person engaged in singles or doubles tennis, was playing for leisure or in a competition, or was playing in a game or nongame setting. In this case, the specific activity is coded as 15675, tennis, general. Although most specific activities appear under a single major heading, depending on the context and purpose of an activity, a specific activity may be duplicated in more than one major heading. For example, code 17021, walking, carrying a 10-lb child also is listed as 05182, home activities, carrying a 10-lb child, slow walking. Both specific activities have the same MET value. This duplication allows the user to attribute the correct context for an activity that may have multiple purposes.

To streamline the occupation major heading, some of the activities identified previously with separate five-digit codes were combined into a single code and specific activity and were provided with a longer description of the types of activities performed. For example, code 11125, custodial work, is described as light-effort activities such as cleaning a sink and toilet, dusting, vacuuming, and light cleaning. Likewise, code 11126, custodial work, is described as moderate-effort activities such as using an electric buffer, feathering arena floors, mopping, taking out the trash, and vacuuming. The activities listed in the descriptions for codes 11125 and 11126 had their own codes in the 2000 Compendium but are now combined in the 2011 Compendium. Table 3 provides a brief example of the changes made to the 2000 Compendium specific activities and their associated descriptions as presented in the 2011 Compendium. A detailed list of the changes made to the codes is presented on the Compendium Web site (https://sites.google.com/site/compendiumofphysicalactivities).

Intensity of activities. As noted previously, to provide consistency with past compendia, all activities are assigned an intensity unit on the basis of their rate of energy expenditure expressed as multiples of 1 MET, described as the ratio of the metabolic rate for an activity divided by a standardized expression of the RMR (20). We use the definition of a MET as described by Balke (6) to be 3.5 $mL \cdot kg^{-1} \cdot min^{-1}$, often characterized as the metabolic cost of resting quietly. For a reference adult, 1 MET is approximately 3.5 mL oxygen$\cdot kg^{-1}$ body weight$\cdot min^{-1}$ or 1 kcal$\cdot kg \cdot h^{-1}$ body weight.

There has been a discussion about the use of 3.5 $mL^{-1} \cdot kg^{-1} \cdot min^{-1}$ as the appropriate denominator to

TABLE 3. Example of documentation of changes made to codes in the 2011 Compendium.[a]

Code	Major Heading	Description
01009	Bicycling	Changed the description of activities to "bicycling, mountain, general"
01015	Bicycling	Changed MET level from 8.0 to 7.5
02011	Conditioning exercise	Changed MET level from 3.0 to 3.5; changed the description of activities to read "bicycling, stationary, 30–50 W, very light to light effort"
02012	Conditioning exercise	Changed MET level from 5.5 to 6.8; changed the description of activities to read "bicycling, stationary, 90–100 W, moderate to vigorous effort"
03010	Dancing	Changed MET level from 4.8 to 5.0; changed the description of activities to read "ballet, modern, or jazz, general, rehearsal, or class"
03015	Dancing	Changed MET level from 6.5 to 7.3
04001	Fishing and hunting	Changed MET level from 3.0 to 3.5
04010	Fishing and hunting	Changed MET level from 4.0 to 4.3; added "fishing related" to the description of activities
05100	Home activity	Changed MET level from 2.0 to 3.3; added "changing linens" to the description of activities
05120	Home activity	Changed MET level from 6.0 to 5.8

[a] Selected codes and major headings are displayed for example only. The full list of changes is available at the 2011 Compendium Web site (https://sites.google.com/site/compendiumofphysicalactivities).

denote 1 MET for calculating the activity MET listed in the Compendium, especially when assessing the energy cost of PA in individuals (9,22,23). The concern is that RMR is lower in overweight persons, declines with age, and is lower in females than in males (18). Thus, using a fixed RMR of 3.5 $mL^{-1}\cdot kg^{-1}\cdot min^{-1}$ to denote 1 MET may underestimate the true "ratio" (activity/rest) in certain populations. It has been recommended that a correction factor be used to adjust the MET level on the basis of an estimate of one's RMR, which accounts for age, height, weight, and sex. For example, Byrne et al. (9) and Kozey et al. (22) recommend dividing the fixed RMR (3.5 $mL^{-1}\cdot kg^{-1}\cdot min^{-1}$) by an RMR ($mL^{-1}\cdot kg^{-1}\cdot min^{-1}$) predicted from the Harris–Benedict (18) equation. This quotient is then multiplied by the Compendium MET value (9,22).

Standard MET levels in the 2011 Compendium are a direct translation of the weight-specific energy costs, computed by taking the energy costs ($\dot{V}O_2$, $mL^{-1}\cdot kg^{-1}\cdot min^{-1}$) and dividing them by 3.5 $mL^{-1}\cdot kg^{-1}\cdot min^{-1}$. As such, they represent a shorthand way of expressing the weight-specific energy costs of activities (19). It should be noted that expressing the values relative to body weight is desirable because this normalizes the data and minimizes the variation between overweight/obese and normal-weight individuals. To our knowledge, it has not been shown that expressing the energy costs as "corrected MET" would be a superior approach for normalizing the data.

Most of the source studies cataloged in the 2011 Compendium reported the energy costs of activities as either $\dot{V}O_2$ ($mL^{-1}\cdot kg^{-1}\cdot min^{-1}$) or MET using 3.5 as the denominator. Thus, for consistency, we have continued to define 1 MET in the same manner. We recognize that some researchers may prefer to use corrected MET, and the 2011 Compendium can be used to derive these values. To accomplish this, the Compendium MET level for an activity is multiplied by the ratio of the standard MET divided by the individual's predicted RMR (9,22). Thus, for an individual with a predicted RMR = 2.8 $mL^{-1}\cdot kg^{-1}\cdot min^{-1}$, the corrected MET would be 3.5/2.8 = 125% of the Compendium values.

Calculation of kilocalorie energy expenditure. The methods used to calculate the energy cost of the specific activities in the 2011 Compendium have been described in detail in the 1993 (1) and the 2000 (2) compendia articles by Ainsworth et al. As noted earlier, the energy cost of specific PA may differ on the basis of a person's body weight and body fat percentage (8), age (33), physical fitness (33), genetics (33), sex (8,18), mechanical efficiency (27), and the environmental conditions (16) under which the activity is performed. In general, we recommend estimation of the caloric cost of PA with the equation, kilocalories = MET × weight in kilograms × duration in hours. For example, to compute the kilocalorie energy expenditure for a 70-kg person, sweeping at a moderate effort (3.8 METs) for 30 min would result in 133 kcal (3.8 × 70 kg × 0.5 h). This method reflects the fact that 3.5 $mL^{-1}\cdot kg^{-1}\cdot min^{-1}$ is equal to 1.0 $kcal\cdot kg^{-1}\cdot h^{-1}$, within a very close approximation. Thus, there are only very small errors involved in conversion of MET (defined as 3.5 $mL^{-1}\cdot kg^{-1}\cdot min^{-1}$) to kilocalories.

Calculating the kilocalories expended in PA using Compendium data may not be appropriate for all settings. Inclusion of the body weight in a PA score can bias the results of studies designed to evaluate the effects of PA frequency, duration, and intensity on specific health outcomes in clinical studies or in comparing population PA levels in surveillance systems. A person with a higher body weight will expend more kilocalories for a specific activity especially if it is a weight bearing activity (e.g., walking). It is possible to compute a PA score that is independent of body weight by dividing the kilocalories expended by body weight. Using the example for 30 min of sweeping with an energy cost of 133 kcal (3.8 METs × 70 kg of body weight × 0.5 h), dividing 133 kcal by 70 kg creates a summary score of 1.9 $kcal\cdot kg^{-1}\cdot h^{-1}$. It also is easy to compute MET-h or MET-min scores that are independent of body weight by multiplying the activity MET value by the duration of the activity in hours or minutes, respectively. In addition, this approach can be used to develop an overall activity score combining time spent at different MET levels. PA scores can be expressed as kilocalories per kilogram per hour, METs per hour, and METs per minute, and all are used frequently in PA assessment (7,30), surveillance studies (4,11), and showing inverse associations between PA and mortality (13,29), body weight gain (25), and incidence of various chronic diseases (31).

Measured MET values. Sixty-eight percent (561 of the 821) of codes included in the 2011 Compendium have measured MET values derived from published sources. The MET values were obtained from laboratory or field experiments that measured the oxygen cost of the specific activities listed. To find articles showing the intensities of the specific activities, we searched databases (PubMed, Google Scholar, and EBSCOhost to access MEDLINE, PsychINFO, SocINDEX, the Cumulative Index to Nursing and Allied Health Literature, and the Education Resources Information Center), using key words of "metabolic cost," "calorimetry," "energy expenditure," "oxygen cost," and "energy cost." Titles and abstracts were scanned, and promising references were assembled for closer inspection. Additional sources were obtained from reviewing reference lists of identified publications. In regard to existing specific activities in the Compendium for which we could not identify a measured MET value, estimated MET values were carried forward from previous compendia. For new specific activities, if no published data were available, MET values were estimated from activities that were deemed similar. The 2011 Compendium Web site differentiates the measured and estimated MET for the specific activities by using a color-coded scheme with the five-digit code colored blue if the MET value is based on measured MET and colored red if the MET value is estimated. The printed version of the Compendium presents estimated values in italics. During the

literature search, we often identified multiple references for the same specific activities. For example, we located 11 references relevant to code 08120, "mowing lawn, walking, power mower, moderate or vigorous effort," with MET values ranging from 3.90 to 5.75. In cases such as this, we present the average of all the identified measured MET as the representative value (i.e., 5.0 METs for code 08120).

New codes. As a result of the literature review and changes in the types of PA identified since the 2000 revision of the Compendium, several new five-digit codes were added to the 2011 Compendium. Many of the new codes reflect a global approach to including culture-specific activities (e.g., native New Zealand dances and sports activities). Other new codes include computerized games and activity promoting videos and/or arcade games (e.g., Wii Fit (Nintendo Co., LTD); Dance Dance Revolution (Konami Digital Entertainment, Inc.)). Other new activities identify the energy cost of approaches to reduce sedentary behaviors, such as performing work activities while standing, walking for transportation, and fidgeting. The expansion of health clubs since 2000 has introduced various types of conditioning exercises to include military boot camp–style workouts, energetic dance routines, and different types of yoga exercise. A brief example of the new codes and specific activities included in the 2011 Compendium is presented in Table 4. A full list of the new codes is available on the 2011 Compendium Web site.

Web site resources. Along with the 2011 Compendium update of the major codes and specific activities, development of the Web site provides for a searchable interface and easy navigation to locate information from the 1993, 2000, and 2011 compendia. The Web site search features allow users to enter key words to locate specific activities, their five-digit codes, and associated MET values. One of the primary goals for the 2011 Compendium update was to identify activities that have MET values supported by published literature and to differentiate them from activities without measured MET values. As described earlier, the Web site provides a color coding scheme to identify specific activities with measured and estimated values (blue = measured, red = estimated). Users can access detailed reference lists for the specific activities with measured MET values on the Web site. Users will note that for some activities, there are multiple references that present measured MET values for the same specific activities. It is then possible for users to review the context for the measured activities (e.g., if activities were measured only in men or in women, ages of participants studied, etc.) and evaluate the relevance of the MET values for their specific use. The Web site also presents a comprehensive list of the new activities and those for which the Compendium MET values or activity descriptions have changed. Consistent with the 2000 Compendium, a tracking guide can be viewed to trace the addition of new codes and changes in existing codes from the 1993, 2000, and 2011 compendia. Finally, Web site users can download the 2011 Compendium as a PDF file. All Web site documents may be downloaded free of charge by all users.

A primary benefit of using a Web site to present the 2011 Compendium is the ease of providing substantial information related to the assessment of PA free to users globally. The Web site provides resources to estimate the caloric energy expenditure of specific PA and compute corrected MET values designed to tailor MET values for individual differences in age, sex, body weight, and height and allows easy search to look up activities and compare changes in the MET values between the different compendia. The Web site also provides links to programs that use the Compendium to assess the energy cost of PA (e.g., Exercise is Medicine™).

A goal of future compendia is to have measured MET values for all activities. To increase this level from 68% of measured MET levels, the Web site provides a mechanism for users to upload findings from published peer-reviewed research studies that directly measured the energy cost of PA. Submission documents are located on the Compendium Web site. This information will then be readily available to provide future updates in a timely manner.

TABLE 4. Example of new codes added to the 2011 Compendium.[a]

Code	Major Heading	MET	Description
01003	Bicycling	14.0	bicycling, mountain, uphill, vigorous
01004	Bicycling	16.0	bicycling, mountain, competitive, racing
02001	Conditioning exercise	2.3	activity-promoting video game (e.g., Wii Fit), light effort (e.g., balance, yoga)
02003	Conditioning exercise	3.8	activity-promoting video game (e.g., Wii Fit), moderate effort (e.g., aerobic, resistance routines)
03012	Dancing	6.8	ballet, modern or jazz, performance, vigorous effort
03014	Dancing	4.8	tap
04005	Fishing and hunting	4.5	fishing, crab fishing
04007	Fishing and hunting	4.0	fishing, catching fish with hands
05011	Home activity	2.3	cleaning, sweeping, slow, light effort
05012	Home activity	3.8	cleaning, sweeping, slow, moderate effort

[a] Selected codes of some major headings are displayed for example only. The full list of new codes is available at the Compendium Web site (https://sites.google.com/site/compendiumofphysicalactivities).

DISCUSSION AND LIMITATIONS

The Compendium is an enduring document that has shown relevance since its initial publication in 1993. The compendia grew out of a need to provide consistency in assigning an intensity level to activities identified on PA questionnaires used in epidemiological studies. Since the introduction of the 1993 Compendium, many studies have used the coding scheme and standard MET values to assign intensity levels to PA questionnaires globally. The results from these studies have supported conclusions that regular PA is health enhancing and that physical inactivity is a major risk factor for chronic diseases and premature mortality (31). As discussed in the 2008 PA guidelines (12), regular moderate-intensity PA performed for 150 min·wk^{-1}, vigorous-intensity PA performed for 75 min·wk^{-1}, or a

combination of moderate- and vigorous-intensity PA is sufficient to reduce the risks for premature mortality related to chronic diseases and disabling conditions.

The 2011 Compendium has clinical applications for primary and secondary prevention of adverse health conditions. Clinicians, fitness trainers, and health promotion experts can use the 2011 Compendium to identify and/or track suitable activities for patients and/or clients to perform that have sufficient intensity to elicit desired results. For example, if an adult wanted to follow the US PA guidelines to accumulate 150 min of moderate-intensity PA and engage in 2 d of strength training activities, an individual could perform the following plan: Monday, walk at 3.0 mph for 30 min (code 17190, 3.5 METs); Tuesday, lift weights for 20 min (code 02054, 3.5 METs); Wednesday, bicycle at 9.4 mph for 40 min (code 01019, 5.8 METs); Friday, lift weights for 20 min (code 02054, 3.5 METs); Saturday, attend a low-impact aerobic dance class for 40 min (code 03020, 5.0 METs); and Sunday, rest. The Compendium is very useful to identify PA that may be too intense for clinical patients' health/functional status or sufficiently intense to elicit the desired health-enhancing benefits.

As a living document, versions of the compendia have been used for nearly 20 yr to provide intensity values to classify PA and estimate their energy cost. Regarded globally as the primary source for obtaining MET values to score PA questionnaires, logs, and records and to estimate the caloric energy costs of PA, the 2011 Compendium provides a timely update with the adoption of evidence-based MET values. Looking forward, the goal is to have all specific activities in the Compendium derived from published direct measurements. Researchers are encouraged to submit studies to the Web site that describe measured MET values for current activities with estimated values. Regular updates of the Compendium will continue to incorporate this emerging evidence.

We have chosen to retain the presentation of the intensity units as standard MET with the RMR represented as 3.5 $mL^{-1} \cdot kg^{-1} \cdot min^{-1}$ as in past versions of the compendia. Although the Compendium was not developed to determine the precise energy cost of activities within an individual, we recognize that there are situations when one may want to use the MET values to estimate an individual energy cost of PA as multiples of measured or predicted RMR. Thus, for someone who has an RMR less than 3.5 $mL^{-1} \cdot kg^{-1} \cdot min^{-1}$, the standard MET overestimates the individual's RMR, resulting in an underestimate of the ratio (total EE/resting EE). Readers interested in learning more about use of the "corrected MET" to account for differences in individual RMR values are referred to Byrne et al. (9) and Kozey et al. (22).

As noted in the 1993 (1) and the 2000 (2) articles, the Compendium MET values are intended for use in able-bodied adults who are 18–65 yr old and do not reflect the energy cost of children and youth, older adults, and persons with disabilities. Readers interested in identifying the energy cost of PA in children and youth are referred to Harrell et al. (17), Ridley et al. (35), and Ridley and Olds (36) who present results of studies that identify the energy cost of PA in children and youth. Readers interested in assessing the energy cost of PA in persons with physical disabilities are referred to Collins et al. (10) and Lee (26) who present the energy cost of PA in persons with spinal cord injuries and paraplegia, respectively. Price (32) also provides prediction equations that can be used to estimate the energy cost of PA in persons with spinal cord injuries. Lante et al. (24) also provide a list of the energy costs of activities of daily living for adults with intellectual disabilities.

SUMMARY

The 2011 Compendium provides 821 codes that reflect 21 major headings, numerous specific activities and their detailed descriptions, and associated MET values that can be used to identify the energy cost of PA. Building on the 1993 and the 2000 versions of the compendia, the 2011 Compendium includes 217 additional specific activities beyond the 2000 revision. In addition, the 2011 Compendium identifies measured MET values obtained from the published literature for approximately two-thirds of the of specific activities listed and is supported by a Web site that provides extensive documentation of references for the MET values; a tracking guide to link codes, activities, and MET values between the 1993, 2000, and 2011 versions; and equations to compute kilocalories and corrected MET values. Despite its known limitations, the Compendium has withstood the test of time to provide a valuable resource to code PA surveys or records and to provide examples of activities within a broad intensity range for use in PA counseling, research, and clinic settings. It remains a living document, and continued improvements are anticipated and will be updated at regular intervals.

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