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Perspective

How to Write a "Prescription" for Physical Exercise

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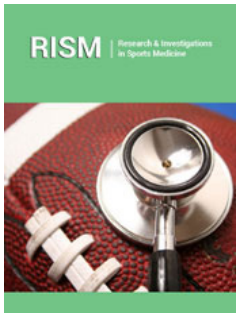

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Background

The 2018 American Physical Activity Guidelines recommend a minimum of 150 to 300 minutes per week of "moderate" exercise, 75 to 150 minutes per week of "vigorous/Intense" exercise or a combination of both [1] for all adult Americans, including those adults with Intellectual and Developmental Disabilities (AIDD). AIDDs have been found to have increased minutes/week of sedentary behavior as well as reduced minutes/week of meaningful physical exercise [2,3]. This places AIDD at increased risk for many chronic physical and mental health conditions [4]. Therefore, it is important for all health professionals who treat AIDD to be able to determine their baseline "physical activity level" (i.e., minutes/week of both Sedentary behavior and Moderate/Vigorous physical activity) and prescribe effective patient-preferred endurance (aerobic) and/or resistance (strength-building) exercise programs [5-11]. While AIDDs will willingly wear activity watches [12], there has been difficulty "recording" their minutes of exercise due to lack of abilities of AIDDs and/or cooperation of their caregivers [13,14]. These measures are important because extensive research has shown that they are associated with increased risk for mental illness, cardiovascular disease, cancer, and many other diseases, as well as an overall increased mortality risk. The problem of documentation of exercise outcomes may be solved by using remote monitoring of fitness watch-generated exercise data, such as that provided by the Fitabase, Inc. company (Table 1). Fitabase, Inc., is a comprehensive data management platform primarily designed to support innovative research projects using wearable and internet-connected devices. Fitabase, Inc. collects all physical activity data tracked by Fitbit and Garmin devices. This includes steps, activity intensity, energy expenditure, and METs. Once a device is connected to Fitabase, the clinician or researcher can bring in that device's data as soon as the wearable service makes it available. This usually happens immediately after the device synchronizes. (www.fitabase.com).

Table 1: Weekly Exercise results (out comes)–(7-different health parameters) from 10 "Neuro typical" (not IDD) adult men and women of various ages who have variable exercise programs [1].

Dates 01-06-2023 Adult #	7 Day Mean Resting Heart Rate-bpm	Sedentary Mins/ Week	No Intensity Min/ Week	Low Intensity Min/ Week "Fat Burn"	Moderate Intensity Min/ Week "Cardio"	High Intensity Min/ Week "intense"	7-Day Mean 5 Steps/ Day
1	67	8155	1186	469	400	190	9416
2	65	4640	1429	616	234	14	10983
3	67	4900	1934	44	0	0	9393
4	68	5750	1821	43	10	0	10479
5	63	5150	1381	414	172	22	15026
6	67	7378	2147	80	24	22	9396
7	63	6001	2256	198	20	0	10801
8	72	8903	621	183	12	0	3930

9	63	6825	2476	159	102	0	11291
10	74	8010	1529	326	108	18	6714
"Normal Values" (based on Published Reports)							
Dates of Week 7 Days	Mean RHR (bpm)	Total Sedentary (Minutes/ Week)	Total Light-No Intensity Minutes/ Week slow walk	Total Low Intensity (Minutes/ Week)	Total Moderate Intensity (Minutes/ Week)	Total High Intensity (Minutes/ Week)	Mean Steps/ Day
Jun-23	<70 bpm	< Minutes/ week	>1000 Minutes/ week	≥300 Minutes/ week	150-300, up to 600 min/week	75-150, up to 600 min/week	>8,000

Note: "Intensity" refers to degree (%) of age-corrected increase of heartrate.

Results: Only 3 participants (30%) met the US standard for moderate exercise (150-300 min/week). Only 1 participant met the US government Standard for high intensity exercise. Most of these individuals were health professionals.

To measure exercise in our patients, we currently use The Fitabase, Inc. system (www.fitabase.com) which allows the user of a Fitbit or Garmin activity watch to automatically record seven parameters of fitness, namely, 1)Resting heart rate [15], 2) Sedentary minutes per day [16], 3)"Light" exercise minutes per day [16], "Active" (heartrate-increasing) minutes per day of 4)Mild, 5) Moderate or 6)Intense heartrate increasing exercise [17] and 7) Steps-per day. It has recently been shown that higher levels of total physical activity, at any intensity, and less time spent sedentary, are associated with substantially reduced risk for premature mortality, with evidence of a non-linear dose-response pattern in middle aged and older adults [5]. In addition, it has been shown that being sedentary for more than 12 hours per day was associated with 38% higher mortality risk, but only among individuals accumulating less than 22min per day of Moderate to Vigorous Physical Activity [18]. Thus, if individuals obtain at least 22 minutes per day (or 154 minutes/week) of moderate physical activity the risk from sedentary behavior is eliminated. These data can be used by the primary care health professional to inform and advise his/her patient/client regarding whether adequate levels of these seven parameters of exercise have been obtained (www.fitabase.com) and to provide recommendations for an individualized patient/client preferred exercise program/routine, and feedback regarding progress in obtaining measurable goals. Table 2 demonstrates the results from an overweight 30-year-old man with Limb Girdle Muscular Dystrophy. He began an exercise program in a community pool and was able to attain a significant number of minutes of meaningful exercise, which he tolerated well. It will be easier for him to eliminate the risk from his increased sedentary minutes by increasing his exercise (if tolerated), than directly attempting to reduce the number of sedentary minutes. This is an example of how the primary care health provider, by using Fitbit watch/Fitabase collected exercise data can create an exercise "prescription" for his/her patient.

Table 2: Patient physical activity report form.

Date Day of Exercise Measurement	Resting Heart Rate (bpm)	Sedentary Minutes (Minutes/Day)	Total Light Ni Intensity Minutes/ Day	Low Intensity Exercise (Minutes/Day) fot Burn	Moderate Intensity Exercise (Minutes/Day) Cardio	High Intensity Exercise (Minute/Day) peak	Total Steps/ Day
12/20/23	68	852	56	51	34	0	4040
12/21/24	73	647	59	130	36	0	6688
12/22/25	69	859	46	34	0	0	4063
12/24/26	72	854	25	31	16	0	3461
12/25/27	70	916	38	35	2	0	4508
12/26/28	72	900	51	1	0	0	3770
12/27/29	72	920	18	0	0	0	1299
Weekly Results							
Dates of Week	Mean RHR (bpm)	Total Sedentary (Min/Week)	Total Light-No Intensity Min/Week	Total Intensity (Min/Week)	Total Moderate (Min/Week)	Total High Intensity (Min/ Week)	Weekly Mean Steps/Day
12/20-12/27/23	71	5948	293	282	88	0	3976
Goals							

Dates of Week 7days	Mean RHR (bpm)	Total Sedentary (Minutes/Week)	Total Light-No Intensity Minutes/ Week slow walk	Total Low Intensity (Minutes/Week)	Total Moderate Intensity (Minutes/Week)	Total High Intensity (Minutes/Week)	Mean Steps/Day
	<70	<5040 Minutes/ Week	>1000 Minutes/ Week	≥300 Minutes/ Week	150-300, up to 600 min/week	75-150, up to 300 min/week	>8,000

Name: Deidentified adult with limb girdle muscular dystrophy; Date of Birth: Deidentified; Age: Deidentified; Gender: Deidentified.

Impression: (Note: No exercise recorded on 12/23/23): First week of monitoring exercise in pool. "intensity" refers to increase of heart rate, with percent of "maximum heart rate" 220=29=191 beats per minute for Zachary. He did demonstrate significant ("heart pumping") exercise. Optimal goal would be 150 minutes of "moderate" per government guidelines, but it is unknown whether he can tolerate this much exercise. He has almost normal "low intensity" levels. He might focus on attaining > 300 min/week of low intensity exercise as initial goal or reduction of sedentary minutes.

Achieving the American Activity Guidelines for Exercise reduces the risk for 35 different health conditions, including Heart Attacks, strokes, cancer, osteoporosis, obesity, anxiety/ depression, periodontal disease, aging-related hearing loss and Alzheimer's Disease [4]. Obtaining these objectives will require motivation of the health professional to support his/her AIDD patient in a meaningful exercise program. Unfortunately, there is evidence that currently, physician support for this type of service is lacking in the general population [19] and especially so for AIDD [8]. For the reasons discussed above, we believe that if health professionals were familiar with and comfortable in utilization of the "remote" Fitabase system and were then able to discuss objective exercise outcomes with their patients, their AIDD patients and their caregivers [20] would be more likely to cooperate with an individualized, evidence-based health promoting physical exercise program. Finally, a recent article in JAMA [18] indicated that clinicians should now be encouraged to recommend physical activity for their patients using the various health parameters determined by activity devices as guides to establish goals and objectives for physical exercise. It was also recommended in this same article that the "clinicians themselves should hew to the same advice not only to set an example but also to personally experience and understand potential barriers that can exist".

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