

Health Promotion and Disease Prevention through Physical Activity in Individuals with TBI

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Objectives

- Describe importance of physical activity
- Describe strategies for promoting physical activity

US Department of Health and Human Services Physical Activity Guidelines

“All Americans should engage in regular physical activity to improve overall health and fitness and to prevent negative health outcomes.”

“The benefits of physical activity occur in generally healthy people of all ages, in people at risk of developing chronic diseases, and in people with chronic conditions or disabilities.”

Cost

\$117 billion in annual health care costs and about 10 percent of premature mortality are associated with inadequate physical activity

TBI is a chronic disease

- Link to medical conditions that may arise over the course of the lifespan of someone with a traumatic brain injury.
- Medical Professionals should view any ailments through the lens of the traumatic brain injury, regardless of how long it has been since the TBI occurred.

Terms

Physical Activity: body movement

Exercise: is a type of physical activity. Planned, structured and repetitive movements. The goal is to improve or maintain one or more components of physical fitness

Health Benefits of Physical Activity

- Reduce mortality
- Reduce heart disease
- Reduce blood clots
- Reduce certain cancers (bladder, breast, colon, endometrium, esophagus, kidney, lung, and stomach)
- Reduce non-insulin dependent diabetes mellitus
- Improved bone health

Health Benefits of Physical Activity

- Improved physical function
- Improved quality of life
- Reduced anxiety
- Reduced risk of depression
- Improved sleep
- Lower risk of falls (older adults)
- Lower risk of fall-related injuries (older adults)

Obesity in the U.S.

39.8% U.S. (93.3 million) adults are obese

Estimated annual medical cost for people who have obesity was \$1,429 higher than those of normal weight

Body Mass Index (BMI) is a person's weight in kilograms divided by the square of height in meters

Obesity in the U.S.

BMI categories (CDC)- kg/m²

- BMI < 18.5, underweight
- BMI 18.5 to <25, normal
- BMI 25.0 to <30, overweight
- BMI ≥ 30.0, obese
 - Class 1: BMI of 30 to < 35
 - Class 2: BMI of 35 to < 40
 - Class 3: BMI of 40 or higher, “extreme” or “severe” obesity

Pattern of Weight Change in the TBI Population

Community Follow-up: (median=38 months)

- 42% significantly gained weight
- 28% significantly lost weight
- 30% remained stable

- 16% developed arterial hypertension, dyslipidemia or type 2 diabetes (average age was 36 years old)

Weight control through physical activity

- Weight loss (along with proper nutrition)
- Prevents or slows weight gain

Benefits of Regular Physical Activity in individuals with TBI

Lower levels of depression

Better general health

Higher self-efficacy

Better quality of life

Physical Activity Guidelines to Benefit Health

150 minutes to 300 minutes a week of moderate-intensity physical activity

Or

75 minutes to 150 minutes a week of vigorous-intensity physical activity

Preferably, the activity should be aerobic

Physical Activity following TBI

Study	Primary measures	Main Findings
Driver et al.	Self-report PA min/wk	Moderate PA min/wk= 46 Vigorous PA min/wk=18
Gordon et al.	Self-report exercise/ wk	Exercise > 90 min/wk - TBI=26.7% - Non-disabled = 47.5%
Reavenall et al.	Self-report min PA / wk	52% not active enough for health benefit
Williams et al.	Activity monitor device	Steps/day significantly < controls

Effect of Mobility on Community Participation at 1 year Post-Injury in Individuals with Traumatic Brain Injury (TBI)

Irene Ward, PT, DPT, NCS; Anthony Lequerica, PhD;

Erin Donnelly, PT, MPT, NCS; Neil Jasey, MD; Nancy D. Chiaravalloti, PhD



Select Medical



Changing the lives of people with disabilities



Methods



Design: Observational study using prospectively collected data from a TBI Model Systems center (Northern New Jersey Traumatic Brain Injury System).

Setting: Acute Inpatient Rehabilitation Hospital (AIRH).

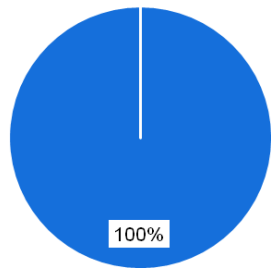
Procedure: A structured interview was conducted with the patient or surrogate while in AIRH and 1 year post discharge from AIRH.

Results: Sample Demographics

- **245** patients admitted to AIRH with TBI
- **156 (63.7%) moderate, 88 (35.9%) severe** TBI
- Ages ranged between **16 and 92** years old
- Mean LOS in acute hospital= **16.19 days** (SD \pm 13.7)
- Mean LOS in AIRH= **24.60 days** (SD \pm 17.34)

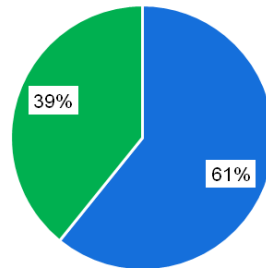
Walking Ability

Figure 1: Walking at Admission



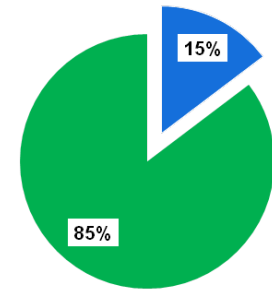
■ Dependent ■ Independent

Figure 2: Walking at Discharge



■ Dependent ■ Independent

Figure 3: Walking at 1 Year Post-Injury



■ Dependent/ Declining ■ Independent

Dependent / Declining Ambulators at 1 yr Post-injury:

- **94.4%** did not leave their homes on a daily basis, $\chi^2=16.2$, $df=1$, $p<0.001$
- **52.8%** showed a decline in walking ability from discharge to 1 year follow-up

Community Ambulation After Botulinum toxin injection

Stephen Hampton, MD
Rutgers-NJMS/Kessler Institute for Rehabilitation

Fit Bit Zip worn for 9 weeks

N= 11 independent ambulators (CVA, TBI, SCI)

>0.6 meters/ min

2000-3000 steps per day

88% compliance in wearing the device

Activity Monitors: Healthy Adults

LEVEL	STEPS / DAY
Sedentary	< 5000
Low active	5000 – 7499
Somewhat active	7500 – 9999
Active	≥ 10,000
Highly active	> 12,5000

Tudor-Locke, 2004

Barriers Associated with Lower Physical Activity Levels after TBI

Poor mobility

Pain

Fatigue

Functional limitations

Hamilton et al, 2016

Barriers Associated with Lower Physical Activity Levels after TBI

Lack of exercise facilities

No transportation

Lack of social support

Cost of program

Fitness center staff unable to assist

Strategies

- See your rehab team (medical clearance and assistance with starting a program)
- Role of caregiver: “cheerleader” vs. “coach”
- Monitor your activity

Activity Monitors

- Measure activity throughout the day.
- Ideally, waterproof and free.
- Helps with setting goals and recognizing your accomplishments!



Summary

Physical activity impacts secondary health issues

Has been shown to have health benefits in individuals with TBI

Activity monitors may help monitor activity and set goals

Thank you!

