



## ABI JOURNAL CLUB

Evaluation of a Physical Activity Intervention for Adults With Brain Impairment: A Controlled Clinical Trial

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ABI Outreach and Day Program



Nova Scotia  
**ABINetwork**

# LAND ACKNOWLEDGEMENT

The Nova Scotia Rehabilitation & Arthritis Center (NSRAC) is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People, and we acknowledge them as the past, present, and future caretakers of this land.

This territory is covered by the “Treaties of Peace and Friendship” which Mi'kmaq Wəlastəkwiyik (Maliseet), and Passamaquoddy Peoples first signed with the British Crown in 1725. The treaties did not deal with surrender of lands and resources but in fact recognized Mi'kmaq and Wəlastəkwiyik (Maliseet) title and established the rules for what was to be an ongoing relationship between nations. We are all Treaty people.

Mi'kma'ki includes all of Nova Scotia, Prince Edward Island, part of New Brunswick, the Gaspé region of Quebec, part of Maine, and southwestern Newfoundland.



## Disclaimer

The goal of the ABI Journal club is to foster skills of research critique, promote interprofessional interaction and encourage the inclusion of evidence-based practice.

Please join us in creating a safe and approachable learning environment.

Please note that although presenters may have an interest in the article that is presented, they may not necessarily be an expert in that field.

This event is for your learning only. Please do not distribute slides or recordings. Recordings can be distributed by Journal Club organizers only.

# Evaluation of a Physical Activity Intervention for Adults With Brain Impairment: A Controlled Clinical Trial

Why this paper?

- It all started with the Day Program...
- Physical activity education to the general population – existing
  - Physical activity education to people with ABI – limited

Why present this paper in the journal club?

- Something to think about
  - Return to function vs prevention



## PRIMARY ISSUES TACKLED:

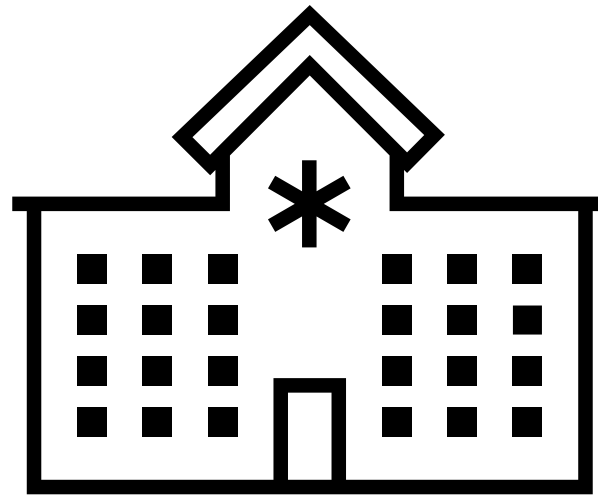
“Individuals with brain impairment (BI) are less active than the general population and have increased risk of chronic disease” <sup>2,3</sup>

- Coronary heart disease
- Hypertension
- Colon cancer
- Diabetes mellitus



## PROBLEM:

- To date, interventions aimed at increasing physical activity in BI population largely failed... <sup>4-9</sup>
  - Fixed facilities
  - Structured exercise prescription



## Purpose of this study:

To evaluate a community-based physical activity intervention

## Outcome Measures:

1. Objectively measured physical activity
2. Decisional balance, self-efficacy, and social support

# Participants

Referred by community-based practitioners and outpatient rehabilitation services in Brisbane.

Inclusion	Exclusion
Males and females Age: 18-60	Lower-limb surgery in the past 6 months, or scheduled for during intervention
BI from Cerebral Palsy, TBI, or Stroke	Lower-limb Botox in the past 3 months, or scheduled for during intervention
Living within 150km radius of the University of Queensland	Serious, regular, or uncontrolled substance abuse
Ambulatory (with or without aids)	Documented violent or aggressive behaviour
Medically safe to participate in moderate PA	Suicidal ideation
Have cognitive ability to participate in behaviour change activities	





## Participant Characteristics:

Age:  $38.1 \pm 12.0$

Height (m):  $171.4 \pm 10.8$

Weight (kg):  $81.6 \pm 21.8$

Male=27 (63%), female=16 (37%)

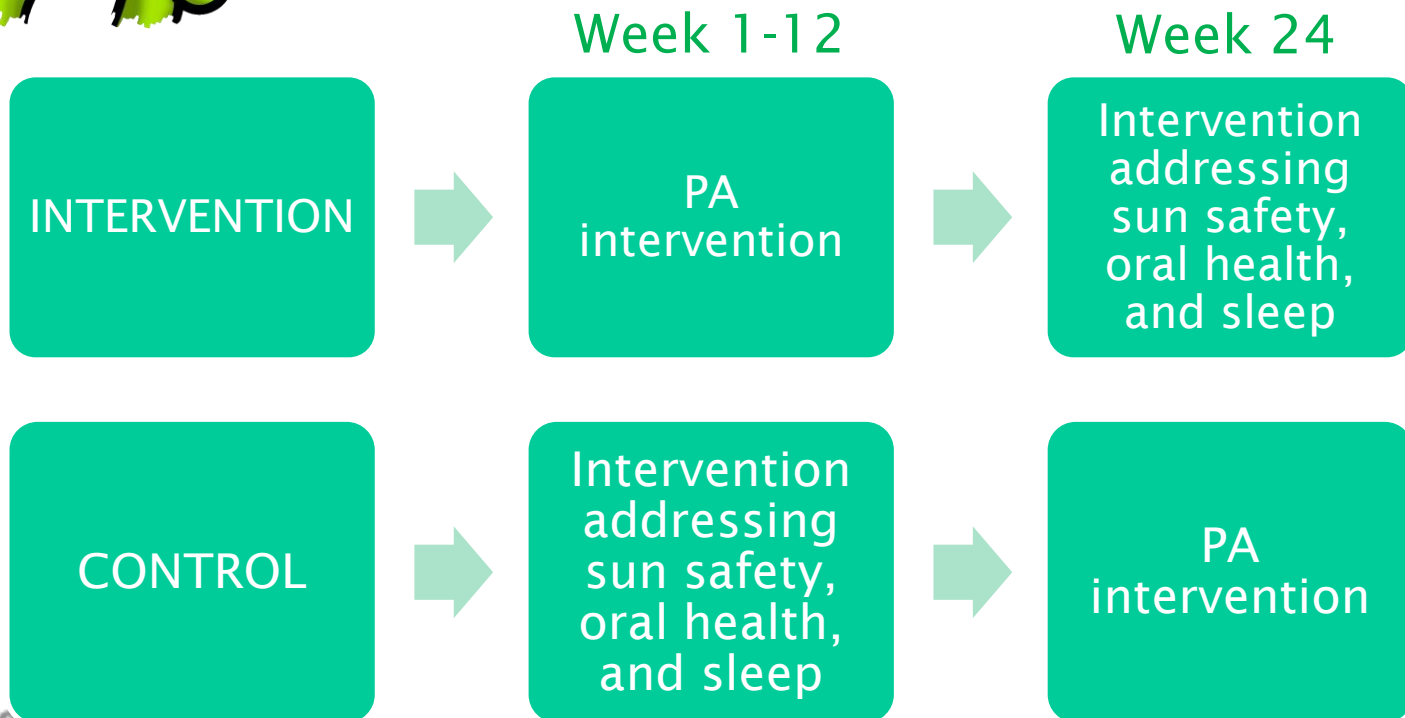
Driving status:

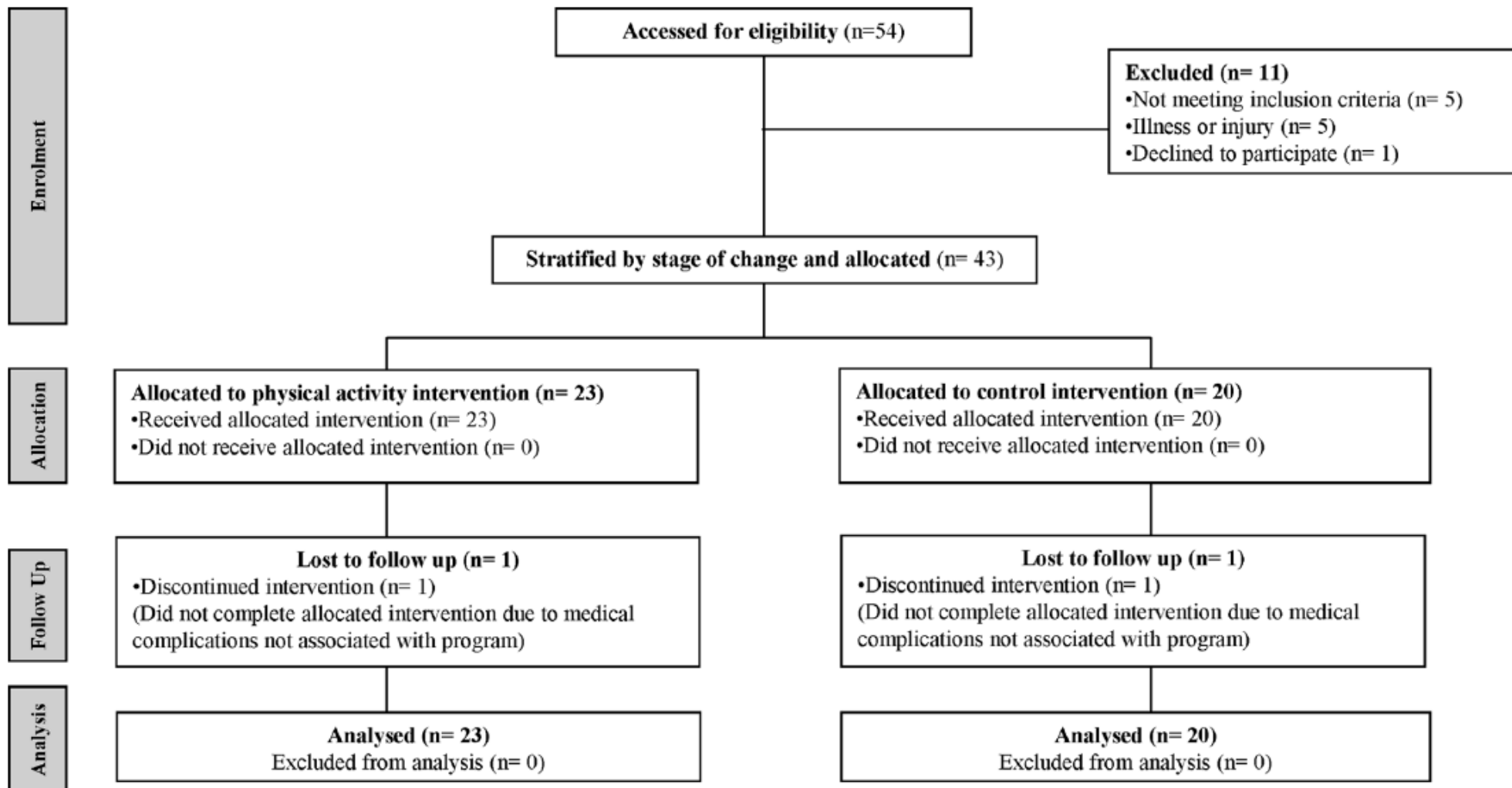
No driver's license/No car to drive = 95% (!)

# Methods



Randomization: Coin toss and then one to each group



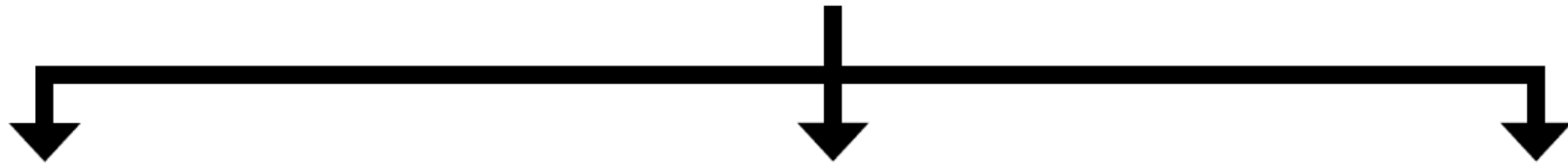


# Intervention Procedure:

**Table I.** Physical Activity Intervention Outline.<sup>a</sup>

## **Step I: Preparticipation assessment**

- preparticipation assessment based on domains of the International Classification of Functioning, Disability, and Health (ICF): health condition, impairments, activity limitations, and participation restrictions as well as environmental and personal characteristics that are relevant for the development of the intervention; includes identifying activities of interest, home and community facilities, disposable income, levels of independence and support, activity or mobility limitations, and other commitments; and
- information sharing: video presentation to develop a shared understanding of physical activity (definition, benefits, opportunities)



\*\*\*

Done the **Marcus and Simkin** staging algorithm to determine readiness for change, and only 1, 2, and 3 were eligible to participate (not noted in the eligibility criteria). (9)

Stage 1 – precontemplation – not active and no intention to increase PA in the next 6 months

Stage 2 – contemplation - not active but intention to increase PA in the next 6 months

Stage 3 – preparation – doing some PA, but not enough to meet the PA guidelines for health.

## Step 2: Intervention implementation

### 2a: Individualized behavior change strategies

SOC 1 or 2 strategies

- Information sharing
- Value identification
- Modelling
- Decisional balance
- Motivational interviewing (Value Card Sort, Importance and Confidence Rulers, expressing empathy, rolling with resistance, developing discrepancy)
- Social support
- Personal time audit
- Barrier identification and resolution
- Build self-efficacy
- Foster enjoyment

SOC 3

- Self-monitoring
- Goal setting
- Reward systems
- Prompting/Reminders
- Social support
- Personal time audit
- Barrier identification and resolution
- Foster enjoyment
- Support self-efficacy

### 2b: Structured exercise prescription

Goal-oriented physical activity prescribed in terms of frequency, intensity, time, and type

### 2c: Community access/adaptation

Organizational and logistical activities undertaken to facilitate physical activity: for example,

- education of activity stakeholders (eg, coaches, administrators, instructors, or potential team members);
- identifying opportunities for increasing incidental activity (eg, fostering physical independence rather than dependence on others or walking rather than using a wheelchair for long distances);
- equipment modification or other specialist information;
- identifying potential funding sources available to the client; and
- sourcing affordable, accessible transport options where necessary



### **Step 3: Tailored relapse-prevention strategies**

Work with clients and their primary caregivers to teach skills and develop strategies that will ensure ongoing participation, including what worked and what did not (past successes);

- planning for high-risk situations;
- education on exercise progressions; and
- community entry skills

# RESULTS:

**Table 3.** Changes in Outcome Measure (From Baseline to Postintervention and Baseline to 3-Month Follow-up) Scores and Net Differences Between the Intervention and Control Groups for All Outcome Measures.

Variable	Group	Baseline	Postintervention	Follow-up	Change Baseline to Postintervention			Change Baseline to 3-Month Follow Up		
					Mean Change Scores $\pm$ SE	Net Difference (95% CI)	Effect Size, <sup>a</sup> P Value	Mean Change Scores $\pm$ SE	Net Difference (95% CI)	Effect Size <sup>a</sup> , P Value
Counts per minute (cpm)	Intervention (n = 23)	202.6 $\pm$ 15.1	263.4 $\pm$ 15.5	237.0 $\pm$ 15.8	60.9 $\pm$ 20.7 <sup>b</sup>	71.9 (10.5 to 133.4)	0.75, .02 <sup>c</sup>	34.5 $\pm$ 21.0	29.3 (-32.4 to 91.1)	0.30, .35
	Control (n = 20)	208.4 $\pm$ 16.6	197.3 $\pm$ 17.1	213.5 $\pm$ 17.1	-11.1 $\pm$ 22.9			5.1 $\pm$ 22.8		
MVPA (min/d)	Intervention (n = 23)	20.8 $\pm$ 3.1	31.2 $\pm$ 3.1	25.3 $\pm$ 3.2	10.4 $\pm$ 4.0 <sup>b</sup>	12.9 (0.9 to 24.9)	0.69, .03 <sup>c</sup>	4.5 $\pm$ 4.1	4.2 (-7.9 to 16.2)	0.22, .49
	Control (n = 20)	22.2 $\pm$ 3.4	19.6 $\pm$ 3.5	22.5 $\pm$ 3.5	-2.5 $\pm$ 4.5			0.3 $\pm$ 4.5		
Family social support	Intervention (n = 22)	33.3 $\pm$ 2.3	35.5 $\pm$ 2.3	37.1 $\pm$ 2.3	2.2 $\pm$ 1.7	0.8 (-4.3 to 5.9)	0.10, .77	3.9 $\pm$ 1.7 <sup>b</sup>	3.7 (-1.5 to 8.8)	0.45, .16
	Control (n = 19)	32.6 $\pm$ 2.4	34.1 $\pm$ 2.4	32.8 $\pm$ 2.4	1.4 $\pm$ 1.9			0.2 $\pm$ 1.9		
Friend social support	Intervention (n = 22)	27.4 $\pm$ 2.1	30.2 $\pm$ 2.1	28.2 $\pm$ 2.1	2.8 $\pm$ 2.1	1.8 (-4.4 to 8.0)	0.10, .57	0.8 $\pm$ 2.1	2.0 (-4.2 to 8.0)	0.45, .53
	Control (n = 19)	29.8 $\pm$ 2.3	30.8 $\pm$ 2.3	28.6 $\pm$ 2.3	1.1 $\pm$ 2.3			-1.2 $\pm$ 2.3		
Self-efficacy	Intervention (n = 23)	2.3 $\pm$ 0.2	2.4 $\pm$ 0.2	2.7 $\pm$ 0.2	0.1 $\pm$ 0.2	-0.05 (-0.7 to 0.6)	0.05, .88	0.5 $\pm$ 0.2 <sup>b</sup>	0.5 (-0.1 to 1.1)	0.52, .11
	Control (n = 20)	2.7 $\pm$ 0.2	2.9 $\pm$ 0.2	2.7 $\pm$ 0.2	0.2 $\pm$ 0.2			-0.02 $\pm$ 0.2		
Decisional balance	Intervention (n = 23)	0.9 $\pm$ 0.2	1.4 $\pm$ 0.2	1.2 $\pm$ 0.2	0.5 $\pm$ 0.2 <sup>b</sup>	0.6 (-0.1 to 1.2)	0.53, .10	0.3 $\pm$ 0.2	0.6 (-0.1 to 1.3)	0.59, .07
	Control (n = 20)	1.4 $\pm$ 0.3	1.3 $\pm$ 0.3	1.1 $\pm$ 0.3	-0.1 $\pm$ 0.2			-0.3 $\pm$ 0.2		

Abbreviations: cpm, counts per minute of monitoring time; MVPA, moderate-to-vigorous physical activity.

<sup>a</sup>Cohen's *d*.

<sup>b</sup>Denotes a significant within-group difference ( $P \leq .05$ ).

<sup>c</sup>Denotes a significant between-group (intervention vs control) difference ( $P \leq .05$ ).





## MAIN RESULTS:

Variable	Group	Baseline	Postintervention	Follow-up
Counts per minute (cpm)	Intervention (n = 23)	202.6 ± 15.1	263.4 ± 15.5	237.0 ± 15.8
	Control (n = 20)	208.4 ± 16.6	197.3 ± 17.1	213.5 ± 17.1
MVPA (min/d)	Intervention (n = 23)	20.8 ± 3.1	31.2 ± 3.1	25.3 ± 3.2
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	Control (n = 20)	2.7 ± 0.2	2.9 ± 0.2	2.7 ± 0.2
Decisional balance	Intervention (n = 23)	0.9 ± 0.2	1.4 ± 0.2	1.2 ± 0.2
	Control (n = 20)	1.4 ± 0.3	1.3 ± 0.3	1.1 ± 0.3

Abbreviations: cpm, counts per minute of monitoring time; MVPA, moderate-to-vigorous physical activity.

<sup>a</sup>Cohen's *d*.

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## AUTHOR'S CONCLUSIONS

- Intervention is effective in increasing PA
- Intervention is limited in promoting maintenance of PA
- While statistical significance was lost, the clinical significance remains
  - Even very small increases in PA brings on significant health benefits<sup>10</sup>

## JOURNAL ARTICLE EVALUATION

Are the methods described in sufficient detail? Do they make sense? Should they have done something differently?

Was there any issues with sampling? Do the participants adequately reflect that the group that they represent?

What do you like about the method, implementation, and evaluation, especially with reference to the Acquired Brain Injury content?

What don't you like?

How applicable are the results to our population?

What might come next?





Bye!

And thank you for  
listening and  
participating!!!! :-)

## REFERENCES & RECOMMENDED READING

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<http://anniesplacecafe.ca/>

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