

EXERCISE AND PAEDIATRIC DISABILITY

CASE STUDY



**Accredited Exercise
Physiologist:** Claire Willis

Client Names: Jasmine and
Brooke*

Ages: 16



OVERVIEW OF DISABILITY:

Conceptual models of disability have undergone a shift in the past two decades, broadening the focus beyond the level of the impairment to emphasise the significance of participation and the environment on a child's development, health, and well-being.¹ Current approaches to rehabilitation for children with disabilities utilise the International Classification of Functioning, Disability and Health (ICF) to assess outcomes, design and evaluate interventions, and develop services and policies.¹ There is a strong evidence base in the paediatric rehabilitation literature demonstrating the efficacy of goal-directed and family-centred interventions to enhance outcomes across all domains of the ICF. The following case study is an example of how these theoretical concepts can be applied to exercise interventions to elicit outcomes meaningful to children, parents, AEPs and the community.



REFERRAL AND CLIENT HISTORY:

Jasmine* is a 16 year old female with ataxic cerebral palsy (CP) and mild intellectual disability. Gross Motor Function Classification System (GMFCS) Level I, Manual Ability Classification System (MACS) Level I. Jasmine lives with her grandparents and attends mainstream school in a supported education unit. Medication: Amitriptyline 10mg. Jasmine was referred for exercise physiology services through the children's hospital, for assistance in improving aerobic capacity, feelings of wellbeing, and physical activity participation.

Brooke* is a 15 year old female with spastic hemiplegic CP and moderate intellectual disability. GMFCS II, MACS III. Brooke lives with her mother and father and attends school with Jasmine in the same supported education unit in the year below. Brooke was referred through the same hospital service, for assistance in improving the use of her hemiplegic arm following persistent refusal of botulinum toxin therapy.

Jasmine and Brooke live in a suburb categorised within the top ten areas of highest disadvantage within their metropolitan area.²

Knowing of the relationship between Jasmine and Brooke, sessions were completed together with both girls.





IDENTIFIED NEEDS / CLIENT GOALS:

Jasmine and Brooke presented as two delightful teenagers, with considerable hesitation regarding their participation in exercise and physical activity. They wanted to be active, but were uncertain as to whether their physical impairments would enable them to participate in their chosen pursuits. Jasmine and Brooke also detailed a number of community attitude and service-related barriers that had limited their opportunities to participate in physical activity throughout their life.

In their own words, Jasmine and Brooke identified the following goals (see Goal Attainment Scale for goals and outcomes):

1. 'Try out lots of different physical activities to find out which one(s) I like best' (J & B)
2. 'Improve my fitness because I get tired easily' (J)
3. 'Use my bad arm more' (B)



EXERCISE INTERVENTION

The exercise physiology service utilises the local environment of the child and their family as a means of facilitating exercise rehabilitation and physical activity participation goals. This service is offered in-kind to patients receiving services from the paediatric rehabilitation department at the children's hospital.

Core pillars of the service include:

- Collaborative goal setting, directed by the child.
- Family-centred, including engaging parents and caregivers in some parts of sessions.³
- A participation-focused approach, i.e. using participation as a catalyst to foster outcomes at the level of body function and activity.⁴
- Community capacity building, utilising and upskilling services in the community to assist in sustaining physical activity outcomes.
- Environmental considerations.

Jasmine and Brooke participated in 1-2 sessions a week for 12 weeks. Sessions were structured to enable the girls to try many

new and different activities in a 'safe' environment, a setting that encouraged the girls to explore their limits, take on challenges and make errors, without fear or need for self-protection from social pressures. Sessions involved exposure to a wide variety of sport and exercise activities, including basketball, soccer, boxing, circuit classes, cricket, and tennis, using local parks and facilities. Participation in these activities was also used as a means to facilitate Jasmine and Brooke's body function and activity-related goals.

After 6-8 weeks, the girls indicated that they would like to join a boxing 'team' in the community. Together with their families, we identified a boxing gym close to where the girls live, and applied for financial assistance from the state government (available to all children experiencing financial hardship). Provided with the necessary information and education, the coaching staff were able to adapt instructions and activities where necessary. The boxing classes included 45-65 minutes of moderate-high intensity exercise, and a mix of boxing, footwork, games, and time in the ring.





OBJECTIVE MEASURES / RESULTS

The Goal Attainment Scale (GAS)⁵, the primary outcome measure for this intervention, illustrates the effectiveness of the intervention in achieving goals related to activity and participation.

GAS OUTCOME	J & B GOAL 1	J GOAL 2	B GOAL 2
-2 Baseline capacity / Much less than expected outcome	J & B participate in physical activity outside of school 0 times per week with supervision	J can participate in more than 15 but less than 30 minutes of moderate intensity exercise without becoming too fatigued and asking to terminate the session	B engages her left arm less than 25% of the time during physical activity, without verbal cueing
-1 Less than expected level of outcome	J & B can participate in physical activity outside of school once per week with supervision	J can participate in more than 30 but less than 45 minutes of moderate intensity exercise without becoming too fatigued and asking to terminate the session	B engages her left arm more than 25% but less than 50% of the time during physical activity, without verbal cueing
0 Expected level of outcome	J & B can participate in physical activity outside of school 2 times per week with supervision	J can participate in more than 45 but less than 60 minutes of moderate intensity exercise without becoming too fatigued and asking to terminate the session	B engages her left arm for more than 50% but less than 75% of the time during physical activity, without verbal cueing
1 Greater than expected level of outcome	J & B can participate in physical activity outside of school 3 times per week with supervision	J can participate in more than 60 but less than 75 minutes of moderate intensity exercise without becoming too fatigued and asking to terminate the session	B engages her left arm for more than 75% but less than 100% of the time during physical activity, without verbal cueing
2 Much greater than expected level of outcome	J & B can participate in physical activity outside of school 4 times per week with supervision	J can participate in more than 75 but less than 90 minutes of moderate intensity exercise without becoming too fatigued and asking to terminate the session	B engages her left arm 100% of the time during physical activity, without verbal cueing

*A score of '0' is the target score when using the GAS. A score of +1 or +2 indicates you have underestimated potential outcomes during the initial scaling of the goal.

The green boxes highlight the level of achievement to date.

Jasmine and Brooke also demonstrated improvements in cardiovascular fitness, strength, and balance throughout this time.

AX	JASMINE		BROOKE		INTERPRETATION
	PRE	POST	PRE	POST	
Goal Attainment Scale					
G1	-2	0	-2		Expected outcome Greater/much greater than expected outcome
G2	-2	+1	-2		
6min walk (m)	750	900	400	500	Improved
Sit to Stand in 30s (n)	17	25	12	17	Improved
Standing broad jump (cm)	1.44m	1.55	60cm	90cm	Improved
Dynamic balance: Heel-toe along a 15m line	10	Whole line (22)	3	7	Improved
Static balance: Single leg stand	L 26 R 6	L 60 R 20	L 15 R 5	L 15 R 5	Improved/consistent
CP Quality of Life Questionnaire: ⁶ How do you feel about...					
a. Your ability to participate in sporting activities	3	9	2	9	Improved
b. The way you use your arm and hands	7	8	3	7	Improved
c. Your life in general	6	8	8	8	Improved/consistent
d. How happy you are	6	8	8	8	Improved/consistent



CONSIDERATIONS

- Pain and epilepsy are commonly associated with cerebral palsy, and need to be examined within screening and/or subjective/objective assessment processes.
- Children and youth with disabilities have often had limited opportunity to participate in physical activity and exercise. They may be unfamiliar with exercise-induced symptoms such as sweating, increased skin temperature, maximal heart rates, and changes in breathing.
- Addressing environmental barriers and facilitators within interventions is essential for the promotion and sustainability of physical activity participation outcomes.



STATEMENT TO SUPPORT AEP INTERVENTIONS

Accredited Exercise Physiologists (AEPs) play an imperative role in the multidisciplinary rehabilitation teams of children with disabilities. This case study demonstrates the effectiveness of a goal-directed, family-centred approach, intervening at the level of participation and the environment, to increase physical activity (and related) outcomes in adolescents with cerebral palsy. The use of valid outcome measures, evidence-based intervention approaches, and developmentally appropriate motivation and engagement strategies, including social support, can be successfully implemented into practice to achieve rehabilitation goals.

REFERENCES

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*All names have been changed

