

## Direct Evidence of GameCycle® Benefits

Three Rivers' research and development of the GameCycle has been supported by two grants from the National Institutes of Health (SBIR Grants #R41HD39535-01 and #R44HD39535-02A1). Also, researchers at the University of California Davis and Shriners Hospital for Children in Northern California have conducted grant-funded research on the GameCycle (Grant 8600 from Shriners Hospital for Children). The results of these research efforts have provided compelling evidence of the important benefits gained from the way in which the GameCycle combines upper-body exercise with gaming.

GameCycle research has been presented at scientific conferences and has been published in several scientific journals. Of particular significance are two articles in the Journal of Spinal Cord Medicine, one by Shirley Fitzgerald and her colleagues published in 2004, and one by Lana Widman and her colleagues published in 2006. These two articles are briefly summarized below.

### You Don't Feel Like You're Exercising When You Are Having Fun!

Fitzgerald and her colleagues (2004) compared exercising with an arm ergometer (without a videogame) to exercising with the GameCycle (arm ergometer with videogame). Fitzgerald found that although metabolic data indicated that more calories were being expended while using the GameCycle (compared with the standard arm ergometer), research participants did not perceive greater exertion. In other words, participants were exercising harder with the GameCycle, but did not feel it or realize it.

### Encouraging Exercise and Getting the Benefits

Widman and her colleagues (2006) examined the impact of regular exercise with the GameCycle among adolescents with mobility impairments due to spina bifida. Eight participants used the GameCycle over a 16-week period. Widman's findings supported the effectiveness of the GameCycle in encouraging exercise and providing health benefits:

- 87% (7 of 8) of participants increased their maximum exercise capability after training with the GameCycle for 16 weeks (3 exercise sessions a week)
- 87% (7 of 8) agreed that the GameCycle was physically challenging, enjoyable, and comfortable to use
- Regarding exercise compliance, participants also agreed that the GameCycle would motivate them to exercise longer (75%) and more often (62%)

### Summary and References

Research on the GameCycle clearly indicates that the gaming challenge of the GameCycle encourages exercise and facilitates adherence to rehabilitation and exercise regimens in the clinic or at home.

#### References for the two articles summarized above:

Fitzgerald SG, Cooper RA, Thorman T, Cooper R, Guo S, Boninger ML. The GAME(Cycle) exercise system: comparison with standard ergometry. Journal of Spinal Cord Medicine, 2004; 27: 453–459.

Widman LM, McDonald CM, Abresch RT. Effectiveness of an Upper Extremity Exercise Device Integrated With Computer Gaming for Aerobic Training in Adolescents With Spinal Cord Dysfunction. Journal of Spinal Cord Medicine, 2006; 29(4):363-70.

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