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# Addressing Ataxia Among Children with Cerebellar Disorders

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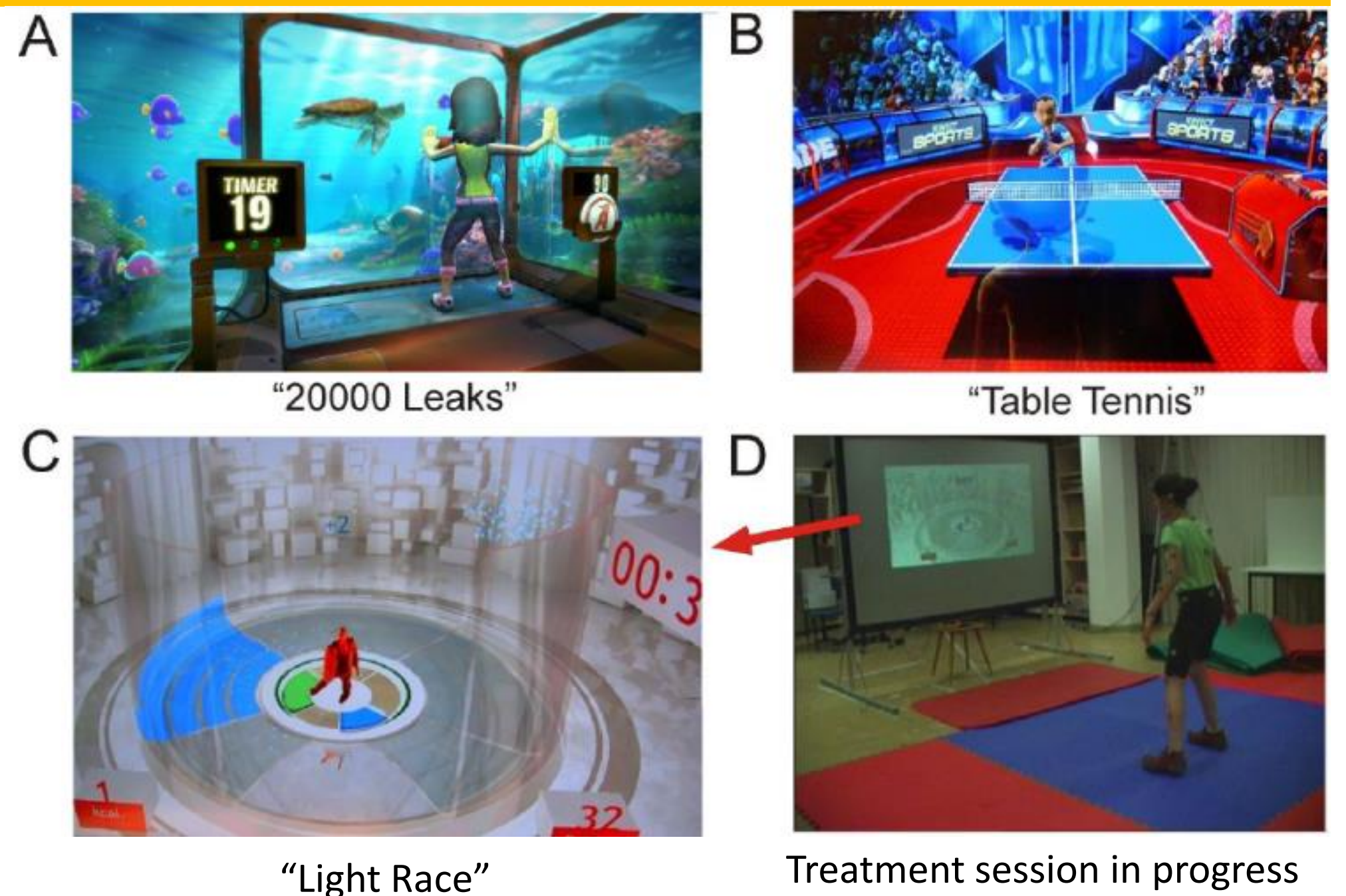


# Addressing Ataxia Among Children with Cerebellar Disorders

Maureen McConville & Shane O'Shea, OTS

## Case

Valerie is a 7-year-old girl who presents with cerebellar ataxia, causing lack of coordination in her movements. Among dysmetria, she displays many other symptoms of ataxia that cause dysfunction in her daily life such as clumsy gait and dysdiadochokinesia. She is unable to control her arms and hands. Valerie has difficulty with bilateral tasks of her upper and lower extremities. Valerie's Occupational Therapist is determined to help improve her symptoms but is limited in specific interventions designed to help ataxia. The occupational therapist is interested in determining the most effective treatment for improving upper extremity function in children with ataxia.



## 1 Ask: Research Question

What is the most effective treatment for improving upper extremity function in children with ataxia?

## 2a Acquire: Search Terms

**Patient/Client group:** Pediatric, Children, Cerebral Palsy, Ataxia, Cerebellar Ataxia, Ataxic Cerebral Palsy, Incoordination, Balance Dysfunction  
**Intervention:** Occupational Therapy, Physical Therapy, Physiotherapy, Coordination Therapy, Ataxia Therapy  
**Comparison:** Intervention Outcomes  
**Outcome:** Decreased Ataxia Symptoms, Improved Coordination

## 2b Acquire: Selected Articles

**Ilg et al. (2012):** An intraindividual control design analyzing the effects of game-based coordinative training on ataxia symptoms in children with degenerative ataxia

**Marquer et al. (2014):** A systematic review of the assessment and treatment of postural disorders in cerebellar ataxia

**Koy et al. (2016):** A systematic review of the advances in management of movement disorders in children.

## 3a Appraise: Study Quality

**Ilg et al. (2012).** Level 3, Small n-size (n=10), homogeneity of participants, double blinded, reliable scales

**Marquer et al. (2014):** Level 1, High number of articles reviewed (3 of which are randomized control studies), well respected assessment tools used for comparison between interventions, poorly defined search strategy

**Koy et al. (2016):** Level 1, Personal experiences utilized may be clinically questionable, focus is on medical treatment but displays strong evidence of the lack of rehabilitation research on ataxia

**3b Appraise: Study Results** There is limited research on rehabilitative interventions for ataxia in children. Of the research available, one study displayed promising results and was backed in further reviews on effective interventions. This study was done by Winifred Ilg (2012) and demonstrated that various symptoms in children with in degenerative ataxia were significantly reduced following a 2 week laboratory training and 6 week home program of video game-based coordinative training. The Microsoft Xbox Kinect was used in this intervention with the subjects engaging in the following Xbox movement-controlled video games: 2000 Leaks, Table Tennis, and Light Race. When utilized, this intervention led to a decrease in step variability ( $p=0.019$ ) and lateral sway ( $p=0.012$ ), both indicating a decreased risk of falling and improvement of dynamic balance. Additional studies (Marquer, 2014 & Koy 2016) found on ataxia treatment in children mentioned Ilg's study and supported his findings as the most effective treatment available to utilize as of 2016.

**4 Apply: Conclusions for Practice** Ataxia is rarely treated without the accompany of other, more complex symptoms or diagnoses. Although the coordinative training was found to be helpful, it should be cautioned that these results may not generalize to patients with additional diagnoses. However, the programs used in the study were found to be cost-effective for occupational therapists and motivating to children for engagement in therapy. The possibilities for a child's ataxic symptoms to improve using this intervention may outweigh the alternative of using another intervention that may or may not work with nonexistent evidence to support it. Further studies should be implemented with larger sample sizes to increase support for this intervention.

## References:

Ilg, W., Schatton, C., Schicks, J., et al. (2012). Video game-based coordinative training improves ataxia in children with degenerative ataxia. *Neurology*, 79, 2056-2060. doi: 10.1212/WNL.0b013e3182749e67

Koy, A., Lin, J.P., Sanger, T.D., et al. (2016). Advances in management of movement disorders in children. *Neurology*, 7, 719-735. doi: [http://dx.doi.org/10.1016/S1474-4422\(16\)00132-0](http://dx.doi.org/10.1016/S1474-4422(16)00132-0)

Marquer, A., Barbieri, G., Perennou, D. (2014). The assessment and treatment of postural disorders in cerebellar ataxia: A systematic review. *Annals of Physical and Rehabilitation Medicine*, 57, 67-78. doi: <http://dx.doi.org/10.1016/j.rehab.2014.01.002>

**Video game-based coordinative training shows promising results to improve ataxia in children with degenerative ataxia.**

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