



Digital magazine for pediatric occupational and physical therapists.

# **Issue 24 - March 2011**









# **New and Popular Products**



#### **Action Alphabet:**

Download of 26 cards that incorporate the alphabet and movement plus 25 suggested games to play with the cards

List Price for electronic book: \$3.99

Sale price for ELECTRONIC book: \$1.99 until March 31, 2011

### www.YourTherapySource.com/actionalphabet



#### **Spring Handwriting Activities**

Get over 30 pages of Spring handwriting templates, visual motor and visual perceptual worksheets.

List price: \$4.99

www.YourTherapySource.com/springhandwriting

### **5 Reasons to Push In**

hether you work in the schools or in the home, here are 5 reasons to provide pediatric occupational or physical therapy in a child's natural environment:

1. You have the chance to see first hand during each session what functional tasks or skills need improvement.

2. The child's normal daily routine is not interrupted. If it is during school hours, the child will not be missing important class instruction.

3. You can provide and use only materials that are in the classroom or home making it more feasible for teachers and parents to carry over activities when you are not there.

4. You can actually see whether your environmental modifications are appropriate. Are teachers or parents able to carry out your recommendations to use adaptive equipment or modify assignments?

5. The teachers and parents can observe what you are doing each time making it easier for them to incorporate any techniques into the child's normal day everyday not just 2 times per week for 30 minutes.



Modifications and Interventions for School -Reporting Forms

Includes over 60 reproducible reporting forms with hundreds of suggested modification and interventions for students

www.YourTherapySource.com/modifications

# A

#### ge Related Changes in Children with Cerebral Palsy

*Developmental Medicine and Child Neurology* published research on age related changes in 184 children (age range 4 -16 years old) with cerebral palsy. The children were initially evaluated with the Gross Motor Function Measure (GMFM), Pediatric Evaluation of Disability Inventory (PEDI) and Lifestyle Assessment Questionnaire -Cerebral Palsy (LAQ-CP) and again 2 years and 7 months later. Significant improvements were seen over time on all evaluation tools although mean raw oxygen cost was less over time. At 12 years old, gait was the most inefficient. GMFM scores continued to improve until 13 years of age and two subsets of the PEDI improved until 14 years of age before scores began to decrease. The researchers recommend that these factors be taken into consideration to maximize physical function into adulthood.

Reference: CLAIRE KERR, BRONA C MCDOWELL, JACKIE PARKES, MIKE STEVENSON, AIDAN P COSGROVE. Age-related changes in energy efficiency of gait, activity, and participation in children with cerebral palsy. Developmental Medicine & Child Neurology Volume 53, Issue 1, pages 61–67, January 2011

#### ealthy Parents - Healthy Children with CP

Physical Medicine and Rehabilitation published research on the function of parents and their children with cerebral palsy. Fifty one parents completed surveys on the care of their children with cerebral palsy from 5-18 years old. In addition, the GMFCS, Pediatric Quality of Life Inventory, Parenting Stress Index, Family Environment Scale, relationship dimension and Self-Efficacy for Parenting Tasks Index were completed. The results indicated a positive correlation between the health of the parents and the health of the children with regards to: mental health, emotional function, psychosocial function and total health related quality of life. The researchers suggest that in order to maximize functional levels in children with cerebral palsy interventions that support parent health (especially mental health) should be explored.

Reference: Murphy, N et al. The Function of Parents and Their Children With Cerebral Palsy PM&R Volume 3, Issue 2, Pages 98-104, February 2011

### Handwriting

#### isual Motor Scores and Handwriting

*Physical and Occupational Therapy in Pediatrics* published research on the relationships between fine-motor, visual-motor, and visual perception scores and handwriting legibility and speed. Klein et. al. evaluated 99 third through sixth graders with learning or behavioral problems. Each child was assessed with the following: Upper-Limb Speed and Dexterity Subtest of the Bruininks–Oseretsky Test of Motor Proficiency, the Beery–Buktenica Developmental Test of Visual-Motor Integration—5th Edition, the Test of Visual Perceptual Skills—Revised, the Visual Skills Appraisal, and a handwriting copying task. The results indicated:

a.) statistical analysis indicated that variance in handwriting based on the assessments was greater than or equal to 20% for legibility and greater than or equal to 26% for speed

b.) only scores on the Developmental Test of Visual Motor Integration were different between skilled and non skilled handwriters

The researchers suggest that occupational therapists explore other influential factors besides sensory motor for handwriting difficulties because of low correlations between the assessments and handwriting ability.

Reference: Sheryl Klein, Val Guiltner, Patti Sollereder and Ying Cui Relationships Between Fine-Motor, Visual-Motor, and Visual Perception Scores and Handwriting Legibility and Speed Physical & Occupational Therapy in Pediatrics 2011 31:1, 103-114

#### **Sinesthetics and Handwriting**

*Pediatric Physical Therapy* published interesting research comparing 8 children with proficient handwriting and 8 children with non proficient handwriting. All of the children did not have a history of motor or cognitive issues. Each child was tested for kinesthetic sensitivity, discriminate tactile awareness, diadochokinesia, stereognosis, and graphesthesia. Following statistical analysis, the two groups did show a significant difference in handwriting legibility. The was no differences between the two groups in kinesthetic sensitivity or other measures of sensation.

Reference: Brink, Anne O'Leary PT; Jacobs, Anne Burleigh PT, PhD Kinesthetic Sensitivity and **Related Measures of Hand Sensitivity in Children With Nonproficient Handwriting Pediatric Physical Therapy: Spring 2011 - Volume 23 -Issue 1 - p 88–94 doi: 10.1097/PEP.0b013e318208cc8** 

### **Executive Function**

he Center on the Developing Child at Harvard University has published a paper entitled *Building the Brain's "Air Traffic Control" System: How Early Experiences Shape the Development of Executive Function.* This paper provides an overview on executive function and how it develops in children.

Executive functions include working memory, inhibitory control and cognitive or mental flexibility. These three main abilities work together to make up executive functions.

Some of the key research indicates the following:

a.) that the building blocks of executive function start during early childhood but continue to develop into the adolescent years

b.) scientists are making great gains in determining what areas of the brain executive functions are dependent upon to develop i.e. mostly the prefrontal cortex but also the anterior cingulate, parietal cortex and the hippocampus

c.) executive function builds a strong foundation for school readiness, academic success, social, emotional and moral development.

d.) a child's environment plays a large role in developing executive function

The evaluation research indicates that:

a.) specialized training programs can help executive function skills to develop

b.) focused preschool interventions can help to strengthen a child's executive function skills

c.) when improvements in executive function are seen it carries over to social and academic successes

This is an extensive article on executive functions which also includes a helpful table of a developmental time line for working memory, inhibitory control and cognitive flexibility develop. You can download the entire paper at the Center on the Developing Child - Harvard University.

Reference: Center on the Developing Child at Harvard University (2011). Building the Brain's "Air Traffic Control" System: How Early Experiences Shape the Development of Executive Function: Working Paper No. 11. Retrieved from www.developingchild.harvard.edu

### Walking

#### **Energy Expenditure of Pediatric Amputees**

The *Journal of Bone and Joint Surgery* has published research on the effect of amputation level on energy expenditure during overground walking by children with an amputation. The oxygen consumption of 73 children with amputations was measured while walking overground for 10 minutes at a self selected pace. The results indicated that children with above knee amputations walk significantly slower and with an increased energy cost when compared to their peers. Children with below knee or at the knee amputations were able to maintain normal walking speed without increased energy consumption.

Reference: Jeans, Kelly A., Browne, Richard H., Karol, Lori A. Effect of Amputation Level on Energy Expenditure During Overground Walking by Children with an Amputation J Bone Joint Surg Am 2011 93: 49-56

#### Toe Walking and Autism

The *Journal of Child Neurology* published research on a review of records of 934 children with a history of tight heel cords and toe walking. Toe walking (20.1%) and tight heel cords (12%) were present more often in the 324 children with autism but lower in 30 children with Asperger Syndrome (10% with toe walking and 3% with tight heel cords). The researchers reaffirmed previous research that toe walking is more prevalent in children with autism and are concerned there may be a secondary orthopedic deformity in this population.

Reference: William J. Barrow, Margie Jaworski, and Pasquale J. Accardo. Persistent Toewalking in Autism J Child Neurol 0883073810385344, first published on January 31, 2011 doi:10.1177/0883073810385344

#### Walking and Social Interactions

*Infant Behavior and Development* published interesting research on walking and social interactions. Research has already indicated that crawling is a motor as well as a cognitive milestone. In this study there were three experiments and the results were the following:

1. social and exploratory behaviors were the same in crawling infants whether crawling or in a baby walker

2. independently walking infants spent significantly more time interacting with toys and mothers, made more vocalizations and directed gestures than age matched, crawling peers in a baby walker

3. when infants progress from crawling to walking increased interaction with mothers and more sophisticated social interactions were observed (even when controlled for age)

The researchers concluded that there is a developmental progression that links social interactions with developmental milestones in locomotor skills. For non ambulatory young children, this may be appropriate to reference when justifying a need for powered mobility or mobile standing frames.

Reference: Melissa W. Clearfield Learning to walk changes infants' social interactions. Infant Behavior and Development Volume 34, Issue 1, February 2011, Pages 15-25

# Hot Topics

#### **ADHD and Overflow Hand Movements**

A recent study published in Neurology compared 25 boys and girls with ADHD and 25 boys and girls without ADHD. All of the children were right handed. They were asked to perform left handed finger tapping. Using video and a recording device measuring finger movements, the children with ADHD exhibited more mirror overflow movements with the right hand than the children without ADHD. This was particularly noticeably in the boys who showed almost four times as much mirror overflow.

In a second study, the researchers used trans-cranial magnetic stimulation to the motor control area of the brain on 49 children with ADHD compared to 49 children without ADHD. The results showed that the short interval cortical inhibition (the brain's "braking mechanism") was decreased by 40% in children with ADHD. This reduction in inhibition was strongly associated with the severity of the ADHD. In addition, the children with ADHD scored 60% lower on tests of motor development.

Reference: American Academy of Neurology. Abnormal Control of Hand Movements May Hint at ADHD Severity in Children. Retrieved from the web on 2/15/2011 from http://www.aan.com/press/index.cfm?fuseaction=release.view&release=908

#### Physical Activity Linked to Improved IQ and Math Scores in Kids

Health Psychology published research on a study of 171 overweight 7 to 11 year olds who participated in increased physical activity. The following results were seen in the children who participated in the vigorous exercise group :

- 1. Increased brain activity in prefrontal cortex seen on MRI
- 2. IQ scores increased by 3.8 points with 40 minutes of exercise per day afterschool (smaller increases in

children who exercised 20 minutes per day)

3. Improved math scores but not improved reading skills

Reference: Physorg.com Exercise helps overweight children think better, do better in math. Retrieved from the web on 2/10/11 at http://www.physorg.com/news/2011-02-overweight-children-math.html

#### Kinect versus the Wii?

I recently was able to try out the new Kinect on the Xbox. It was an interesting experience. The Kinect is able to detect your motions without any remote or game controller. Not only does it detect upper extremity motion (like the Wiimote) it also can detect lower extremity motion. I played soccer and did several track and field events. It was definitely very different from the Wii. The first step is to get the Kinect to register your motions. It was hard to match up my hands or feet exactly where the Kinect wanted me to. I found it to be difficult to follow which person I even was. In addition, the motor planning and body awareness required to kick the ball or jump a hurdle was challenging. I am sure if I practiced more I would be able to plan and execute my virtual motor actions better. For now though I am sticking with the Wii.

I do see amazing possibilities for the reasonably priced technology though. I imagine therapeutic home exercise programs where therapists can remotely track how a client is doing with regards to range of motion, reaction time, balance skills and more.

# On the Web...

#### **Apps for Special Needs**

There is a fun new website entitled Apps for Children with Special Needs. The unique thing about this website is the video demonstrations of the apps. For example here is an app about <u>dressing skills</u>. There are videos on how to dress, how to wash your face, how to wash your clothes, etc. You can get a nice preview of the app before purchasing it. Worth a look if you are unsure of what to load your iPad or iPhone with. Check it out at <u>Apps for Children with Special Needs</u>.

#### Podcast on Pediatric Variability

Physical Therapy has just posted a new podcast entitled Variability in Childhood Development. Several researchers discuss the importance of variability in normal child development. The podcast is approximately 26 minutes long. You can download it for free at <u>Physical Therapy podcasts</u>.

I just finished listening to it and the researchers bring up some good points on:

- why children need variability in order to learn motor skills.
- · Children need to fail at times in order to learn the correct movements or postures.
- how children benefit from variability as they explore their environments

Therapists need to take cues from infants and children to allow for variability to occur.

Reference: Variability in Childhood Development. Physical Therapy doi: 10.2522/ptj.2010.90.12.1708 Physical Therapy November 2010 vol. 90 no. 12 1708-1709

#### **Play Activities for Children with Disabilities**

The Alliance for Technology Access has a wonderful, free publication that you can download entitled "We Can Play". This is a 20 page document loaded with fun, adaptable ideas for children with disabilities. Topics include bike riding, accessible birthday party ideas, games for the car, cooking tips and more. Each topic is a one page document that would make a great hand out for parents and teachers. Check it out <u>here</u>.

Follow us on Facebook www.Facebook.com/YourTherapySource Follow our blog at www.YourTherapySource.blogspot.com





www.YourTherapySource.com

Follow us on Twitter www.Twitter.com/YTherapySource

### **Glass Stone Letters and Shapes Activity**

**Purpose:** Encourage fine motor skills, separation of radial and ulnar sides of the hand, letter recognition and sensory input

**Materials:** glass stones (available at dollar stores for \$1/bag in plant section), download of letter and shape template, glue stick, optional: sensory table or clay. Do not do this activity with children under 3 years old or children who mouth objects. The glass stones are a choking hazard.



#### How to Make and Play:

Step 1: Print the glass letters and shapes download on this page - http://yourtherapysource.com/files/glass\_letters.pdf.

Step 2: Cut out the squares. Apply glue to letter side of square and glue to the flat side of the glass stone. Let dry. Your letters and shapes are ready.





Step 3: Hide the glass stone letters in a sensory table with dry items. Can the child dig out matching upper case and lower case letters? Try hiding the glass stone letters in clay. Can the child pull out the letters and match them up?

Step 4: Print the matching board. Can the child find the matching shapes and put them on the board?

Challenge: Have the child pick up the glass letters of his/her name,one at a time, holding the glass stones in the same hand to encourage separation of the radial and ulnar side of the hand. Can they pick up all the letters and hold them under the pinky and ring fingers?

One more idea: Put magnets on back and put on vertical surface to practice spelling words.

# Your Therapy Source Inc.



www.YourTherapySource.com

## Visit <u>www.YourTherapySource.com</u>

for a full list of our products including:

- documentation forms
- sensory motor activity ideas
- sensory processing resources
- visual perceptual activities
- music downloads

We ship digital items worldwide for FREE!

Visit our website for FREE hand-outs, articles, free newsletter, recent pediatric research and more!