ADHD: Exploring Role of OTs and PTs:

Reference	Findings	Clinical Application
Support School Staff and Parents		
Mautone, Jennifer A., Elizabeth K. Lefler, and Thomas J. Power. **"Promoting family and school success for children with ADHD: Strengthening relationships while building skills."** Theory into practice 50.1 (2011): 43-51.	strengthening relationships (parent–child relationship, family involvement in education at home, family–school collaborate) to build academic and social skills	optimizing the effects of intervention typically involves a multisystem approach that targets both the family and school. PT and OT: Support of this team
Daley et al. **ADHD and academic performance: why does ADHD impact on academic performance and what can be done to support ADHD children in the classroom?** Child Care Heath Dev. 2010. Jul; 36 (4): 455-64.	-Reviewed preschool through adulthood -The literature suggest that it is the symptoms of ADHD and underlying cognitive deficits or executive functioning (EF) deficits not hyperactivity or co-morbid problems that are at the root of the academic underachievement (i.e. leg shaking) -EF deficits: Response inhibition, working memory; Problems with: Planning, prioritizing, focusing, filtering distractions, organization	-ADHD symptoms impact academic attainment across the lifespan from school readiness to performance in college -Classroom based interventions can help and support children in the classroom, Key Strategies: (1) use short clear messages (promotes more efficient processing of info) (2) shorter assignment length or break into parts/units and movement breaks (thus minimizing symptoms of hyperactive/impulsivity), (3) use of distracter objects to increase focus during longer instruction and test , (4) consider motivational style -Key factors to student academic success: (1) increasing a teacher's knowledge about ADHD and treatment strategies (2) teacher and school staff working in a team approach interdisciplinary based, collaborative approach (3) positive attitude toward students (4) use of gestures when communicating to students -Deficits in executive functioning appear to be at the root of ADHD related academic underperformance, academic interventions should focus on EF deficits, promote strategies for: (1) working memory, (2)

		planning, (3) response inhibition (4) inattentive symptoms (focusing, filtering distraction
Mulligan, Shelley. "**Classroom strategies used by teachers of students with attention deficit hyperactivity disorder**." *Physical & Occupational Therapy in Pediatrics* 20.4 (2001): 25-44.	**Strategies receiving the highest frequency and effectiveness ratings:** enforcing routine and structure, frequent contact, preferential seating, use of motor breaks, and teaching self-monitoring of behaviors. **Strategies receiving the lowest effectiveness ratings:** peer tutoring, timeout, and giving assistance during transitions. **Teacher responses to open-ended questions** provided recommendations for improving the education of children with ADHD, including: increasing special education support in the classroom, smaller class sizes, frequent parent-teacher collaboration, and more hands-on learning experiences.	OTs and PTs can support these strategies and teacher recommendations
Richardson, Michelle, et al. "Non-pharmacological interventions for attention-deficit/hyperactivity disorder (ADHD) delivered in school settings: systematic reviews of quantitative and qualitative research." (2015).	Importance of decisions teachers made about treatment, the self-perceptions students developed about themselves, role of the classroom environment and stigma in aggravating ADHD	relationship-building skills are potential implications for interventions, **relationships between pupils-teachers, parents-teachers and pupils-peers**

	symptoms, and the significant barrier to treatment posed by the common presence of conflict in relationships between pupils-teachers, parents-teachers and pupils-peers in relation to ADHD	
Motor Skill Development		
Kedro, Melinda. **Gross & Fine Motor Development in ADHD Children.** Avaialbe at: http://oureverydaylife.com/gross-fine-motor-development-adhd-children-22906.html. Accessed: January 8, 2017. *Article references recent research •	Children with ADHD are more prone to gross and fine motor developmental problems. Children with ADHD might struggle with gross-motor skills as a result of their inability to slow down and focus on their movements. ight require additional help to complete written homework assignments and any tasks that necessitate hand-eye coordination and precision.	Provides an outlet for the elevated level of energy that these children typically display. Fine-motor training programs are available to help children with ADHD develop the manipulation of their hands and fingers
SeSalem, Kamal. Special Education: The Effect of Fine Motor Training Program on the Academic Achievement for Students With ADHD. Available at: *http://www.articlesbase.com/adhd-articles/the-effect-of-fine-motor-training-program-on-the-academic-achievement-for-students-with-adhd-619540.html*	20 male students 6 and 11years, all of whom had classified as having combined symptoms of ADHD , RCT - The first instrument was the Wide Range Achievement Test-III (WRAT-III). The WRAT-III includes 3 subtests: reading, spelling, math - Fine Motor Training (FMT) program.	-FMT program appears to enable students diagnosed with the Combined Type of ADHD to make statistically significant gains in measures of academic achievement in the areas of reading, spelling, and mathematics. -suggests that providing ADHD students with fine motor training would positively impacted their academic achievement.

Equipment		
Schilling, Denise Lynn, et al. "Classroom seating for children with attention deficit hyperactivity disorder: Therapy balls versus chairs." *American Journal of Occupational Therapy* 57.5 (2003): 534-541.	-4th grade inclusive classroom during language arts. -increases in in-seat behavior and legible word productivity for the students with ADHD when seated on therapy balls.	use of therapy balls for students with ADHD may facilitate in-seat behavior and legible word productivity. •
Fedewa, Alicia L., and Heather E. Erwin. "Stability balls and students with attention and hyperactivity concerns: Implications for on-task and in-seat behavior." *American Journal of Occupational Therapy* 65.4 (2011): 393-399.	- 8 students in the 4th and 5th grades, 3 times/wk for 12 wk - increased levels of attention, decreased levels of hyperactivity, and increased time on task and in seat or on ball.	evidence for the effectiveness of stability balls in the general education classroom for children who exhibit difficulties with attention and hyperactivity.
Pfeiffer, Beth, et al. "Effectiveness of Disc 'O'Sit cushions on attention to task in second-grade students with attention difficulties." *American Journal of Occupational Therapy* 62.3 (2008): 274-281.	-63 2nd graders, RCT (31 treatment, 32 control) Treatment group: Disc 'O' Sit cushions throughout the school day for 2 wks. -teachers completed the Behavior Rating Inventory of Executive Functioning for each participant before and after the intervention. - statistically significant difference in attention to task before and after the	results provide preliminary evidence for the use of the Disc 'O' Sit cushion as an occupational therapy intervention to improve attention in the school setting

	intervention for the treatment group.	
Lin, Hung-Yu, et al. "Effects of weighted vests on attention, impulse control, and on-task behavior in children with attention deficit hyperactivity disorder." *American journal of occupational therapy* 68.2 (2014): 149-158.	Randomized, 110 children with ADHD, used the Conners' Continuous Performance Test–II (CPT–II) task. - significant improvement in all 3 attentional variables of the CPT–II task, including inattention; speed of processing and responding; consistency of executive management; and three of four on-task behaviors, including off task, out of seat, and fidgets. No significant improvements in impulse control and automatic vocalizations were found.	findings support the use of the weighted vest to remedy attentional and on-task behavioral problems of children with ADHD •
Movement Breaks		
Imeraj, Lindita, et al. "The Impact of Idle Time in the Classroom Differential Effects on Children With ADHD." *Journal of attention disorders* 20.1 (2016): 71-81.	investigated the differential impact of classroom "idle time"--periods when students are not actively engaged or waiting for a task--on the behavior of 31 children with	Findings highlight the differential susceptibility of ADHD children to classroom idle time. Classroom interventions might consider targeting specifically these periods to reduce disruptive behavior in these children.

	ADHD and 31 typically developing classmates During idle time, levels of hyperactivity and noisiness increased significantly more in children with ADHD than in their classmate	
McMullen, Jaimie, Pamela Kulinna, and Donetta Cothran. "Physical activity opportunities during the school day: classroom teachers' perceptions of using activity breaks in the classroom." *J Teach Phys Educ* 33.4 (2014): 511-27.	Twelve elementary and high school classroom teachers Emergent themes included: the need for and threats to classroom control; a preference for breaks with connections to academic content; and the importance of implementation ease and student enjoyment	teachers prefer activity breaks that are easy to manage, quick, academically oriented and enjoyable for students
ADHD and the Classroom https://www.cdc.gov/ncbddd/adhd/treatment.html	**Allow time for movement and exercise**	OTs and PTs can support these strategies
Physical Activity Benefits		
Smith, Alan L., et al. "Pilot physical activity intervention reduces severity of ADHD symptoms in young children." *Journal of attention disorders* 17.1 (2013): 70-82.	Seventeen children (Grades K-3) exhibiting four or more hyperactivity/impulsivity symptoms on the Disruptive Behavior Disorders Rating Scale (Pelham, 2002) completed about 26 min of continuous moderate-to-vigorous physical activity daily over eight weeks.	reduces severity of ADHD symptoms in young children
Pontifex, Matthew B., et al. "Exercise improves behavioral, neurocognitive, and	Following a single 20-minute bout of exercise, both	indicate that single bouts of moderately intense aerobic exercise may have positive implications for

scholastic performance in children with attention-deficit/hyperactivity disorder." *The Journal of pediatrics* 162.3 (2013): 543-551.	children with ADHD and healthy match control children	aspects of neurocognitive function and inhibitory control in children with ADHD.
Medina, José A., et al. "Exercise impact on sustained attention of ADHD children, methylphenidate effects." *ADHD Attention Deficit and Hyperactivity Disorders* 2.1 (2010): 49-58.	25 children diagnosed with ADHD - high intensity PA	results suggest that children's attention deficits can be minimized through PA irrespective of treatment with methylphenidate
Chang, Yu-Kai, et al. "Effect of acute exercise on executive function in children with attention deficit hyperactivity disorder." *Archives of Clinical Neuropsychology* 27.2 (2012): 225-237.	40 children with ADHD were randomly assigned into exercise or control groups. Participants in the exercise group performed a moderate intensity aerobic exercise for 30 min	Findings suggest executive function benefits
Verret, Claudia, et al. "A physical activity program improves behaviour and cognitive functions in children with ADHD: An exploratory study." *Journal of attention disorders* (2010).	fitness level, motor skills, behaviors, and cognitive functions are assessed by standardized tests before and after a 10-week training or control period. improves behaviour and cognitive functions	Findings show that participation in a physical activity program improves muscular capacities, motor skills, behavior reports by parents and teachers, and level of information processing. A structured physical activity program may have clinical relevance in the functional adaptation of children with ADHD.
Gapin, Jennifer I., Jeffrey D. Labban, and Jennifer L. Etnier. "The effects of physical activity on attention deficit hyperactivity disorder symptoms: the evidence." *Preventive Medicine* 52 (2011): S70-S74.	reduces ADHD symptoms Literature was reviewed examining the effects of PA on cognitive and/or behavioral symptoms of ADHD.	current research generally supports the potential for acute and chronic PA to mitigate ADHD symptoms.

Lufi, Dubi, and Jim Parish-Plass. "Sport-based group therapy program for boys with ADHD or with other behavioral disorders." *Child & Family Behavior Therapy* 33.3 (2011): 217-230.	20 weekly sessions for 1 academic year Assessed- before, at completion of group, and 1 year after completion	results showed: children indicated improvement in behavior, parents indicated improvement in the children's behavior -**Reduction of anxiety.**
Wigal, Sharon B., et al. "Exercise: applications to childhood ADHD." *Journal of attention disorders* (2012): 1087054712454192.	Exercise affects the same dopaminergic and noradrenergic systems that stimulant medications target and is a stressor, which elicits measurable physiological changes. The magnitude of these peripheral alterations is posited as a potential biomarker of ADHD. The hypothesis that exercise training alters the underlying physiology present in ADHD and other medical conditions as well as conceptual issues behind its potential clinical utility is reviewed.	
Barnard-Brak, Lucy, et al. "The association between physical education and symptoms of attention deficit hyperactivity disorder." *Journal of Physical Activity and Health* 8.7 (2011): 964.	Review of 10 years of research	physical activity interventions may provide an alternative, non-pharmaceutical approach to management of ADHD in children.
Kiluk, Brian D., Sarah Weden, and Vincent P. Culotta. "Sport participation and anxiety in children with ADHD." *Journal of Attention Disorders* (2008).	Scores on parent-reported measures of mood and behavior were retrospectively compared among a group of 65 children (ages 6 to 14) diagnosed with ADHD based on their amount of sport participation.	-Children with ADHD who participated in three or more sports displayed significantly fewer anxiety or depression symptoms than did those who participated in fewer than three sports. -Results suggest that active sport participation may be associated with a **reduced expression of anxiety or depression symptom**s in children with ADHD.
Articles on the Benefits of Physical Activity		
The Benefits of Exercise for Children with ADHD http://www.c8sciences.com/the-benefits-of-exercise-for-children-with-adhd/ **Exercise for Children With ADHD: http://www.webmd.com/add-adhd/childhood-adhd/exercise-for-children-with-adhd_#1**		

Exercise Is ADHD Medication http://www.theatlantic.com/health/archive/2014/09/exercise-seems-to-be-beneficial-to-children/380844/ **(great brain scan visuals)**

How Exercise Works Like A Drug for ADHD http://www.everydayhealth.com/add-adhd/can-you-exercise-away-adhd-symptoms.aspx

How Exercise Works Like A Drug for ADHD: Physical activity has short-term but powerful benefits for adults and kids with ADHD. http://www.everydayhealth.com/add-adhd/can-you-exercise-away-adhd-symptoms.aspx

How Exercise Boosts Brain Function
http://m.additudemag.com/?url=http%3A%2F%2Fwww.additudemag.com%2Fadhd%2Farticle%2F936.html&utm_referrer=#2816

Exercise: An Alternative ADHD Treatment
http://m.additudemag.com/?url=http%3A%2F%2Fwww.additudemag.com%2Fadhd%2Farticle%2F3280.html&utm_referrer=#2498

The Best Sports for Children With ADHD http://www.everydayhealth.com/adhd/best-sports-for-children-with-adhd.aspx

ADHD and Exercise: Studies show that even half an hour a day can help kids function better and feel better.
http://childmind.org/article/adhd-and-exercise/

Taking Away Recess Bad for ADHD Kids, Experts Say http://www.livescience.com/20557-adhd-exercise-recess-improve-behavior.html

Exercise: An Alternative ADHD Treatment Without Side Effects Physical activity may be good for focus. Plus, it's an inexpensive, self-prescribed, and accessible alternative ADHD treatment for both adults and children.
http://m.additudemag.com/?url=http%3A%2F%2Fwww.additudemag.com%2Fadhd%2Farticle%2F3142.html&utm_referrer=#3094

ADHD & Social Problems in Young Children: http://www.smartkidswithld.org/adhd-and-social-problems-in-young-children/ Solution: sports, turn taking sports, physical activity