# **Evidence-Based Secondary Transition Predictors for Physical Therapists Working** With High School Students

Antonette Doty, PT, PhD, PCS; Laurie Ray, PT, PhD; Kelly Clark, PhD; Lauren Bethune, PhD; David Test, PhD

Walsh University (Dr Doty), North Canton, Ohio; Department of Public Instruction (Dr Ray), University of North Carolina-Chapel Hill, Chapel Hill, North Carolina; Yang-Tang Institute on Employment and Disability (Dr Clark), School of Industrial and Labor Relations, Cornell University, Ithaca, New York; Vanderbilt Kennedy Center (Dr Bethune), Vanderbilt University, Nashville, Tennessee; Special Education Department (Dr Test), University of North Carolina at Charlotte, Charlotte, North Carolina.

Purpose: Individuals with disabilities experience poorer postschool outcomes compared with their peers without disabilities. Youth with orthopedic or physical disabilities experience challenges during transition particularly in the areas of education and employment. Physical therapists should continue to become more involved in transition planning and providing services for transition-age students with physical disabilities. The purpose of this article is to clarify the role of physical therapists who work with students who have disabilities, as they transition from high school to postsecondary roles as well as provide the current evidence-based predictors of postschool success and recommended practices to school-based physical therapists who work with these students.

Summary of Key Points: Evidence-based instructional practices for secondary students with disabilities and identified in-school predictors of postschool success for students with disabilities are aligned with effective practices for physical therapists. Additionally, suggestions for involving physical therapists in transition planning and increasing collaboration in providing transition services for students with disabilities are provided.

Statement of Conclusions: Physical therapists can provide critical expertise for many individuals with disabilities; however, they are not always included effectively in transition planning and services for students with disabilities.

Recommendations for Clinical Practice: Recommendations for practice include ways to involve physical therapists in transition planning and services and increasing collaboration between teachers, physical therapists, and other members of the Individualized Education Program team to provide effective, comprehensive transition services. (Pediatr Phys Ther 2020;32:258–265)

Key words: physical therapy, related services, secondary students with disabilities, special education, transition planning

Research indicates young adults with disabilities consistently experience poor postschool outcomes in the areas of postsecondary education, employment, and independent living.<sup>1</sup> For people with physical disabilities (eg, cerebral palsy, spinal cord injury, and spina bifida), transitioning to adulthood often

0898-5669/110/3203-0258 Pediatric Physical Therapy Copyright © 2020 Academy of Pediatric Physical Therapy of the American Physical Therapy Association

Correspondence: Antonette Doty, PT, PhD, PCS, Physical Therapy Program, Walsh University, 2020 East Maple St, North Canton, OH 44720 (adoty@walsh.edu).

Grant Support: Support for graduate students (Clark and Bethune) was provided by grant H326E1400004. The National Technical Assistance Center on Transition is funded by a grant from the US Department of Education, Office of Special Education and Rehabilitative Services.

The authors declare no conflicts of interest.

DOI: 10.1097/PEP.00000000000000706

presents many challenges, particularly in the areas of education and employment.<sup>2</sup> Data indicate youth and adults with physical disabilities are less likely to obtain paid employment when compared with peers without disabilities. Michelsen et al<sup>3</sup> reported only 33% of students with cerebral palsy obtained competitive employment compared with 82% of students without disabilities. National longitudinal transition data indicate students with visual and hearing impairments (78%) were more likely to attend and participate in postsecondary education 4 years after high school graduation than students with orthopedic disabilities (only 54%).<sup>4</sup> Additionally, data from the National Longitudinal Transition Study 2012 indicate youth with orthopedic impairment and multiple disabilities were less likely than peers with other types of disability to (a) perform daily living activities independently, (b) get together with friends weekly, (c) take a college entrance or placement examination, (d) have recent paid work experience, and (d) have parents who expect them to live independently after high school.<sup>5</sup>

Further, education and mobility training have been positively correlated with paid employment for students with orthopedic and physical limitations. Tobimatsu and Nakamura<sup>6</sup> asserted that a barrier to success for students with physical and orthopedic disabilities is the level of and access to education, along with psychosocial challenges associated with adjustment to different environments.<sup>7</sup> School-based physical therapists have provided support to students with disabilities for over 40 years under the Individuals with Disabilities Education Act (IDEA).<sup>8,9</sup> However, their participation in providing supports to secondary students has not been consistent. The 1997 IDEA amendments adopted a focus on postschool outcomes and added related services, including physical therapy, as transition services to the transition definition.<sup>10</sup>

Recently, a national survey of school-based physical therapists working with secondary students with disabilities was conducted to provide a baseline for current practices of physical therapists across the United States and identify predictors of their involvement with secondary students.<sup>11</sup> Doty et al<sup>11</sup> stated that there was more involvement of physical therapists on transition teams than previously described. More than 50% of the 1041 respondents had high school students on their caseloads. However, therapists expressed the need for continued training and support to provide quality services for secondary students.

While the evidence-based predictors of postschool success described in this article align with the physical therapy scope of practice and can promote integration of effective practices into school-based intervention, limited research has investigated what in-school services are positively correlated with paid employment and participation in postsecondary education for youth with physical disabilities.<sup>2</sup> It is critical to understand how physical therapy services provided during secondary education impact the postschool outcomes of youth with physical disabilities. Research recommends providing youth with disabilities critical secondary transition services using evidencebased practices as one way to help close gaps in postsecondary education, employment, and independent living.<sup>12</sup> However, there remains a paucity of research on evidence-based, physical therapy practices for secondary students.<sup>11</sup> With the number of people with orthopedic and physical disabilities, the need for effective school-based physical therapy services and health care practices is essential.12

In response to poor postschool outcomes experienced by students with disabilities<sup>1</sup> and an increased involvement of physical therapists in transition planning for students with disabilities,<sup>11</sup> clarification of the role of the physical therapist working with transition-age students is needed. The purpose of this article is threefold:

- 1. Clarify the role of physical therapists in postsecondary transition in middle and high school to adulthood and community engagement.
- 2. Provide current evidence-based predictors of postschool success.
- 3. Suggest recommended or best practices for physical therapy intervention to school-based physical therapists who work with these students.

# EVIDENCE-BASED IN-SCHOOL PREDICTORS OF POSITIVE POSTSCHOOL OUTCOMES

Because experimental research identified by Test et al<sup>12</sup> did not investigate effects of the evidence-based practices on postschool outcomes of students with disabilities, Test et al<sup>14</sup> synthesized high-quality correlational research in secondary transition published since 1985 and identified 16 predictors of postschool success. Since then, Mazzotti et al<sup>15</sup> identified 4 additional predictors of postschool success bringing the total to 20 predictors. These predictors can be clustered into 4 categories: (a) collaborative systems, (b) policy, (c) career development, and (d) student skills. These clusters are suggestions from the National Technical Assistance Center for Transition (NTACT) for grouping the predictors by similar topics or themes to facilitate discussion. A list of predictors and correlated postschool outcome areas is shown in Table 1. Table 2 (ie, collaborative systems and policy) and Table 3 (ie, career development and student skills) provide information on each cluster, predictors associated with that cluster, applicable physical therapy practices, and examples of how physical therapy services relate to each cluster. The 4 categorical clusters and predictors they contain have been outlined and discussed to provide physical therapists a background, terminology, individual predictors, and an organizational framework. We hope to assist each practitioner to conceptualize this work for their own practice.

# **COLLABORATIVE SYSTEMS**

The collaborative systems cluster includes:

- interagency collaboration, which requires developing relationships with multiple adult agencies such as vocational rehabilitation, agencies serving people with developmental disabilities, employers, and university disability services;
- parent expectations/parent involvement, which relies on active, meaningful involvement by parents and families during middle and high school years (or transition years). This can boost sustainable employment opportunities for students with disabilities, among other important contributions.
- student support can come from multiple sources including family, friends, the school community and the community at large who assist the student throughout the school and workday; and
- the transition program, a comprehensive, individualized collection of goals, instruction, activities, services, and team philosophy offered by a district to achieve postschool goals.<sup>13,16</sup>

Collaborative systems within and beyond the school are a lynchpin to successful student transitions to adulthood. Sustained collaboration adds both depth and breadth to transition resources, choices, and activities. Functional collaboration systems afford each student broad problemsolving options and can drive improvement for local transition

TABLE 1
Clustered Predictors of Success by Postschool Outcome Area

	Outcome Area		
Predictor	Education	Employment	Independent Living
Career development cluster			
Career awareness	Xa	Х	
Occupational courses	Х	Х	
Paid employment/work experience	Х	Х	Х
Vocation education	Х	Х	
Work study		Х	
Student skills cluster			
Community experiences		Х	
Goal setting	Х	Х	
Self-advocacy/self-determination	Х	Х	
Self-care/independent living	Х	Х	Х
Social skills	Х	Х	
Travel skills		Х	
Youth autonomy/decision-making	Х	Х	
Collaborative systems cluster			
Interagency collaboration	Х	Х	
Parent expectations	Х	Х	Х
Parental involvement		Х	
Student support	Х	Х	Х
Transition program	Х	Х	
Policy cluster			
Exit exam requirements/high school diploma status		Х	
Inclusion in general education	Х	Х	Х
Program of study		Х	

 $^{a}X =$  has high-quality correlational research tying predictor to improve postschool outcomes in this area.

programs. Conversely, poor or inconsistent collaborative systems can, just as powerfully, impede meaningful transition efforts.

# POLICY

The policy cluster includes the following predictors:

- Exit examination requirements/high school diploma status, encompassing the multiple diploma tracks available for students with disabilities, from traditional diplomas to alternative diplomas. What is offered and/or available can vary widely from state to state.
- Inclusion in general education is the amount of time students with disabilities spend in courses with typical peers and promotes enrollment in postsecondary education.
- Program of study is the continuum of curricula available in high school. This is most often determined by a student's postschool goals of postsecondary education or employment.<sup>13</sup>

Clear policy and expectations for student transitions allow transition teams to individualize transition planning and explore available choices, even to create a new choice. Teams and their partners are less likely to try a novel or unique solution without the confidence derived from clarity and fore knowledge of policy, procedure, and administrative support. Without established policy and procedures, success can be temporary or isolated.

#### CAREER DEVELOPMENT

The career development cluster encompasses the following:

- Career awareness/career and technical education includes employment-related skills such as interviewing, job searching, and understanding the requirements of a variety of careers.
- Occupational courses modify curriculum for students with disabilities focusing on employment and adult living rather than postsecondary education.
- Paid employment/work experience refers to students with disabilities having paying job while in high school.
- Work study encompasses students attending traditional classes, part of the day in addition to working at a job site for pay or credit.<sup>13</sup>

An early start on career development enables a student and team's time to experiment, try things, adjust situations and supports, and narrow the focus to the best career path to pursue (currently). All students can struggle with many possibilities for work. Identifying appropriate work for students with varied abilities and needs compounds this challenge. Additionally, career exposure and paid work can be very limited in many communities. Established relationships and creativity must be leveraged to make opportunities for our students. This cluster clearly demonstrates how enmeshed each predictor is with the other predictors. Without aspects contributed by each of the other clusters (eg, parent involvement, effective curriculum, clear policy, work exposure, and effective collaboration),

 TABLE 2

 Physical Therapy Applications for Collaborative Systems and Policy Clusters

Cluster	Predictors	Physical Therapy Application	Examples
Collaborative systems	Interagency collaboration Transition program Student support Parent involvement Parent expectations	<ul> <li>Obtain consent/assent to communicate with community providers/agency partners</li> <li>Build relationships with involved agency partners; offer environmental or equipment assessment/support</li> <li>Collaborate for specific, measurable transition goals</li> <li>Solicit input from multiple stakeholders for equipment needs</li> <li>Assess needed skills and convey abilities (for employment, continued education, and/or independent living), as well as challenges to student and family</li> <li>Address needed skill areas with individualized home programs, monitoring needs</li> <li>Assist with identifying potential living options and accompany student/family on tours to indicate inherent supports and challenges</li> <li>Identify potential barriers to goals; work to bring into alignment with resources, community options, mastered skills</li> <li>Prepare other team members for role release of motor and mobility activities</li> <li>Problem solve and clearly instruct other team members to promote access/provide supports in the community</li> <li>Work within student preferences and team priorities to developing consensus goals and objectives</li> <li>Identify, increase, and promote natural opportunities for students (especially those with complex disabilities) to practice motor skills needed for employment, independent living, and recreation in the community</li> <li>Emphasize and promote family and student participation in all decisions</li> <li>Facilitate involvement of families, establish and deepen</li> </ul>	Become a "go-to" source for job coaches, caregivers, and counselors for assistance/ problem-solving with communication, collaboration, or new barriers Assist the family with postschool goals such as independent living Assess activities of daily living and supports required for the student to live independently and potential options for accessibility Analyze needed skills, abilities, and supports. Intervene as appropriate for skills, supports, adaptation, and environmental accommodations
Policy	High school diploma status Inclusion in general education Program of study	<ul> <li>team relationships.</li> <li>Explore opportunities for time with peers without disabilities, identify classes, "specials," extracurricular activities building on student strengths and interests; problem solve subsequent participation</li> <li>Ensure physical access (eg, mobility and positioning) to programs, classes, instructional activities, and extracurricular activities</li> <li>Understand and promote individual student transition goals and transition program initiatives and goals</li> <li>Participate in planning and decisions for secondary programs, especially regarding students with complex disabilities</li> <li>Understand resource availability as well as constraints of the program; align interventions accordingly to promote success of transition age students with whom they work<sup>24</sup></li> </ul>	Student, teacher, and PT problem-solve positioning issues while promoting engagement Note: While many students on PT workloads may not be included in general education, it is the responsibility, insight, and advocacy of the PT that can lead to initial experiences with peers without disabilities. These experiences and reverse-inclusion opportunities can progress over time to accessing the general curriculum

success is curtailed. This cluster requires contributions from the school staff, the student, parents, family, and community partners working together.

# STUDENT SKILLS

The student skills cluster contains these predictors:

- Self-care/independent self-determination/self-advocacy. Students must possess the adaptive and behavioral skills needed for daily life as an adult. This improves quality of life for everyone, including students with disabilities.
- *Goal setting and youth autonomy.* Mastering the skills needed for choice making, setting individual goals, self-awareness, self-regulation, and efficacy lead to autonomy, increased independence, and positive employment outcomes.
- Social skills, travel skills, and community experiences. Social skills are needed for students to interact with others at school, work, and in the community. This ability improves quality of life and increases opportunities for employment and social engagement after graduation. The ability to use transportation and move throughout the community impacts a student's ability to work and live

 TABLE 3

 Physical Therapy Applications of Career Development and Student Skills Clusters

Cluster	Predictors	Physical Therapy Application	Example
Career development	Career awareness Occupational courses Paid employment Work experience Work study Vocational education	Task analyze jobs or professional interests Intervene for job/task components Assist with identifying potential work/volunteering/community engagement Identify potential barriers Employ ecological assessment and integrated therapy approaches to promote effective teaching, and maintenance of functional skills in community settings <sup>15</sup> Integrated PT into community instruction (especially for students with complex disabilities) to promote generalization of skills in context	Analyze the workplace for accessibility Analyze work/tasks and skills needed including endurance and posture Create adaptations as needed
Student skills	Self-care Independent living Self-determination Self-advocacy Social skills Community experiences Youth autonomy and decision-making Goal setting Travel skills	<ul> <li>Plan physical therapy interventions driven by students' goals and interests</li> <li>Ask students what skills they need to learn for success on the playground, in PE, or at a jobsite</li> <li>Give students a variety of opportunities to make choices and communicate needs during direct intervention</li> <li>Support on-site/community experience or provide intervention in community (eg, intended "home," work site, gym/YMCA, martial arts or dance class, community activity/program)</li> <li>Eliminate or mitigate barriers; promote adaptive skills</li> <li>Address logistical challenges (eg, scheduling, sensory needs, and transportation)</li> <li>Explore and problem solve mobility issues at grocery store, work site, gym, etc</li> <li>Explore and problem solve transportation for frequently visited places</li> <li>Practice and problem solve hygiene, bathing, toileting, cooking, and cleaning among other activities of daily living; ensuring caregivers provide appropriate support, demonstrate adequate biomechanics, and do not "overhelp"</li> <li>Explore, select, and promote full access to gyms, parks, classes, and selected activities/programs</li> </ul>	Student visits neighborhood gym with PT (and parent if possible) to ensure safe access to facility and equipment; consults with trainers/staff; creates routine(s); instructs student in exercises and gym etiquette; models appropriate social interactions Student and PT walk through "getting ready" routine with caregiver, problem solve and provide strategies, ensure appropriate expectations, promote independence, ensure safety and appropriate use of equipment, suggest accommodations or environmental adaptation Student and PT work to ensure student can communicate the need for a change in positioning throughout the day and how to guide a future caregiver how to assist them for activities of daily living
		self-determined, which should be discussed with the IEP team but can be acceptable if team is informed and consequences of refusal are explained	

Abbreviations: IEP, Individualized Education Program; PE, physical education; PT, physical therapy.

in the community. Lastly, community experiences rely on natural adult environments as the context to teach and practice skills and promote postschool education.<sup>13,21</sup>

The skills a student carries from school provide the foundation for the life that follows. These students require explicit instruction for skills and practice in the natural places and situations where they will be used. Students with disabilities require additional time and practice opportunities to acquire the skill set needed for "adulting." Physical therapists are trained, equipped, and uniquely suited to contribute to the work represented by this cluster of predictors.

# DISCUSSION

This article clarified the role and work of physical therapists to identify and address needs of students who have disabilities, as they transition from high school to postsecondary/adult roles. Current evidence-based predictors of postschool success were provided and discussed to assist school-based physical therapists, school administrators, community partners, and transition teams to better understand and engage the potential contributions of physical therapy to successful postsecondary transitions. The aim is to assist school-based physical therapists in implementing effective, quality transition services to students with disabilities by aligning predictors with relevant researchbased practices.

# **Implications for Physical Therapy Practice**

Doty et al<sup>11</sup> identified current practices and gaps in practices by school-based physical therapists in the areas of transition planning, evaluation, and Individualized Education Programs (IEPs)/Individualized Transition Plans (ITPs). Respondents in this study reported collaboration with school-related personnel in transition planning more often than with employers,

Copyright © 2020 Academy of Pediatric Physical Therapy of the American Physical Therapy Association. Unauthorized reproduction of this article is prohibited. community programs, institutions of higher education, or adult service agencies. School-based physical therapists attended transition planning meetings only some of the time and reported using observation or narrative summaries when considering a student's preferences and interests. They reported rarely using ecological task analysis, observing students in the community, or employing published checklist/tools. The most common practices for developing IEPs/ITPs were providing input for goals and objectives, making decisions as a member of the educational team, and collaborating and brainstorming with team members about activities. These results suggest physical therapists were less involved in participating in IEP meetings or assisting in completing the summary of performance.

The reasons physical therapists may not routinely be involved in postsecondary transition, nor the effects of physical therapy intervention on transition outcomes have been investigated. Factors associated with professional preparation, adequate staffing, appropriate workloads, and cost of services may well impact physical therapist involvement in transition planning and services in all practice settings (eg, school, hospital, and community). Professional education in pediatrics usually focuses on young children, with limited content on youth, adults, and aging adults with developmental disabilities. Physical therapists working with adults in hospitals or outpatient clinics are often not aware of issues common to adults with developmental disabilities.<sup>2,17</sup> Intellectual disability can further complicate health care for this population. Iacono and colleagues<sup>18</sup> found health care professionals lacked training for working with students with intellectual disability. These professionals were ill equipped to respond to challenging behaviors and sensory responses and communicated poorly and/or ignored communication efforts by patients with disability. Another challenge may be finding competent, adult health care providers. One aspect of independent living addressed through transition planning could be to locate a medical home that is competent to meet the needs of a patient with lifelong disability rather than trying to remain with pediatric providers.

Physical therapists are encouraged to increase their involvement in transition planning and service delivery to promote postschool success for students who could benefit from physical therapy expertise and active involvement. Physical therapists can provide expertise to mitigate or eliminate obstacles to employment, independent living, recreation/leisure activities, and community engagement for young adults with disabilities. James<sup>19</sup> investigated the perceptions of 5 students with multiple disabilities transitioning to adulthood using a qualitative design. Their results indicated students, families, and teachers described a need for assistance with assistive technology, transportation, and toileting. Bagatell and colleagues<sup>20</sup> conducted focus groups with young adults with cerebral palsy (19-34 years old). They identified 4 salient themes for the challenges faced while evolving into adulthood including (a) being thrust into adulthood, (b) navigating systems and services, (c) understanding and managing their bodies, and (d) dealing with stereotypes and prejudice. Physical therapists can be pivotal contributors supporting each of these themes, as they are addressed through meaningful transition planning at school.

Thomas and Rosenberg<sup>21</sup> conducted a survey of pediatric physical therapists and occupational therapists to determine the level of service delivery provided to individuals with disabilities and their families. This study revealed less than optimal service provision by therapists to promote community recreation and leisure involvement for children and adolescents with disabilities and their families. For example, many therapists indicated they were not discussing transportation options, how to access the community, or gathering information on social barriers students and families may be facing. Additionally, examination of educational programs found certain attributes, which may enhance or hinder provision of physical therapy services to secondary students. For example, in some areas, budgetary constraints of the local education agency can, in effect, curtail therapy services at the secondary level and inhibit communitybased intervention and practice. In addition, administrative support was noted as the strongest predictor of physical therapy services being provided at the secondary level.<sup>11</sup>

## Recommended Practices for Physical Therapists in Postsecondary Transition

Throughout the secondary transition process, physical therapists can work to ensure the student is functioning as independently as possible across all environments. Physical therapists have specialized skills to offer students and transition teams throughout the transition process.<sup>21-23</sup> By aligning these specialized skills with the knowledge of the predictors of postschool success in the 4 clustered areas, physical therapists can assume a variety of roles and improve services to secondary students and educational teams. See Tables 2 and 3 for practical suggestions.

Recommended practices for increasing meaningful involvement of physical therapists working with secondary students include the following suggestions from Doty et al<sup>11</sup>: physical therapists working in secondary transition programs need to (*a*) complete more comprehensive evaluations across a variety of future environments with students who have intensive support needs, (*b*) expand collaboration efforts of service providers to include the student's local community, and (*c*) provide interventions in the community to promote generalization ability of skills. These recommended physical therapy practices can improve student outcomes and are directly aligned with predictors of student success.

#### **Collaborative Systems**

Physical therapists can have increased and intentional involvement in transition-age students over the years. Collaboration can be enhanced at the building level by increasing attendance IEP/ITP meetings, as this where most transition planning and collaboration occurs. This provides opportunities for contextualized problem-solving and working within the student's preferences and the team priorities to provide input to consensus goals and objectives. Expanding engagement with community agencies such as vocational rehabilitation, employers, and university disability services begins with therapists learning and understanding the roles and eligibility requirements of these agencies. This is naturally followed by establishing relationships with local representatives of these agencies by attending the transition planning meetings. Improved understanding and relationship can foster higher expectations and involvement from both parents and these community partners.

When considering the parental involvement/expectations predictor, physical therapists often have developed solid relationships with families through many years of working together. Unlike educators who may only have students for a few years, some school-based therapists are involved with students across their lifespan. Therapists who know the importance of families in decision-making can facilitate a family's involvement, as the student progresses through school. Therapists working with younger students can begin investigating expectations, interests, preferences and abilities to apply to employment, education, adult living, and health care transition at earlier ages. This in turn can focus efforts on meaningful, realistic goals and plans that inspire family engagement in postsecondary successes of their child. Refer to Table 2 for specific examples.

#### Policy

Examining the policy cluster reveals that while physical therapists may not directly impact high school diploma and exit examination requirements, they can provide ideas and supports to better and more frequently include students in general educational environments. It is critical for therapists to consider their role in advocating for transition policy by participating in work groups or committees at building, district, or state levels as opportunities arise. Improving related services at the secondary level requires therapists as effective stakeholders in these processes. There are additional strategies to optimize physical therapists' practice with transition-age youth. These include administrative support, in-services and professional development on postsecondary transition for physical therapists. When therapists have administrators, who understand their role and contribution to transition planning and services, physical therapists are more likely to be involved in transition teams. Finally, the most effective professional development for physical therapists regarding transition is local/district in-services, typically 2 to 4 hours with their collaborative transition team members.<sup>11</sup> This approach may be effective because the content is derived from and can be immediately applied at the school. These in-services can be where transition teams can learn the value a physical therapist can add. Also, collaboration and relationships can begin here. Refer to Table 2 for specific examples.

#### **Career Development**

Therapists can assist and advocate for high school students with disabilities by promoting environment access to occupational courses and vocational education. This can be accomplished by assuring students know how to use safe, efficient, and reliable means of community mobility. Ensuring the support of an appropriate assistive device can literally open doors to new opportunities. This can include therapists assessing job sites in the community to eliminate physical barriers, ensure proper biomechanics, and collaborate with supervisors for appropriate job tasks. These efforts can only help students to obtain paid employment while in high school. At younger ages, therapists can advocate for students with physical disabilities to participate in career awareness activities and assist with classroom leadership activities, such as line leader, in preschool/elementary levels, and the physical therapist can ask students with disabilities to have chores at home. Refer to Table 3 for specific examples.

# Student Skills

This cluster of predictors may be where therapists have the most obvious effect for students with physical disabilities. Completing more comprehensive evaluations and using more ecological assessments will assist students to develop meaningful skills in the community-based settings where they will use them. This can include direct intervention for travel skills, work-hardening skills, and adult living skills at work, in the community, and/or at home whenever possible. Therapists can promote self-determination and appropriate social skills by giving the students opportunities to actively participate in IEP meetings/transition planning, making choices and setting goals during therapy sessions. Finally, therapists provide supports for students with the most intensive physical needs by eliminating barriers to socializing, transportation, toileting, and technology—providing community-based interventions when possible.<sup>19,21</sup> Refer to Table 3 for specific examples.

# **Suggestions for Future Research**

Future research is needed on a number of topics. Future research should investigate (a) the efficacy of school-based physical therapy interventions with students with orthopedic, physical, and complex disabilities<sup>2</sup>; (b) the effects of physical therapists' involvement in the transition planning process, as well as the effect of school-based physical therapy services (eg, in school, at work sites, in community, or home) for transition-age students with orthopedic, physical, and complex disabilities; (*c*) which physical therapy interventions are most effective for successful transition; (d) how can the expertise of a physical therapist be used more efficiently and effectively; (e) factors influencing physical therapists' involvement in transition planning and development of the student's summary of performance to advance practice in this area; and (f) efficient methods for effective collaboration between physical therapists and businesses, colleges, families, adult agency providers, and community organizations and how to increase and streamline these collaborative efforts to increase positive postschool outcomes for students.

#### CONCLUSION

Students with disabilities are achieving much lower postschool outcomes when compared with peers without disabilities. For individuals with physical disabilities, the outcomes can be even lower.<sup>2</sup> Researchers have established predictors of positive postschool outcomes for students with disabilities.<sup>14,15</sup> Evidence-based practices have been aligned with those predictors.<sup>12</sup> Physical therapy and mobility training have been found to increase outcomes for students with physical

Copyright © 2020 Academy of Pediatric Physical Therapy of the American Physical Therapy Association. Unauthorized reproduction of this article is prohibited.

disabilities.<sup>6</sup> There is a need for physical therapists to provide effective services for students with physical, orthopedic, and complex disabilities during middle and high school.<sup>17</sup> Schoolbased physical therapists will be welcome assets to transition teams when they understand the transition process and integrate evidence-based practices aligned with identified predictors to enhance interventions they provide to students with disabilities. These efforts could lead to gainful employment, further education, and meaningful community engagement for students with orthopedic, physical, and complex disabilities.

## ACKNOWLEDGMENT

We would like to thank Catherine Fowler, PhD, from the NTACT for her vision and mentorship.

#### REFERENCES

- Newman L, Wagner M, Knokey A, et al. The post-high school outcomes of young adults with disabilities up to 8 years after high school: a report from the National Longitudinal Transition Study-2 (NLTS2). www.nlts2. org/reports/
- Bjornson K, Kobayashi A, Zhou C, Walker W. Relationship of therapy to postsecondary education and employment in young adults with physical disabilities. *Pediatr Phys Ther.* 2011;23(2):179-186.
- Michelsen SI, Uldall P, Hansen T, Madsen M. Social integration of adults with cerebral palsy. *Dev Med Child Neurol.* 2006;48(8):643-649.
- Newman L, Wagner M, Cameto R, Knokey AM. The post-high school outcomes of youth with disabilities up to 4 years after high school. A report of findings from the National Longitudinal Transition Study-2 (NLTS2) (NCSER 2009-3017). https://files.eric.ed.gov/fulltext/ ED505448.pdf.
- Lipscomb S, Haimson J, Liu AY, Burghardt J, Johnson DR, Thurlow ML. Preparing for life after high school: The characteristics and experiences of youth in special education. Findings from the National Longitudinal Transition Study 2012. Volume 2: Comparisons Across Disability Groups: Full Report (NCEE 2017-4018). Washington, DC: US Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance; 2017.
- Tobimatsu Y, Nakamura R. Retrospective study of factors affecting employability of individuals with cerebral palsy in Japan. *Tohoku J Exp Med.* 2000;192(4):291-299.
- Fowler WM Jr, Abresch RT, Koch TR, Brewer ML, Bowden RK, Wanlass RL. Employment profiles in neuromuscular diseases. *Am J Phys Med Rehabil.* 1997;76(1):26-37.

- Individuals with Disabilities Education Improvement Act of 2004, P. L. No. 108-446, 20 U.S.C.
- 9. American Physical Therapy Association [APTA]. *Guide to physical therapy practice* 3.0. Alexandria, VA: APTA; 2014.
- Test DW, Aspel NP, Everson JM. Transition Methods for Youth with Disabilities. Columbus, OH: Pearson Merrill/Prentice Hall; 2006.
- Doty A, Flexer R, Barton L, McEwen I, Fitzgerald S. A National Survey of School-Based Physical Therapists and Secondary Transition Practices [doctoral dissertation]. Ann Arbor, MI: ProQuest LLC; 2010.
- 12. Test DW, Fowler CH, Richter SM, et al. Evidence-based practices in secondary transition. *Career Dev Exc Individuals*. 2009;32:115-128.
- Test D, Cease-Cook J. Evidence-based secondary transition practices for rehabilitation counselors. J Rehabil. 2012;78(2):30-38.
- Test DW, Mazzotti VL, Mustian AL, Fowler CH, Kortering L, Kohler P. Evidence-based secondary transition predictors for improving postschool outcomes for students with disabilities. *Career Dev Exc Indi*viduals. 2009;32(3):160-181.
- Mazzotti VL, Rowe DR, Sinclair J, Poppen M, Woods WE, Shearer ML. Predictors of post-school success: a systematic review of NLTS2 Secondary analyses. *Career Dev Transition Exc Individuals*. 2016;39:196-215.
- Simmons TJ, Flexer RW, Bauder D. Collaborative transition services. In RW Flexer, RM Baer, P Luft, & TJ Simmons eds. *Transition Planning for Secondary Students with Disabilities* (3rd ed.) Upper Saddle River, NJ: Prentice-Hall; 2008:203-229.
- Compton-Griffith K, Cicirello N, Turner A. Clinicians' perceptions on incentives and barriers when providing physical therapy to adults with neuromotor disabilities: a preliminary study. *Phys Occupational Ther Pediatr.* 2011;31(1):19-31.
- Iacono T, Bigby C, Unsworth C, Douglas J, Fitzpatrick P. A systematic review of hospital experiences of people with intellectual disability. BMC Health Serv Res. 2014;14:505.
- James S. I Was Prepared to Do Nothing; I Will Do Nothing: Why Students With Multiple Disabilities Do Not Have Jobs After Leaving High School [master's thesis]. Norman, OK: University of Oklahoma; 2001.
- Bagatell N, Chan D, Rauch KK, Thorpe D. "Thrust into adulthood": transition experiences of young adults with cerebral palsy. *Disabil Health* J. 2017;10(1):80-86.
- 21. Thomas AD, Rosenberg A. Promoting community recreation and leisure. *Pediatr Phys Ther*. 2003;15(4):232-246
- 22. Campbell SK. Therapy programs for children that last a lifetime. *Phys Occup Ther Pediatr*. 1997;17:1-15.
- Inge K, Shepherd J. Occupational and physical therapy. In: SH De Fur, Patton JR, eds. Transition and School Based Services: Interdisciplinary Perspectives Enhancing the Transition Process. Austin, TX: Pro-ed; 1999:117-165.
- Okolo CM, Hinsey M, Yousefian B. Learning disabled students' acquisition of keyboarding skills and continuing motivation under drill-andpractice and game conditions. *Learning Disabil Res.* 1990;5:100-109.