

# A vocational rehabilitation partnership to provide transition services to young adults with neurodevelopmental disabilities: The cognitive skills enhancement program

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## Abstract.

**BACKGROUND:** There is an urgent need for services that support a successful transition to postsecondary education and employment for young adults with neurodevelopmental and cognitive disabilities (e.g. autism spectrum disorder, attention-deficit/hyperactivity disorder, traumatic brain injury).

**OBJECTIVE:** The purpose of this expository article is to describe the Cognitive Skills Enhancement Program (CSEP), a comprehensive clinical program designed for young adults with neurodevelopmental and cognitive disabilities transitioning to postsecondary education.

**METHODS:** CSEP was developed through a community-academic partnership between a university and a state vocational rehabilitation program. Young adult participants complete programming that addresses four primary clinical targets: (1) emotion regulation, (2) social skills, (3) work readiness, and (4) community participation with the overall goal to increase awareness and promote successful employment outcomes while they transition to post-secondary education.

**RESULTS:** To date, CSEP has supported 18 years of sustained programming and clinical services to 621 young adults with neurodevelopmental and cognitive disabilities.

**CONCLUSION:** This partnership model allows for flexible responses to participant needs, implementation barriers, and advances in evidence-based practices. CSEP meets the needs of diverse stakeholders (e.g. state vocational rehabilitation, post-secondary training facilities, participants, universities) while providing high-quality and sustainable programming. Future directions include examining the clinical efficacy of current CSEP programming.

Keywords: Neurodevelopmental disorders, vocational rehabilitation, community partnerships, transition program, adults, autism spectrum disorder

## 1. Introduction

Adults with neurodevelopmental and acquired cognitive disabilities (NCD) are a growing population with unique and complex clinical rehabilitation

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needs (Shattuck et al., 2020). NCD includes diverse diagnoses such as autism spectrum disorder (ASD), attention deficit/hyperactivity disorder (ADHD), and traumatic brain injury (TBI). While heterogeneity is inherent across NCDs, there are cognitive, social, and emotional impairments that are common across diagnoses (Gioia et al., 2010; Lau-Zhu et al., 2019; Otterman et al., 2019). Limitations in cognitive flexibility, self-awareness, problem solving, and impulse control exacerbate existing challenges with social skills and forming relationships (Bornhofen & McDonald, 2008; Otterman et al., 2019; Parke et al., 2021). Further, impaired emotion regulation is a transdiagnostic process that underlies co-occurring mental health symptoms and impedes the ability to adaptively manage new stressors and environments (Christiansen et al., 2019; Conner et al., 2021; Mazefsky & White, 2014; Stubberud et al., 2020). It is not surprising, therefore, that young adults with NCD have more difficulty in the areas of education, employment, and independent living compared to both neurotypical peers and individuals with disabilities without NCD (Alszuler et al., 2016; Ponsford et al., 2014; Roux AM, Shattuck PT, Rast JE, Rava JA, Anderson KA, 2015).

Individuals with NCD experience a well-documented functional and emotional decline occurring at the transition from adolescence to adulthood (Howlin & Magiati, 2017; Picci & Scherf, 2015). Impairments in executive functioning and emotion regulation make it challenging to independently navigate new environments, to meet increased social and occupational demands, and to cope with amplified stressors associated with these developmental challenges. Mental health problems are pervasive (Howlin & Magiati, 2017). Thus, adults with NCD are less likely to enroll in and graduate from postsecondary education, maintain gainful employment, and live independently (Friedman et al., 2013; Gordon & Fabiano, 2019; Roux AM, Shattuck PT, Rast JE, Rava JA, Anderson KA, 2015; Wei et al., 2015). There is a strong need for services that support young adults with NCD and foster successful transition to adulthood (Roux AM, Shattuck PT, Rast JE, Rava JA, Anderson KA, 2015; Wehman et al., 2014).

In the United States, young adults with NCD often encounter a “service cliff” when transitioning out of public-school systems (Roux AM, Shattuck PT, Rast JE, Rava JA, Anderson KA, 2015; Shattuck et al., 2012, 2020; Wehman et al., 2014). At this juncture, individuals and families are tasked with identifying and navigating new funding systems and providers.

State vocational rehabilitation (VR) agencies, with missions of helping individuals with disabilities gain or maintain employment, are one available resource (Roux et al., 2013; Roux AM, Shattuck PT, Rast JE, Rava JA, Anderson KA, 2015). These agencies typically provide services such as career counseling and guidance; job placement; job coaching; and funding for education, training, and assistive technology (Lustig & Strauser, 2008). However, they less frequently provide psychosocial or rehabilitation treatments, resulting in a large treatment gap. Comprehensive clinical rehabilitation programs targeting limitations in cognitive, social, and emotional functioning are a promising service designed to prepare transition-age adults with NCD to successfully engage in VR programs.

The purpose of this article is to describe the Cognitive Skills Enhancement Program (CSEP), a comprehensive clinical rehabilitation transition program designed for young adults with NCD who are receiving state-funded VR services. CSEP, a result of a longstanding community-academic partnership, was first developed in 2004 and has evolved over the past 18 years to implement emerging evidence-based treatments and to meet stakeholder needs. We will first describe our community-academic partnership with the state VR program that was formed to deliver these services. We will then review the evolution and current state of CSEP and discuss future directions for program evaluation.

## 2. Methods

### 2.1. History of the cognitive skills enhancement program

#### 2.1.1. Community-academic partnership

CSEP is a clinical rehabilitation program designed for transition-age adults with NCD. It is funded by a community-academic partnership between an academic institution and the state VR program. The partnership was established when the state VR program identified that customers with NCD were less likely to graduate from vocational training programs than customers without NCD and therefore sought to support customers with NCD via cognitive rehabilitation transition services. Through this partnership, the academic institution faculty and staff are contracted to develop, implement, and operate a clinical transition program that is located within a state VR pre-vocational training facility, referenced hereafter

as ‘state VR training facility’. This ongoing contract allows the state VR program to provide unique and comprehensive clinical rehabilitation services to young adults with NCD transitioning to postsecondary education. Academic faculty and staff with expertise and experience in NCDs conceive the program (based on prior work), maintain the contract, develop, and implement the program.

Thus, CSEP is neither a research grant nor a traditional fee-for-service model. This offers a major advantage in service delivery, as participants are offered comprehensive rehabilitation services on site while pursuing postsecondary education. The considerable access and service delivery barriers that are often present for young adults with NCD who are enrolled in postsecondary education are minimized. Further, this partnership supports flexible responses to rapidly changing needs, barriers, and priorities from all stakeholders (e.g., institutions, state VR training facility leadership, clinicians, participants).

### 2.1.2. Participants

Participants with NCD are referred by state VR counselors. Participants are typically diagnosed with ASD, specific learning disabilities, ADHD, and/or other acquired cognitive disorders (e.g., TBI). When CSEP began in 2004, there was heterogeneity across diagnoses within the program. Over time, ASD emerged as the most common diagnosis, perhaps due to increased diagnosis and referrals for adults on the spectrum. Participants are often referred to CSEP due to limited self-awareness and understanding of the impact of disability, difficulty establishing and maintaining reciprocal social relationships, poor emotional regulation and impulse control, and/or other executive functioning impairments. Most participants experience cognitive inflexibility, intolerance of uncertainty and change, and have difficulty generalizing learning across environments.

Participants are screened for CSEP eligibility via a review of records and an individual screening interview. Individuals who meet criteria for CSEP demonstrate: (1) evidence that cognitive impairments are contributing to functional limitations; (2) adequate verbal functioning and abstract reasoning to allow participation in group treatment, typically demonstrated by a Wechsler Adult Intelligence Scale (WAIS-IV) (*Wechsler Adult Intelligence Scale—Fourth Edition - PsycNET*, n.d.) Full Scale IQ > 70, Verbal Comprehension Index > 70, and Similarity Subtest > 6; and (3) expression of understanding of and willingness to participate in the program.

This program evaluation was approved by the University of Pittsburgh’s Office of Research Protections, IRB# 2204005. This project has been characterized as being an activity that does not meet the formal definition of research, according to the federal regulations at 45 CFR 46.102(l). Participants are fully informed and provide written consent to participate before enrolling in this transition program.

### 2.1.3. Evolution of CSEP from 2004–2018

The overarching goal of CSEP is to improve employment outcomes for transition-aged individuals with NCD by increasing awareness of strengths, limitations, and impact of disability, all through the development of social-emotional and executive functioning skills. Although the goal has remained consistent since inception in 2004, CSEP has evolved in terms of treatment targets, interventions, and staff structure.

*2.1.3.1. Program and staff structure* CSEP participants are enrolled in the program full time (i.e. Monday through Friday, 8:00am-3:30pm) for 15 weeks. The program cycles coincide with the semester ‘term’ schedule at the training facility. From 2004 through 2018, CSEP employees primarily consisted of academic faculty and staff. Specifically, the staff team included one Program Coordinator: a masters or doctoral-level clinician with relevant certifications (e.g., Certified Brain Injury Specialist, Certified Rehabilitation Counselor); one state VR counselor; and two to four part-time rehabilitation counseling graduate student trainees. The graduate student trainees were the interventionists responsible for the bulk of provision of clinical services. Interventionists were supervised by a team of experienced clinicians that included masters and doctoral level Licensed Professional Counselors and a Licensed Psychologist specializing in neuropsychology during weekly group supervision meetings. Graduate student trainees also received individual supervision.

*2.1.3.2. Treatment targets and interventions* CSEP was initially developed as a comprehensive clinical rehabilitation transition program modeled after programs with preliminary efficacy in TBI populations (Ben-Yishay & Daniels-Zide, 2000, p.; Cicerone et al., 2011; Dahlberg et al., 2007; Gehring et al., 2011; Prigatano, 2005; Prigatano et al., 1984). CSEP initially targeted self-awareness, cognitive rehabilitation, and executive functioning skill building. As the program evolved, a variety of specific

cognitive skills (e.g., memory, attention, problem solving), social skills (e.g., communication, self-advocacy, assertive behavior), and vocational skills (e.g., resume building, mock-interviews, appropriate workplace behavior), as well as an introduction to assistive technology, were identified as treatment targets. In essence, a broad range of developmental and cognitive challenges (e.g., awareness, problem solving, memory, social skills) were targeted simultaneously and in sequence in the context of a supportive therapeutic environment.

Individual counseling was eventually embedded into a program built on psychoeducation groups. Participants were assigned a primary interventionist with whom they established one to three individualized goals designed to increase employability. These goals were tracked for program evaluation purposes and fell into the following domains: social skills, personal hygiene, emotion regulation, impulsivity, self-esteem and advocacy, problem solving, planning, cognitive flexibility, and organization. Interventionists developed individualized treatment plans with SMART (i.e., specific, measurable, attainable, relevant, time sensitive) goals and methods for goal attainment (Bovend'Eerd et al., 2009). Participants met with their interventionist twice a week for 30 minutes to work on goals.

Vocational mentorships have been a core component of CSEP since its inception. Participants are matched with a mentorship site based on their interests and skills. They work at a local business or organization for seven weeks, approximately six hours per week. This exposes participants to workplace settings, often for the first time. Mentorship provides the opportunity for participants to practice newly learned social skills and regulation strategies. These placements also increase participants' awareness of the impact of their disabilities in the workplace. Community-based assessments are completed at the conclusion of the mentorship.

### 3. The current cognitive skills enhancement program

#### 3.1. Rationale for program changes

Based on nearly 20 years of clinical experience and ongoing consultation with key stakeholders (clinicians, academic institution leadership, state VR leadership, state VR counselors, and participants), CSEP goals, programming and structure were



Fig. 1. CSEP community-academic partnership, key stakeholders, and current programming targets.

modified in 2019. The current iteration of CSEP was designed to address shifting stakeholder priorities, increase capacity for assessing efficacy, enhance generalization of skills to new environments, and resolve implementation-related barriers. Figure 1 displays the current CSEP iteration in context of the overall community-academic partnership with the state VR program.

#### 3.1.1. Stakeholder priorities

Leadership of the state VR training facility emphasized two new needs, 1) enhance the facility-community relationship, and 2) provide mental health counseling to an increasing number of students presenting with mental health challenges. The need to improve the facility-community relationship grew out of a desire to advocate for individuals with disabilities in the local community. We determined we could meet this need while simultaneously enhancing opportunities for skill generalization by designing programming that engaged CSEP participants in meaningful community volunteering.

The second need related to the increasing number of students with NCD presenting with co-occurring symptoms of anxiety, depression, post-traumatic stress disorder, etc. Given the expertise of our staff in NCD disabilities, we expanded the scope of our program to also address co-occurring mental health symptoms. Whereas CSEP was originally designed to narrowly address the impact of cognitive deficits, providing mental health interventions reduced the burden on the in-house therapists, increased the number of students who could receive mental health services, and potentially enhanced vocational outcomes by addressing symptoms that

were constraining the impact of vocational rehabilitation efforts.

As part of this increased emphasis on addressing mental health challenges, CSEP leadership, based upon ongoing clinical research being conducted by members of the CSEP team (Beck et al., 2020; White et al., 2021), decided to place particular emphasis on addressing emotion regulation. There is increasing evidence that emotion regulation is a transdiagnostic mechanism underlying many mental health disorders and symptoms (Mazefsky & White, 2014). Further, emotion regulation impairment likely underlies co-occurring mental health diagnoses, aggression, meltdowns, avoidance, self-harm, crisis services, and suicidality in individuals with NCD (Conner et al., 2020, 2021). Ineffective emotion regulation exacerbates social functioning impairment and continues to be largely unaddressed in many traditional VR programs (Mazefsky et al., 2013).

### 3.1.2. Skill generalization

During the early years of the program, CSEP clinicians consistently reported that participants were not generalizing learned strategies and skills in novel environments. These outcomes occurred despite participants seemingly mastering content in group and individual sessions, as evidenced by restating material in their own words, independently generating individualized examples, and planning to use newly learned skills. For example, clinician observations made through community-based assessments during mentorship indicated participants were not using newly learned strategies and accommodations on site. During CSEP exit interviews, participants had difficulty recalling or describing the material learned in CSEP. Many had difficulty identifying the individual goals they worked on all term. Vocational training program instructors also indicated that many participants were not implementing strategies in their academic training programs. We concluded that program targets needed to be narrowed to focus on two to three targets with repetition and depth rather than breadth, and that additional supports be provided to generalize strategies and skills into new settings.

### 3.1.3. Implementation-related barriers

We experienced two interrelated implementation challenges. First, we noted low fidelity in delivering the intervention. Second, it was challenging to meet and sustain the intensive training and supervision needs of the clinical staff. To that point in the project, CSEP had primarily been delivered by

graduate student trainees who worked for one to two years before graduating. This model inevitably produced a high turn-over rate, and training students in a short amount of time was challenging. Further, student trainees required months of training prior to being able to effectively deliver evidence-based mental health treatments, thereby exacerbating the turnover issue.

To resolve these issues, we recruited and hired full-time staff as the primary interventionists. Graduate student trainees remain involved in CSEP but are now given a small caseload for training purposes and are not the primary interventionists. Interventionists consist of four Master's-level clinicians, one Bachelor's-level clinical support staff, and one or two graduate student interns. Interventionists are still supervised by a team of experienced clinicians that included three Licensed Professional Counselors and a Licensed Psychologist/Neuropsychologist.

## 3.2. Program interventions

In 2019, CSEP interventions were re-focused on four primary targets, (1) emotion regulation, (2) social skills, (3) work readiness, and (4) community participation (see Fig. 1). An emotional regulation intervention was added to meet the needs of the population of adults with NCD and co-occurring mental health concerns. Social skills remained a treatment target, though with heightened priority, emphasis, and increased dosage. Consistent with our clinical experience, research shows that for college students with ASD, interpersonal competence and emotional regulation are identified as primary areas of difficulty (Elias et al., 2019; Elias & White, 2018; White et al., 2011). The work readiness and community engagement components were enhanced to meet stakeholder needs and to facilitate skill generalization.

### 3.2.1. EASE

The Emotional Awareness and Skills Enhancement (EASE) program is a 16-week individual mindfulness-based intervention designed to target emotion dysregulation among adolescents and young adults diagnosed with ASD (Conner et al., 2019). EASE incorporates meditation practices and cognitive strategies, drawn from Mindfulness-Based Stress Reduction and Mindfulness-Based Cognitive Therapy, to teach individuals with ASD to cultivate awareness of emotional intensity and strategies to calm during states of heightened emotional intensity. EASE consists of four modules and incorporates four

generalization sessions to practice skills learned in sessions. Participants are taught to notice physical and behavioral cues of emotional arousal intensity, rather than emotion labeling or processing. Participants develop a personalized scale for rating emotional intensity and strategy plan for managing emotions by the end of treatment. EASE has established feasibility, acceptability, and preliminary efficacy among youth and young adults on the autism spectrum (ages 7–25) with and without intellectual disability (Beck et al., 2021; Conner et al., 2019).

EASE was optimized for implementation with the CSEP context and population. The 16-week intervention was collapsed into 14 weekly individual therapy sessions with a trained EASE clinician. The EASE manual was edited for college-age participants and caregiver involvement was removed from the treatment. Group meditation practices were integrated into CSEP at the beginning and end of each programming day. All CSEP clinicians were trained to prompt participants to use EASE strategies at any sign of heightened reactivity for *in vivo* practice. CSEP clinicians completed an EASE training and engage in regular weekly supervision with one of the EASE developers.

### 3.2.2. PEERS®

The Program for the Education and Enrichment of Relational Skills (PEERS®) for Young Adults is an evidence-based social skills training program designed for neurodiverse young adults with social skills deficits (Laugeson et al., 2015). The intervention consists of 16 weekly 90-minute groups, with groups for young adults and caregivers being run simultaneously. Group leaders use the Socratic method to teach social skills, primarily in the form of concrete rules and steps of social etiquette and forming and maintaining relationships. Participants practice social skills in-session and are assigned homework to practice in natural social settings. PEERS® was developed for neurodiverse individuals with average intellectual ability, and, as a result, is a fast paced and complex treatment. PEERS® has been successfully adapted for inclusive residential postsecondary college programs (Rose et al., 2021).

All CSEP interventionists are PEERS® for Young Adults Certified Providers and engage in weekly supervision. PEERS® was tailored to fit within the CSEP context while retaining the intervention content. Adjustments were made to the number of sessions (i.e. 14 total sessions), the pace of the intervention (i.e. one session was delivered in four

50-minute groups), and the social coaching format. Participants were assigned to work with a CSEP interventionist who served as a social coach instead of the caregiver model. Social coaches met with participants weekly and provided 1) social coaching in natural settings (e.g., the cafeteria), 2) assistance with weekly social skills homework assignments (e.g., planning, pre-coaching, and post-coaching), and 3) assistance with finding a source of friends (Laugeson, 2017).

### 3.2.3. Work readiness

Work readiness has remained a priority for the state VR program. CSEP work readiness programming incorporates aspects of pre-vocational training that stakeholders have identified as necessary to improve employment outcomes (Hedley et al., 2017), including soft skills (e.g., punctuality, hygiene); professional behavior (e.g., professional introductions, teamwork); and identifying, securing, and using reasonable accommodations through self-advocacy. Psychoeducational work readiness groups are offered three days per week, three to four 45-minute groups per day.

Vocational mentorship placements remain a cornerstone of CSEP work readiness programming. In addition to promoting self-awareness, placements are designed to facilitate applied learning of work readiness domains (e.g. soft skills, professional behavior, and reasonable accommodations). Mentorships also serve as an excellent opportunity to practice generalization of emotional regulation and social skills.

### 3.2.4. Community participation

Community-based activities have been found to predict positive employment outcomes in students with disabilities (Test et al., 2009). In addition to facilitating positive relationships in the local community (a stakeholder goal), community participation activities are excellent opportunities to generalize skills learned to real world settings (Test et al., 2009). This is particularly important for young adults with NCD given their challenges with skill generalization.

CSEP community participation programming includes community-based activities in non-school and natural environments. Community participation activities are facilitated one day per week (Fridays). CSEP staff work with local businesses and organizations to identify opportunities to volunteer (e.g., adopt a highway, local soup kitchen), tour community resources and meet community leaders (e.g. visiting the County Courthouse, interviewing the Deputy Coroner), and fundraise (e.g. food drive,

raising money for charity). These activities require navigating public transportation, introductions and conversing with new people, working as a team, and navigating novel situations, which all provide ample opportunity for skill practice and generalization. Prior to community participation, participants plan with clinicians the emotion regulation and social skills they would practice during the activities. Interventionists provide *in vivo* skills coaching and evaluation, which facilitates the consolidation and generalization of new skills and promotes insight and awareness.

#### 4. Sustainability

The partnership between our institution and the state VR program has served 621 young adults with NCD over the past 18 years as they transition to postsecondary education. CSEP runs three 15-week 'terms' each year, which matches the academic semester of the state VR training facility. For over 52 terms, CSEP has served an average of 12 young adults with NCD per term. We receive approximately 150 customer referrals from the state vocational rehabilitation system each year. On average, 40% of all referrals meet criteria for participation in CSEP. The average completion rate of CSEP participants is 85%, with approximately 1-2 participants leaving the program each term (e.g. medical discharge, behavioral disruptions). The program has maintained high satisfaction among CSEP participants, OVR counselors, and agency leaders, as evidenced by sustained increases in our overall contract budget and steady stream of referrals.

#### 5. Conclusion

Comprehensive clinical rehabilitation programs are a promising approach to support transition-age adults with NCD, with the goal to promote work readiness and employment. Community-academic partnerships are an ideal model to develop and deliver a comprehensive program, such as CSEP. CSEP has an 18-year history of providing these services to youth with NCD and is located on site at a state vocational rehabilitation training facility. This ultimately reduces access barriers, allows for comprehensive services on site, and promotes flexibility to respond quickly and iteratively to changing needs and priorities.

The current iteration of CSEP focuses on four intervention targets: emotion regulation, social skills, work readiness, and community engagement. Targets were selected based on updated empirical evidence and systematic review of individualized goals set over a five-year period in addition to stakeholder priorities. By focusing intently on this limited target set, we strive to maximize skill acquisition and generalization of these skills in novel environments. In addition, clinical programming and staffing structure were changed to improve fidelity, sustainability, and quality of care, while still maintaining our focus on training the next generation of clinicians.

CSEP is one established model for developing a comprehensive clinical rehabilitation program for transition-age adults with NCD. The sustainability of this model is supported by the lengthy history of the community-academic partnership with over 600 individuals served. Future directions include examining the clinical outcomes and sustainability of current CSEP programming. Implementation science methods and design (Damschroder, 2020; Damschroder et al., 2009) are gaining traction to empirically test and improve the effectiveness of services while simultaneously testing sustainability and scalability (Odom et al., 2014). Utilizing these approaches will be useful in efforts to capture clinical outcomes, sustainability, and usability of CSEP, with the intention of providing a sustainable and meaningful rehabilitation program model for others to use with other transition-age individuals with NCD.

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#### Conflict of interest

The authors declare that they have no conflict of interest.

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## Ethics statement

The program evaluation was approved by the University of Pittsburgh's Office of Research Protections, IRB# 2204005. The project has been characterized as being an activity that does not meet the formal definition of research, according to the federal regulations at 45 CFR 46.102(l).

## Informed consent

Participants were fully informed and provided written consent to participate before enrolling in the transition program.

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