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Clinical Focus

Cotreatment as a Vehicle for Interprofessional Collaborative Practice: Physical Therapists and Speech-Language Pathologists Collaborating in the Care of Children With Severe Disabilities

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Purpose: This article defines interprofessional collaborative practice and links its key features with accepted practice conceptualizations of physical therapy. Cotreatment with speech-language pathology is described as a vehicle for interprofessional collaborative practice for children with severe disabilities.
Method: The article reviews the International Classification of Functioning, Disability, and Health (WHO, 2015) and the Hypothesis-Oriented Algorithm for Clinicians II (Rothstein, Echternach, & Riddle, 2003) as existing service-delivery frameworks in physical therapy and discusses how interprofessional collaborative practice between speech-language pathologists and physical therapists can be useful within these practice guidelines.
Results: A case illustration featuring interprofessional collaborative practice during cotreatment for a child with severe disabilities through physical therapy and speech-language pathology showed more seamless care and better progress in the pursuit of three main goals: physical movement, communication of needs, and participation in classroom activities.
Conclusions: Interprofessional collaborative practice is supported as a recommended practice methodology for physical therapists and speech-language pathologists serving persons with severe disabilities.

Individuals with severe disabilities are often characterized by extreme limitations in learning abilities, personal/social skills, communication, and sensory and physical development that contribute to limited general independence (Westling, Fox, & Carter, 2015). This population may present with complicated coexisting physical (e.g., quadriplegia, bone malformations, scoliosis), sensory (e.g., vision and hearing loss), and health conditions that necessitate sophisticated care and ongoing support (Westling et al., 2015). Though persons with severe disabilities live with significant limitations, they can be expected to demonstrate considerable variability with respect to overall health and developmental functioning. Variability can occur at an intraindividual level, with health conditions, arousal levels, and behavioral states changing from day to day and even hour to hour (Tunson & Candler, 2010).

The needs of persons with severe disabilities are myriad and often call for ongoing and interrelated services. Therefore, therapists and educators find themselves enmeshed in a fabric of interventions sharing a broad common goal—the advancement of outcomes that improve the everyday lives of those they serve. As authors, we contend that interprofessional collaborative practice (IPCP) offers a professional orientation that makes the attainment of this goal more likely. This article defines IPCP, describes its role within established team models, links key features of IPCP with accepted practice conceptualizations of physical therapy, and provides a case illustration featuring IPCP for a child with severe disabilities from the perspectives of two disciplines: physical therapy and speech-language pathology.

The article is authored by two physical therapists (PTs) and a speech-language pathologist (SLP) who share extensive experience serving individuals with severe disabilities.

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Although we recognize the importance of all disciplines serving this population, here we highlight IPCP as it can occur when PTs and SLPs work together. This said, the IPCP principles illustrated in the featured case have been accepted by and have broad applications for other related disciplines (Stern, 2006). This commitment to IPCP is highlighted both in the Interprofessional Education Collaborative Expert Panel (2011) report endorsed by health disciplines such as nursing, medicine, dentistry, and pharmacy, and in position statements from the American Physical Therapy Association and the American Speech-Language-Hearing Association (APTA, 2014; ASHA, 2016).

Interprofessional Collaborative Practice

Definitions and Empirical Support

The Interprofessional Education Collaborative, representing 13 organizations for health professionals, defines interprofessionalism as the "consistent demonstration of core values evidenced by professionals working together…and wisely applying principles of altruism, excellence, caring, ethics, respect, communication, and accountability to achieve optimal health and wellness in individuals and communities" (Stern, 2006, p. 19). IPCP is the ongoing implementation of interprofessionalism and appears as a reflective, integrative, and cohesive process in which professionals are engaged, with each other, and with patients and their stakeholders, in continuous interaction and knowledge-sharing to address a variety of care and advocacy issues (Ogletree, 2017).

Ogletree (2017) notes that IPCP has at least two sources of origin—preprofessional joint academic and clinical preparation referred to as interprofessional education or IPE (Barr, Koppel, Reeves, Hammick, & Freeth, 2005) and posttraining continuing education. The continuing-education path to IPCP occurs as professionals find themselves in team-based settings where IPCP is the expected or desired practice standard.

The IPCP movement has emerged due to increasingly complex health care necessitating professional interdependency (D'Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005). In spite of a call for IPCP by most allied health disciplines, including physical therapy and speech-language pathology (APTA, 2009; ASHA, 2013), evidence supporting this collaborative process is limited. Although some researchers have reported mixed to positive IPCP findings (Deneckere et al., 2012; Zwarenstein, Goldman, & Reeves, 2009), others have been less enthusiastic (Brandt, Lutfiyya, King, & Chioreso, 2014). In truth, research considering the effectiveness of IPCP is in its infancy (Hammer et al. 2012).

The most current IPCP writings describe team formation and functioning with the intent of improving team-based instruction and care. For example, McKinlay, Gallagher, Gray, Wilson, and Pullon (2015) provided a longitudinal report of the creation of an IPCP clinical teaching team, whereas Vasset and Almas (2015) espoused the value of peer shadowing as an IPCP learning experience. Giosa, Holyoke, Bender, Tudge, and Gifford (2015) described a framework for integrating care on the basis of observation, coaching, assistance, and collective reporting. These types of efforts embrace IPCP and can be used by PTs, SLPs, and other providers to inform collaborative practice.

The lack of strong empirical support for IPCP is likely due to both its recent emergence and complexities associated with evaluating its dynamic nature. As will be noted later in this article, IPCP is a fluid and multifaceted practice ideal, and it can be difficult to quantify. An empirical trend supporting or refuting IPCP awaits stronger definitions of the concept and its components. Only as these definitions emerge and are measured will researchers provide clarity to this issue.

Given what is known about IPCP, therapists and other stakeholders/practitioners are left with the important decision either to embrace collaborative practice or remain siloed in discipline-specific efforts. With research trends (as cited earlier in this article) generally supporting the concept, and with the emergence of broad-based IPCP acceptance around the world (CAIPE, 2016; Hammer et al., 2012; Holtman, Frost, Hammer, McGuinn, & Nunez, 2011), we support IPCP as a primary practice trend for the future for PTs, SLPs, and other health, mental health, and educational providers. IPCP may be most appropriate in clinical applications where interrelated health, developmental, and educational complexities abound. Individuals with severe disabilities make up such a population.

IPCP and Team Practice

Some may question if it is useful, in a time when team-based service delivery is ubiquitous, to consider IPCP within the context of established team structure and functioning. That is, is IPCP something new? One would hope that IPCP, as it is defined in this article, is a characteristic of all health and other team-based care. It should be fair to assume that all providers and recipients of care appreciate and strive for a service-delivery process characterized by reflective, integrative, and cohesive services—a process that reflects professional interdependency and family inclusiveness. The question remains: Are teams of today demonstrating IPCP?

There is little empirical evidence available to determine if IPCP is occurring within today's health care and related teams. Possibly the most cited study of IPCP was conducted by Zwarenstein et al. (2009). These investigators reviewed existing literature (over 1,100 article abstracts spanning multiple decades) to identify interventions where team-based IPCP outcomes were reported. Only five investigations met researchers' inclusionary criteria, and three reported improved care with IPCP. It is interesting that these authors suggested that the effects of IPCP are difficult to quantify.

More recent research findings specific to IPCP within team service delivery have been mixed. Whereas Deneckere et al. (2012) noted that interprofessionalism contributed to optimal performance in their study of Belgian team-based

care in hospital settings, a 2014 review of the effect of IPCP on team-based patient care and per capita costs was less supportive (Brandt et al., 2014).

In the introduction to this forum, Ogletree (2017) described IPCP as a fluid, highly integrated process that builds from collaborative investment and energy. He noted that optimal IPCP possesses a dynamic vitality that translates to informed, responsive, and seamless practice. Existing research, though limited, suggests that IPCP vitality is difficult to both attain and measure (Zwarenstein et al., 2009). One might assume that IPCP would be facilitated or constrained depending upon the constructs and practices characteristic of existing team structures.

Almost 20 years ago, Ogletree (1998) reviewed multidisciplinary, interdisciplinary, and transdisciplinary team-based service delivery. He noted that multidisciplinary teams are the least interdependent and rely upon a strong leader who gathers, synthesizes, and disseminates team findings. Ogletree suggested that multidisciplinary teams also largely exclude the individual receiving care and/or family members from active team decision making. Patients and their families are merely recipients of services. In contrast, Ogletree described interdisciplinary teams as interdependent, less reliant upon a central team leader, and more inclusive of patients and other stakeholders. Rokusek (1995), in an early discussion of team process, noted that interdisciplinary team members are knowledgeable of their professional peers and the disciplines they represent, yet they largely function within established professional boundaries and roles. That is, disciplines have well-defined areas of practice. Last, Ogletree stated that transdisciplinary teams are known for their interdependence and family inclusiveness. On transdisciplinary teams, patients and families have disproportionate authority compared with other team members. Their opinions drive the process. Transdisciplinary teams utilize a highly collaborative structure that is dependent upon professional role release. On the transdisciplinary team, professionals are expected to view the patient and family holistically and to share professional expertise to promote coordinated care.

It is assumed that interdisciplinary and transdisciplinary teams value collaborative practice and will be the most likely to attract and support IPCP. This said, the adoption of a specific team model will not ensure that IPCP occurs. IPCP, then, should be viewed as a process that transcends various team structures. At its core, IPCP is an absolute commitment to collaborative practice. Although IPCP occurs today, we do not believe that it is reflected within everyday team practices. IPCP occurs only where there is both a team structure supportive of collaboration and professional commitment to collaborative practices.

IPCP and the Practice of Physical Therapy

In the guiding principles to support its vision statement, the American Physical Therapy Association (APTA) strongly advocates that PTs work in collaboration with other health care professionals, consumers, community organizations, and other entities to help solve health-related concerns (APTA, 2015). The APTA (2015) also insists that interprofessional collaboration, in both clinical and research endeavors, will help to ensure evidence-based clinical practice that is truly consumer-centered. Although this professional support for collaboration and interprofessionalism is encouraging, serious discussions about IPCP have only occurred in the last decade. Early on, Rothstein (2003) encouraged movement from autonomous professional service delivery to increased professional interactions with others, whereas Jette and Portney (2003) promoted collaborative experiences in PT students' clinical rotations. In 2005, Purtilo (2005) advocated for a "common professionalism" for PTs and team-based colleagues in an effort to generate new policies enabling optimal team communication, as well as honest and open relationships with patients, and Nosse and Sagiv (2005) reported increased PT willingness to extend practice efforts to include collaborative experiences, if doing so optimized patient care. In more recent years, examples have been published of PTs working with other disciplines (Choe, Jung, Baird & Grupen, 2013; Maroufi et al., 2014; Pretzer-Aboff & Prettyman, 2015; Trabi, Dunitz-Scheer, Kratky, Beckenbach, & Scheer, 2010), yet there is limited evidence to suggest that this collaboration has achieved the integrative care expectations of IPCP.

It is clear that the practice of physical therapy is inching ever closer to IPCP. This being the case, one can question whether theoretical frameworks for physical therapy (and likely other disciplines) support IPCP. Riddle and Stratford (2013) used the International Classification of Functioning, Disability, and Health (ICF; WHO, 2015) and the Hypothesis-Oriented Algorithm for Clinicians II (HOAC II; Rothstein, Echternach, & Riddle, 2003) as frameworks in which physical therapy practice can be conceptualized. Both the ICF and the HOAC II are generally accepted by practitioners. The ICF has been adopted as a model for medical care by 191 member countries of the World Health Organization (WHO, 2001), and the HOAC II has current broad-based support from PTs (Riddle & Stratford, 2013).

The ICF incorporates four key elements in its model: the health condition, body function or structure, activity, and participation, which includes environmental and personal contextual factors. The health condition typically initiates the clinical process. For example, a child experiences a prenatal event leading to cerebral palsy (CP). This event, then, contributes to alterations of body functions or structures such as muscle spasticity and limited range of motion. Body function/structural alterations, in turn, result in gait patterns that limit activities and alter typical participation patterns. Last, environmental factors such as access to services and attitudes of others, or personal factors including social or lifestyle interests, either support or inhibit positive therapeutic outcomes. The ICF is described here in a linear fashion for the sake of simplicity. However, the model is best represented by bidirectionality. That is, any and all model components can and do interact with each other.

Each element of the ICF model has subdomains that provide additional categories into which service delivery may be focused. These encompass all aspects of bodily function and structures, including those needed for both nonsymbolic and symbolic communication (e.g., general body movement, facial expression, voice and speech functions, structures of the respiratory system, and structures involved in voicing and speech production). They also address interpersonal interaction, socialization, and community life (i.e., participation subdomains).

Riddle and Stratford (2013) suggested that PTs participate in outcome measures related to each of the elements and subdomains of the ICF model. For example, they could use radiographic findings to assess, understand, and treat health conditions, and manual muscle test grades, dynamometer scores, and pain measures (among other things) to gauge body structures and function. PTs observe individuals in their relevant environments, use performance measures or participation scales, and assess patients for environmental adaptations to support personal factors such as socialization and coping.

In addition to the ICF, PTs can use the HOAC II to guide service delivery (Kenyon, 2013; Rothstein, Echternach, & Riddle, 2003). One of the unique aspects of the HOAC model is that goals are established after initial data collection (from sources such as medical and educational records and the patient–family–teacher interview) but before formal examination and the development of intervention strategies. This model acknowledges the roles of current and future problems in patient management. Problems can be reported by the patient or identified by others. For existing problems, the PT utilizes the scientific method to test hypotheses about a problem's etiology. For example, a PT may address strengthening a certain muscle group, and, if weakness is the source of the patient's problem, functioning should improve. The HOAC II suggests the use of predictive criteria for anticipated problems. For example, a PT could prescribe varied body positioning throughout the day for the prevention of bed sores. The predictive element of this intervention would be that immobility could contribute to sores in the future. According to Riddle and Stratford (2013), physical therapy outcomes with the HOAC II relate to the measurement of hypotheses associated with existing problems and predictive assumptions specific to anticipated outcomes. Riddle and Stratford advocated physical therapy practice that infuses elements of both the ICF and HOAC II frameworks and noted that these models are not mutually exclusive.

It is interesting to note that the ICF and HOAC II theoretical frameworks, though explained here from a physical therapy perspective, are quite consistent with the practice of speech-language pathology. For example, the ICF is the practice framework recommended in speech-language pathology (ASHA, 2004), and SLPs frequently use predictive criteria (a central feature of the HOAC II) to anticipate and address communication impairment. For example, SLPs use an emerging evidence base to predict communication outcomes and make informed treatment decisions when working with young children on the autism spectrum (Paul, Chawarska, Cicchetti, & Volkmar, 2008) or persons with specific augmentative and alternative communication (AAC) needs (ASHA, 2004). The ICF and HOAC II theoretical models, then, provide ideal opportunities from which IPCP possibilities can emerge. Simply stated, IPCP can be free to evolve and flourish between PTs and SLPs operating broadly within the practice principles and guidelines of the ICF and HOAC II.

Conceptual Frameworks Melding PT and SLP Practices: IPCP

With a general understanding of accepted conceptual frameworks underlying physical therapy and consistent with speech-language pathology, one can explore the potential value of IPCP to PTs. For the purpose of this article, we are most interested in collaborative practices involving PTs and SLPs, because we represent these disciplines and are frequently involved in the provision of services for children with severe disabilities. Using the ICF and HOAC II frameworks for care, what are the key helpful features and potential benefits of IPCP?

The definition of IPCP provided earlier in this article suggested that IPCP professionals are reflective care providers who integrate their efforts with others to create seamless and cohesive therapeutic processes. These professionals are also engaged with and value all other stakeholders, including the patient and his or her family.

On the basis of the previous discussion of the ICF and HOAC II frameworks, reflection would seem to be an essential professional attribute. This quality would allow PTs and SLPs to consider each other's perspectives when working within elements of the ICF model. Reflection would contribute to a broader understanding of health conditions and body functions/structures while allowing collaborative professionals to influence activity, participation, and contextual elements from their respective professional angles. For example, the PT's knowledge of physical aspects of CP would complement the SLP's knowledge of respiration, phonation, and communication/speech production. Likewise, the SLP's knowledge of social interactional dynamics could inform the PT's understanding of physical activity limitations. That is, knowledge specific to communication abilities could provide PTs with a window into patient health and participatory patterns. Reflective professional collaboration would also help PTs and SLPs generate HOAC II hypotheses specific to a patient's current functioning and predictive criteria to anticipate future concerns. The adage "two heads are better than one" is particularly applicable when those two heads are reflective.

Reflective problem-solving enables professionals to demonstrate another hallmark of IPCP: integrated and cohesive service delivery. In the example in the previous paragraph, the PT who has been exposed to an SLP's knowledge about respiration, phonation, and speech production is more likely to use that knowledge in his or her work

with a child with CP, or to see the potential benefits of a cotreatment effort. In this situation, the PT could ensure the child is properly positioned, enabling full expansion of the child's rib cage and diaphragm, better breath control for speech, and/or more functional upper extremity use for communication-device access. Furthermore, an SLP who understands the relationship between physical limitations or postural insecurities and social interaction is much more likely to work collaboratively with a PT to address these limitations.

Last, investment in and commitment to the well-being of the patient and his or her stakeholders open considerable avenues to increase the collaborative nature of care and broaden therapeutic impacts. This IPCP feature can provide valuable information across all elements of the ICF model and can provide additional points of reference for HOAC II hypothesis testing. Engaged stakeholders provide insights specific to patient problems. They are also rich sources of solutions and, often, willing partners in treatment.

The remainder of this article provides a brief overview of cotreatment, argues for the application of IPCP in the care of children with severe intellectual disabilities, and illustrates a cotreatment IPCP effort for a child with severe disabilities. Cotreatment is explored for two reasons. First, it is a reasonably developed collaborative service-delivery concept (APTA, 2002). As such, it provides an obvious vehicle for potential IPCP. Second, collaborative practice opportunities are more available in the broader realm of assessment, especially when addressing the needs of individuals with severe disabilities. For example, effective interdisciplinary and transdisciplinary assessment is largely premised on collaboration (Ogletree, 1998). Although we, as researchers, realize the need for IPCP in all areas of practice, we suggest that intervention offers the greatest challenges for therapists. That is, providers are more likely to forgo collaborative treatment possibilities due to, among other things, limited visions for joint service delivery, siloed disciplinary views, perceived or actual time constraints, and scheduling conflicts.

Cotreatment

Fourteen years ago, the APTA in conjunction with the American Occupational Therapy Association and the American Speech-Language-Hearing Association developed guidelines for cotreatment (APTA, 2002). These organizations supported collaborative practice within a single therapy session assuming the following guidelines: (a) Coordination between the disciplines benefits the patient and does not occur simply for convenience; (b) documentation indicates the rationale for cotreatment and states both overall and discipline-specific goals to be addressed; and (c) sessions are limited to two collaborating disciplines per session.

The evidence base for cotreatment is sadly lacking. Studies generally fail to share outcome data specific to joint therapy objectives (dependent variables) and collaborative methodologies (independent variables). An exception is Winter's (2014) evaluation of an occupational therapy and SLP cotreatment in which practice benefits were noted for each discipline represented, yet methodological problems limited this study's conclusions. Other research studies (Foley et al., 2012; Vikman, Fielding, Lindmark, & Fredrikson, 2008) have considered patients participating in ongoing multiple yet independent interventions (e.g., physical therapy, occupational therapy, speech therapy), but these failed to meet the guidelines for cotreatment reviewed earlier.

As with the broader concept of IPCP, research specific to cotreatment is complicated by problems with measuring outcomes that result from highly integrated interventions. Notwithstanding this fact, writings guiding practice have supported cotreatment as an extension of transdisciplinary teams working with specific disorders such as dysphagia (Moskowitz Kurjan, 2000) and cotreatment concepts for AAC interventions in health care settings (Beukelman & Nordness, 2015).

Although specific evidence supporting cotreatment is not readily available, the idea has intuitive appeal. As was proposed earlier in the discussion of IPCP's fit within conceptual frameworks for physical therapy practice, cotreatment appears to be a natural avenue for the broader-based intervention outcomes evident in the ICF and HOAC II treatment conceptualizations. Working with individuals with severe disabilities to achieve functional goals can require considerable time, and having members of the team collaborate and cotreat within a child's daily routine can be crucial and efficient.

IPCP and Individuals With Severe Disabilities: Mike's Case

Given the description of severe disabilities provided at the outset of this article, individuals with these conditions are likely to receive a variety of services throughout their lives. These include, but are not limited to, physical therapy and speech-language therapy. This article emphasizes potential benefits of IPCP to PTs and SLPs largely because of the collaborative histories of the authors. Simply stated, we have enjoyed intensely integrated therapeutic contexts in which PTs and SLPs learned from each other while children and stakeholders received innovative and cohesive care. For a population with significant health, developmental, and educational needs, this kind of care seems both essential and intuitive.

Thus far, this article has argued for professional collaboration from the perspective that, for PTs and SLPs at least, IPCP could emerge from practice occurring within the ICF and HOAC II frameworks and contribute to the realization of desired patient outcomes. Although a case illustration of this point follows, we are not advocating for the practice of IPCP among PTs and SLPs alone. To the contrary, we encourage the broad-based acceptance and application of IPCP.

Mike's story is conveyed with occasional commentary specific to the ways in which the professional orientations of PTs and SLPs, central to ICF and HOAC II frameworks,

provide fertile opportunities for the occurrence of IPCP.[1] It is our hope that Mike's portrayal will spark more collaborative risk taking by readers of this article.

Mike's IPCP Experience: PT and SLP Cotreatment

Background and Case Description

Mike is a 3-year-old boy who was born at 27 weeks of gestation. His medical history includes a 4-month stay in his community hospital's neonatal intensive care unit (NICU), during which he experienced several generalized seizures. Mike was diagnosed with failure to thrive and eventually received a gastrointestinal tube for feeding. Mike's general muscle tone increased significantly over the first several months of his life, resulting in an additional diagnosis of spastic CP. Early evaluations conducted in the hospital also revealed bilateral moderate hearing loss and suspected visual impairment.

Upon hospital discharge, Mike and his family (father, mother, and older brother) participated in a neonatal follow-up clinic, where Mike was evaluated monthly and received weekly therapeutic services in his home. The clinic provided social work, physical therapy, occupational therapy, audiology, and speech-language therapy services. By 11 months of age, Mike's development was increasingly behind adjusted expectations. Mike was described by his NICU team as presenting with the developmental abilities of a 3-month-old child. He was not yet rolling over or sitting up and was not actively engaged with those around him. At this time, Mike's team described him as severely developmentally delayed. He had received bilateral hearing aids and was wearing glasses.

Over the next year and a half, Mike continued to receive therapeutic services through his NICU follow-up team. His social worker worked with the local school district to find an inclusive developmental preschool, where Mike participated in daily physical, occupational, and speech therapy (consistent with Part C of the Individuals with Disabilities Education Act [2004]). By 30 months of age, Mike was sitting with support and enjoying upright time in a stander. Because his lower-extremity spasticity prevented independent ambulation, Mike had a custom-formed wheelchair for mobility (over time, a joystick was included to promote more independent movement). Spasticity in muscles of upper extremities made reaching and hand movement difficult. Mike oriented to others and showed interest in social interactions at school and home, though he presented no clear evidence of conventional symbol use or language comprehension. He brightened when spoken to and expressed a range of emotions (e.g., he cried, fussed, smiled, and laughed). Mike's expressive communication was largely limited to orientations and behavioral changes that were read by others as purposeful. In other words, Mike was not an intentional communicator. AAC options had been introduced, including choice-making with objects and single-message switches for voice output. Mike's switches conveyed simple preferences, for example, "I'd like the ball please," and attention-getting phrases, for example, "Look at me," and were used in scripted interactions with peers and preschool staff and at home. Mike used these options at a slightly better than chance level in his preschool and home settings. Mike tolerated his hearing aids and glasses well. He was generally thought to be functioning at about a 1-year-old level.

Just before his third birthday, Mike's family moved to a nearby community to be closer to his father's extended family. His former NICU follow-up team and developmental preschool staff worked with Mike's family and his new school district to transition services. Because he would soon be 3, Mike was evaluated by the local schools for placement in their inclusive developmental preschool. This setting was staffed with a lead special-education teacher and two paraprofessionals. The preschool received weekly therapeutic services from a PT and SLP and had regular consultative services from other disciplines, including occupational therapy and audiology. A vision specialist was available when needed but had a large service area.

Mike's PT and SLP, Mary and Rose, respectively, had developed a close working relationship after graduating together from the local university. During their educational and clinical training, they had been exposed to IPE opportunities and experiences. Since coming to work in the preschool setting, both had become committed to IPCP through cotreatment. Due to their IPE training, Mary and Rose benefited from a unique understanding of each other's disciplines and practice ideals. Using this knowledge, they developed an IPCP protocol to be used in conjunction with each student's intake and evaluation and treatment processes. In the case of a new student, the protocol directed Mary and Rose to (a) engage the family and other stakeholders upon referral to gain information about the child and family functioning, dynamics, and expectations; (b) participate, collaboratively where possible, in motor and communication assessment; and (c) determine how goals arising from assessment and family or stakeholder engagement could be addressed through cotreatment.

Initial PT and SLP IPCP Comments

Mike's PT (Mary) and SLP (Rose) both entered the therapeutic context with a grounding in ICF constructs. They appreciated the four key ICF elements (health condition, body function or structure, activity, and participation, including environmental and personal contextual factors) and understood how they might interact bidirectionally to affect practice. They were also equipped to apply hypothesis testing and predictive decision making as is suggested in the HOAC II. What made IPCP emerge? First, Mary and Rose had participated in preprofessional IPE. They understood each other's professional contributions and orientations. Second, they were prepared. Mary and Rose had seen the benefits of collaboration and worked together to create an IPCP protocol to guide their actions. Mary and Rose's

[1]For confidentiality purposes, all names appearing in this article have been changed.

knowledge of and comfort with each other gave rise to reflective, integrative, and cohesive care—all central to IPCP (Ogletree, 2017).

Planning

In Mike's case, Mary (PT) and Rose (SLP) set up a meeting with his parents, brother, and paternal grandparents, and Mike attended as well. Prior to the meeting, Mary and Rose reviewed all available records and contacted Mike's previous therapists to prepare. During the meeting, Mary and Rose learned of the family's strong commitment to Mike's care. They also were able to clarify several aspects specific to Mike's medical and service-delivery history. Mary and Rose learned that Mike's prior PT and SLP treatment had not occurred collaboratively, and they took this opportunity to share how they had used cotreatment with other children in the preschool as a means of providing integrated and cohesive care. Mary and Rose also asked Mike's family about how they hoped to be involved in treatment. The family ended the session by sharing some of Mike's preferences and conveying some aspirational expectations for Mike.

Mike's initial weeks in the preschool setting were highlighted by developmental and educational assessments. The preschool team functioned largely from a transdisciplinary orientation and conducted arena assessment sessions (i.e., sessions conducted with all providers and stakeholders present and participating) with Mike and his family over a 2-day period. Mary (PT) and Rose (SLP) used Mike's mother both as an informant and as an assessment partner with physical and communication tasks. Team members worked to obtain information about Mike's life away from school, including the community settings he enjoyed and his various participation patterns. The team convened after assessment with Mike and his family members to share findings and formulate treatment goals. Mike's parents served as active team members, sharing freely in the dialogue and offering ideas and suggestions. As a part of this process, Mary and Rose expressed their hope to see Mike in cotreatment sessions three times weekly and to provide collaborative support to the rest of the team to support the carryover of communication and physical goals for Mike in the classroom and at home. Mike's father expressed some concern that this plan seemed to offer less individual therapeutic contact, but he agreed to cotreatment once Mary and Rose reviewed benefits they had observed with other children similar to Mike. Mary and Rose assured Mike's parents of ongoing contact through daily notes and videos and encouraged them to attend treatment sessions whenever their schedules allowed.

Mike's physical assessment suggested he could benefit from building core strength, leading to independent sitting, which would support greater breath control and use of his arms; increasing tolerance to supported standing; and increasing upper extremity range of motion. His communication assessment suggested Mike's communication environment and opportunities could be enhanced by introducing a daily object schedule to assist with anticipation for ongoing events; using stop–start movement to promote emergent intentional signaling (behaviors offered purposefully to express communicative intentions); and offering consistent choice-making with objects. Together with Mike's family, Mary and Rose used their assessment information to choose the following global person-centered goals: (a) Mike will move independently (or with assistance) at home, school, and community while positioned upright and secure in his wheelchair; (b) Mike will communicate his needs (nonsymbolically and symbolically) in the classroom and throughout his day; and (c) Mike will participate in classroom activities at the whiteboard from his standing frame (this will also help improve bone density to prevent fracture). Goals were to be implemented over a 6-month period.

Mary and Rose met to plan Mike's initial treatment course. Mary (PT) shared general information about activities to increase core strength and postural support for breathing and function, whereas Rose discussed how these activities could be incorporated into communication-related home and school activities. Mary's ideas included ensuring that Mike was properly and securely seated in his wheelchair as well as in other classroom seating options. She worked with Rose to find the best postural support to allow Mike to utilize his muscles of respiration, which helped to improve his vocalizations. Also, she suggested instructing the teacher and others to use Mike's lap tray so that once he was seated appropriately, he could use his arms to operate a switch for his AAC device. In addition, Mary suggested engaging Mike in classroom activities at the whiteboard in his stander, similar to the way other children stand and participate. Mary explained that supported standing for 60–90 min five times per week would be beneficial for maintaining bone mineral density (and preventing osteoporosis), maintaining lower extremity range of motion, and preserving the integrity of his joints (Paleg, Smith, & Glickman, 2013). Mary helped the teacher and Rose ensure that Mike's trunk and extremity posture was aligned and secure during these activities and during similar standing activities at home.

Rose (SLP) thought that seating and standing options would provide excellent positions from which Mike could be provided fixed object choices and single-switch AAC communication devices. Furthermore, he could also use his vocalizations as needed for attention-getting if his AAC device was not available. Mary (PT) noted that as Mike's core strength increased and sitting stabilized, he should be able to reach more successfully in choice-making tasks and develop better breath control for functional vocalizations. Mary also suggested that treatment sessions should occur in a setting that minimized loud noises and strong lighting, noting that these variables can contribute to increased tone. However, knowing that life does not always occur in quiet/calm places, Mary noted the need for classroom and home guidelines to ensure that Mike remained posturally secure and appropriately seated to minimize extreme muscle-tone reactions to unexpected sights and sounds. Mary also identified several functional upper extremity range-of-motion activities that could occur during cotreatment sessions and throughout the day, such as removing and putting on his

jacket, washing hands, reaching for the whiteboard, or engaging in ball activities during gym class.

Rose (SLP) pointed out that the therapy ball could also provide a base for stop–start movement frequently associated with programs to promote emergent signaling. Rose described the van Dijk method (van Dijk, 1967) as a multistep therapy approach in which individuals with severe disabilities and sensory deficits participate in joint movement with facilitators who implement stop–start actions and await responses (Janssen, Riksen-Walraven, & van Dijk, 2003; Janssen, Riksen-Walraven, van Dijk, Huisman, & Ruijssenaars et al., 2011; Nelson, van Dijk, McDonnell, & Thompson, 2002). For Mike, Rose thought van Dijk movements could occur as Mike was closely held and moved back and forth on a ball or swing. Stopping and starting could be interjected while facing Mike and "looking" for his responses. Rose suggested that these and other types of movement activities, including Mike moving in his power wheelchair, would be best if they occurred as a part of Mike's regular classroom and home transitions rather than as isolated therapy events.

Rose also suggested an effort be made to extend cotreatment to multiple settings, providing the opportunity for greater interaction with peers and allowing for nonsymbolic and symbolic communication attempts to be observed and valued by others. Specific to cotreatment, she described the possible use of visual supports such as an object schedule to represent treatment activities in sequence. Rose also encouraged the involvement of peers in cotreatment to model communication attempts with Mike's AAC device. She advocated for the use of a communication and movement diary documenting treatment and home gains and suggested capturing cotreatment sessions on video as a means of modeling facilitative strategies.

Comments on Planning IPCP

The HOAC II intervention framework calls on providers to establish aspirational goals and directions after initial data collection. This directive generated a collaborative opportunity as Mary (PT) and Rose (SLP) reviewed records and interviewed stakeholders collectively. One can assume that their shared knowledge led to a stronger appreciation of Mike's abilities and needs. In addition, the joint interview provided the opportunity for Mary and Rose to learn of family expectations and Mike's preferences.

Mike's assessment considered ICF key elements in that it addressed condition, physical abilities and functioning, activities, and participation. A transdisciplinary team orientation promoted optimal opportunities for collaboration between Mary and Rose as well as other team members. Transdisciplinary functioning also promoted significant family involvement throughout the process. Last, eventual joint therapeutic goal planning with the family increased the likelihood of "buy in" and later participation in cotreatment efforts.

The discussions and planning between Mary (PT) and Rose (SLP) leading up to their cotreatment effort reflected the hypothesis testing and predictive aspects of the HOAC II theoretical framework. In particular, both providers shared rationale for actions and learned from each other. One can only assume that this sharing established the basis for a more cohesive cotreatment process.

In sum, the shared theoretical frameworks of both providers allowed a basis for IPCP qualities such as reflection and integrated/inclusive planning and care to emerge and flourish.

Cotreatment

Mary (PT) viewed a video provided by Mike's parents and previous preschool staff specific to his stander use. Mike was noted to be in his stander for about 20 to 30 min daily. During this time, Mike was separated from his classroom peers and provided with switch access toys. Observation of the video suggested that Mike's old stander might require modified support, as it might have been contributing to increased muscle tone and toe pointing (plantar flexion). Mary shared with Rose that a referral for ankle/foot orthoses seemed appropriate, as well as consideration of a new, better-fitting stander. Rose watched the video and noticed that Mike was often grumpy or fussy in the stander, suggesting that he might be uncomfortable. Mary pointed out that Mike's standing for a prolonged period of time may have been painful and could lead to skin breakdown and foot sores. Referrals were initiated leading to ankle/foot orthoses and a new stander more appropriate for Mike's size and weight. Furthermore, Mary and Rose questioned whether Mike's separation from the typical preschool environment might also contribute to his discontent. A dynamic stander with large wheels was suggested to allow the stander to be easily moved from one setting to another within his environment and to encourage Mike to learn to propel the stander himself. It was hoped that this would make standing more enjoyable and allow Mike to be in supported standing for longer periods as recommended.

Cotreatment sessions were initiated for Mike over the first semester of preschool. Mary and Rose worked together on Mike's goals, noting good results in independent sitting, reaching for object choices, and emergent signaling behaviors. Mike's peers were incorporated into sessions when possible. Treatment videos were created and shared each week with Mike's parents and other preschool staff, who implemented many of the treatment ideas in nontherapy contexts. In addition, Mike's parents and his brother were able to attend several sessions and generated ideas for home. Mike's new orthoses and stander allowed him to be upright more often, and standing was incorporated into preschool groups where Mike had increased social opportunities.

Comments on Cotreatment IPCP

The ICF and HOAC II provided the shared framework and practice principles to foster the IPCP process with Mary (PT) and Rose (SLP) and led to Mike's cotreatment. The cotreatment context allowed Mary to support Mike's care in a more complete, interprofessional fashion by sharing knowledge specific to positioning and movement that could be helpful in all therapeutic and educational

efforts. Mary was also able to benefit from Rose's observations about Mike in his stander, specifically, how Mike's extremity mobility contributed to the potential for greater success with communication interventions. Last, Mary and Rose together were able to present and model an integrated treatment effort for Mike's parents and other members of his preschool team. Their joint efforts also allowed for a more thorough understanding of environmental and personal factors important to Mike's case.

Case Summary

Mike's case portrays complexities frequently observed by those working with children with severe disabilities. Traditional therapy would have placed Mike in isolated treatments led separately by a PT or an SLP. Gains would likely have occurred in a fragmented fashion, and a broader cohesive outcome may have been lost. Instead, Mary (PT) and Rose (SLP) elected to practice collaboratively through cotreatment.

It is interesting to note that Mary and Rose came from disciplines that directly shared (ICF), or shared in principle (HOAC II), theoretical frameworks for practice. This suggests that they would have organized treatment in similar ways whether working together or not. By electing to work together and specifically pursuing IPCP ideals, Mary and Rose created more seamless care. We hypothesize that the shared principles of the ICF and HOAC II provided common goals supporting a collaborative opportunity. We also postulate that Mary and Rose's holistic orientation allowed them to address both the spirit and letter of ideal care as it is described by the ICF and HOAC II. Mike's case, though not perfect, illustrates the type of reflective and integrated care processes central to IPCP.

Conclusions

This article identified IPCP as an aspirational goal for PTs and SLPs working with individuals with severe disabilities. We argue that IPCP is a foundational process supporting both optimal broad-based team functioning and more limited isolated cotreatment efforts. The article identified joint professional reflection and integrated care as critical factors in seamless and cohesive IPCP therapeutic processes. It has also noted that IPCP flourishes when all stakeholders, including the patient and his or her family, are engaged.

General acceptance of IPCP is dependent upon numerous factors. First, researchers must work to define objectively the components of IPCP and measure their effect on therapeutic outcomes. Simply stated, IPCP is intuitively attractive, but its broad-based application awaits additional empirical support. Though IPCP measurement seems daunting, perceptions of similar dynamic care processes have been evaluated reliably (King, King, & Rosenbaum, 2004; King, Rosenbaum, & King, 1996). For example, the Measurement of Processes of Care-20 (King, King, & Rosenbaum, 2004) has been used successfully to evaluate perceptions of family-centered care, a complex, inclusive, and integrated process not unlike IPCP. It is fortunate that readily available resources are emerging for researchers to make IPCP measurement more consistent and effective (Medical University of South Carolina, 2016; National Center for Interprofessional Practice and Education, 2015). Second, preprofessional training programs in physical therapy, speech-language pathology, and other disciplines must commit to IPE. Students must have classroom and clinical experiences that create a greater preparedness for IPCP. For IPE to become the "training norm," professional organizations and accrediting bodies must value interprofessionalism and mandate its presence in preprofessional preparation. Last, in a challenging world of service delivery, providers must commit to IPCP when it may be the path less easily traveled. Myriad reasons are always present that discourage practice innovations. Tomorrow's provider must find a way to press toward IPCP. As authors and clinicians, we believe the potential benefits outweigh the costs.

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