

The Application of a Transdisciplinary Model for Early Intervention Services

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This article reviews the literature on the transdisciplinary approach to early intervention services and identifies the essential elements of this approach. A practice model describing the implementation of the approach is then presented, based on the experiences of staff members in a home visiting program for infants that has been in existence for over 30 years. The benefits and challenges experienced by therapists and managers of the program are considered, along with the unique aspects of the program and implications for program management. The managerial and team resources required to successfully implement a transdisciplinary model are high, but the potential payoffs for children, families, and therapists' development of expertise are considerable.

Key words: *early intervention, infants, model, transdisciplinary*

Isabella Garcia was a two-month-old little girl who was diagnosed with a degenerative, neuromuscular disorder shortly after birth. Her parents were devastated by the news and overwhelmed by the number of appointments they had with medical specialists. They did not want to spend their daughter's short life going from appointment to appointment. A transdisciplinary early intervention program with one primary therapist helped simplify services. The family was able to access the supports they needed through one key relationship.

Transdisciplinary models of practice aim to provide more family-centered, coordinated, and integrated services to meet the com-

plex needs of children with disabilities and their families (Carpenter, 2005). The transdisciplinary approach (TA) has been recognized as a best practice for early intervention (Bruder, 2000; Guralnick, 2001), and many early intervention programs adopt some form of TA (Berman, Miller, Rosen, & Bicchieri, 2000). In contrast to other service delivery approaches, TA is considered to reduce fragmentation in services, reduce the likelihood of conflicting and confusing reports and communications with families, and enhance service coordination (Carpenter, 2005; Davies, 2007).

Transdisciplinary service is defined as the sharing of roles across disciplinary boundaries so that communication, interaction, and cooperation are maximized among team members (Davies, 2007; Johnson et al., 1994). The transdisciplinary team is characterized by the commitment of its members to teach, learn, and work together to implement coordinated services (Fewell, 1983; Peterson, 1987; United Cerebral Palsy National Collaborative Infant Project, 1976). A key outcome of TA is the development of a mutual vision or "shared

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meaning" among the team (Davies, 2007; McGonigel, Woodruff, & Roszmann-Millican, 1994), with the family considered to be a key member of the team.

Much has been written about the conceptual basis of TA, including its premises and elements, but information is lacking about transdisciplinary service delivery from a practitioner's perspective (Ryan-Vincek, Tuesday-Heathfield, & Lamorey, 1995). Practice-relevant information is needed about how to deliver transdisciplinary services. Little is known about the roles of practitioners; the types of services that can be offered within this approach (eg, home visits, parent training); and how managers can provide structures, supports, and opportunities to create and sustain smoothly functioning and effective transdisciplinary teams.

One exception to the lack of published practice models is a family-centered, transdisciplinary model of early intervention service delivery called "Team Around the Child" (Davies, 2007), based on work by Limbrick (2005) in the United Kingdom. Davies outlines 10 model components, including philosophy, family role, key worker role, team interaction, lines of communication, staff development, and the assessment process. Descriptions of practice models such as this translate the rhetoric of TA into reality. The present article contributes to the literature by providing information about how to implement a transdisciplinary model of service for infants with special needs and their families, developed in Ontario, Canada. It is hoped that the article will inform managers and early childhood intervention practitioners about how to design a transdisciplinary service program and ensure its key aspects are sustained over time.

The article is organized as follows. First, we identify the defining elements of TA. Second, we discuss the benefits and challenges of the approach. In the remaining sections, we discuss the model adopted by the Home Visiting Program for Infants (HVPI), a transdisciplinary program in operation for over 30 years. We end by discussing unique aspects

of the HVPI model and implications for program managers.

ESSENTIAL ELEMENTS OF THE TRANSDISCIPLINARY APPROACH

Various researchers have highlighted the importance of the arena assessment (eg, McGonigel et al., 1994; Moodley, Louw, & Hugo, 2000; Ryan-Vincek et al., 1995). Other researchers have discussed the importance of role release as a defining characteristic, meaning that services are provided by one team member with consultation from other members (eg, Rainforth, 1997; Ryan-Vincek et al., 1995; Sheldon & Rush, 2001). Others have pointed to the importance of the interdependence among team members; their interchangeable roles and responsibilities; and the need for them to exchange information, knowledge, and skills (eg, Costarides, Shulman, Trimm, & Brady, 1998; Moodley et al., 2000). More recent articles have stressed the importance of a high degree of collaborative teamwork (eg, Limbrick, 2005; Reilly, 2001; Stepan, Thompson, & Buchanan, 2002).

On the basis of a review of the literature, we propose that TA has 3 essential and unique *operational features*, which, for the most part, correspond to those outlined by Foley (1990). The first is the arena assessment, where professionals from multiple disciplines assess the child simultaneously, using both standardized measures and informal methods (Foley, 1990). One person assumes the role of facilitator, and 1 or 2 others interact with the child while members of other disciplines observe. Everyone present has a role, including the parent, who provides information about the child and who can, with guidance, administer structured tasks (Foley, 1990). Upon completion of the assessment, there is a brief discussion of information and impressions. A more definitive formulation is made once the team has had time to analyze the data and reflect. Parents may or may not be present at this meeting, depending on their wishes.

The second essential feature is intensive, ongoing interaction among team members from different disciplines, enabling them to pool and exchange information, knowledge, and skills, and work together cooperatively. This feature reflects Foley's (1990) notion of role expansion but clarifies the role of collaborative interprofessional teamwork in making this happen.

The third defining feature of TA is role release, which is the most crucial and challenging component in transdisciplinary team development. The team becomes truly transdisciplinary *in practice* when members give up or "release" intervention strategies from their disciplines, under the supervision and support of team members whose disciplines are accountable for those practices. The role release process therefore involves sharing of expertise; valuing the perspectives, knowledge, and skills of those from other disciplines; and trust-being able to "let go" of one's specific role when appropriate. Role release also occurs with respect to the family (eg, parents can be educated about appropriate activities to incorporate into daily routines).

Isabella had low muscle tone and limited strength and endurance. She was able to move her eyes to look about the room, but not able to move her neck, trunk, or limbs without assistance. One of her parents' priorities therefore was to find positions that were comfortable for her. Isabella's primary therapist (a speech-language pathologist) and a physiotherapist together determined that supported side-lying would be a good position for the primary therapist to try. Since positioning does not typically fall within the realm of speech-language pathology, this is an example of role release.

The process of role release involves several aspects (Fig 1), including role extension, role enrichment, role expansion, role exchange, role release, and role support (Johnson et al., 1994). Role release is an ongoing process rather than a series of linear steps. In the role expansion phase, a common vocabulary develops, along with expanded theoretical knowledge and the capacity to implement integrated interventions that meet the holistic needs of the child within the family context,

resulting in a more naturalistic intervention (Foley, 1990).

The literature discusses other features of transdisciplinary models, such as a coordinated intervention plan and attention to the needs, desires, and goals of the family. However, these features also characterize program models that are interdisciplinary and/or family-centered in nature. Although the literature often characterizes transdisciplinary models as family-centered, this is not a unique, defining feature. In practice, the defining features of TA operate together, influencing all aspects of service delivery, including planning (the arena assessment), the organizational context of practice (ie, operational mechanisms and strategies to ensure ongoing exchange, communication, and development among team members), and implementation (ie, the lead role played by a primary worker who receives role support from the team).

BENEFITS OF THE TRANSDISCIPLINARY APPROACH

Following a home visit, Mrs. Garcia had questions about the positioning suggestions that were provided as well as questions about an application that was submitted for the funding of specialized equipment. She knew to call her primary therapist for clarification on both issues.

The presumed benefits of TA include (a) service efficiency, (b) cost-effectiveness of services, (c) less intrusion on the family, (d) less confusion to parents, (e) more coherent intervention plans and holistic service delivery, and (f) the facilitation of professional development that enhances therapists' knowledge and skills (Foley, 1990; Polmanteer, 1998; Sheldon & Rush, 2001; Warner, 2001). These presumed benefits have not been extensively evaluated. Empirical research on the transdisciplinary model is very much needed (Foley, 1990).

First, with respect to service efficiency, it has been argued that more children can be served because fewer providers routinely see a given child. Instead of each child receiving direct assessment and intervention

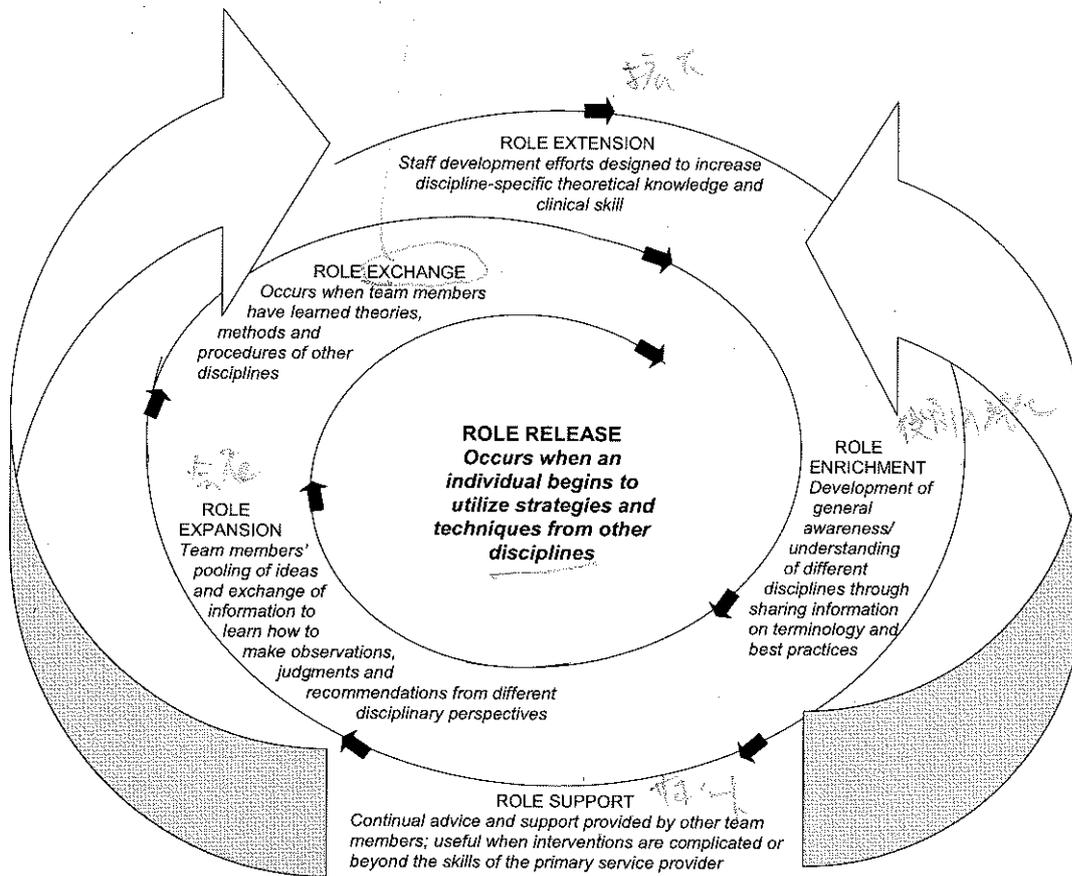


Figure 1. Aspects of the role release process.

services from each team member, services are funneled through one primary therapist, freeing other team members to see other children.

Second, one of the presumed benefits of TA is cost-effectiveness, but this will occur only if the process is going well. The arena assessment has been estimated to be at least 40% more cost-efficient than an interdisciplinary approach for similar assessment services (Kiss, 1983, cited in Foley, 1990), and transdisciplinary play-based assessments have been found to take less time to complete than multidisciplinary standardized assessments (Myers, McBride, & Peterson, 1996). Economic evaluations are required to determine system expenditures and societal outcomes associated with this model, both over

the short- and long-term. Short-term overall costs may be higher, but longer-term costs lower and longer-term outcomes superior.

Third, TA is considered to be less intrusive because parents only need to build one key relationship (Foley, 1990) and often only one service provider visits the home (Rossetti, 2001). There is less repetition of the same information to different service providers. Enhanced and streamlined communication is therefore considered to be a key benefit for the family.

Fourth, confusion is allegedly reduced for parents, since recommendations are coordinated and prioritized by the team, which includes the parent. Parents know whom to contact when issues arise; however, they may be confused about why, for example,

a speech-language pathologist is working on their child's physical mobility. The intent and safeguards of TA therefore need to be repeatedly explained (in writing and verbally) so that parents are comfortable with the approach and understand its evidence-base. In comparison with center-based interdisciplinary services, home-based services provided by one therapist have been found to be associated with lower family stress and enhanced infant development (Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992). Child development and parent-child interaction are fundamentally intertwined in the early years, and no one discipline is more effective than another in providing early intervention services, particularly for children younger than 1 year of age (Rossetti, 2001).

Fifth, TA fosters a holistic approach to care (Foley, 1990) through the development of more coherent intervention plans and a "shared meaning" or a mutual vision among the team and family (Davies, 2007). The mutual vision and good communication required by this model lead to services designed to best meet the needs of the child.

Last, from the managerial perspective, one of the benefits of TA is that it allows—in fact requires—significant professional development. Professional skills and mutual respect are enhanced through the use of this approach (Baine & Sobsey, 1983; Foley, 1990).

CHALLENGES OF THE TRANSDISCIPLINARY APPROACH

Isabella's family was experiencing a lot of stress and grief related to her diagnosis, and was under financial strain due to costs associated with equipment she needed. The primary therapist felt that a referral to the team social worker would be appropriate; however, the family had been recently connected with a social worker from another agency. The primary therapist therefore decided not to refer them for a social work consultation to avoid duplication of services, but met with the team social worker on several occasions to learn how to best support the family during this very difficult time and to work through her own feelings of sadness.

Challenges for service providers

Professional, personal, and interpersonal challenges occur for service providers (Davies, 2007). These include the loss of professional identity, liability implications (including fear that negligent behavior may occur through lack of sufficient supervision) (Ryan-Vincek et al., 1995), and inadequate sharing of knowledge and roles due to the experience of threat (Polmanteer, 1998; Sheldon & Rush, 2001; Warner, 2001).

To practice in a transdisciplinary manner, service providers must grasp the concepts of role release and collaborative interprofessional teamwork and display the skills required to deal with the practicalities each entails. Role release and teamwork reflect 2 of the 3 essential elements of TA we have outlined. The required professional competencies go beyond discipline-specific knowledge and skills and include personal qualities such as empathy, self-awareness, self-reflection, emotional self-control, sensitivity, interacting with authenticity, listening effectively, facilitation skills, and interpersonal communication skills (Davies, 2007; Ebershon, Ferriera-Prevost, & Maree, 2007; King et al., 2007; Pilkington & Malinowski, 2002). Service providers require self-confidence and a positive professional identity, allowing them to share without feeling threat to professional identity (Foley, 1990) and accept feedback with humility.

In general, the holistic, family-centered approach, breadth of knowledge, and interpersonal and team skills required make it most likely that therapists with higher levels of expertise will be most comfortable and proficient with TA. Novice practitioners may feel overwhelmed by the expectation that they operate in a collaborative team manner, especially if they have not received university training in interprofessional practice.

Challenges for managers

Practitioners may lack the peer support and professional development experiences they require to be effective in a transdisciplinary

role (Maher et al., 1998). Managers therefore need to create an environment in which there is openness to learning and opportunity for team members to learn from one another and discuss shared intervention strategies (Davies, 2007). Role support is a critical component of TA, requiring ongoing interaction among team members. It may be difficult for managers to ensure frequent enough opportunities for the level of interaction required. Other managerial challenges include building an effective team, engaging in succession planning to ensure the transfer of expertise, ensuring time for role release training (Foley, 1990; Ryan-Vincek et al., 1995), and providing opportunities and supports to encourage reflection and self-development (King, in press-a).

An appreciable amount of time is required for teams to plan, practice, and critique their work together, and to be able to deliver efficient and cost-effective services. As well, it takes a skilled and experienced manager to recognize problematic situations, such as when team members feel threatened by sharing knowledge with others. Another challenge faced by managers is ensuring a funding model that supports the indirect time required to provide high-quality transdisciplinary services (Pilkington & Malinowski, 2002).

In the following sections, we describe a practice model that applies the conceptual aspects of TA. We consider challenges experienced by therapists and managers of the program, the unique aspects of the model, and implications for program management.

THE HOME VISITING PROGRAM FOR INFANTS

HVPI mandate, clients, and services

HVPI is an early intervention program based at the Child and Parent Resource Institute in London, Ontario, Canada, and part of a continuum of early intervention programs in Ontario. The program's role is (a) to enhance the growth and development of infants and young children younger than 6 years of age

who have developmental disabilities or who are at risk for developmental delays due to established, biological, and psychosocial risk factors (Table 1) and (b) to promote the quality of life of the child and family (Ministry of Community and Social Services, 2001). Services are often provided in conjunction with other agencies.

Approximately 280 children and families receive services from HVPI on an annual basis. In 2008, an end-of-service satisfaction survey, receiving a 40% response rate, indicated that 80% of families strongly agreed that they were satisfied with the services received whereas an additional 15% agreed. In the last 3 years, only 3 families expressed discontent with the primary therapist role, preferring instead to receive direct service from multiple disciplines.

The program provides family support, service coordination, parent education, as well as assessment, treatment, and consultation services for the child, to families residing in 5 counties of Southwestern Ontario. Approximately 50% of the families live in the city of London and 50% live in small communities and rural areas outside the city. Approximately 80% of the children reside with their biological or adoptive families and 20% are in a form of foster care. Services are typically offered in the caregivers' home but center-based therapy groups for children and support groups for parents are also offered.

Program history

When HVPI was established in 1977, the program was led by a psychologist, with nurses providing frontline services. The focus was on providing infant stimulation activities to promote child development in a variety of domains. In the mid-1980s, the transdisciplinary model of service emerged and staff members from other disciplines were hired, including occupational therapy, physiotherapy, psychology, social work, and speech-language pathology, and the process of sharing roles and working across disciplines began.

Table 1. Risk factors determining eligibility for early intervention services at the Home Visiting Program for Infants^a

Types of risk factor	Description
Established	These are related to diagnosed medical disorders that are known to be associated with developmental delays (eg, genetic syndromes, neurological disorders, cerebral palsy, congenital malformations of the nervous system, infections of the nervous system, and metabolic disorders).
Biological	These are related to prenatal, perinatal, neonatal, and early developmental events that increase the probability of developmental difficulties (eg, exposure to alcohol and drugs in utero, premature birth, and birth asphyxia).
Psychosocial ^b and environmental	These are external to the child and reflect the child's surroundings (eg, parental mental retardation, attachment relationship difficulties, and abusive or neglectful home environment).

^aDerived from guidelines provided by the Ministry of Community and Social Services (2001).

^bChildren who exclusively have psychosocial risk factors are not eligible for services.

Staffing remained stable for several years, and clinicians became proficient and comfortable in their roles and developed cohesiveness as a team. Team members mastered the theories, methods, and techniques of other disciplines and were able to provide seamless service across traditional disciplinary boundaries. The arena assessment at that time had a medical focus, with the primary purpose being to diagnose and assess the child; cross-training between disciplines was simply a by-product of these joint assessments. As medical services at the facility changed, the arena assessment, a key component of TA, was lost.

Over time, working across disciplinary boundaries became second nature and less attention was paid to transdisciplinary team development. There was no explicit operational framework for the ongoing development of the team, aside from a thorough orientation process and a peer mentoring program. By 2004, many seasoned clinicians had retired, and newly hired professionals had minimal experience working in a transdisciplinary model. A new program manager had little knowledge of and no experience managing a transdisciplinary team. In 2006, a small group reviewed the literature to gain a better understanding of TA and insight into how to train and support new staff members and build and maintain the team. It became apparent that many team members were unfamiliar with the approach and that the team had deviated somewhat from the true definition of TA. On the basis of discussion at a staff retreat, a work plan was created to develop a common language, understand the aspects of role release, reintroduce the arena assessment, and examine how the team's transdisciplinary functioning could be improved.

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**BUILDING THE HVPI
TRANSDISCIPLINARY TEAM**

HVPI therefore developed a comprehensive orientation program for new staff, lasting about 9 months, that includes an orientation manual, peer mentorship, and participation in activities designed to facilitate the role release process. The purpose of the systematic orientation process is to develop "shared meaning" so that new team members understand the terminology, roles, and basic principles of each profession represented on the team as well as the importance of adopting a holistic view of the family. Although the

formal orientation process takes 9 months, experienced team members concur that it takes many years for new clinicians to feel comfortable with TA. Expertise is widely considered to require at least 10 years of professional experience (Ericsson, Krampe, & Tesch-Romer, 1993; Goodyear, 1997).

Orientation manual

The specific learning expectations for new team members are outlined in detail in the manual. The manual also includes a brief description of each of the disciplines on the team and their areas of expertise, suggestions for when to refer for consultation, a list of interventions that should not be released, and resources available for role enrichment. The manual outlines learning opportunities, such as reading relevant materials, meeting with other team members to discuss their roles, and participating and being observed in joint home visits. It also provides opportunities for members from each discipline to comment on direct teaching and other educational opportunities provided to the new staff member, and allows each discipline to provide written feedback on the new staff member's future learning needs.

Peer mentorship

New team members are assigned to a more experienced peer mentor whose role is to guide the orientation process and provide support. During the orientation period, the new team member meets regularly with her mentor and manager, and is assigned responsibilities and clients gradually. The mentor typically follows fewer families so that she has more time to meet with the new staff member and support her on home visits.

Activities facilitating role release

Annual learning plans, ongoing professional development, and monthly in-service education allow team members to extend and enrich their roles. Completing joint visits, participating in team assessments, and coleading groups provide opportunities to teach and learn from one another. The arena assessment

allows team members to view the family and child from different perspectives, and therapists serve as role models as they take turns facilitating the assessment and the debriefing session that follows. In time, team members develop confidence in themselves and one another, and role release begins to occur.

Performance appraisals, caseload reviews, and peer mentor meetings provide team members with opportunities for self-appraisal and to receive feedback from others. Families are given the opportunity to provide feedback through focus groups and a satisfaction survey completed during program involvement and upon discharge.

THE HVPI TRANSDISCIPLINARY PRACTICE MODEL

HVPI team functioning

Each family is assigned a primary therapist, who may be a nurse, occupational therapist, physiotherapist, psychometrist, or speech-language pathologist. Caseload and geography are typically the main factors used to decide which therapist will work with a new family, but therapists' professional background and expertise also play a role. The primary therapist is responsible for developing a therapeutic relationship with the family; offering emotional support; building advocacy skills; and providing education on issues related to health, development, treatment options, and community resources. As well, the primary therapist is the key contact person between the family and the rest of the team. It is her role to facilitate communication and cohesive teamwork. The primary therapist helps parents set goals with the team and coordinates and monitors the implementation of the plan of care.

Depending on the child's needs and family's goals, the primary therapist may work to enhance parent-infant interactions; provide strategies to improve the child's participation in everyday activities; promote the development of gross motor, fine motor, communication, and social skills; and assist with

transitions to day care, school, and services from other agencies.

A common misconception of TA is that one team member exclusively delivers all services to the family. In reality, even though a family may see one therapist most frequently, every family is supported by the larger team. Arena assessments, consultation services, short-term therapy, and groups are examples of ways that team members other than the primary therapist provide direct services to families. Indirect support is provided to the family via the primary therapist, who regularly confers with other team members, both formally (eg, mentor meetings) and informally (eg, phone contact).

There are times when the transdisciplinary model is not the best fit with family or child needs or the abilities of the primary therapist. One model of service delivery is not appropriate for all situations. The family may prefer separate services from individuals with disciplinary expertise, the family and child may have so many complex needs that it is not possible for one person to meet them all, or the primary therapist may be a novice and the family and child needs may be beyond her expertise. In these cases, an interdisciplinary approach is adopted.

Limits to role release

Role release only occurs at HVPI when team members have adequate understanding of the theoretical and practical components of the intervention. In addition, some components of assessment and intervention should not be released because they are too complicated, beyond the skills of most other team members, and risks to clients are too great. Examples include assessing feeding and swallowing and prescribing and adjusting mobility equipment. There are also some assessment tools that only individuals with specific training and/or education may use.

Due to her limited mobility, Isabella was at high risk for the development of joint contractures. The primary therapist felt that monitoring Isabella's range of motion was beyond her abilities, and requested

that a physiotherapist make a home visit with her to provide teaching and role support.

The HVPI arena assessment

Families are offered the opportunity to take part in an arena assessment, ideally within the first 6 to 8 weeks of program involvement. Prior to the assessment, the primary therapist speaks with the family about what they hope to gain, and then meets with the team to provide a summary of the issues and the parents' goals for the assessment.

The assessment team typically consists of a nurse, occupational therapist, physiotherapist, social worker, and speech-language pathologist. Because of scheduling constraints, a psychologist is included only when there are concerns about attachment or behavior management. The primary therapist determines who would be the most helpful to have in the room with the family, and other team members observe the assessment through a 1-way mirror. During the assessment, the child and his/her parents play with developmentally appropriate toys, and team members use clinical observation and/or screening tools to assess the child's strengths and weaknesses across all developmental areas. Team members also make observations about parent-child interaction.

Following the assessment, the team meets with the family to discuss their priorities and concerns, outline next steps, and answer specific questions the family may have. The team then engages in a debriefing process, intended to support the primary therapist in working with the family. The debriefing also provides opportunities for team members to provide feedback to one another. The primary therapist then develops an intervention plan with the family, based on the assessment information and family priorities, and implements the plan with the family while other team members monitor implementation and provide role support as needed.

There are many benefits to the arena assessment process. It provides a forum for parents to meet team members face-to-face and ask them questions specific to their disciplines.

It also makes it easier to reintroduce a team member at a later date for consultations. The assessment and intervention plan tend to be broader, more holistic, and better integrated than any one discipline could do alone. Since the role of facilitating the assessment is rotated, team members have opportunities to watch and learn from colleagues. The assessment also provides the opportunity for role enrichment through exposure to a variety of families, diagnoses, and issues.

CHALLENGES IN MAINTAINING THE TEAM AND MOVING FORWARD

Ongoing skill enhancement

The creation of a transdisciplinary team is an ongoing process. New members bring new skills to the team, and members continually build upon their expertise both within and across disciplines. One of the challenges in applying TA is enabling the systematic and deliberate teaching of skills to clinicians with different viewpoints, experiences, and levels of understanding. Creating and including a curriculum in the orientation manual has helped to ensure that all team members receive the same basic training and provides a way for managers, peers, and staff members themselves to record and monitor learning needs.

The process of training and being trained results in close scrutiny of each other's skills and can create an intimidating environment. This may be particularly difficult for novice team members who often feel most comfortable building expertise within traditional disciplinary boundaries. Ongoing formal sharing of information during monthly in-services and article reviews and informal, reciprocal asking and providing of advice help to create an atmosphere of learning and trust and break down barriers between expert and novice.

Despite challenges in educating and training staff, building a knowledge base is not as difficult as changing practice. It can be easy for a primary therapist to habitually request referrals from each discipline for each client. Referrals and joint visits may be neces-

sary for novice clinicians, but, as skill sets are built, joint visits may be needed less often, and the primary therapist may benefit from other forms of role support. It is important for therapists to look at ways to enhance practice as their competence improves. The role release process requires each team member to continually appraise his or her own skills, as well as those of others.

Evaluating competence

Another challenge related to role expansion and cross-disciplinary training concerns the evaluation of competence. Clinicians find it difficult to perform self-appraisals, and it is equally difficult for colleagues and managers to assess clinical reasoning skills and competence in a different disciplinary area. The program needs to look for ways to measure competence and identify learning needs through self-appraisal and reflective practice. Without these checks, the process of role release cannot be complete.

When team members retire or move on to other opportunities, managers need to find not only replacements who are skilled clinicians in their own discipline but also, perhaps more importantly, individuals who can learn to function in a team environment. Hiring practices play a crucial role in the maintenance of a transdisciplinary team. Individuals who do well within the team are open-minded, comfortable working outside the "expert" model, good listeners, and receptive to feedback. The ability to collaborate and work well with others is a key factor (Briggs, 1997). Theories and skills can be taught to any clinician who is receptive to learning.

UNIQUE ASPECTS OF THE HVPI TRANSDISCIPLINARY MODEL

The description of the HVPI practice model contributes to the literature by providing more detailed understanding of several practical aspects of TA. First, the HVPI program exemplifies a holistic and comprehensive transdisciplinary program, in which there is an emphasis on transdisciplinarity in all

aspects of the program. In contrast to other programs described in the literature, HVPI involves a large number of disciplines (not just 1 or 2), and role release occurs, within appropriate boundaries, in all stages of assessment, planning, and intervention (not just assessment). Second, the HVPI program attempts to include parents in all aspects of the intervention process, including assessment, goal setting, and intervention. The one exception is team debriefing, which is done for teaching purposes. Third, the HVPI program deliberately places an emphasis on team building, and there is ongoing discussion of issues related to group dynamics. This is considered to be essential to the success of the model.

IMPLICATIONS FOR SERVICE PROVIDERS AND FAMILIES

Ensuring role clarity

The intensive collaborative teamwork involved in TA requires clear articulation of team members' roles and responsibilities. Following family-centered service principles, parents should choose their role in the service delivery process, but this requires that they understand the options presented to them and the intents and safeguards of TA. To negotiate and clearly articulate roles, the primary therapist requires a sound understanding of principles of interprofessional teamwork and needs to appreciate the importance of appropriate documentation. Detailed and up-to-date dual purpose reports documenting roles and treatment plans are required to meet the needs of both families and staff members. Since goals change in an ongoing manner, reports should be revised to capture these changes, thereby ensuring clarity and "shared meaning" about who is doing what and why.

Educational role of service providers

Service providers have an educational role in explaining the premises and evidence-base of TA to families, and in fostering clear expectations about how services will be deliv-

ered. Therapists also play an educational role with respect to service providers from other agencies. An ongoing challenge is to provide education to community professionals about the benefits and practical application of TA, so that agencies can work better together.

Personal responsibilities of service providers

In this model of practice, service providers have personal responsibility to engage in role extension, enrichment, and expansion through self-directed study, dialogue and interaction with other team members, and self-appraisal and reflection. An attitude of openness to learning will enable them to embrace learning on the job. The skills necessary for collaborative interprofessional teamwork include listening and communication skills, negotiation skills, skills in giving and providing feedback, and skills in resolving conflicts and reaching consensus (King, Batorowicz, & Shepherd, 2008). As well, therapists need to be aware of their personal zone of comfort in enacting interventions from other disciplines.

Meeting family needs

TA is presumed to have benefits for families, including less intrusion on family life, and better outcomes for children due to more coherent intervention plans and holistic service delivery. However, many of these presumed benefits have not been evaluated, and it is important for service providers to understand that TA may not meet the needs of all families. They need to be able to recognize when the transdisciplinary model is not the best option for a family. Customized services designed to meet child and family needs are paramount in ensuring optimal outcomes (King, in press-b).

IMPLICATIONS FOR PROGRAM MANAGEMENT

Managers need to pay careful attention to the needs of individual practitioners to facilitate their development of competencies and expertise. Managers need to provide

appropriate formal and informal professional development experiences (King, in press-a); provide time for sharing, mentoring, coaching, giving and receiving feedback, and reflection; and facilitate a learning-based and supportive team environment. Such an environment is fundamentally necessary for the success of TA. The managerial and team resources required to successfully implement a transdisciplinary model are high, but the potential payoffs for children, families, and therapists' development of expertise are considerable.

CONCLUSION

This article has reviewed the literature on the transdisciplinary model of service, outlining its basic premises and operational features. The application of TA in a long-standing transdisciplinary HVPI has highlighted the importance, in enhancing the success of this model of practice, of clear roles, personal responsibility for professional development, and a learning-based and supportive team environment.

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