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## Pediatric Telehealth: Opportunities Created by the COVID-19 and Suggestions to Sustain Its Use to Support Families of Children with Disabilities

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### ABSTRACT

**Aims:** Telehealth is being rapidly adopted by physical and occupational therapists in pediatrics as a strategy to maintain services during the COVID-19 crisis. This perspective presents a mix of theoretical and practice perspectives to support the implementation of telehealth. Although research evidence is just emerging, there is sufficient indication to believe telehealth is effective. However, which telehealth strategies are best for which children and families, and which intervention goals, are not yet clear.

**Methods:** We discuss how different telehealth strategies (e.g. video-conferencing, emails, phone calls, online programs) are being used to address specific intervention goals. Comments from therapists using telehealth and examples of practices in different context and with different populations are provided. We discuss how newly adopted telehealth practices could be included in future hybrid service delivery models and programs, as well as factors influencing the decision to offer face-to-face or online interventions.

**Conclusion:** Although telehealth has been implemented quickly as a response to a health care crisis, and is not a one-size-fits-all intervention, we believe it offers great opportunities to increase the accessibility, cost-effectiveness and family-centredness of our services, to best support families of children with disabilities.

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eHealth; pediatric; service delivery; telerehabilitation-rehabilitation

The COVID-19 pandemic started in China in late 2019 and rapidly spread throughout the world, pushing the world health organization (WHO) to declare the outbreak as a Public Health Emergency of International Concern on 30 January 2020 (World Health Organization, 2020). Many health care services for children with disabilities were canceled and pediatric therapists quickly turned to telehealth to support the families they previously served face-to-face. As most countries are progressively implementing deconfinement measures while carefully monitoring risks of a second wave, therapists will be considering the role of telehealth in providing care and support to children and families in the upcoming years.

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Telehealth, defined generally as providing health care at distance, is not new. For decades, research has been ongoing to identify how technology could be used to increase access to rehabilitation services for individual with disabilities, mostly by decreasing time and costs related to travel distance (Camden et al., 2019; Edirippulige et al., 2016; Iacono et al., 2016). Prior to the COVID-19, organizations such as the World Confederation for Physical Therapy (WCPT) and the World Confederation of Occupational Therapists encouraged clinicians to embrace telehealth (Jacobs et al., 2015; WCPT and INPTRA, 2020). Yet, many technological limits and barriers at the patient-, clinician-, organizational- and system levels have limited the uptake of telehealth thus far. Could the COVID-19 be an opportunity to implement and sustain the use of telehealth for children with disabilities to realize it's promise of greater access, equity and quality of care?

Prior to the COVID-19, the percentage of clinicians using telehealth was low. An international survey of 1,133 therapists from 76 countries was undertaken pre-Covid (August 2019) and then all respondents ( $n = 107$ ) were re-surveyed post-Covid in May 2020. Pre-covid, only 4% (43/1133) reported that telehealth was used in their work setting (Camden, 2020), whereas post-Covid, this percentage increased to 70% (75/107) (Camden, unpublished data). Therapists were asked if they needed any support to implement telehealth. Three main categories of support needs emerged from the survey: 1) *Equipment and technology* (e.g. access to computers, secure internet connection and platform, and Information Technology (IT) support); 2) *System and organizational support* (e.g. legislation, insurance coverage, payment regulation, guidelines and ethics recommendations around the use of telehealth, support for team meeting, resources available for families); and 3) *training*, which was by far the most commonly cited need. Training needs included communication skills (i.e. how to optimize communication through phone and internet), safe and effective use of platforms, intervention strategies that can be used online, how to replace hand-on interventions, how to assess children at distance, how to adjust interventions for different age groups, and best practices for children with specific health conditions.

This article aims at sharing some perspectives about the use of telehealth to support children with disabilities and their families. Specifically, we share theoretical perspectives and discuss telehealth evidence in pediatric, as well as general and context specific considerations for its implementation. We conclude by presenting how hybrid service delivery models and programs, combining face-to-face and at-distance-intervention, could be implemented to support families, and discuss implications for practice and research.

Throughout the perspective, we present reflections from therapists who have been using telehealth. These therapists' comments come from discussions at the eHealth Summit for therapists in pediatrics (<https://the-ehealth-summit-for-therapists.heysummit.com/>) that was organized in May 2020 by an international committee. Over 4 days, 82 presenters from 9 countries gave 89 talks covering diverse topics from early intervention and therapy in schools to approaches supporting online learning for therapists. Topical issues around ethical, legal and logistical issues were addressed as well as the latest research, technology solutions, and practical application ideas. Presenters were a mix of clinicians and researchers from diverse backgrounds (physiotherapists, occupational therapists, speech therapists, psychologists, physicians, podiatrists), and parents.

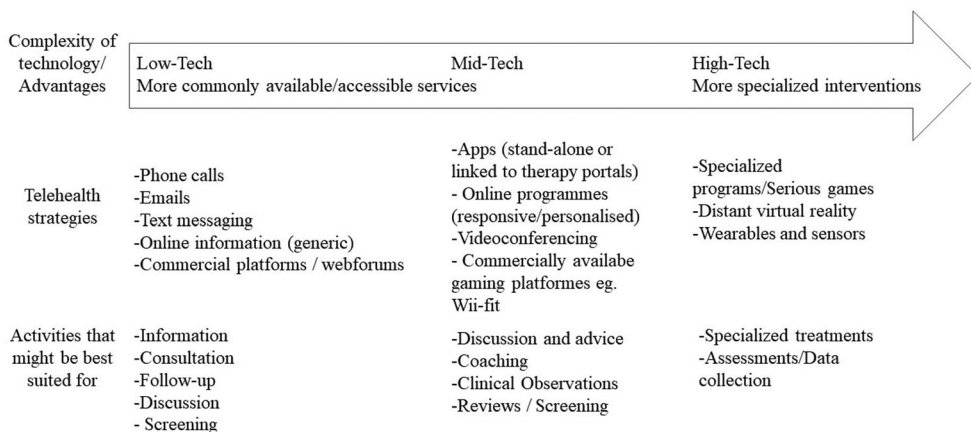
Almost 10,000 participants, mostly occupational and physical therapists, from more than 30 countries, participated in these presentations, either live or via replays, joined live Facebook discussions, and engaged in virtual social activities. Interactive platforms, such as Padlet, allowed participants to discuss among themselves and ask questions to presenters on a web wall. Most of the telehealth examples discussed here were presented at this eHealth summit, and therapist’ comments are citations from participants engaging on Padlet discussions, which are publicly available at <https://the-ehealth-summit-for-therapists.heysummit.com/all-discussions-2/>.

## Theoretical Perspectives

### What is Telehealth?

There is no consensus around the definition of telehealth, but most authors would agree that it refers to activities 1) related to health care, 2) provided at distance, and 3) involving either health care providers and/or patients (Camden et al., 2019; Zylstra, 2013). Telerehabilitation is the term used to refer to rehabilitation activities as opposed to telemedicine, which is specific to the field of medicine. We choose telehealth as opposed to telerehabilitation in agreement with authors who believe the focus of our work might not be on re-habilitating children with disabilities but rather should foster their functioning and development (Rosenbaum & Gorter, 2012). In this perspective, telehealth in pediatric physical and occupational therapy refers to the use of technology to provide distant support to children, families or individuals in a child’s environment, to foster the health, functioning and development of this child.

Figure 1 presents a general classification of telehealth strategies according to the complexity of the technology from low-tech strategies (e.g. phone calls and video/photo sharing), to more high-tech strategies that can offer personalized and specialized intervention. The focus of this perspective paper is on low and mid technology options, as they are the ones more commonly used and often most feasible.



**Figure 1.** Telehealth in pediatric rehabilitation: Use of technology to provide distant support to children, families or individuals in a child’s environment, to foster the health, functioning and development of this child.

## Evidence for Use of Telehealth for Children with Disabilities

A review in 2013 concluded that sufficient evidence existed to justify the use of telehealth in pediatric occupational therapy (Zylstra, 2013). It is one of many that support the feasibility of using telehealth in physical and occupational therapy in pediatrics, and the perception that telehealth could help increase access to services (Edirippulige et al., 2016; Iacono et al., 2016). One of the limitations identified by Zylstra (2013) was that most studies primarily investigated families' and therapists' satisfaction, as opposed to children and family outcomes. Another concern is that research has focused on children with autism (Ferguson et al., 2019; Sutherland et al., 2018) although telehealth it is applicable and potentially effective for all children.

A 2019 systematic review of randomized-control trials suggests that telehealth for children with disabilities is effective, although few studies included physical or occupation therapy (Camden et al., 2019). Another systematic review supports the use of telehealth in parent education and skill development (Chi & Demir, 2015), which is a key component of all pediatric therapy service. No telehealth strategy was found to be most effective (e.g. online modules might be just as effective as videoconferencing), but multimodal interventions (i.e. combining multiple strategies) might be most responsive to families' needs, as they provide families with accessible information in different formats to accommodate families preferences.

Despite this research evidence, perceptions that telehealth might not be as effective as face-to-face interventions remain (Edirippulige et al., 2016). As telehealth is a service delivery model, and not the intervention itself, the question should not be "Is telehealth effective", the same way we would not ask 'Is physical or occupational therapy effective'. What is needed is to understand which components of the telehealth service delivery are effective to achieve what goals, for who, and under what circumstances.

Comments from participants at the eHealth summit echoed these concerns:

- *I'm school based and not feeling effective right now for a variety of reasons. I think, for me, its that I have very high expectations of what I can achieve in one session and that I have to be content with smaller interventions. Plus dealing with very stressed families, kids not having equipment at home and parents trying to work.*
- *The gap identified in the research is around our lack of understanding about what works well - what do effective services look like? How do we know they are effective? How are they delivered? Who delivers them... lots we don't understand as yet.*

Therapists' concerns reflect their need for skills development and organizational support to deliver effective telehealth. Additionally therapists might need specific examples about how to apply telehealth in their own practice.

## Considerations for Telehealth across Contexts and Practices

Figure 2 illustrates our guiding principles for implementing telehealth in pediatric rehabilitation. We use 'VIRTUAL' as an acronym as many of the telehealth strategies

- V**iewing. What can I observe?
- I**nformation. What information does the families need?
- R**elationships. How can I build relationships and become a coach to this family?
- T**echnology. Am I ready and correctly using the technology?
- U**nique. What are this family's needs and context?
- A**cces. How can I ensure telehealth services are accessible to all?
- L**egal. Did I consider all legal (e.g. confidentiality) and organizational aspects?

**Figure 2.** Guiding Principles Framework for Implementing Telehealth in Pediatrics.

use the internet to deliver at-distance service. The acronym VIRTUAL also denotes that services are not a physical product, but a conceptual or digital one, and represent the innovative ways that communication and technology are used to deliver therapy or support families. These principles are detailed below, along with comments from participants at the eHealth summit.

### Viewing

- *It's been great to "see into" the client and family's home to provide recommendations on safety, positioning, transfers, etc.*
- *I think we also have to shift what we are looking at a bit - looking more at function in natural environment and less standardized assessment.*

Viewing reminds us of the importance of our observation skills, which are key to clinical analysis and treatment provision. Using video and photos as part of a telehealth approach provides a window into the child's natural environment, enabling therapists to identify aspects that can be modified to increase the child's participation and to assist in breaking-down tasks in a functional approach. Sharing screen captures (e.g. to show family the child's posture), photos and videos illustrating recommendations can enhance exercise programs.

Discussions are ongoing about how to use visual observation to deliver remote assessment of wheelchair and seating needs (Graham et al., 2019), supervise administration of standardized measures such as the Movement Assessment Battery for Children by community workers (Nicola et al., 2018), and supplement information from a family reported questionnaire such as the GMFCS Family Report Questionnaire to classify gross motor function in children with cerebral palsy (Rackauskaite et al., 2012).

### Information

- *Yes - providing the information and support just in time. And making sure we clearly explain how our eHealth intervention works.*

- *I am working with some families who have really risen to the challenge of these times. They have taken more ownership of their's child's program and figured out how to fit it into their routines.*

*Information* refer to multiple possibilities to deliver information according to families' preferences. Unlike static mediums (eg. pamphlets and booklets), digital information can be easily updated and delivered in interactive formats that match the pace, needs, and interests of families. Telehealth enables delivery of information in a very cost-effective way at scale, meaning online modules can reach thousands of families. It is however important to recognize that when used as stand-alone strategy, most apps fail to sustain long-term engagement (Michie et al., 2017); outcomes improved when online solutions are supported by person-person contact/coaching (Ingersoll et al., 2016). This could simply be in the form of a phone call or an email to check in and see if the family have any questions.

### **Relationships**

- *Where I am based (in Sydney) prior relationships do seem to be influencing the nature of the experience.*
- *From my perspective in sessions with children, caregivers expect to achieve less, be "open" to listening more. My experience is that Physios (myself) are perhaps more skilled at visual and physical observational skills – [we] need to work on "listening/auditory" skills.*

*Relationships* are equally important in telehealth, if not more, compared to face-to-face interventions. Many of the non-verbal cues and cultural etiquettes that support the developing relationship between families and therapists are absent in telehealth, requiring additional time and effort to establish trust and rapport. The quality of therapists' communication and interactions might be more important than the context, virtual or presential, where the therapist-family interactions happen. Having clear telehealth instructions and intervention guidelines will facilitate more intimate discussions to problem-solve with families in their natural environment. Trusting relationships facilitate engagement of families in telehealth, along with the use of coaching approaches, which seem to be key for effective telehealth sessions (Camden et al., 2019). Coaching styles vary from more directive, traditional approaches where therapists recommend or supervise a pre defined set of exercises, to more collaborative and problem-solving approaches. No evidence is available on whether one telehealth coaching style is superior to the other, but directive styles might be effective for skills acquisition while collaborative styles might foster families' engagement in the rehabilitation process and best support children' functioning and participation.

### **Technology**

- *Amazing to have the tech support for clinicians. This has been the biggest challenge in the departement I work in - some staff have such challenges that do not reflect their skill and competence as therapists.*

- *Education in tele-rehabilitation and use of telehealth needs to be prioritized and valued in services.*

Technology options and digital literacy of families, therapists, and organizations are critical to selection of telehealth strategies. Managers may need to consider technology hardware as essential health equipment, alongside appropriate training and reliable technical support for families and therapists alike. There are assessments available to help determine the readiness of therapists, organizations and families to implement telehealth (Touré et al., 2012), and identify areas where more preparation is required. In some cases, having specialized Information Technology (IT) support might be required and IT staff might become members of interdisciplinary teams.

### **Unique**

- *To be able to focus more on coaching skills, listening and asking families what they need.*
- *I would like to hear/read about the guidance/coaching of parents required to have them label/grade their [own] objectives.*

*Uniqueness* of each family is a key principle of family centered care that applies equally to a family's preferences for technology. Matching the family's preference to the technology solution should therefore be a primary consideration. Some families might prefer a phone call over a stressing videoconferencing session to discuss sensitive issues. Others might prefer to read a report first, having a therapist available later to respond to questions. Simply asking families what they are more comfortable with is essential. Low technology might well be preferable to complex web platforms or apps, depending on the intervention goals and families' preferences. Beyond responding to technological family preferences, telehealth also needs to address families' priorities in terms of services and support.

### **Access**

- *I am always so surprised by the look of disappointment of the therapist that both of us parents couldn't make the appointment for our child in the MIDDLE of the day!!*
- *Schools here have handed out mobile hot spots for families to have at home for internet access.*

*Access* to services is a perceived benefit of telehealth. Decreasing geographical barriers for rural populations and increasing access to specialized services are common perceived benefits of telehealth. More broadly, telehealth can increase timely access to services, because family can access information and support via asynchronous strategies (ie. online information or programs) and save travel time. The COVID-19 crisis demonstrates how telehealth might be an alternative way to access services. However, it has also created awareness of the inequities not only around access, but also around digital literacy and comfort using technology, both for therapists delivering services, the families receiving therapy, and the educational institutions preparing therapist for practice.



There are concerns that telehealth might fail to reach individuals either because of the lack of access to technology or the lack of time or desire to engage in interventions provided at a distance (Rideout & Katz, 2016). Using low technology (e.g. phone) and partnering with community workers who support these families face-to-face are avenues to explore to ensure telehealth equity access.

## **Legal**

- *Is there emerging policy regarding reporting neglect or abuse observed during telehealth sessions?*
- *Very thoughtful and informative session [about ethical issues]. Makes us all realize that the child's best interests is the most important aspect of telehealth.*

*Legal* aspects, including privacy and protection of health information, significantly impact how agile and responsive health systems are in utilising the best that technology has to offer. COVID-19 saw a temporary relaxing of many regulatory barriers that accelerated the up-take of telehealth by practitioners. Now, as we settle into our new normal, a closer look at what is in the best interest of the health privacy and protection requirements whilst still accessing the newest technology advances will be important as our service delivery models gradually increase their use of telehealth. Supporting therapists and organizations to navigate these concerns safely with clear guidelines from regulatory bodies, privacy commissioners and legal experts is of the highest priority in supporting the uptake and growth of telehealth. Other organizational aspects, relating to institutional accountability, payment systems, service delivery model, and institutional mandate might also need to evolve to facilitate the implementation of telehealth.

## **Implementing Telehealth**

### **Selecting Telehealth Strategies**

Deciding on how to deliver telehealth requires baseline knowledge of Telehealth options. This includes both Computer-Mediated-Communication (CMC), where the computer mainly serves to facilitate human-human communication and Human-Computer-Interaction (HCI), where the computer is programmed to interact with user independently. CMC, from low-technology solutions like texting and telephone to mid-technology solutions like videoconferencing, was the predominant form of telehealth presented at the eHealth Summit. Low-tech options are a surprisingly effective form of telehealth. Even when other technology options were more available, many therapists noted that text communication was the most effective way to keep connected with their families and this is supported by research showing email and text messaging have been found to positively impact health promotion intervention (Head et al., 2013). Speakers at the conference described the benefits of being able to take a photo or video of an activity in the moment using a mobile phone. Therapists shared ideas for using text messaging, photos, and video to successfully tweak programs and enhance therapy planning or review sessions. One therapist presented a case study

that demonstrated how effective a low tech solution like the telephone could be to the therapy process.

- *I surprisingly felt a sense of ease as if I was situated where I belonged, enabling coaching, directing with as least interruption as possible, not even my face or my gestures or physical presence was in the way of the parent-child bond.*

HCI solutions are emerging in pediatric health and rehabilitation where computers are programmed to respond, adapt, and deliver personalized content to families. Some exciting HCI technology solutions were presented at the eHealth Summit (see Table 1). For instance, Zingo is a child-focused app using gamification and behavior change principles to encourage adherence and goal-achievement with therapist directed home programmes. The app predominantly functions via HCI, providing rewards and motivation to the child in response to the child's interaction with the app, however some CMC is facilitated through messaging functionalities built into the application.

**Table 1.** HCI and multimodal telehealth interventions presented at the eHealth Summit 2020.

Application	Details	Links
Fun and Games For children with unilateral CP	Downloadable PDFs with activity instructions based on a specific toy and upper-limb sensory-motor goal (Parent-focused)	<a href="https://research.ncl.ac.uk/hemiplegiaresearch-fungames/toysandgames/">https://research.ncl.ac.uk/hemiplegiaresearch-fungames/toysandgames/</a>
TwoCan For children with unilateral CP	Serious gaming with the use of wearables (Child-focused)	<a href="https://research.ncl.ac.uk/earlytherapy/home/">https://research.ncl.ac.uk/earlytherapy/home/</a>
TEDEI For Health Care Professionals	An interactive e-learning course for the early detection of developmental delay	<a href="https://research.ncl.ac.uk/earlytherapy/researchstudies/tedei/">https://research.ncl.ac.uk/earlytherapy/researchstudies/tedei/</a>
CPTOYS App For children with unilateral CP	Interactive platform tailoring toy suggestions to child's age, diagnosis and therapy goals (Parent-focused)	<a href="https://www.cptoys.org/">https://www.cptoys.org/</a>
Introduction to Occupational Performance Coaching	An interactive e-learning course introducing Occupational Performance Coaching for Health Professionals	<a href="https://opc.elearninggroup.co.nz/">https://opc.elearninggroup.co.nz/</a>
Baby Moves App For the GMA ( <a href="http://www.general-movements-trust.info">www.general-movements-trust.info</a> )	Baby Moves allows parents to record and upload a video of their baby to be checked by a health professional (Parent-focused)	<a href="https://apps.apple.com/au/app/baby-moves/id1020058117">https://apps.apple.com/au/app/baby-moves/id1020058117</a>
T.E.D.I. For health professionals	Education on using Telehealth for the early detection and intervention of developmental delay	<a href="https://catalog.lms.unimelb.edu.au/browse/communities/courses/tedi-training-program">https://catalog.lms.unimelb.edu.au/browse/communities/courses/tedi-training-program</a>
SameView App For parents of children with disabilities	An online platform for families that connects and share information between therapists, educators and support workers. (Parent-focused)	<a href="https://www.sameview.com.au/">https://www.sameview.com.au/</a>
ImPACT ONLINE For parents of children with ASD	An online platform that teaches parents to promote their child's social-communication skills. (Parent-focused)	<a href="http://psychology.psy.msu.edu/autismlab/projectimpact.html">http://psychology.psy.msu.edu/autismlab/projectimpact.html</a>
Zingo For children with disabilities and developmental delays	A mobile app that supports a therapist directed home programme, using gamification and behavior change principles (Child-focused)	Contact <a href="mailto:zingo@abilitycentre.com.au">zingo@abilitycentre.com.au</a>
WECARE For parents of children with DCD	An online platform where a coaching model is used to support goals and parent networking (Parent-Focused)	<a href="https://www.smartpatients.com/trials/NCT04254302">https://www.smartpatients.com/trials/NCT04254302</a>

WECARE was presented as an example of a multi-modal telehealth research programme using both CMC and HCI. WECARE stands for **Web-based Early-intervention for Children using multimodal Rehabilitation** and has been developed following pilot projects and consultations with families and stakeholders (Camden et al., 2019; Pratte et al., 2020). WECARE is designed for families of children aged 3–8 years who have motor difficulties but are not accessing public rehabilitation services. A coaching approach is used to onboard parents to the programme and set functional family-centered goals. An occupational therapist and physical therapist then work with families to problem-solve and achieve these goals. Support is provided on an as-needed basis through a web platform, where the parents are able to initiate the level of support they want for their family. Thirty-minutes videoconferencing sessions are generally offered every two weeks. A virtual community of parents is facilitated where parents can support each other with questions and answers, moderated by clinicians as needed. A resource area is also provided. The information is driven by both the needs of the parents and what therapists would like to emphasize as part of the treatment programme.

### **Telehealth Barriers and Solutions**

Table 2 presents commonly mentioned barriers and potential solutions for telehealth, classified as per implementation science common categories (Damschroder et al., 2009) and telehealth implementation frameworks (Van Dyk, 2014). Overall, funding and service delivery models might pose specific challenge to the implementation of telehealth in pediatric rehabilitation, especially where services are only reimbursed when direct face-to-face interventions are provided.

Organizations also play a key role in the successful role out of telehealth. They provide the software and hardware, infrastructure, guidelines, professional development opportunities and resources, both for therapists and for the families being served. Examples from the eHealth summit highlighted how beneficial it could be when organizations quickly came together to create guidelines that addressed legislation and/or standards, processes such as informed consent, and supervision requirements.

Servers going down, applications not working, people interrupting sessions unexpectedly, and breaches of data are just a few examples of potential barriers to delivering therapy through technology from our eHealth Summit. Having a Plan B (or C or D) that is shared with the team (including parents and children) was recommended by

**Table 2.** System constrains to the implementation of telehealth and potential solutions.

System constrains	Potential solutions
Families, therapists and society perception of telehealth being less effective	Raising awareness about the benefits of telehealth
Technology (hardware and software, ICT infrastructure)	Consider technological equipment and IT support staff as part as the rehabilitation material and interdisciplinary teams
Behavioral Learning (healthcare workers)	Training therapists and students to use telehealth should be part of continuous education
Economic - Policy reimbursement models	Services provided at-distance should be reimbursed similarly as services provided face-to-face
Organizational (process integration and prioritization)	Processes need to be in place to support hybrid service delivery model

manypresentors to minimize the stress, optimize efficiencies, and ensure therapists are practicing safely within their legal and ethical requirements.

Therapists shared examples of how teamwork was facilitated by telehealth. Other team members could easily be invited to join a session, which not only significantly reduced barriers related to scheduling and traveling, but could prove less intimidating for the child or family than having all the therapists in the room for the session. Using text messaging between team members during a telehealth session was described as an efficient way to communicate that minimized disruptions in co-treatment sessions. Technology further facilitated teamwork when therapists were able to share documents and media in the cloud. Teams from specialist centers and primary centers could more easily connect to share goals and plans, whilst geographical barriers between teams and between teams and families could be virtually eliminated. It was noted that incompatibility of software between organizations created barriers to these potential benefits.

### ***Therapists' Skills for Delivering Telehealth***

Some traditional therapy approaches and techniques transfer well to telehealth, and may even be strengthened with a telehealth delivery. Specific professional development needs should be supported in this transition, including therapeutic skills, technical skills, digital literacy, and knowledge regarding online privacy, ethics, and safety.

Coaching is a good example of a therapy skill that naturally fits with a telehealth delivery model, particularly for early intervention and the early school years. At least a quarter of all presentations at the eHealth summit mentioned or discussed coaching as part of a telehealth service delivery model, with some talks focusing specifically on coaching skills (topics including mindset shifts from therapist to coach, coaching for specific populations and age-groups, and practical strategies). Coaching was discussed as a primary telehealth service modality by many therapist at the eHealth summit and, therefore, we put forward that therapists should have the benefit of additional training in this skillset to develop appropriate competencies and confidence.

### ***Context- and Age-Specific Considerations***

Some examples from the eHealth Summit of considerations based on the child's age and the context in which the service provider is working are highlighted here. With younger children where where interaction at distance might be more complex, coaching approaches involving collaboration with families and or individuals in the child's environment were thought to work best. For outpatient/rehabilitation services where interventions involve specialized services and equipments or hands-on and complex manipulations, capacity-building and supporting children's functioning and participation via telehealth could provide value. For school-base rehabilitation, collaborative approach with school teams through telehealth can foster inclusive learnings and provide opportunities to include families in school-base interventions, fostering collaboration among all stakeholders and continuity of care.

### ***Specific Considerations for Assessment***

Discussions about the validity of norm-referenced and criterion-referenced assessments being amenable to telehealth identified a lack of clarity about what is available or acceptable. Speakers shared examples of assessment providers who are facilitating transitions to telehealth by, for example, providing online portals where assessments can be completed. Families are provided a log-in and scoring and reporting can be automatically generated. When assessment providers do not have telehealth options, copyright restrictions may prevent forms being scanned or copied for delivery in a digital format. Therapists discussed work-around solutions such as posting the forms out prior to a telehealth session.

Many therapists commented on the positive aspects that telehealth provided when children are assessed and intervention is provided in their natural environment. These discussions generated lots of comments about the importance of observation and parental perceptions as critical assessment strategies in telehealth.

### ***Parents' Perspectives on Telehealth***

Table 3 shares parent perspectives of telehealth that can inform practitioners and funding bodies when considering telehealth as a service delivery medium. The comments highlight that despite holding promise, parents identified important challenges with telehealth that therapists need to remain aware of. To overcome these challenges, providing hybrid model of services, combining face-to-face and telehealth services, might be the way to move forward.

### ***Hybrid Model of Service Delivery***

A hybrid model, where both face-to-face or at-distant services can be used, will probably be the norm in the future. A case report in the Appendix and [supplementary video](#) of a hybrid model illustrate how telehealth can be used to support families from a distance, even when there has been no prior relationship. The case highlights the complementarity of a hybrid approach and demonstrates how telehealth facilitates delivery of the right information and support at the right time, in the right place for families, whilst in-person therapy accelerates the treatment gains that are being made.

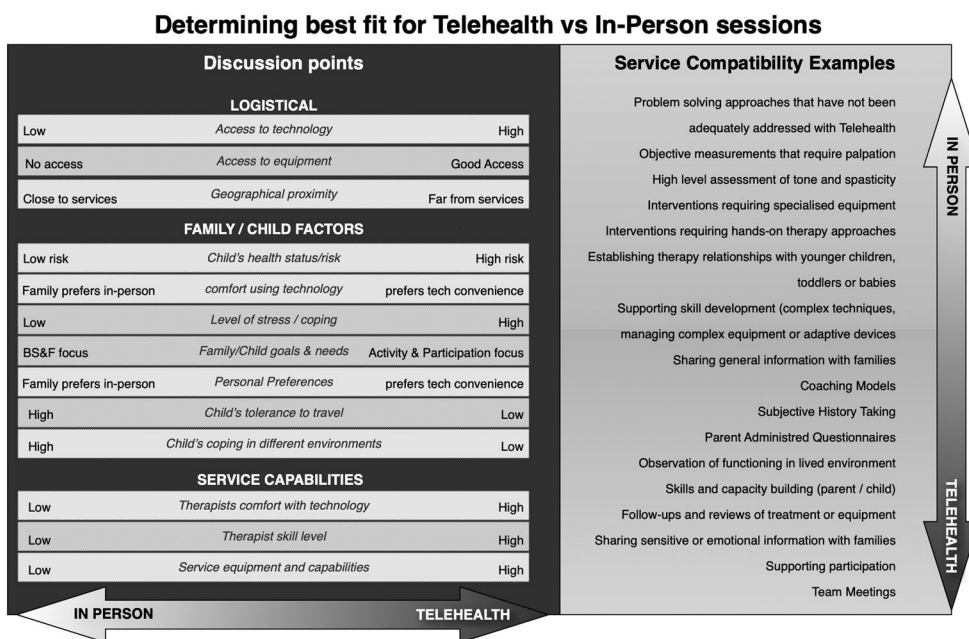
Figure 3 illustrates the many factors that therapists might want to consider when deciding to offer one or the other type of services. Factors on the left relate to logistics, family/child factors, and service capacity that will influence the decision to offer face-to-face or telehealth services. Therapists are encouraged to engage in conversation with families about advantages and disadvantages of each approach. Type of services listed on the right provide examples of services that might be more easily be implemented through face-to-face or telehealth.

Logistical and service capacity factors are critical to development of service delivery models that support the use of telehealth. Interestingly, when looking at some of the commonly used service delivery models, such as the Life Needs Model (King et al., 2002), telehealth appears to hold promises, particularly with regards to its ability to support the delivery of services aiming at interpersonal and external spheres. In fact, online

**Table 3.** Parent perspectives from eHealth summit.

Pro's	Con's
Coaching model was empowering	Feelings and fears of having to cope on their own and all the responsibility falling on them,
Asynchronous sharing of videos and photos was a good way to communicate struggles and progress. The use of videos and photos during a coaching session also meant they weren't having to manage their child and focus on the therapists during the session which could be very stressful.	Difficulties trying to implement the program that therapists were asking them to do – manage the technology, the activity, other siblings and their child's cooperation and emotions when they were already stressed and not feeling competent or confident
Implementation of activities in the natural environment meant there was no barriers to following through with activities between sessions as they had already practiced it at home with whatever equipment was available at the time.	Fears of losing progress, not having access to equipment or activities that can help their child.
Having therapists advise them on how to adapt games and routines that children are doing at home was very helpful in carry over	Child not engaging with the therapists over video creates stress and anxiety
Top tips: Using dolls, videos and other props to demonstrate exercises is helpful. Being clear about instructions, where to place the video camera etc is important.	There is a fine line between parents feeling empowered to do things and parents feeling overwhelmed by the responsibility of having to do everything on themselves.
Telehealth really emphasizes the need for building relationships and rapport. Much more time is spent with the parent and more effort is put into communication	Isolation from other people and networks when everything is done online – exacerbated during COVID
For children who are medically fragile, having less people come into the home helps eliminate another area of stress and worry.	
Therapists can be more responsive and available with follow-ups and help training in-home care givers	
It's easier to get everyone together for a virtual meeting which speeds up team collaboration. It's also much easier to get the whole team on the same page by using technology to share important goals, progress, treatment plans etc.	
Less travel and stress getting to appointments	
More time in the day for other things, whether that is family time or work time	
Continuity of care	
Real-time learning about what works best for your child in your own home whilst being coached and supported by the therapists, rather than trying to discuss and communicate this in a clinic environment.	

information and social media have recently been suggested as strategies to be used within family-centered services as effective ways to provide information and education (King et al., 2017). More broadly, if we want to maximize the potential of telehealth, where open-access strategies can be used to reach and support large collectives, we might need to reconceptualize how we think about pediatric rehabilitation. Workload models, where therapists are collectively responsible for a group of families, schools or programs, compared to caseload models, where therapists have a list of individual clients, might best support the full potential of telehealth. These models have been suggested in different contexts (e.g. school-base services, Missiuna et al., 2012) and would fit better within health promotion approaches, as opposed to our traditional specialized rehabilitation services approach. They have yet to be explored to support the use of telehealth in pediatric rehabilitation.



**Figure 3.** Discussion points for determining best fit for Telehealth and in-person visits.

## Implications and Future Directions

Implications for therapists include the need to learn more about the different telehealth strategies, to engage families in conversations about their service delivery preferences, and to explore how telehealth could be used to best respond to families' needs. These changes imply new ways of thinking, and foster the implementation of approaches centered on functioning and participation.

Implications for managers and policy makers include the need to ensure organizational and system barriers to telehealth are removed. The implementation of telehealth will need new resources, new funding and accountability mechanisms, and new clinical processes. It might also require us to reconceptualize who we believe our clients are, and what a rehabilitation service is. Innovative service delivery models might support well integrated care pathways, with some activities supporting the general development of all children, and an intensification and specialization of services as needed, for some children. Therapists will need to be well-supported and have access to appropriate resources, training and support to maximize this opportunity. The impact of a greater use of telehealth on clinicians' well-being will also need to be monitored, as potential negative impact on the therapists' physical (due to being more sedentary) and mental (e.g. due to mental fatigue on videoconferencing meetings) health were raised at the eHealth Summit.

Future directions will require collaborative work between families, therapists, and researchers to better understand families' preferences and how to foster their engagement in telehealth, ensuring no families are left out of the new hybrid model. Finding what telehealth strategies are best to use in which context, to achieve what intervention goals will be required. Finally, we will need to engage in cost-effectiveness studies to

compare either face-to-face interventions and telehealth, or different telehealth approach. These studies will need to provide enough details about the intervention, both the rehabilitation approach and the technology, to be able to replicate and sustain the use of the most cost-effective practices.

## Conclusion

Telehealth is feasible and can be effective to achieve a broad variety of goals in different contexts. We propose that telehealth aligns well with best practices in pediatric rehabilitation including a family centered approach. Determining how telehealth is best integrated into service delivery model is an opportunity to reflect on our practices, and perhaps consider when hands-on therapy is necessary and when a hands-off coaching approach can offer advantages. We hope this perspective will stimulate ongoing innovation, discussion and research into the best way to use telehealth within services that respond to families' needs by being not only cost-effective, but accessible, effective and family centered.

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## References

- Camden, C. (2020). *SCOOPPP STUDY: An International perspectives of Scope, Context, Organization Of services & Practices in Paediatric Physiotherapy*. <https://chantalcamden.wordpress.com/scooppp-study/>
- Camden, C., Pratte, G., Fallon, F., Couture, M., Berbari, J., & Tousignant, M. (2019). Diversity of practices in telerehabilitation for children with disabilities and effective intervention characteristics: Results from a systematic review. *Disability and Rehabilitation*, 1–13. <https://doi.org/10.1080/09638288.2019.1595750>
- Chi, N. C., & Demiris, G. (2015). A systematic review of telehealth tools and interventions to support family caregivers. *Journal of Telemedicine and Telecare*, 21(1), 37–44. <https://doi.org/10.1177/1357633X14562734>
- Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science*, 4(50). <https://doi.org/10.1186/1748-5908-4-50>
- Edirippulige, S., Reyno, J., Armfield, N. R., Bambling, M., Lloyd, O., & McNevin, E. (2016). Availability, spatial accessibility, utilisation and the role of telehealth for multi-disciplinary paediatric cerebral palsy services in Queensland. *Journal of Telemedicine and Telecare*, 22(7), 391–396. <https://doi.org/10.1177/1357633X15610720>
- Ferguson, J., Craig, E. A., & Dounavi, K. (2019). Telehealth as a model for providing behaviour analytic interventions to individuals with autism spectrum disorder: A systematic review. *Journal of Autism and Developmental Disorders*, 49(2), 582–616. <https://doi.org/10.1007/s10803-018-3724-5>
- Graham, F., Boland, P., Grainger, R., & Wallace, S. (2019). Telehealth delivery of remote assessment of wheelchair and seating needs for adults and children: a scoping review. *Disability and Rehabilitation*, 1–11. <https://doi.org/10.1080/09638288.2019.1595180>
- Head, K. J., Noar, S. M., Iannarino, N. T., & Grant Harrington, N. (2013). Efficacy of text messaging-based interventions for health promotion: A meta-analysis. *Social Science & Medicine*, 97, 41–48. <https://doi.org/10.1016/j.socscimed.2013.08.003>
- Iacono, T., Stagg, K., Pearce, N., & Chambers, A. H. (2016). A scoping review of Australian allied health research in ehealth. *BMC Health Services Research*, 16(1), 1–8. <https://doi.org/10.1186/s12913-016-1791-x>
- Ingersoll, B., Wainer, A. L., Berger, N. I., Pickard, K. E., & Bonter, N. (2016). Comparison of a self-directed and therapist-assisted telehealth parent-mediated intervention for children with ASD: A pilot RCT. *Journal of Autism and Developmental Disorders*, 46(7), 2275–2284. <https://doi.org/10.1007/s10803-016-2755-z>
- Jacobs, K., Cason, J., & McCullough, A. (2015). The process for the formulation of the international telehealth position statement for occupational therapy. *International Journal of Telerehabilitation*, 7(1), 21–32. <https://doi.org/10.5195/ijt.2015.6163>
- King, G., Tucker, M. A., Baldwin, P., Lowry, K., LaPorta, J., & Martens, L. (2002). A life needs model of pediatric service delivery: Services to support community participation and quality of life for children and youth with disabilities. *Physical & Occupational Therapy in Pediatrics*, 22(2), 53–77.

- King, G., Williams, L., & Hahn Goldberg, S. (2017). Family-oriented services in pediatric rehabilitation: A scoping review and framework to promote parent and family wellness. *Child: care, Health and Development*, 43(3), 334–347. <https://doi.org/10.1111/cch.12435>
- Michie, S., Yardley, L., West, R., Patrick, K., & Greaves, F. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: Recommendations resulting from an international workshop. *Journal of Medical Internet Research*, 19(6), e232. <https://doi.org/10.2196/jmir.7126>
- Missiuna, C., Pollock, N., Levac, D., Campbell, W., Sahagian Whalen, S., Bennett, S., Hecimovich, C., Gaines, R., Cairney, J., & Russell, D. (2012). Partnering for change: An innovative school-based occupational therapy service delivery model for children with developmental coordination disorder. *Canadian Journal of Occupational Therapy. Revue Canadienne D'ergotherapie*, 79 (1), 41–50. <https://doi.org/10.2182/cjot.2012.79.1.6>
- Nicola, K., Waugh, J., Charles, E., & Russell, T. (2018). The feasibility and concurrent validity of performing the Movement Assessment Battery for Children - 2nd Edition via telerehabilitation technology. *Research in Developmental Disabilities*, 77, 40–48. <https://doi.org/10.1016/j.ridd.2018.04.001>
- Pratte, G., Couture, M., Morin, M., Berbari, J., Tousignant, M., & Camden, C. (2020). Evaluation of a web platform aiming to support parents having a child with developmental coordination disorder: Brief report. *Developmental Neurorehabilitation*, 23(1), 64–67. <https://doi.org/10.1080/17518423.2019.1655675>
- Rackauskaite, G., Thorsen, P., Uldall, P. V., & Østergaard, J. R. (2012). Reliability of GMFCS family report questionnaire. *Disability and Rehabilitation*, 34(9), 721–724. <https://doi.org/10.3109/09638288.2011.615881>
- Rideout, V., Katz, V. S. (2016). Opportunity for all? Technology and learning in lower-income families. In *Joan Ganz cooney center at sesame workshop*. Joan Ganz Cooney Center at Sesame Workshop. <https://eric.ed.gov/?id=ED574416>
- Rosenbaum, P., & Gorter, J. W. (2012). The ‘F-words’ in childhood disability: I swearthis is how we should think!. *Child: care, Health and Development*, 38(4), 457–463. <https://doi.org/10.1111/j.1365-2214.2011.01338.x>
- Sutherland, R., Trembath, D., & Roberts, J. (2018). Telehealth and autism: A systematic search and review of the literature. *International Journal of Speech-Language Pathology*, 20(3), 324–336. <https://doi.org/10.1080/17549507.2018.1465123>
- Touré, M., Poissant, L., & Swaine, B. R. (2012). Assessment of organizational readiness for e-health in a rehabilitation centre. *Disability and Rehabilitation*, 34(2), 167–173. <https://doi.org/10.3109/09638288.2011.591885>
- Van Dyk, L. (2014). A review of telehealth service implementation frameworks. *International Journal of Environmental Research and Public Health*, 11(2), 1279–1298. <https://doi.org/10.3390/ijerph11020127924464237>
- WCPT and INPTRA. (2020). *Report of the WCPT/INPTRA Digital Physical Therapy Practice Task Force*. [http://webcache.googleusercontent.com/search?q=cache:XMC5rtGOvAsJ:www.inptra.org/portals/0/pdfs/ReportOfTheWCPTINPTRA\\_DigitalPhysicalTherapyPractice\\_TaskForce.pdf+&cd=1&hl=fr&ct=clnk&gl=ca&client=firefox-b-d](http://webcache.googleusercontent.com/search?q=cache:XMC5rtGOvAsJ:www.inptra.org/portals/0/pdfs/ReportOfTheWCPTINPTRA_DigitalPhysicalTherapyPractice_TaskForce.pdf+&cd=1&hl=fr&ct=clnk&gl=ca&client=firefox-b-d)
- World Health Organization. (2020). *Rolling updates on coronavirus disease (COVID-19)*. Retrieved June 24, 2020, from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>
- Zylstra, S. E. (2013). Evidence for the use of telehealth in pediatric occupational therapy. *Journal of Occupational Therapy, Schools, & Early Intervention*, 6(4), 326–355. <https://doi.org/10.1080/19411243.2013.860765>