



*Special Collection: Short Report*

**Systematic and Collaborative Review of E-health Ecological Networks (SCREEN) Model**

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**Abstract**

Due to the Covid-19 pandemic, occupational therapy services in the Philippines experienced a shift in service delivery. As face-to-face services were halted, E-health became the key solution for rendering rehabilitation services. Practitioners relied on their clinical judgment in accepting clients for this type of service delivery. The Systematic and Collaborative Review of E-health Ecological Networks or SCREEN is a model that may aid occupational therapists practicing in the pediatric setting and providing services through E-health. The SCREEN model will assist practitioners in deciding what type of service delivery would be beneficial for the client and if the therapist is equipped to provide E-health as a service. SCREEN model includes the framework and a decision tree for its usability and application to OT practice, particularly in E-health.

**Keywords:** *e-health, telehealth, teletherapy*

**INTRODUCTION**

As soon as Covid-19 was declared a pandemic on March 10, 2020, Pediatric therapy centers and establishments offering rehabilitation services (such as occupational therapy, physical therapy, speech therapy, and even special education services) for children with special needs discontinued operations following the Interagency Task Force's guidelines on community quarantine in most areas in the Philippines. Apart from the community quarantine guidelines, parents and caregivers are also wary about going outside because of the Covid-19. With the dilemma of continuity of care for their children and the fear of contracting the virus, both parents and therapists explored E-health as an alternative form of occupational and speech therapy service provision. Albeit it is a relatively new approach in the rehabilitation

setting in the Philippines, E-health, synonymously termed as telerehabilitation or teletherapy (telehealth in general) in the Philippine context, has been widely practiced in a pre-pandemic setting in developed countries like Canada and the US.

For the purpose of this paper, E-health will be used to signify telerehabilitation, teletherapy, and telehealth in general. The Philippine Academy of Occupational Therapists (PAOT) has released guidelines regarding the utilization of telehealth as early as March 16, 2020. The positive position of the professional organization increased its utilization. They mentioned, however, that "while direct and in-person occupational therapy (OT) service delivery always supersedes all other forms of service

provision, public health emergencies call for alternatives such as telehealth”.<sup>1</sup> With this, there are still challenges in this type of service provision which is currently at its early stages in the Philippines.

“Telehealth is the remote service delivery of health care services using information and communication technologies in which the provider and service recipient are in different physical locations. Broader use of the term incorporates health education and health administration; however, the term telehealth is commonly used interchangeably with telemedicine and describes the delivery of clinical services”.<sup>2</sup> This definition, however, did not specify methods that it uses in service delivery, but it does highlight the idea that telehealth is a service used when therapist and client are not able to meet face-to-face for a session.

According to WFOT, the term ‘telehealth’ can refer to synchronous (real-time) interactions between the therapist and client (e.g., videoconference, remote monitoring, virtual interactions using applications (‘apps’) and gaming technologies); and/or asynchronous (i.e., “store-and-forward”) transmission of data (e.g., video, photos, electronic mail) by the provider and/or the client. There are instances where telehealth may be incorporated with in-person interaction or clinic-based sessions as part of a hybrid service delivery model.<sup>3</sup>

“Telehealth may be used for evaluation, intervention, monitoring, supervision, and consultation (between remote therapist, client, and/or local health-care provider) as permitted by jurisdictional, institutional, and professional regulations and policies governing the practice of occupational therapy.”<sup>3</sup> Occupational therapy services delivered using E-health technologies occur within a virtual context, defined as “interactions that occur in simulated, real-time, or near-time situations with the absence of physical contact.”<sup>4</sup>

Studies to determine the efficacy of E-health in the Philippines are still currently being conducted, however, only a few articles regarding teletherapy, telerehabilitation, or telehealth have been produced in the country. Another challenge for rehabilitation

professionals, including occupational therapists, is determining whether the client may benefit from such service, which is usually determined during the screening as part of the OT process. A study by Sy et al. has also expressed different factors and difficulties that an OT might have in utilizing the telehealth services for individuals with disabilities.<sup>5</sup>

As such, the Systematic and Collaborative Review of E-health Ecological Networks (SCREEN) model aims to serve as a guiding framework for OTs in deciding what type of service for pediatric clients may be best utilized in the OT process. With the use of a decision tree, the model will help identify whether the therapist can provide E-health services to the client; Consequently, to identify services (E-health, Face-to-face, Home program, etc.) appropriate for the client in the OT process.

## METHODS

After reflection of clinical experience, one of the identified clinical roadblocks was on determining what type of E-health service would be best utilized for a client, considering the current practice of a judgment-based screening. The idea was to create guidelines and list requirements of what OTs need to consider when deciding to use E-health services. Consequently, a literature review was conducted to aid in conceptualizing the model. The model was patterned with the PEO model’s core constructs of Person, Environment, and Occupation domain. However, deviating from the notion of screening that primarily involves the client, it included the therapist’s person, environment, and occupation constructs. In terms of its design, a puzzle was used to depict and represent the pediatric population as its primary focus and to emphasize that each factor needs to be considered. Additionally, certain terminologies were also created for the model to encapsulate the idea of collaboration between the therapist and client in a virtual environment such as *Ecological networks*. A decision tree was created for its application, which was adapted from the Dynamic Performance Analysis (DPA). The decision tree included guide questions conceptualized using the factors identified, which are answerable by yes or no, leading to

what type of service may be best utilized in the OT process for the client. The name of the model was inspired by the OT screening process and the laptop screen (used as a communicative device or an E-health tool); For better recollection, an acronym of SCREEN, which stands for Systematic and Collaborative Review of E-health Ecological Networks, was used.

Peer review commenced after that, where two licensed occupational therapists who use E-health as an intervention reviewed the created model, and their comments were incorporated to improve the model's design and manuscript. Pilot testing and utilization of the model will be conducted after to strengthen its validity and improve its usability and application in the OT practice.

**Terminologies.** For better understanding, these terms are defined in the context of this paper.

*Ecology* is defined by Merriam-Webster as the totality or pattern of relations between organisms and their environment.<sup>6</sup> In this paper, ecology refers to the dynamic interaction between the person, environment, and tasks constructs that are considered in each person on the model. Moreover, ecological network is a term that refers to the client-therapist relationship. In this paper, it focuses on how the virtual context intertwines with the factors involved for each person, specifically the therapist and the client.

*E-health* or electronic health is also known as telehealth. The American Occupational Therapy Association defines telehealth as the application of service delivery through telecommunication and information technologies.<sup>7</sup> In this paper, E-health would refer to the provision of occupational therapy services through the use of telecommunication technology such as through phone calls or through virtual meetings.

*Ecological network* refers to the interaction of individuals in the ecosystem. In relation to the SCREEN model, it refers to the client-therapist relationship and how the virtual context affects the connection of both components. Virtual context is the interaction between individuals in real-time situations where an absence of physical contact and the use of a virtual technology to connect and interact with others is evident. Virtual technologies such as but not limited to internet connectivity, video conference software, and various devices are being utilized to perform the E-health process.<sup>8</sup> The factors mentioned must be considered on how it specifically affects the quality of intervention for both the client and the therapist.

## THEORETICAL BASES

The SCREEN model reviewed articles and conceptual models that will serve as the foundational theoretical bases for the conceptualization of the model.<sup>5, 9,11, 12</sup>

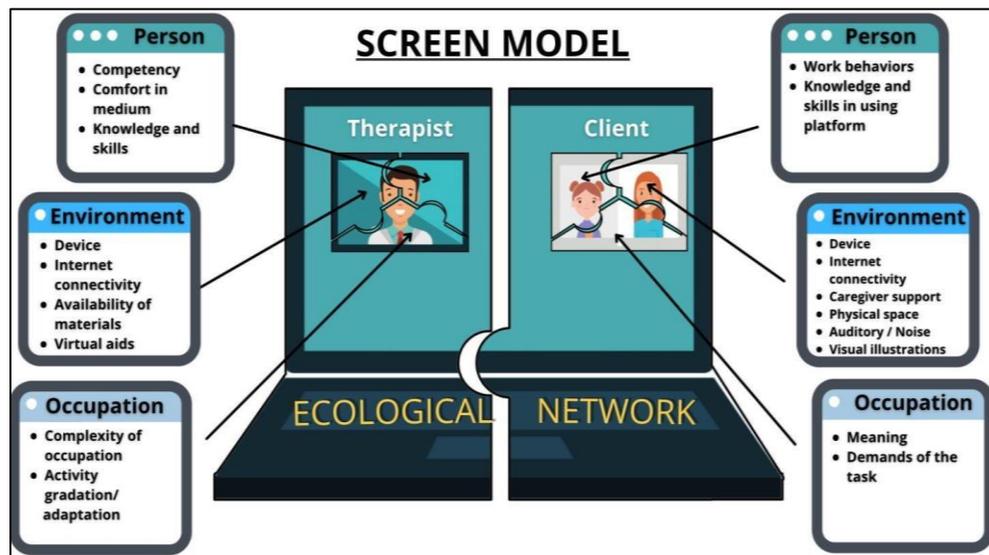


Figure 1. SCREEN Model

A simplified diagram of the SCREEN model is provided for practicalities in ink usage in publication as the original diagram has parts with solid colors that may affect its clarity when printed on paper. The simplified version consists of two elements, the therapist and client, that overlap at the middle forming the fit for E-health services creating the ecological network.

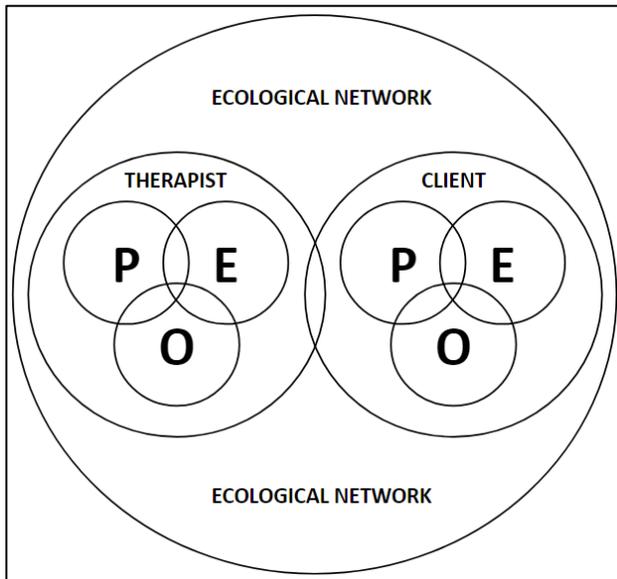


Figure 2. Simplified SCREEN Model

## DISCUSSION

The SCREEN model was formulated and adapted from the Person-Environment-Occupation (PEO) model. This was developed by Law et al. and is one of the ecological models that view occupational performance with three distinct elements, the Person, Environment, and Occupation. The PEO is a model that emphasizes the interaction between the person, environment, and occupation and how this shapes the occupational performance. The three domains mentioned for the PEO are all dependent on each other. The person is considered to be a dynamic, motivated, and ever-developing being. A unique and holistic view of the person acknowledges the mind, body, and spirit. The person is composed of their values and interests, skills and abilities, and life experiences. It consists of role, self-concept, cultural background, personality, health,

cognition, physical performance, and sensory capabilities. The environment is where the occupational performance occurs and consists of physical, cultural, and social components. This element is constantly changing that may hinder or supplement occupational performance, and occupational performance is incomprehensible if not in its context. This domain includes the physical, cultural, institutional, social, and socioeconomic environment. For the occupation, this refers to the tasks that one person would engage in to meet self-maintenance, expression, and the fulfillment of oneself. It is complex, pluralistic, and necessary for quality of life and well-being. The overlapping of the three domains shapes occupational performance, providing the congruence between the three. This model also shows that there is a direct relationship with the congruence and the occupational performance.<sup>9, 10</sup>

Like the PEO model, the SCREEN model looks at the fit of the three domains; unlike the PEO, the SCREEN model looks at the three domains for the key persons, the therapist, and the client, and that they are considered as two different entities. The person, environment, and occupation domains are puzzles that show the congruence of one person. The factors for these domains, both for the therapist and client, are discussed and elaborated on above. The fit of the domains in completing a puzzle signifies the person's readiness for E-health. The lack of one domain is a problem for both parties as this means that one, may it be the therapist or the client, is not ready for this type of service. If both parties can form the puzzle of the three domains, they may form the bigger puzzle together, now known as the ecological network. The model serves as the foundation for the SCREEN model, which focuses on the client and the therapist. The model identifies and evaluates elements (person, environment, and occupation) in the client and therapist that may influence the success of E-health service delivery.<sup>9,10</sup>

Factors of the PEO of both the therapist and the client were formulated using the studies by Fischl et al.<sup>11</sup> and Sy et al.<sup>5</sup> as reference. Both studies were used as a basis for identifying the factors of the domains presented in the SCREEN

**Table 1.** Factors to consider in screening for E-health embedded in the SCREEN model and Decision Tree

<b>Therapist</b>	
<i>Person</i>	<ul style="list-style-type: none"> <li>● Competency and requirements the therapist acquired</li> <li>● Comfort of the therapist in using the medium for service delivery</li> <li>● Knowledge and skills in using any platform the client will be comfortable in</li> </ul>
<i>Environment</i>	<ul style="list-style-type: none"> <li>● Communication device to be used by the therapist</li> <li>● The internet connectivity</li> <li>● The availability of the therapy materials to the client as the sessions will be done from home</li> <li>● The availability of virtual or digital visual aids</li> </ul>
<i>Occupation</i>	<ul style="list-style-type: none"> <li>● Degree of complexity of the occupation</li> <li>● Ability to do activity grading and adaptation</li> </ul>
<b>Client</b>	
<i>Person</i>	<ul style="list-style-type: none"> <li>● Work behaviors of the client</li> <li>● Knowledge and skills in using the platform</li> </ul>
<i>Environment</i>	<ul style="list-style-type: none"> <li>● Communication device the client will be using</li> <li>● The internet connectivity</li> <li>● Caregiver support</li> <li>● Adequate physical space</li> <li>● Visual and auditory distractions in the workspace</li> </ul>
<i>Occupation</i>	<ul style="list-style-type: none"> <li>● Meaning for the client</li> <li>● Demands of the task</li> </ul>

model, specifically the therapist and the client. Fischl et al. stated factors such as the relevance of the occupation or technology in their digital engagement, specifically the client’s goals, needs, values, beliefs, and perceived utility towards engagement in digital technology-mediated occupations.<sup>11</sup> In addition, the study by Sy et al. also emphasized determinants such as the perceptions of occupational therapists in therapist-client relationships, alternative occupations, emotional and mental declines such as the feeling of isolation, other possible potential from the profession, and preparation in enabling occupations amidst global crises.<sup>5</sup>

Both studies’ constructs and key points supported the conceptual model and decision tree in determining the factors that may affect the therapist and client’s engagement in the E-

health practice. *Table 1* shows the factors generated from the review of these studies and researchers’ consensus upon reflection in practice.

The factors identified are then embedded together with the process of Dynamic Performance Analysis (DPA). DPA emphasizes an observation-based assessment to determine problems in an individual’s performance in occupations. It delves on the assumption that there is no sequence of steps when performing an occupation or tasks; rather, it focuses on the actual performance of the task. Moreover, DPA’s purpose is to identify, solve, and address performance problems that impede the execution of the activity.<sup>12</sup>

DPA has a decision tree to systematically judge whether it is applicable for the client. The format

of the decision tree of DPA was adapted in the process of decision-making in the SCREEN model. Subsequently, the process of DPA involves an observation of the individual on how they participate in their respective occupations and utilization of a set of questions designed to identify specific problems and breakdowns in their performance of a specific task. The questions produced by the analysis are further divided into two.<sup>12</sup>:

- **Performer prerequisites**

Assesses the individual's basic knowledge about the task and their motivation to engage in the activity.

- **Performance prerequisites**

Determines the initial competence level of an individual for the activity as a whole before their performance in a subunit of the activity. These are specifically identified using: direct observation, reported performance, competence, and performance breakdown. A set of questions are given to provide detailed information regarding the individual's competence in performing the activity (e.g., is the performance competent? Where in the performance is there a breakdown? etc.).

The model likewise incorporates a decision tree (As shown in *Figures 3 and 4*) to complete the puzzle pieces of the therapist's frame and the client's frame, leading to the ecological network. The decision tree critically decides whether a client will benefit from E-health in any type provided by the therapist, E-health provided by other capable therapists, or face-to-face therapy session will be the most appropriate service that the client may receive. In essence, it serves as a guideline to a judgment-based screening process of OT services. A study by Camden and Sylvia had identified different factors to be considered before undergoing the e-health service, which was integrated with the DPA's decision tree to help screen individuals and help foresee an effective intervention for children with disabilities using e-health.<sup>13</sup>

**Clinical Utilization: Decision Tree.** Using the factors that make up the SCREEN model and the

DPA, a decision tree was generated to guide occupational therapists in identifying whether both the therapist and the client can participate in E-health services. *Figures 3 and 4* show how the occupational therapist will use the SCREEN decision tree.

**Limitations.** The model primarily focuses on the pediatric population. It will aid occupational therapists in distinguishing the fit between the therapist and the client's ecological network. Applying the model in the screening process can help therapists picture the fit and the idea of mismatch. Hence, the provision of a supplemental decision tree to apply the model practically in practice. The conceptual framework and decision tree's usability might be limited to this OT practice. It is limited in the screening process; however, some concepts and factors may be considered when doing intervention planning.

## CONCLUSIONS

The pandemic of the Covid-19 virus has resulted in an immediate paradigm shift in the service delivery of the rehabilitation team in the Philippines. E-health service was strengthened and became one of the key solutions for rendering rehabilitation services as face – to – face in – clinic sessions became restricted. Initially, due to the lack of published literature on this topic, practitioners may have relied primarily on their own clinical judgment and/or trial and error in admitting clients for E-health services without a well-defined determinant of acceptance. With the growing number of literature accessible for reference, a screening tool could be useful in assisting therapists in determining whether a client is qualified for E-health services, hence the development of SCREEN Model. This model could assist current and future practitioners in determining whether a client will benefit from E-health services by assessing therapists' and clients' criteria that could potentially influence successful implementation

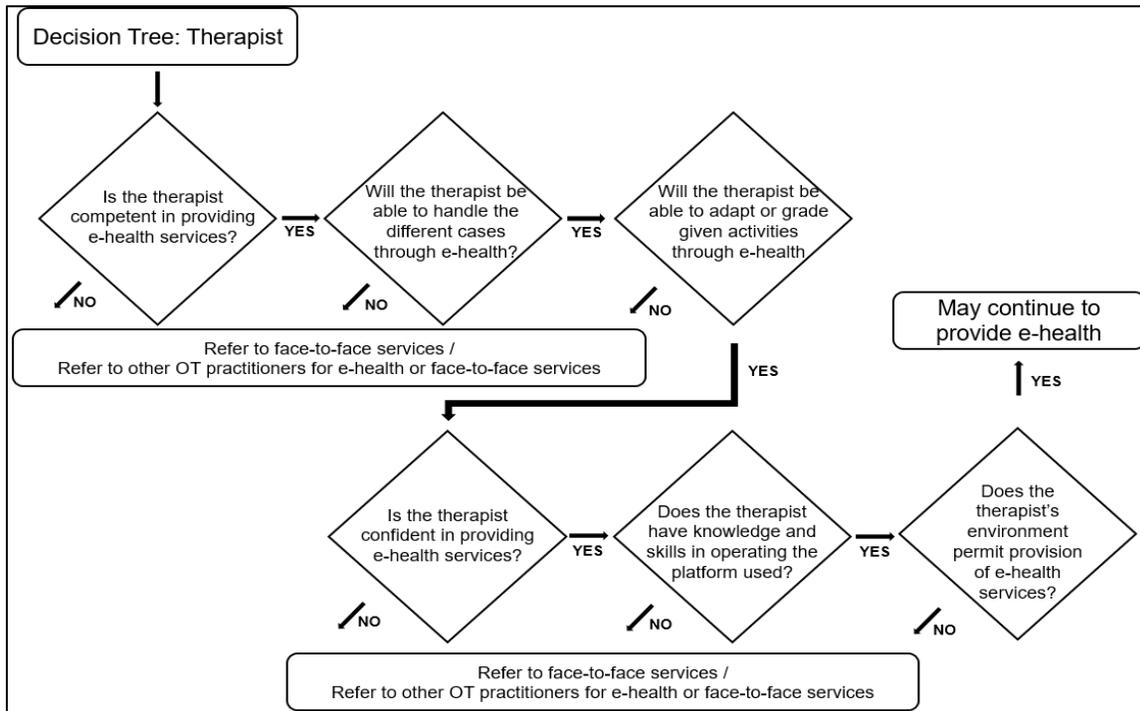


Figure 3. Decision Tree of the Occupational therapist

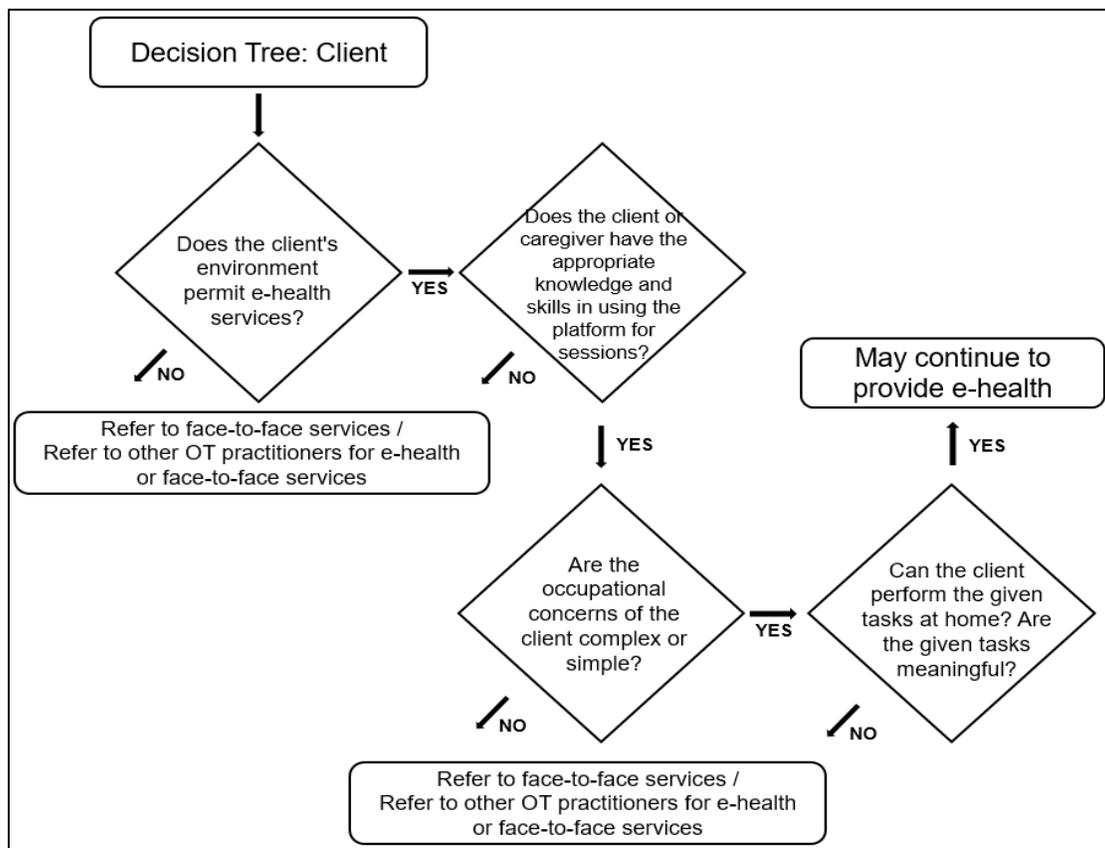


Figure 4. Decision Tree for the Client

**Recommendations.** Future research may focus on OT evaluation and intervention and other services as part of the service delivery

framework of occupational therapy. Other health practitioners practicing in the pediatric setting through e-health may utilize the SCREEN model,

but heed as future research is needed in using the model by other disciplines. A mixed methodology with focused-group discussion and survey with occupational therapists may be conducted to extensively incorporate other factors sensitive to the cultural and social context depending on geographical location to further strengthen the evidence in the factors used in the SCREEN model. Furthermore, additional research may increase the SCREEN model's flexibility for usage in various occupational therapy areas of practice and age groups that may benefit from getting rehabilitation treatment via E-health services.

### Individual author's contributions

M.A.B: proposition and conceptualization of framework idea, drafting and revising work critically, acquisition, analysis, and interpretation of work, approval of the version to be submitted for publication, and accountable for most of the work; J.B.M: drafting and revising work critically, analysis and interpretation of the work, accountable for majority of the work under terminologies and discussion; J.J.:drafting and revising work critically, creating the diagrams, figures and visuals for the decision tree, accountable for the majority of the work under theoretical base; V.M.:drafting and revising work ; J.P..S: drafting and revising work, accountable for seeking reviewer of the work ; R.C.D.: approval of the version to be submitted for publication

### Conflicts of interest

The corresponding author is affiliated with the University of British Columbia Pulmonary Rehabilitation Research Laboratory. The views expressed in this paper do not reflect the general position or opinion of the organization.

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conceptual framework, as well as the decision tree.

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