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CLINICAL CANVAS: A TOOL FOR CLINICAL CASE MANAGEMENT

LONA CLÍNICA: UMA FERRAMENTA PARA O MANEJO DE CASOS CLÍNICOS

CLINICAL CANVAS: UNA HERRAMIENTA PARA LA GESTIÓN DE CASOS CLÍNICOS

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ABSTRACT
Purpose: The present study objective to develop, based on the tools of Design Thinking and Business Model Canvas, a dynamic visual resource that allows the dialogue on insights generated by all research and clinical performance to improve the management of clinical cases. Method: The double diamond model was used as a methodological approach to define the problem. From this, it was possible to define the main aggravating factors for the problem as well as the definition of the central problem. Results: As a result, nine topics have been selected as key points for success in clinical management and these topics can be customized for other clinics as they are standard in healthcare. Clinical Canvas summarizes the ideas of leaders in healthcare design to enable healthcare professionals to develop the ability to create their own laboratory or critically evaluate their performance, based on effective clinical case management, useful for strategic planning and management purposes clinical cases that traditionally exist. For qualitative and quantitative assessments carried out with caregivers, an iterative digital form will be used. Conclusion: The Clinical Canvas synthesizes insights from leaders in health design to allow healthcare professionals to develop the ability to create their own laboratory or critically evaluate their performance, based on effective clinical case management, useful for strategic purposes of planning and managing clinical cases that traditionally exists.

KEYWORDS: Innovation. Universal Design. Health. Technological Development and Innovation Projects. Disease Management.

RESUMO
Objetivo: O objetivo do presente estudo é desenvolver, com base nas ferramentas de Design Thinking e Business Model Canvas, um recurso visual dinâmico que permita o diálogo sobre insights gerados por toda pesquisa e desempenho clínico para melhorar a gestão de casos clínicos. Método: O modelo de diamante duplo foi utilizado como uma abordagem metodológica para definir o problema. A partir disto, foi possível definir os principais fatores agravantes do problema, assim como a definição do problema central. Resultados: Como resultado, nove tópicos foram selecionados como pontos-chave para o sucesso no gerenciamento clínico e estes tópicos podem ser personalizados para outras clínicas, uma vez que são padrão na área da saúde. Clinical Canvas resume as idéias dos líderes em projetos de saúde para permitir aos profissionais de saúde desenvolver a capacidade de criar seu próprio laboratório ou avaliar criticamente seu desempenho, com base no gerenciamento eficaz de casos clínicos, útil para fins de planejamento estratégico e gerenciamento de casos clínicos que tradicionalmente existem. Para avaliações qualitativas e quantitativas realizadas com os cuidadores, será utilizada uma forma digital iterativa. Conclusão: A Tela Clínica sintetiza insights de líderes em projetos de saúde para permitir aos profissionais de saúde desenvolver a capacidade de criar seu próprio laboratório ou avaliar criticamente seu desempenho, com base no gerenciamento eficaz de casos clínicos, útil para fins estratégicos de planejamento e gerenciamento de casos clínicos que tradicionalmente existem.

PALAVRAS-CHAVE: Inovação. Desenho Universal. Saúde. Projetos de Desenvolvimento Tecnológico e Inovação. Gestão de doenças**.**

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RECISATEC – REVISTA CIENTÍFICA SAÚDE E TECNOLOGIA
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RESUMEN
Propósito: El presente estudio tiene como objetivo desarrollar, a partir de las herramientas de Design Thinking y Business Model Canvas, un recurso visual dinámico que permita dialogar sobre los insights generados por toda la investigación y la actuación clínica para mejorar la gestión de los casos clínicos. Método: Se utilizó el modelo del doble diamante como enfoque metodológico para definir el problema. A partir de él, fue posible definir los principales factores agravantes del problema, así como la definición del problema central. Resultados: Como resultado, se han seleccionado nueve temas como puntos clave para el éxito en la gestión clínica y estos temas pueden ser personalizados para otras clínicas ya que son estándar en la asistencia sanitaria. Clinical Canvas resume las ideas de los líderes en el diseño de la asistencia sanitaria para permitir a los profesionales de la salud desarrollar la capacidad de crear su propio laboratorio o evaluar críticamente su rendimiento, basándose en la gestión eficaz de los casos clínicos, útil para la planificación estratégica y la gestión de los casos clínicos que existen tradicionalmente. Para las evaluaciones cualitativas y cuantitativas realizadas con los cuidadores, se utilizará un formulario digital iterativo. Conclusión: El Lienzo Clínico sintetiza las ideas de los líderes en el diseño de la salud para permitir a los profesionales de la salud desarrollar la capacidad de crear su propio laboratorio o evaluar críticamente su desempeño, basado en la gestión eficaz de casos clínicos, útil para fines estratégicos de planificación y gestión de casos clínicos que tradicionalmente existe.

PALABRAS CLAVE: Innovación. Diseño Universal. Salud. Proyectos de Desarrollo e Innovación Tecnológica. Gestión de enfermedades.

INTRODUCTION

Innovation is a concept that has been occupying a prominent place in several areas, including health. Innovation in healthcare facilitates practices, services and offers a more consistent and user-centered performance. From a global perspective, several health services have been presenting innovation as an ally to improve practices and reduce costs[1]. A variety of health innovation models are in operation around the world, whether for care provision, financial transactions, data storage or as support in team management[2]. Health management with technological support presents changes in strategic planning and management, as innovation enables more assertive and high-impact decision-making[3]. Originally, health improvement was a variant of a continuous quality improvement, which involved a quality project team, using continuous quality improvement tools to improve the quality of their health service delivery processes. Now, it is really any activity that tries to improve the quality of health care using any method of change.

Walter Shewhart popularized this, while looking for leadership in health, improvement and innovation[4]. Quality improvement came to health care in the late 1980s and early 1990s. There were two competing approaches to quality improvement: pattern checking and the continuous improvement approach. Standards verification was used in accreditation, and in licensing doctors and verifying people with credentials. It was also used in something called a clinical or medical audit, where people were checking to see if they were covering some basic clinical standards. The process improvement approach is more related to the organization of a care system, and it is less about how to focus on the actual clinical content and each specific practice, it is more a case of organizing a process. The idea has a lot to do with the results being the way people work together, as well as people who follow the practice and skills.



RECISATEC – REVISTA CIENTÍFICA SAÚDE E TECNOLOGIA
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The process of continuous quality improvement was really symbolized in the work of Berwick[5], in which these two approaches came together. The challenge is innovation and scientific delivery. There is a growing difference between demanding and suppling and part of this is expressed in terms of great inequalities, not only in relation to countries with high and low resources, but inequalities between income groups, ethnic groups and geographic regions. So, definitely, there are challenges[6].

The point is that quality improvement methods can help us with these challenges. They are necessary tools in a toolbox for managers without health. Improving quality usually involves learning to work on projects with multidisciplinary teams. The people who work in the clinics work together to see how to make improvements and how to reorganize. For that, very simple tools are enough, like planning-doing-checking-acting. So, we talk about redefining the profile of a team or workforce and reorganizing the work and how it is done.

Some procedures were chosen by the NHS (National Health Institute) Institute of Innovation and Improvement, in 2008, to be the focus of an improvement initiative. A group of trusts at each end of the performance spectrum was identified. Teams of senior clinicians, improvement specialists and managers paid structured visits to these organizations. The objective was to understand, in some detail, what was different in the case of consistently high performances compared to those with less performance. The findings were published, validated and supported by instruction guides developed by clinicians to help other organizations to adopt these practices. They established: the significance of each characteristic of high performance; the benefits for patient experience, staff experience, quality of outcomes, service delivery, structures and costs; the help available to make the change; likely barriers and how they can be overcome; how progress can be monitored through measurement. The results were very positive, and, behind them, there was a toolbox, advice and measurement systems[7].

Health systems around the world are striving to improve the quality and user experience while managing population health and lowering costs[8]. Many health centers have linked traditional research or quality improvement initiatives to their innovation agenda. With technology increasingly in organizations, new forms of strategic planning and management with innovation are gaining space[3].

The proposal is to bring this component of innovation to clinical management in health care, using Design Thinking (DT)[9] tools for creating a product, since DT has already been used as a method for health solutions.

Although it is not yet universally understood in the health system and social assistance, there are some pioneers in the adoption and advocates of a design approach to solving problems. The Mayo Clinic Innovation Laboratory, for example, demonstrated success in leveraging human-centered design to improve patients experiences and transform care systems. The Mayo Clinic Center for Innovation aims to transform health and medical care. It offers a multidisciplinary team to transform innovative ideas from medical practice into practical solutions. They see experience as the health product based in very well described objective outcomes[10].

For implementing innovation in an organizational environment, different methodological approaches and resources have been employed[11]. These management resources are used as

support for decision making, work organization, analysis of functioning, monitoring and organizational control[12]. As they allow adaptation to different contexts, approaches such as Design Thinking[9] and Business Model Canvas[13] are commonly used by several organizations.

The clinical management is an important component for the success of health organizations, since from a clearer and more cohesive view of the organization, better user-centered services can be offered[14]. This question concerns how we manage our clinical cases. We do exhaustive data collections from anamnesis to therapeutic follow-up for long periods of time, which means that we need to have very agile and responsible methods of data management and that we need to put ourselves in the position of clinical case manager, in most of the time.

We need an effective instrument to analyze and to manage the data collected on a timeline. Some design techniques include: classify data to understand patterns and trends; visually represent responses to better understand data; clustered responses detect similar and different attributes; synthesis map helps to explore visually the research. Maps are typically designed as communicative artifacts that translate various perspectives of knowledge and illustrate dilemmas and challenges within a complex scenario.

The Business Model Canvas[13] is a strategic management model for developing new business models or documentation, to analyze existing organizations. It is a visual graph with elements that portray a company's value, proposition, infrastructure, customers and finances. The Business Model Canvas was used to inspire the creation of the Health Lona Design Laboratory. It was also used to create The Clinical Canvas, a tool that can be used by anyone who wants to innovate projects or critically evaluate an existing approach.

What elements of Design Thinking and the Business Model Canvas were taken up into the Clinical Canvas, and why? There are at least two reasons. The first is that possibility digitalizing traditional inefficient paper-based system. It can be a motivation for using a digital approach, and we can also point out the shortcomings like wasting time, human error, etc. Second, and even more important, having all data or information in one place streamlines facilitates the process. The concrete layout of the canvas offers a whole-case visualization in which the clinical easily access the greater information.

One of the objectives of this model is to advance in the improvement of clinical case management, creating, from the tools of Design Thinking and Business Model Canvas, a dynamic visual resource that allows the dialogue on insights generated by all clinical research. Thus, the objective of this work is to relate the development of Clinical Canvas, a resource to research and clinical performance to improve the management of clinical cases.

MATERIAL AND METHODS

Starting from the problem that involves the dynamic and safe management of clinical cases, the double diamond model (Fig.1) was used to define the problem[15].

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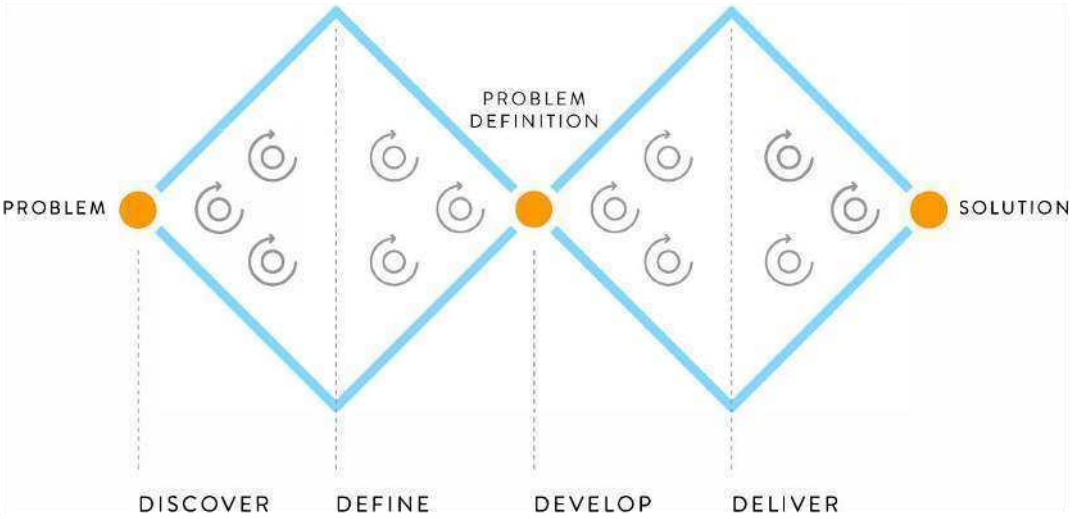

Fig. 1- Double diamond to define the problem[15]

With this, it was possible to define the main aggravating factors for the central problem, such as: the lack of vision of the professional as a clinical manager, lack of instruction in the management area, large amount of data and difficulty in bringing them all together in a clear and concise manner, the traditionalism in clinical care, the difficulty of analyzing the effectiveness and efficiency of techniques employed, which result in less evidence-based practice, as evidence is lost over time, among others. Thus, it was possible to reach the main problem: the absence of instruments that offer methodological support for clinical management, as well as facilitate the organization and visualization of data.

For the development of this study, submission for consideration by the Research Ethics Committee was not necessary, since it aims at the theoretical development of the instrument, without its application in human beings at the present time.

RESULTS

The result was the development of the Clinical Canvas (Fig. 2) to support the practice of clinical management. In order to support the practice of clinical management, the Clinical Canvas was developed, with the characteristics that better allow its application in the health area. The idea of managing a clinical case is like putting together a puzzle with transdisciplinary pieces, which need to be dynamically, visually and didactically available to the clinician. Usually, cases are described in exhaustive reports, often redundant, other times, omitted in relation to valuable information. The Clinical Canvas contains nine sections: Demographic data, History, Complaints, Behavior, Medical record history, Clinical impression, Current conduct, Cost structure and prognosis and Complementary measures. Each section was selected based on the main needs of users, in order to facilitate the collection of clinical insights and patient overview.

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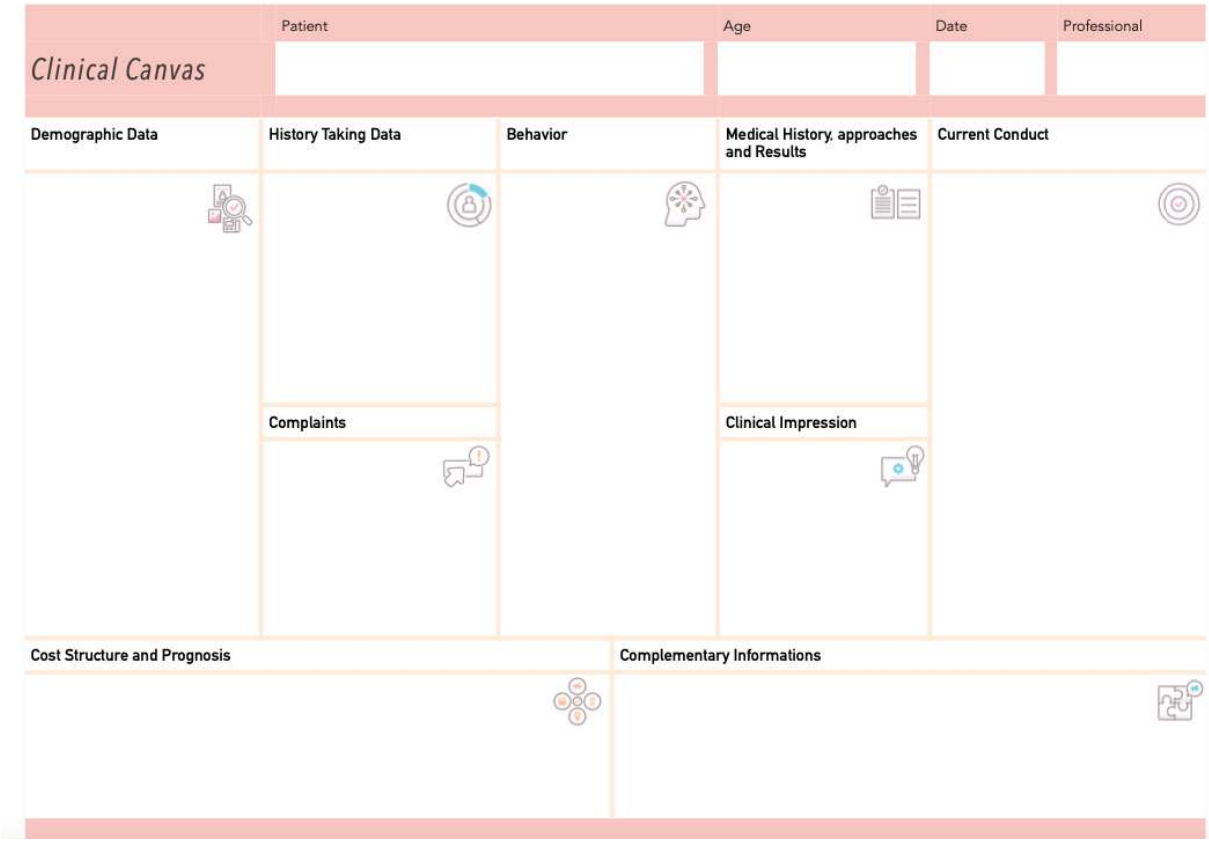

Fig. 2- Clinical canvas developed in this study

Thus, each section of the Clinical Canvas was designed according to the needs of users, in order to facilitate the collection of insights: both from the clinicians involved, which involves the turnover of health professionals and users, in terms of optimization and dynamization of services. The idea was to develop a synthesizer of insights.

The main questions to consider in each section are: what key activities does the clinical case require? what data is important in customer relations? The choice of topics present in the Clinical Canvas was made based on the visualization of problems faced in clinical practice, initially in an outpatient speech therapy service. Nine topics were selected as key points for success in clinical management and these topics can be customized for other clinics, once they are standard in healthcare:

1. **Demographic data:** this section was intended for the organization and synthesis of the main social and demographic data of the user, since the propaedeutics has a great influence on the actions that will be taken later, so that they are applicable according to social, demographic and user/patient cultural background[16]. The conduct, resources/procedures to be performed must be in accordance with the user's profile, so that the intervention is effective and accessible.



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2. **History**: as part of the analysis of medical semiology, the user's history, whether clinical or developmental, is responsible for about 80% of the influence of the diagnosis and conduct, since the analysis of the medical history transcends the anamnesis data, being built with the support of reviews and past history.
3. **Complaints:** the complaint is of great importance and is dynamic. The user's perception of the problem is the highlight and can change over time. Complaints, signs or symptoms presented by users tend to guide us in the decision of better behavior. It places us as mediators and the user as an agent of their health, facilitating adherence and sharing responsibilities of the health-disease-care relationship[17].
4. **Behavior:** the analysis of behavior is essential for building a differential diagnosis, as well as for analyzing motivation and awareness of the problem. With a comprehensive view of the user, decision-making and clinical management becomes a clearer task, with behavioral analysis being one of the factors of great importance for differential diagnosis[18]. This section is occupied by behavioral inventories, obtained from existing scales, therefore, it is recommended to use behavioral descriptors adopted in general diagnostic manuals in health, for content synthesis, better visual support and transdisciplinary efficacy.
5. **History of medical records:** this section is essential in interdisciplinarity, as it describes the user's entire clinical history in a summarized form, containing a history of diagnoses, therapeutic evolution, response to treatments, adherence to conduct, changes in behavior, changes in approaches, shared decision making and referrals. These data are essential for good interprofessional communication and development of shared activities.
6. **Clinical impression:** the purpose of this section is to describe behaviors with good results, or strategies that failed to build a clearer and more dynamic view of the situation. The importance of clinical impression records is essential for the construction of the clinical history, monitoring of evolution and verification of the effectiveness and efficiency of the decisions taken[19].
7. **Current conduct**: space for detailing the current intervention, instruments, strategies, drugs and/or other measures.
8. **Cost structure and prognosis:** the prognosis is designed in the short, medium and long term, so that, with diagnosis, clinical phenomenology and prognosis in hand, solutions are timely and effective, based on the optimization of resources. The goal is to combine specific solutions to the demand of each client, providing the necessary support for clinical, operational and financial decision-making. Effective clinical management reduces costs and improves productivity.
9. **Complementary measures**: a space for referrals, interpersonal meetings, records of various demands, by any stakeholder.



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ISSN 2763-8405

The analysis of the Clinical Canvas must be performed from left to right, following the traditional organization of the Canvas. To verify the effectiveness and efficiency of methods and techniques used, the analysis must be done from right to left, investigating, first, if the current conduct complies with the objectives presented in the clinical impression, then, if it is influenced by other approaches taken during the clinical history, if the user's complaints are met and then, if the current conduct is useful, considering the social and economic profile.

The tool developed is a prototype. Research projects involving its implementation by various professionals from different areas of health are already being thought of to better consider its usefulness in different fields, and it can be used to share approaches for the use of user-centered design in hospitals and other health organizations , far beyond the outpatient service, a digital version of the Clinical Canvas was also developed, deposited on a digital platform that allows remote access to the template to use the tool in different languages: Portuguese, English, Spanish and French, as well as a brief tutorial indicating how to fill and what is the objective of each of the nine blocks. In this digital version, still alpha, the Digital Clinical Canvas can provide a template and a brief tutorial, explaining how to save and what is the purpose of each of the nine blocks.

The originality of the digital version is guaranteed by the Judiciary, through registration on the platform of the National Institute of Intellectual Property - INPI. Clinical Canvas accommodates legally sensitive data that is the responsibility of the end user. It is noteworthy that, from the registration of intellectual property, the authors legally retain all rights to the original work, as well as the exclusive property to make changes and/or corrections to the work, and the general public is only entitled to use the version made available by the authors. To ensure copyright, Clinical Canvas is registered with the National Institute of Intellectual Property under registration number BR512020001437-2.

DISCUSSION

This instrument adds the concept of harm-free, non-iatrogenic care, consistent with the intention of most health professionals, especially nurses and staff, who provide direct assistance to the patient for a longer time than other professionals and are, consequently, more susceptible to errors[20]. In addition, as it was developed in a school-clinic, it can assist in teaching clinical reasoning, diagnostic accuracy, and critical thinking. The management of clinical cases is a transdisciplinary and dynamic task, which needs to be performed with visual resources and didactically available to the clinician[16-18]. Traditionally, cases are described in exhaustive reports, often redundant, sometimes omitting valuable information. Thus, when an instrument is developed that allows a better visualization of these cases, we can have greater efficacy and efficiency in terms of clinical management.

The Clinical Canvas also allows the creation and visualization of storytelling in different scenarios, which facilitates the clear visualization of the application of clinical decision making in a previous way. In addition, it is possible to obtain an overview of the professionals and the patients views, to analyze possible patient and family behaviors, the expected benefits, how to adapt decisions



RECISATEC – REVISTA CIENTÍFICA SAÚDE E TECNOLOGIA
ISSN 2763-8405

according to the patient's sociocultural profile and also to check the possible reasons that will lead the patient to engagement in the activities to be proposed.

The possibility of creating different scenarios for the future is a great ally to justify clinical decision making, since it is possible to select clinical activities that provide more realistic, empathic outcomes[21]. It makes ideas tangible, in addition to providing greater clarity to details. From the creation of clinical scenarios, good ideas can arise, however, a good part of these ideas can be discarded because they do not apply to the case.

For the development of these scenarios, strategies such as talk / text and image, role play and comic strip can be used[22]. It is necessary to describe how the clinical activity will be developed always returning to the user's profile (based on data available on the Clinical Canvas) as the main piece (complaints, demographic and behavioral data and clinical history) and to choose the goals and expected outcomes in short, medium and long term.

For this description, it is necessary to use the Clinical Canvas to perform the crossing of information:

Complaints -> Clinical impression

Conduct -> Complaints -> Clinical impression

Conduct -> Behavior

Conduct -> Complementary measures -> Cost structure

Conduct -> History -> Demographics

This crossing of information is essential for a good understanding of the clinical case general panorama and the patient life[23]. Through this analysis, questions may be raised in order to verify the effectiveness and the applicability of the current and/or future clinical procedures. The moment to check which of the proposed scenarios for the different conducts is the most applicable is when the possibilities of scenarios have already been created, according to the following matrix:

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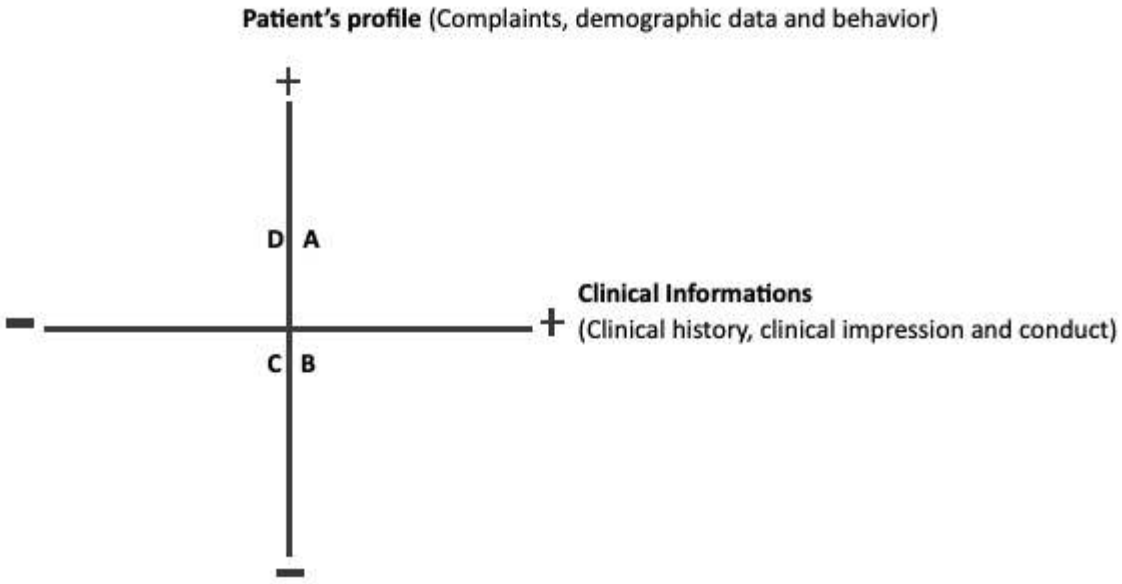

Fig.3- Matrix for creating scenarios

For a scenario to be more likely to be effective and efficient, its information needs to be sufficient to be located in the "A" quadrant of the forecast scenario matrix (fig.3). That is, the solution/activity proposed by the clinician is sufficient to meet the demands arising from the patient, as well as being in line with the clinical information present in the Clinical Canvas.

CONCLUSION

This prototype is the result of a synthesis map built over a year of innovation in an outpatient speech therapy service, as part of the establishment of an Assertive Therapeutic Design - DTA, which will be published later, and can be used by any organization that intends to develop their own design skills or for those who need to develop better clinical case management skills, including for interdisciplinary dialogues.

This work synthesizes insights from leaders in healthcare design to enable healthcare professionals to develop the ability to create their own laboratory or critically assess their performance, based on effective clinical case management. Thus, Clinical Canvas was developed for strategic purposes of planning and managing traditionally existing clinical cases.

The possible difficulty in implementing the Clinical Canvas is known, since health routines, whether in outpatient clinics or hospitals, are traditionally quite risk-averse. But the tool enables improvement in building relationships inside and outside the organization.

Building archetypes of different applicability for the Clinical Canvas in healthcare design laboratories can support efforts to examine successful models of innovation and how they can best be



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ISSN 2763-8405

supported. It is hoped, therefore, that it can become a prototype that is tested and iterated as the design advances in maturity and use in diverse healthcare environments.

Next steps or future thoughts:

(a) What were the results associated with its use? What were the biggest challenges?

(b) What barriers to adopting and measuring these changes?

(c) What methods will be used to measure success?

(d) How do different levels of organizations get involved with Clinical Canvas?

(e) How does it interact with the external health system?

(f) How to be able to expand and maintain a follow-up of the product in different areas of health?

(g) There is a lacking about what be developed further up, like using the clinical canvas in a computer program, or an app, online, in which all the public health web is connected, covering and guaranteeing patients have data privacy and security.

(h) Search for positive results from a pilot in the speech therapy facility.

Clinical Messages

We believe in the potential of this tool for rehabilitation scenarios, since through the methodological support offered by Clinical Canvas, therapists will be able to offer user-centered and personalized care with a focus on rehabilitation. We highlight three points that positively impact rehabilitation:

1- Clinical organization: The development of this tool contributes to the organization of therapists, whether in clinical or organizational management.

2- Clinical management: The use of Clinical Canvas for the rehabilitation scenario brings gains for a better understanding of the case, management of strategies and resources, clinical decision making and prognostic possibilities.

3- Interprofessional communication: This instrument aims to facilitate interprofessional communication, since professionals involved with the clinical picture will be able to share the tool and make their clinical evolutions in line with the other professionals of the team. For people in need of rehabilitation, solid interprofessional work is an immeasurable gain.

Because of the appreciation we have for the journal, we chose your journal as the home of our work, and we hope that it can effectively add to the improvement of health spaces and services, as well as praise Speech Therapy as a science and profession that uses innovation to change processes clinical trials.

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