PASPADOC

Empowering patients with chronic pain through digital solutions.

The Regional Health Service of Murcia (Servicio Murciano de Salud-SMS) provides healthcare to 1.47 million inhabitants (about 3.09% of the whole Spanish population). It integrates 11 hospitals, with 3,651 beds and more than 400 primary care centers. It is noteworthy that the Region of Murcia has been chosen by technological partners as a convenient living lab. Being a single-province region, political and administrative decision-making would be faster, which saves time, money and resources. The Region of Murcia owns the award of Reference site 2 stars in EIP AHA (European Innovation Partnership on Active & Healthy Ageing).

The Murcian Health Service has extensive experience in demand-driven co-creation, whether or not associated with innovative public procurement. Not in vain, SMS has obtained national and international awards such as the First International Prize in the category of "*Outstanding Innovation Procurement in ICT*" of the Procura+ 2021 awards for the 'InDemand' project or the Technology & Health Foundation Award for the *Best Technological Innovation in Health Driven by an Autonomous Community 2022* to the "Indemand" project

Challenge description

The current health system has difficulties in carrying out efficient activity in patients with chronic painful pathologies. Due to the system structure, patients with chronic pain find themselves left aside as a result of the lack of accessibility, care and follow-up. On many occasions they create false expectations of healing with tests and referrals that distort the patient's perception, preventing their empowerment and self-care, which decreases quality of life.

Currently, the indicators of first visit and follow-up in hospital care and referrals through consultations from Primary Care are not relevant to evaluate the efficiency of treatments in patients with chronic pain. The patient is seen by a hospital specialist that refers them again to the Primary Care team with a new treatment, which is again ineffective and the Primary Care doctor once again consults another specialist to look for new solutions. In all referrals, with their waiting times due to the overload of the healthcare system, caused, in turn, by the prevalence of chronic processes, the patient is left in a care limbo, waiting...

The waiting lists for services that deal with musculoskeletal problems (Traumatology, Rehabilitation and Rheumatology) add up to 30% of the total list of waiting times of the Murcian Health Service and they increase year after year, without an efficient staff management to balance activity/demand. Notably, surgical indications for chronic processes occur due to an increase in user demand, once it has been considered that the conservative treatments do not achieve the expected benefit and even though it will not be achieved with surgical treatment either. The surgical indication is very striking conditions such as fibromyalgia. The objective would be to treat the processes by indication and not by escalation (RD 605 indicators, surgery, outpatient consultations and evidence).

In this sense, we highlight the following needs for chronic pain patients:

- Longitudinal and comprehensive patient follow-up.
- Holistic treatment.
- Continuous remote assistance, avoiding unnecessary in-person consultations.
- Linkage with the patient that facilitates quality care in their process.

- Empowerment of the patient that allows them to manage their pain using all available tools, both pharmacological and non-pharmacological.
- Unified therapeutic plan that not only focuses on a false promise of healing, but also focuses on achieving your best functional state, making you understand key aspects such as diet, activity, sleep, emotional management and medication with the aim of improving the patient's quality of life.

Challenge main objectives

- A more efficient management of chronic pain from Healthcare Organization point of view
- Improve accessibility and follow-up of patients with chronic pain
- Promote self-empowerment among patients with chronic pain

Solution functional requirements

Compulsory functional requirements

- The solution must offer the patient a quick access route to healthcare.
- User's environment will be a dashboard for professionals (nurses of the call centre, family doctor and hospital healthcare professionals) and a responsive mobile app for patients.
- The solution will be hosted in the cloud and managed by the company with all the guarantees of privacy and security.
- The tool will provide the operator with indicators that are relevant to detect changes in health status that allow them to make changes to the therapeutic plan.
- The solution may request care with other healthcare services depending on the needs detected (Nursing, physiotherapy, doctor, social worker, etc.).
- The operator will be able to modify the indications within the limits of the treatment plan.
- Automation of responses to patients depending on the query.
- The tool will have standardized support health resources (recommendations on healthy habits, emotion management, relaxation, etc.).
- The tool will allow the registration and exploitation of data.
- A ´dashboard´ view for health professionals where they can exploit all the information and ability to manage all patients and detect abnormal situations or suggest changes, being able to configure a system of alerts to avoid them.
- It´s also needed a dashboard for the patient, showing them the path to their empowerment with the strengths and needs, motivating him /her through rewards and gamification of tasks.
- Synchronous and asynchronous contact through chats and video conferencing.
- It will allow the administration of questionnaires and scales that the patient can complete autonomously and generate a tree of automatic recommendations.
- SMS will provide a nursing team that integrates the management of all these needs remotely.

Desirable functional requirements

- Possibility of translation to avoid language barriers.
- The patient will receive information about their follow-up from a professional who knows their situation and it will be reflected in the patient's history.
- Possibility of synchronization with other devices such as a smart watch that reduces the digital divide, with autonomy >5 days, allowing the registration of the agreed physiological parameters and with voice recognition.

- It will allow the monitoring of certain physiological parameters (HR, BP, RR, circadian rhythm, activity, etc.).
- The solution will be able to apply Artificial Intelligence (AI) embedded in the workflow manager to alert of possible problems at the 'process' level not perceived by the actors or nodes.
- We want technology to help in the adherence and sharing with third parties of good practices in chronic pain management, as well as community resources in a sustainable and cost-efficient way for SMS.

Pilot scope

The pilot will be developed in a total period of 12 months, including design, validation, testing and measuring of the impact of the co-created solution.

It will include at least 30 patients, who will test the solution for 6 months.

The healthcare professionals' team will be composed by different profiles and specialities. The main professional actors in the pilot will be nurses, physicians from Primary Care, rehabilitation, and physiotherapists.

End-user type	Role	Number
Patients	With different skills and conditions	At least 30
Nurses	Close patient´s follow-up, bridging the gap between patients and SMS resources.	5
Rehabilitation physician	Leading the design and compliance of the plan	1
Physiotherapist	Leading the compliance of the plan	1
Primary Care physician	Recruitment and monitoring of the patients	1

Table 1. Targeted users

Language

- The solution must be in Spanish. Other languages would be desirable (English, French, German, Arabian).

Pilot set-up conditions

The pilot set-up conditions are based on three pillars: a data processing contract, the use of standards as HL7 or FHIR, and an agile and short integration with the corporative system during the pilot, focused on validating a Minimum Viable Product (MVP).

Ethical, legal or regulatory

The Entity undertakes to process the personal data to which it has access as a result of the execution of the contract, observing the principles required by the legislation on data protection, in particular those relating to data quality, data security and duty of secrecy, as well as in accordance with the specific instructions received from the data controller, not using the data for any purpose other than the provision of services described in the object of the contract. Likewise, it undertakes to observe professional secrecy, maintaining absolute

confidentiality and confidentiality on any data it may come to know on the occasion of compliance with the contract, in accordance with the level of protection established in the European data protection Regulation (EU 2016/679)of the European Parliament and of the Council, of 27 April 2016, relating to the protection of individuals with regard to the processing of personal data and Organic Law 3/2018 of 5 December, on the Protection of Personal Data and guarantee of digital rights, not communicating to any third party the data provided by the data controller. The data controller will determine whether, at the end of the services provided by the data processor, the personal data should be destroyed, returned to the data controller or handed over, where appropriate, to a new data processor. The destruction of the data shall not proceed when there is a legal provision obliging their conservation, in which case they shall be returned to the data controller, who shall guarantee their conservation for as long as such obligation persists. This obligation will continue even after the end of their relationship with the person in charge. The Entity will ensure and be responsible for its employees and / or collaborators receive the data only to the extent that it is necessary to their knowledge for the provision of the object of the contract. In the event that the Entity uses the data for purposes other than those stipulated, communicates them or uses them in breach of the instructions set out in this contract, it shall be liable for the infringements set out in Articles 70 et seq. of Organic Law 3/2018, of 5 December, on the Protection of Personal Data and the guarantee of digital rights, in which it has incurred.

Technological

The user identification will be then provided through the OAuth standard. The solution may notify SMS systems about certain events and situations. Ideally via ´HL7´ messaging, but web services could also be an option. This information may include registration status, activity, progress and periodic (summarized) clinical information. The IT systems needed for running the solution will be hosted by the solver. If the complexity of the connections is too high or the personal data could be at risk, these systems could be hosted in local servers of the SMS. This will be established in a technical session at the beginning of the project. Anyway, the solver will provide mechanisms to guarantee that the Servicio Murciano de Salud can exploit the data. Data No prior Challenger data is expected to be available, meaning all users will start as new users in the system. The repository of documents and resources to be shared with the end users will be supplied and / or validated by the SMS.

Data access

No initial data will be provided for pre-load. All participants will have to register for free and fill their own data.

Expected impact and KPIs

The expected impact is:

- a decrease in the perception of pain (measured using pain scales),
- a decrease in the need for medications with consequent reduction in side effects,
- increase in self-care,
- improvement in accessibility to the health system,
- reduction in the number of visits (primary care, emergencies, etc.),
- reduction in the number of hospital admissions caused by exacerbation of the disease
- increase in their quality of life.

KPIs are divided into three categories:

Health

We will measure this aspect with quality of life questionnaires administered to the patient both prior to the pilot and afterwards, as well.

- Quality of life before / after valued through the SF12 short questionnaire. Goal: 20% improvement. Satisfaction:

A control cohort could be created to establish differences.

Satisfaction

We will determine the impact on satisfaction through validated satisfaction questionnaires, such as the System Usability Scale (SUS), both in terms of users as well as the professionals who work with the solution.

- Tool satisfaction survey segmented by user roles (patient, neurologist and nurse) using the Customer Satisfaction Score (CSAT).): Goal: CSAT >8 (out of 10) in each user group (role).
- Patient experience through the Net Promoter Score (NPS). Goal: NPS >+50

Usability measured by System Usability Scale (SUS). Goal: SUS >80 Efficiency

Regarding the healthcare impact, we will measure the efficiency of the solution based on the reduction of tests, referrals and in-person consultations, as well as savings on medication pre-registration. We could compare the different variables before and after inclusion in the pilot and even establish a cohort control.

Business opportunity

Market size

In the Region of Murcia chronic pain is responsible for more than 30% of the total waiting list, as the rest of the region in Spain. This new solution could be easily expanded to all the other healthcare systems after a hypothetical success in this pilot, based on demonstrated cost savings achieved.

The challenger group offers their cooperation in the following:

- Advice on business model.
- In case of success of the pilot experience, the SMS undertakes to manage the possible resulting solutions in the volume to be determined, through the appropriate legal means, in particular as provided by the contractual regulations.
- Dissemination of results with the support of clinicians and patient associations, in order to make patient organizations aware of the solution at national and international level.
- Collaboration with a study of cost saving based on the published evidence, as well as with its publication and dissemination.
- Identification and contact with other potential customers.
- Advice on collaboration with the pharmaceutical industry by shortening treatment evaluation times in collaborative clinical trials.

Adoption plans

If the pilot is successful, SMS intends to adopt the solution, by a shared ownership of the solution co-created and procure its maintenance.

Intellectual Property Rights

This section sets the rules for the evaluation, ownership, and exploitation of Intellectual and Industrial Property Rights.

Evaluation and Documentation: Each party shall evaluate and document in the Pilot Action Plan their respective contributions to the new solution. This assessment will consider each party's background knowledge, resources, and tasks undertaken in the co-creation pilot project, determining the ownership and rights of the resulting shared IP&IPR.

Intellectual Property (IP) Rights: The intellectual property rights developed or contributed by SMS are inalienable, reflecting the knowledge and resources provided by SMS, including work time, patient access, and real-world validation. Usage of such intellectual property by other parties shall require a formal licensing agreement with mutually agreed terms.

Industrial Property Rights (IPR): SMS may opt-out of the commercial exploitation of the solution due to its lack of capacity in this area. In such a case, the exploitation rights will defer to the two companies, subject to compensations to SMS. These compensations will be based on SMS relinquishing approximately 20% of royalties to both companies and shall include:

- Reduced overall cost in licensing and maintenance of the solution.
- Allocated hours for corrective and evolutionary maintenance.
- Priority status for SMS in incident handling and new developments.
- Collaboration by SMS in promoting the solution, including identifying customer networks and assisting in presentations.