



inDemand: Demand driven co-creation for public entities

CHALLENGE 5: ONCO (FOCH HOSPITAL)

For this Challenge 5, unlike other challenges, the SME funded within inDemand project will not be the unique owner of the technologies created within this ONCO project. FOCH Hospital complete the European funding (maximum 60,000€) with a specific funding of maximum 60,000€. Furthermore, FOCH Hospital medical and nurse teams have developed an algorithm to help make the decision about the patient care. Thus, FOCH Hospital must have a long-term return on invest: it can be through owning IPR or through any other proposition to be made by the Solver, that will be considered adequate by FOCH Hospital.

Pitch

Improve the long-term monitoring of cancer patients

Global definition of the challenge

It has been shown that there is a real lack of information from the patient on the part of the health professionals of the city and the evaluation of care practices/paths (Scotté F, et al. Eur J Cancer 2013;49:1090-6., Scotté F. et al. Support Care Cancer 2017)

The challenge of the project is to improve oncology patient support outside the hospital and discharged from hospitalization by:

- the creation, reinforcement or optimization of the city-hospital link,
- home care assistance for patients, patient and family support,
- optimising the re-hospitalisation of monitored patients without going through the emergency department,
- strengthening multi-disciplinary and multi-professional work in the context of home and hospital support and care.

The project aims at enabling the periodic collection and analysis of the level of severity of treatment toxicities, subjective data on the general condition, quality of life and satisfaction of patients in the Department of Oncology and Supportive Care. This collection would be carried out during the patient's hospitalisation on one hand, and on the other hand at the patient's home after discharge. It is also envisaged to include in the program at-risk patients presented during the Inter-disciplinary Consultation Meeting. The programme would be supported by:

A nurse coordinator:

- She will make the assessments, during an interview, which will cross-reference the medical, paramedical, psychological, nutritional, social and family information and will then draw up the table of autonomies and dependencies of the patient as well as that of the supports and the possible improvements in the patient's care.
- She will collect data during patient visits to the hospital, including traditional hospitalizations and day hospitals.
- She will track alerts sent by the platform from data collected from the patient's home.
- By monitoring the evolution of the data, and according to procedures identified with the steering committee, it will call on the city workers (private nurse, treating physician...) to organize an assessment in the city.

In the event of unmanageable deterioration at home, she will alert the medical and para-medical steering team to plan an evaluation in hospital, in consultation or day hospital, in order to avoid going through the emergency reception service.

- She will participate in opening and managing the rights for the various stakeholders with the patient outside the hospital (general practitioner, pharmacist, private nurse, etc...), as well as inside the hospital (cardiologist, etc...). She will also participate in issuing access codes by following the rights management module linked to the data hosting centre.

A secure internet portal:

- The secure portal would enable the visualization of all the secure data stored in the central database via a responsive web application.
- This web portal would be accessible by the nurse coordinator, doctors in charge of the patient (at the facility and at home), the patient, caregivers at home (private nurse, physiotherapist, psychologists ...), the pharmacist. The patient would determine who can access the data.
- This portal may contain a certain amount of informative data relating to anti-cancer therapeutics, research programmes in place (see the CARPEM/SIRIC Programme), non-medical information (e.g.: trustworthy person, advance directives ...) and to E-learning sessions.

An intranet portal including:

- a monitoring questionnaire on patient care data. The objective of this questionnaire, developed by the medical team, is to be validated by the French-speaking Association for Oncological Care and Support (AFSOS). It should be completed in electronic form accessible in a web responsive application. A downgraded paper procedure would also be possible, depending on each individual situation.
- The multi-disciplinary data, the anticipated directives and the designation of the person of trust will be elements of the patient's file (therefore outside the system).

A central aggregation server:

- This server should be able to store any data regardless of its source and would ensure interoperability among the different elements of the project.
- It should be able to interface with any application in a secure way.

Definition standard profiles

The objective of defining standard profiles is to better understand the current situation within the facility and more particularly the people related to the problem defined in the Challenge, and who will therefore eventually use the innovative developed. These standard profiles will enable interested companies to apply to fully understand all the contours of the current situation in the facility.

2 "patient" standard profiles related to the Challenge have been described (the standard profile of the "problem" patient and the standard profile of the "easy" patient). Also, 2 "health professionals" standard profiles related to the Challenge are described (the standard profile of the specialised physician and the standard profile of a nurse, for example).

For info, here are the target users:

- The product administrator;
- The patient;
- The doctor (coordinator or hospital);
- The city doctor;
- The nurse coordinator or the hospital;
- The liberal city nurse;
- The city pharmacist;
- The hospital pharmacist;
- City laboratories (and hospital);
- The ambulance service (SAMU);
- The city network;
- Hospital care at home (HAD);
- Home Nursing Services (SSIAD);
- The physiotherapist;
- The dietitian;
- The psychologist;
- etc...

STANDARD PROFILE OF THE « Problem patient »

Name	Mr. Problem
Age	80 years
Status	XX
Location in relation to the institution	20 km – 1 hour away
Occupation	n/a
Short biography in three points	n/a
Pathologies	Polypathological; cancer metastasis, is dependent on his diabetic, accompanied/assisted by
Potential disabilities	Loss of cognitive functions
Motivations (recognition, power, reward...)	Power
Objectives in relation to illness and treatment	Survival
Constraints and frustrations	n/a
Personality traits (introverted, logical, reflective...)	n/a
Understanding of the illness	2/5
Observance	2/5
Internet skills	2/5
Mobile telephone skills	1/5
Social networks skills	1/5

STANDARD PROFILE OF THE « Easy patient »

Name	Mrs. Simple
Age	40 years
Status	n/a
Location in relation to the institution	Close by
Occupation	n/a
Short biography in three points	n/a
Pathologies	n/a
Potential disabilities	n/a
Motivations (recognition, power, reward...)	Recognition
Objectives in relation to illness and treatment	Rapid remission and no impact on her private/social life
Constraints and frustrations	n/a
Personality traits (introverted, logical, reflective...)	n/a
Understanding of the illness	4/5
Observance	4/5
Internet skills	5/5
Mobile telephone skills	5/5
Social networks skills	4/5

STANDARD PROFILE OF THE « Health professional 1 »

Position	Physician
Name	Dr Onco
Age	40 years
Status	n/a
Location in relation to the institution	n/a
Short biography in three points	n/a
Motivations (recognition, power, reward...)	n/a
Objectives in relation to illness and treatment	n/a
Constraints and frustrations	n/a
Personality traits (introverted, logical, reflective...)	n/a
Understanding of the illness	n/a
Internet skills	n/a
Mobile telephone skills	n/a
Social networks skills	n/a

STANDARD PROFILE OF THE « Health professional 2 »

Position	Nurse
Name	Private support nurse
Age	30 years
Status	n/a
Location in relation to the institution	n/a
Short biography in three points	n/a
Motivations (recognition, power, reward...)	n/a
Objectives in relation to illness and treatment	n/a
Constraints and frustrations	n/a
Personality traits (introverted, logical, reflective...)	n/a
Understanding of the illness	n/a
Internet skills	n/a
Mobile telephone skills	n/a
Social networks skills	n/a

Definition uses

Uses are defined as the description of the current situation in the healthcare organisation facility from a particular point of view (patient or health professional, for example).

In order to have a perfect understanding of the current situation, it is important that each use be defined step-by-step, starting with step 1, which is the starting point (which can be, for example, the first consultation at the hospital for the patient, admission to the emergency room, return to the room after surgery) and finishing with stage X, which is the end point (the patient is completely treated,

an end of remote monitoring ...). The time between the starting point and the end point represents the moment when the new digital solution must be used in the patient's treatment. At each defined step, it is important to highlight the current problems encountered and which must be solved by the use of the new co-developed digital solution. For each step, please list the current issues and what should be done to solve them.

Find below the description of the case

Take the case of a patient with prostate cancer, bone metastasis and hormone resistance.

Today,

- The patient has an announcement consultation with the Foch team
- The patient receives his prescriptions but waits at the pharmacy as it takes time to prepare them
- The report is sent by secure courier or courier without any traceability for Foch
- The patient is then called to a Day Hospital to establish his personalized care plan (psychological assessment, dietary etc.)
- The patient starts his cycle of chemotherapy and is called 48 hours before these (or completes an online questionnaire) to make a mini-report and recover the results of biological analyses
- At the same time, a nurse injects an anticoagulant daily because the patient had a pulmonary embolism, but she does not have access to the patient's file. She cannot communicate anything to the Foch team or to the attending physician other than by phone
- There are no communications (and if there are any, these are not secure) between the various hospital and city workers.
- There is no precise inter-cure monitoring enabling the identification of complications and thus emergency transfers or hospitalisations that are too long.
- There is no response from city professionals to these episodes
- In post-cure monitoring of chemotherapy patients, there is no regular dematerialised monitoring (outside consultations ...) for patients
- There are also non-regular mailings of accompanying documents (a folder is provided when he enters the process)
- The patient does not receive support from peers if he does not join a patient association

Tomorrow

- The patient has an announcement consultation with the Foch team
- The patient receives his prescriptions and these are automatically sent to the pharmacy that can prepare them. The patient no longer has to wait.
- The Report is sent by secure mail or mail and is made available on the platform.
- The patient is then called to a Day Hospital to establish his personalised care plan (psychological assessment, dietary etc.)
- The patient starts his cycle of chemotherapy and is called 48 hours before these (or completes an online questionnaire) to make a mini-report and recover the results of biological analyses
- At the same time, a private nurse injects an anticoagulant daily because the patient had pulmonary embolism, and has access to the patient's records. She writes a Report on her intervention in the platform and can interact with the Foch team or other stakeholders.
- The platform provides secure messaging between the various hospital and city workers
- The platform enables precise inter-cure monitoring to identify complications and thus emergency transfers or hospitalisations that are too long.
- The platform integrates automated algorithms to guide the patient and alert health professionals in real time as needed.
- All the professionals have access to all the information.
- The platform enables precise post-cure monitoring
- The platform provides content (cards, videos, games, etc.) for support.
- The platform integrates social network features so that patients can support each other.

Technical and operational requirements

The application has the following features:

- Create a patient profile,
- Register on the platform,
- Identification of a health professional,

- Manage the authorisations of health professionals,
- Medical file,
- Questionnaire,
- Medical report,
- Alert system,
- Dashboard panel,
- Notifications,
- Programme Activity Report, Introductions for medications (city/hospital pharmacy link),
- Introductions for medications (city/hospital pharmacy link),
- Observance (city/hospital pharmacy link),
- General information: Laws, Drug Toxicity, etc.
- Calendar for the patient reminding him of his appointments (display)
- Use of images strictly for monitoring a dressing or an injury in collaboration with a city professional (nurse and general practitioner);
- Eventually, it may be possible for the regulator of the ambulance services to have access to the patient's data in order to be able to direct him according to his condition to emergency care, or a specialised consultation of a HDJ for which he could make an appointment for the patient.

The Hospital application would have the following features:

- An administration and configuration interface;
- Consultation of professional questionnaires in the city + the hospital;
- Consultation of patient questionnaires in the city + the hospital;
- Consultation of alerts generated (dashboard + Email and/or SMS notifications);
- Consultation of the Reports on complementary examinations carried out in the city + the hospital;
- Consultation of Reports, observations and results in the city + the hospital;
- Consultation of a summary of the information collected for a given patient in the form of graphs. - Calculating alerts and sending notifications to professionals and possibly patients.
- Image consultation strictly for the follow-up of a dressing, an injury in connection with a city professional, a nurse and a general practitioner.
- No diagnosis of imaging or biology will be requested via this platform unless the programme changes.

The city application would have the following features:

- Registration of patients by the Hospital Physician and/or nurse coordinator, the unit's health manager after they have expressed the wish to be part of the follow-up programme and have signed a consent;
- open registration of health professionals: Health professionals do not have access to anything at first. They will have access to the information of a given patient once they have the validation code of the patient;
- An administration and configuration interface;
- Consultation of professional questionnaires in the city + the hospital;
- Consultation of patient questionnaires in the city + the hospital;
- At the time the patient is admitted, the questionnaires must be configurable to show only the information under the responsibility of the professional who completes them;
- Consultation of alerts generated (dashboard + Email and/or SMS notifications);
- Consultation of the Reports on complementary examinations carried out in the city + the hospital;
- Consultation of Reports, observations and results in the city + the hospital;
- Consultation of hospital discharge prescriptions;
- Consultation and creation of images strictly for monitoring of bandages, or of an injury in collaboration with a city private nurse and a general practitioner.

- No diagnosis of imaging or biology will be requested via this platform unless the programme changes.
- Consultation of the E-learning module

There are several types of notifications: information, contact, emergencies detected (by an algorithm) and emergency reported (by a human). Notifications would appear on the home page just after login: They would be generated by the application and sent as appropriate to ...:

1. For the patient:

- When a health professional joins or leaves his team of caregivers.
- When his medical file is updated (add document).
- When a questionnaire he completed was consulted.
- When he did not complete his questionnaire
- When the nurse coordinator informs the patient of the procedure to follow in case of emergency
- When a questionnaire must be completed after a predefined time by an algorithm
- After a long period of time without completing the questionnaires

2. A health professional

- A "patient" questionnaire is completed
- A new document is added (update of the medical file)
- When a patient presents an alert about him [define "about him": = decided by the nurse coordinator?]

3. The nurse coordinator

- The patient does not complete the questionnaire within the expected time or does not connect
- A health professional is not aware of an emergency
- An emergency is detected or reported
- Requests have not been consulted

Depending on the profile setting, notifications can also be sent by email or SMS.

Foch has already developed a decision algorithm (tree), here are some of the components:

- 8 entries
- Up to 10 questions per questionnaire
- Combination of possible questionnaires according to the symptoms reported (e.g.: digestion questionnaire, fever questionnaire etc.)
- Around 400 instruction for which parameters must be set

Interoperability with the Hospital Information System.

Feasibility

Interoperability with the HIS: as this part is specific to each facility, the reproducibility is less assured → to work at maximum with standard flows (HL7 flow)

Avoiding a platform that is too heavy, which would become unusable → ergonomics for co-building with health professionals and patients

Do not create an "all automated" system: ensure that the human is still at the heart of the system → leave the setting of alerts and actions associated with the facility

Guarantee long-term use by patients → work on motivational levers (and measure them as much as possible)

Guarantee long-term use by health professionals → Introduce application to all the professionals involved

Some patients do not have a smartphone but they have a computer → Development of a Web Interface & Smartphone application

Sharing information between the patient application and the hospital and city professionals → guarantee confidentiality /compliance with the data-protection legislation

Financial Aspects

The current problems are paradoxically generating activity for our services (and therefore revenue). However, this is obviously not satisfactory because there are complications for patients, sometimes serious, initially supported by the emergency department, which is overwhelmed. The goal is to extend their lives with a better quality of life.

The estimation of the the maximum this institution would be able to pay per year to use an innovative solution that will solve your actual Challenge is

€ 30k - 50k including VAT

Any economic model/ad hoc financing (mutuals, pharmaceutical industry) could be considered

Expected Impact

- Enable the anticipation and improvement of the accompaniment of patients outside the hospital, out of hospital in connection with city professionals
- Creation, strengthening or optimisation of the city-hospital link
- Help in maintaining the patients' homes and providing support for patients and relatives.
- Minimisation and, where appropriate, anticipation and optimisation of the re-hospitalisation of patients followed without going through the emergency department.
- Strengthening inter-disciplinary and inter-professional work in the context of home and hospital support and care.
- Improved quality of life for patients
- Improvement of the life of the patients.

Better tolerance of treatmentsScope of the challenge

Information on the specificity of the challenge, if it is defined specific to the hospital

However, these do not go that far and are not as integrated as our project.

Cancer treatment is an area that will grow in the coming years and is one of the fields at the heart of public policy (see the different Cancer Plans). In the face of a chronic pathology, it is legitimate to propose an economic model for the authorities to finance this type of scheme in the future.

We are confident that this type of platform will bring a real medico-economic benefit (the demonstration of this point is an integral part of the project) and that it can be duplicated in most hospitals and Centres for Combating Cancer.