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PRESENTATION AND IMPLEMENTATION OF THE FIRST CONNECTED SYSTEM OF AUTOMATED PERITONEAL DIALYSIS IN FRANCE

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Résumé

Le premier système connecté de dialyse péritonéale automatisée (DPA) a été mis en place en France au CHSF. Il s'agit d'un système collectant les données des séances de DPA via un modem et une plateforme sécurisée puis les transmettant vers l'équipe médicale et permettant l'adaptation des traitements à distance. Cette mise en place a nécessité un certain nombre de démarches à l'échelle nationale et régionale. Nous en présentons le fonctionnement et les bénéfices attendus.

Mots clés : télémédecine, télésurveillance, Dialyse Péritonéale Automatisée

Abstract

The first system of connected automated peritoneal dialysis (APD) was set up in France in the CHSF. This system allows to collect and transmit the data of APD sessions via a modem and a platform towards the medical team and permits the remote adaptation of the treatments. This implementation required a number of steps on national and regional levels. We present the functioning and the expected benefits of such a system.

Keywords : telemedicine, automated peritoneal dialysis

INTRODUCTION

Our medical practice is currently taking the turn of telemedicine. This is already effective in certain specialties and allows the collection of patients' data, capillary or interstitial blood sugars, blood pressure, for example. This is possible using via different media: phones and smartphones, the Internet, software and specific programs. It allows teleconsultations by means of webcams or tele-expertise advices within the framework of professional networks.

Currently, patients treated by peritoneal dialysis (PD)

have the choice between two main methods: either the chronic continuous ambulatory peritoneal dialysis where the data are collected by the patient or his nurse on a note book, or even transmitted to the medical team via a computer tablet for some centers; or automated peritoneal dialysis (APD). The prescribed programs and session data are then stored on a computer card that which the patient brings to each consultation in his PD center in order to be read on site.

In the Nephrology Department of Centre Hospitalier Sud Francilien (CHSF), in partnership with the

Baxter company, we have set up since April 2018 a APD system connected via a modem that allows not only to collect patient data, but also to allow changes of PD prescription from remote location.

PRINCIPLES

The cycler, named Claria, is installed at the patient's home when the APD treatment start, at the end of his training. During this installation, the cycler is connected to a modem, with a personal identification number provided to the patient. This modem transmits all session data each morning at the end of the program and receives, if necessary, the programs prescribed by the doctor.

nical support, maintenance and software updates.

The data can be analyzed in the morning by the teams, at a their own pace decided by it. The access rights to the Sharesource platform are set for each staff according to the policy of the centers: whether or not authorized to read the results, whether or not to modify the programs.

The results appear as a global dashboard with patient rows and daily columns (Figure 1).

Sessions' review is carried out by a system of flags, green-yellow-red, simple and fast reading, symbolizing the roll out of the sessions . The set up of parameters and

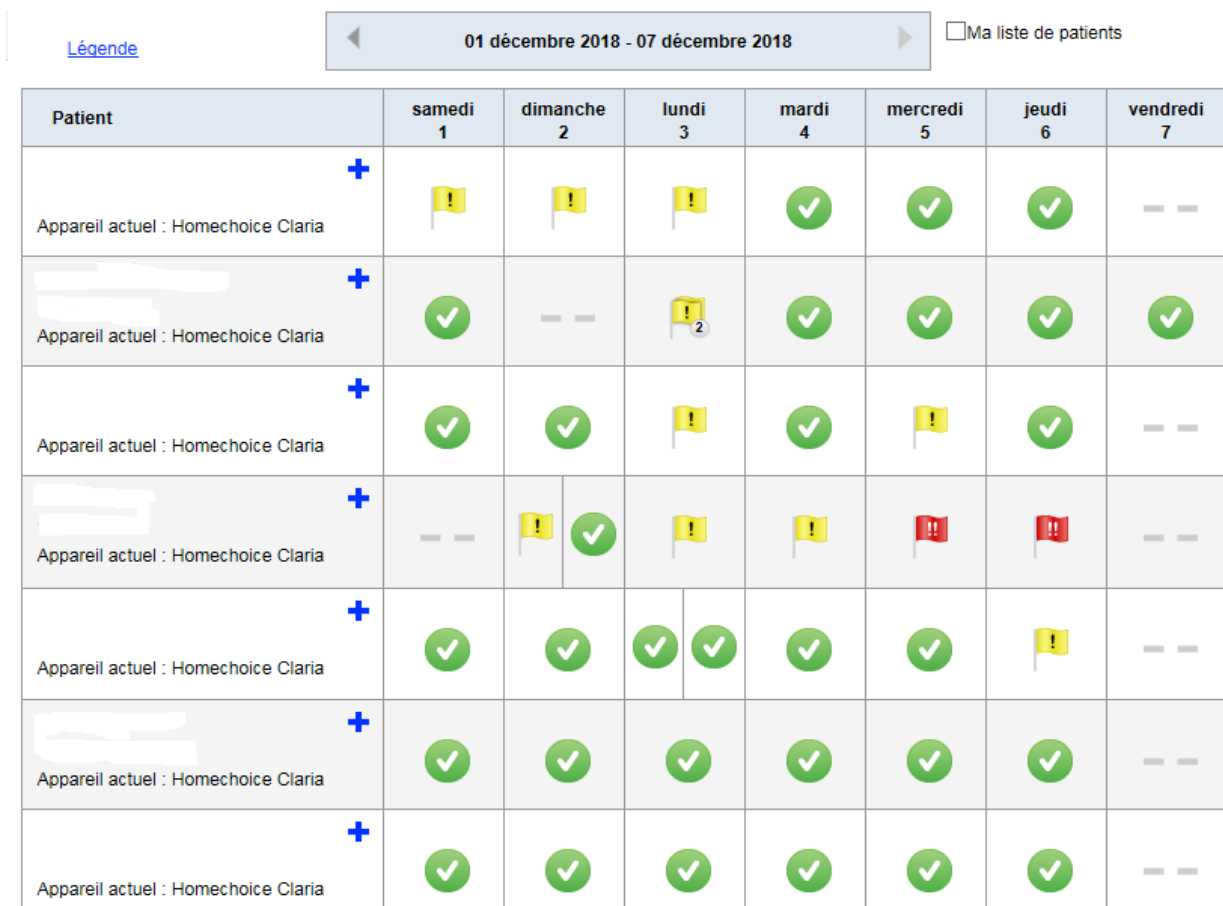


Fig. 1: Weekly overview dashboard showing the progress of DPA APD sessions

The connection of this modem is the only modification made to the system for the patient. The training and technique are identical to those used previously.

The data is sent via the cloud to a Baxter Sharesource platform to which the medical and paramedical team connect to view and analyze. Data is are coded and Baxter does not have access to them it. It provides only tech-

alert thresholds are established in advance by the medical and paramedical team so as to coincide to match as best as possible with their practices, during the training of the center.

Each session can be viewed in detail, the team has access to reports and analysis of data in a synthetic manner, as well as clinical data such as weight and blood pressure

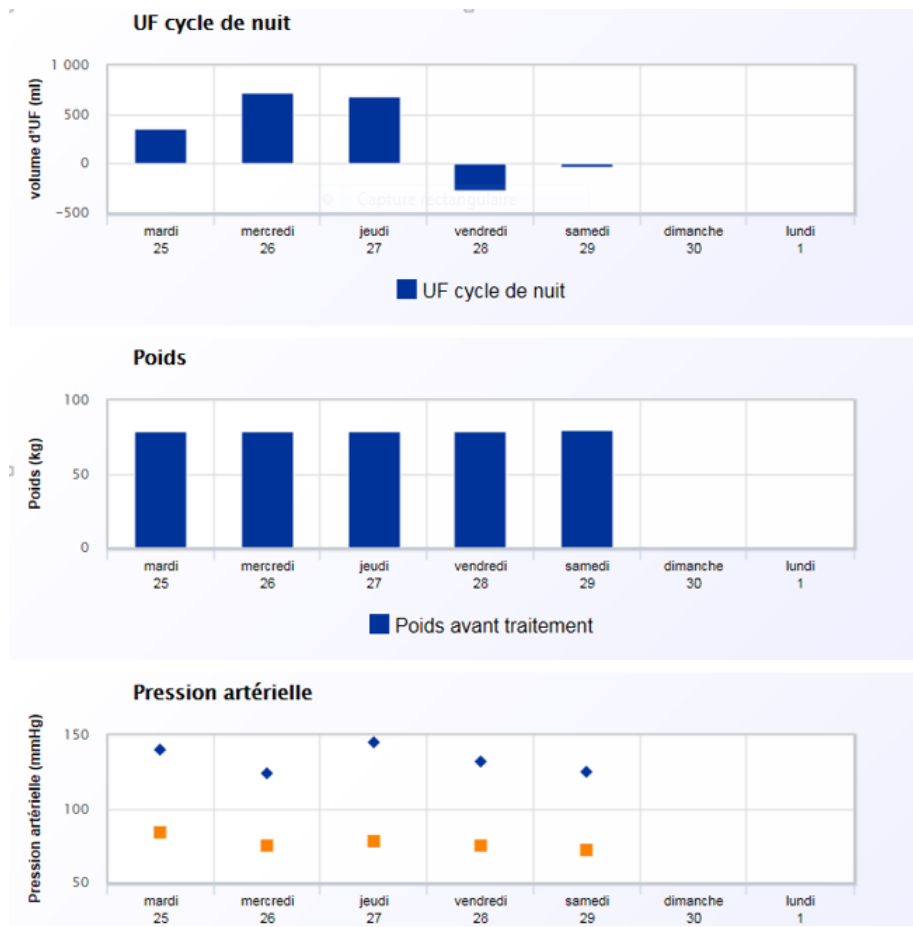


Fig. 2 : Patient's clinical data evolution entered by the patient on the cyclor (Figure 2).


In case of alert, minor (yellow flag) or major (red flag), it is possible to detail it to determine the cause and quickly make a correction. These alerts can concern all aspects of the PD session: duration, dwell time, drainage or infusion, patient lines, ultrafiltration ... as on the pre-existing system (Figure 3).

SET UP

Significant preliminary work was required before the deployment of this connected APD system. We were contacted for the first time by the Baxter company during summer 2016 summer. The system was first presented to the entire medical and paramedical staff and then to the various stakeholders of the hospital: hospital director, Direction of Medical Committee, IT department, legal and financial directors to establish a contract of use between the Baxter company and the Centre Hospitalier Sud Francilien. It was, of course, necessary to obtain the agreement of the CNIL (Commission Natio-

nal Informatique et Libertés) and the ASIP (Agency of Shared Health Information Systems) for the storage of patient data. This agreement, obtained in October 2017, is valid for the entire national territory. Each healthcare facility wishing to use the connected APD must simply provide its usual data storage approval number held by all care providers. Similar steps were taken at the Regional Health Agency of Ile de France, with the management in charge of telemedicine, for the establishment of a contract between the Baxter Company and the ARS (Regional Health Agency). Such contracts are to be established in each region with the different ARS.

At the beginning of 2018, we were able to begin start training the medical and paramedical staff at the CHSF for the secure connection and the management of the Sharesource platform. We were able to offer connected APD to all new ESRD patients entering end-stage renal disease, during information sessions on renal replacement techniques. We also informed patients previously treated by APD on Home Choice machine about the possibility of switching them to connected APD. The

Symbole de l'alerte	Description de l'alerte
	Temps de stase perdu: 30 minutes

Symbole de l'alerte	Description de l'alerte
	Fin prématurée du drainage: 1

Symbole de l'alerte	Description de l'alerte
	Temps de stase perdu: 97 minutes
	Variance de drainage initiale: 56%

Fig. 3 : Analysis of alarms

collection of the patient's written consent is necessary because of the circulation, even coded and secure, of the data of his sessions. his sessions data

The first patient was able to start the connected APD in April 2018. We currently have about ten patients thus connected ...

IN PRACTICE

Patient training does not differ from the usual APD training. The training of the medical and paramedical staff was fast, the management of the platform appears simple and intuitive.

Every morning, or at the pace set by the healthcare team, the doctor and the nurses in charge of PD patients can connect to the Sharesource platform to check that the night sessions are have been running smoothly. They can thus check patient compliance, monitor weight and blood pressure, check the amount of ultrafiltration, manage the different alarms, prevent drifts.

The doctor can also adjust remotely the prescription parameters of the remote PD programs. This even during the patient 's holidays, etc ... All the parameters can be modified and at the end of the validation of the modifications, a message is sent to the patient on the cyclor to inform him the modifications which he will need to validate. Similarly, it is possible to establish several programs for the same patient and to choose from a remote location which one will have to be applied (for example long or short program according to the schedules of work of the patient, program belly full or empty during the day in case of PET test the next day etc ...).

EXPECTED BENEFITS, THE MEDICAL AND THE PATIENT'S POINT OF VIEW

For the medical and paramedical team; it is a simple system to set up, and easy to use. It makes it possible to follow patients as closely as possible, to identify dysfunctions, to quickly diagnose drifts: uncontrolled hypertension, weight gain, UF failure, drainage difficulties ... Data visualization of APD sessions allows preparing monthly consultations and anticipating possible prescription changes, allowing more time for dialogue with the patient. The use of remote data analysis avoids many trips for the patients, which limits unnecessary visits and transportation costs the cost of transportation. The patients feedback on the system is positive. The first advantage put forward is the feeling of safety security because they know the medical and paramedical team connected to their data and feel less isolated during the installation at home with the cyclor and less alone in front of the machine. They also point out that the system did not require them any particular effort or learning which is not negligible when one must already acquire a whole technique of PD. In addition, patients feel reassured when they travel because they always feel connected to their healthcare team, even when they are abroad. They are less constrained, in case of dysfunction, to contact a local team that does not know them or even with which they will encounter a language barrier. All this should contribute for them to a better quality of life.

CONCLUSION

The Sharesource system of connected APD has been implemented easily in our center and brought benefits to both the healthcare team and patients. It can be offered to all patients choosing APD and the Baxter Connection System. It does not add unnecessary extra work to the health care team but allows follow-up and intervention over the water on the stream.

CONFLICTS OF INTEREST

The first author claims to have received a fee from Baxter for an oral presentation of this work at the SFNDT de Lille in October 2018. The other authors have no conflict of interest for this article.

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