

## BACKGROUND

The process "Chemotherapy" implies three main steps (prescription, preparation and administration), each capable of producing errors with potentially severe consequences for patients. In our Hospital, prescription was computerized 10 years ago. However, potential sources of error may arise during the transcription of medical orders. The preparation of cytotoxic formulations is centralized in the pharmacy since 17 years but only with a partial practice in-process control. In this setting, the cytotoxic administration is partially secured by providing nurses all data on the preparation coupled with the patient's information .

## OBJECTIVE

- 1) To secure the activity of chemotherapy formulation by standardizing treatments.
- 2) To secure and follow-up the activity of the cytotoxic preparations by introducing an in-process control.

## DESIGN

- 1) To develop a software (PREDICYT) dedicated to the standardisation and management of chemotherapy treatments.
- 2) To establish a connection between PREDICYT and our software for general drug prescription (PREDIMED).
- 3) To implement the CATO software, a gravimetry controller during chemotherapy preparation.
- 4) To validate the whole process by a pilot study in a care unit.

## SETTING

Pharmacy and Oncology Departments, University Hospital, Lausanne, Switzerland.

## RESULTS

### 1. Standardisation of the treatment protocols (Predicyt):

A team including 1 doctor, 2 nurses and 2 pharmacists reviewed the whole adult's chemotherapy protocols prescribed in our hospital. This operation permitted the standardisation by substance (eg. cisplatin) for antiemetics, hydratations and co-medications but also for the laboratory exams that were ordered before or during the treatment and the management of treatments by the nurses.

For instance, in figure 1, we can see the template for ordering laboratory exams before a treatment including a dose of cisplatin > 60 mg/m<sup>2</sup>. In figure 2, we can see the management of the same treatment.

Figure 1: Orders for pre-chemotherapy exams

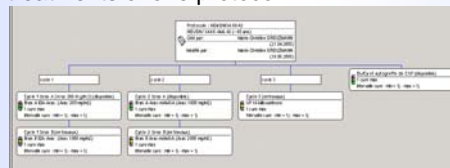
Cisplatine (60 mg/m<sup>2</sup> à 100 mg/m<sup>2</sup>)  
FSC, Na, K, Ca, Mg, créatinine, urée, protéines totales, LDH, ASAT, ALAT, phosphatase alcaline, bilirubine totale, glycémie.  
Cure1: audiogramme selon OM.

Figure 2: Management during chemotherapy

Cisplatine (60mg/m<sup>2</sup> à 100 mg/m<sup>2</sup>)  
Faire un bilan avant de poser le cisplatine; si diurèse < 100 ml/h, appeler le médecin.  
J1: bilans aux 6h.  
J2: créatinine.  
Poids: 1x/jour.

Predicyt has been configured to connect different treatments within one protocol (figure 3), thus permitting the global management of these treatments.

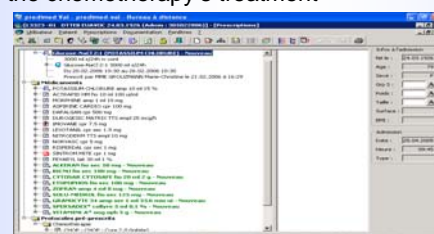
Figure 3: Connection between different treatments of one protocol



### 2. Connection between Predicyt-Predimed:

The transcriptions of medical orders were eliminated by connecting PREDICYT with PREDIMED, our software for general drug prescription. The whole prescriptions including the chemotherapy's treatment for one patient appear together on the same screen (Fig. 4).

Figure 4: Prescription of one patient including the chemotherapy's treatment



## RESULTS

### 3. Implementing the CATO software:

A connection was developed between PREDICYT and CATO to permit the management of preparations. This software assists the operator during the whole manufacturing process by validating and registering all manipulations.



### 4. Validating the entire process:

The whole process was validated during one month. Twenty different treatments were prescribed according to the old and the new system. The results obtained by new and old system were identical.

## DISCUSSION:

- 1) The standardisation of the treatments protocols in PREDICYT (antiemetics, hydratation,...) improves the care of patients.
- 2) The prescription via PREDIMED eliminates the transcriptions of medical orders and allows a global approach of the treatment of patients.
- 3) CATO assists the operator during the whole manufacturing process by validating and registering all manipulations.
- 4) Connections and Softwares have been validated since the manufacturing orders transmitted by PREDIMED to CATO are in agreement with the original prescription of cytotoxics.

## CONCLUSIONS:

The first two steps of the chemotherapy process (prescription and manufacturing) are entirely secured. The remaining weak point is the uncertainty that chemotherapy has been administered to the right patient in the care unit. The control of this last step will be performed in a future project.