

Sahra Muhammad¹, Emmanuel Gaspéri¹, François Bordet¹, Marie-Laure Maëstroni¹

Pharmacy Unit, Centre Hospitalier Sud Francilien, Corbeil-Essonnes, France

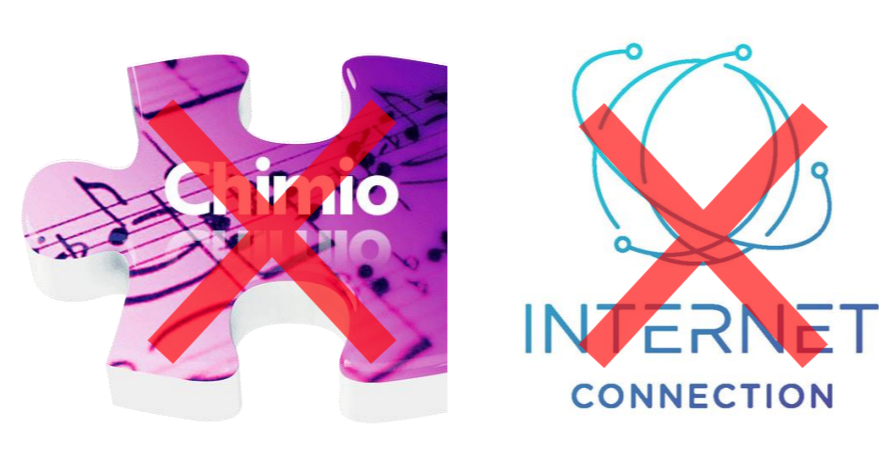
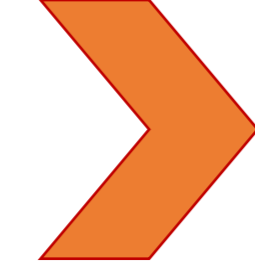
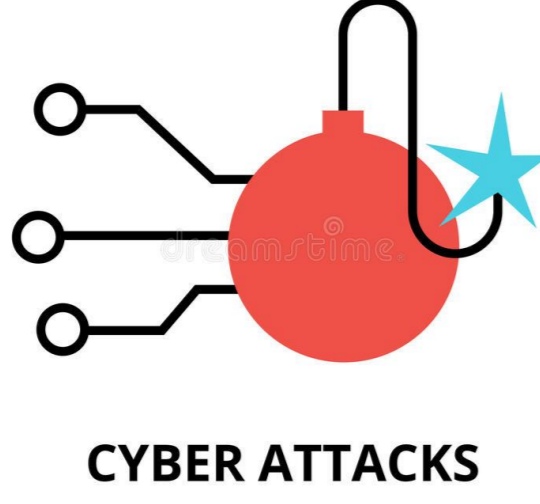
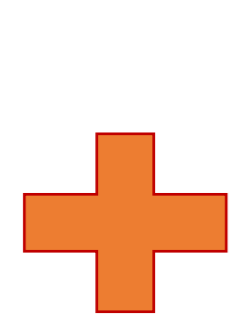
Background and importance



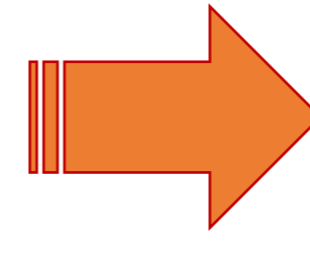
Our Chemotherapy Production Unit (CPU) produces about 19,000 sterile preparations a year using Chimio®. Before the cyber-attack, prescriptions were validated and printed up to 3 days in advance in accordance to patient history and protocol. Each preparation was double checked by a second pharmacist.



August 20th 2022 (summer holidays)
→ understaffed



No software
No internet



Chimio® manages production of chemotherapy from prescription to administration → no access to :

- stability data (duration, dilution, ...)
- dose/volume calculation
- protocols
- prescriptions and production traceability

Aim and objectives : The objective was to pursue the production of chemotherapy respecting the most the usual production and quality process.

Materials and Methods

AFTER the cyber-attack, main steps and documents developed to recreate our process :

1



PHARMACEUTICAL VALIDATION

Prescriptions of the first 3 days were already validated and printed serving as patient history, chemotherapy protocol model

2



MOLECULE DATA REGISTRER WITH CYTOTOXIC DRUGS DATA

stability, concentration, solvent, expiration, ...
Recreated mostly from memory

3



SCHEDULER

A unique number per sterile cytotoxic preparation

4



PATIENT'S HISTORY REGISTER

Last protocol date and name, important data for pharmaceutical validation (dose adaptation, ...)

5



HANDWRITTEN MANUFACTURING SHEETS (MS)

mimicking Chimio® were created

Day 1



EXCEL® MS

Day 1

1st version : A unique model for all preparations filled manually and using copy-paste

Day 3

2nd version : Several MS models for bags, infusors or syringes

Day 5

3^d version: Formulas added to automatically fill the labels, secure and speed up the process

All MS edited were double-checked by a second pharmacist until the recovery of Chimio®

Pharmacie CH SUD FRANCILIEN	Pharmacie CH SUD FRANCILIEN	Pharmacie CH SUD FRANCILIEN
Bevacizumab - 325 mg	Bevacizumab - 325 mg	Bevacizumab - 325 mg
NaCl 100 mL V final: 309 mL LAM AI	NaCl 100 mL V final: 309 mL LAM AI	NaCl 100 mL V final: 309 mL LAM AI
n°ordo: 436 J1 30/08/22 exp: 15/04/23	n°ordo: 436 J1 30/08/22 exp: 15/04/23	n°ordo: 436 J1 30/08/22 exp: 15/04/23
Conservation: Frigo	Conservation: Frigo	Conservation: Frigo

Pharmacie CH SUD FRANCILIEN			
FICHE DE FABRICATION			
Patient :	LAM AI	J1	30/08/2022
Rordonnance :	436		
Protocol :	Felfox avastin		
DCI :	Bevacizumab	325 mg	Produit : Avastin
Volume à prelever :	13	Lot :	
Reconstitution :	mL/Flacon	De :	
Poche :	NaCl		
Volume (en mL) :	100		
Connecteurs :	Simple		
V total :	109 mL		
V retrait :	mL		
Stabilité :	84 jours		15/04/2023
Conservation :	Frigo		
Flacons utilisés :	Flacons		
Pharmacien édition :		Pharmacien contrôle :	

Example of the 3^d version of excel MS for bags (In grey, the cells to fill. The rest is locked)

RESULTS

6 working days were needed before the recovery of Chimio®

PRODUCTION



Total of 447 preparations
73 per day



Only 5 % of total production could be outsourced in other hospitals (transfer of patients)



MS EDITING PROCESS AND TIME



5 handwritten MS only (1st day)



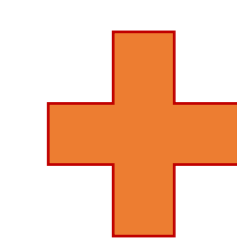
Filling and printing (1st pharmacist) and double-checking (2nd pharmacist)
3 hours a day



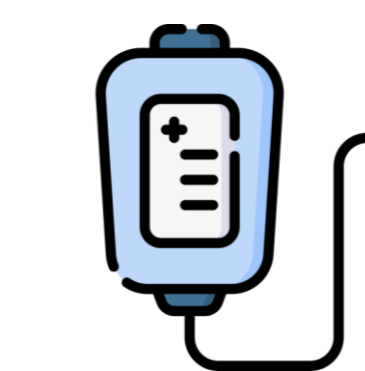
Improving MS → reducing time to 1 hour a day



Limited errors by double checking every MS



Final checking of preparations detected 3 errors (< 1 %)



2 MAJORS : wrong patient name and dose (- 47 %)

1 MINOR : wrong scheduler number
→ All 3 due to copy-paste error with the 1st version of Excel MS



CONCLUSION AND REVELANCE

This experience was a real challenge for us. It demonstrated the importance of qualification and implication of CPU staff (pharmacist and technicians) to maintain our activity despite everything. Development of a semi-automated Excel® MS and double control of MS allowed us to maintain a safe and almost normal production. Excel® tool tracing patient's history allowed to detect prescription errors (dose adjustment, intervals of administration, protocols respect). Regular backups and development of a valid degraded mode protocol will be undertaken soon.

