

# THE FIRST TOTALLY ROBOTIZED LABORATORY FOR CYTOTOXIC DRUGS



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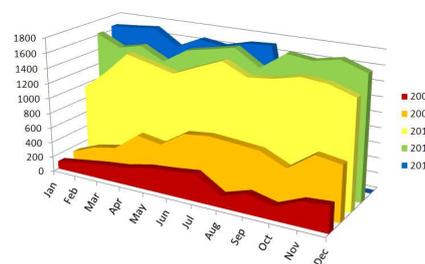
## BACKGROUND

The Oncology Pharmacy of the University Hospital of Ancona (Italy) began a process of robotization of its laboratory five years ago after an agreement of collaboration with Loccioni Group that manufactures automatized system for compounding cytotoxic drugs (APOTECaChemo). Before the use of robot our laboratory worked with two laminar air flow cabinet that usually produced about 20-22000 oncology preparation every years. After the introduction of the first automatized system, the work was gradually transferred to the robot and one laminar air flow cabinet was disused. Then the robot increased a lot its capacity and the arrive, at the end of 2009, of a new machine allow us to think a new kind of laboratory where the robots are the principal way of compounding and the manual handling under a laminar air flow cabinet is only a minimal portion of the total work. This were the first example of totally automatized laboratory for preparation of anticancer drugs. The new objectives we established were 1) to cover more than 85% of total production with robots 2) to maintain unchanged the delivery time to the administration units.

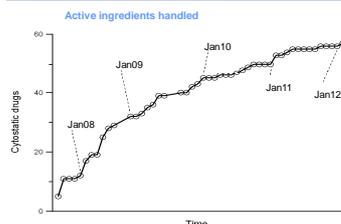
This work shows the impact of the robotized pharmacy in the oncology workflow, together with the results reach along the years.



Trend of the monthly compounded preparations with APOTECaChemo



## MATERIAL AND METHOD



Data were obtained from the robot database. An other advantage of automation is related to the data mining. Every step is measured and traced, providing a huge amount of information helpful for both performance statistics and process re-organization.

## RESULTS

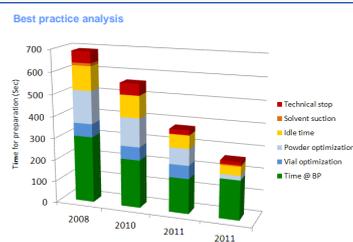
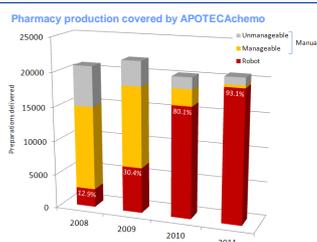
The preparations compounded with the robots were 16200 in 2010 and 19300 in 2011. Actually in the first three months of 2012 we produced 4980 bags of therapies and we expect to overcome 20000 preparations delivered by the end of 2012. Our yearly workload was exactly 20220 preparation in 2010 and 20680 in 2011, so we covered with robotics respectively 80% and 93% of all the whole activity. In some days, we produces robotic production overcame 96% of workload.

The delivery time has not increased, on the contrary thanks to the integration between APOTECaChemo and the oncology medical record, the overall waiting time decreased of about 15%.

On the other side, the unique level of quality guaranteed on each preparation find the wide acceptance of patients and physicians, who showed their satisfaction.

DRUGS			
Acyclovir	Dacarbazine	Interferon alpha 2b	Rituximab
Alemtuzumab	Daunorubicin	Irinotecan	Temsirilimus
Bendamustine	Docetaxel	Levofolinate	Thiotepa
Bevacizumab	Doxorubicin	Melphalan	Tocilizumab
Bleomycin	Doxorubicin Liposom.	Mesna	Topotecan
Bortezomib	Eculizumab	Methotrexate	Trabectedine
Busulfan	Epirubicin	Mitomycin	Trastuzumab
Carboplatin	Etoposide	Mitoxantrone	Vinblastine
Cetuximab	Fludarabine	Ondansetron	Vincristine
Cisplatin	Fluorouracil	Oxaliplatin	Vinflunine
Ciadrabine	Ganciclovir	Paclitaxel	Vinorelbine
Clofarabine	Gemcitabine	Palonosetron	Zoledronic acid
Cyclophosphamide	Idarubicin	Pamidronate	
Cytarabine	Ifosfamide	Panitumumab	
Cytarabine Liposom.	Infliximab*	Pemetrexed	

## CONCLUSION



The automated production of the cancer therapies represents a big leap forward in the safety of patient and operator, thanks to the verification and traceability of each preparations, and to the confinement of the hazardous activities. We are confident this technology is going to represent the standard for the oncology pharmacy in the near future.



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