

100.000 treatments prepared by robot what have we learned?

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BACKGROUND

In 2007, the University Hospital of Ancona started the journey in IV automation compounding. At the end of 2009, the clinical validation process and workflow reorganization ended, the second robot was introduced to set a fully automated i.v. oncology pharmacy. The laboratory is composed of two APOTECACHemo

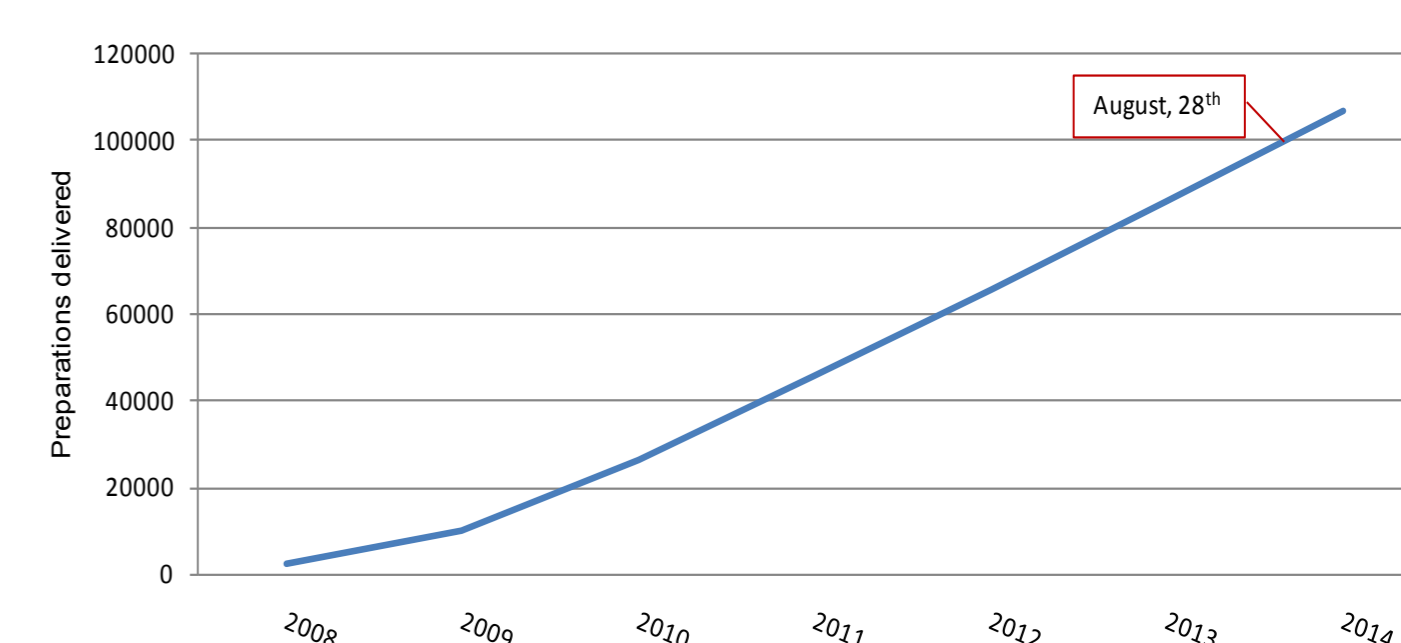
systems and a laminar airflow cabinet which work from 8am to 4pm. There are 3 technicians from 8am to 2pm and 1 technician from 10am to 4pm. We work in a just-in-time production (80% for outpatient and 20% inpatient) and the rush hours go from 9am to 1pm. Two systems are used until 2pm and one system works for entire day.



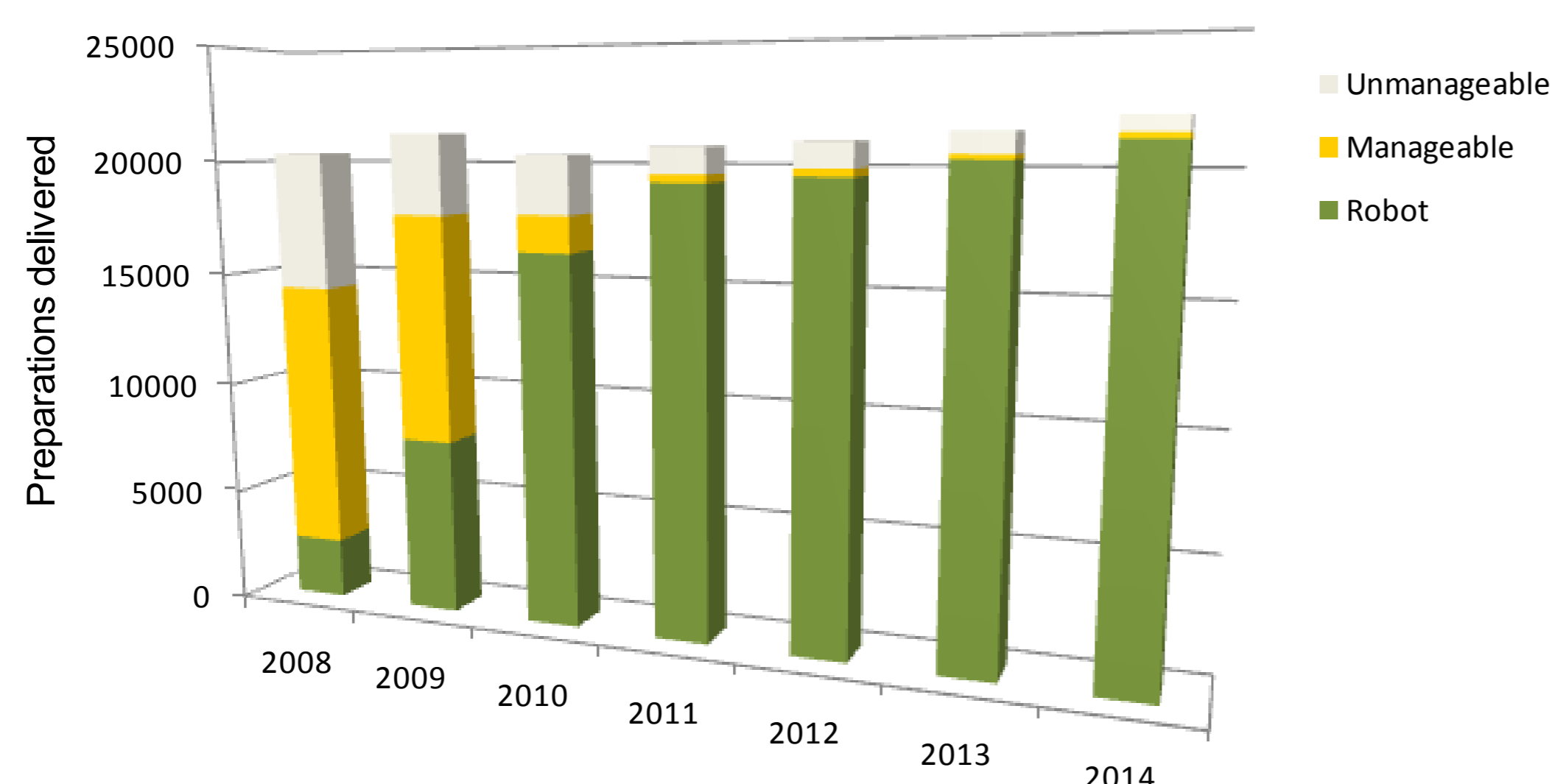
MATERIAL AND METHOD

The production data are analysed in terms of delivered doses and type of preparations, by means of the statistical tools of APOTECACHemo.

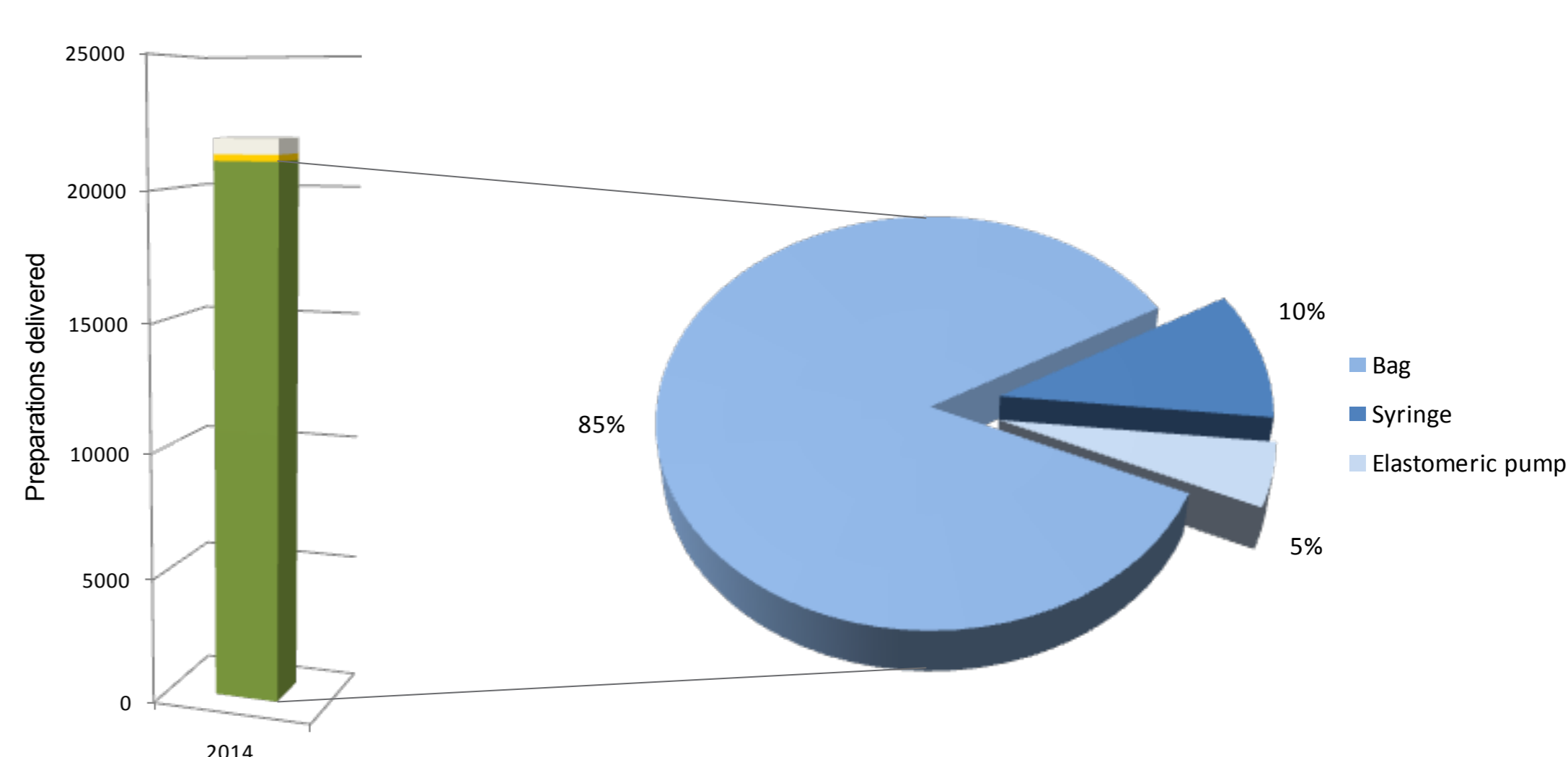
Active ingredients			
Alemtuzumab	Cytarabine Liposom.	Infliximab	Rituximab
Bendamustine	Dacarbazine	Irinotecan	Temsirolimus
Bevacizumab	Daunorubicin	Levofolinate	Thiotepa
Bleomycin	Docetaxel	Methotrexate	Tocilizumab
Bortezomib	Doxorubicin	Mitomycin	Topotecan
Brentuximab	Doxorubicin Liposom.	Mitoxantrone	Trabectedine
Busulfan	Eculizumab	Ondansetron	Trastuzumab
Cabazitaxel	Eribulin	Oxaliplatin	Vinblastine
Carboplatin	Epirubicin	Paclitaxel	Vincristine
Cetuximab	Etoposide	Paclitaxel Albumine	Vinflunine
Cisplatin	Fludarabine	Palonosetron	Vinorelbine
Cladribine	Fluorouracil	Pamidronate	Zoledronic acid
Clofarabine	Ganciclovir	Panitumumab	
Cyclophosphamide	Gemcitabine	Pemetrexed	
Cytarabine	Ifosfamide	Pertuzumab	



RESULTS



Before 2010 the automatic production was 10400 medications and in 2010 increased to 16300 (80% of yearly production). In the following years, the production raised: it was 19300, 19600 and 20300 respectively in 2011, 2012 and 2013. In August 2014, we overcame the threshold of 100.000



medications compounded with APOTECACHemo and a robotic production rate of 95%. The yearly production is composed of 85% bags, 10% syringes and 5% elastomeric pumps. 57 different active ingredients are used.

CONCLUSION

- Automation guarantees utmost quality standards because every step of the compounding process is controlled and traced.
- Automation can cover more than 90% of daily preparations also in a just-in-time production.
- Automation allows a more intelligent and efficient management

- of human resources: every 10000 preparations, one FTE technician can be elevated to higher value-added tasks.
- To take advantage of automation, the workflow should be redesigned (i.e. introduce multi-dose vials and drug day).