Drug supply/logistics

**A PHARMACOECONOMIC COMPARISON BETWEEN A COUNTY HOSPITAL IN CHANIA AND A CENTRAL HOSPITAL IN ATHENS, GREECE**

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**Background** Agios Georgios' Chania General Hospital (CGH) on the island of Crete has 460 beds and Sismanoglio General Hospital (SGH), in the capital of Greece, Athens, has 459 beds. In the Greek National Health System the uninsured poor patients receive their drugs free of charge from the hospital pharmacies.

**Purpose** To compare the pharmacoeconomic profiles of the two hospitals.

**Materials and Methods** We examined the pharmacoeconomic data for the first half of 2011. Data were extracted from the Hospital Information Systems.

**Results** 14,996 patients were hospitalised in CGH and 15,520 patients in SGH with a mean number of nursing days 3.99 vs. 3.55 respectively.

The total cost of drugs was €6,705,297 vs. €4,933,028 (P < 0.05) respectively.

The drugs cost for the inpatients was €5,034,701 vs. €3,965,127 and the mean cost per inpatient per nursing day was €77.67 vs. €67.23.

The drugs cost for the insured outpatients was €1,452,668 vs. €718,203 (1,595 prescriptions vs. 1,152, P < 0.05), and the mean cost per prescription was €909.42 vs. €619.10 (P < 0.05).

For the uninsured outpatients the drugs bill was €217,923 vs. €254,694 (3,506 prescriptions vs. 2,016 prescriptions) (P < 0.05) and the mean prescription cost was €62.16 vs. €126.34 (P < 0.05).

The percentage cost for the main categories of drugs were: cytostatics 16.50% vs. 10.65%, antibiotics 21.65% vs. 24.51%, antirheumatics 7.54% vs. 4.55%, cardiovascular 5.57% vs. 3.98% and erythropoietins 11.45% vs. 3.11% (P < 0.05).

The ratio of generics to patented medicines was 40.32%:59.68% and 39.14%:60.86%

**Conclusions** We found statistical differences among the pharmacoeconomic data of the two hospitals. In SGH, HIV+ patients are served (27.47% of uninsured and 47.35% of insured outpatients) and this is reflected in the increased cost of the outpatient while this is reflected in the increased cost of the outpatients while erythropoietins and cytostatics cost differences are related to the different DRGs and treatment protocols followed in each hospital.

No conflict of interest.

**AUTOMATION OF DRUG DISTRIBUTION: IMPACT ON ERROR RATE AND DISTRIBUTION SPEED**

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**Background** Human reliability is limited and information technology has the potential to improve the safety of the medication process. In July 2011, a robot (ROWA/ARX) was implemented in our hospital pharmacy to reduce error rates and improve the efficiency of our global drug distribution.

**Purpose** To evaluate the impact of this automation on distribution errors and workload efficiency.

**Materials and Methods** Approximately 52% of the dispensary stock (1126 articles, 50,000 boxes) is managed by the robot.

1. Distribution errors: content accuracy of random orders was verified before and after the implementation of the robot. Errors were classified in three categories: wrong drug, missing drug/quantity or additional quantity.

2. Workload efficiency: time to prepare a sequence of orders manually or with the robot was measured.

**Results**

1. Manual dispensing error rate was 0.93% (n = 5805 ordered lines; wrong drug: 0.36%, missing drug/quantity: 0.31%, additional quantity: 0.26%). By decreasing this error rate to 0.27% (n = 5840; only conveyer errors leading to missing drug/quantity and additional quantity), the automation avoided more than 4500 errors each year.

2. With the distribution of 880 boxes of drugs/hour (reduced to 630 when the automated ‘Pro-log’ filling system was working simultaneously), the robot significantly increased the distribution speed in comparison with the manual picking (305 boxes/hour).

**Conclusions** This reorganisation contributed to safer and more efficient distribution of drugs. No more incorrect picking of medicines occurred thanks to the high reliability of the robot. Remaining errors could still be reduced by improving the conveyer software. With one single person operating the robot, 2 full-time equivalents were saved, leading to an estimated return on investment in 4.5 years. For medicines remaining outside the robot (i.e. controlled drugs, cold chain drugs or those with an unusual size, shape or weight), a scanning system will be introduced and evaluated by the same protocol.

No conflict of interest.

**AUTOMATION OF STORAGE AND DISPENSING: WHAT SYSTEM SHOULD WE IMPLEMENT?**

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**Background** Innovation and new technologies help reduce the rate of medication errors and maximise efficiency in the drug administration system thus improving the safety and quality of patient care. In the market there are various automation systems, all of which are costly.

**Purpose** To analyse two storage and dispensing automation systems in order to make a decision to improve the safety, efficiency and quality of medicines use in our hospital.

**Materials and Methods** Review of two systems: A) fully integrated robotic automation (fully enclosed storage modules that automatically generate individual dosage units (DUs) grouped into rings per patient), and B) system with different components (semi-automatic storage and cart-filling system, plus storage tanks filling, automatic dispensing systems (DAS) in inpatient units, plus outpatient medicines automation and repacking).

We analysed the resources currently available and the benefits of the two systems. DUs consumed in 2011 were examined and classified by pharmaceutical lines; wrong drug, missing drug/quantity or additional quantity.

limitation of the study is that the costs of maintenance and the human resources reengineering required need to be further explored.

Abstract DSL-004 Table 1

<table>
<thead>
<tr>
<th>Advantages and disadvantages of the two systems</th>
<th>System A</th>
<th>System B</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAFETY</td>
<td>All DUs can be unequivocally identified with batch expiry date</td>
<td>Partial identification with batch barcode and expiry date, code without batch</td>
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<tr>
<td></td>
<td>Complete record, including batch, administration by scanner</td>
<td>Record drug administration by bar code without batch</td>
</tr>
<tr>
<td></td>
<td>Closed system</td>
<td>Partially open systems, error risks</td>
</tr>
<tr>
<td>EFFICIENCY</td>
<td>Entire integrated system including outpatients and elderly residences</td>
<td>Immediate availability of nursery doses needed to the patient</td>
</tr>
<tr>
<td></td>
<td>Full return of unmanaged DUs</td>
<td>Full expiry date control is difficult</td>
</tr>
<tr>
<td></td>
<td>Allows automatic checking of expiry dates</td>
<td>High cost</td>
</tr>
<tr>
<td>QUALITY</td>
<td>Complete record of all movements of both drugs and users</td>
<td>Partial recording of users, batches, drugs in drug use chain</td>
</tr>
<tr>
<td>Additional cost per DU (euros)</td>
<td>0.19</td>
<td>0.20</td>
</tr>
</tbody>
</table>

No conflict of interest.

DSL-005 COMPARATIVE STUDY OF THE COST OF ERYTHROPOIETIC FACTORS, ORIGINAL MEDICINES AND BIOSIMILARS IN FRENCH CARE FACILITIES

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Background The patent expiries of leading biological products and the development of biosimilars create opportunities for cost savings. No studies have been carried out in the French hospital market.

Purpose To perform a cost saving modelling analysis and investigate the potential factors that could affect the price of drugs.

Materials and Methods We carried out a comparative study in French healthcare facilities, representing about 65% of national hospital beds, of the price of erythropoietic factors. The data were collected on procurement procedures operative as of 1 January 2012.

Results 25 care facilities agreed to participate in the study. The overall sales turnover reached €15 M. Biosimilars represent less than 1% market share. All the establishments granted a discount of between 5% and 69% on the prices fixed by negotiation between the Comité Économique des Produits de Santé and the manufacturers, depending on the category (drugs, biosimilars or original biopharmaceuticals). The average discounts ranged from 11% to 73%. Binocrit, the main biosimilar represented was 25.6% less expensive than its original medicine Eprex. Based on French hospital financing, we show a 24.7% cost savings if a high interchangeability rate is adopted. Some participants could save up to 50% of their budget.

We identified and analysed three criteria known to have a far-reaching effect on the drugs price. We observe no or little effect of the type of procurement procedure and specified quantity of medicine. The starting date of the contract is the primary criterion when purchasing drugs. The impact of these criteria varied depending on the drug in question and no general conclusions about medicines could be drawn.

Conclusions The market for biosimilars is growing at a faster rate than the global prescription-drug market. Many top-selling biologicals are due to lose patent protection over the next few years. The great potential for cost savings apparent in our study could be investigated in other countries.

No conflict of interest.