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Implementation of the Falsified Medicines Directive in the secondary care environment - experiences and recommendations from European hospitals.

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Abstract

The World Health Organisation estimates that up to 50% of medicinal products in the world are counterfeit. Counterfeit drugs pose a huge threat to human health and life. Although the number of counterfeit drugs in Europe is much lower than in developing countries, the European Union has developed a directive that prevents the trade in falsified drugs. Despite the provisions of the directive are relatively easy to implement in community pharmacies, they may create difficulties in implementation in hospitals. Our article, based on experience in European hospitals, shows the most effective methods of verification and authentication of drugs. These activities minimize the risk of using drugs of unknown origin in hospitals.

Keywords: Counterfeit drugs, Quality of medicines, Falsified Medicines Directive, Hospital pharmacy.

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Introduction

Counterfeit drugs are a huge public health risk [1-3]. The World Health Organization (WHO) and numerous publications indicate that more than 10% of drugs globally are counterfeit. Moreover, in some countries such as India, China or Nigeria, up to 50% of the drugs may be counterfeit. [4,5]. The WHO defines the counterfeit medicine as a medicine, which is deliberately and fraudulently mislabeled with respect to identity and/or source. Counterfeiting can apply to both branded and generic products and counterfeit products may include products with the correct ingredients or with the wrong ingredients, without active ingredients, with insufficient active ingredients or with fake packaging [5].

Although the phenomenon of counterfeit drugs is much lower in Europe (reaching about 10% of drugs), the European Union has issued a directive minimizing the risk of counterfeit drugs (Falsified Medicines Directive, FMD) traded in the European Union. The directive entered into force in 2019 and indicates that the medicines on the market must have special security features, thus ensuring that each medicine is verified at any time throughout the supply chain. While the requirements of the European Union are quite easy to meet in the case of drugs sold in social pharmacies, these regulations may be difficult in hospitals [6-7].

Goods in and Goods out and what that means for hospital dispensing

Hospitals often have numerous inter-working IT systems supplied by a variety of relatively small software providers. This variety creates IT system heterogeneity resulting in more complexity when implementing the FMD locally, and the need for a bespoke solution.

The dispensing of a pack of medicine involves a series of predetermined steps i.e. it is a process. Due to the regulatory requirement more than one solution needs to be available for the verification or decommission process.

Experience gained from working with numerous hospitals across Europe indicates the majority of pharmacists will choose one of two interfaces to be enabled for medicines authentication in the same software:

- At goods-in with the possibility to verify the authenticity and/or decommission
- During the dispensing process, before sending to the ward with the possibility to decommission, the medicinal product will leave the premises of the hospital pharmacy.

Article 25 of the Delegated Regulation states that persons authorized or entitled to supply medicinal products to the public, operating within a healthcare institution may carry out that verification and decommissioning at any time the medicinal product is in the physical possession of the healthcare institution. This could possibly result in the need for multiple scanning points within the hospital and development of suitable interfaces [7].

It is worth noting at this point that verification and decommissioning are different. Verification can be done at any time of the supply chain. Authentication is the last step of the

supply chain at the last dispensing point because it will decommission the serial codes from the national repository.

That means that the question facing institutions is where would decommissioning be most efficient in their workflows? Scanning at goods in, without any mandatory requirement for code aggregation can be time consuming. This is different to inventory control so every pack will need to be scanned.

For some institutions, depending on volume and any automation available, during the dispensing process could be the more efficient option.

One of the key considerations for hospitals is the implementation of the 10-day rule. Here if the medicine is decommissioned at goods in then the unique code for the pack is removed from the national repository. If the medicine is unused it can be returned into the database but only if this happens with 10 days from the original decommission. Outside of that time the medicine cannot be returned. This has significant implications for stock and budget control and the effective management of both [6-8].

Good Authentication Practice

The Good Authentication Practice (GAPTM) guide was developed in a UK NHS Teaching Hospital, using the Aegate Ltd (Melbourn, UK) authentication service. Adopting these guidelines will aid a smooth transition to the implementation of an authentication and verification system in secondary care, minimizing risks to patient safety and facilitating pharmacy compliance [9].

Headline results: Freiburg University Hospital

To investigate some of the points raised above a formal project was developed with the University Hospital of Freiburg.

It dispenses 3.5 million packages a year. Supplies 115 wards and 70 outpatient clinics. Furthermore, it supplies 14 other healthcare institutions in the local area. The hospital pharmacy has multiple locations for dispensing drugs. In terms of dispensing procedures, the majority of drugs are dispensed manually and by bulk.

The project was completed over several days, and the goods were scanned at goods in. A total of 59 goods receipt orders were scanned at this location, giving a total of 1546 medicinal packs decommissioned. The time for the scanning varied tremendously due to the differences in packaging formats and barcode positions.

The minimum time was 0.62 seconds, whereas the maximum was 6.48 seconds, which is higher by a factor of 10. The median was 2.13 seconds and the average 2.09 seconds (Figure 1).

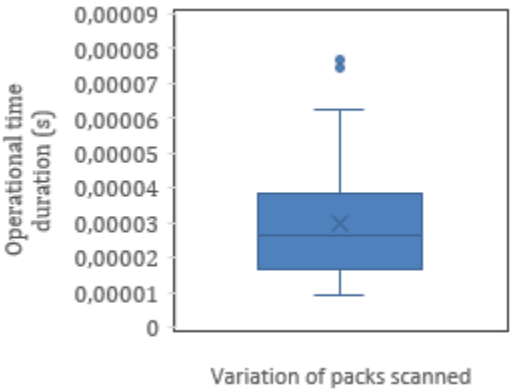

Figure 1. *M Box-and-whisker plot for the operational times at goods receipt. The box length or interquartile range (IQR) distributes between 1.44 and 3.31 seconds. It shows two outliers defined by values more than 1.5 times the spread from the upper or lower edge of the box (Q3 + 1.5 IQR).*

The middle fifty of drugs have an operational time between 1.44 and 3.31 seconds and are thus distributed around the median.

In the dispensary before supplying to the wards, a total of 51 orders were performed in the dispensary area. Around 1619 individual packages were scanned, and the number of drugs per order was between 2 and 187. This took 1 hour and 28 seconds to complete. The resulting median is 2.10 seconds per package with an average of 2.05 seconds per package. The time required for scanning was between 0.8 seconds and 3.47 seconds (Figure 2).

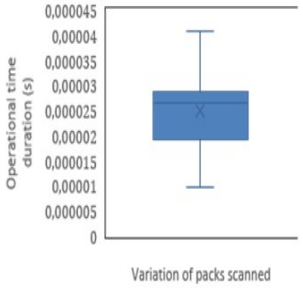

Figure 2. *Box-and-whisker plot for the operational times at the dispensary*

During this study the conclusion was clear that performing decommission at goods receipt will lead to an increase in operational time. So hospitals will achieve operational effectiveness by decommissioning medicinal products before supplying to the wards.

Headline results: Landeskrankenhaus Innsbruck – Tirol Kliniken

Another project developed in Innsbruck compared the same order in the actual dispensing operations and through the authentication system and regulatory requirements under the FMD.

Table 1 summaries the outcomes. There is a 51% increase of the operational dispensing time in a FMD environment. The hospital pharmacy in Innsbruck scanned items for inventory control at the moment of the study but after the implementation deadline, in February 2019, the hospital pharmacy staff needs to scan every medicinal product dispensed a requirement of the FMD.

Table 1: Operational dispensing time between a normal dispensing scenario and authentication system.

	Normal dispensing operations	**FMD Environment**
Operational Dispensing time (s)	20224	36530
Operational Dispensing time (min)	337	608
Operational Dispensing time (hour)	5.62	10
Total of Operational time (h) in a year	12298	21960
Hours a day	33.7	60
Staff in 8 hours shift needed per 365 days	4.21	7.5
Staff required per working year	4.5	8

Conclusion

Counterfeit drugs pose great risks to human health, but also economic damage [3,10]. In order to effectively stop the spread of falsified drugs, it is necessary to create an appropriate regulatory environment, as well as appropriate implementation of drug verification and authentication systems, both in community pharmacies and in hospitals.

Implementation of FMD in the hospital pharmacy is a major challenge. Compared with the community pharmacy a much greater degree of planning and organization is needed to cope with the decommission of large number of medicines. Our experiences suggest that an authentication performed on the products before sending them to the ward is the optimal point for decommission. The operational effectiveness and the integration in the workflow of this new step will not have a huge impact to restructure completely the actual workflow.

References

1. Koczwara A, Dressman J. Poor-Quality and Counterfeit Drugs: A Systematic Assessment of Prevalence and Risks Based on Data Published From 2007 to 2016. J Pharm Sci. 2017; 106: 10: 2921-9.
2. Kumar B, Baldi A. The Challenge of Counterfeit Drugs: A Comprehensive Review on Prevalence, Detection and Preventive Measures. Curr Drug Saf. 2016;11: 2: 112-20.
3. McManus D, Naughton BD. A systematic review of substandard, falsified, unlicensed and unregistered medicine sampling studies: a focus on context, prevalence, and quality. BMJ Glob Health. 2020; 5: 8: e002393.
4. Yadav S, Rawal G. Counterfeit drugs: problem of developing and developed countries. Int J Pharmceut Chem Anal. 2015; 2: 1: 46-50.
5. Khttp://www.who.int/medicines/services/counterfeit/impact/TheNewEstimatesCounterfeit.pdf
6. Naughton B. EU Falsified Medicines Directive Mandatory Requirements in Secondary Care: A Concise Review. J Generic Med. 2016; 12: 95-101.

7. Omer AM. Counterfeit drugs set alarm bells ringing: comparative analysis of drug policies. Pharm Biol Eval. 2016; 3: 1: 92-114.

8. http://eurlex.europa.eu/legalcontent/EN/TXT/PDF/?uri=OJ:L:2016:032:FULL&from=EN

9. http://ejhp.bmj.com/content/early/2015/10/01/ejhpharm-2015-000750.short?rss=1

10. https://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:174:0074:0087:EN:PDF (accessed on 5 February 2021).

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