DrugLog® Evaluated at the University Hospital of Lille

In order to increase the quality assurance for compounded intravenous medication doses in the operating theatre, University Hospital of Lille has tested and evaluated DrugLog. The results show great promise for enhanced healthcare safety culture and efficiency in the future.

THE MAIN ISSUE

Errors in compounded intravenous medication can lead to serious harm for the patient and as a side effect also for the caretaker.

Patients are supposed to feel safe under treatment and healthcare professionals are supposed to feel confident in performing their job. Unfortunately, study after study presents a different reality in the chain of care.

There's not one isolated element that leads to medical errors. There are actually several. According to the Institute for Safe Medication Practices (ISMP), they are:

- patient information
- drug information
- adequate communication
- drug packaging, labeling, and nomenclature
- medication storage, stock, standardization, and distribution
- drug device acquisition, use, and monitoring
- environmental factors
- staff education and competency
- patient education
- quality processes and risk management.

These errors don't come cheap in any way. There's a general need for improvement in the safety standards in healthcare around the world. One step in the right direction is to work with safety equipment that's both efficient and accurate.

THE DEVICE

DrugLog® is a combination of hardware and software that through a patented process can identify the drug being prepared and verify its concentration, prior to patient infusion. The device itself hardly takes up any space and can benefit the healthcare system in many different ways. DrugLog® has a built-in computer that can be connected to local networks for integrating with existing records, as well as with other related databases. We have identified three main areas for the usage of DrugLog®:

1. COMPOUNDING

The compounding process is being performed in a wide range of health-related environments, such as pharmacies, medical centers and hospitals. Even in the hands of a professional there's always the risk of a mistake being made, and the complexity of medical compounding demands extra precaution.

2. COUNTERFEIT

Counterfeit medication is produced and sold to deceive the customer by trying to represent the original pharmaceutical. In healthcare environments, large quantities of medication pass through the system each day. But can you be absolutely sure that the products are legit and manufactured by the medical companies, or could they in fact be counterfeit medication?

3. DIVERSION

The abuse and illegal distribution of prescription drugs in healthcare is not only a personal problem for the addict, but also a patient safety issue. On top of that, drug diversion is extremely costly for society. After an operation is completed, a common policy is to send back all medicals that haven't been used to the pharmacies. To make sure nothing has been stolen, the solution's validity need to be tested.

CODONICS

Pharmacolog

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THE EVALUATION

The renowned University Hospital of Lille is one of the first in the world to test the many possibilities of DrugLog on a larger scale. In France, there are no resources for centralised additive services, which means nurses have to prepare injections on the wards. As we've explained earlier, this is a critical area where mistakes due to human factors can be easily made and where both patients and caretakers become victims. Professor Pascal Odou, who worked very closely with Pharmacolog to adjust the device in line with the user's needs, sees many risks that need to be addressed in today's healthcare work environments.

»In the busy, stressful atmosphere of the operating theatre, there is always the possibility of errors when injections are prepared. DrugLog could make this a safe process,« he explains.

> **"There is always the possibility of errors when injections are prepared. DrugLog could make this a safe process**
>
> *– Professor Pascal Odou*

In the Lille study, DrugLog was used in the most crucial hospital area – the operating theatre. This is where the action takes place, and with heavy workload and responsibility comes mistakes. This is unfortunate, but not completely unavoidable. DrugLog is not a quality control instrument that can analyze all drugs in detail, but as a complement to other safety standards at the end of a treatment process, it's very efficient. What it does is identifying errors and warns the caretaker. Before it's too late. In the study, the theatre personnel tested the device to check concentrations of analgesics. When the evaluation period ended, the response from the Lille staff was very positive.

»It's the simplicity of the system that appeals to the users – simplicity of operation and simplicity of interpretation,« Professor Odou explains.

However, The study also showed that there's room for improvement with the device. Sometimes the intravenous bags that hold the liquid arrive overfilled. If so, the device may show a lower concentration than expected which leads to false negative results. This is something that will now be adjusted.

»The next version of the software will ask the user to specify the brand of intravenous bag being used and will then adjust the calibrations accordingly,« says Professor Odou.

THE TESTAMENT

This chart shows the results from the Lille study. Both concentration errors and drug errors were detected during the testing period (see table *Number of real drug error* below).

THE CONCLUSION

The evaluation of DrugLog at the University Hospital of Lille by Professor Odou and his staff shows that the device offers an efficient, easy and accurate quality assurance when compounding high-risk pharmaceuticals, and that it could improve patient safety significantly.

> **"With the thorough evaluation from Lille in mind, we continue to develop our software to enhance the safety culture and efficiency in the chain of care even further**
>
> *– Pharmacolog*

TABLE. NUMBER OF REAL DRUG ERROR

	ACCEPTANCE LIMITS	NUMBER OF SAMPLE	IDENTIFICATION ERROR	MAXIMUM AND MINIMUM RELATIVE ERROR	NUMBER (%) OF SAMPLE WITH A RELATIVE ERROR < 5%	NUMBER (%) OF SAMPLE WITH A RELATIVE ERROR OUTISDE OF THE ACCEPTANCE LIMITS	RSD (%) OF THE RESULTS
Amikacin	20%	5	1	-7.36 – 2.20%	2 (40%)	0 (0%)	5,12%
Amiodaron	15%	0	non	ND	ND	ND	ND
Gentamicin	15%	2	non	-31.36 – 5.00%	1 (50%)	1 (50%)	ND
Insulin	15%	10	non	- 15.21 – 1.96%	7 (70%)	n =0 (0%)	6.50%
Ketamin	15%	22	non	-1.,20 – 18.00%	8 (36%)	n = 2 (9%)	9.97%
Néfopam	15%	12	non	-12.26 – 0.00%	3 (25%)	n = 2 (17%)	4.24%
Noreponephrin	15%	1	non	6.00 %	0 (0%)	n = 0 (0%)	ND
Tramadol	15%	4	non	-22.89 – >120.00%	0 (0%)	n =4 (100%)	72.44%
Vancomycin	20%	11	non	-29.45 – 5.11%	6 (55%)	n = 1 (9%)	10.41%

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