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Integrated electronic prescribing and robotic pharmacy dispensing

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Background

Sunderland Royal Hospital has 1,000 beds and serves a population of 350,000. They've used integrated electronic prescribing (EP) since 2001 and installed a robot for their main dispensary in September 2009. A key element for both their electronic prescribing and their robot is the GS1 product barcode, which links the two together.

What was the problem?

Sunderland wanted an electronic link to help integrate their prescribing and dispensing functions. They also wanted to find a better way to manage their distribution system for IV fluids. In both areas, the introduction of GS1 standards meant greater efficiencies and improved patient safety.

What was their solution?

At Sunderland, they've integrated their prescribing, pharmacy, and patient administration systems, as well as pathology, radiology, and drug administration records. Their processes have been built around linking EP with their robotic dispenser as far as possible using a GS1 13 digit barcode. This combination has given them a lot of efficiencies:



- Greater formulary control which means a lower rate of drug expenditure
- More control of medicines processes and therefore less iatrogenic illness and greater patient throughput
- Easily identify missed doses via a quick report
- Greater efficiency in handling information and staff ability to call down what they need

Integration means there's a direct electronic link between prescription, barcode medicine and the label that the robot applies. By linking robotic dispensing with electronic prescribing via a GS1 barcode, they've effectively designed out any room for error.

In their experience, clear benefits in using electronic prescribing and robotic dispensing will be realised so long as the following conditions are met:

- The EP system used is integrated with all the other hospital software systems
- The robotic dispenser is joined with the EP system
- There are automated labellers for those items robotically dispensed

Using GS1-128 barcode for IV fluids

The other way in which Sunderland uses GS1 standards is for their IV fluids. They'd previously had a lot of problems with their fluids, with large volumes being distributed as and when porters had the time to move them. They introduced GS1-128 barcode for IV fluids because it made subcontracting this work easier and gave each pack a unique number so it could be traced right through their system.

The unique pack number tracks if further supplies have been made outside scheduled deliveries (e.g. extra supplies from pharmacy), giving accurate usage figures. Wards are also barcoded for this system using a location code.

Results

Significantly, there have been zero errors for the combined robot-EP system and that's based on around 800,000 items per annum. It has a huge impact on safety but also speeds up turnaround time for prescriptions, it's nearly instantaneous following clinical check. Sunderland dispenses a maximum of 360 items per hour, equating to 36 dispensing staff (their actual is 7-10 staff). If the pharmacy can dispense 360 items an hour, it therefore now has a capacity of 57,000 items per month, based on a 40 hour week. Another benefit is that the efficiency of dispensing process means pharmacists don't need to be in the dispensary all the time, but can be more available for ward-based work.

The pharmacists themselves also perceived significant benefits. When asked in a study, they liked the easy availability of information as a result of the system. 87% also felt more empowered at a ward level because they were free to cover more ground, and were therefore more in tune with what is happening there and then. Other benefits included:

- 1. Ward relationships** – because they were more available, they were better integrated into ward teams. Doctors also saw them as more available and therefore as better able to help them when they needed it
- 2. Policy enforcement** – EP removed task of policing the formulary and access to relevant clinical information removes communication barriers

Benefits

Before	After
Delivery time: 1-2 days	4 hours
Overall cost	No change
Pharmacy stockholding	No change
Nurse acceptability	75% greater satisfaction
Reduction in pharmacy supplies ad hoc	30% reduction in pharmacy supplies

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