Medical technology vastly improves patient care

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Technology is entrenched in practically every aspect of our daily lives, so it makes sense that the health industry is embracing the use of technology to improve patient safety and minimise human error. A significant number of adverse drug events in South African hospitals every year can be attributed to human error, which is why the adoption of barcode technology has become so critical.

According to the World Health Organization, more than 50% of countries do not implement basic policies to promote the rational use of medicines. Less than 40% of patients in developing countries in the public sector, and 30% in the private sector, are treated according to clinical guidelines.

Safe medication administration is underpinned by the “five rights” principle:

- The right medication
- At the right dose
- At the right time
- For the right patient
- Using the right route.

When implemented properly, barcode solutions can significantly improve the success rate of this process and enhance patient care at the bedside.

The benefits of new technologies and tools aimed at improving healthcare were the focus at the South African Medical Device Industry Association and Health Africa conferences held in Gauteng last month. Thus, there is merit in exploring how patient barcode solutions are taking medical technology to the next level.

Of the medical technologies being developed, barcode solutions have reached top of the industry list because of their relative ease of implementation, demonstrated return on investment and broad array of applications.

Simply put, barcode technology eliminates the need for traditional keyboard data entry. It requires the conversion of an identifier to a symbolic representation, i.e. the barcode.

The barcode can then be printed onto or affixed to an item, and subsequently read by a light source and fed into a computer.

Barcode solutions can be used in a variety of healthcare applications, including the production of hospital wristbands, and labelling pharmaceutical unit-dose medications, intravenous mixtures, laboratory and pathology specimens, blood products, asset tags and file labels.

Pharmaceutical companies can locate and track each dose of medication produced in vast batches. Hospitals can monitor and utilise equipment with greater efficiency, and healthcare staff are able to create and maintain healthcare records more efficiently.

The rate of accuracy at which information can be captured is exceptional. Barcode-scanning equipment is much faster than the human eye and notably more accurate. When tested, barcode scanners were proven to have an accuracy rate of one error per 10 000 000 characters. By comparison, keyboard entry error rates of one error per 100 characters were noted.

In short, the benefits of patient barcode solutions or barcoding point-of-care systems can be summed up as follows:

- They eliminate the chance of errors occurring in recording data, with the added benefit of this being achieved in a fraction of the time required using manual entry.
- They are easy to use. Unskilled operators can learn and operate the equipment in a fairly short time.
- The likelihood of barcode equipment purchased this year becoming obsolete next year is not high with the use of standardised codes and finely honed technology.

So, what is the cost of barcoding to business?

Because it is important for cash-conscious hospitals to carefully investigate the long-term benefits of any new technology, the use of patient barcode technologies in hospitals has been modest. However, like most electronic technologies, the unit costs have been dramatically reduced over the past few years, and the uptake is expected to increase exponentially.

The US Food and Drug Administration (FDA) estimates that purchasing barcoding equipment and training staff to use the technology costs approximately $53.1 million, but results in 413 000 fewer adverse errors over the next 20 years, and avoids related hospital stays, thereby resulting in a saving of an estimated $41.4 billion. In South Africa, this translates into a cost of R556 million and an estimated saving of R431.5 billion.

While the initial investment is costly, the long-term benefits and return on investment (clinical and measurable financial) far exceed any investment capital required. It has been proved in studies conducted abroad that the results of implementing such systems include notably fewer adverse drug events, the avoidance of related hospital stays and marked savings on hospital bills.
Importantly, hospitals are expected to avoid litigation associated with preventable adverse events. According to the FDA, this reduces malpractice liability insurance premiums and increases receipts from more accurate billing procedures (in excess of the barcode implementation and maintenance costs).

Hospitals also gain from the marketing and patient preference benefits associated with quality care and industry leadership in the adoption of new technologies and clinical processes. The collateral benefits of barcoding with respect to nursing and pharmacist productivity, charge capture, inventory management, asset utilisation, commodity tracing and tracking, and the market value of patient safety leadership, are less obvious, but are of equal importance.

In the USA, the FDA has mandated that pharmaceutical manufacturers barcode their products at unit dose level. The benefits that emanate from this include patient safety, brand protection and fraud detection, and an improved supply chain, as well as return and recall processes.

Ultimately, the most important factor is the vast improvement in the quality of patient care and the improved efficiency that leads to the delivery of a better service, as well as the reduction in costs.

Note: This article emphasises the fact that technology is available, and should be embraced, not only for our own benefit, but also for the benefit of our patients. Although the technology discussed is not new, and has been in use globally in private hospitals for many years, and certainly in some South African private hospital pharmacies, considerable improvement is required before it can be said that the technology is being used optimally in all pharmacy sectors. Ed.