

e-coding

— enhancing supply from manufacturer to patient

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The authors discuss the problems with present systems for identifying products and make recommendations for better coding, now needed more than ever in the age of e-commerce

The pharmaceutical supply chain is intricate and complex (see Figure 1, p241). Traditionally, this has been a manual system vulnerable to human error. As technology moves forward, it becomes increasingly important that clear definitions of products are used. Inevitably, the different parts of the pharmaceutical supply chain have developed their own isolated solutions for identifying and tracking products. These solutions have mostly solved the requirements of that part of the supply chain, but do not necessarily provide solutions required elsewhere. The situation is exacerbated by the development of electronic prescribing, with a new set of data requirements for transmission and recording of clinical information linked to details of product choices.

If the true potential and economies of an integrated electronic supply chain are to be realised, these various solutions will have to be integrated in some way to allow:

- | Supply chain efficiency
- | Connectivity
- | Data consistency and visibility

SUPPLY CHAIN EFFICIENCY

At present, all processes within the pharmaceutical supply chain (eg, ordering, invoicing, forecasting, logistics, reporting) are made more complex and time consuming by the inconsistencies that arise from different participants referring to the same product by a different identifier. However, when using the European Article Number/Uniform Code Council (EAN.UCC) numbering system, one product has one identification number which is applied by the manufacturer. This number is used regardless of where in the supply chain the product needs to be identified. It is the manufacturer's responsibility to ensure that a code is only ever used once because problems have

occurred when the codes have been reused on other products.

Individual sales packs, outers and shippers should all be coded using individual codes.

CONNECTIVITY

In order for different IT systems to connect to each other and successfully pass data, coding standards must be agreed and adhered to. Electronic data interchange standards for doing business electronically are well established in many industries, using coding standards which have been identified for many years. Adherence to standards is in the hands of the customer. Since the standard is voluntary, it is up to the customer, whether retailer, central pharmacy or laboratory, to require the supplier to identify the product uniquely for ordering, invoicing, tracing and tracking purposes.

CONSISTENCY AND VISIBILITY

At present, it is not possible to get an overview of the supply chain in its entirety, and it is not possible to tell whether the data are consistent. Without this facility, the potential savings of electronic procurement will not be achieved.

This paper is an attempt to describe the current situation and the requirements of some of those participating in the pharmaceutical supply chain. It does not provide an exhaustive description of the data set required and no immediate answers. The paper is intended to suggest and facilitate a potential way forward, and to identify the type of work necessary to realise the potential of an electronic pharmaceutical supply chain.

CURRENT SITUATION

The current situation has been brought about by a number of false starts in the development of a unique product identifier in past years. To our knowledge, they have all failed to incorporate the views and needs of the whole pharmaceutical supply chain.

Table 1, p242 shows some of the coding systems being used.

Clinical codes versus procurement codes As clinical information systems become more developed, there is an increasing demand for a clinical classification system. The preliminary model for this is the PACT (Prescribing analysis and cost tabulation) system administered by the Prescription Pricing Authority, which produces detailed information on drug use classified by BNF category. As electronic administration systems are developed in secondary care, however, it should be possible to go beyond this and collect data on which drugs are used for which clinical conditions (by matching the issues to the electronic patient record [EPR]). This will allow outcome data to be collected, and is potentially a very powerful clinical tool. Again, it would appear that these clinical coding systems are being developed in isolation to current systems. Clinical classification systems and coding are far from being standardised, and there are a number of organisations working worldwide with different systems.

Contracting Contracting for medicines requires an "umbrella" generic coding system for hierarchical identification of products. With such identification, the codes can "drill down" from drug, to drug and strength, to drug, strength and pack size, with each level related to the one above. This is necessary in order that generic products can be identified and compared. Generic codes can be incorporated into the EAN 128 bar code as a secondary identification code. Departments of health in many countries around the world are demanding that their suppliers use EAN.UCC numbering to identify products uniquely. Some have given preference to those suppliers willing to comply.

The search for a holy grail Thus, there has been a search for a holy grail — not only a procurement code common to all countries in the UK, but ideally, one to cover both pur-

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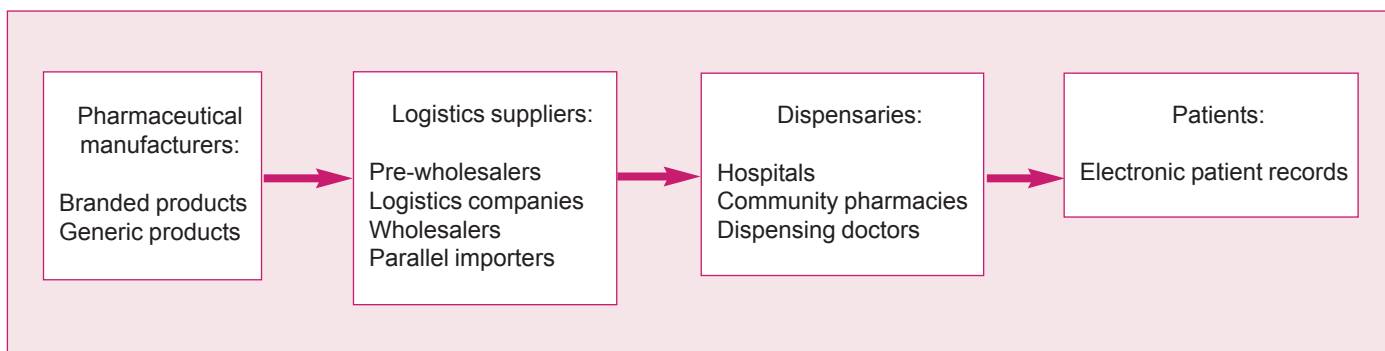


Figure 1: The pharmaceutical supply chain

chasing and clinical codes. Obviously, it is possible to create an integrated code containing a (large) set of separate data fields. The data set would be huge, however, and the code would be both complex and long. There would be too much data to print on an ampoule perhaps, although reduced space symbology (RSS) bar codes can be printed on ampoules and a tablet in a blister pack. RSS bar codes condense bar codes so that they can be printed in a small format yet still retain the information. The National Health Service Information Authority is developing a coding system, Snowmed, that allows information to be widely and easily shared by IT systems. The system is to be incorporated into the UK clinical products reference source (UKCPRS). Further information can be obtained from www.nhsia.nhs.uk/ukcprs/pages/default.asp

Mapping Mapping is the matching of different coding systems so that codes relating to the same product are matched. It is usual for databases to store information so that one code can be accurately "translated" to another. Mapping would seem to be essential because there are so many gaps in current coding systems and no one system or independent group has the capacity to provide for all the requirements. It may well be necessary to map the existing widely used coding systems (eg, PIP, EAN) to the new UKCPRS.

MANUFACTURERS' NEEDS

For systems to work efficiently, manufacturers need the following:

- | Coding systems which identify individual products down to batch number and expiry date
- | Ideally, coding systems that work at sales pack, outer and shipper levels. This could be dealt with by the factoring up of sales packs allowing the relationship between a code for a single pack and that for an outer or shipper to be clear. In other words, where the code for a product might be yy33xy, an outer of 10 could be yyy33xy, but not 10yy33xy
- | An ability to identify customer purchases throughout the supply chain, including wholesalers, retailers and hospitals

The majority of manufacturers use EAN coding.

WHOLESALEERS' NEEDS

The needs of wholesalers and logistics require a coding system to facilitate goods in, stock control, batch and date recording. System requirements are:

- | Coding systems to identify individual products down to batch number and expiry date

- | Ideally, coding systems that work at sales pack, outer and shipper levels. This could be dealt with by factoring up of sales packs (as explained under "Manufacturer's needs")
- | An ability to identify customers' purchases with dates and volumes of issues

Most wholesaler systems are electronic. They have coding systems of their own which are unique to each wholesaler and not interchangeable. There is also use of the universal PIP coding system for wholesalers and customers.

COMMUNITY NEEDS

In community pharmacy, the supply chain involves the issuing of packs to patients and, potentially, the updating of the patient record. Stock control functions are undertaken. Data are collected from prescriptions to develop PACT data. Requirements include:

- | A unique product identifier including name, form, strength, manufacturer, batch number and expiry date, to allow ordering, booking in and issuing of drugs. Ideally, this would be a readable bar code. This will allow for batch recalls and updating of an individual's EPR
- | Collection of PACT data with details of prescriber, date, as well as the above. The PPA will have data for this information

| The electronic transfer of prescriptions projects using the UKCPRS system

HOSPITAL NEEDS

In hospitals, the supply chain starts in the pharmacy department and extends to the patient. Information systems are also used to classify usage of medicines, and ideally match those to patient indications and outcomes. Requirements include:

- | A unique product identifier including name, form, strength, manufacturer, batch number and expiry date. to allow ordering, booking in and issuing of drugs. This needs to allow for broken pack dispensing (to capture individual dosing of patients). Ideally, this would be a readable bar code
- | Details such as date, prescriber, nurse, for administration systems as well as product information. This will allow capture of issues to individual dosing events, allowing for recalls as well as Medicines Control Agency (MCA) guid-

ance, in their Guidance Note GN14 requirements on the treatment of "specials", particularly the requirement to store details of batch number and expiry date information linked to the patient dispensing episode)

- | A generic coding system to allow for contracting. This may also be usable as a primary clinical coding system
- | An agreed clinical coding system to allow medicines usage to be mapped to clinical condition and outcome

Hospitals are starting to invest in automated picking and distribution systems. It is possible, or rather, probable that bar coding of products will become mandatory as a part of the contracting system.

RECOMMENDATIONS

It is essential to agree, adopt and enforce a UK standard for trading with and within the NHS to cover primary and secondary care needs. It is probable that separate clinical and procurement codes will be required, but

the standard must encompass this and allow for the matching of these codes in a sensible and accessible manner. It is necessary for a detailed mapping process to take place, matching codes on a one-to-many basis where appropriate. Only once this database of matched codes is available can IT systems within the supply chain maximise the potential benefits they can deliver, in terms of process improvements and cost reductions.

The standard needs to be owned and championed by the Government and a database set up to administer and maintain the code structures. It must be, and remain, responsive and adaptable otherwise it will not be adopted by future system developments. Perhaps it could be internet-based to give open access and to facilitate quick and efficient file maintenance. The standard should not just be a UK solution, but a global one, particularly since there are so many overseas suppliers.

Table 1: Coding systems in use

Code	Comment
Read	Too complicated at procurement level
BNF	A clinical code. Useful for reporting use of drugs vs clinical indication, but codes change as new drugs are introduced; also, drugs appear in more than one section. Does not contain pack or manufacturer's data. Are only updated every six months and so can be inaccurate
NPC	Purchasing and Supply Agency (PASA) code. Contains pack information. Is a generic code and is thus not specific to a manufacturer. This is needed for contract adjudication but is not helpful for tracking individual products
NSV	Local PASA code. Similar to NPC, but duplicated for each regional contract
NATO	Allocated to product by the Medical Supplies Agency. Used in the armed forces
WHO	Internal code used by the World Health Organization
EAN 13	Contains pack and manufacturer information but is missing batch number and expiry date data. No clinical codes. However, batch numbers and use-by dates can be represented in bar code format on the individual pack along with the EAN 13 (see EAN 128). EAN 13 is allocated by the brand owner randomly or sequentially, and contains no information about the product; it is an identifier or key that unlocks the information held in databases
EAN 128	EAN is a system of symbols that represents data. It is not a codification structure. Large amounts of information can be represented such as, use-by date, lot number, serial number, production date and packaging date. Where space is limited, as in individual dose blister packs and vials, reduced space symbology and composite coding has been developed
Wholesaler	Individual coding systems used by wholesalers and sometimes community pharmacists. Unique to each individual wholesaler
Pipcode	Universal coding system allocated by Chemist and Druggist. Used by wholesalers and community pharmacists. Does not contain the batch number and expiry date. Identifies sales pack only
UKCPRS	UK Clinical Product Reference Source. In development by the National Health Service Information Authority and combines primary and secondary care drug dictionaries and the medical devices dictionary. Primary Care Drug Dictionary being used in electronic transfer of prescription projects. Does not currently contain batch numbers and expiry dates. Also incorporates clinical coding via Snowmed