Representation of drug allergies, intolerances and adverse reactions in GP electronic patient records.

Introduction

Records of drug allergies are recognised as key components of patient records, since awareness of previous drug allergies can be of vital significance in enabling safe prescribing. Also patients who suffer unintended side effects or adverse reactions from particular drugs or classes of drug may be unable to tolerate them. While adverse reactions and intolerances are, in general terms, a lesser threat to patient safety than true drug allergy they are of similar value in guiding prescribing decisions. Doctors need, therefore, to record drug allergy, intolerances and adverse reactions in a way that readers of the record or those with whom they communicate can reliably understand.

Requirements of GP electronic patient records

Records of drug allergies, intolerances and adverse reactions in electronic patient records are required to support multiple functions:

- Decision support – activation of warnings to prevent inappropriate prescribing.
- Population of referral documents and other communications – often as components of semi-automatic mail-merge extracts to facilitate reliable communication.
- Onward transmission to other GPs on patient transfer as components of GP2GP transfer messages.

Implications

It follows from the above requirements that records of drug allergies, intolerances and adverse reactions should be in a form that is:

- Capable of activating, where appropriate, decision support routines in the host application.
- Capable of identifying candidate components for inclusion in documents.
- Able to be mapped to the GP2GP standard representation for onward transmission with minimal loss of meaning and functionality.

Issues

There is currently no standardised method of recording drug allergies, intolerances and adverse reactions and current applications adopt a variety of proprietary or semi-proprietary approaches to the task. In essence the differences between approaches adopted in different applications lie on two axes:

- Drug dictionaries:

  A range of drug dictionaries are available. Those known to be in current use in different applications are:
  - Read codes
  - Multilex (First DataBank)
  - Proprietary dictionaries

  Because of structural differences compatibility between these different dictionaries is limited.

- Representation:

  In order to support further functionality (e.g. decision support) suppliers have adopted a range of approaches to representation of these phenomena:

  - Enumerated Read codes. The Read codes provide a small number of enumerated codes to represent a small subset of the drug allergies, intolerances and adverse reactions that patients may demonstrate. These codes suffer two disadvantages:
    - Partial coverage. Because of the enumerative approach it has proved impractical to extend the range of codes to include all possible instances. In practice the range of concepts included is severely limited.
    - No links to any drug dictionary. The limited scope of the available codes inhibits useful linkage to the available drug dictionaries. The implication of this is that such limited decision support as is practicable must rely on drug dictionary links provided by a third party.
  - Compositional coding. The compositional approach to representation involves the use of a non-specific Read code for the type of reaction linked to (or qualified by) a code from the relevant drug dictionary indicating the drug or class of drugs that is implicated. The advantage of this approach is that it facilitates secondary use of the data (e.g. decision support) in the host system. The disadvantage is that transfer to an alternative system which employs a different drug dictionary may be unreliable.
  - Proprietary. Some applications make use of a structured data approach in which components of the application are configured to recognise certain data elements as representing drug allergies, intolerances and adverse reactions. This has broad similarities, and conveys similar benefits and disadvantages, to the compositional coding approach.

  In addition some applications support a hybrid approach in which enumerated Read codes are permitted in addition to a compositional or proprietary approach. In such systems it is unusual for the enumerated Read codes to be configured such that they will activate decision support or other secondary functions.

Other considerations

- GP2GP records transfer:

  The GP2GP transfer messages and protocols have been specifically configured to exploit compatibilities and accommodate incompatibilities between different applications in their approaches to recording of these phenomena. Methods have been incorporated to ensure that, where possible, records are transferred with preservation of full meaning and functionality. Where it is not possible to preserve meaning and functionality records are degraded and flagged as requiring end-user intervention to enable restoration of meaning and functionality in the receiving system. The processes are believed to provide an optimal method of resolving incompatibilities between applications.

- SNOMED-CT and dm+d:

  Under the auspices of Connecting for Health the NHS will adopt SNOMED-CT and dm+d as the standard coding vehicle and standard drug dictionary for use in electronic patient records. In anticipation of these developments the current GP2GP message already makes use of dm+d to support transfer where it is feasible to do so.

These will provide greatly improved support for the representation of drug allergies, intolerances and adverse reactions by ensuring that incompatibilities between coding substrates are eliminated. Guidance has been compiled indicating that a standard approach (using compositional coding techniques) to creating such records will be defined.

Conclusions

This is a complex topic which has the origins of its complexity in the historical and somewhat piecemeal development of coding schemes, classifications, dictionaries and the applications which exploit them. It is confidently expected that migration to new standards such as SNOMED-CT and dm+d will provide a long term effective solution through standardisation of both the code substrate for electronic records and also representational conventions. In the interim the compromise solution made available through the GP2GP message development offers the most promising prospect for safe and effective working.

Recommendations

- End users of electronic patient records should be encouraged to familiarise themselves with the conventions for recording drug allergies, intolerances and adverse reactions implemented within the application(s) that they use.
- End users should continue to record these in the ways that best support the specific functionality (in particular decision support) of the application(s) that they use.
- Development of the GP2GP message should continue with a view to ensuring that maximum benefit can be derived from records that are transferred between systems on patient transfer.
- Connecting for Health should initiate a programme of work to clearly define the clinical requirements that must be supported by these components of the patient record
- System suppliers should work urgently towards common representations of these phenomena using Snomed and dm+d.

Pete Horsfield
Clinical Advisor Clinical Leads Connecting for Health September 29, 2005