

## Chapter III

# Coding and Messaging Systems for Women's Health Informatics

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### ABSTRACT

*Recording information about symptoms, observations, actions, and outcomes is a key task of health informatics. Standardization of records is vital if data is to be used by different groups, and transferred between organizations. Originally, coding focused on causes of death and other outcomes. Such systems include the international classification of diseases (ICD). However, more recently the need to allow communication between health organizations has encouraged the development of standards such as health level seven (HL7). Further work has focussed on vocabularies such as systematic nomenclature of medical terms (SNOMED), which allow standardised recording of any health-related information. Coded data is necessary to allow computers to assist in decision making and for audit purposes. With the rapid development of computer networks and the Internet, there has been a growing effort to include semantic information with computer data so that the meaning of the data can be bound to the data store. The chapter discusses these standards and the areas that are undergoing rapid development.*

### INTRODUCTION

“We need three types of clinical information standards: document structuring standards; term lexicons; and ontologies”(Gardner, 2003)

Coding and messaging systems allow the standardisation and systemisation of information storage and transmission in healthcare. They al-

low the accurate and structured representation of information which can be used to impart a common understanding. The aim of this chapter is to introduce some of these systems along with the theory that underlies them and the uses to which they are put. These approaches are particularly important in women's health informatics for a number of reasons:

- In pregnancy it is common for women to be cared for by a number of healthcare professionals, and communication between them should be precise and efficient
- Past outcomes and complications often have a great influence on the care plans for women in subsequent pregnancies, and this information is much more effective if standardised. Information recorded in previous pregnancies may be useful for risk prediction if presented in a suitable format.
- Government agencies and healthcare organisations require accurate and extensive information in order to fulfil their information needs. Information relating to births has been collected for centuries, and improvement in morbidity and mortality can only be noted with standardised recording.
- Funding and fee for service are often related to the case mix of the institutions providing the care.
- Health Surveillance and audit of outcomes is particularly important for screening programmes and also to understand long-term trends such as the general rise in operative deliveries.
- Research in the area of women's health often requires re-examination of clinical records generated in the past. Accurate coding allows the selection of suitable records and patients for research studies as well as linkage between history, intervention and outcomes.
- An exciting area of research is the development and use of decision support tools that use historical data to provide patients and clinicians with guidance concerning the likely outcome of clinical decisions and the natural history of disease. This sort of decision support is covered in more detail in Chapter XV.

For all these reasons, coding of clinical events, diagnoses and interventions is an important part

of an information system designed to support women's health.

At its heart, coding is a systematic and reproducible method of recording pertinent information for the improvement of management of healthcare. Messaging involves the transmission of healthcare information in a standardised and efficient format within and between information systems that are involved in the care of people.

In terms of system efficiency, coding can dramatically reduce the amount of data stored, and also increase the usefulness of this data for analysis. However the coding process is demanding and requires care and understanding of the principles of the coding system being used.

The next section of this chapter gives some background to the development of modern coding and messaging system. The main varieties of coding systems in use currently (ICD, READ, DRG) are described in the coding systems section. Messaging systems are then described including health level 7 (HL7) and Digital Imaging and Communications in Medicine (DICOM). More complex and complete systems for recording information including some controlled vocabularies such as SNOMED and ontologies are then described. Finally a discussion of the state of the art, and some future areas of development is contained in the final section.

## **BACKGROUND AND HISTORY**

Medicine has grappled for many years with the need to have efficient means of communicating data about patients, diseases and treatments. From the time of Hippocrates, writing down clinical information has been a major part of health care. Comparison between patients, and agreement on diagnosis and symptoms requires agreed recording and communication standards. Medical language has been sometimes seen as a barrier between professionals and lay people, but precision and flexibility are vital even if a

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