



Clinical Disease Coding and Classification

An Overview for General Practitioners

**Dr. Brian Meade
Version 1.1**

What is a classification system?

A classification system groups concepts together for a specific purpose. In health it is sometimes useful to group certain diseases or presenting complaints together in order to be able to study them in more detail. Classification systems frequently use codes to group items together.

What is a disease coding system?

Disease coding systems assign a code or value to a specific entity. In ICD-2 the code for Asthma is R96 allowing this diagnosis to be easily retrieved by a computer application.

Why do we need disease classification systems when using computers?

Doctors are trained to write narrative accounts of their encounters with patients but computer systems are unable to use this type of information when performing tasks such as finding patients with a particular disease or on a particular drug. As an example, an attempt by GPs in Exeter using computers in the early 80's to identify all cases of patients with Otitis Media over a given period, grossly underestimated the incidence of this condition. This was because some GPs diagnosed Otitis Media, others "middle ear infection" and some simply wrote "OM" into their computer records. The system simply couldn't cope with the many different terms and didn't have the "intelligence" to know that they were all the same condition.

While computer systems are getting much better at dealing with different meanings, applying a single code to a condition like Otitis Media allows GPs to still record whatever they like in the clinical notes but the computer will "know" what the GP wants to indicate in each case. Classifying codes into different categories will further add clarity to this and assist in the retrieval and linkage of information.

Other potential benefits of using coding and classification systems include

- Supports audit, training and research within GP practices due to the ability to retrieve high quality information quickly
- Supports the identification of patients suitable for preventative medicine interventions such as immunisation or screening programmes
- Allows practices to quickly establish a disease register for coded conditions
- Supports the linkage of particular signs and symptoms with outcomes e.g. how many cases of patients who present with weight loss in General Practice are eventually diagnosed with a malignancy
- Supports the exchange of information with Public Health and Hospital information systems
- Supports the exchange of information with GPs from other countries using different languages

- Can provide the information required to run decision support systems which can assist GPs in making correct diagnoses and better management decisions
- Supports the management of chronic disease by assisting with the formation of disease registers, disease management protocols and recall
- Supports more efficient organisation of electronic patient records e.g. all consultations on an individual patient for a condition such as Asthma can be filtered out and examined in isolation from all other consultations
- Allows the rapid retrieval and organisation of information.

Does coding disease make a consultation longer?

Ideally coding and classification systems should work in the background and GPs using IT systems should be virtually unaware that they are in fact coding diseases, drugs, investigations and other items. In modern computer applications, once an item is selected from a drop down menu it will be coded correctly by the software and there is no need for the GP to remember codes or refer to a coding document.

Other software applications offer search tools within the software so that when the GP types the first few letters of the disease, the application will offer a list of matches from a list of the codes embedded within the system. Selecting the nearest match also selects the code and links it to the patient's record.

Which classifications systems are in use in General Practice?

ICPC-2 – International Classification of Primary Care

This classification system is used in all GPIT certified GP software systems. It receives a lot of criticism from GPs here as it has far fewer diagnosis codes than other systems such as ICD 10. ICPC-2 however was not designed to be simply a disease classification system. One of its principle aims was to capture the interaction or “episode of care” between the GP and the patient. It was designed to be structured around the SOAP (S for subjective information, O for objective Information, A for assessment and P for plan) method of recording consultation information. It therefore offers codes for various components of the consultation such as presenting complaints and investigations carried out, as well as final diagnosis.

ICPC-2 has a biaxial structure. The first axis which is primarily orientated around one of the 17 body systems on offer is represented by a letter. D is for digestive and N is for Neurological for example. The second axis is represented by a number which covers the seven components (presenting symptoms, diagnosis etc) contained in each of the body systems. The result is a simple code with one letter and two digits unique to each item on the list of around 1300 items.

ICPC has been in existence since 1987 and has been adopted by WONCA for use within general practice and primary care. It is also recognised by WHO as a related classification for use in primary care, in the WHO “Family of Classifications”. It is widely used across Europe and has been translated into 22 languages so far.

ICPC-2 Plus

This is a terminology developed by the Family Medicine Research Centre, University of Sydney, Australia. There are over 7,000 terms in the Plus terminology and each term is classified to ICPC-2. This system is often referred to as the BEACH coding system as it is used in a national data collection programme in Australia known as “Bettering the Evaluation and Care of Health” which provides valuable epidemiology information to the Australian Government and the profession.

The Plus terms each have a 6 digit code made up of the (3 digit) ICPC-2 code and a three digit term code. Selection of the desired term from a pick-list generated from a linked keyword results in the saving of the term and its code. Later, data can be drawn out on the basis of the ICPC-2 classification (the first 3 digits).

Although not much in use outside of Australia, it is mapped to ICD 10 and is also being mapped to SNOMED CT (see below). ICPC-2 Plus is being made available by some GP software suppliers here to Irish GPs who find ICPC-2 and/or ICD 10 not meeting their needs. The future of ICPC-2 Plus is somewhat uncertain given the stated intention of the Australian Government to move to SNOMED CT for use across their health system. This could present a problem to Irish GPs if the Irish government do not adopt SNOMED CT in the same way.

ICD 10 – International Classification of Disease

The ICD classification system started out as a method of classifying cause of death in the late 19th century. It has evolved now into an extremely rich classification system covering signs, symptoms, procedures, social circumstances and causes of injury as well as diseases. ICD is published by the WHO and is widely used across the world, primarily for the recording of morbidity and mortality statistics.

While it is excellent in this role, it is perhaps too detailed for use by GPs and does not cope well with many of the undefined conditions found in general practice. ICD 10 is however available in most Irish GP software systems and can be used either alone or in conjunction with ICPC-2.

SNOMED CT – Systemised Nomenclature of Medicine Clinical Terms

SNOMED has arisen from SNOMED RT, a system used mainly by pathologists in the US and NHS Clinical Terms Version 3 which is used in the UK. The latter evolved from

the very popular Read coding system developed for use by GPs in the UK in the eighties and still widely used there today. Because of this, the system should be suitable for use in Irish general practice also.

The system has a multi axial structure and is a lot more complex than ICD and ICPC-2. It not only defines and codes individual concepts; it also defines the relationship between concepts and therefore allows much greater flexibility in defining what is observed. It is designed for use both in primary and secondary care and is driven by clinical rather than statistical analysis requirement. SNOMED supports 315,000 concepts with 1.3 million relationships between these concepts.

Currently SNOMED CT is used by a number of large health organisations in the US. Its use however is likely to grow in the UK due to the involvement of the NHS in its development for use in General Practice there. It is now the responsibility of the IHTSDO, an international collaborative organisation with about 15 member countries (including the US and UK). Collaboration between IHTSDO and a widely used electronic messaging standard known as HL7 is also likely to increase its use in many countries. It is not yet available to Irish GPs.

Disease Registers

One of the benefits of coding disease is that it is then possible to develop an electronic disease register. It is important to understand that using a GP software system which offers a coding system does not automatically provide an accurate disease register. Some patients with particular conditions will not present to their GP for management of the condition as they are attending private consultants or out patient clinics. On the other hand some patients who have been coded correctly will die or move to other practices and should not therefore be included. Maintaining an accurate and up to date disease register is a “work in permanent progress” and it is good practice to have one member of the practice responsible for keeping the register up to date.

In order to set up a disease register, consider the following sources of information

- A search of the patient population using GP management software. If the practice has not been using a classification system, then the search will need to be done using free text terms. Searching for diseases using free text is fraught with difficulty not least because many diseases have several names and each of these will need to be searched for individually
- A search of the patient population using GP management software for drugs associated with certain conditions e.g. Glucophage, Diamicon
- Local pharmacies may be able to provide a list of patients on drugs associated with certain conditions
- Local hospital clinics may provide a list of patients attending clinics for the target condition

- Individual patients may assist in setting up disease registers. Consider placing a notice in the waiting room advising patients that the practice is in the process of establishing a disease register and outline the reasons why patients may wish to be included. Patients can then be invited to confirm that they are on the register and that their contact details are correct, in the same way that voters can confirm they are on the electoral register.

In order to maintain an accurate and up to date register, consider the following measures

- Ensure that all GPs and practice nurses in the practice know which conditions you are coding
- Ensure that all GPs and nurses are coding target conditions in the same way
- Ensure that all patients who die or move away from your practice are marked inactive in the practice software as soon as this becomes known
- Put in place a system where discharge letters and consultant reports containing new diagnoses are not missed and the new condition is coded correctly in the patient record
- Put in place a system where prescriptions for certain drugs are not given out unless a matching condition appears in the patient record
e.g. hypoglycaemic agents – Diabetes
inhalers – Asthma / COPD
- Review the register regularly by printing out a list of names and contact details of those linked with certain conditions. If certain names are missing or appear twice on the list, investigate why this is occurring.

Dr. Brian Meade
National GPIT Co-ordinator
MICGP MRCGP MSc (Health Informatics)
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References:

1. Van Bommel J H, Musen MA, *Handbook of Medical Informatics*; Springer
2. ICPC-2 International Classification of Primary care, second edition. Prepared by the International Classification Committee of WONCA. Oxford: Oxford University Press, 1998
3. Soler J, Okkes I, Wood M, Lamberts H; The coming of age of ICPC: celebrating the 21st birthday of the International Classification of Primary Care; *Primary Care Fam. Pract.*, August 1, 2008; 25(4): 312-317
4. History of the development of ICD;
<http://www.who.int/classifications/icd/en/HistoryOfICD.pdf>
5. Benson T, *Principles of Health Interoperability HL7 and SNOMED*; 2009, Springer.
6. Patrick J, Wang Y, Miller G, O'Halloran J *Automatic Mapping ICPC-2 Plus Terms into SNOMED CT Terminologies* Semantic Mining Conference on SNOMED CT Oct 2006, Copenhagen, Denmark.
7. O'Halloran JF, Miller GC and Britt H. Defining chronic conditions for primary care with ICPC-2. *Family Practice* 2004; **21**: 381–386.