

## INTRODUCTION

Since its formation in 1990, the Malta College of Family Doctors has strived to promote and improve the standard of Family Medicine practised in Malta. The concept of keeping good quality medical records is central to achieving this goal. Audit, essential for quality assurance, is almost impossible without medical records, and similarly research is also difficult without data from records to provide information about the population under study. It is not surprising then, that record-keeping was always considered important to allow development of Family Medicine as a discipline.

Unfortunately, only a few doctors outside hospital regularly keep medical records. In the Government Health Centres, record keeping is very rudimentary, and has improved very little over the years. A minority of self-employed family doctors keep medical records, but most of those that do use a manual system of sorts, such as a card-file system. Such systems make data retrieval for analysis laborious, and also prone to errors.

Recently, the availability of database development software has allowed solo practitioners to develop customised electronic medical record solutions. Furthermore, a handful of professional medical software packages have become available on the local market during the last few years. However, there is no standard for data storage and retrieval, and most of these programs are incompatible. In addition, there was no consensus about a classification system to use and most solutions do not incorporate an international classification to allow data to be summarised and analysed.

### *The College's initiative*

Late in 1997, the author brought up the subject of computerised medical records during a College Council meeting. Little had been done till then to promote medical record-keeping in a pro-active way. The introduction of a standardised program allowing coding with an international classification such as ICD-9 or ICD-10 was believed to be a good way to do this. Various Council members had been toying with the idea of developing a system either alone or in small groups, and it was decided to join forces and work together.

In September 1997, the sub-committee to develop computerised medical records was formed. Members included the author, Dr. Anthony Mifsud, Dr. Philip Sciortino, and Dr. Wilfred Galea. A call for applications was made to invite software companies to participate in the project to develop an EMR (electronic medical record) in partnership with the College.

After much effort, nearly a dozen companies applied, with the sub-committee outlining proposals and requirements for such a package during a meeting at St. Philip's Hospital. The Minimum Dataset developed by Hugo Agius Muscat, Anthony Azzopardi and Wilfred Galea was also presented as a guide to developers. A detailed proposal was requested as a basis for future discussions, and one company produced a detailed brief that met all reasonable expectations. The proposed project would allow for the development of a cheap, powerful

application to be used by GPs. A drug prescribing system had already been developed, and could be included. However, unfortunately, the amount of financial support required to sustain the project in the long term was so large as to require substantial sponsorship on an on-going basis. The project seemed unsustainable and was shelved.

So, in April 1998 the sub-committee had not yet defined a viable solution.

### *The International Classification of Primary Care (ICPC)*

Later on that year, the author was invited to act as Maltese representative on the WONCA (World Organisation of Family Doctors) International Classification Committee. Through his activities on this committee, the author became familiar with the ICPC in its second version, published that year by Oxford University Press<sup>1</sup>.

The International Classification of Primary Care is a classification designed for Primary Care, as its name suggests. It has been in development since 1975, with the birth of the International Classification of Health Problems in Primary Care (ICHPPC) by WONCA and the American Hospital Association. In 1979 WONCA and WHO published ICHPPC-2, which was published with inclusion criteria for the rubrics as ICHPPC-2 Defined in 1983. ICPC was first published by WONCA in 1987<sup>2</sup>, and the second edition was published in 1998<sup>1</sup>.



A – general	R – Respiratory
B – Blood, immune system	S – Skin
D – Digestive	T – meTabolic, endocrine
F – Eye (oFthalmic)	U – Urological
H – Ear (Hearing)	W – Women’s health, pregnancy, family planning
K – Circulatory (Kardiovascular)	X – female genital
L – musculoskeletal	Y – male genital
N – Neurological	Z – social problems
P – Psychological	

Table 1: ICPC-2 chapters<sup>1</sup>

Component 1 – Complaints and symptoms
Component 2 – Diagnostic, screening and preventive
Component 3 – Medication, treatment and procedures
Component 4 – Test results
Component 5 – Administrative
Component 6 – Referrals and other reasons for encounter
Component 7 – Diagnostic and disease component (infectious, neoplastic, injuries, congenital anomalies, other)

Table 2: ICPC-2 components<sup>1</sup>

ICPC is a classification for primary care. It has a bi-axial structure, with seventeen letters referring to body systems or areas of health care (Table 1), and two-digit numbers in seven components (Table 2) defining the actual code or rubric.

Rubrics in components 2 to 6 are common to all chapters (e.g. -50 refers to medication, treatment or prescription in any chapter), while rubrics in components 1 and 7 are unique to each chapter (e.g. R71 refers to whooping cough, U71 refers to cystitis, D71 is mumps).

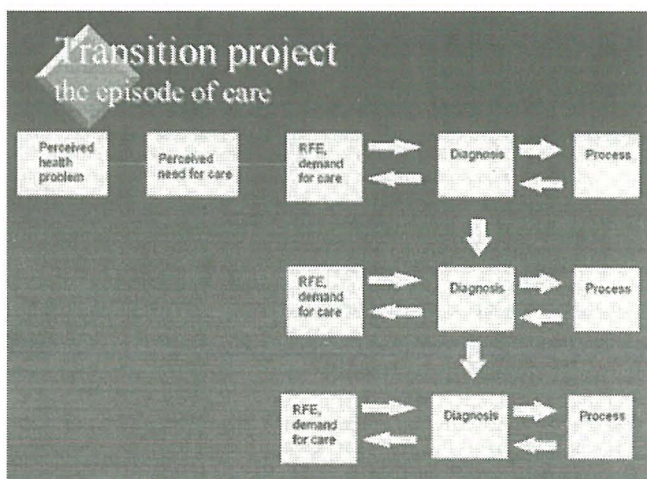


Figure 1 – an episode of care, comprising three encounters with the care provider.

The episode starts with the first reason for encounter (RFE) presented to the care provider at the first encounter. Each of the three encounters comprises a reason for encounter by the patient, a diagnosis made by the provider and which gives the title to the episode, and process of care (diagnostic and therapeutic interventions).

### Episode-oriented epidemiology

The episode of care is defined as a health problem from its first encounter with a health care provider through to the completion of the last encounter. An episode of care is distinct from an episode of illness and from an episode of disease<sup>3</sup>.

The concept of an episode of care is central to the use of ICPC. The unit of an episode of care is a useful validated measure of comprehensiveness and longitudinality of primary care. A diagrammatic representation of an episode is illustrated in figure 1, where one episode of care made up of three encounters is illustrated.

### The College’s choice of Transhis and ICPC-2

Thus, ICPC is an international classification of primary care, which can be used to code for reasons for encounter by the patient, process of care, diagnostic titles of the episode by the doctor, and various investigations, therapeutic interventions and referrals. The concept of an episode of care can be used to measure activity in primary care and the relationships, which will change over time, between the various entities mentioned above.

Moreover, ICPC is easily introduced into an electronic medical record system as the core for coding all elements of the consultation. This obviates the need for repetitive text entry, and allows for storing information in a way that is easily retrieved for analysis. The classification is international, and data can be compared with that from studies done abroad.

During the WICC meeting in Dublin in June 1998, the author met Professor Henk Lamberts and



Dr Inge Okkes from the University of Amsterdam. In fact, they demonstrated just such a computer record system, which they were prepared to allow Maltese GPs to use for the purpose of data collection for comparative studies. They were immediately interested to collaborate with the College to collect this data and jointly publish it as part of international collaborative studies.

The College Council immediately saw this as an opportunity to solve the impasse we had reached in developing our own EMR. This was a much better system which could be modified with less financial resources than those necessary to develop and support a new system. The College invited Prof. Lamberts and Dr. Okkes to Malta to talk to Maltese GPs at a one-day workshop at the Forum Hotel in November 1998. The program was well received, and the College decided to co-operate with the "Transition project" in December 1998.

In March 1999, at the 4th Maltese Medical School Conference, the College was invited to host the first Family Practice session at the Conference. Prof. Lamberts was invited to open the session, and he presented a talk about "General Practice – the key to health care in a new era". This was followed by a presentation by the author and Dr. D. Soler discussing "Presentation of an analysis of 539 consecutive consultations, coded with ICPC, in a Family Doctor's Practice. Do they reflect the core of General Practice?"

The focus was very much on ICPC and episode-oriented epidemiology, and soon after the College was officially recommending the use of ICPC for coding contacts in Primary Care in Malta, and specifically via the use of Transhis<sup>4,5</sup> software. Even in the first call for applications for part-time lecturers in family medicine, candidates were expected to use "... electronic patient records coded with ICPC<sup>6</sup>".

### Transhis

To facilitate the use of ICPC-2, the Maltese Family Doctor has the opportunity to use "Transhis",

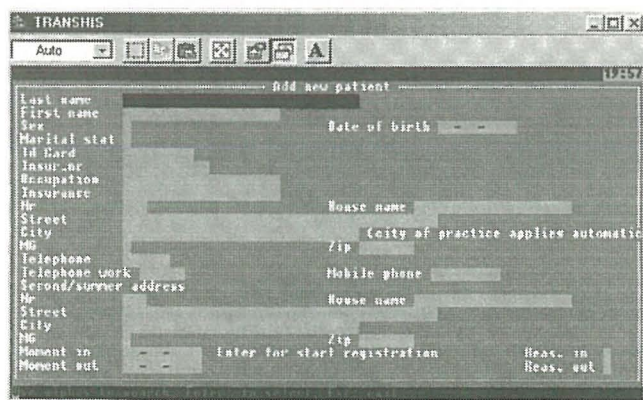


Figure 2 - the patient input screen modified for Maltese users

electronic medical record software designed by the University of Amsterdam Transition Project<sup>4,5</sup>. The Maltese version is one of the first international versions to use the electronic version of ICPC second edition, E-ICPC-2<sup>7</sup>, and is also modified to better suit Maltese Family Medicine. The program is written in DOS Clipper, and will run on low-end machines based on Intel 386 microprocessors, but also on high-end Pentium machines running Windows 95 and 98.

The program is in English, and the forms have been adapted to local characteristics, as can be seen from the screenshots illustrated (Figures 2, and 3)

Data stored for each encounter includes the date, the doctor ID (in group practices), the type of encounter, reason/s for encounter and request/s for intervention by the patient, history of the presenting complaints, interventions, episode title (diagnosis), whether the episode is old or new, diagnostic certainty, and resulting interventions (therapeutic, referrals, investigations, etc.). All coding is taken care of by the program, and terms are entered in free text. The option to also code diagnoses with ICD-10, to add clinical specificity, is also incorporated. The user is allowed to store free text at every stage of the consultation, and separate modules allow for storage of investigation results, parameters (blood pressure, weight, peak flow rate, etc.), and treatment prescribed.

The author has organised a series of small-group meetings to train doctors to use ICPC, and Transhis. Twenty users have been recruited, and the programme allows for many more users to join.

Support for users is presently web based, with a dedicated e-mail listserv servicing the user group. Regularly, updates of the program are received from Holland, and distributed to users. The data collected by users is also forwarded to the University of Amsterdam in anonymised format, with all patient particulars being stripped out of the database. This allows for detailed analysis of the data by our distinguished colleagues abroad.

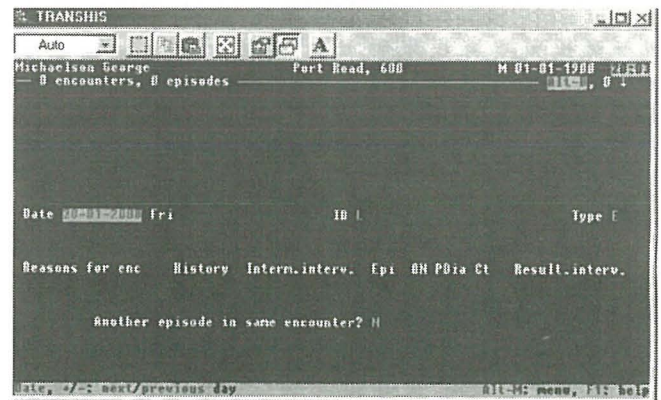


Figure 3 - the patient screen, ready to accept data input



To follow this up, a series of workshops, small-group sessions and practice visits were held in Malta at the end of May and beginning of June in collaboration with Prof. Lamberts and Dr. Okkes. The feedback received was that the data collected was indeed of high quality.

### *Opportunities for research*

The data collected by users allows ongoing research in the field of Family Medicine to be conducted in Malta for the first time. Doctors using the program in their day-to-day practice have access to an excellent medical record that assists them to practice good medicine. Patients are impressed by the doctor's access to up-to-date information about their past history, with problem lists and medication lists available at the touch of a button. A decision support system is included, with data from more than 118,000 encounters in Dutch General Practice<sup>7</sup>.

The data collected is available to primary care researchers, to allow them to collect data and provide evidence to policy-makers that what is being done is valid and cost-effective. This research will allow us to justify more resources being made available to primary care.

Interested parties are invited to write to the author to participate in this important project.

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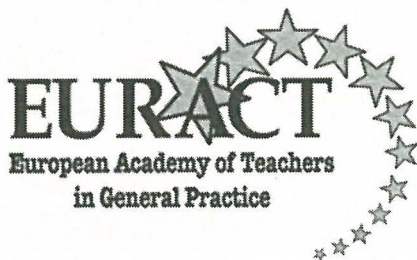
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