

Questions for coding system suppliers

Organisation Profile

Name of Organisation	
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Does your organisation have any links to standard setting bodies?

The Family Medicine Research Centre is the first Collaborating Centre of the World Organisation of Family Doctors (WONCA).

The application for collaborating status was unanimously supported by the Council of the Royal Australian College of General Practitioners (RACGP), the Australian member organisation of WONCA.

The Centre is also the sole distributor of ICPC (in electronic form) in Australia and the Pacific Basin on behalf of WONCA which is responsible for the development of the International Classification of Primary Care (ICPC).

- ◆ The Director and Medical Director are both members of the WONCA International Classification Committee (WICC) which is responsible for the continuing development of ICPC.
 - ◆ The Director is Convenor of the WICC Working Group on Clusters (development of standardised code groupers for ICPC where concepts cross chapters /components) and a member of the WICC Data Working Group (development of standards for analyses and reporting).
 - ◆ The Medical Director is a member of both the WICC Web Working Group and the Drugs Working Group
- ◆ The Medical Director is Chair of the WONCA Asia-Pacific Committee on Classification and the Director is a member.
- ◆ The Medical Director is also Convenor of the RACGP/RNZCGP Working Party on Classification which is “harmonising” data collection standards in general practice between Australia and New Zealand. The Director is a co-opted member of this Working Party.
- ◆ The GP Statistics and Classification Unit (GPSCU) is a Collaborating Unit of the Australian Institute of Health and Welfare (AIHW).
 - ◆ The AIHW is the custodian of the National Health Data Dictionary (NHDD) and the ‘knowledgebase’ which are the repository of data element and codeset standards for the health industry.
 - ◆ The AIHW provides the secretariat for the National Health Information Group and the National Health Data Committee which approve data items for inclusion in the NHDD. The GPSCU operates within the data standards framework of the AIHW.
- ◆ The Medical Director is a member of three Standards Australia Committees concerned with data modelling, medical records and pathology messaging.

Please indicate the number of staff (equivalent full time) in each category below:

- ◆ **Total: 14 FTEs** – including 1 FTE administration and 13 FTEs who are health professionals – one of whom is a recognised GP.

Brief staff profiles for full-time health professionals are attached as Appendix 1.

Health professionals: 13 FTEs

- ◆ Software (Applications development): 1 FTE
- ◆ Education/training/support 1 FTE
- ◆ Epidemiologists / researchers / nosologists 11 FTEs

Coding System Administration and General Information

Name of Coding System	ICPC-2 PLUS
<p>Media in which the system is available eg: books, computer browser, software application</p> <p><i>ICPC-2 PLUS is available as:-</i></p> <ul style="list-style-type: none"> ◆ Electronic data files - a generic format suitable for inclusion in computerised systems. ◆ MS Access 97 computer Browser. ◆ Electronic health Record (EHR) software applications and a prescribing software package (e.g. Synapse Medical Systems, Medical Spectrum Solutions, MIMS prescribing). <p><i>ICPC-2</i> is available as a book or as a computer readable file.</p>	
<p>For what health environments was this system developed (e.g. General Practice, Primary Care, Acute Care)?</p> <ul style="list-style-type: none"> ◆ The International Classification of Primary Care (ICPC) was designed for use by primary care clinicians during the consultation. The World Organisation of Family Doctors (WONCA) considers the term “primary care” to cover general practice, family medicine and other primary health care providers (eg: nurses in third world countries).¹ ◆ ICPC-2 PLUS was designed for use in electronic health records (EHRs) and electronic prescribing packages for general practice in Australia.² <p>A feasibility study that investigated its possible application in community health demonstrated that it could also be satisfactorily applied in this health environment. However some additional work on terms used specifically by community health providers would be required.³</p>	

How was this system developed and by whom?

The International Classification of Primary Care (ICPC)

Background

From the early 1950s it became clear that to improve the quality of primary medical care it was necessary to study the activities of family doctors and their patients' problems and management. While significant data regarding patient problems was being captured in hospitals using the ICD classifications, these data did not relate well to problems being managed in the community. Early attempts to use ICD to capture community based patient problems revealed its significant inability to adequately code basic health problems seen in the community and that it contained a large number of codes unused or seldom used in primary care. In 1958 The Royal College of General Practitioners ascertained that more than one third of the problems managed in primary care could not be satisfactorily classified according to ICD⁴. This argument continues to be supported in more recent data collection studies that report up to 45% of problems presented in general practice remain undefined at the end of the consultation⁵. With this realisation, groups throughout the world began to develop their own systems for primary care coding and classification of morbidity.

Early objectives: *to design an international classification system which would adequately cope with the range of morbidity managed in primary care.*

Development of ICHPPC

In 1972 WONCA recognised the need for one internationally accepted classification for primary care and created a working party to develop a classification based on ICD 8 for use in family practice. The resulting classification the 'International Classification of Health Problems in Primary Care' (ICHPPC) was published by WONCA in 1975 with the assistance of the American Hospital Association⁶.

A revision of ICHPPC prepared by the WONCA International Classification Committee (WICC) in collaboration with WHO, was based on ICD 9. ICHPPC 2 also included revisions and definition criteria for many rubrics. It was published in 1983, with endorsement by WHO⁷. A companion classification, the 'International Classification of Process in Primary Care' (IC-Process-PC) was published by WONCA in 1986. This classification attempted to cover the processes used by practitioners in the provision of primary care. Kerr White, in the introduction to the book suggested that these classifications should, with ICD 10, become part of a 'family' of 'International Classification of Health Problems and Services'⁸.

Later objectives: *To design an international classification system which would better reflect the problems managed in primary care, that would be more reliably applied by primary care providers and that would cover patient reasons for encounter*

Development of ICPC

Throughout the world difficulties were experienced in the reliable application of ICHPPC-2. In parallel there was a growing international interest in a more patient centred (rather than disease centred) approach to primary care and in turn this placed emphasis on the importance of the patient's reasons for encounter. Recognising the need for a reason for encounter classification, the WHO formed a working party which produced a draft in 1978 – the Reasons for Encounter Classification (RFE-C). RFE-C was first tested in the Netherlands⁹ and subsequently modified. The modified RFE-C was further tested in an international field trial with family physicians and nurses in nine countries (including Australia), and approximately 90,000 RFEs being analysed^{10;11}.

Subsequently the WONCA International Classification Committee struggled with the problem of amalgamating the diagnostic sections of ICHPPC, the process codes in IC-Process-PC and the reasons for encounter codes in RFE-C and improving their relevance to family practice. They considered that a fundamental change was needed in the classification structure to make it relevant to people's experience of their health problems. A bottom up rather than "top down" approach was needed for ordering and relating the elements involved in providing an episode of care, which would include expressions employed by both patients and health professionals for manifestations of ill health and disease. An episode structure was chosen to allow the clinician to describe the development of a problem from patient 'reason for encounter', through symptom to disease. ICD 10 is correctly an 'end point' classification for differentiated disease and as such is complementary to an episode classification.

The redeveloped classification was published by WONCA in 1987 as the 'International Classification of Primary Care' (ICPC). While the ICPC was compatible with ICD 9 and a map between the two classifications was included in the book, the departure from the ICD structure led the WHO to withhold its endorsement of the WONCA classification.

The second version of ICPC (ICPC-2) published in 1998 (with the addition of inclusion & exclusion criteria for most rubrics) contains a conversion structure to ICD 10 and a conversion structure for ICD 10 to ICPC-2 (as does the electronic version of the classification – ICPC-2-E).

ICPC-2 PLUS

Background

The Family Medicine Research Centre (then Unit) applied ICPC in the centralised coding of patient reasons for encounter and problems managed in a major National study of morbidity and treatment in general practice¹² and in a popular quality assurance program¹³.

To date the Centre has secondarily coded data from over 1 million paper based encounter records completed by GPs at the time of the encounter. These include descriptions of about 1.5 million problem labels/diagnoses and an equivalent number of patient reasons for encounter. The terms used by GPs in their encounter records were noted by the FMRC and classified according to ICPC to improve inter-coder reliability. These were later consolidated into a list of terms used by GPs in Australia.

In 1993 the FMRC undertook the AUS READ Trial of READ Clinical Codes. Following the governments decision not to license READ codes for Australia the FMRC continued to receive requests from general practice software developers for a general practice classification system.

Objectives: *to design a coding system for Australian general practice electronic health records which would:-*

- ◆ *Reflect the terms used by clinicians in describing the content of patient encounters*
- ◆ *Allow for the wide variance in terminology used by different GPs to describe the same or similar concepts*
- ◆ *Provide for ease of term selection*
- ◆ *Ensure reliable coding and classification of selected terms through automatic electronic code application*
- ◆ *Ensure reliable data output (audit, research) through development of standard concept groups*

Work began on the creation of a database of terms that could be readily incorporated into computerised systems that supported Australian general practice terminology and could be classified to facilitate data extraction and research. Each term added to the system (from lists previously mentioned) was assigned a meaningless consecutive ID code so it could be individually identified. Terms were then classified to an ICPC rubric and an individual extension code (PLUS code) added (see diagram on page 23). This allows storage of the more specific term coded and classified for later retrieval in the medical record.

Each term was then linked to multiple logical **keywords** to facilitate speedy access to a term. A single keyword can lead to multiple concepts and at times, to multiple ICPC rubrics, and these are offered as a pick list. While each term within any one ICPC rubric has a unique code, a clinician may, on different occasions, use different keys to access that term. There is only one ICPC-2 PLUS code per term, irrespective of the number of key words. New keywords and additional terms are added as their necessity is identified.

This linked database of terms and keywords called ICPC PLUS was released in 1995. When WONCA released the ICPC-2 in June 1998, the FMRC released a revised version of the extension codes, ICPC-2 PLUS. This shift from the first to the second version provided an opportunity to undertake a complete review of terms, key words and pick lists. This overhaul resulted in ICPC-2 PLUS being released as a notably refined product.

ICPC-2 PLUS can be applied to the following data elements in an electronic health record or electronic prescription system:

- Patient reasons for encounter
- Presenting symptoms
- Problems managed/diagnoses
- Therapeutic procedures
- Counselling and other clinical services
- Referrals (to specialists & allied health professionals)
- Pathology ordered
- Radiology ordered
- Other tests/investigations ordered
- Administrative procedures (e.g. work certificate)

Where is the coding system in its development cycle?

ICPC-2 PLUS is a mature product. It was first released for beta testing in early 1995, and later that year distributed as Version 1. The release of ICPC-2 by WONCA in 1998 facilitated the parallel release of ICPC-2 PLUS. Throughout both versions the classification has continued to mature in response to the needs of clinicians and researchers.

How is it licensed?

◆ ICPC-2

The FMRC distributes ICPC-2 in electronic form on behalf of WONCA in Australia and the Pacific Basin. WONCA granted the FMRC an exclusive licence for the distribution of ICPC/ICPC-2 (in Australia and the Pacific region) in order to ensure copyright was upheld and to facilitate standardised use of the classification. Evaluations have demonstrated that ICPC alone has insufficient granularity for use in electronic health records. Thus, in reality, the FMRC distributes and licences ICPC-2 as part of the ICPC-2 PLUS package.

The one-off lifetime licence agreement for use of ICPC-2 is incorporated in the ICPC-2 PLUS licence agreement (see below) and licence fees for ICPC-2 are forwarded to WONCA quarterly, in full.

◆ ICPC-2 PLUS

Copyright of ICPC-2 PLUS (the extended vocabulary of terms classified to ICPC-2) is held by the University of Sydney.

Each developer and each end user must sign a licensing agreement, developed by the University's Business Liaison Office. The Director of the FMRC on behalf of the University of Sydney countersigns these.

There are several types of agreements:

◆ Software developers/providers

The Agreement between developers/software suppliers and the University is called a "Services Agreement". This Agreement appoints the Developer as a contractor who has a non-exclusive licence to provide the ICPC-2 PLUS in their software but requires them to ensure that the end user has a licence with the University for the use of ICPC-2 PLUS. The Agreement also requires the developer/provider to ensure the application of ICPC-2 PLUS in their software complies with the Functionality Requirements supplied by the FMRC. A copy of a "Services Agreement" is attached as Appendix 2a.

◆ End users

Currently all developers place their client in contact with the FMRC and payment of the User's licence is made directly to the University. Annual renewal fees are invoiced directly to the end user by the FMRC unless the FMRC is notified that a client is not continuing with the use of ICPC-2 PLUS.

Each end user must sign a licence agreement with the University in order to legally use ICPC-2 PLUS in their software and to receive quarterly updates. The Agreement between the University and the end user of ICPC-2 PLUS is called a "Database licence". A copy is attached as Appendix 2b.

- ◆ **Other licences** for use of ICPC-2 PLUS are supplied in the form of a shrinkwrap.

With each copy of the ICPC-2 PLUS demonstrator and of Launchpad a shrinkwrap licence is supplied. (Appendix 2c and 2d). These ensure that end users are legally obliged not to copy, market or change the PLUS terms or the ICPC classifications. Clients who choose to purchase Launchpad for use in their systems are also required to sign a “Database Licence”.

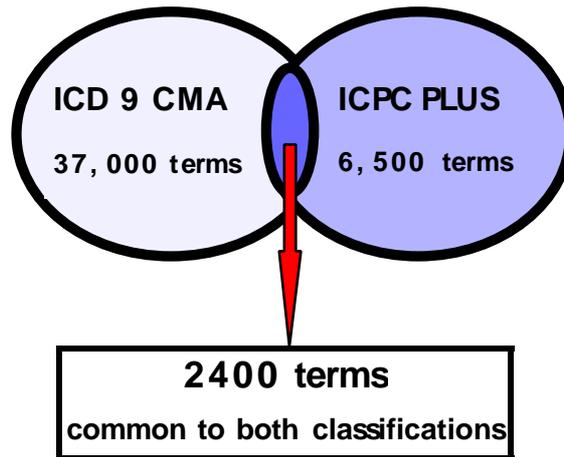
Relationships to other systems? Please indicate structural and developmental relationships.

ICPC-2 PLUS represents a move away from the combined anatomic and aetiology based structure of ICD. For example where ICD includes a separate chapter for neoplasms, one for infections and infestations and another for injuries, such problems are distributed among chapters in ICPC depending on the body system to which they belong. Regrouping of the terms (eg. for all neoplasms in all body systems) can still be undertaken across chapters if required. Australian modifications of ICD are used in most Australian hospitals in the secondary and tertiary sectors. It is a very detailed classification of diseases and has poor coverage of the many ill defined, social and psychological issues managed in primary care settings.

While the diagnosis/disease rubrics in ICPC-2 (and their more detailed PLUS terms) usually have a reasonably close partner in the ICD classification, there are a large number of conditions covered by ICPC-2 and ICPC-2 PLUS for which there is no equivalent code in the ICD. This means that many ill-defined conditions (non-specific), social problems and symptoms do not have a “partner” code in ICD and when mapped must be relegated to such codes as “other diseases of the.... System” etc. There are also many highly specific ICD codes that have no direct “partner” in ICPC-2 PLUS because they are attached to disease descriptions rarely (if ever) used in general practice but which are commonly ascribed in a hospital environment.

Some examples of the relationship between ICPC PLUS and ICD drawn from the ICPC-1 PLUS → ICD 9 CMA map of best fit (at the 4 digit ICD level) are presented below:

ICPC-2 PLUS terms (codes)	ICD 9 CMA code to which these map
34 terms including: cramps; colic; tenderness; epigastric pain; umbilical pain etc.	789.0 = Abdominal pain
27 codes including: chills; shivering; chronic pain; generalised aches/pains; disturbed memory; memory loss; short attention span etc.	780.9 = Other general symptoms
27 ICPC 2 PLUS codes including: CIN 1; CIN 2; CIN NOS; unsatisfactory cervical smear; mild dysplasia; low grade change; etc.	795.0 = Non-specific abnormal papanicolaou smear cervix



Relationship to Read Clinical Codes

In earlier Versions of Read (including Version 2) the classification structure applied to the concepts was very much based on ICD 9. Thus the relationship between ICPC-2 PLUS and Read Version 2 would be similar to that outlined above. Dr Nick Booth created a map from Read 2 to ICPC (1).

In contrast, Read 3 has no inbuilt classification structure, it being a thesaurus rather than a classification. This is why GPs in the UK have difficulty analysing their data and are considering using ICPC-2 as the classification to be applied to Read 3 for analyses of data.

Indicate coding systems to which this system is mapped

SUMMARY

ICPC-1 is mapped to:-

ICPC-1 → ICHPPC-2

ICPC-1 → RCC

ICPC-1 → ICD 9

ICPC-1 is also mapped from:- Read Clinical Codes → ICPC-1

ICPC PLUS is mapped to:-

ICPC PLUS → ICD 9 AM)

ICPC-2 is mapped to:-

ICPC-2 ↔ ICD 10

Indicate coding systems to which this system is already mapped if any

Components 1 and 7 of ICPC-1 are mapped to:-

- ◆ The International Classification of Health Problems in Primary Care (ICHPPC-2)
- ◆ The Classification of Diseases, Problems and Procedures 1984, Royal College of General Practitioners (RCC)
- ◆ The International Classification of Diseases, 9th revision (ICD-9)

ICPC PLUS is mapped to ICD-9 CMA (a one way map of best fit)

ICPC-2 is mapped to ICD 10

Indicate if this coding system is being mapped to, from any other coding systems (name the systems)

- ◆ ICD 10 is already mapped to ICPC-2 (best fit map)
- ◆ ICD 9 is already mapped to ICPC-1
- ◆ Read Clinical Codes (Version 2) are already mapped to ICPC-1.
- ◆ ICPC-2 PLUS is currently scheduled for inclusion into the Unified Medical Language system (UMLS) in January 2000. (US work funded by the US Department of Health & Human Services; work in Australia funded by the National Health Priorities and Quality Branch DHAC).

The inclusion of ICPC-2 PLUS into the UMLS will provide the basis on which to complete a two way best fit map between ICPC-2 and ICPC-2 PLUS and other classifications in the UMLS.

Since the UMLS relies on linkage of concepts rather than direct mapping it will not generate the maps without additional work. Decisions will need to be made in future about which coding/classification systems available in UMLS would usefully be mapped to. For example, a conversion map from Read Clinical Codes (Version 2) to ICPC-2 PLUS may be useful if there are orphan Read 2 systems currently being used in Australian general practices. Mapping to other coding systems using the UMLS concept links as a basis may also be considered if there is reason to do so in the Australian health environment.

Since ICD 10AM is to be included in the UMLS at the same as ICPC-2 and ICPC-2 PLUS the basis for a two way best fit map between the two systems will automatically be available. A proposal was put forward for a two way map of this type between ICD10AM and ICPC-2 PLUS in response to an invitation for submissions regarding a clinical Coding Workshop, from the Health Service Outcomes Branch of the DHAC in October 1998. A mechanism for implementation and application of such a mapped system for the transfer of information between primary and tertiary sectors of the health system was suggested. A copy is attached as Appendix 3 (see pages 6-7).

Describe the process for maintenance of standards regarding use of the coding system

Standardised implementation and ongoing utilisation control and maintenance of ICPC-2 PLUS is achieved through binding contractual license agreements and the application of system regulation mechanisms.

Functionality Requirements and licence agreements

Prior to receiving ICPC-2 PLUS clients are required to complete a contractual agreement. This agreement binds clients to the terms and conditions outlined in the system's functionality requirements. This ensures maintenance of standards through standardised system implementation and utilisation.

Various licence/contractual agreements are available to ensure that all ICPC-2 PLUS products are covered.

- ◆ Developers
- ◆ End Users
- ◆ Launchpad software users
- ◆ Demonstration program

See Appendices 2a – 2d – ICPC-2 PLUS License agreements

Appendix 4 – ICPC-2 PLUS functionality requirements

J Codes – ensuring term set standardisation

Once the classification has been installed it is important that the functionality of the system protects the term set from end user access and manipulation whilst still fulfilling user requirements/needs. An alternative mechanism that gives end users the capability of adding new terms to the term set whilst protecting the installed classification is the 'J codes' mechanism which is outlined in the system's functionality requirements.

J- codes are temporary ICPC-2 PLUS codes. They allow the end user to record a term they cannot locate and would like added to ICPC-2 PLUS (sometimes the requested term is in the system and new keywords need to be added). The J code is end user specific and is used by that end user until a decision about its location within the classification is made and the next version is released. End user's lists of 'J – codes' are forwarded to the classification committee at the FMRC for consideration.

This system ensures that users and developers cannot alter the term structure of the classification, so that the structure and content of ICPC-2 PLUS terms is not compromised.

Estimate the cost for use of coding system (not including software) including estimates for user costs and maintenance

Current licensing fees for ICPC-2 PLUS clients include the payment of a “one off” WONCA fee for the lifelong use of ICPC-2 in addition to an annual ICPC-2 PLUS site licence fee.

◆ **WONCA SITE FEES (once off payment – payable in the initial licensing year)**

A “one off” user fee for the life long use of ICPC-2 has been set by WONCA at the following rates*:

Single User \$100

2-4 User \$150

5+ User \$200

This user fee is payable to the FMRC, who forward the total payment to WONCA. The monies received by WONCA assist the Classification Committee in continuing its research and development work.

◆ **ANNUAL SITE LICENCE FEE FOR ICPC-2 PLUS**

For Australia annual site licence fees are set at the following rates*:

Single User \$100

2-4 User \$150

5+ User \$200

This annual fee covers the provision of quarterly database updates and correspondence, a Users Guide and unlimited access to the classifications help-line and new term suggestion/modification mechanisms.

- ◆ Large group licences can be negotiated
- ◆ No charge is made to the software developer (with licensed end users) and to academics for use in competitive research grants.

*Quoted rates do not incorporate GST.

What is your approach to “public ownership” “public domain” of the coding system

The University of Sydney, the World Organisation of Family Doctors and the Australian Institute of Health and Welfare are concerned that end user cost may become a barrier to the use of ICPC-2 and ICPC-2 PLUS by general practitioners. Therefore, a low or non-existent end user cost is seen as desirable. The GPSCU joint Management Committee (AIHW/University of Sydney) considers the current annual licence fee of \$100-\$200 per practice to be quite reasonable however recognises that GPs see the price as a barrier.

Both organisations regard a license system as a desirable method of ensuring that coding and functionality standards are complied with, particularly by developers but also by end users. This is necessary to ensure uniformity of application and transmission. Thus, a nominal or notional payment may be required in order to make the licence agreement legally binding. Such a licencing agreement system should be as easy and user friendly as possible.

We suggest that a National Licence for ICPC-2 be purchased by the Government through the Australian Institute of Health and Welfare in its roles as National data standards custodian and the WHO Centre for Disease Classification. WONCA has indicated its willingness to negotiate a “one off” perpetual, unlimited National licence for general practice in Australia.

Similarly, we propose that a National licence for ICPC-2-PLUS be granted to the AIHW by the University of Sydney in return for government funding through the AIHW. This funding would be used to support the ongoing maintenance, development, distribution, and developer and end user support of ICPC-2 PLUS by the GPSCU under the joint management of the University and the Institute.

These arrangements would enable the supply of ICPC-2/ICPC-2-PLUS at nominal or notional licence cost to the end user.

These arrangements would parallel those for ICD 10 and create collaborative links with the WHO “family” of classifications through the AIHW.

How is the system currently maintained? Please provide details of the maintenance timetable, contributors, and processes

To ensure continuing consistency with prevailing general practice terminology, ICPC-2 PLUS is revised at 3 monthly intervals using feedback from a number of communication pathways.

◆ Production Timetable

ICPC-2 PLUS is updated on a quarterly basis (January, April, July and October).

◆ ICPC-2 PLUS classification committee

This committee comprises Centre staff from a range of backgrounds and experiences in general practice, research, classification and information management. The committee meets quarterly (prior to the release of each ICPC-2 PLUS version) or as required by the frequency of GP requests.

A/Prof Helena Britt – Director of FMRC

Dr Graeme Miller - Medical Director

Ms Sharon Scahill – Classification and Information Manager

Ms Jan Charles – Senior Researcher

Occasionally, further clarification on classification issues is obtained from Emeritus Professor Charles Bridges-Webb. Prof Bridges-Webb is ex-chair and current member of the WONCA International Classification Committee and he was chiefly responsible for leading the Committee in the major revision from ICPC to ICPC-2.

◆ Maintenance program

Direction for change is initiated through a number of established feedback mechanisms that encompass both a top down and bottom up approach towards classification growth. This schedule ensures continued development of a dynamic and comprehensive classification of terms, that can be readily interpreted by the end user and that are linked to an adequate resource of keywords (term access pathways).

Issues addressed at each release include:-

Addition of new terms to the classification

New codes are presented to the FMRC through a number of different pathways. New terms are generated directly from end users suggestions, through our established communication mechanisms (J codes), through our own development and refinement processes, the data received from our population of GPs participating in the Bettering the Evaluation And Care of Health (BEACH) program, and classification direction from WONCA.

New term suggestions are tallied and relative rates of frequency calculated. All terms suggested are presented to the FMRCs classification committee for discussion.

Modification of term labels for existing ICPC-2 PLUS terms

As with new code suggestions, modification of existing ICPC-2 PLUS term labels originate from end users (J codes), the FMRCs own revisions and longitudinal data collection processes.

Terms suggested for modification are presented to the classification committee for discussion.

Keyword and linkage additions/deletions

Adequate keywords or 'access pathways' to locate a term are just as important as sufficiency of the term set. The addition of new keywords and linkage of keywords to existing terms in order to facilitate ease of pick list term identification is common within releases. Suggestions once again are received from end users, and staff employed at the Centre for general practice classification and coding.

Term location (code) corrections

Direction to move an ICPC-2 PLUS term to a new location is rare and is usually identified by the international ICPC-2 classification committee or the Centres own revision processes.

Maintenance of term set over time

ICPC-2 PLUS follows the philosophy that a code should never be re-used or overwritten. This means that for each ICPC-2 PLUS term its code and unique ID number are never reproduced. Each year a small number of codes need to be moved to a new location or become redundant due to term set development. In these cases the terms status is changed to 'inactive'. To ensure data continuity over time a map is created (inactive term map) that links these inactive terms to an active equivalent in the classification. A file containing these changes is then forwarded to developers to assist their end users with longitudinal data retrieval.

Maintenance of mapping mechanisms

Maps require maintenance each time a code is added, moved or modified to ensure the systems accuracy and completeness. Maps requiring revision include the ICPC-2 PLUS inactive term map and those to external classifications.

Maintenance of ‘Groupers’

It is important to ensure that ICPC-2 PLUS concept groupers continue to reflect the most current terms available in the classification.

As a new term is added to the PLUS term set its applicability to existing ICPC-2 PLUS term Groupers is assessed. Creation of new term Groupers is also considered. When a term is moved to a new code location this change must also be reflected in the Grouper codes (if applicable)

For further information on groupers see – Architecture of the system.

User Guide updates

To ensure the User Guide remains up to date with the latest version of ICPC-2 PLUS a number of version specific appendices are updated and distributed to all users. This includes “Appendix C – New terms” which details new terms and term modifications in the latest release so users can quickly browse changes to the term set.

When a new version of the electronic ICPC-2 PLUS Grouper file is released (six monthly) an updated paper and/or electronic based “Appendix E – Code Groupers” is also distributed.

Correspondence and notices

Each version release is distributed with a cover letter that provides a brief outline of work undertaken within the last 3-month period and /or development schedules for the future.

Additional correspondence is forwarded to end users who supplied the FMRC with ‘new term suggestions’ for terms they could not locate in the current version release.

Discussions – further development and direction

Ideas from Centre staff, system developers and end users are tabled at classification meetings to assist future direction and planning.

◆ Database maintenance

ICPC-2 PLUS is maintained by an Access database that has been specifically designed and developed by the FMRC and the Australian Centre for Corporate Solutions for this purpose. Controlling the maintenance process of the classification through the governing mechanisms of this database ensures data integrity and system functionality is maintained.

Standardisation features of the database include:-

- ◆ Elimination of duplicate ICPC-2 PLUS codes and labels
- ◆ Adherence to field length specifications for terms (30 char) and keywords (10 char)
- ◆ Attachment of valid keywords to terms (i.e. keywords attached from a standardised pick list)
- ◆ Automated term ID number allocation
- ◆ Automated ICPC-2 PLUS code allocation
- ◆ Automated creation of ICPC-2 PLUS CSV files for distribution to users
- ◆ Automated production of various reports including version statistics and term indexes
- ◆ Limitation of new terms to recognised ICPC-2 rubrics
- ◆ Pro-active maintenance of an inactive term map (database locks ensure immediate map to an active term equivalent)
- ◆ Capabilities to map terms to ICD- 9CMA and ICD-10AM

How might Australia's local general practice needs be incorporated into the coding system?

It was clear in the Aus-Read trial conducted by the FMRC that there were linguistic differences in the terminology used by GPs in the UK and that used in Australian general practice.

ICPC-2-PLUS is based on the language of Australian general practitioners and has been designed not only to encompass Australian GP medical linguistics but also to deal effectively with the variance between GPs in the use of medical terminology. While individual GPs use only a few hundred terms, the term set has approximately 7000 terms to cover the inter-GP variance. The term set is updated on a three monthly basis to ensure that it remains relevant to current medical terminology.

What technical support could be available to support this localisation?

The current maintenance program of ICPC-2-PLUS is sufficient to maintain local relevance.

Describe the architecture of the system.

◆ Structure of ICPC-2 PLUS

ICPC and ICPC-2 - has a biaxial structure with 17 chapters on one axis and seven components on the other.

Chapters are based on body systems with additional chapters for general and unspecified problems (concepts that cross three or more body sites), for psychological problems and one for social problems. Each chapter is identified by a single alpha code which is the first character of all rubrics belonging in the chapter

Each chapter is divided into seven components, identified by a range of two digit numeric codes which are not always uniform across chapters.

Component 1 provides rubrics for symptoms and complaints. It drew on the National Ambulatory Medical Care Survey/Reason for Visit Classification (NAMCS/RV) ^{14;15} and on the RFE-C developed by the WHO working party. ¹⁶⁻¹⁸

Component 7, the diagnosis/disease section in each chapter, is based on the ICHPPC-2 and most rubrics are directly comparable. However the psychological and social chapters of ICPC are drawn from problem lists developed by the WHO sponsored Triaxial Classification Group ¹⁹

Within the diagnostic component are five sub groups (not shown in diagram below) which are not numerically uniform across chapters: infectious diseases; neoplasms; injuries; congenital anomalies; and other diseases. Components 1 and 7 in ICPC function independently in each chapter and either can be used to code patient RFEs and the problems managed.

Components 2-6 are common throughout all chapters, each rubric being equally applied to any body system. Components 2 (diagnostic screening, prevention) and 3 (treatment, procedures and medication) are based broadly on the ICD-9 Procedures in Medicine ²⁰ and are heavily influenced by the International Classification of Process in Primary Care (IC-Process-PC). ⁸

The structure of ICPC represents a move away from the combined anatomical and aetiology based structure of ICD. For example, where ICD includes a separate chapter for neoplasms, one for infections and infestations, and another for injuries, such problems are distributed among chapters in ICPC, depending on the body system to which they belong. Regrouping of the rubrics (eg for all neoplasms in all body systems) can still be undertaken across chapters if analysis of totals is required. (See section on Groupers below). A diagrammatic representation of ICPC is displayed below.

Components	Chapters																
	A	B	D	F	H	K	L	N	P	R	S	T	U	W	X	Y	Z
1. Symptoms, complaints																	
2. Diagnostic, screening, prevention																	
3. Treatment, procedures, medication																	
4. Test results																	
5. Administrative																	
6. Other																	
7. Diagnoses, disease																	

A General	L Musculoskeletal	U Urinary
B Blood, blood forming organs	N Neurological	W Pregnancy, family planning
D Digestive	P Psychological	X Female genital
F Eye	R Respiratory	Y Male genital
H Ear	S Skin	Z Social
K Circulatory	T Metabolic, endocrine, nutritional	

Structure of the International Classification of Primary Care (ICPC)

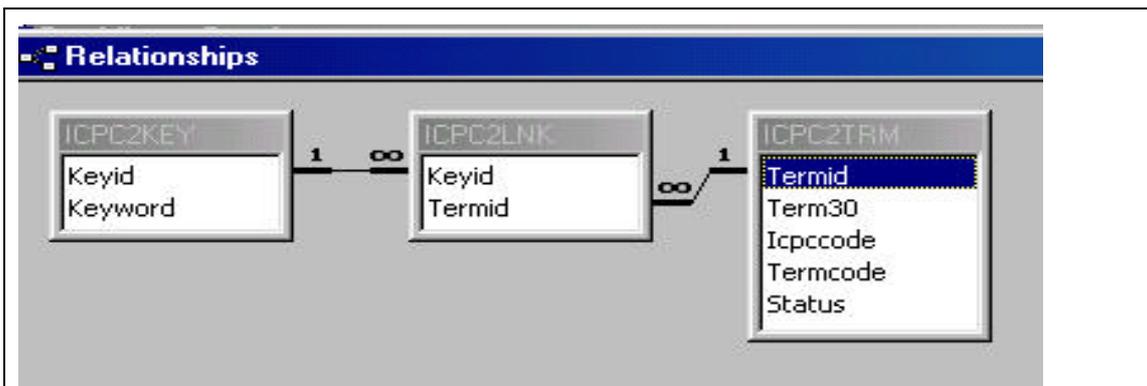
◆ **Structure of ICPC-2 PLUS**

ICPC-2 PLUS has a flat term set structure. Each ICPC-2 PLUS term is allocated a unique numerical code (TermID) which has no inherent meaning. Structure and classification of the term is provided through the ICPC-2 PLUS alphanumeric code (Icpccode and Termcode) to which the TERMID is linked.

For example:- each ICPC-2 PLUS term has a three digit alphanumeric ICPC-2 rubric (e.g. R75 – Sinusitis acure/chronic) which is combined with the three digit term number (e.g. 002). This produces a unique 6 digit alphanumeric ICPC-2 PLUS code (e.g. R75002 – Sinusitis;acute) that is classified within the structure of ICPC-2.

◆ **Architecture and functionality of the system**

Functionality of the classification is achieved through linkage of three main data tables that are supplied to developers and end users for inclusion into their system.



Structure of ICPC-2 PLUS data tables

ICPC2trm

Provides information about ICPC-2 PLUS terms. This includes the term label, ICPC-2 code and term code (which together create a 6 digit ICPC-2 PLUS code) and a unique numeric identifier (TermID) for each term.

ICPC2key

Details ICPC-2 PLUS keywords including the keyword label and a unique identifier for each keyword (KeyID).

ICPC2lnk

Provides the linkage relationship between the above mentioned tables namely the relationship between keywords and terms. This table details keywords that are attached/linked to a particular term.

See Appendix 5 – ICPC-2 PLUS System Architecture.

◆ Functionality of ICPC-2 PLUS

ICPC-2 PLUS has been designed for utilisation at the point of patient contact. It is therefore vital that the system's functionality provides user friendly, timely access to terms. Access to the pick list of related terms the user requires must also be flexible (i.e. allowing multiple approaches) and accurate (only appropriate terms are displayed in the pick list).

ICPC-2 PLUS system functionality utilises the application of keywords (words, word fragments or abbreviations) that describe the concept you are interested in. In software designed to follow the Functionality Requirements, entry of a keyword automatically produces a pick list of related terms in a 'window'. Browsing of this term pick list is then achieved through arrow buttons or mouse control. When the term required is selected the associated ICPC-2 PLUS term is automatically transferred into the records data sheet or 'back end'. The term is saved to the 'front end' record. Thus, to all intents and purposes the end user is unaware of the "coding" process as it is automatically performed by the computer.

See Appendix 4 – ICPC-2 PLUS Functionality Requirements.

◆ **Data analysis and reporting tools**

To complete the automated ‘data in - data out’ cycle of the classification the Centre has developed a number of standardised data extraction formats.

Meaningful data extraction is accomplished through the use of ‘Groupers’. A grouper is a classification of like or similar concepts that hold some clinical significance for the practitioner. Groupers allow data to be extracted at a number of different hierarchical or cross-sectional levels within the classification such as:-

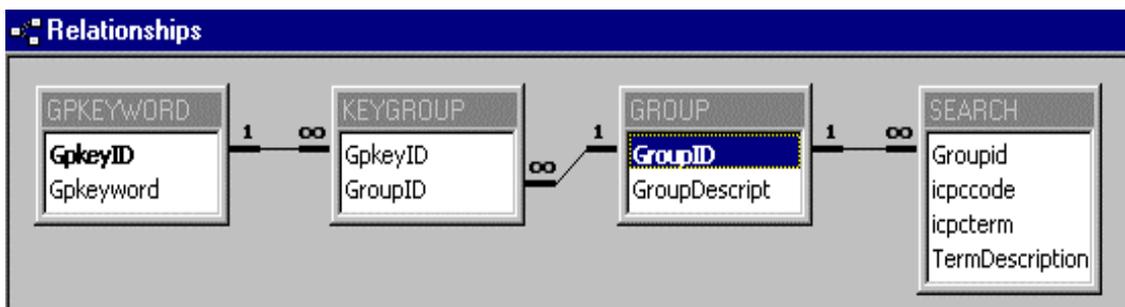
- ◆ Chapter groupers *e.g. all respiratory problems*
- ◆ Component groupers *e.g. all symptoms and complaints for a particular chapter(s)*
- ◆ Broad medical constructs *e.g. STD’s*
- ◆ Patient groups *e.g. all patients treated for an injury over the last week*

See Appendix 6a – ICPC-2 Groupers

Appendix 6b – ICPC-2 PLUS Groupers

◆ **Architecture and functionality of ICPC-2 PLUS groupers**

Functionality of ICPC-2 PLUS groupers is achieved through linkage of 4 main data tables.



Structure of ICPC-2 PLUS grouper data tables

An example of Term Analysis Levels of ICPC-2/ICPC-2 PLUS

See hard copy

GPKEYWORD

This table contains a list of ICPC-2 PLUS keywords that are entered by the end user to access a pick list of related concepts from which a grouper search can be executed.

GROUP

This table lists ICPC-2 PLUS grouper search options (labels) which the user selects for their search e.g. chlamydia, NIDDM

KEYGROUP

This table links the GPKEYWORD table to the GROUP table. It details all keywords that are attached to a specific grouper.

SEARCH

This table contains a comprehensive list of ICPC-2 PLUS terms that are included for each grouper. These terms are the criteria that the grouper searches for in the patient record.

Functionality requirements and process recommendations for the application of ICPC-2 PLUS groupers are supplied to developers.

See Appendix 7 – ICPC-2 PLUS Grouper Functionality Requirements.

What do you consider to be optimal diversity of coding in general practice, more codes or fewer codes?

A “problem/diagnosis” coding system for electronic health records requires sufficient terms to cover the problems encountered in general practice with minimal redundancy. The number of terms should be sufficient to allow individual GPs to use their own preferred terms while being controlled to ensure that pick lists are not too long and that term search time is kept to a minimum.

The term set size of ICPC-2-PLUS has stabilised after coding close to 1.5 million RFEs and 1.5 million patient problems and after feedback from current GP end-users.

The Centre has made a considered decision not to include context (such as ‘family history of’ or ‘past history of’) and attributes (such as chronicity or severity) of problem codes within the term set. We believe these are better handled as separate but linked fields in the EHR. These and other data elements and code sets will be addressed in the Data Model and Core Data Set Project.

**In what computer readable format are the codes available?
(samples may be required)**

Being specifically designed and developed for computerised clinical systems ICPC-2 PLUS is available in a number of different electronic formats. These products are updated on a quarterly basis in the following computer readable file formats.

◆ **Comma delimited text files**

These files are most commonly provided to software developers, clients who would like to view the entire term set or clients who would like to incorporate ICPC-2 PLUS directly into their own (self developed) clinical system.

Updates to software products such as Launchpad are provided as a comma-delimited text file that is automatically up-loaded into the software through the systems update function.

◆ **ACCESS MDB files**

An Access 97 demonstration program of ICPC-2 PLUS is available to clients who have Microsoft Access 97. This program provides immediate installation and active term searching (through both a keyword and ICPC-2 rubric heading search). Licensing information, classification structure and analysis features are also detailed.

What computer readable standards and rules of the coding system are available (samples may be required)

Licensed end users are supplied with a hard copy Users Guide that includes sections on using ICPC-2 PLUS, term structure, acronyms, keyword usage and frequently asked GP questions.

A computer readable format of the Users Guide is also available to software houses so they can provide on-line access to their clients.

A system help file is available on the Launchpad software program. This file outlines the system's functionality as well as providing hints on accessing terms, and areas to refer to for more information in the Users Guide.

Future direction and development of ICPC-2 PLUS has outlined further refinement and expansion of standards and computer readable support mechanisms. (see section – short/medium/long term plans for the coding system)

Is a coding engine available? Please indicate how it works in the software section

ICPC-2 PLUS was designed to allow incorporation into many different systems. As there are already numerous types of EHRs available, based on a number of different platforms it is not the current intention of the FMRC to produce software or a “bolt on” coding engine for distribution.

Current ICPC-2 PLUS coding engines include:**◆ *Launchpad***

This product is used by the DVA as a coding engine across a windows/cobol mainframe interface. Several other groups are also using this product as a stand alone system e.g. Illawarra Community Health.

◆ *Secondary coding – BEACH*

The FMRC has developed its own ICPC-2 PLUS coding engine to facilitate term location in the national BEACH program (an Access 97 database).

◆ *Other coding engines*

A number of ICPC-2 PLUS coding engines have been developed by licensed software houses for inclusion in their own system. These search mechanisms have been created in line with the instructions detailed in the classifications’ Functionality Requirements.

What are the short / medium / long term development plans for this coding system?

- *Continued maintenance, regular update and distribution of ICPC-2 PLUS in response to identified need for additional terms and key words from primary end users and from the secondary coding of forms (100,000 per year) from the BEACH program*
- *Continued development of the grouper file (clusters) and regular release of updates*
- *Further education of software developers to assist them in understanding the need for utilisation of the grouper file and the development of analytical tools to maximise system functionality.*

Further development:

1. Development and release of a “natural language” term file:

- ◆ Currently the structure of each ICPC-2 term is hierarchical. This facilitates formation of the tabular pick lists in alphabetical order and this in turn assists speedy location of the required term. For example: Osteoarthritis of the cervical spine is presented in the pick list as *osteoarthritis;spine;cervical*. Endogenous depression is in the pick list as *depression;endogenous*. This structure also facilitates key word access to groups of concepts so the clinician can easily see the choice of available terms associated with the concept.
- ◆ Some users have requested that the ICPC-2 PLUS system allow storage of the selected term in natural language in the medical record. They also wish to utilise this natural language term in referral letters, etc..

Work required:

- Manual alteration of each of the PLUS terms into natural language terms
- Creation of a database of these natural language terms linked through their ICPC-2 PLUS code to the current hierarchical ICPC-2 PLUS term
- Preparation of educational material and revision of Functionality Requirements to include the requirement for systems to provide the facility to save the selected ICPC-term in its natural language form in the medical record and to utilise these terms in health summaries, referral letters and other external correspondence.
- Release of the new file in the next three month release
- Continued update of natural language files with continued development of ICPC-2 PLUS.

2. Mapping

2.1 Complete a two way map of best fit between ICPC-2 PLUS and ICD 10AM

This will facilitate data transfer between general practice and the tertiary sector.

Work required:

- ◆ Using the UMLS concept linkages as a basis, develop a map of best fit from ICPC-2 PLUS to ICD 10 AM.
- ◆ Using the UMLS concept linkages as a basis, development of a best fit map from ICD-10AM to ICPC-2 PLUS. National Centre for Classification in Health (NCCH) should be responsible for this side of the map because the Centre holds considerable knowledge of the ICD classification systems.
- ◆ Reconcile the two maps - identify areas of disagreement; using both NCCH and FMRC expertise come to agreement for these contentious code maps.
- ◆ Release final two way map as public domain
- ◆ Continue updates of maps (both ways) in line with additions of PLUS terms and release updates as required.

2.2 Read 2 → ICPC-2 PLUS map:

Utilising the UMLS concept links finalise a map of Read 2 to ICPC-2 PLUS. This would enable translation of historic data in orphan systems left from the Read test practices. However, depending on the number of practices involved it may be more efficient to obtain a list from each practice of the Read 2 codes used at least once in their records and map only these to ICPC-2 PLUS. This would allow these practices to update their historic records once only but would not require a full Read 2 → ICPC-2 PLUS map.

2.3 Quality assurance of maps from other systems currently being used in general practice in Australia.

A one off mapping of other coding systems currently being used in EHRs and electronic prescribing systems, to ICPC-2 PLUS would be required to update historical data to the selected preferred system. The coding system providers should undertake such mapping but these would require quality assurance by the ICPC-2 PLUS team.

3. Further development of specific code sets.

3.1 Pathology coding.

A proposal for the further development of a pathology term set, classified according to ICPC-2 and coded in ICPC-2 PLUS, mapped to the LOINC pathology codes (used by Pathologists to describe the test undertaken in response to a GPs request) and mapped to the MBS has been developed with funding from the Pathology Branch of the DHAC. It has been submitted to the Pathology Strategic Development Sub-Committee for consideration. However a decision about its funding awaits the decision of the Coding Jury on a preferred coding and classification system for Australian General Practice. The proposal is provided as Appendix 8.

3.2 Imaging coding.

There is also a need to review the terms used by GPs in the ordering of imaging. An expression of interest in the development of a term set in this area, classified to ICPC-2 and coded to ICPC-2 PLUS was submitted to the Diagnostics and Technology Branch earlier in 1999. Unfortunately time has not permitted the development of a full application for the Department's final consideration. The proposal is provided as Appendix 9.

4. Improving update procedures

Currently the three month updates of ICPC-2 PLUS are sent to the software providers either electronically or on disk (as required by the providers) where the update is incorporated into the software and distributed to the clients. This three-month cycle aligns with the dates of other cyclic updates (e.g: MIMS).

We suggest that more reliable update mechanisms could be designed which rely on electronic data alerts and automatic connection to our Web site for automatic update of files. However the co-operation of the software providers in altering system design will be required to introduce this process.

5. Education

5.1 Getting the data INTO the record:

Currently end users are provided with a User Guide on paper (copy enclosed) and in electronic form. The electronic format contains HTML links which makes it easier for the end user to find the section of interest within the document. The User Guide includes hints about how to utilise the key words to access terms, offers guidance about what do when a desired term cannot be located, describes the use of J codes etc.

We propose to develop a more graphic presentation to assist beginners in use of the key words, and pick lists. This could be made accessible through our Web site.

5.2 Getting the data OUT of the records

Data retrieval will be the responsibility of the individual practitioner or practice, irrespective of for whom the data are drawn or the purpose for which the data are retrieved.

- ◆ Individual practitioners or practices may wish to draw the data from their records for the purposes of audit, recall, or research.
- ◆ Divisions may wish to draw data from multiple practices to gain a picture of the population under management in the Division, the problems being managed or the treatments provided.
- ◆ The State Based Organisations (SBOs) may wish to collate data from multiple Divisions to gain a picture of what is happening in general practice in the State. The Australian Divisions of General Practice (ADGP) may wish to collate the State based data.
- ◆ The level of detail required by the clinician in the medical record may be far greater than that required in each step of this data collation process.

Education of systems developers

The primary target for education about data output will be the systems developers themselves. Well designed software can facilitate reliable data retrieval by the practitioner or practice but the designers must first have an understanding of the structure of the classification system; the multiple levels of possible analysis and the use of code groupers.

We suggest that we design and offer to general practice software developers a training program in coding and classification using ICPC-2 PLUS.

Education of the end users

Currently the User Guide gives less guidance in the area of analysis than it does on data input.

We suggest that this section needs to be expanded to provide a more complete paper and electronic based guidance system (connected to a Help file) in analysis of data with ICPC-2 PLUS.

However, standardised application of the analytical structures available together with development of minimum data set reports on a selected topic will decrease the need for high levels of training of individual GPs.

We also suggest that web based education on data retrieval and analyses could be prepared and made available on our Web site.

5.3 Collating and reporting on grouped data (Divisions, SBOs, ADGP)

Those responsible for collation of grouped data from multiple practices will require an understanding of the classification system and the many options available for group concept level retrieval. This will ensure that the data specified for retrieval by individuals is clear and that there is no confusion about the codes to be included in the concept under investigation.

We suggest that personnel in the SBOs could be trained in the application of ICPC-2 PLUS for retrieval and in turn these persons could offer training at Divisional level (i.e. train the trainer).

5.4 User telephone support

We suggest that a practical workshop for SBOs on terming with ICPC would also provide some personnel who could act as the initial inquiry level for practitioners who have questions about the use of ICPC-2 PLUS at either the data in, or the data out stage. More complex questions could be referred to the FMRC.

5.5 General Practice Registrars:

Clinicians of the future will rely more heavily on electronic data and its electronic transfer in their provision of clinical care.

We propose that a brief course on ICPC-2 PLUS should be included in the RACGP Training Program.

5.6 Undergraduate Medical students

With the increasing acceptance of the need for the application of Evidence Based Medicine (EBM) medical practitioners will require an understanding of methods of data collection and analysis from general practice as well as from the other clinical disciplines. Further, with increased primary entry of clinical information in the tertiary sector, clinicians will require an understanding of ICD. A knowledge of ICPC-2 PLUS would also assist the clinician when in receipt of information from general practice, even where an ICD code is also provided with the problem label.

Efforts should be made to institute a basic training program in coding, classification, ICD 10AM and ICPC –2 PLUS in undergraduate medical courses throughout Australia..

5.7 Health Information Management: undergraduate level

There will be an increasing need for trained staff to handle data across the general practice sector. Currently Health Information Management students are trained in ICD 10 AM. With the exception of the University of Sydney 1999 3rd year students, the inclusion of training in ICPC is rare in HIM courses.

We suggest that every effort should be made to include training in ICPC-2 and ICPC-2 PLUS in all HIM undergraduate courses to ensure there a personnel available who have an understanding of both the tertiary and primary care based classification systems.

Where does your product fit with the National Health Information Model and ICD-10-AM used for acute care coding ?

- ICPC-2 and ICPC-2-PLUS are classifications related to component health and well-being data elements in the National Health Information Model Version 2.0 published in the National Health Data Dictionary Version 8.0, 1999. While many of the data elements that are needed in general practice electronic health records, (including some which can be coded in ICPC-2-PLUS) are not currently in the NHDD, these will be added as part of the GP Data Model project. These data elements will map to the component health and well-being entities in the National Model.
- ICPC is listed as a classification system to classify diagnostic information for the data element concept “Diagnosis” in the NHDD. This is the first data element in the physical well-being section of health status in the NHIM.
- ICPC-1-PLUS was mapped to ICD-9-CMA by the FMRC in a project funded by the Department of Veterans’ Affairs.
- ICPC-2-PLUS and ICD-10-AM are currently being included in UMLS in two projects funded by the National Health Priorities and Quality Branch. This will provide the first step to a two way concept map between ICPC-2-PLUS and ICD-10-AM. The UMLS project will be completed by the end of the first quarter of 2000.

Coding System Statistics

All statistics are based on the October 1999 version of ICPC-2 PLUS.

Number of terms (codes)

6,618 active terms
3,695 active keywords
19,919 links between terms and keywords

Number of synonyms

In the absence of a national preferred term set the FMRC has continued to develop ICPC-2 PLUS with a bottom up approach to term creation. This process has resulted in a product that caters extremely well for differences in general practice terminology.

One of the many difficulties in creating synonym sets is that many terms are not quite synonymous – there are hypernyms (= a little more than) and hyponyms (= a little less than) throughout general practice terminology.

As ICPC-2 PLUS does not classify terms as synonyms (i.e. synonyms are given a unique term and code) it is difficult to ascertain the number of synonyms contained in the classification. We can state however that ICPC-2 PLUS does identify and classify most recognisable synonyms used by GPs.

Scope of granularity / number of mapping levels

ICPC-2 PLUS has a single level hierarchy. The first level is provided by the ICPC-2 rubric (e.g. H75 – neoplasms of the ear) and the second level by the specificity of the ICPC-2 PLUS term located within a particular rubric (e.g. H75 contains ICPC-2 PLUS terms that detail benign, malignant and uncertain nature neoplasms, carcinomas, mixed parotid tumours, and unspecified neoplasms of the ear).

In a broader sense however the classification can be further grouped by ICPC-2 chapter or component (see Diagram on page 23). ICPC-2 PLUS groupers provide another alternative for the collection of similar concepts at a broad or specific level (Appendix 6b).

Number of symptom terms

Clarification of the true definition of a “symptom” term causes some difficulties. It should be recognised that symptom terms are often a combination of reasons for encounter (RFE), complaints and undifferentiated problem labels.

The number of symptoms (including RFEs, complaints and undifferentiated problems) in ICPC-2 PLUS is 1182 terms (Component 1 – Symptoms and complaints).

Number of diagnosis terms

It is important to recognise that problem management in general practice may not have a defined diagnostic label. The problem may, by necessity be labelled in terms of a symptom or undifferentiated disease state (that may not be equivalent to the definition of disease as defined by other classifications such as ICD), or an administrative process (e.g. medical certificate), or a procedure (e.g. general checkup)

ICPC-2 PLUS currently incorporates 2839 diagnosis or problem managed terms. (Component 7 – Diagnosis and disease. including diagnoses of an infectious, neoplastic, injury, congenital and other category).

Number of treatment / consultation terms

ICPC-2 PLUS process codes encompass a range of treatment terms such as, diagnostic and preventative investigations, medical therapies such as prescriptions, incision, aspiration and dressings, results of tests and investigations, administrative procedures and referrals.

The number of treatment terms currently available in ICPC-2 PLUS is 1897. This figure was calculated by combining codes available in Components 2, 3, 4, 5 and 6.

Number of cause of injury terms

Generally, cause of injury terms (place and process of injury) are viewed by WONCA and the FMRC as an additional term or text qualifier that can be applied to terms contained in the classification.

ICPC-2 PLUS however, does include a number of cause of injury terms such as motor vehicle accidents, chemical poisoning, plant, food and animal poisoning etc. It is recognised that such terms do not provide the level of specificity provided by code sets specifically designed for this purpose.

Classifications or term sets that have been specifically developed to classify these data elements such as ICD 10 AM could perhaps be considered for use for this data element.

Number or structure of qualifiers

The Centre has made a considered decision not to include context (such as ‘family history of’ or ‘past history of’) and attributes (such as chronically or severity) of problem codes within the classification. We believe these are better handled as separate but linked fields in the EHR. These and other data elements and code sets will be addressed in the Data Model and Core Data Set Project.

Current Users

Where is this coding system being used?

◆ *ICPC/ICPC-2*

ICPC (1) has been translated into more than 35 languages and is being used to classify patient reasons for encounter and/or problems managed in general practice in many countries. Published papers demonstrate its use in Norway,²¹ Denmark²², Canada^{23;24}, the Netherlands²⁵⁻²⁷ and the United States^{24;28;29}.

French speaking GPs from Belgium and France have formed a group called the CISP (ICPC in French) Club. They are developing an extended vocabulary of French terms classified in ICPC for EHRs and utilising them in their practices^{30;31}.

ICPC-2 is currently being translated into many languages.

◆ *ICPC-2 PLUS*

ICPC-2 PLUS is currently implemented in a range of primary care clinical systems and data collection mechanisms across all Australian states.

In what health environments is this system being used?

Within Australia ICPC-2 PLUS is currently implemented across a number of primary health care settings.

◆ General Practice - clinical

ICPC-2 PLUS has been adopted by general practice in a mix of both rural and urban settings ranging from solo to large practices with up to 9 GPs. Presently the majority of our general practice clients are based in Queensland however our user base is rapidly expanding in NSW and Western Australia. We also have a small user base in Victoria and Tasmania. The Royal Flying Doctor Service (RFDS) is also using ICPC-2 PLUS to classify all clinical information for their patient contacts.

◆ General Practice – research

For secondary coding purposes ICPC-2 PLUS is currently utilised in the national BEACH data collection program for general practice (100,000 records per year), and various coordinated care/after hours trials in Sydney, Brisbane, Adelaide Victoria and Tasmania. The Commonwealth Department of Veterans Affairs is also utilising ICPC-2 PLUS in the diagnostic section of its health care plan.

◆ Developers

ICPC-2 PLUS is currently installed in the clinical systems/prescribing packages in the following software companies:- MIMS, Family Doctors Computers, Medical Spectrum Solutions, Synapse. A number of other developers who are still in beta testing phase also hold developers licenses.

◆ Community Health

Community health has also adopted the use of ICPC-2 PLUS in the Illawarra region and various Northern Territory health centres.

◆ Aboriginal Health

ICPC-2 PLUS is used by Northern Territory Health to classify information in Aboriginal Medical Services.

Evaluations performed

Please provide details of any independent evaluations of this classification system to which we may refer.

Evaluation reports are supplied in the form of citations. Where available, copies of the papers/reports are supplied in Appendix 10.

Evaluations by the Family Medicine Research Centre, where these have been published in peer reviewed journals, have been included.

◆ **EVALUATIONS of ICPC (or ICPC subsets such as RFE-C):**

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5. Britt H, Meza RA, Del Mar C. Methodology of morbidity and treatment data collection in general practice in Australia: a comparison of two methods. *Fam.Pract.* 1996;13 :462-7.
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14. Lamberts, H., Meads, S., and Wood, M. Results of the International Field Trial with the reason for encounter classification (RFEC). 1984. Paper for international working conference of IMIA, Ottawa.
15. Lussier YA, Bourque M. Comparing SNOMED and ICPC retrieval accuracies using relational database models. *Proc.AMIA.Annu.Fall.Symp.* 1997;:514-8:514-8.
16. Van der Horst F, Metsemakers JF, Vissers F, Saenger G, De Geus C. The Reason-for-Encounter mode of the ICPC: reliable, adequate and feasible. *Scand.J.Prim.Health Care* 1989;7:99.
17. Wood M, Lamberts H, Meijer JS, Hofmans-Okkes IM. The conversion between ICPC and ICD-10. Requirements for a family of classification systems in the next decade. *Fam.Pract.* 1992;9:340-8.

◆ **EVALUATIONS of ICPC PLUS and other systems using local term sets:**

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Software**1. LAUNCHPAD**

<p>Type of coding software:</p> <p>Pick-list (list of codes presented for the user to select from)</p> <p>Browser (automatic look-up of the coding system)</p> <p>Hierarchical decision tree (questions asked and code determined by user selected answers)</p> <p>Automatic Coder (text entered and codes allocated from the text)</p> <p>Combination/Other - please define</p>	<p>LAUNCHPAD</p> <p>Yes</p> <p>Yes</p> <p>No</p> <p>No</p> <p>Term selection automatically assigns the associated ICPC-2 PLUS term to the record. To all intents and purposes the user is unaware of the coding process.</p>
<p>If possible please provide a copy of the software system, or details of a contact from whom we can obtain specific details about this system</p>	<p>See attached Disk Set ICPC-2 PLUS Products. – <i>ICPC-2 PLUS Launchpad</i></p>
<p>Where is this product being used?</p>	<p>Department of Physiotherapy WA</p> <p>Department of Veterans Affairs (DVA)</p> <p>Health Information Management Unit NT</p> <p>Wollongong Community Health Centre</p> <p>Department of General Practice (ANBP2) SA</p> <p>Hunter Urban Division of General Practice</p> <p>West VIC Division of General Practice</p> <p>Tasmanian - After hours patient medical care trial (AHPMCT)</p> <p>Brisbane Division of General Practice Teamcare trial</p>

What platform does it run on?	A windows operating system.
What language is it written in?	Fox Pro.
Where is the product in its development / product cycle?	A mature product that has completed its preliminary development cycle.
How is it the system licensed? (please address issues such as annual cost vs. ongoing costs)	<p>The product is licensed through the University of Sydney who holds the copyright to the program.</p> <p><i>See Appendix 2c – ICPC-2 PLUS Launchpad licence (shrinkwrap).</i></p> <p>Initial costs:</p> <ul style="list-style-type: none"> ◆ Cost of software program (see below). ◆ One-off WONCA site fee for the lifelong use of ICPC-2 and an annual ICPC-2 PLUS site cost fee for the provision of ICPC-2 PLUS data updates (for one year). <p>Both these rates are dependant of the number of users that the site has (see page 12 – ICPC-2 PLUS licencing fee schedule).</p> <p>Ongoing fees (annual renewal):</p> <ul style="list-style-type: none"> ◆ Renewal of the ICPC-2 PLUS site licence fee is based on the number of users utilising system.
Please provide an indicative price list for the software, including license to use the coding system.	<p>Software pricing:</p> <p>Cost of Launchpad program software \$200 (one off).</p> <p>See abovementioned ‘initial and ongoing cost’ pricing schedules for the purchase of ICPC-2 PLUS data updates.</p>

2. ICPC-2 PLUS DEMONSTRATOR

<p><i>Type of coding software:</i></p> <p>Pick-list (list of codes presented for the user to select from)</p> <p>Browser (automatic look-up of the coding system)</p> <p>Hierarchical decision tree (questions asked and code determined by user selected answers)</p> <p>Automatic Coder (text entered and codes allocated from the text)</p> <p>Combination/Other - please define</p>	<p>ICPC-2 PLUS DEMONSTRATION PROGRAM</p> <p>Yes</p> <p>Yes</p> <p>No</p> <p>No</p> <p>Term selection automatically assigns the associated ICPC-2 PLUS term to the record. To all intents and purposes the user is unaware of the coding process.</p>
<p>If possible please provide a copy of the software system, or details of a contact from whom we can obtain specific details about this system</p>	<p>See attached CD ICPC-2 PLUS Products. – <i>ICPC-2 PLUS Demonstrator.</i></p>
<p>Where is this product being used?</p>	<p>This product is forwarded to prospective clients who are not familiar with the classifications term set, structure or functionality.</p>
<p>What platform does it run on?</p>	<p>Windows 95/98/NT.</p>
<p>What language is it written in?</p>	<p>Access 97.</p>
<p>Where is the product in its development / product cycle?</p>	<p>A mature product that has completed its preliminary development phase.</p>
<p>How is it the system licensed? (please address issues such as annual cost vs. ongoing costs)</p>	<p>The product is licensed through the University of Sydney who holds the copyright to the program.</p> <p>See Appendix 2d –ICPC-2 PLUS Demonstrator licence (shrinkwrap).</p> <p>Costs This program is free of charge and only used for demonstration purposes. Licences for this program are to protect copyright and system replication.</p>
<p>Please provide an indicative price list for the software, including license to use the coding system.</p>	<p>The ICPC-2 PLUS software program is provided free of charge as it is distributed for demonstration purposes only.</p>

3. MEDICAL SPECTRUM SOLUTIONS

<p>Type of coding software: Pick-list (list of codes presented for the user to select from) Browser (automatic look-up of the coding system) Hierarchical decision tree (questions asked and code determined by user selected answers) Automatic Coder (text entered and codes allocated from the text) Combination/Other - please define</p>	<p>The user enters a 'term' that may be a word, description (full or part thereof) to describe the issue to be coded. The application will then determine and return a suitable short pick-list with possible codes from which the user can select the most appropriate.</p>
<p>If possible please provide a copy of the software system, or details of a contact from whom we can obtain specific details about this system</p>	<p>Please refer to Ian Threlfall, Medical Spectrum Pty Ltd. 07-3801 0333.</p>
<p>Where is this product being used?</p>	<p>Approx 60 General Practice Surgeries have elected to take the ICPC option.</p>
<p>What platform does it run on?</p>	<p>Windows 95/98/NT.</p>
<p>What language is it written in?</p>	<p>Microsoft Foxpro.</p>
<p>Where is the product in its development / product cycle?</p>	<p>Mature but on-going development is occurring. 500 sites nationally.</p>
<p>How is it the system licensed? (please address issues such as annual cost vs. ongoing costs)</p>	<p>The ICPC coding engine is offered as an option within the integrated Medical Spectrum Clinical and Practice Management application. There is a one-time licence fee and ongoing support & upgrade fees.</p>
<p>Please provide an indicative price list for the software, including license to use the coding system.</p>	<p>Licensing of the coding engine is between the surgery and ICPC/FMRC. Medical Spectrum is available from \$500 per licence.</p>

4. MIMS SCRIPT ELECTRONIC PRESCRIBING

Type of coding software:	MIMS Script Electronic Prescribing
Pick-list (list of codes presented for the user to select from)	Yes
Browser (automatic look-up of the coding system)	No
Hierarchical decision tree (questions asked and code determined by user selected answers)	No
Automatic Coder (text entered and codes allocated from the text)	No
Combination/Other - please define	No
If possible please provide a copy of the software system, or details of a contact from whom we can obtain specific details about this system	We can send a CD if required Dr J Ainge or Mark Francis MIMS Data Systems 02 6282 8511
Where is this product being used?	GPs; Specialists; Nursing Homes; Hospitals.
What platform does it run on?	Windows 16/32 bit.
What language is it written in?	Delphi (primarily).
Where is the product in its development / product cycle?	Recently released.
How is it the system licensed? (please address issues such as annual cost vs. ongoing costs)	See ICPC-2 PLUS costing structure.
Please provide an indicative price list for the software, including license to use the coding system.	\$300pa with ads \$1000pa with no ads

5. NORTHERN TERRITORY HEALTH

<p><i>Type of coding software:</i></p> <p>1. Pick-list (list of codes presented for the user to select from)</p> <p>2. Browser (automatic look-up of the coding system)</p> <p>3. Hierarchical decision tree (questions asked and code determined by user selected answers)</p> <p>4. Automatic Coder (text entered and codes allocated from the text)</p> <p>5. Combination/Other - please define</p>	<p>Yes</p> <p>Yes</p> <p>No</p> <p>Yes</p> <p>No</p>
<p>If possible please provide a copy of the software system, or details of a contact from whom we can obtain specific details about this system</p>	<p>Dr. Jo Wright (08) 8999 2986 Dr. Sam Heard (08) 8922 7937</p>
<p>Where is this product being used?</p>	<p>Coordinated Care Trial sites: Tiwi Islands, Katherine West. Ultimately will be used in "all" remote area coordinated care sites.</p>
<p>What platform does it run on?</p>	<p>Access front-end/Oracle back-end.</p>
<p>What language is it written in?</p>	<p>Access/Oracle.</p>
<p>Where is the product in its development / product cycle?</p>	<p>1. Coordinated Care Trial Information System (CCTIS) <i>Production.</i></p> <p>2. Rural Health Information System (RHIS): <i>Development.</i></p>
<p>How is it the system licensed? (please address issues such as annual cost vs. ongoing costs)</p>	<p>ICPC-2 PLUS: Corporate licence, \$500 for 5 sites.</p>
<p>Please provide an indicative price list for the software, including license to use the coding system.</p>	<p>The two systems above are covered by an annual corporate licence fee for the Oracle component.</p>

6. ROYAL FLYING DOCTOR SERVICE

<p><i>Type of coding software:</i></p> <p>Pick-list (list of codes presented for the user to select from)</p> <p>Browser (automatic look-up of the coding system)</p> <p>Hierarchical decision tree (questions asked and code determined by user selected answers)</p> <p>Automatic Coder (text entered and codes allocated from the text)</p> <p>Combination/Other - please define</p>	<p>Microsoft Access 97 using a lookup table system to find the correct term.</p>
<p>If possible please provide a copy of the software system, or details of a contact from whom we can obtain specific details about this system</p>	<p>Unable to supply copy of system due copyright - our programmer David Deere 08 8398 0324 can discuss the system.</p>
<p>Where is this product being used?</p>	<p>Location Broken Hill</p>
<p>What platform does it run on?</p>	<p>Windows 95 across a Novell network.</p>
<p>What language is it written in?</p>	<p>Using Microsoft Access 97.</p>
<p>Where is the product in its development / product cycle?</p>	<p>Has been in use for two years.</p>
<p>How is it the system licensed? (please address issues such as annual cost vs. ongoing costs)</p>	<p>The ICPC system is licensed to the Royal Flying Doctor Service at an annual cost of \$100.00.</p>
<p>Please provide an indicative price list for the software, including license to use the coding system.</p>	<p>Unable to give indication as coding system is a small part of our information system.</p>

7. SYNAPSE MEDICAL SYSTEMS

Type of coding software:	Synapse Medical System
Pick-list (list of codes presented for the user to select from)	Yes
Browser (automatic look-up of the coding system)	No
Hierarchical decision tree (questions asked and code determined by user selected answers)	No
Automatic Coder (text entered and codes allocated from the text)	No
Combination/Other - please define	
If possible please provide a copy of the software system, or details of a contact from whom we can obtain specific details about this system	Mike Maldon Synapse Medical Systems 15 Strathlora St Strathfield NSW 2135 02 9642 5596
Where is this product being used?	6 practices solo to large group mainly in NSW.
What platform does it run on?	Unix.
What language is it written in?	Pick basic.
Where is the product in its development / product cycle?	Mature system with continuing development.
How is it the system licensed? (please address issues such as annual cost vs. ongoing costs)	Licensed to practice - Initial plus annual support costs.
Please provide an indicative price list for the software, including license to use the coding system.	\$4,000 +/- initial cost then \$350 p/a per doctor. Coding licence directly with FMRC

8. MEDIPAK CLINPLUS AND PATIENT\$

Type of coding software:	Medipak Clinplus and Patient\$
Pick-list (list of codes presented for the user to select from)	Yes
Browser (automatic look-up of the coding system)	No
Hierarchical decision tree (questions asked and code determined by user selected answers)	No
Automatic Coder (text entered and codes allocated from the text)	No
Combination/Other - please define	
If possible please provide a copy of the software system, or details of a contact from whom we can obtain specific details about this system	Mr Tony Bailey Director Medipak Pty Ltd Level 1, 313 Burwood Rd Hawthorne Vic 3122 Phone 03 9818 5488
Where is this product being used?	Multiple group general practices, mainly in Victoria.
What platform does it run on?	Clinplus –Unix, Patient\$ - Windows.
What language is it written in?	
Where is the product in its development / product cycle?	Clinplus being superceded by Patient\$.
How is it the system licensed? (please address issues such as annual cost vs. ongoing costs)	Installation \$35,000 +/- for large practice Ongoing \$2,500 pa +/-
Please provide an indicative price list for the software, including license to use the coding system.	Coding system licensed from FMRC at usual rates.

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