

Deloitte.



B·H·F
www.bhfglobal.com

Investigation into a
Procedural Coding System
For South Africa

Prepared by Actuarial & Insurance Solutions at Deloitte
And Dr Mark Ferreira
For the Board of Healthcare Funders
February 2007

Table of Contents

- 1. Introduction3**
 - 1.1 Background and purpose of report3
 - 1.2 Limitations4
- 2 Background to coding5**
 - 2.1 Preamble.....5
 - 2.2 Background to diagnostic coding (ICD).....6
 - 2.3 Background to Diagnosis Related Groups (DRGs).....8
- 3 Review of Diagnostic and Procedure Coding Schemes in Use in Selected Countries 10**
 - 3.1 United States of America10
 - 3.2 Canada12
 - 3.3 Australia.....13
 - 3.4 The Australian Grouper.....15
 - 3.5 International Classification of Health Interventions (ICHI).....16
 - 3.6 Other countries and coding systems16
- 4 Background to different coding systems used in South Africa 17**
 - 4.1 Introduction.....17
 - 4.2 CPT: Current Procedural Terminology.....18
 - 4.3 UPFS: Uniform Patient Fee Schedule.....18
 - 4.4 NAPPI (National Pharmaceutical Product Interface) codes for medication.....19
- 5 Evaluating a procedural coding system22**
 - 5.1 Introduction.....22
 - 5.2 Evaluation framework.....22
 - 5.3 The Irish experience with implementing ACHI26
 - 5.4 Conclusion27
- 6 Results of interviews29**
 - 6.1 Introduction.....29
 - 6.2 Does NHRPL need to be replaced?30
 - 6.3 Is there a need for a generally available DRG grouper?30
 - 6.4 Is international comparability of codes important?.....31
 - 6.5 The viability of using CPT as a new procedural coding system?.....31
 - 6.6 Should we build our own coding system and grouper?32
 - 6.7 Are there any other coding systems to consider?33
 - 6.8 What would the training costs of implementing ACHI be?.....33
 - 6.9 What other costs would be incurred?.....34
 - 6.10 Given the shortcomings of out-of-hospital ACHI codes, would it not be best to introduce ACHI only for in-hospital coding?35
 - 6.11 If ACHI is implemented, how will it be governed and who pays for it?.....36
- 7 Recommendations37**
 - 7.1 Decision Tree37
 - 7.2 Recommendations39
- Appendix 1: Comparison of Coding System used Internationally 41**
- Appendix 2: Comparison of Coding System used in South Africa with ACHI.....42**

1. Introduction

1.1 Background and purpose of report

1.1.1 The Health Systems and Policy Department of the Board of Healthcare Funders (BHF) commissioned Actuarial & Insurance Solutions (AIS) at Deloitte, together with Dr Mark Ferreira (independent consultant) to conduct an investigation into the procedural coding in South Africa. Whilst the focus of this study is procedural coding, rather than diagnostic, we also discuss a range of relevant matters in the context of diagnostic and billing coding.

1.1.2 Our terms of reference can be summarised as follows:

- (a) To evaluate the current procedural coding systems used in South Africa
- (b) To discuss the concept of Diagnostic Related Groups (DRGs) in the context of procedural coding
- (c) To evaluate the need for, and impact of, adopting an alternative procedural coding system in South Africa
- (d) And, in the process, to evaluate international procedural coding systems and the viability of such coding systems in a South African context.

1.1.3 The full terms of reference was set out as follows:

Key research questions the study needs to address therefore includes:

1. *What have been the shortcomings of the current CPT system?*
2. *What are the strengths and weaknesses of the current CPT system?*
3. *What are the strengths and weaknesses of the Australian system?*
4. *Should South Africa implement the new coding system which option is more viable – the ACHI or the ICHI? If the ACHI is adopted can it be adapted at a later stage towards ICHI? If ICHI is adopted which disciplines' coding systems will be omitted? What is the availability of cross-mapping from CPT to either ACHI or ICHI from 3M?*
5. *To what extent will the adoption of either ACHI or ICHI facilitate DRG roll-out?*
6. *What challenges will implementing the Australian system pose to South Africa vis-à-vis the National Health Act and the NHRPL in terms of sustainability? How and who will see to the maintenance of the system?*
7. *What are the implications of implementing the Australian system from a provider perspective – i.e. costs, licensing, capacity requirements, adaptations, policy buy-in?*
8. *What are the implications of implementing the Australian system from a funder perspective - i.e. costs, licensing, capacity requirements, adaptations, policy buy-in?*

1.1.4 In order to answer these questions, we conducted a literature review, and also interviews with a number of stakeholders in the industry. As our time and resources were limited, we selected only a sample of parties to interview, rather than postponing the completion of the report. Some of the parties approached chose not to participate in interviews. The eventual sample is not necessarily representative of the views of all the stakeholders in the industry, and the decision was that this report should be regarded as a discussion document, and that everyone with an interest in procedural coding should be given the opportunity to comment on it.

1.2 Limitations

- 1.2.1 This report has been prepared as a discussion document and is open for review and comment by any interested party.
- 1.2.2 This report should be considered in its entirety, as parts taken out of context may be misleading.
- 1.2.3 We have relied upon information provided by a variety of parties, and we do not accept responsibility for the views expressed by such parties.

2 Background to coding

2.1 Preamble

- 2.1.1 In 2004, health care services in South Africa consumed R110 Billion¹. All this care must be paid for and what the country is getting for its health care spend needs somehow to be assessed.
- 2.1.2 This process of assessment and evaluation requires that the complexities of health care be reduced to a set of diagnostic and procedure codes. In a short string of alphanumeric characters, those codes must bear the burden of description for this complex system.
- 2.1.3 The benefits of such encoded description are the following (provided the descriptions are sufficiently detailed):
- It allows service providers to inform funders of the services provided, and to be paid for it
 - It allows funders and regulatory bodies to analyse treatment provided to members, and to make decisions on how to allocate limited funds to various forms of treatment
 - It allows all interested parties to evaluate the health outcomes achieved by the treatment provided to patients
- 2.1.2 Health information is the foundation for the policy, strategic and operational levels of the healthcare industry. Managing and translating health information efficiently is clearly important, and data standards and classifications are mechanisms through which this can be achieved^{2 3}
- 2.1.3 Health classifications are systems that categorise terms used in healthcare and order them in a logical and methodical way.⁴ They are primarily used for statistical and reporting purposes, but are also used for other reasons, such as health services planning, health outcomes measurement and funding.
- 2.1.4 The aim of this investigation is to determine whether there are shortcomings with the procedural coding systems currently in use in South Africa, whether alternative coding

¹ Comments on the National Treasury Discussion Document on the Proposed Tax Reforms Relating to Medical Scheme Contributions and Medical Expenses: By Professor Di McIntyre, Professor Heather McLeod and Dr Michael Thiede (Health Economics Unit and Department of Public Health and Family Medicine University of Cape Town)

² Gardner, M. (2003). Why clinical information standards matter. *British Medical Journal* 326: 1101-1102. <<http://www.bmj.bmjournals.com/cgi/content/full/326/7399/1101>

³ Information and Communications Technology Standards Committee (2004). *Foundations for the future. Priorities for health informatics standardisation in Australia, 2005-2008*. Available at: <<http://www.ahic.org.au/downloads/Foundations%20for%20the%20future.pdf>

⁴ Hoffman, E. and Chamie, M. (1999). *Standard statistical classifications: basic principles*. Available at: <<http://unstats.un.org/unsd/class/family/bestprac.pdf>

systems would remove these shortcomings, and what the implications are of introducing an alternative.

- 2.1.5 Our investigation does not address the matter of the remuneration for service providers to be attached to various codes and coding systems. This is subject to separate processes and legislation, such as the National Health Act and the Competition Act. Whatever coding system is adopted, or if the current coding system is retained, separate investigations would have to be made and separate processes would have to be followed to determine remuneration for service providers.
- 2.1.6 In other words, in this investigation, *procedural* coding is evaluated and investigated as a means of describing treatment provided, not a means of determining how much service providers should be paid for the treatment provided, which is subject to its own legislative framework. The assumption is that a clear description of procedures and treatment provided can only assist in determining fair remuneration of service providers. Please note that we use a fairly wide definition of “procedural coding” and “procedures” – we include in these concepts all forms of treatment provided, including consultations.
- 2.1.7 The purpose of this study is to evaluate different procedural coding systems by considering the structure and complexity of codes, the descriptive value of codes, the ease of implementation and training, the availability of diagnostic-related groupers, international use of different coding systems, and related matters. Any matters relating to the remuneration of service providers are beyond the scope of this report.
- 2.1.8 The main forms of coding currently used in South Africa are:
- Diagnostic coding (ICD10)
 - Procedural coding (CPT4)
 - Billing coding (NHRPL and UPFS)
 - Medicine classification coding (NAPPI)
- 2.1.9 The most widely used statistical classification in healthcare is the *International Statistical Classification of Diseases and Related Health Problems (ICD)*, now in its 10th revision. The ICD is used internationally to classify morbidity and mortality data. This is a diagnostic coding system, as opposed to a procedural coding system. Whilst the focus of this report is procedural coding, some understanding of ICD is important for later discussions in the report, and hence we include background discussion of ICD here.

2.2 Background to diagnostic coding (ICD)

- 2.2.1 The history of statistical healthcare classification systems dates back to the eighteenth century. The *Bertillon Classification of Causes of Death* was developed in 1893. Subsequent revisions were titled the *International Classification of Causes of Death*. Until 1948, the classification was only used to classify causes of mortality. At

that time, the sixth revision was published under the auspices of the WHO and the scope was extended to include morbidity data.⁵

- 2.2.2 The current purpose of the ICD is to promote international comparability in the collection, classification, processing, and presentation of health statistics, including both morbidity and mortality. In practice, the ICD has become the international standard *diagnostic* classification for all general epidemiological and many health management purposes.
- 2.2.3 The purpose of ICD revisions is to stay abreast with medical advances in terms of disease nomenclature and aetiology. While the introduction of new classifications is costly and may cause some disruption in mortality and morbidity statistics, it is essential to stay abreast of advances in medical science and to ensure the international comparability of health statistics.
- 2.2.4 Work on the Tenth Revision of the ICD started in September 1983 with a meeting in Geneva. The programme of work was guided by regular meetings of Heads of WHO Collaborating Centres for Classification of Diseases. It represents the broadest scope of any ICD revision to date. It has over 2000 categories, which is almost 900 more than are in place in ICD-9.
- 2.2.5 It was realised that the great expansion in the use of the ICD necessitated a thorough rethinking of its structure and an effort to devise a stable and flexible classification which should not require any fundamental revision for many years. Consequently, although the traditional ICD structure was retained, an alphanumeric coding scheme replaced the previous numeric one. This provided a larger coding frame and leaves room for future revision without disruption of the numbering system. The alphanumeric codes also distinguish ICD-10 from any previous ICD version.
- 2.2.6 ICD-10 was published by the World Health Organisation (WHO) in Geneva in 1992.
- 2.2.7 Updating is now maintained by the WHO International Collaborating Centres through their Update and Maintenance Committee. The previous update from ICD-8 to ICD-9 retained most of the basic structure with the addition of some detail at the level of the four-digit subcategory and some optional five-digit subdivisions. The ninth revision introduced an optional alternative method of classifying diagnostic statement, including information about both an underlying general disease and a manifestation in a particular organ or site. This system became known as the dagger and asterisk system and is retained in the Tenth Revision.⁶
- 2.2.8 The ICD has a ten year update cycle, though it is now more than 10 years since ICD-10 was introduced (1992). Plans to introduce ICD-11 have been extended to 2011,⁷ primarily because the World Health Organization now has a mechanism through which the ICD is regularly updated — the WHO Update Reference Committee⁸.

⁵ Sue Bowman, RHIA, CCS, Director, Coding Policy and Compliance, AHIMA “Testimony of the American Health Information Management Association” to the National Committee on Vital and Health Statistics on ICD-10-CM. May 29, 2002.

⁶ See <http://www.int/classifications/icd/en> - (last accessed 22nd November 2006.)

⁷ Ustun, T.B. (2004). ICD revision process – towards ICD-11. Available at:- http://www.nordclass.uu.se/WHOFIC/papers/ICD_revproc_to_ICD-11_Ustun.pdf

⁸ National Centre for Classification in Health — ICD-10-AM Chronicle. Available at:- <http://www3.fhs.usyd.edu.au/ncch/4.6.htm>.

- 2.2.9 The ICD-10 is the diagnostic coding standard for South Africa as accepted by the National Department of Health and the Council for Medical Schemes and this standard is not likely to change in the near future.
- 2.2.10 The WHO promotes the development of adaptations that extend both the usefulness of the ICD and the comparability of health statistics and, therefore, has authorised the development of adaptations of ICD-10. The US has been developing its own adaptation of ICD since the seventh revision in the late 1950s. Before ICD-9 was introduced in the US, the National Centre for Health Statistics there developed an expanded version called ICD-9-CM (CM standing for 'Clinical Modification'). ICD-9-CM contained additional codes in the disease classification to provide more detail, and it included a procedure classification. Ireland adopted the US ICD-9-CM in 1990. Australia initially used ICD-9-CM but subsequently adapted it to an Australian version. The First Edition of the Australian Modification of ICD-10, called ICD-10-AM was published in 1998. The fifth edition of ICD-10-AM is due to be released this year. Other countries such as Canada and the Nordic bloc have also modified the ICD-10.
- 2.2.11 All modifications to ICD-10 must however conform to WHO conventions for the ICD.
- 2.2.12 While ICD-10 is becoming the standard for diagnostic coding outside of the US, the fact that an equivalent coding scheme of international standing has not been produced by the WHO for coding of *procedures* is problematic. Many countries have consequently been developing national coding schemes for procedures. A coding scheme which is only in use within one health system however has the disadvantage of not facilitating international comparisons.

2.3 Background to Diagnosis Related Groups⁹ (DRGs)

- 2.3.1 Current physician payment systems are not designed to necessarily accurately describe procedures, promote quality or ensure better outcomes. Both theory and history support this claim¹⁰. Fee-for-service is essentially pay-for production and offers rewards for seeing more patients, generating more services (whether appropriate or inappropriate care) and upcoding procedures and diagnoses.
- 2.3.2 It is generally acknowledged by many parties within the South African healthcare industry that new methods for paying providers are needed so that doctors are appropriately rewarded for providing high-quality care and promoting better outcomes for their patients.
- 2.3.3 In many countries, state and private health insurers have adopted global, diagnosis based descriptors such as Diagnosis Related Groups (DRGs) for reimbursing hospitals. This approach considerably reduces the transaction costs of third party payment, and gives providers the incentives to provide care more efficiently because reimbursement is determined by the level of patient need, not the service intensity provided.

⁹ *Casemix Funding for Acute Hospital Care in Victoria, Australia* by Dr Chris Brook, Director, Acute Health, Department of Human Services, Victoria, Australia and Immediate Past President, International Society for Quality in Health Care (ISQUA).

¹⁰ Weiner, S. L., Maxwell, J. H., Sapolsky, H. M. et al. (1987). Economic incentives and organizational realities: managing hospitals under DRGs. *Milbank Quarterly*, 65(4), 463-87

- 2.3.4 In the late 1970s, Professor Robert Fetter, of Yale University, developed the concept of Diagnosis Related Groups (DRG) to simplify the complexity of patient specific diagnoses, by grouping similar diagnostic categories into clinically meaningful diagnostic clusters, where resource use was also similar.
- 2.3.5 US authorities quickly perceived the potential value of DRG as a payment tool. Thus, in 1980, the New Jersey State introduced the first casemix funding system. Other systems moved, at first slowly, but subsequently much more rapidly, so that, today, casemix is becoming the standard inpatient funding mechanism across the globe.
- 2.3.6 There are three rules for a competent DRG system. These are that:
- each DRG must be clinically meaningful - that is that the diagnostic clusters must be accepted by clinicians;
 - each DRG must be resource homogeneous - that is that the type of resources used, and their amount, should on average be the same for each episode of care within the DRG; and
 - within each DRG, the specific diagnostic episodes should "map" to that DRG alone, and not to multiple possible DRGs.
- 2.3.7 There are complex coding rules and audit procedures, which ensure that these fundamental rules are followed. They depend, however, on the underlying ICD system and the DRG profile in use in each system.

3 Review of Diagnostic and Procedure Coding Schemes in Use in Selected Countries¹¹

3.1 United States of America

- 3.1.1 In the United States, coding is carried out by coders who can attain accreditation as a Certified Professional Coder (CPC) through the American Academy of Professional Coders (AAPC) or through the Society for Clinical Coders (SCC) that is affiliated with the American Hospital Information Management Association (AHIMA). The American Hospital Association (AHA) issues official Coding Guidelines on a quarterly basis in their *Coding Clinic* journal. Clinical information is coded using the ICD-9-CM classification.
- 3.1.2 ICD-9-CM was the first adapted and fully integrated coding scheme developed from the WHO ICD-9 disease classification over 20 years ago which incorporated a procedure classification since inception, it has been updated annually.
- 3.1.3 In the US, two procedure classifications are used to code clinical procedures. ICD-9-CM is used for in-patient services. CPT® (Current Procedure Terminology) is used in both ambulatory and in-patient settings.¹² Both systems are used for payment.
- 3.1.4 The ICD-9-CM: Volumes 1 and 2 of this code set deal with diagnoses. Volume 3 covers procedures with a focus on inpatient procedures.¹³
- 3.1.5 The other code set, the CPT®, which describes outpatient procedures and inpatient services reported directly by physicians. The CPT is owned by the American Medical Association.
- 3.1.6 Between 1994 and 1996, clinical modifications were made to that standard, creating ICD-10-CM for classifying diagnoses. At the same time, the Centers for Medicare and Medicaid Services (CMS) decided to revamp the entire system of classifying inpatient procedures and developed what it called ICD-10-PCS.(Procedure Coding System)
- 3.1.7 The Health Insurance Portability and Accountability Act of 1996 (HIPAA) gave the Department of Health and Human Services (HHS) the responsibility for designating a standard code set with which to describe diagnoses and procedures. At the time,

¹¹ This section draws heavily from two published documents namely:

Murphy D, Wiley M, Clifton A, McDonagh D; Updating Clinical Coding in Ireland: Options and Opportunities. The Economic and Social Research Institute; Dublin, 2004 ISBN 0 7070 0226 5 and Hospital Funding and Casemix: The Danish Ministry of Health Booklet series on health analyses. 1999. Translation: Jørgen Engraf. ISSN 1395-2528, ISBN 87-17-06950-5.

¹² Separate specialized code sets are used in specific medical fields, such as psychology and dentistry. Inputs for materials such as supplies and devices are accounted for using other coding systems, e.g., the health care procedure coding system

¹³ Murphy D, Wiley M, Clifton A, McDonagh D; Updating Clinical Coding in Ireland: Options and Opportunities. The Economic and Social Research Institute; Dublin, 2004 ISBN 0 7070 0226 5 and Hospital Funding and Casemix: The Danish Ministry of Health Booklet series on health analyses. 1999. Translation: Jørgen Engraf. ISSN 1395-2528, ISBN 87-17-06950-5.

ICD-10 was not deemed mature enough to be mandated, and so ICD-9-CM was chosen instead. This choice in no way was meant to prejudice the eventual move to ICD-10. Nevertheless, the transition to ICD-10-CM and ICD-10-PCS did not take place as soon as its proponents would have liked.¹⁴

- 3.1.8 Between December 1997 and February 1998 NCHS placed a draft version of an ICD-10-CM system on their web site and had an open comment period of 60 days. They received over 1,200 comments from about 20 organisations. The most common comment was that ICD-10-CM was an improvement over ICD-9-CM. It was removed off the web site to prevent vendors or others producing training materials on a classification which could subsequently change.
- 3.1.9 In 1998, the implementation date of ICD-10-CM was hoped to be synchronous with the launch of an ICD-10 Procedure Classification System and NCHS were working towards a date of October 2001. This implementation date has subsequently been repeatedly postponed and at present there is no fixed date for the implementation.
- 3.1.10 Channel Publishing (one of the main publishers of ICD-9-CM) state the following on their web site:

*Given all the relevant information and issues regarding ICD-10-CM and a possible implementation date, Channel Publishing believes that it can be no earlier than October 1, 2009, and quite possibly 2010 or even beyond. The NCHVS committee has submitted its recommendation for approval to the department of Health and Human Services. Upon approval, CMS will begin the Proposed and Final Rule process. In addition, the HIPAA process provides for a two-year implementation window after a Final Rule has been published in the Federal Register.*¹⁵

- 3.1.11 It seems therefore from numerous sources that the US will continue to use the ICD-9-CM coding scheme for the foreseeable future. This despite widely acknowledged fact that the ICD-9-CM procedure coding system is obsolete and must be replaced, and that the ICD-10-PCS represents a significant improvement over ICD-9-CM procedural coding system,¹⁶ and that this keeps the US out of step with the many countries now using ICD-10. Also the future of the CPT is not certain as debate goes on about the value of having only one procedure classification for the US.¹⁷¹⁸¹⁹

¹⁴ Libicki, M. and Brahmakulum, I. (2004). *The costs and benefits of moving to the ICD-10 code sets*. Available at: http://www.rand.org/pubs/technical_reports/2004/RAND_TR132.pdf.

¹⁵ Source: <http://www.channelpublishing.com/> October 2006.

¹⁶ Sue Bowman, RHIA, CCS, Director, Coding Policy and Compliance, AHIMA "Testimony of the American Health Information Management Association" to the National Committee on Vital and Health Statistics on ICD-10-CM. May 29, 2002. Full text available at www.ahima.org.

¹⁷ Libicki, M. and Brahmakulum, I. (2004). *The costs and benefits of moving to the ICD-10 code sets*. Available at: http://www.rand.org/pubs/technical_reports/2004/RAND_TR132.pdf (accessed 13 June 2005).

¹⁸ Sue Prophet; Testimony of the American Health Information Management Association to the National Committee on Vital and Health Statistics on ICD-10-CM; May 29, 2002 Available at <http://www.ahima.org/>.

¹⁹ STATEMENT of the AMERICAN MEDICAL ASSOCIATION to the Subcommittee on Health Data Needs, Standards and Security National Committee on Vital Health Statistics Department of Health and Human Services Re: Physicians' Current Procedural Terminology (CPT) Presented by: T. Reginald Harris, MD April 16, 1997

- 3.1.12 This also means that the DRG-type case-mix systems developed for use in the US are unavailable to outside countries.

3.2 Canada.²⁰

- 3.2.1 The Canadian Institute for Health Information (CIHI) is an independent, pan-Canadian, not-for-profit organisation established jointly by federal and provincial/territorial Ministers of Health to co-ordinate the development and maintenance of a comprehensive and integrated approach to health information for Canada and to provide and co-ordinate the provision of accurate and timely data and information required for:

- establishing sound health policy;
- effectively managing the Canadian health system; and
- generating public awareness about factors affecting good health

- 3.2.2 The Canadian Institute for Health Information (CIHI) supports clinical coding and the Classifications in Canada. These Classifications are:

- **ICD-10-CA** – Enhanced Canadian version of the 10th revision of the International Statistical Classification of Diseases and Related Health Problems. ICD-10-CA replaces the ICD-9 and ICD-9-CM in Canada.
- **CCI** – Canadian Classification of Health Interventions, developed to accompany ICD-10-CA. CCI replaces the earlier Canadian Classification of Diagnostic, Therapeutic, and Surgical Procedures (CCP).
- **ICF** – International Classification of Functioning, Disability and Health (formerly known as ICIDH).

- 3.2.3 CIHI prepares all training materials for training health records coders in acute care facilities across Canada in the application of ICD-10-CA and CCI and uses electronic infobases instead of books to search for codes. These materials are not available commercially.

- 3.2.4 The development of a new classification of health interventions to accompany ICD-10 began in Canada in 1996, namely the Canadian Classification of Health Intervention (CCI). It contains a comprehensive list of diagnostic and therapeutic interventions (approximately 17,060 codes) and includes a tabular listing, an alphabetical index, anatomical diagrams and appendices to provide further information about the code structure. CCI is the companion classification to the International Statistical Classification of Diseases and Health Related Problems, Tenth Revision, Canada (ICD-10-CA). The term 'intervention' is used instead of 'procedure' to reflect its expanded scope which addresses applications beyond traditional medical and surgical services. CCI has a totally alphanumeric structure with a code length of up to 10 characters.

- 3.2.5 Although the ICD-10-CA/CCI national classification system has the advantages of being available in English and regularly updated, to date CIHI have not set up any licensing agreements for CCI outside of Canada.

²⁰ Source: CIHI Website - www.cihi.ca

3.3 Australia

- 3.3.1 An Australian version of ICD-9-CM was produced in July 1995. This was superseded in July 1998 by the development of ICD-10-AM.
- 3.3.2 ICD-10-AM is the Australian modification of the World Health Organisation (WHO) ICD-10 disease classification and is produced by the National Centre for Classification in Health (NCCH). As WHO do not publish a procedure classification, the NCCH developed a procedure classification using the Australian Commonwealth Government's Medicare Benefits Schedule (MBS). The ICD-10-AM procedure classification was, therefore, previously referred to as MBS-Extended (MBS-E). On the publication of the third edition of ICD-10-AM in July 2002, the procedure classification became known as the Australian Classification of Health Interventions (ACHI). Volume 5 of ICD-10-AM contains the Australian Coding Standards (ACS). The NCCH is responsible for developing rules and guidelines on how to apply and interpret the ICD-10-AM disease and procedure classifications when coding. ICD-10-AM consists of 5 volumes:
- Volume 1 – Tabular List of Diseases
 - Volume 2 – Alphabetic Index of Diseases
 - Volume 3 – Tabular List of Procedures
 - Australian Classification of Health Interventions (ACHI)
 - Volume 4 – Alphabetic Index Procedure Index (ACHI)
 - Volume 5 – Australian Coding Standards (ACS)
- 3.3.3 The major difference between ICD-10 and the disease classification in Volume 1 of ICD-10-AM is that in ICD-10-AM there are additional codes that are more specific than the original ICD-10 codes. Usually these have been created by adding fifth characters to some codes. There are also a small number of additional three and four character categories where the NCCH was not able to create a new code at the fifth character level.
- 3.3.4 The procedure classification of ICD-10-AM (ACHI) was developed by the NCCH and is based on the Commonwealth Medicare Benefits Schedule (MBS). The MBS is a fee schedule and has been structured according to specialty. ACHI is the Australian national standard for procedure and intervention coding in Australian hospitals.
- 3.3.5 The main features of the classification are a seven-character code in the format xxxxx-xx. The first five characters represent the MBS item number and the last two characters were allocated for each new procedural concept derived from the MBS item description. The procedures are presented in the tabular in Block number order rather than in numerical order.

- 3.3.6 The Australian Coding Standards are designed to be used in conjunction with ICD-10-AM Volumes 1–4. The Australian Coding Standards (ACS) were written with the objective of providing sound coding conventions for the use of ICD-10-AM. The standards are arranged according to the ICD-10-AM chapter to which they relate. Each standard is uniquely identified by a four-digit number. These are arranged according to ICD-10-AM structure with the first 2 digits of the standard denoting the chapter to which they refer. '00-xx' refers to general standards for both diagnoses and procedures.
- 3.3.7 The National Centre for Classification in Health's core activity is creating and maintaining the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification* (ICD-10-AM) which is revised biennially.
- 3.3.8 The following comments are taken from an e-mail exchange between Brenda Gous (Medihelp and PHISC) and Sue Walker in Australia, Associate Director at the NCCH.
- The codes within ACHI are not linked to relative value units (RVUs), as a linking to RVUs would have been a fundamental change to existing fee structures
 - ACHI is part of Australian classification and is used in all hospitals. There are coding guidelines published in the Australian Coding Standards (ACS). The ACS are maintained by the NCCH and are updated every two years, but are under continual review.
 - ACHI is used in every hospital in Australia – public, private and day surgery. It forms the basis of casemix groupings within AR-DRG (the grouper used in Australia) but is also used similarly in the private sector. Private hospitals enter into their own agreements with insurance companies for funding purposes, usually (but not exclusively) on a casemix basis. ACHI is based on the Medicare Benefits Schedule (MBS), which is the fee schedule used in Australia for Medicare services including general practice consultations, specialist consultations, operations and other medical services such as diagnostic investigations and optometric services. The five-character MBS code forms the first part of the ACHI code with an extension code of two characters completing the ACHI code. The Department of Health and Ageing updates MBS at least twice each year and these code changes are either incorporated into ACHI or the MBS codes are mapped to existing ACHI codes. ACHI includes not only surgical interventions performed in hospitals but also dentistry, imaging and allied health interventions. So, billing is not based on ACHI but on MBS - but there is a link between the two.
 - ACHI has not been compared with CPT4 as CPT is not used in Australia.
- 3.3.9 *Coding Matters* is the quarterly newsletter of the National Centre for Classification in Health NCCH (Sydney). It is circulated by e-mail in pdf format. All back issues are available for downloading from the NCCH website.²¹ The '10-AM Commandments' within each issue of *Coding Matters* provide advice regarding coding. Any changes

²¹ *Coding Matters*, Vol. 8 No.1 p., 13, June.

in practice are expected to be implemented by coders once they have been published in *Coding Matters*.

- 3.3.10 The NCCH updates the ICD-10-AM every 2 years. There is a public submission process advertised on its website²² which allows all stakeholders to participate in the update process. Similarly, the Australian Government Department of Health and Ageing updates the *Australian Refined Diagnosis Related Groups* (AR-DRGs) classification in line with updates to the ICD-10-AM and has a public submission process.²³
- 3.3.11 We discuss ACHI in more detail in subsequent sections of the report.

3.4 The Australian Grouper²⁴

- 3.4.1 The Australian DRG grouper was originally developed for use with ICD-9-CM (Australian version) and continues to be modified for use with ICD-10-AM.
- 3.4.2 The Australian DRG grouper was developed under the auspices of the Clinical Casemix Committee of Australia (CCCA). The CCCA was established in 1991 by the then Commonwealth Department of Health, Housing and Community Services to co-ordinate the clinical evaluation of inpatient classifications so that clinically relevant recommendations for the development of an Australian inpatient casemix classification could be identified.
- 3.4.3 The Australian DRG classification comprises:
- a description of body systems,
 - a separation of medical and surgical procedures, and
 - description of a hierarchy of procedures, medical problems and other factors that differentiate processes of care.
- 3.4.4 ICD-10-AM and the Australian Grouper are currently in use in original or adapted form in many countries outside of Australia including New Zealand, Germany and a number of Asian countries. The NCCH works closely with many countries, supporting those still using the Australian version of ICD-9-CM and those implementing ICD-10-AM. This centre also has an ongoing involvement with the WHO Update Reference Committee ensuring that any developments within the Australian system are consistent with international practice.

²² <http://www3.fhs.usyd.edu.au/ncch/4.7.1.htm>.

²³ <http://www.health.gov.au/internet/wcms/publishing.nsf/Content/Casemix-1>.

²⁴ <http://www.health.gov.au/casemix/andrg1.htm>

3.5 International Classification of Health Interventions (ICHI)

- 3.5.1 ICHI is a shortlist of 1421 enumerated classes of health interventions, arranged in a shallow hierarchy, based on the *Australian Classification of Health Interventions* (ACHI). These classes correspond to the lowest aggregation level in the Australian Classification of Health Interventions (ACHI), so-called “blocks”. In ACHI a block aggregates a number of more specific classes whereas in ICHI a block is the class
- 3.5.2 However, via e-mail communication with Kerry Innes, Associate Director at the NCCH, we established that at a meeting of the WHO in October 2006, it was decided that ICHI was not suitable as an international classification.
- 3.5.3 It was agreed at that meeting that until a decision is made about possible reengineering that would better meet expectations and adequate business model for initiating the process, it would be best to consider ICHI as a related classification rather than one of the core WHO classifications. In order to avoid confusion, another name should be used that would give credit to the originators: Condensed Classification of Health Interventions (CCHI) was suggested.
- 3.5.4 It is anticipated that the English version of CCHI will continue to be disseminated internationally by NCCH. The current version of ICHI will remain available until at least 30 June 07. There is also a French version almost completed which will also be available. This proposal to continue CCHI as a related classification will enable current users of ICHI (or now CCHI) to continue with it while discussions continue about a new version that will occupy the official position of WHO international classification of interventions. They will probably set up an Interventions Working Group which will be active before or at the next WHO-FIC network meeting in Oct 07.
- 3.5.5 In terms of options for countries still to implement a classification, there will have to be a decision on whether the jurisdiction needs something broad like CCHI or something much more detailed, e.g. the CCHI parent classification ACHI or perhaps the Canadian classification which unfortunately carries the same acronym of CCHI or the French classification CCAM – all well-regarded internationally.

3.6 Other countries and coding systems

- 3.6.1 The South African Private Healthcare Information Standards Committee (PHISC) appointed a DRG working group in 2005 to investigate international coding schemas with a special emphasis on the investigation of different case mix grouping software in use internationally, and the coding systems that support these.
- 3.6.2 The PHISC DRG working group has generously made their documents available for inclusion in this report.
- 3.6.3 Appendix 1 contains a summary and comparison of various coding systems, including those discussed above, and others. We discuss some further work by PHISC in the sections below.

4 Background to different coding systems used in South Africa

4.1 Introduction

- 4.1.1 It is assumed that the reader of this report is familiar with the history of the former BHF Recommended Scale of Benefits (RSOB) and the National Health Reference Price List (NHRPL). At the time of writing, the Regulations under the National Health Act, setting the scene for the determination of the NHRPL by the Department of Health, is open for comment. As the regulatory framework for NHRPL is currently under review, we cannot comment further on the final context in which NHRPL and the process relating to it will be implemented.
- 4.1.2 It should however be emphasised that NHRPL should mainly be regarded as a coding system for the purposes of billing, rather than a coding system for descriptive purposes. There are billing rules and guidelines relating to the use of NHRPL in different medical specialities, and these might mean that the NHRPL codes submitted would not be a complete or true reflection of the actual procedures performed, but rather an indication of the rules that the service provider must follow for billing purposes.
- 4.1.3 The most important shortcoming of NHRPL from a coding perspective is that it is not a hierarchical coding system. In other words, there is little inherent and consistent logic in the structure of the codes, which creates significant problems with data analysis.
- 4.1.4 The advantages of a hierarchical coding system are:
 - 4.1.4.1 It is easier for a medical service provider to learn the principles underlying the codes used in his / her discipline
 - 4.1.4.2 Data analysis is much simplified, as the structure of the codes could be used in programming when attempting to extract information about a certain category of procedures from a database.
- 4.1.5 CPT is a hierarchical coding system, which we now describe in more detail. CPT is currently used mainly in hospitals in South Africa.
- 4.1.6 Note that there are some medical services provided in South Africa for which coding systems are not well defined, not used regularly, or non-existent, such as traditional healers.
- 4.1.7 ICD-10 is also used extensively in South Africa, but was discussed in section 2.2 above.

4.2 CPT: Current Procedural Terminology

- 4.2.1 The 1st edition of CPT was published in 1966. CPT is a listing of descriptive terms and codes that are used for reporting of medical services and procedures performed.
- 4.2.2 The aim of the terminology is to provide a uniform language that will accurately describe medical, surgical and diagnostic services and provide an effective means for reliable communication between doctors, patients, hospitals and funders or administrators of health care.
- 4.2.3 CPT is copyrighted to the American Medical Association (AMA) and is updated annually.
- 4.2.4 CPT was introduced to South Africa in 1996. The South African Medical Association was licensed by the AMA to customise and modify CPT, hence the name CCSA (Complete Current Procedural Terminology for South Africa (SA)).
- 4.2.5 The current version in use in SA is CCSA 2006. Version updates in SA are done every 1 to 2 years. This is agreed to at PHISC and changes usually occur in March.
- 4.2.6 CPT was designed by the AMA for use by doctors only, however in SA CPT is used both by doctors and hospitals.
- 4.2.7 CPT is used largely in the private sector for the purposes of data collection and analysis and to a lesser extent for reimbursement within contractual agreements between funders and providers of healthcare.
- 4.2.8 The public sector has 'adopted' CPT, however no implementation has happened to date.

4.3 UPFS: Uniform Patient Fee Schedule

- 4.3.1 The Uniform Patient Fee Schedule was developed to provide a simpler charging mechanism for public sector hospitals in South Africa and was introduced in the Northern Province in 2002.
- 4.3.2 Public hospitals currently treat patients for whom external funding is available. The UPFS replaces the itemised billing approach with a grouped fee approach.
- 4.3.3 The UPFS was designed with the following objectives in mind:
- It must be simple enough to implement in both manual and computerized systems.
 - It should be based on health service activities (activity based costing).

- Linked to the BHF scale of Benefits for initial purposes. I.e. BHF was used as a reference when developing the UPFS, which means that it also has a link with NHRPL.
- It must be easy to adjust for changes in cost structure.
- Different levels of health service delivery should be taken into consideration.

4.3.4 The basic principles of the Uniform Patient Fee Schedule can be summarised as follows:

4.3.4.1 All tariffs with the exception of anaesthetics are divided into two components. The 1st being the facility fee and the 2nd the professional fee.

4.3.4.2 Facility fee

4.3.4.2.1 The facility fee reflects the overhead costs of providing the environment in which the healthcare services are delivered.

4.3.4.3 Professional fee

4.3.4.3.1 The professional fee reflects the costs of the healthcare professionals delivering the service.

4.3.4.4 These fees are charges whenever healthcare professionals employed by the applicable provincial health department provide the services.

4.4 **NAPPI (National Pharmaceutical Product Interface) codes for medication**

4.4.1 A NAPPI code is a unique identifier for a given product (medicine or surgical products). Medikredit (www.medikredit.co.za) is responsible for the management and maintenance of the NAPPI file subject to the governing authority of the NAPPI Advisory Board (NAB).

4.4.2 We interviewed Medikredit about NAPPI codes and asked in particular whether there are other coding systems that might be more appropriate (e.g. GPI), and questions on the fees raised for NAPPI codes. The following is a paraphrased extract from an e-mail communication that we received from Matthew Dijkstra, Clinical Operations Director at Medikredit:

4.4.2.1 Medikredit, as custodians of the NAPPI file, have made a commitment to the Department of Health that they will allocate NAPPI codes and publish these codes in the public domain without charge. The application process from initial enquiry to receiving a unique identifier code is therefore offered free of charge to the industry along with voluntary training sessions to new applicants to facilitate a smooth process.

4.4.2.2 NAPPI codes are allocated and the requestor is informed of their new code, allowing them to publish the code on price files, packaging or catalogues as they choose.

- 4.4.2.3 The 9 digit NAPPI code and description are then made available on the Medikredit website the morning after the product goes live.
- 4.4.2.4 This process needs to be divorced from the sale of the price file which Medikredit maintains and updates at additional overhead costs and makes available to customers who require it for medicine pricing. There is a cost associated with receiving this price file and it is not a public domain product. Medikredit could never put these prices in the public domain as it would be deemed anti-competitive.
- 4.4.2.5 A number of software vendors and other companies who have an interest in pricing medicine claims maintain similar price files, which are also sold to the industry.
- 4.4.2.6 Medikredit further ensures the accuracy of its pricing data by running weekly comparisons against various other price files available in the industry highlighting discrepancies to the individuals where investigation is required.
- 4.4.2.7 We have investigated the use of GPI in the USA as well as in South Africa. From what we can gather, GPI is essentially an over-coding system that links drugs which possess the same Clinical characteristics (drug class, active ingredient/s and strength). As the length of the GPI code increases in characters, so the classification becomes more defined and specific - as in the example below. GPI is not a unique identification system and will therefore have a one-to-many relationship with branded products. In the USA, GPI is linked to a NDC code (National Drug Code corresponding to a clinical drug (e.g. 66109-ABD-00), which is similar to our NAPPI coding system.
- 4.4.2.8 NAPPI coding allows the provider to identify which brand he/she is dispensing, the dispensed pack and the manufacturer. Managed Care companies are able to link GPI to each new NAPPI code that is created, thus allowing a method to group drugs for reference pricing models amongst other things.

Medi-span™ Classification System - Example of an Antidepressant		
GPI	Coding	Example
58-	Drug group	Antidepressants
58-20-	Drug class	Tricyclic agents
58-20-00-	Drug sub-class	--
58-20-00-60	Drug name	Nortipytyline
58-20-00-60-10	Drug name extension	Hydochloride
58-20-00-60-10-01	Dosage form	10mg

- 4.4.2.9 Medikredit and other companies in South Africa such as Mediscor have developed over the years a linking process of NAPPI codes to the relevant clinical classification systems such as First Data bank.
- 4.4.2.10 We also requested an indication of the number of products which can directly be linked to a single clinical condition (ICD-10 code). Based on Medikredit's

investigations, it appears as if fewer than 10% of all active MCC registered products on the NAPPI database are linked to a single condition, including drugs categories such as: Radio-opaque products, Flu vaccines, other viral vaccines, products for the desensitization to specific allergens, products for the treatment of obesity etc. This means that a one-to-many coding system, such as GPI, would not really be useful in many types of data analysis.

- 4.4.2.11 It is the relationship between the unique NAPPI code and submitted ICD 10 code that allows both providers and funders to identify the exact product claimed for and the condition being treated. In this way, funding and pricing decisions as well as benefit design can be built around this coding relationship.
- 4.4.2.12 One area of equal importance is coding relating to surgical products. All reimbursable surgical products are allocated NAPPI codes for claiming purposes, allowing identification of exactly which stent, catheter, cochlear implant etc. is being supplied and therefore the appropriate reimbursement to apply. The GPI system will not cater for these products as they do not have any medicinal attributes and therefore cannot be classed. There is currently over 90 000 active 6 digit surgical NAPPI codes on the NAPPI database.
- 4.4.2.13 Comments received regarding the shortcomings of the NAPPI coding system include the inability to cater for the compounding and dispensing professions such as homeopathy as well as the lack of support for stocking, prescribing and dispensing of medicines in the public sector which are generically based. It is the view of one commentator that the NAPPI coding system is a 'non-starter' in the public sector.

5 Evaluating a procedural coding system

5.1 Introduction

5.1.1 Classification systems, whether in the public domain or in the private sector, with or without a copyright, should meet several goals. They should:

- Ensure that the classification system is efficient for all kinds of users.
- Ensure that the codes within the system interact smoothly with each other.
- Be reasonably priced, both to obtain and to maintain, to assure access to all users.
- Be maintained in a way that allows for input from all users to assure that any modifications or clarifications respond to the needs of all users.

5.1.2 It would seem that these goals might be easier to reach if classification systems were in the public domain. While the private sector has played a key role in the past in developing these systems and sometimes the availability of a copyright is an important incentive to encourage useful developments, the importance of standardized managed coding systems should be sufficient for the public sector to ensure continued development.

5.1.3 Further, coding and classification systems should be universal as far as possible – so that the public and private sectors could compare statistics and analysis, and also to ease payment by private sector medical schemes to the public sector for rendering services to medical scheme beneficiaries. In addition, a single coding system across public and private sectors allow the construction of an electronic health record that takes into account all forms of treatment received by patients, whether in the public or private sector.

5.1.4 The requirement for a universal system also implies that the same coding structure should be used for in- and out-of-hospital services, allied health professionals and traditional medicine. This requirement would involve the further development and modification of codes under all coding systems currently available, whether those currently in use in South Africa, or any alternative system that might be adopted.

5.2 Evaluation framework²⁵

5.2.1 Health classifications can be evaluated by the characteristics that define a 'good' classification. These principles are explained below and are grouped into administrative, structural, content and usability principles.

²⁵ Michelle Bramley; **A framework for evaluating health classifications**. Health Information Management 2005 ISSN 1322-4913 Vol 34 No 3 Page 70 – 83.

5.2.2 Administrative principles

5.2.2.1 Purpose and scope (coverage)

- 5.2.2.1.1 A health classification must have its objectives, purpose and scope (or coverage) clearly stated so that its relevance to the domain it serves, or to other domains, can be measured.
- 5.2.2.1.2 Procedure classifications generally have a broad scope because they need to encompass all types of procedures performed in healthcare: diagnostic, therapeutic and preventive interventions; and invasive, non-invasive and cognitive interventions. They also need to be applicable to all clinicians, across all healthcare settings^{26 27}

5.2.2.2 Custodianship

- 5.2.2.2.1 The custodian is the organisation or body responsible for the development and maintenance of a health classification. They should be readily identified and their responsibilities clearly outlined.

5.2.2.3 Maintenance/updating

- 5.2.2.3.1 Health classifications must remain credible and relevant to users and so must be maintained and updated over time. The custodian must have a plan for regular updating and maintenance which clearly documents the criteria against which a submission for change can be made. The plan should be well publicised and allow for all users and producers of statistical data to contribute to the process within an appropriate time frame.

5.2.3 Structural principles

5.2.3.1 Hierarchical organization

- 5.2.3.1.1 Health classifications should have a clinically logical, hierarchical organisation built upon a theoretical framework. The hierarchical organisation should facilitate data retrieval at different levels of specificity by enabling aggregation of data from subcategories to categories ('roll up/roll down')

5.2.3.2 Expansion

- 5.2.3.2.1 Health classifications need to be responsive to changes in clinical practice and new technology if they are to maintain their relevance. The structure of a health classification should be flexible to allow for expansion. The addition of new concepts into the hierarchy should not disrupt systematic code structures.

²⁶ Innes, K., Hooper, J., Bramley, M. and DahDah, P. (1997). Creation of a clinical classification. The international statistical classification of diseases and related health problems – tenth revision – Australian modification. *Health Information Management Journal* 27(1): 31-38.

²⁷ National Committee on Vital and Health Statistics Subcommittee on Medical Classification Systems (1993). Recommendation for a single procedure classification system. *Journal of the American Health Information Management Association* 64(8): 12-22.

5.2.3.3 Comprehensiveness

- 5.2.3.3.1 A health classification must be comprehensive (i.e., exhaustive) to support the domain it serves

5.2.4 **Content principles**

5.2.4.1 Mutual exclusivity

- 5.2.4.1.1 Categories or subcategories must be mutually exclusive. There must be only one code for any given concept with adequate indexing and guidelines to denote the boundaries. There cannot be two (or more) different codes for the same concept. If there are, then the classification is said to have redundancy (needless repetition). The main problems with redundancy are data retrieval and statistical counts, particularly if data managers are unaware of the redundancy.

5.2.4.2 Unique, unambiguous and clearly expressed descriptors

- 5.2.4.2.1 To facilitate communication and understanding between all users and producers of statistical data, each category or subcategory descriptor should be unique (have one only meaning), unambiguous and clearly (not vaguely) expressed to convey meaning. The meaning of each category or subcategory should be understood from its descriptor alone. Meaning should not be inherent in the concept's relationship within the hierarchy.²⁸

5.2.4.3 Relevant and standardised terminology used in descriptors

- 5.2.4.3.1 Standardised use of language that is accepted and in common usage, and relevant to the domain and scope should be used to describe each category or subcategory. In the case of health classifications, descriptors should be clinically relevant.
- 5.2.4.3.2 Descriptors for procedures or interventions should be setting and provider neutral; they should not reflect the clinician who performed the procedure or indicate where the procedure was performed. One reason behind this principle is redundancy; such additional information is captured elsewhere in the information system. Another is to enable comparability across different clinicians and sites.

5.2.5 **Usability principles**

5.2.5.1 Definitions and instructional notes

- 5.2.5.1.1 The categories or subcategories in a health classification must be well defined and supported by definitions and explanatory notes.

5.2.5.2 Guidelines/training materials

²⁸International Organization for Standardization (2000). *ISO/DTS 17117 Health informatics — controlled health vocabularies — vocabulary structure and high-level indicators*. Geneva, ISO.

- 5.2.5.2.1 Guidelines or rules on how the classification is to be used should be available to all users. Training materials should also be provided, particularly when revisions or updates are introduced.
- 5.2.6 The NCVHS (National Committee on Vital and Health Statistics in the USA) also developed recommended characteristics of a procedure classification system in November 1993. These are:
- 5.2.6.1 Hierarchical structure – the ability to aggregate data from individual codes into larger categories
- 5.2.6.2 Each code should have a unique definition forever – in other words, codes are not reused
- 5.2.6.3 Expandability – the coding system should be flexible enough to accommodate new procedures and technologies, there should be a mechanism for periodic updated and code expansion must not disrupt the systematic code structure.
- 5.2.6.4 The classification system should be comprehensive
- 5.2.6.5 Non-overlapping - each procedure (or component of a procedure) is assigned to only one code
- 5.2.6.6 The system should be easy to use
- 5.2.6.7 There should be standardization of definitions and terminology
- 5.2.6.8 The system should contain adequate indexing and annotation for all users
- 5.2.6.9 There should be Setting and Provider Neutrality – i.e. the same code regardless of who performs the procedure or where the procedure is performed
- 5.2.6.10 The coding must be multi-axial, in other words, specify the body system(s) affected and the technology used
- 5.2.6.11 A procedural coding system should be limited to the classification of procedures and should not include diagnostic information. (Note that we would regard a consultation also as a procedure for the purposes of this report. Other data elements (such as age) should be elsewhere in the record).
- 5.2.7 In reviewing the choices of coding schemes made by other countries, it is apparent that in each case different challenges and goals have been addressed, including the development of local adaptations for ICD-10 and the creation of national coding schemes for procedures.
- 5.2.8 As far as implementation is concerned, the important issue is whether the code development and implementation process incorporates the following principles:
- Sensitivity to all user needs, recognizing that organized delivery systems shifts from inpatient to outpatient procedures and from physician offices to outpatient treatment facilities.

- Structured so that code usage can be easily accessible and widely distributed.
- Maintained through a clearly defined structure in order to achieve a high level of coding integrity.

5.2.9 Complementing these principles is a well-defined maintenance and implementation process. Input into the process should be broad-based and changes to the coding system should take into consideration the needs of all users. Overall, the process should also be predictable and take into account the capabilities of the users to adapt to coding changes when they occur. Providers should be able to count on routinely scheduled meetings to review coding changes and a certain date for when approved coding changes take effect.

5.3 The Irish experience with implementing ACHI²⁹

5.3.1 In the determination of the options for upgrading coding schemes for diagnoses and procedures in Ireland, the factors that were considered important included:

- the availability of an integrated coding scheme for diagnoses and procedures
- which is regularly updated,
- facilitates international comparability and
- provides for the availability of training and software support as required.

5.3.2 While the systems used in all the countries the Irish reviewed went some way towards meeting these requirements, a number of key factors specific to each system were taken into consideration before their final decision was reached.

With regard to current US experience, it is regrettable that neither a procedure coding scheme or a version of ICD-10-CM has been finalised for national application within this system. the disadvantages are that this is not compatible with ICD-10 and is not considered to have kept pace with current developments in coding internationally.

Canada has produced a national modification of ICD-10 along with the Canadian Classification of Health interventions. This system is not used outside of Canada.

²⁹ Murphy D, Wiley M, Clifton A, McDonagh D; Updating Clinical Coding in Ireland: Options and Opportunities. The Economic and Social Research Institute; Dublin, 2004 ISBN 0 7070 0226 5 and Hospital Funding and Casemix: The Danish Ministry of Health Booklet series on health analyses. 1999. Translation: Jørgen Engraf. ISSN 1395-2528, ISBN 87-17-06950-5.

The remaining option available for consideration therefore is the Australian developed ICD-10-AM system which constitutes an integrated coding scheme for diagnoses and procedures. Within the five volume set of manuals available, a comprehensive presentation of Australian coding guidelines is included in the fifth volume. There are regular updates and ongoing maintenance of this system with new publications produced with each update every two years. In addition to being used in Australia, New Zealand and a number of Asian countries, this system is also being adapted for use in Germany, the largest country within the EU. There is also an established train-the-trainer scheme in place and guidelines are discussed and reviewed regularly in Coding Matters, the newsletter of the NCCH. The availability of the Australian Grouper is an important factor in ensuring that a case-mix classification system compatible with the ICD-10-AM coding systems is available and supported on an ongoing basis.

- 5.3.3 The ICD-10-AM had a number of important advantages, including the fact that it is an integrated coding scheme for diagnoses and procedures; the coding scheme for diagnoses is compatible with WHO's ICD-10 and the systems are regularly evaluated and updated.
- 5.3.4 The number of countries using ICD-10-AM continues to increase facilitating international comparability with other health systems. Training in the use of the coding system is provided both by the NCCH and HIMAA. The code books are readily available in English and guidelines are published in Volume 5 of ICD-10-AM and also in *Coding Matters*, a journal published regularly by the NCCH. The coding systems are well maintained and continually reviewed and the support for coders is excellent through the NCCH, the HIMMA and the CCSA. The Australian Grouper is available for case-mix classification of data coded in ICD-10-AM.

5.4 Conclusion

- 5.4.1 Irrespective of the choice of coding scheme determined, there will be resource implications in terms both of the purchase of publications, software, training materials, and also in terms of the time required to undertake the required training courses.
- 5.4.2 The choice of a new coding scheme for diagnoses and procedures ultimately needs to be determined on the basis of which option best meets the needs of the country – and such options should not exclude the possibility of maintaining the status quo.
- 5.4.3 Any new system must undergo a thorough testing for compatibility to the various reimbursement systems, to prove their value and importance. The new system must also demonstrate its ability to provide an accurate record of the patient's condition and what happened to the patient before and after the rendering of care.
- 5.4.4 Equally important for successful implementation is the establishment of a carefully planned and predictable schedule so that all healthcare participants move in unison. A phased approach to implementation is essential.

- 5.4.5 A critical step is to include a requirement to have all payers abide by the same national coding guidelines as published through official sources and that all code changes should be governed by the same process and body.
- 5.4.6 Every health provider is affected by any type of change to the coding system. The real question is: To what extent and to what degree? The bulk of the cost of managing changes are those associated with training personnel so they are educated and can develop a high level of proficiency in the routine use of the coding system. It should be noted that small and rural health care providers may not have available to them the information systems and coding system support programs that would allow them to work with computer encoding. This remains a significant challenge in South Africa.
- 5.4.7 A major change to the existing coding system nomenclature would require extensive and costly modifications to existing health care information systems and training of support staff. It is obvious from discussions to date that providers do not want a costly conversion to another standard unless it can clearly prove that it is better than the one they are currently using, and unless there is clear direction on the way in which the system will be implemented, and the timing of the implementation. (A better system is one that is not just marginally better, but one that is much better). The system must be tested in all care settings. The evaluation of benefits must also include ease of use, efficiency, uniformity and data integrity. Movement to any new system must be carefully planned and predictable.
- 5.4.8 Change, even a change to a superior coding system, is not free. Costs can be classified into three categories:
- costs of training
 - productivity losses
 - system changes.
- 5.4.9 Of course, the capacity to provide training is also important. We address this issue in more detail below.
- 5.4.10 One of the most important considerations in reducing the costs and enhancing the benefits of moving from one coding system to another is the quality of the mapping from the one to the other. Good mappings, which are largely a characteristic of the code definitions themselves, ease the cost of transition by permitting the logic that is used for old codes (e.g. to determine whether the medical care given is covered by insurance) to be carried over to the new ones. It also permits old data to be meaningfully combined with new data to create a time series that smoothly spans the transition between code sets. This is clearly a very important consideration, and would have to be developed in South Africa, as any new coding system would have to be mapped to NHRPL, which is unique in South Africa.

6 Results of interviews

6.1 Introduction

- 6.1.1 In this section we report on the interviews held with a number of market players. From the outset, we realised that it would be impossible to interview all the relevant stakeholders, and that we instead had to select a sample of role players. The rationale behind this was that the report is intended as a public document, open for comment.
- 6.1.2 The following is a list of the parties that we interviewed. Some of the parties that we invited declined to participate. Interviews were conducted with (in no particular order):
- Neil Harvey & Associates
 - The Health Professions Council of South Africa
 - Medihelp
 - Medscheme
 - Mediclinic
 - Life Healthcare
 - Netcare
 - Discovery Health
 - Medcode
 - Medikredit
 - South African Medical Association, and some representatives from a selection of medical disciplines
 - Eternity Health
- 6.1.3 We decided not to report on each party's comments and hence the paragraphs below do not necessarily reflect the views of all parties. We have paraphrased and aim to highlight the emerging views. Where there is strong disagreement about a particular issue, we highlight this in the paragraphs below.
- 6.1.4 We summarise the comments received from parties interviewed into a number of major headings below.

6.2 Does NHRPL need to be replaced?

- 6.2.1 Most of the parties interviewed, particularly medical scheme administrators, IT providers and hospital groups indicated that there are severe shortcomings with NHRPL. Data analysis is difficult as the coding system is not hierarchical and there is no consistent logic in the construction of the codes. Funders feel that the billing guides do not contain sufficient detail, that NHRPL is not comparable internationally, and that there is no viable DRG grouper associated with NHRPL (see par. 6.3 below).
- 6.2.2 Further, a problem experienced by both the medical service provider fraternity and funders is the fact that NHRPL is primarily a coding system for billing. In other words, the billing rules relating to codes might mean that what the funder receives is a reflection of the rules relating to billing, not necessarily the a description of the services provided. For instance, where there is a billing rule indicating that a funder would not pay on the basis of a particular code, this would typically not be submitted to the funder, even though the service might have been performed. This is complicated by the fact that the billing guidelines are vague and non-specific in many instances.
- 6.2.3 A very important principle therefore is that billing guides and billing practices must be divorced from the need to describe the services actually provided. As discussed in the first section of the report, the intention behind a new coding system would be to remove any discrepancy behind what is coded and the services actually provided in practice, regardless of how a medical scheme might pay for those services.
- 6.2.4 In terms of suggesting whether NHRPL should be replaced or not, most organizations indicated that it should be replaced, but only with caution, and only if some of the conditions mentioned below are met.
- 6.2.5 The general consensus was that a coding system should cater for both the public and the private sector (although the ability of the public sector to cope with coding was questioned) and be expanded to also include traditional and complementary medicine.

6.3 Is there a need for a generally available DRG grouper?

- 6.3.1 The answer to this was a unanimous “yes” from funders, and a cautious “yes” from hospital groups. Some hospital groups were more enthusiastic than others. Other players did not really have an opinion on the need for a grouper, as it would mostly be used in a hospital context. Two of the three hospital groups indicated that they believe a DRG tool would be a good thing, but one of these was undecided about whether they believe they should be reimbursed on the basis of DRGs, rather than fee-for-service.
- 6.3.2 Note that, even if DRGs are introduced in a consistent way nationally, this does not mean that hospital reimbursement would necessarily be on the basis of DRGs. The information could be used, for instance, to monitor health outcomes.

- 6.3.3 It is clear that funders in particular are keen to see a DRG tool being made available, as they believe that this would help them to understand hospital costs better, and hence to manage a large proportion of their claims better.
- 6.3.4 It was almost unanimous amongst those who had opinions on the matter, and who did not oppose the concept of DRGs, that ACHI with its attendant grouper is the most viable coding system for hospitalisation. This was because it was:
- Demonstrated to be implemented in a variety of countries
 - It comes with an existing DRG tool
 - It is regularly updated and maintained by the NCCH
 - There is precedent for the licensing to happen at a Government-to-Government level, obviating the need for the private sector to carry the costs of licensing

6.4 Is international comparability of codes important?

- 6.4.1 Interviewees from the funding industry were most interested in international comparability. The benefit of comparability is two-fold:
- We can learn from other countries' implementation experiences
 - We can compare health outcomes to international standards using the same coding structures
- 6.4.2 However, there was a general feeling that international comparability would be a "nice to have" rather than a central consideration in choosing a coding system. Several players, but particularly those from the medical service provider groups, emphasised the need for our coding system to cater for local health care practice and to take into account the unique South African disease profile, and that this might mean considerable development and modification of any international system adopted. Coding systems that are already used in more than one country would therefore be preferable.
- 6.4.3 It should also be borne in mind that international coding systems are used in the context of billing in their local countries, and as such, there might be a need to modify the system in any event. As discussed above, we believe the matter of billing should be entirely separated from the decision to implement a coding system that would describe what treatment was actually provided.

6.5 The viability of using CPT as a new procedural coding system?

- 6.5.1 CPT4 is already used in South Africa, but mostly in hospitals. SAMA has developed CPT to a considerable extent to cater for local needs, and licenses CPT to the industry. CPT has not gained general acceptance outside of hospitals and is not used there.

6.5.2 The main advantage of CPT is that it is a hierarchical coding system and detailed. It is also used in the USA.

6.5.3 However, the main and most important disadvantage is that it does not come with a grouper that would meet South African needs. The only grouper available with CPT is the 3M IR-Grouper, which has been used in South Africa by 3 players in the market. It was therefore developed to take into account NHRPL, via a mapping of NHRPL to CPT. However, the South African version never gained general acceptance as it has the following disadvantages:

- It is proprietary and license fees are high
- It is not transparent, and there were different opinions on whether the grouper even uses ICD-10. Some of the interviewees suggested that it uses ICD-9 (since the USA has not yet moved to ICD-10) mapped to ICD-10 (which would necessarily lose a significant amount of information as ICD-9 is considerably less detailed than ICD-10) and then combines this with CPT4 to group. However, this process happens in a “black box”, and the results, where tested in South Africa, were particularly weak with disease staging, and seemed not to group correctly in a significant number of cases. As a result, some players have done their own development of the 3M IR-Grouper, but they indicated that they would certainly favour another DRG grouper.

6.5.4 Given the above, we got the sense that:

- CPT4 could potentially be adopted more widely, and would at least assist in describing treatment more accurately and allowing more sensible data analysis. The medical service provider industry would seem to prefer this rather than a change to a new coding system.
- However, the absence of a viable DRG grouper is seen as a major disadvantage by the funding industry, and by some hospital groups. As hospitalisation costs make up a very significant proportion of medical scheme expenditure, there is a great need to be able to analyse such costs with more accuracy and in more detail, as would be possible with a DRG grouper.
- Also, CPT is considerably more complex thanACHI.

6.5.5 The question now is whether there are any other coding systems that could be adopted if neither NHRPL nor CPT is used.

6.6 Should we build our own coding system and grouper?

6.6.1 The answer to this was unanimous: “No”.

6.7 Are there any other coding systems to consider?

- 6.7.1 Up until we received notification that the WHO does not regard ICHI as appropriate as an international classification system, there was general agreement that the two most viable alternative coding systems would be ACHI and ICHI.
- 6.7.2 Given that ICHI would be withdrawn fairly shortly, this leaves us only with ACHI to consider as a potential new coding system.
- 6.7.3 The main advantages of ACHI include the following:
- It is a hierarchical coding system
 - It is not as complex as CPT
 - It comes with extensive training support (more on training below)
 - It has a track record of successful implementation in Germany and Ireland
 - It seems as if ACHI will also be implemented in several other countries in due course
- 6.7.4 The main disadvantages of ACHI are:
- It focuses on in-hospital treatment, and the codes for out-of-hospital treatment are not well developed
 - It makes no provision for traditional healers and complementary medicine.
- 6.7.5 Given all of the above, the focus of our investigation became the appropriateness of ACHI for South Africa, and the practical implications of implementation.

6.8 What would the training costs of implementing ACHI be?

- 6.8.1 In terms of hospitalization, we should bear in mind that CPT4 is currently being submitted in respect of hospital bills. Since ACHI is a simpler coding system than CPT4, it is likely that it would require a smaller number of coders. We have received communication from the NCCH indicating that, in Australia, on average, each coder can handle 25 to 30 discharges per day. There is considerable variation around this mean, depending on the type of facility and the individual coder – but this seems to be the average.
- 6.8.2 However, one should also bear in mind that, in Australia, there are extensive case-mix reporting requirements, and information is audited for payment and budgeting purposes. The South African experience may therefore be different.
- 6.8.3 In terms of the training of coders, the NCCH has indicated that they would be in a position to make available training manuals and engage in a “train the trainer” exercise in South Africa.

- 6.8.4 Training requirements for the introduction of a new coding schema (based on the requirements to implement ICD-10-AM, both diagnostic and procedural coding schemes) is estimated to be the following:
- Basic training – 2 weeks
 - Intermediate training – 1 week
 - Advanced training – ongoing distance learning
- 6.8.5 Whilst the training of all relevant hospital staff on a new coding system would be a challenge, the introduction of a new coding system will be a major challenge for medical practitioners outside the hospital environment.
- 6.8.6 It was clear in our discussions with the medical service provider role players that there would be significant resistance against the introduction of a new coding system for out-of-hospital procedures, for the following reasons:
- 6.8.6.1 Some disciplines have already done considerable work in removing problems within their existing NHRPL codes, such as Radiology.
- 6.8.6.2 ACHI codes are not well-developed for some disciplines relating to out-of-hospital treatment (e.g. allied health services), and this would have to be developed locally.
- 6.8.6.3 It is seen as a major shortcoming that ACHI codes do not contain RVUs, and that there would in any event have to be a re-pricing on the basis of the new codes. This is problematic for both medical service providers and medical schemes, as the financial impact of such re-structuring and re-pricing could be unpredictable. However, even if ACHI codes did contain RVUs, we would not be in a position to use them in South Africa, as there are significant differences in input costs, patient profiles, medical practice, and so on.
- 6.8.7 The health professions who attended our meeting indicated that they would not be in a position to carry the cost of training all their members in a new coding system, but that it would have to be carried by Government. Many medical service providers see the introduction of a new coding system as an unnecessary burden placed on the various disciplines.

6.9 What other costs would be incurred?

- 6.9.1 The main other costs that would be incurred include:
- 6.9.1.1 The cost of licensing. We tried to establish what this would be, but could not do so at the time of writing this report. It is, however, assumed that if Government wants to set ACHI as the new standard for South Africa, Government would have to obtain the license and pay for it. This seems to be a fair assumption given the fact that there is precedent for ACHI to be agreed on a Government-to-Government basis.
- 6.9.1.2 The cost of software upgrades for hospitals, medical service providers, and administrators. Whilst the cost of such upgrades would be noticeable for hospitals

and administrators, we got the impression that such costs are manageable. However, the cost of software for medical service providers might be more of an issue, and service providers would be unwilling to pay for any upgrades.

- 6.9.1.3 The cost of local development of ACHI codes, particularly for out-of-hospital services and allied health services.
- 6.9.1.4 The cost of governance of the introduction of new codes, the development of local coding guidelines and of local review of codes.
- 6.9.1.5 The cost of the development of cross-walks between ACHI and NHRPL and between ACHI and CPT.
- 6.9.2 It was beyond the scope of this report to determine the actual costs of these various components, especially in the absence of an official decision that South Africa should change its coding system or that we should introduce ACHI. Once a decision is made, these cost components will have to be investigated.

6.10 Given the shortcomings of out-of-hospital ACHI codes, would it not be best to introduce ACHI only for in-hospital coding?

- 6.10.1 There was generally little support for this course of action, except from medical service provider disciplines who practice mainly in out-of-hospital environments. For those medical service providers who practice in both in- and out-of-hospital environments, the maintenance of two (or perhaps even three if we include CPT) procedural coding systems was seen as impractical.
- 6.10.2 Medical scheme administrators did not support this route, but much prefer a single procedural coding system.
- 6.10.3 However, many of the parties who are not medical service provider organisations indicated that there are two critical requirements for the success of the introduction of a new coding system:
 - 6.10.3.1 It has to be legislated by Government
 - 6.10.3.2 The medical service provider community has to buy into the benefits of the new coding system
- 6.10.4 The use of multiple coding systems would clearly also not be to the advantage of Government if, for instance, Government wants to build up an electronic health record of every South African citizen, especially if it is the intention that this record would span services provided in both the public and private sectors.
- 6.10.5 Nevertheless, despite fairly general agreement that a new coding system should be a single coding system for in- and out-of-hospital, and for the private and public sectors, there is still the possibility that it might be introduced gradually and in a phased manner. There was unanimous agreement that a new coding system should not be introduced in a “big bang” manner, but there was also a call from several of the parties interviewed that we should commit shortly to a decision on which coding system to use, and then introduce any changes gradually with a clear picture and time line in mind on when we would arrive at the complete implementation of a new

coding system, if relevant. In other words, the uncertainty about coding systems should be removed as soon as possible.

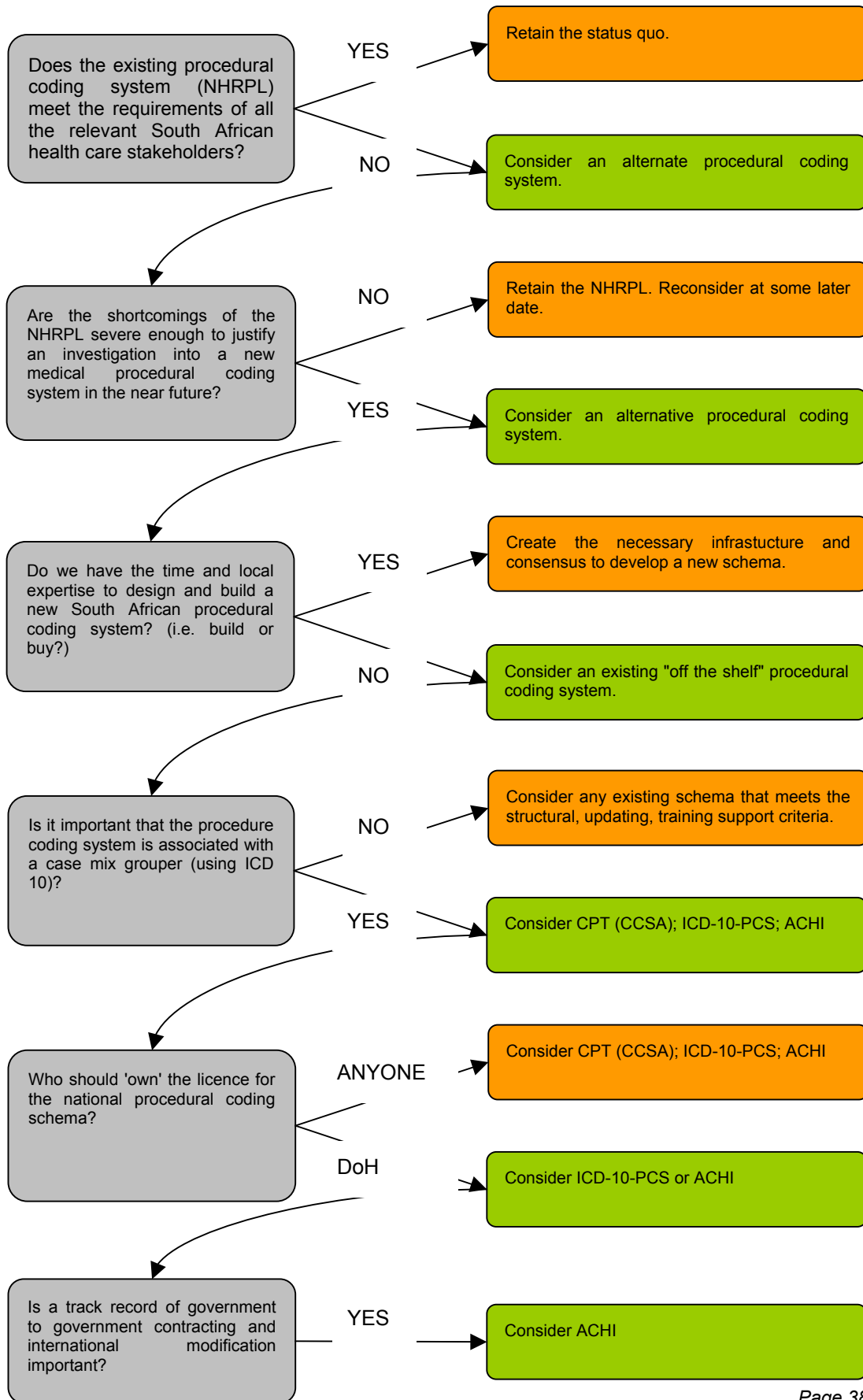
6.11 If ACHI is implemented, how will it be governed and who pays for it?

- 6.11.1 There would have to be three levels of governance relating to a new coding system:
- 6.11.1.1 High level regulatory responsibility and ensuring that the legislation on PMBs and other regulations are harmonised with the introduction of a new coding system. This is clearly the responsibility of Government.
 - 6.11.1.2 Code development, refinement and updating. As far as possible, we should rely on the codes already developed in Australia, but where we cannot, it seems desirable that this function be driven by an independent governance body, probably advised by academics, and also, importantly, involving the medical discipline whose codes are under review. This last part is important, as those who practice medicine should be in a position to determine the codes and descriptors that are necessary to describe the treatment that they provide, provided such codes and descriptions follow the conventions of the coding system and that duplication and vagueness is avoided.
 - 6.11.1.3 Billing or payment. This should be subject to an entirely separate process and regulatory framework, which is the way in which the proposed regulations under the National Health Act are developing in any event.
- 6.11.2 As mentioned above, there is a clear need for regulatory direction in respect of coding, but before we get there, it is important that there be sufficient buy-in from the industry, whether administrators, funders, medical service providers, or any other stakeholders, on the coding system to be adopted and the broad time lines in which this would be done. Given this, we believe that the cost of licensing of the coding system itself and the DRG grouper should be carried by Government and that it should be made available to the industry free of charge.
- 6.11.3 Such regulations should also set the framework for the independent governing body, and the constitution of its members. Note that the HPCSA believes that they should fulfill this role. There should clearly be substantial input from various disciplines and medical professional bodies, and the process of review and introduction of new codes should be simple. Again, the cost of this governing body has to be carried by Government and introduced in terms of enabling legislation.
- 6.11.4 The cost of billing studies would have to be carried by the medical professions, as is currently happening, and the cost of evaluating such studies would have to be carried by Government.

7 Recommendations

7.1 Decision Tree

- 7.1.1 The following is a decision tree indicating how we believe a decision should be made on whether to change to a new procedural coding system or not. In this section of the report, we conclude with recommendations on the basis of the literature review and interviews held with various parties.



- 7.1.2 It is clear from the above that one of the most critical decisions would be whether we have to have a DRG grouper generally available in the industry or not. It is our view that the availability of a software tool to analyse and interpret hospital events is of critical importance in the South African health care industry, given the large proportion of health care costs that go into hospitalisation.
- 7.1.3 However, this should not be seen only as a means of understanding, analysing and negotiation hospital costs, but of equal importance is the evaluation of health outcomes and quality of care. Whilst the concept of measuring quality has recently received considerable attention in the private sector industry, all current efforts are significantly limited by the limitations inherent in our procedural coding system and, more importantly, the absence of a DRG grouper with an adequate indication of disease staging and severity.
- 7.1.4 Given the comments received from a variety of players to whom hospitalisation is important, the introduction of a new and sensible hierarchical coding system coupled with a DRG grouper is essential and there is an urgent need for it.
- 7.1.5 It is clear that NHRPL has three major shortcomings:
- It is not hierarchical and not an intelligent coding system
 - It does not come with a DRG grouper
 - It has too many ambiguities and is vague, which results in inconsistent coding and uncertainty about actual services provided, as opposed to those coded, particularly resulting from distortions relating to remuneration.

7.2 Recommendations

- 7.2.1 As a result of this conclusion, we believe that the introduction of ACHI is really the only viable alternative for South Africa and we recommend that a parallel test environment be created for comparative testing in order to confirm / refute this claim.. The rest of our recommendations assume that ACHI is the coding system of choice.
- 7.2.2 However, all these players also acknowledge the challenges of such an introduction and recommend a phased approach. This would probably focus on hospitalisation first.
- 7.2.3 Even a phased approach will require a number of very important preliminary steps before going “live” in the first environment where it is introduced. These are:
- 7.2.3.1 Workshops on this report and its contents, and any other research done by various parties within South Africa, to conclude firmly whether a new coding system should be introduced or not, and whether ACHI is the preferred route.
- 7.2.3.2 The drafting of and introduction of enabling legislation for a single procedural coding system in South Africa, for both public and private sectors, and for both in- and out-of-hospital procedures.

7.2.3.3 Setting up the governance framework, with representation and powers of the governance body determined in such a way that medical disciplines determines to a large extent what new codes and descriptors are necessary to describe treatment actually provided, and representation from other stakeholders to ensure that:

7.2.3.3.1 The integrity of the coding system and codes is maintained

7.2.3.3.2 The descriptors are not vague

7.2.3.4 Commission the construction of a cross-walk between ACHI and NHRPL and between ACHI and CPT. See Appendix 2 for an example of such a cross-walk for a very small number of codes.

7.2.3.5 Do parallel testing of ACHI within a specific environment (preferably a hospital environment), to also decide on shortcomings and further areas of development.

7.2.3.6 Develop the ACHI coding system to cater better for out-of-hospital services and allied health services. This is clearly a large project, and would have to be done with substantial input from various medical disciplines.

7.2.3.7 Set up the processes and framework for the separate development of remuneration linked to ACHI codes.

7.2.4 In conclusion, whilst our study indicated a clear preference for ACHI amongst a large number of players, it is important that interested parties comment on this report to make sure that all points of view are reflected. We recommend that the BHF then sets up a consultative Working Group with broad representation to come up with final recommendations on the way forward, with the results of the deliberations of the Working Group presented to Government by around June 2007, if possible.

7.2.5 A significant part of the Working Group's mandate should be:

- To evaluate the need for prior testing of ACHI in restricted environments, and identifying the parties who will conduct such testing
- To decide on whether ACHI is indeed the best coding system for South Africa and make a clear recommendation on whether it should be introduced or not.
- To make recommendations on the process to be followed and the governance structures to be set up for the introduction of ACHI, and the likely time lines

Emile Stipp
BBusSc LLB FIA FASSA
In my capacity as
An employee of Deloitte & Touche

Dr Mark Ferreira
MB BCh M Fam Med
In my capacity as
an independent contractor

February 2007

Appendix 1: Comparison of Coding System used Internationally

Procedure Coding Schemas									
Procedure Coding Schema	Full Description	Custodian	Intention/Aim	Code Length	Code Structure	Example(s)	Version Control	Licensing	Additional Comments
CPT	Current Procedural Terminology	American Medical Association (AMA)	Doctor billing/reimbursement	5 characters	Numeric	42820 (Tonsillectomy)	Annual updates - 1 January	American Medical Association (AMA)/South African Medical Association (SAMA)	Not appropriate for use as a hospital procedure system - rules are too specific/clinical.
						44950 (Appendectomy)			http://www.ama-assn.org/ama/pub/category/3113.html
ICD-9-CM Procedure codes	International Classification of Diseases, version 9, Clinical Modification, Procedure Codes	Centre for Medicare and Medicaid Services (CMS) - USA together with NCHS (National Center for Health Statistics)	Hospital in-patient procedure coding/billing may link into DRG's for payment purposes.	2 to 4 characters	Numeric	20.41 (Simple mastoidectomy)	Annual updates - 1 October	CMS/Public domain	Clinically modified from ICD-9 by USA
						10.6 (Repair of laceration of conjunctiva)			Valid codes must be in the 3 or 4 character range of length.
									Includes codes for "other" procedures NEC.
									Possibility of running out of codes-range of codes exhausted due to being 15 years old already http://www.cms.hhs.gov/paymentsystems/icd9/icd9NewCodes.asp
ACHI (ICD-10 AM Procedure Classification)	Australian Classification of Health Interventions (used to be called ICD-10-AM procedures)	NCC (National Coding Authority) who are part of the National Coding Board; were Tasked by	Hospital, doctor, dentist and minor allied-professional coding and billing	7 characters	Numeric, Multiaxial (similar in structure and concept to ICD-	36561-00 (Closed Biopsy of Kidney)	Biennially (every 2nd year, July)	Public domain within Australia. Outside Australia, license through the NCCH (National Center for	Originally based on the British Commonwealth Medicare Benefit Schedule (MBS). http://www3.fhs.usyd.edu.au/ncchwww/site/4.1.3.htm
ICD-10-PCS	NOT called International Classification of Diseases, simply called "ICD-10" Procedure Coding System. This title was adopted to link the procedure coding system to the disease classification ICD-10-CM.	HCFA (Healthcare Finance Administration) is responsible for the Centre for Medicare and Medicaid Services inpatient procedures (CMS) - USA	New procedure coding system to be used along with ICD-10-CM. To accommodate hospital inpatient and ? doctor procedure coding. This is an entirely new, free-standing coding system which is NOT a modification of any other system, unlike ICD-10-CM diagnosis codes which are a modification of the 'parent' ICD-10.	7 character	Multiaxial; alpha-numeric. Each code character has been determined to have the same meaning within a specific procedure section and across multiple procedure sections.	00B00ZZ (Excision, Brain, Open) 0TQBZZZ (Repair, Urethra, External Approach)	Assume annual	? Public domain in future	HCFA tasked 3M HIS to develop PCS to replace ICD-9-CM proc codes for inpt procedures. High level of specificity with objective of completeness (has building blocks for 52 billion procedures) Future procedures and technologies can be accommodated, thus high level of expandability Digits 0-9, letters A-H, J-N, P-Z (Letters O and I have been avoided due to confusion with numerics 0 and 1). NOS option is not provided NEC option is limited Exact date of roll-out in USA unknown. Final testing stages. http://www.cms.hhs.gov/providers/pufdownload/icd10pcs.pdf
OPCS-4	Office of Population, Census, Surveys	National Health System (NHS) -UK	Hospital, doctor and anaesthetist procedure coding/billing.	5 characters	Alpha numeric, alpha alpha numeric, or all numeric	J6900 (Spenectomy) XR250 (Angioplasty) 20110 (ECG)	Ad-hoc	National Health System (NHS)	No updates for past 10 years. Group outside NHS tasked with future updates (Clinical Classification Schedule Development Group -CCSD) CCSD Roll-out anticipated January 2006. http://www.nhsia.nhs.uk/clinicalcoding/pages/opcs4_prod.asp

Appendix 2: Comparison of Coding System used in South Africa with ACHI

Procedure	NHRPL Code	NHRPL Code Description	CCSA Code	CCSA Code Description	ACHI Code	ACHI Code description	ACHI Code with Block
Tonsillectomy	1101	Tonsillectomy (dissection of the tonsils)	42825	Tonsillectomy, primary or secondary; under age 12	41789-00	Tonsillectomy without adenoidectomy	41789-00 [412]
			42826	Tonsillectomy, primary or secondary; age 12 or over			
Tonsillectomy	1102	Laser tonsillectomy	42825	Tonsillectomy, primary or secondary; under age 12			
			42826	Tonsillectomy, primary or secondary; age 12 or over			
Adenoidectomy	1105	Removal of adenoids	42830	Adenoidectomy, primary; under age 12	41801-00	Adenoidectomy without tonsillectomy	41801-00 [412]
			42831	Adenoidectomy, primary; age 12 or over			
			42835	Adenoidectomy, secondary; under age 12			
			42836	Adenoidectomy, secondary; age 12 or over			
Tonsillectomy and	1101	Tonsillectomy (dissection of the tonsils) and	42820	Tonsillectomy and adenoidectomy; under age 12	41789-01	Tonsillectomy with adenoidectomy	41789-01 [412]
Adenoidectomy	1105	Removal of adenoids					
Tonsillectomy and	1101	Tonsillectomy (dissection of the tonsils) and	42821	Tonsillectomy and adenoidectomy; age 12 or over	41789-01	Tonsillectomy with adenoidectomy	41789-01 [412]
Adenoidectomy	1105	Removal of adenoids					
Other for Ts & A's	1111	Post tonsillectomy or adenoidectomy haemorrhage	42960	Control oropharyngeal haemorrhage, primary or secondary (e.g., post-tonsillectomy); simple	41797-00	Arrest of haemorrhage following tonsillectomy and adenoidectomy	41797-00 [410]
			42961	Control oropharyngeal haemorrhage, primary or secondary (e.g., post-tonsillectomy); complicated, requiring hospitalisation			
			42962	Control oropharyngeal haemorrhage, primary or secondary (e.g., post-tonsillectomy); with secondary surgical intervention			
			42970	Control of nasopharyngeal haemorrhage, primary or secondary (e.g., postadenoidectomy); simple, with posterior nasal packs, with or without anterior packs and/or cauterisation			
			42971	Control of nasopharyngeal haemorrhage, primary or secondary (e.g., postadenoidectomy); complicated, requiring hospitalisation			
			42972	Control of nasopharyngeal haemorrhage, primary or secondary (e.g., postadenoidectomy); with secondary surgical intervention			
CABG	1348	Aorta-coronary bypass operation (including interpretation of angiogram); Utilizing saphenous veins	33510	Coronary artery bypass, vein only; single coronary venous graft	38497-00	Coronary artery bypass, using 1 saphenous vein graft	38497-00 [672]
			33511	Coronary artery bypass, vein only; two coronary venous grafts	38497-01	Coronary artery bypass, using 2 saphenous vein grafts	38497-01 [672]
			33512	Coronary artery bypass, vein only; three coronary venous grafts	38497-02	Coronary artery bypass, using 3 saphenous vein grafts	38497-02 [672]
			33513	Coronary artery bypass, vein only; four coronary venous grafts			

Investigation into Procedural Coding for South Africa

Procedure	NHRPL Code	NHRPL Code Description	CCSA Code	CCSA Code Description	ACHI Code	ACHI Code description	ACHI Code with Block
CABG	1349	Aorta-coronary bypass operation (including interpretation of angiogram): Additional arterial implant: Any artery	33517	Coronary artery bypass, using venous graft(s) and arterial graft(s); single vein graft (List separately in addition to code for arterial graft)	Use a combination of ACHI codes		
			33518	Coronary artery bypass, using venous graft(s) and arterial graft(s); two venous grafts (List separately in addition to code for arterial graft)			
			33519	Coronary artery bypass, using venous graft(s) and arterial graft(s); three venous grafts (List separately in addition to code for arterial graft)			
			33521	Coronary artery bypass, using venous graft(s) and arterial graft(s); four venous grafts (List separately in addition to code for arterial graft)			
			33522	Coronary artery bypass, using venous graft(s) and arterial graft(s); five venous grafts (List separately in addition to code for arterial graft)			
			33523	Coronary artery bypass, using venous graft(s) and arterial graft(s); six or more venous grafts (List separately in addition to code for arterial graft)			
CABG	1350	Aorta-coronary bypass operation (including interpretation of angiogram): Additional double arterial implant: Any artery	33533	Coronary artery bypass, using arterial graft(s); single arterial graft	38500-00	Coronary artery bypass, using 1 left internal mammary artery [LIMA] graft	38500-00 [674]
			33534	Coronary artery bypass, using arterial graft(s); two coronary arterial grafts	38503-00	Coronary artery bypass, using =/ > 2 left internal mammary artery [LIMA] grafts	38503-00 [674]
			33536	Coronary artery bypass, using arterial graft(s); four or more coronary arterial grafts	38500-01	Coronary artery bypass, using 1 right internal mammary artery [RIMA] grafts	38500-01 [675]
			33545	Repair of postinfarction ventricular septal defect, with or without myocardial resection	38503-01	Coronary artery bypass, using =/ > 2 right internal mammary artery [RIMA] grafts	38503-01 [675]
					38500-02	Coronary artery bypass, using 1 radial artery graft	38500-02 [676]
					38503-02	Coronary artery bypass, using =/ > 2 radial artery grafts	38503-02 [676]
					38500-03	Coronary artery bypass, using 1 epigastric artery graft	38500-03 [677]
					38503-03	Coronary artery bypass, using =/ > 2 epigastric artery grafts	38503-03 [677]
					38500-04	Coronary artery bypass, using 1 other arterial graft	38500-04 [678]
					38503-04	Coronary artery bypass, using =/ > 2 other arterial grafts	38503-04 [678]

Investigation into Procedural Coding for South Africa

Procedure	NHRPL Code	NHRPL Code Description	CCSA Code	CCSA Code Description	ACHI Code	ACHI Code description	ACHI Code with Block			
CABG - Other			35500	Harvest of upper extremity vein, one segment, for lower extremity or coronary artery bypass procedure (List separately in addition to code for primary procedure)						
			35572	Harvest of femoropopliteal vein, one segment, for vascular reconstruction procedure (e.g., aortic, vena caval, coronary, peripheral artery) (List separately in addition to code for primary procedure)						
			35600	Harvest of upper extremity artery, one segment, for coronary artery bypass procedure						
								38497-04	Coronary artery bypass, using 1 other venous graft	38497-04 [673]
								38497-05	Coronary artery bypass, using 2 other venous grafts	38497-05 [673]
								38497-06	Coronary artery bypass, using 3 other venous grafts	38497-06 [673]
								38497-07	Coronary artery bypass, using =/ > 4 other venous grafts	38497-07 [673]
								90201-00	Coronary artery bypass, using 1 other material graft, not elsewhere classified	90201-00 [679]
								90201-01	Coronary artery bypass, using 2 other material grafts, not elsewhere classified	90201-01 [679]
								90201-02	Coronary artery bypass, using 3 other material grafts, not elsewhere classified	90201-02 [679]
		90201-03	Coronary artery bypass, using =/ > 4 other material grafts, not elsewhere classified	90201-03 [679]						
				38637-00	Reoperation for reconstruction of occluded coronary artery graft	38637-00 [680]				
CABG and Endarterectomy			33572	Coronary endarterectomy, open, any method, of left anterior descending, circumflex, or right coronary artery performed in conjunction with coronary artery bypass graft procedure, each vessel (List separately in addition to primary procedure)	38505-00	Open coronary endarterectomy	38505-00 [669]			
ECG	1228	General Practitioner's fee for the taking of an ECG only: Without effort: ½ (item 1232)	93005	Electrocardiogram, routine ECG with at least 12 leads; tracing only, without interpretation and report	11700-00	Other electrocardiography [ECG]	11700-00 [1855]			
ECG	1229	General Practitioner's fee for the taking of an ECG only: Without and with effort: ½ (item 1233)	93016	Cardiovascular stress test using maximal or submaximal treadmill or bicycle exercise, continuous electro-cardiographic monitoring, and/or pharmacological stress; doctor supervision only, without interpretation and report	11712-00	Cardiovascular stress test	11712-00 [1857]			
			93017	Cardiovascular stress test using maximal or submaximal treadmill or bicycle exercise, continuous electro-cardiographic monitoring, and/or pharmacological stress; tracing only, without interpretation and report						

Investigation into Procedural Coding for South Africa

Procedure	NHRPL Code	NHRPL Code Description	CCSA Code	CCSA Code Description	ACHI Code	ACHI Code description	ACHI Code with Block
ECG	1231	Physician's fee for interpreting an ECG: With and without effort	93018	Cardiovascular stress test using maximal or submaximal treadmill or bicycle exercise, continuous electro-cardiographic monitoring, and/or pharmacological stress; interpretation and report only			
ECG	1232	Electrocardiogram: Without effort	93000	Electrocardiogram, routine ECG with at least 12 leads; with interpretation and report	11700-00	Other electrocardiography [ECG]	11700-00 [1855]
ECG	1233	Electrocardiogram: With and without effort	93015	Cardiovascular stress test using maximal or submaximal treadmill or bicycle exercise, continuous electro-cardiographic monitoring, and/or pharmacological stress; with doctor supervision, with interpretation and report	11712-00	Cardiovascular stress test	11712-00 [1857]
ECG	1234	Effort electrocardiogram with the aid of a special bicycle ergometer, monitoring apparatus and availability of associated apparatus	93015	Cardiovascular stress test using maximal or submaximal treadmill or bicycle exercise, continuous electro-cardiographic monitoring, and/or pharmacological stress; with doctor supervision, with interpretation and report			
ECG	1235	Multi-stage treadmill test	93015	Cardiovascular stress test using maximal or submaximal treadmill or bicycle exercise, continuous electro-cardiographic monitoring, and/or pharmacological stress; with doctor supervision, with interpretation and report			
ECG	1236	Electrocardiogram without effort: Under 4 years old	93000	Electrocardiogram, routine ECG with at least 12 leads; with interpretation and report			
ECG	1237	24 Hour ambulatory blood pressure: Hire fee	99070	Supplies and materials (except spectacles), provided by the doctor over and above those usually included with the office visit or other services rendered (list drugs, trays, supplies, or materials provided) - Cost of material PLUS an appropriate handling fee			
	1238	24 Hour ambulatory ECG monitoring (holter): Hire fee					
	1239	24 Hour ambulatory ECG monitoring (holter): Interpretation	93227	Electro-cardiographic monitoring for 24 hours by continuous original ECG waveform recording and storage, with visual superimposition scanning; doctor review and interpretation	11708-00	Ambulatory continuous ECG recording	11708-00 [1853]
					11709-00	Holter ambulatory continuous ECG recording	11709-00 [1853]
ECG	1240	Signal averaged electrocardiogram	93278	Signal-averaged electrocardiography (SAECG), with or without ECG	11713-00	Signal averaged ECG recording	11713-00 [1855]

Investigation into Procedural Coding for South Africa

Procedure	NHRPL Code	NHRPL Code Description	CCSA Code	CCSA Code Description	ACHI Code	ACHI Code description	ACHI Code with Block
ECG Other			93012	Telephonic transmission of post-symptom electrocardiogram rhythm strip(s), 24-hour attended monitoring, per 30 day period of time; tracing only			
			93014	Telephonic transmission of post-symptom electrocardiogram rhythm strip(s), 24-hour attended monitoring, per 30 day period of time; doctor review with interpretation and report only			
			93024	Ergonovine provocation test			
			93025	Microvolt T-wave alternans for assessment of ventricular arrhythmias			
			93040	Rhythm ECG, one to three leads; with interpretation and report			
			93041	Rhythm ECG, one to three leads; tracing only without interpretation and report			
			93042	Rhythm ECG, one to three leads; interpretation and report only			
			93224	Electro-cardiographic monitoring for 24 hours by continuous original ECG waveform recording and storage, with visual superimposition scanning; includes recording, scanning analysis with report, doctor review and interpretation			
			93225	Electro-cardiographic monitoring for 24 hours by continuous original ECG waveform recording and storage, with visual superimposition scanning; recording (includes hook-up, recording, and disconnection)			
			93226	Electro-cardiographic monitoring for 24 hours by continuous original ECG waveform recording and storage, with visual superimposition scanning; scanning analysis with report			
			93230	Electro-cardiographic monitoring for 24 hours by continuous original ECG waveform recording and storage without superimposition scanning utilising a device capable of producing a full miniaturised printout; includes recording, microprocessor-based analysis with report, doctor review and interpretation			
			93231	Electro-cardiographic monitoring for 24 hours by continuous original ECG waveform recording and storage without superimposition scanning utilising a device capable of producing a full miniaturised printout; recording (includes hook-up, recording, and disconnection)			

Investigation into Procedural Coding for South Africa

Procedure	NHRPL Code	NHRPL Code Description	CCSA Code	CCSA Code Description	ACHI Code	ACHI Code description	ACHI Code with Block
ECG other			93232	Electro-cardiographic monitoring for 24 hours by continuous original ECG waveform recording and storage without superimposition scanning utilising a device capable of producing a full miniaturised printout; microprocessor-based analysis with report			
			93233	Electro-cardiographic monitoring for 24 hours by continuous original ECG waveform recording and storage without superimposition scanning utilising a device capable of producing a full miniaturised printout; doctor review and interpretation			
			93235	Electro-cardiographic monitoring for 24 hours by continuous computerised monitoring and non-continuous recording, and real-time data analysis utilising a device capable of producing intermittent full-sized waveform tracings, possibly patient activated; includes monitoring and real-time data analysis with report, doctor review and interpretation			
			93236	Electro-cardiographic monitoring for 24 hours by continuous computerised monitoring and non-continuous recording, and real-time data analysis utilising a device capable of producing intermittent full-sized waveform tracings, possibly patient activated; monitoring and real-time data analysis with report			
			93237	Electrocardiographic monitoring for 24 hours by continuous computerised monitoring and non-continuous recording, and real-time data analysis utilising a device capable of producing intermittent full-sized waveform tracings, possibly patient activated; doctor review and interpretation			
			93268	Patient demand single or multiple event recording with presymptom memory loop, 24-hour attended monitoring, per 30 day period of time; includes transmission, doctor review and interpretation			
			93270	Patient demand single or multiple event recording with presymptom memory loop, 24-hour attended monitoring, per 30 day period of time; recording (includes hook-up, recording, and disconnection)			

Investigation into Procedural Coding for South Africa

Procedure	NHRPL Code	NHRPL Code Description	CCSA Code	CCSA Code Description	ACHI Code	ACHI Code description	ACHI Code with Block
ECG other			93271	Patient demand single or multiple event recording with presymptom memory loop, 24-hour attended monitoring, per 30 day period of time; monitoring, receipt of transmissions, and analysis			
					11710-00	Patient activated ambulatory ECG monitoring, recording for at least 20 seconds prior to and 15 seconds after each activation	11710-00 [1854]
					11711-00	Patient activated ambulatory ECG monitoring, recording for at least 30 seconds after each activation	11711-00 [1854]
					11706-00	Phonocardiography with electrocardiograph [ECG] lead	11706-00 [1855]
					11706-01	Phonocardiography with electrocardiograph [ECG] lead with apex cardiogram	11706-01 [1855]
Nebulisation	1136	Nebulisation (in rooms)	94640	Pressurised or nonpressurised inhalation treatment for acute airway obstruction or for sputum induction for diagnostic purposes (e.g., with an aerosol generator, nebulizer, metered dose inhaler or intermittent positive pressure breathing (IPPB) device)	92043-00	Respiratory medication administered by nebuliser	92043-00 [1889]