

National Centre for Classification in
Health



PROFESSIONAL RELATIVITIES STUDY

RESOURCE MATERIAL D

PRS Method October 1998

*NCCH methodology for the PRS ie method for the
development of medical work relative values for MBS
items. Submitted to and endorsed by the MSRB in 1998.*

prepared for

Medicare Schedule Review Board
December 2000

National Centre for Classification in



PROFESSIONAL RELATIVITIES



METHOD

prepared for

Medicare Schedule Review Board
Relative Value Study – Stage 2
October 1998

PROFESSIONAL RELATIVITIES STUDY

METHOD

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Glossary

APPRMS	Advisory Panel on Professional Relativities in Medical Services
CCs	Clinician Consultants
CGs	Consensus Groups
CGAI	Consensus Group on Attendance Items
CGPI	Consensus Groups on Procedural Items
CPT	Current Procedural Terminology (American Medical Association)
DHFS	Department of Health and Family Services
MBS	Medicare Benefits Schedule
MSRB	Medicare Schedule Review Board
MSRTF	Medicare Schedule Review Task Force
NCCH	National Centre for Classification in Health
PRS	Professional Relativities Study
PRTC	Professional Relativities Technical Committee
RBRV	Resource Based Relative Value
RBRVS	Resource Based Relative Value Scale
RVU	Relative Value Unit

1. INTRODUCTION

The purpose of this paper is to inform all those involved in the Professional Relativities Study of the principles underlying the determination of relative values for items in the Medicare Benefits Schedule.

The Professional Relativities Study is being conducted by the National Centre for Classification in Health for the Medicare Schedule Review Board (the Board) to develop a set of relative value units (for professional work) for items in the Medicare Benefits Schedule (MBS).

The study is one of three projects being conducted as part of the Relative Value Study under the direction of the Board and the Medicare Schedule Review Task Force (the Task Force). The other two projects, Remuneration Rates Study and Practice Costs Study, are being undertaken as separate consultancies. The outcome of the studies will be a set of resource based relative values for medical services in the MBS. An overview of the Relative Value Study¹ is provided in *Appendix B1*.

1.1 Feasibility Study

The professional relativities definitive study follows on from a feasibility study carried out in 1996 and early 1997 by the National Centre for Classification in Health for the Board to examine the potential for mapping the professional components of services described in overseas schedules to the MBS.

The overall aim of testing the mapping between the MBS and the American Medical Association's Current Procedural Terminology (CPT) was to see if the work related resource based relative value units developed in the United States during the 1980s and applied to the American CPT (US RVUs) could also be applied to mapped MBS items. Only the Therapeutic Procedures in Category 3 of the MBS were in scope for the feasibility study. That study demonstrated that it is possible to map between MBS and CPT and to gain consensus from expert clinicians on relative intraservice work (time and intensity) for items in the MBS. However, the maps are not sufficiently robust on their own to determine the relative values of the mapped MBS items. As a result a definitive study was designed to use appropriate maps for certain items (core items) to inform about relative value units (RVUs) for all items.

¹ Relative Value Study – this is the second stage of the Medicare Schedule Review which commenced in 1995 to review medical services and fee relativities in the MBS.

1.2 Definitive Study

The Professional Relativities Study requires Australian clinician input to develop professional work content relative values for all specialties. Data to be used include maps between MBS and CPT and clinicians estimates of time and ratings of intensity. The relative value units determined for core items will be used to establish relative values for all items within a specialty. Work related relative values were developed in the United States for CPT codes. These relative values for the relevant CPT codes² will be assumed to apply to the corresponding core MBS items.

The definitive study uses concepts drawn from the work of William C. Hsiao and colleagues (1988)³ and develops definitions and methods for MBS and the Australian clinical context. The study covers over 32 craft groups (see *Appendix A - Stage 2*) and the following categories within the MBS:

- Category 1 - Professional Attendances
- Category 2 - Diagnostic Procedures and Investigations
- Category 3 - Therapeutic Procedures
- Category 4 - Oral and Maxillofacial Services

New attendance items developed under Phase 1 of the Relative Value Study will be adopted. These items will replace most of the current items in Category 1 – Professional Attendances of the MBS.

The study requires a complex organisational effort to bring together specialty groups of clinicians and technical advisers in a series of meetings which are interrelated and which will result in advice and reporting to the Board at regular intervals. The roles of the clinical groups involved in the study are presented in *Appendix A - Stage 1*.

The three projects which make up the Relative Value Study are integrated by a formula developed by the Board and the Task Force (see *Appendix B2*). The mechanism to convert professional work relative values to dollars is via the constants Ep^4 in the formula. In this context it should be emphasised that the development of item specific relative values for professional work is independent of total specialty remuneration.

² It is important to note that there is no intention to adopt CPT codes or descriptors in the MBS as these are copyright to the American Medical Association.

³ Hsiao WC, Yntema DB, Braun P et al: Measurement and Analysis of Intraservice Work: *JAMA* 1988;260:2361-2370.

⁴ Ep = standard or base earning rate per relative value unit for that specialty or class of practitioner taking into account the human capital investment that is relevant to that specialty or class.

2. PRS METHOD

2.1 Overview of Study Method

The ultimate outcome of the PRS project is a set of professional work related Relative Value Units (RVUs) for each item in Categories 1-4 of the MBS (June 1997). RVUs will be formula based to:

- (a) make explicit the basis for the Resource Based Relative Value Scale (RBRVS)
- (b) maximise acceptance by the medical community, and
- (c) facilitate future updates

The method is described in detail in Appendix A. It comprises nine stages which are outlined below with references to the relevant pages of Appendix A.

STAGES of the PRS

- | | |
|----------------|--|
| STAGE 1 | Establish rules and regulations for study (A2) |
| STAGE 2 | Allocate MBS items to specialties for RVU development (A3) |
| STAGE 3 | Map MBS/CPT items (A4) |
| STAGE 4 | Rank items based on total work value, estimate times and rate intensities for all items (A5-A7) |
| STAGE 5 | Regress rankings against times and intensity ratings. Develop formulae. Estimate efficacy of formulae and their consistency with rankings (A8-A10) |
| STAGE 6 | Choose core items based on good maps, MBS item ranks and frequencies (A11) |
| STAGE 7 | Draft RVUs for core items based on the US RVUs from good maps and information on times and intensity ratings (A12) |
| STAGE 8 | Project RVUs to remaining items using rankings and results from core items (A13-A15) |
| STAGE 9 | Determine formula and test application to RVUs for all items (A16) |
-

STAGE 1 Establish rules and regulations for study

A Professional Relativities Technical Committee has been established. It is responsible for recommending definitions, rules and criteria for application throughout the study. The Committee comprises representatives from across the profession including general practitioners, surgeons, physicians and an anaesthetist.

STAGE 2 Allocate MBS items to specialties for RVU development

Information received from the Medicare Benefits Branch of the Department of Health and Family Services (ie frequencies of services provided by MBS item numbers for specialty groups) was analysed in order to allocate items to specialties. The most important consideration was that the specialty groups to be allocated the items, were the groups who were doing the work (ie providing the services).

Specialty groups were allocated items on the basis that the specialty provided most services for the item in proportion to the total number of services provided by that specialty or that the specialty group provided the highest number of services for the item.

In many cases where items were performed by several specialists, items were allocated to more than one specialty; preferably a maximum of two specialty groups per item. These will become the **link items** between specialties.

A list of Specialty Groups approved by the Board is provided in *Appendix A – Stage 4B*.⁵ Item allocation will be checked by clinician consultants⁶ and consensus groups⁷.

The new attendance items (refer p. 2) will be submitted to all specialty groups for review. Attendance items for patients seen on a non referred basis will be submitted to the general practice specialty; items for referred patients will be submitted to all other specialty groups.

⁵ Initially, 32 specialty groups were allocated items. For the consensus group process, several specialties have been merged with other specialties to ensure that a sufficient number of procedural items are reviewed by each group (refer Appendix A – Stage 4B). Where specialties were combined, a selection of MBS items was manually allocated to extra specialties within the group to act as link items in the merging process.

⁶ Clinician Consultants - the role of clinician consultants involves preliminary technical work (ie ranking and rating of items and review of maps) to assist the NCCH in presenting information to consensus groups. Clinician Consultant groups comprised 1 or 2 clinicians from each specialty and worked directly with the NCCH.

⁷ Consensus Groups - all specialty groups undertaking procedural work have been asked to nominate members to participate in consensus groups on procedural items. CG members were nominated by specialist colleges, societies and associations. A single consensus group on attendance items has been formed with broader representation across major specialty categories. The consensus groups will determine relativities for items in the MBS and refer these results to the Advisory Panel on Professional Relativities in Medical Services for confirmation and final recommendations to the Board.

STAGE 3 **Map MBS/CPT items**

The MBS items are being mapped to CPT codes to indicate appropriate US RVUs for use in the Study⁸. Mapping is being undertaken from MBS items to CPT codes (forward maps) and from CPT codes to MBS items (backward maps). The 'goodness' of the map (ie items which map well between the schedules) will be used as one of the criteria for the selection of **core items** for which the initial RVUs will be obtained.

Good maps will be determined from the map ratio and rating and consistency of terminology between MBS items and CPT codes. Maps will be reviewed by clinician consultants and confirmed by consensus groups.

STAGE 4 **Rank items based on total work value, estimate times and rate intensities for all items.**

In order to choose core items, test formulae and ensure the ability to replicate RVUs for MBS items, it is necessary to rank the items within each specialty in terms of their **total work value**. Ranking⁹ is necessary to enable the relative value determinations for the core items to be projected to the remaining items. It will also serve as the focal point in the development of the final formula. Three time estimates are sought: pre service time, intra service time and post service time. Ratings of intensity¹⁰ are being sought on a 0-10 scale for: cognitive skill, clinical judgement and communication skills; technical skill and physical effort; and stress due to risk. Detailed definitions of the individual times and intensity components are contained in Appendix A Stage 1.

Initial rankings were completed by clinician consultants and then referred to the consensus groups for review. Validity checks on estimated times will be undertaken using sources such as theatre times from Australian hospitals and studies of Australian hospital operating theatres for clinical costing purposes¹¹.

⁸ US RVUs - Medicare RBRVS: The Physicians' Guide, American Medical Association, 1997.

⁹ Ranking means the ordering of items from 1-N where 1 is the item of most value to the specialty and N is the total number of MBS items for the specialty.

¹⁰ Rating means giving a score on a predetermined scale. In the PRS, ratings should be spread across the range of 0-10 (decimals can be used which gives up to 100 rating points).

¹¹ Details of the time estimation validation method are set out in Appendix C.

STAGE 5 Regress rankings against times and intensity ratings. Develop formulae. Estimate efficacy of formulae and their consistency with rankings.

Regression analysis¹² will be used within specialty to explain the ranking of total work value in terms of times and intensity. This will have two purposes: firstly to test possible formulae and secondly to provide feedback to the clinical groups about their rankings and ratings. It is also necessary at this stage to ensure that link items (ie MBS items reviewed by more than one group) are ranked in the same order by different specialties. RVUs cannot be developed if link items are misaligned across specialties. Information about rankings and ratings will be referred to the appropriate clinical group for review.

STAGE 6 Choose core items based on good maps, MBS item ranks and frequencies.

Core item selection will be based on the rankings provided by the clinical groups and the mapping and frequency data. Core items should ideally be high frequency items, which have good maps and are evenly distributed throughout each group's rankings. Core items will be confirmed by consensus groups. Core items will be used to ascertain US RVUs; link items will be used to align items across specialties. There may be situations where a core item is also a link item.

STAGE 7 Draft RVUs for core items based on the US RVUs and the time and intensity ratings data.

US RVUs for CPT codes mapped to core items will be provided to the clinical groups to review, using time estimates, intensity ratings and other information. While the ranking of items and the estimation of times and the ratings of effort, skill and stress are significant data for the estimation of a final formula; **they do not link this final formula to a fiscally viable relative value**¹³. This step is accomplished by the RVU estimation for the core items. In this light the estimation of RVUs for the core items can be viewed as a calibration. All US RVUs on core items which do not align with the specialty rankings will be referred to the Medicare Schedule Review

¹² Regression Analysis – Determination of the relationship between a dependent variable and a number of other variables (independent variables) by statistical means

¹³ In this context a fiscally viable relative value means one that can be scaled to provide an absolute value of professional work content.

Board. Otherwise they will be accepted as accurate and will form the basis of our relative value determination.

STAGE 8 Project RVUs to remaining items using rankings and results from core items.

This will initially be accomplished via interpolation using the rankings and later revised on the basis of time estimates and ratings of intensity. These results will be referred to the consensus groups and the Advisory Panel on Professional Relativities in Medical Services for confirmation.

STAGE 9 Determine formula and test application to RVUs for all items

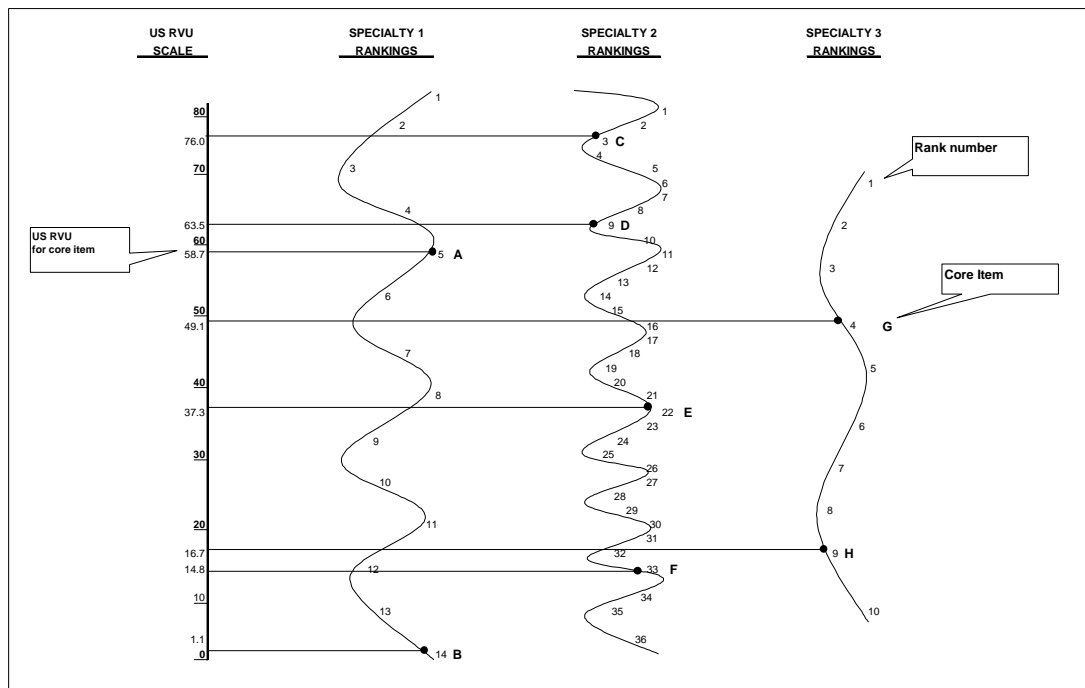
The regression analysis of Stage 5 will be repeated using the full data and the interpolation of non-core RVUs will be refined accordingly. The results will be referred to the Advisory Panel on Professional Relativities in Medical Services for confirmation.

2.2 Detail of Study Outputs

Because Stages 8 and 9 define the outputs of the study and an understanding of them is important, they are described in more detail below. For completeness they are also included in Appendix A together with the full details of Stages 1 to 7. The critical role of core and link items is also explained.

Figure 1 shows the US RVU scale together with the rankings of three specialties. Also shown are eight core items A-H. (viz. specialty 1 items ranked 5, 14; specialty 2 items ranked 3, 9, 22, 33; and specialty 3 items ranked 4, 9). These core items anchor the particular points on the ranking scales to the US RVU scale. However, between these anchor points and outside their range we are not able to assign RVUs with any degree of precision. The accuracy might be acceptable between E and F for specialty 2 but there could be gross errors above A for specialty 1. Additional information is therefore needed to assist with interpolation and extrapolation. This is provided through use of the link items.

Figure 1

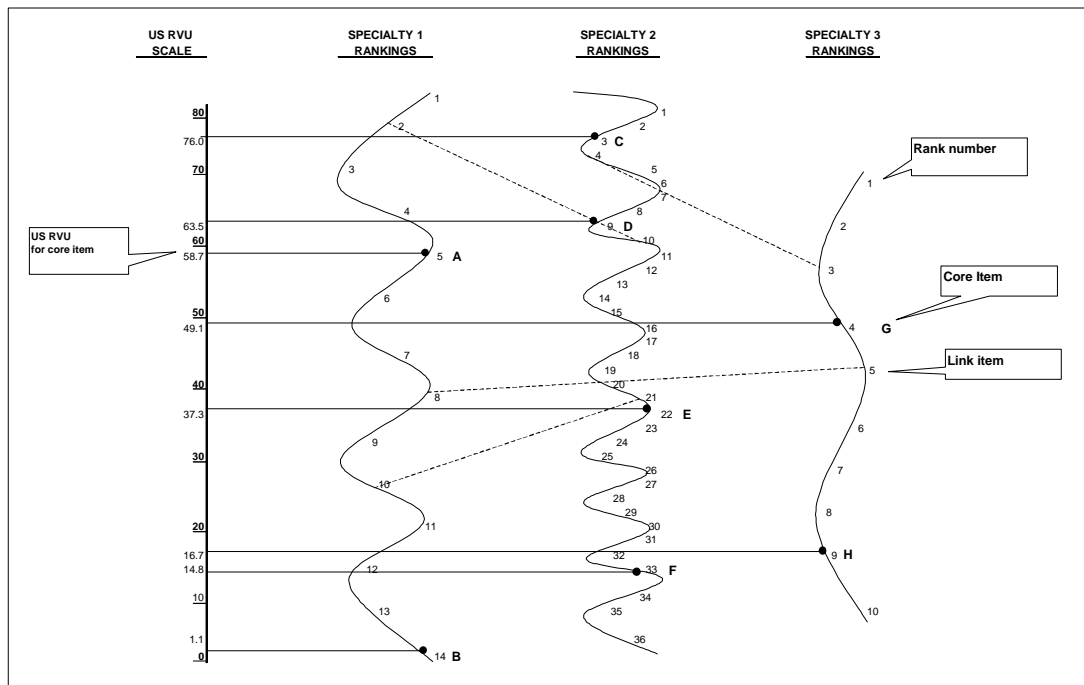


Let us suppose that:

Specialty 1 item ranked 2 is the same as specialty 2 item ranked 10;
 Specialty 1 item ranked 8 is the same as specialty 3 item ranked 5;
 Specialty 1 item ranked 10 is the same as specialty 2 item ranked 21; and
 Specialty 2 item ranked 4 is the same as specialty 3 item ranked 3.

These links are shown as broken lines on Figure 2 below.

Figure 2

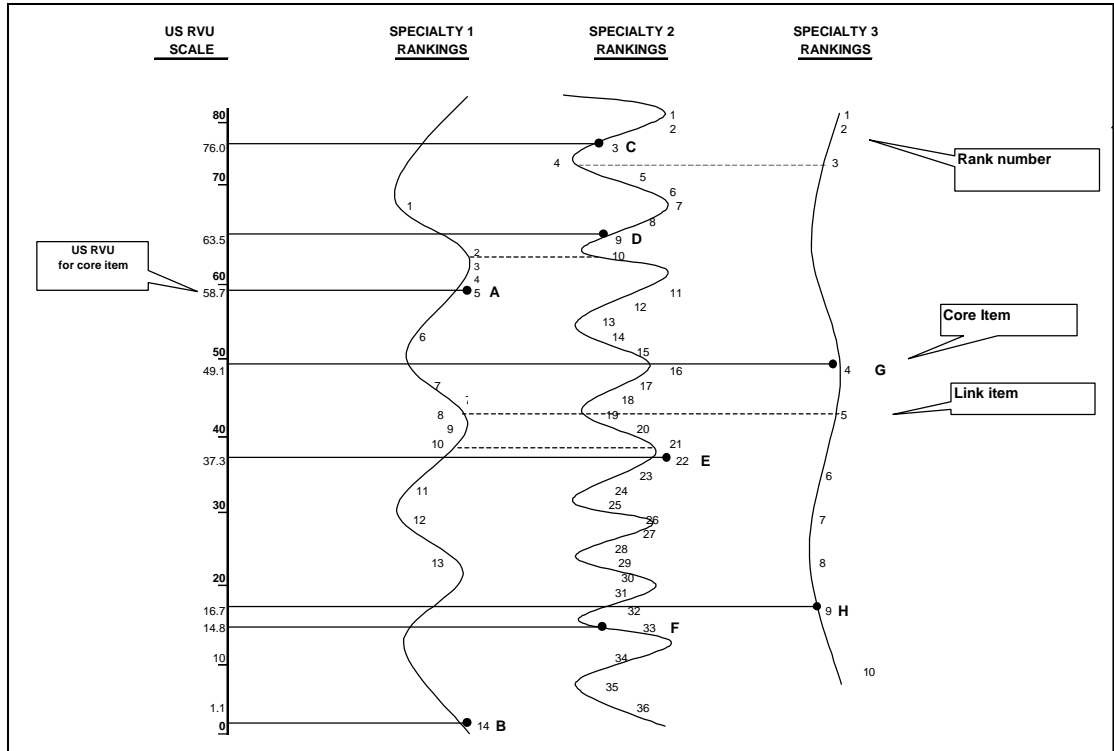


A little reflection now tells us that the link items are providing us with a lot of information. Clearly Figure 2 needs to be redrawn with the link lines parallel to the core anchor lines. Furthermore:

- Specialty 1 item 2 needs to be lowered to a US RVU below 63.5;
- Specialty 1 item 10 needs to be raised to a US RVU above 37.3; and
- Specialty 3 item 3 needs to be raised to a US RVU above 63.5.

Figure 3 over page is the result of the redraw of Figure 2. We still cannot be sure of the precise RVUs for the non core items, but there is far less scope for measurement error.

Figure 3



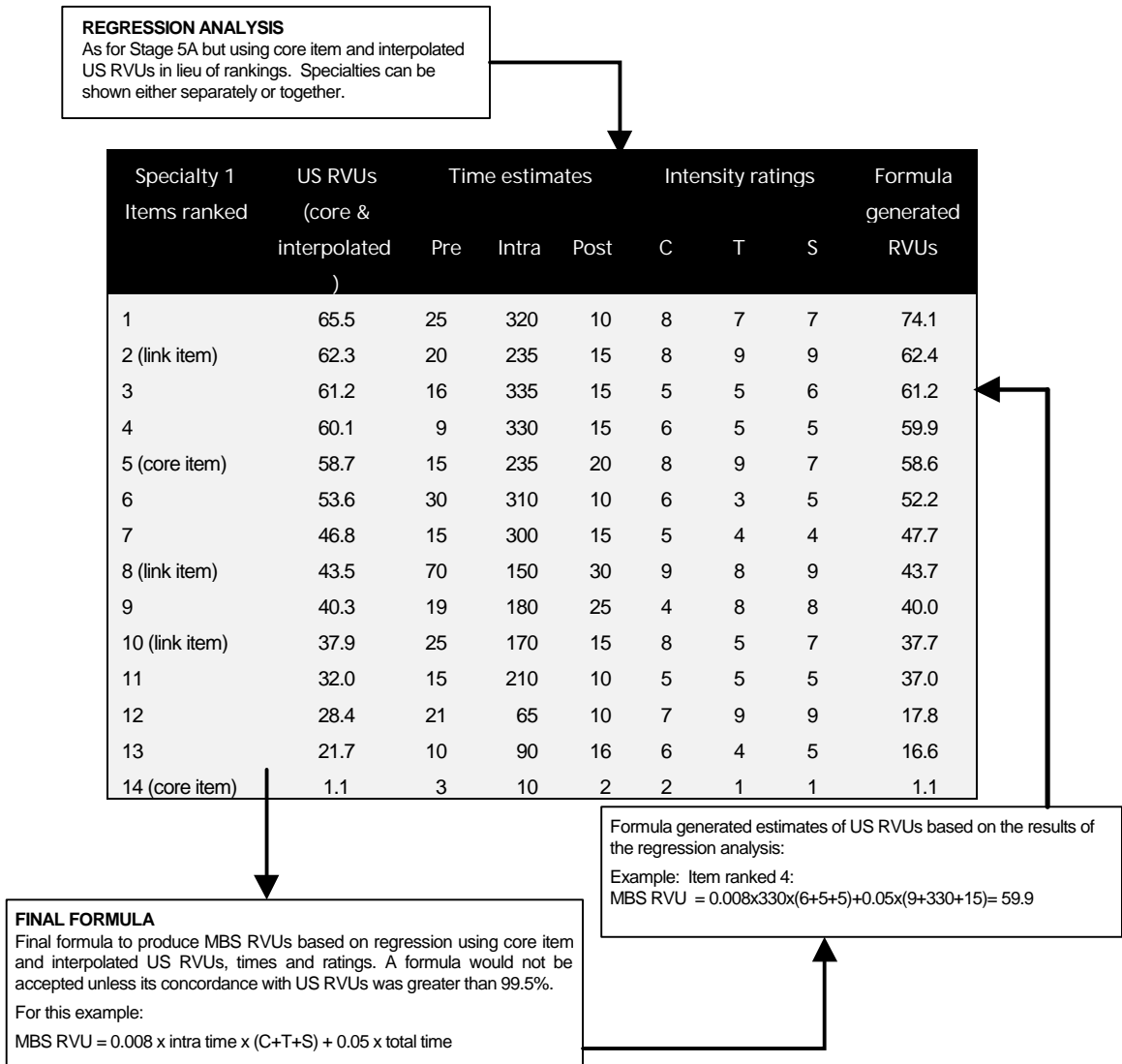
The above considerations indicate the degree of precision achievable using rankings alone with 4 link items and 8 core items. In the PRS, counting attendance items, we already have over 400 link items and are aiming for over 450 core items. Thus, using rankings alone, we should be able to achieve a very high degree of precision for all groups with a moderate number of items (eg >30) for all but the very highest ranked items (assuming that these are not core items). Groups with fewer items will result in far greater uncertainty, which was part of the rationale in reducing the number of groups from 32 to 23.

Once items are aligned onto the RVU scale using the core items as anchor points, RVUs will be interpolated or extrapolated to the remaining items (*refer Figure 4 over page*). For example in the case of Specialty 2, items ranked between C and D, D and E, E and F will be interpolated. Items above core item C and below core item F will be extrapolated. It is important to note that the ranking order for each specialty will not change.

In the final stage of the project, a formula will be derived to calculate RVUs from times and intensity ratings, this time using the core item and interpolated RVUs as the dependent variable rather than the rankings. This formula will predict both the core item RVUs and the interpolated RVUs as closely as possible. During this process, any differences between the specialty specific intensity rating scales will be examined and the development of common scales will be attempted¹⁴.

The process is illustrated in the table contained in Figure 4. This contains an indication of how the final stage should provide the ultimate RVUs for Specialty 1.

Figure 4



¹⁴ Differences in times will be addressed during the review of link item times (refer Appendix C).

The first column in the table shows the Specialty 1 item rankings. The second column shows the US RVUs as they could have been read off the chart in Figure 3 (ie core item RVUs plus interpolated/extrapolated item RVUs). The next six columns give the time estimates and intensity ratings. These six variables, together with the times and intensities for all other specialties form the base data (ie independent variables) for the regression analysis.

The aim of this analysis is to determine a formula which predicts both the core item RVUs and the interpolated RVUs as closely as possible using the time estimates and intensity ratings provided by the relevant specialties.

For the illustrative example, the following formula was derived:

$$RV = 0.008 \times \text{intra time} \times (C + T + S) + 0.05 \times \text{total time}$$

This formula was then used to generate a new set of RVUs for comparison with the original core item and interpolated values. For example, for the first ranked item

$$RV = 0.008 \times 320 \times (8 + 7 + 7) + 0.05 \times (25 + 320 + 10) = 74.1$$

The new formula generated RVUs are shown in the last column of the table. As could have been anticipated, the formula values are closest to the US RVUs for the core items (ranks 5 and 14), link items (ranks 2, 8 and 10)¹⁵ and for the items tightly constrained by the core and link items (ranks 3, 4 and 9). The formula values are least accurate for the items not tightly constrained (ranks 1, 6, 7, 9, 11, 12, 13).

While formula generated RVUs could never match US RVUs precisely, they will be extremely concordant (>99.5%) with the ranks. They will also remove the residual uncertainty from interpolation and the considerable uncertainty from extrapolation. More importantly, the formula can be used to provide an explicit basis for Australia's future MBS Relative Value System: a system which can be readily updated and will not be dependent on US RVUs.

¹⁵ Link item formula generated RVUs will be close to the US RVUs because the regression process takes into account all the information (rankings, times and intensities) provided by all the specialties ranking the link items.

2.3 Consistency Checks and Data Quality

Throughout the nine stages of the PRS a great deal of checking will be undertaken, particularly with regard to the ranking and rating of data by specialties. The final outputs of the study cannot be achieved unless the data are consistent both within and between specialty groups. There are four levels of consistency checks which are outlined below:

Level 1 check This ensures that where one item is ranked above another at least one component of time or intensity must be greater;

Level 2 check This ensures that differences in times and intensities are applied consistently in determining rankings. Level 2 inconsistencies are inconsistencies which apply when formula application is attempted. In the example below, there are no level 1 inconsistencies (between the four items which are ranked) because each of the first three ranked items has an intensity rating higher than the corresponding rating of all lower ranked items. However, the logic of rating item D below items A, B and C must be questioned because item D has 5 times/ratings well above each of the corresponding times and ratings of items A, B and C. This is almost certainly a level 2 inconsistency:

Item	Rank	Pre	Intra	Post	C	T	S
A	1	25	100	10	8	3	3
B	2	25	90	10	3	8	3
C	3	20	90	10	3	3	8
D	4	30	120	15	7	7	7

Level 3 check This ensures that link items are ranked in the same order by different specialties. So that if specialty A ranks item 7 above item 8, then specialty B cannot rank item 8 above item 7; and

Level 4 check This ensures that the ranking of core items is consistent with their US RVUs. So that if core item 9 is ranked above core item 10, then the US RVU for core item 9 must exceed that for core item 10. All level 4 inconsistencies will be referred to the Medicare Schedule Review Board.

Level 1 and level 2 checks are within specialty checks while level 3 checks are between specialty checks and will be reconciled by representatives from each specialty group. Level 4 checks are independent of specialty. All four checks are highlighted in the appropriate stages of the PRS set out in Appendix A.

In addition to the above data consistency checks, times estimated by clinicians will be reviewed against actual theatre times from Australian hospitals and studies of Australian hospital operating theatres for clinical costing. Full details of these procedures are set out in Appendix C. Ranking and rating data will be reviewed by several clinicians working within each specialty craft area.

The study process of including so many clinical groups to examine the data (eg Clinician Consultants, Consensus Groups and the Advisory Panel) will ensure that input to the PRS process is received from a broad range of medical professionals.

3. SPECIFIC METHODS

In principle, the study method will be consistently applied for the development of relativities, however, some modifications have been necessary. These apply in particular to the development of relativities for anaesthetic items and to items in the Schedule that are always undertaken in conjunction with another item (referred to as non-standalone items). These modifications are described briefly below and in more detail in Appendices C and D. Brief explanations of the incorporation of attendance items and of the special issues associated with radiation oncology items are also described in this section.

3.1 Anaesthetic Items

The development and evaluation of RVUs for Anaesthetic MBS items 17701 to 17799 requires some modification to the PRS method so that the process for developing and assessing RVUs across specialties is meaningful. These are items reflecting anaesthetic administration by the anaesthetist as distinct from the range of surgical procedures and interventions covered in other items. They are separate from other items in the schedule performed by the anaesthetist (eg nerve blocks). Further, due to the lack of US RVUs for anaesthetic items and the uniqueness of anaesthetic items, link items will need to be established with other specialty groups. This may be done in a different way from other cross specialty item allocation and comparison.

A method has been designed to accommodate the development of RVUs for items 17701 to 17799 (*refer to Appendix D*). It does not deviate in principle from the overall method outlined in this paper.

3.2 Non-Standalone Items

The development of RVUs for MBS items that are always performed in conjunction with other items needs to avoid bias through double counting. A method for overcoming the difficulties has been developed. Again it does not deviate in principle from the PRS method outlined in this paper. Refer to *Appendix E* for a brief outline.

3.3 Attendance/Consultation Items

The new attendance items developed under Phase 1 of the Relative Value Study will be incorporated into the PRS process. These items will be ranked and rated with the procedural items being reviewed by each specialty group. This process will take place once the rankings and ratings of procedural items are completed by the Consensus Groups (refer to *Appendix A – Stage 5B*).

The process of ranking and rating the attendance items with procedural items is important. There are no good maps between the new attendance items and the CPT. The NCCH is reliant on the interpolation of relative values from the procedure core items to ascertain attendance item RVUs.

At this stage the new attendance items will be submitted to all specialty groups; non-referred items will be allocated to the GP specialty group, and referred items will be allocated to all other specialty groups. Consequently the majority of the new attendance items will be link items between specialties (ie more than one specialty will review the item).

The appropriate specialty groups will also review current attendance/consultation items not covered by the new attendance items. All attendance items will be incorporated with the rankings and ratings of procedural items already completed by the Consensus Groups (refer *Appendix A - Stage 5B*).

3.4 Radiation Oncology Items

Issues have arisen in applying the PRS methodology to the current radiation oncology MBS items whose scope and complexity do not reflect current practice and use of technology. There are difficulties in mapping to the CPT and ranking and rating the items. As a result there are currently no core or link items.

A method for mapping the CPT items to the MBS to accommodate the development of RVUs for radiation oncology items is being explored with the Faculty of Radiation Oncology (Royal Australasian College of Radiologists) and the Australian Association of Private Radiation Oncology Practices. This will be incorporated in the process of ranking and rating items.

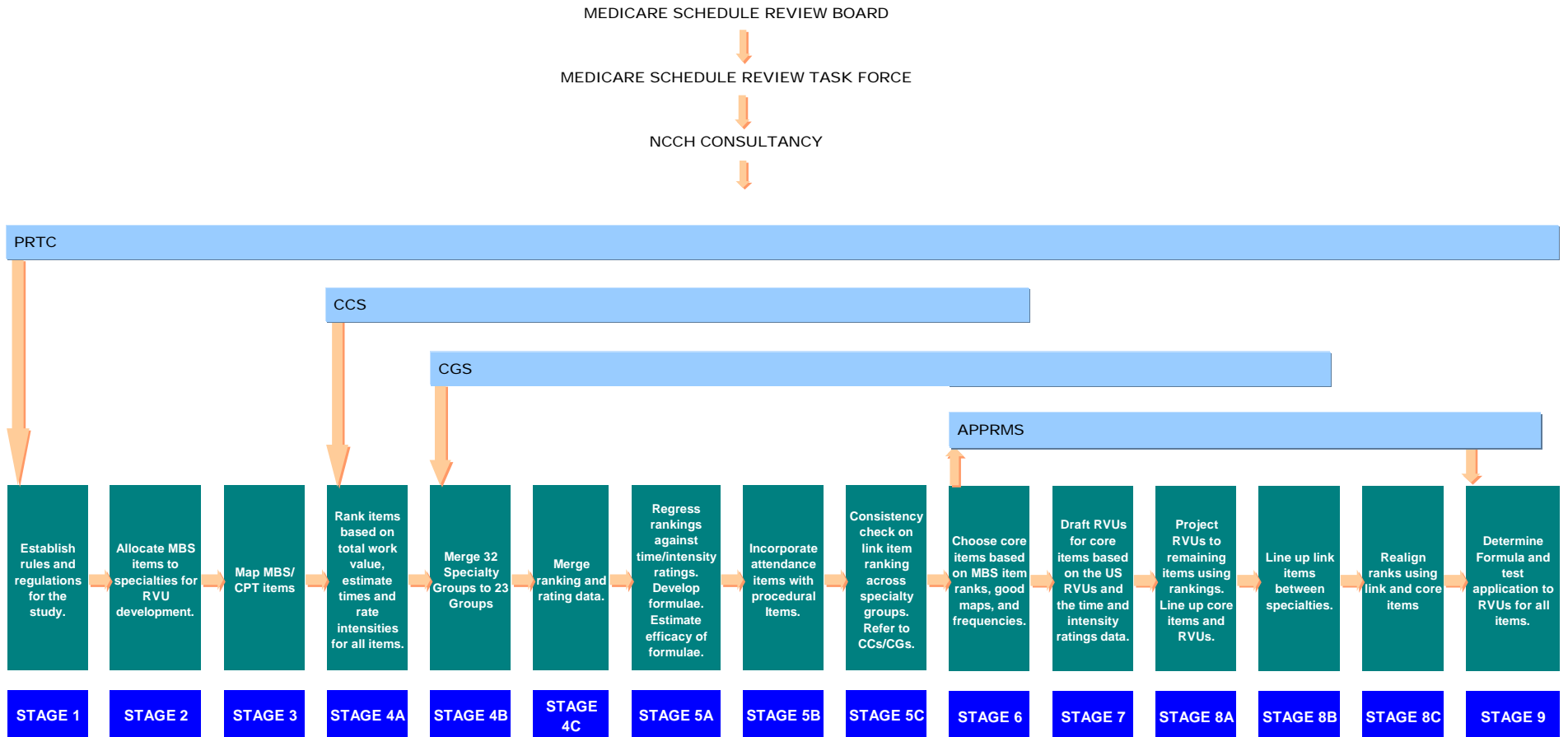


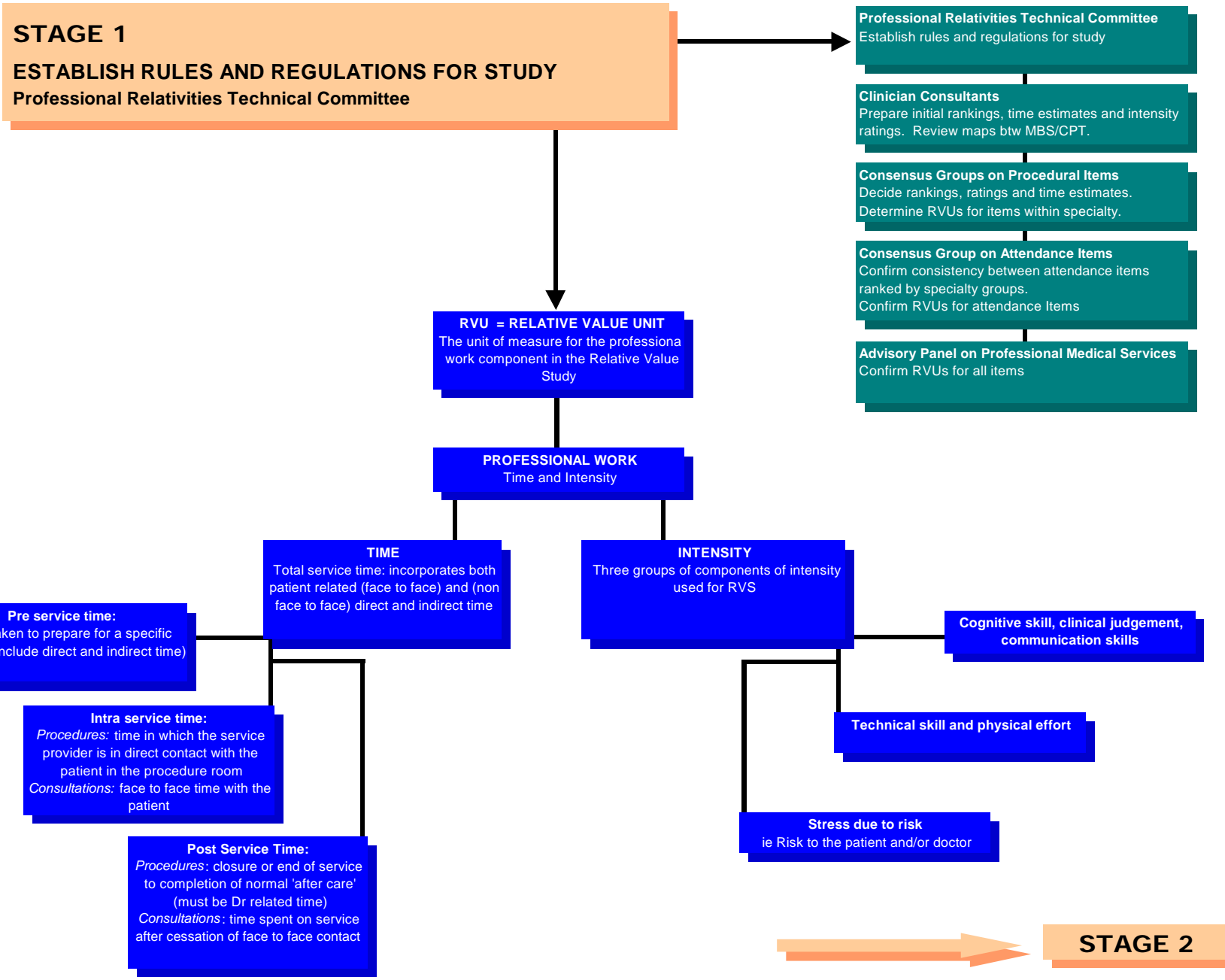
APPENDIX A

Stages of PRS Method

PROFESSIONAL RELATIVITIES STUDY

Outline of Clinical Involvement





STAGE 2 ALLOCATE MBS PROCEDURAL ITEMS

- 32 Specialty Groups
- Allocation using HIC claims data (1996/97) for Categories 2-4
- Items allocated ideally to a maximum of 2 specialty groups
- Groups merged if specialty not identified on HIC and/or items not allocated to specialty using criteria
- Link items = where 2 groups allocated item

STATISTICAL CRITERIA

Criterion 1 % of specialty

Provided the specialty had performed >3 and >12.5% of the total services, MBS items first allocated to the specialty which provided most services for the item in proportion to the total number of services provided by that specialty.

Criterion 2 % of total item frequency

Items allocated to a second specialty if the item constituted more than 0.1% of the specialty's workload, the specialty provided more than 25% of the total services for the item, no other eligible specialty provided more services and the item had not already been allocated to the specialty under Criterion 1.

Criterion 3 % of specialty

Items allocated if the specialty performed the second most services (these being >3, >12.5% of total services and >0.1% of the services provided by the specialty) for the item in proportion to the total number of services provided by the specialty, and the item was not already allocated under Criterion 2.

Additional Criteria Applied

* 487 items were manually allocated as there were insufficient claims data to make an initial allocation according to these three rules.

* An exception report was used to allocate items to major specialty providers (ie specialties which provided >50% of item) who missed out on allocation according to the above criteria

* Where specialty groups were to be combined (Stage 4B) a selection of MBS items were manually allocated to additional specialties in the combined groups to serve as common items for when they merge.

SPECIALTY GROUPS

- 1 General Practice, Emergency Medicine
- 2 Facio-max surg
- 3 Obstetrics/Gynaecology
- 4 Breast surgery, Colorectal surgery, General surgery, Upper GI surgery
- 5 Cardio-thoracic surgery
- 6 Neurosurgery
- 7 Orthopaedic surgery, Hand surgery
- 8 Paediatric surgery
- 9 Plastic surgery, Hand surgery, Burns
- 10 Urology
- 11 Vascular surgery
- 12 Ophthalmology
- 13 ENT
- 14 Anaesthesia, Hyperbaric medicine
- 15 Dermatology
- 16 IVF
- 17 Endocrinology, General medicine, Geriatric medicine, Infectious diseases
- 18 Cardiology
- 19 Renal medicine
- 20 Gastroenterology
- 21 Neurology
- 22 Paediatric medicine
- 23 Rehabilitation medicine
- 24 Rheumatology
- 25 Thoracic medicine
- 26 Psychiatry
- 27 Radiation oncology
- 28 Clinical haematology
- 29 Medical oncology
- 30 Intensive care
- 31 Nuclear medicine
- 32 Immunology

LINK ITEMS *(example only)*

Item	Allocate 1	Allocate 2
A	10: Urology	3: O&G
D	9: Plastic	7: Orthopaedic
G	13: ENT	9: Plastic
L	21: Neurology	22: Paediatric Med
Q	15: Dermatology	12: Ophthalmology

STAGE 3

STAGE 3

MAP MBS/CPT ITEMS

- NCCH Project Officers responsible for mapping
- To find appropriate CPT items for using RVUs
- Forward Mapping = mapping from MBS to CPT (used to identify core items)
- Backward Mapping = mapping from CPT to MBS (used to check forward maps)

Criteria for a good map
Terminology Rating = 3
Code to Code Rating = 4 or 2

Terminology rating

- 3 = Exact match - where the terminology used to describe the MBS item number and CPT code is exactly the same or synonymous.
- 2 = Partial match - where the concepts (in terms of terminology) of MBS items match with CPT codes but they are not the same.
- 1 = Partial match/poor - this is based on the same criteria as "2", however, should be used where the quality of the partial match is really poor.
- 0 = No match

Code to code rating (refer example upper right)

- 4 = 1:1 map (i.e. one MBS item number is completely described by one CPT code)
- 3 = 1:>1 map (i.e. one MBS item number requires one combination of CPT codes to completely describe it, but the codes within the set are all joined by 'and')
- 2 = 1:>1 map (i.e. elements of one MBS item may be described by a number of alternative single CPT codes; indicating that the relationships between them are all 'or')
- 1 = 1:>1 map (i.e. elements of one MBS item may be described by more than one set of CPT codes, so there will be a combination of 'and' and 'or' relationships)
- 0 = no match (i.e. it is impossible to locate CPT code(s) that describe the item number at all)

MAPPING EXAMPLE

MBS Item	CPT Code	Code to code rating
A →	F	4
B →	G and H	3
C →	L or K	2
D →	G and K or Q and J	1

Identify good maps for core item selection

MBS-CPT Mapping Report (Forward mapping)

MBS No 41822 Oesophagoscopy (with rigid oesophagoscope) with biopsy

CPT Codes- Primary Mapping

43202	and	and	and	and	and
-------	-----	-----	-----	-----	-----

Additional Mappings

Key to CPT Codes:

43202	Esoophagoscopy, rigid or flexible; with biopsy, single or multiple
-------	--

NCCH/Clinician Comments

CC - rigid oesophagoscopy is easier than flexible; do not upgrade term rating

Map Grading		
Map Ratio	Code to Code	Terminology
1:01	4	2

STAGE 4

STAGE 4A

RANK, ESTIMATE TIMES AND RATE INTENSITIES FOR MBS PROCEDURAL ITEMS (allocated to 32 Specialty Groups)

- Clinician Consultants working directly with NCCH
- Time Estimates and ratings of Intensity = Professional Work Components
- Ranking of items undertaken for core item selection and testing of formulae
- Check for consistency of data Level 1

Professional Work Components = Intensity Rating and Time Estimates
 Rating of intensity and estimates of time are equivalent to all components of professional work content.

Ranking MBS Items
 Placing items in order - enables the selection of core items for RVU development and testing validity of formulae. Rankings are justified in terms of times and intensity and will be used to calibrate against CPT RVUs - they can therefore be considered an essential part of method to develop the final formula which will obviate the need for rankings in future updates.

Intensity Ratings
 Ratings to be spread across range of 0 -10 (decimals applicable)
 Needed to justify rankings and for final formula development

Time Estimates
 Estimated by clinical groups
 Validated against actual theatre times
 Needed to justify rankings and for final formula development

ALL SPECIALTY GROUPS (x 32) TO RANK ITEMS, ESTIMATE TIME & RATE INTENSITY

Item	Rank	Time estimate			Intensity Rating		
		Pre	Intra	Post	C	T	S
A	1	55	465	55	10	9	9
B	2	55	465	55	9	8	9
C	3	55	465	55	9	9	9
D	4	50	390	55	9	8	9
E	5	50	405	55	7.5	8	8
...							
AAA	250	20	45	25	3	2.5	3
BBB	251	20	30	20	4	3.5	2.5
CCC	252	20	35	30	4	2.5	2.5
DDD	253	20	50	25	3	2	2
EEE	254	25	35	30	3	2.5	2.5

ALL SPECIALTY GROUPS (x 32) TO CHECK CONSISTENCY OF RANKS AND RATINGS

LEVEL 1 CONSISTENCY CHECK

(ie check that where an item is ranked above another that at least one component of time or intensity is greater)

Item	Rank	Time			Intensity		
		Pre	Intra	Post	C	T	S
A	1	55	465	55	10	9	9
B	2	55	465	55	9	8	9
C	3	55	465	55	9	9	9

Should be rank 2 as rated greater than item B on technical skill

STAGE 4B

STAGE 4B

MERGE 32 SPECIALTY GROUPS INTO 23 GROUPS

- To ensure statistical validity and appropriate numbers of items for each specialty group
- Consensus groups on procedural Items to merge data if applicable

CLINICAL GROUPS 32 - CLINICIAN CONSULTANT PROCESS

1	General Practice, Emergency Medicine
2	Facio-max surg
3	Obstetrics & Gynaecology
4	Breast surgery, Colorectal surgery, General surgery Upper GI surgery
5	Cardio-thoracic surgery
6	Neurosurgery
7	Orthopaedic surgery, Hand surgery
8	Paediatric surgery
9	Plastic surgery, Hand surgery, Burns
10	Urology
11	Vascular surgery
12	Ophthalmology
13	ENT
14	Anaesthesia, Hyperbaric medicine
15	Dermatology
16	IVF
17	Endocrinology, General medicine, Geriatric medicine, Infectious diseases
18	Cardiology
19	Renal medicine
20	Gastroenterology
21	Neurology
22	Paediatric medicine
23	Rehabilitation medicine
24	Rheumatology
25	Thoracic medicine
26	Psychiatry
27	Radiation oncology
28	Clinical haematology
29	Medical oncology
30	Intensive care
31	Nuclear medicine
32	Immunology

CLINICAL GROUPS 23 - CONSENSUS GROUP PROCESS

1	General Practice (1), Emergency Medicine (1)
2	Oral and Maxillo-facial surg (2)
3	Obstetrics and Gynaecology (3), IVF (16)
4	Breast surgery (4), Colorectal surgery (4), General surgery (4), Head & Neck surgery, Laparoscopic, Upper GI surgery (4)
5	Cardio-thoracic surgery (5)
6	Neurosurgery (6)
7	Orthopaedic surgery (7)
8	Paediatric surgery (8)
9	Plastic surgery (9), Hand surgery (9), Burns (9)
10	Urology (10)
11	Vascular surgery (11)
12	Ophthalmology (12)
13	ENT (13)
14	Anaesthesia (14), Hyperbaric medicine (14)
15	Dermatology (15)
16	Thoracic medicine (25), Paediatric medicine (22)
17	Endocrinology (17), General medicine (17), Geriatrics (17) Immunology (32), Infectious diseases (17), Nuclear medicine (31), Rehabilitation medicine (23), Rheumatology (24)
18	Cardiology (18), Intensive care (30), Renal medicine (19), Radiation oncology (27)
19	Radiation oncology (27)
20	Gastroenterology (20)
21	Neurology (21)
22	Clinical haematology (28), Medical oncology (29)
23	Psychiatry (26)

STAGE 4C

STAGE 4C

REVIEW & MERGE RANKED AND RATED PROCEDURAL ITEM DATA

- Either from several groups into one group or from several clinicians within a group
- To ensure statistical validity and appropriate numbers of items for each specialty group
- Consensus groups on procedural Items to review data and merge if applicable

Specialty X

Item	Rank	Time estimate			Intensity Rating		
		Pre	Intra	Post	C	T	S
A	1	55	465	55	9	8	9
B	2	45	360	50	9	8	9
C	3	40	320	55	8	9	9
D	4	35	280	40	9	8	9
E	5	20	200	20	6	8	6

Specialty Y

Item	Rank	Time estimate			Intensity Rating		
		Pre	Intra	Post	C	T	S
I	1	60	450	45	9	9	9
J	2	55	420	55	9	8	9
C	3	45	360	50	9	9	9
F	4	30	235	45	7	6	6
G	5	30	180	45	7.5	6	7

CLINICAL ADVICE BY GROUPS NEEDED TO MERGE DATA

Specialty X and Y

Item	Rank	Re rank	Time estimate			Intensity Rating		
			Pre	Intra	Post	C	T	S
A	1	1	55	465	55	9	8	9
I	1	2	60	450	45	9	9	9
J	2	3	55	420	55	9	8	9
B	2	4	45	360	50	9	8	9
C	3	5	40	340	55	9	9	9
D	4	6	35	280	40	9	8	9
F	4	8	30	235	45	7	6	6
E	5	7	20	200	20	6	8	6
G	5	9	30	180	45	7.5	6	7

Note: Time estimates and intensity ratings for Item C (in both groups) after re-evaluation by group

STAGE 5A

STAGE 5A

REGRESS RANKINGS AGAINST TIMES AND INTENSITY RATINGS

- Develop formulae to replicate rankings based on intensity ratings and times

REGRESSION ANALYSIS

Initially for each specialty on a separate basis
Ultimately for all specialties on one scale

Specialty Group Z

Item No	Rank	Formula Rank	Time estimate			Intensity Rating			Formula Value
			Pre	Intra	Post	C	T	S	
A	1	2	45	480	45	9	8	9	33118
B	2	1	60	450	60	9	9	9	33604
C	3	3	50	510	60	7	8	8	31500
D	4	5	50	630	50	6	6	6	29593
E	5	4	45	420	60	9	8	9	29978
F	6	6	50	450	60	7	8	8	28213
G	7	7	45	360	45	9	8	8	24741
H	8	8	50	330	45	9	8	9	24030
I	9	9	50	450	50	6	6	6	21882
J	10	10	50	420	50	6	6	6	20597
K	11	11	50	390	50	6	6	6	19312
L	12	13	45	360	60	6	6	6	18157
M	13	12	40	240	90	8	9	8	18928
N	14	14	45	330	60	6	7	6	17768
O	15.5	15.5	45	240	45	9	8	8	17606
P	15.5	15.5	45	240	45	9	8	8	17606
etc.									

FORMULA TESTING

Initially for each specialty (ie 23 groups)

Example

Formula = TOTAL TIME x (2.34 x C SKILL + T SKILL + STRESS)
+ 1.4 x INTRA TIME x (T SKILL + STRESS)

LEVEL 2 CONSISTENCY CHECK

Check that differences in times and intensities are applied consistently in determining rankings (using formula).

STAGE 5B

STAGE 5B

INCORPORATE ATTENDANCE ITEMS WITH PROCEDURAL ITEMS

- Interleave new attendance items with ranked procedural items
- Each specialty group (x23) to rank and rate attendance items
- Check for Level 1 and Level 2 consistency
- CGPIs to complete this stage



RANK ATTENDANCE ITEMS WITH SPECIALTY GROUP

- Consultation in rooms exceeding 75 minutes with a new patient seen on a referred basis
- Consultation in rooms of approx. 60 minutes with a new patient seen on a referred basis
- Consultation in rooms of approx. 30 minutes with a new patient seen on a referred basis

Item No	Rank	Re Rank	Time estimate			Intensity Rating		
			Pre	Intra	Post	C	T	S
A	1	1	20	240	30	9	9	9
B	2	2	20	200	30	9	9	9
C	3	3	15	90	30	8.5	9.5	9.5
D	4	4	15	100	30	9	9	9.5
90781	4A	5	10	75	25	8	8	8.5
E	5	6	15	70	30	8	8	8
F	6	7	15	90	30	8	8	6
90771	6A	8	10	60	20	7	7.5	8
G	7	9	10	50	20	7.5	7.5	7.5
H	8	10	15	50	10	8	6	7
I	9	11	10	60	20	8	7.5	8
J	10	12	10	45	20	8	7	7
90751	10A	13	10	30	10	7	7	7
K	11	14	10	25	10	6	7	7
L	12	15	15	35	5	7	7	6
etc.								

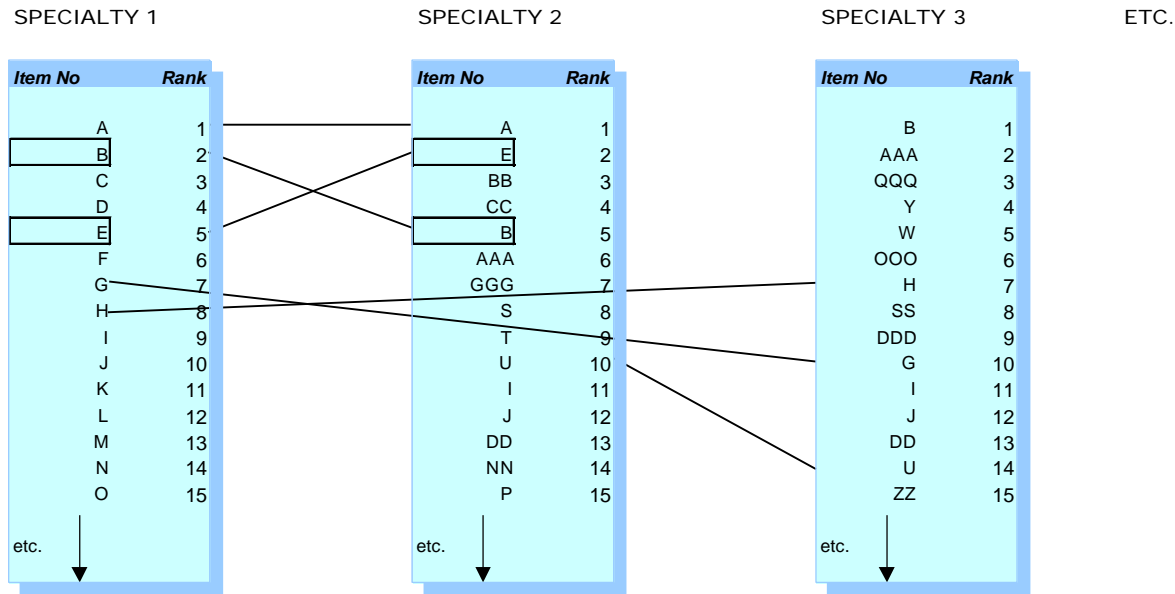
Repeat STAGE 5B for Consistency Check

STAGE 5C

STAGE 5C

CHECK CONSISTENCY OF LINK ITEM RANK ORDER ACROSS SPECIALTY GROUPS

- It is also necessary at this stage to ensure that link items are ranked in the same order by different specialties (= Level 3 consistency)
- Link items are items allocated to more than one group. They include attendance items.



STAGE 5A
Check consistency on Level 1 & 2

LEVEL 3 CONSISTENCY CHECK
Check that link items are ranked in the same order by different specialties.
- CGPIs to reach consensus on rankings of procedural link items
- CGAI to reach consensus on ranking of attendance items

STAGE 6

STAGE 6

CHOOSE CORE ITEMS WITHIN EACH SPECIALTY GROUP (i.e. 23 GROUPS)

- Selection based on good maps, MBS item ranks and frequencies of items
- Link items may or may not be core items
- Consensus Groups to confirm core item selection



SELECTION OF CORE ITEMS

Item No	Rank	Frequency	Time estimate			Intensity Rating		Good map	Item freq	Core items
			Pre	Intra	Post	C	T			
A	1	1560	20	240	30	9	9	9	✓	
B	2	555	20	200	30	9	9	9	✓	
C	3	458	15	90	30	8.5	9.5	9.5	✓	✓
D	4	270	15	100	30	9	9	9.5		
E	5	1024	10	75	25	8	8	8.5	✓	
F	6	2011	15	70	30	8	8	8	✓	✓
G	7	210	15	90	30	8	8	6		
H	8	120	10	60	20	7	7.5	8		
I	9	4500	10	50	20	7.5	7.5	7.5	✓	✓
J	10	810	15	50	10	8	6	7	✓	
K	12	978	10	60	20	8	7.5	8	✓	✓
L	13	180	10	45	20	8	7	7		
M	14	5	10	30	10	7	7	7	✓	
N	15	105	10	25	10	6	7	7		
O	16	60	15	35	5	7	7	6	✓	✓
etc.										

Good maps
Good spread among rankings
Item frequency



STAGE 7

The number of core items selected will vary according to the number of items allocated to each specialty group. For those groups with a small number of items (eg <30) about 33% of the items could need to be core items. In groups with large numbers of items (eg 500) about 7% of items will need to be core. The maximum number of core items would be determined by the number of good maps.

STAGE 7

DRAFT RVUs FOR ITEMS BASED ON US RVUs

- US RVUs - Medicare RBRVS: The Physicians' Guide, American Medical Association, 1997.

Item No	Rank	Frequency	Time estimate			Intensity Rating			Core Items	RVUs
			Pre	Intra	Post	C	T	S		
A	1	1560	20	240	30	9	9	9	✓	45.21
B	2	555	20	200	30	9	9	9	✓	35.2
C	3	458	15	90	30	8.5	9.5	9.5		
D	4	270	15	100	30	9	9	9.5		
E	5	1024	10	75	25	8	8	8.5	✓	15.21
F	6	2011	15	70	30	8	8	8	✓	16.32
G	7	210	15	90	30	8	8	6		
H	8	120	10	60	20	7	7.5	8		
I	9	4500	10	50	20	7.5	7.5	7.5	✓	12.5
J	10	810	15	50	10	8	6	7		
K	12	978	10	60	20	8	7.5	8	✓	10.2
L	13	180	10	45	20	8	7	7		
M	14	5	10	30	10	7	7	7		
N	15	105	10	25	10	6	7	7		
O	16	60	15	35	5	7	7	6	✓	4.5
etc.										

Example of US RVUs for good maps (ie core items)

MBS Item	CPT Code	US RVU
A	F	45.21
B	H	35.2

LEVEL 4 CONSISTENCY
 Check that the ranking of core items is consistent with their RVUs (refer to Medicare Schedule Review Board).



STAGE 8A

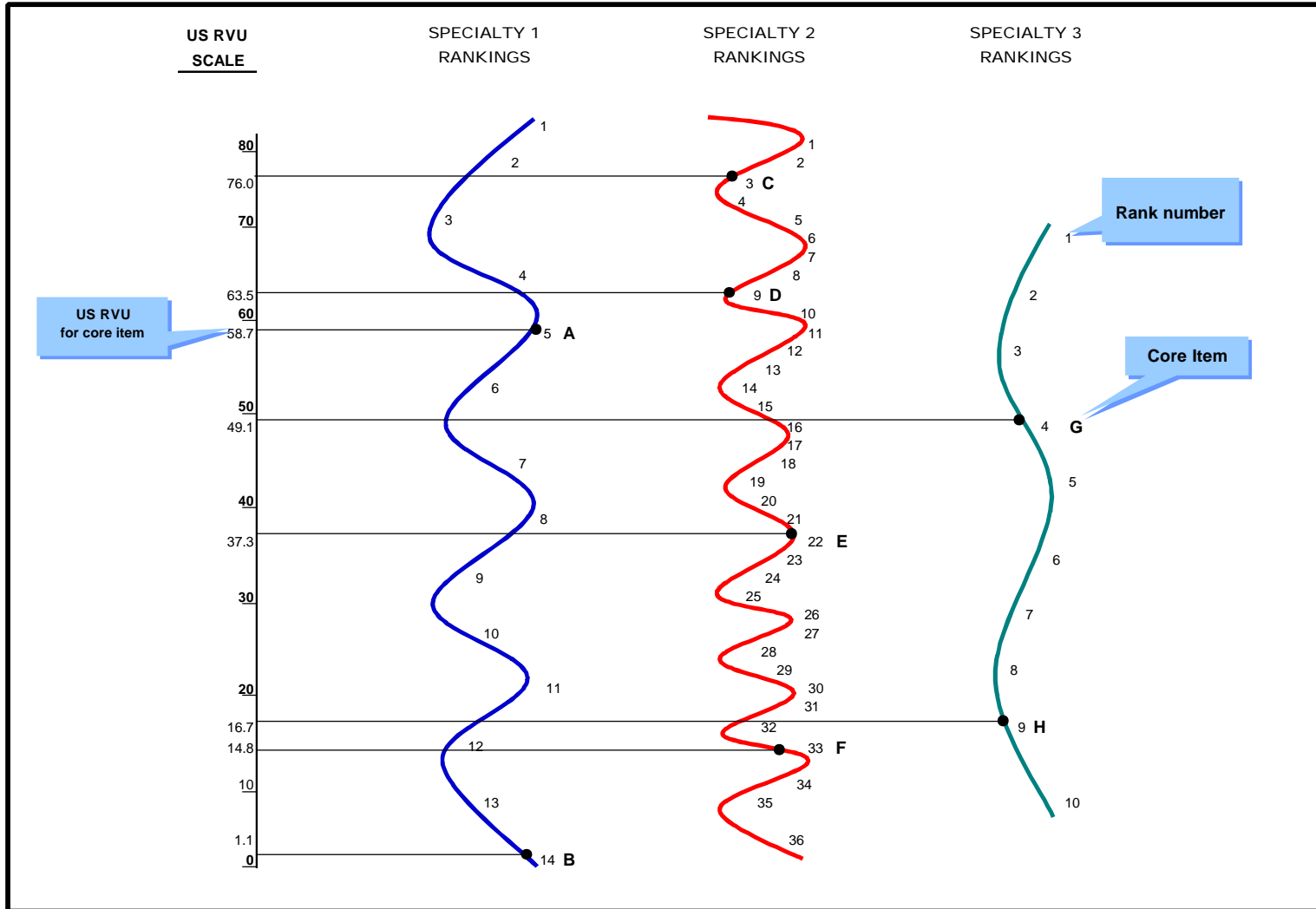
STAGE 8A

PROJECT RVUs TO REMAINING ITEMS USING RANKINGS

- Lining up of core items and RVUs



STAGE 8B



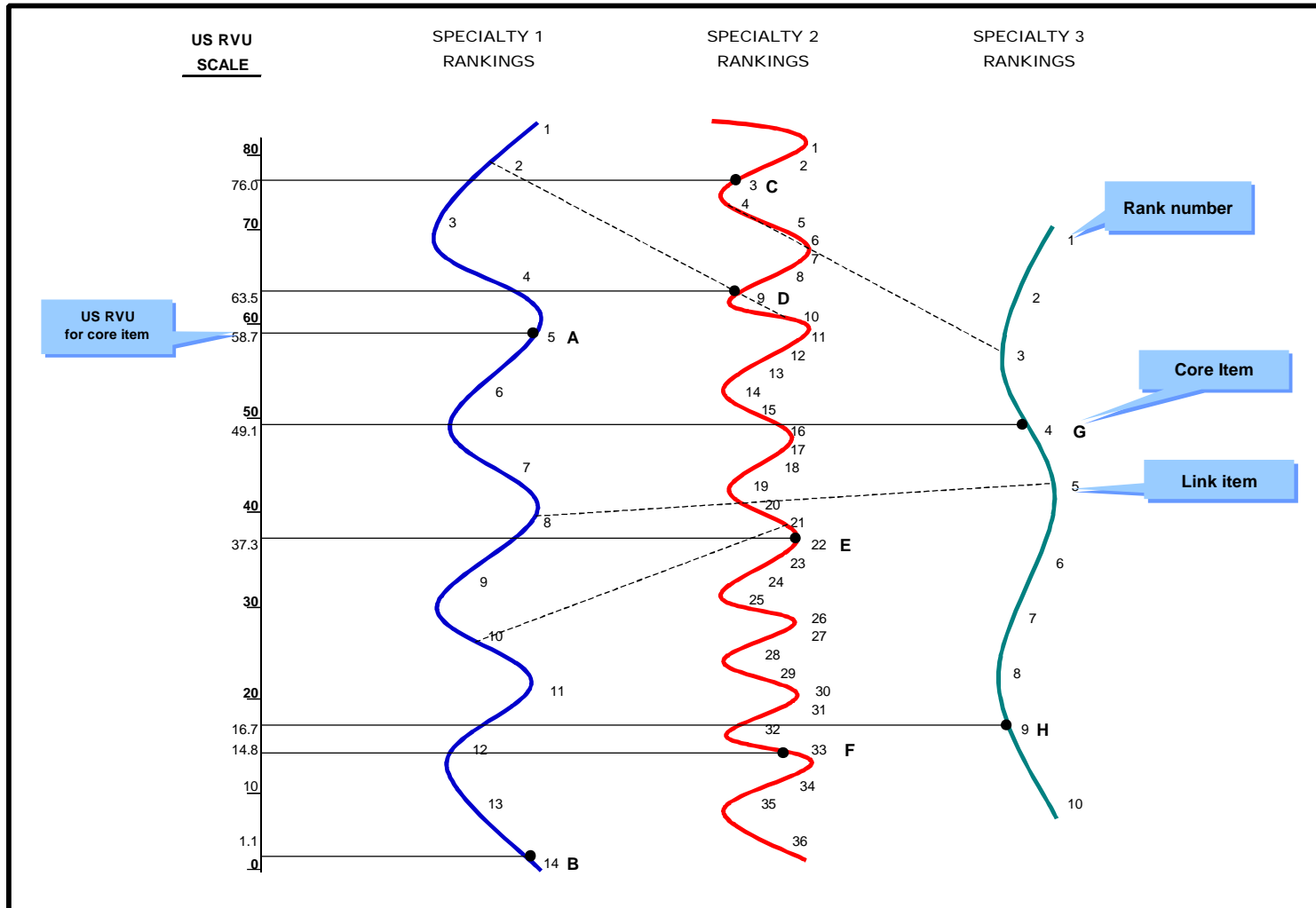
STAGE 8B

PROJECT RVUs TO REMAINING ITEMS USING RANKINGS

- Lining up of link items between specialty



STAGE 8C



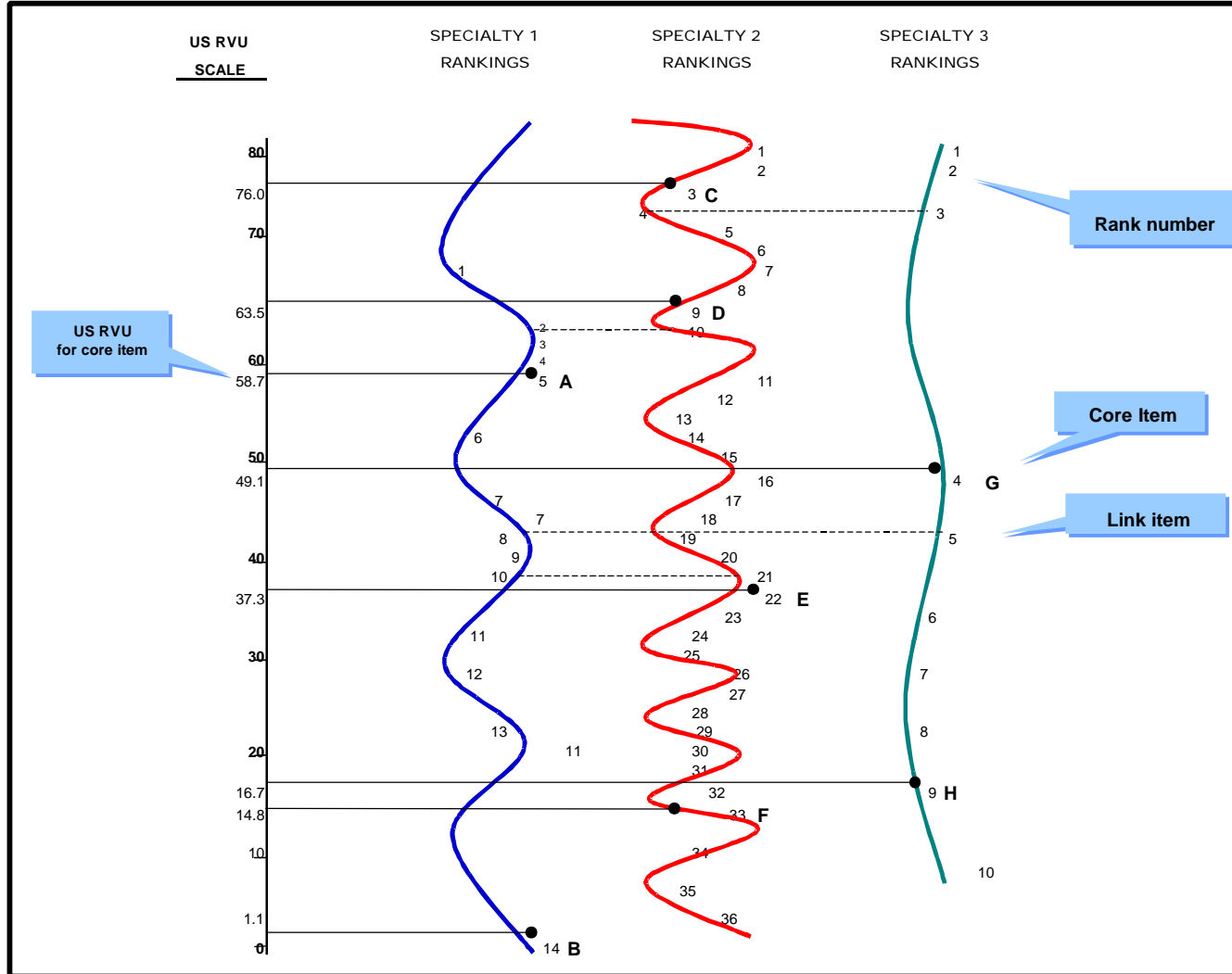
STAGE 8C

PROJECT RVUs TO REMAINING ITEMS USING RANKINGS

- Realignment of ranks using link items and core items



STAGE 9



US RVU for core item

Rank number

Core Item

Link item

Once items are aligned onto RVU scale using core items as anchor points, RVUs will be interpolated/ extrapolated to the remaining items. For example, in the case of Specialty 2, items ranked between C and D, D and E, E and F will be interpolated. Items above core item C and below core item F will be extrapolated.

Important Note:
Rankings for each specialty will not change

STAGE 9

DETERMINE FORMULA AND TEST APPLICATION TO RVUs FOR ALL ITEMS

REGRESSION ANALYSIS

As for Stage 5A but using core item and extrapolated/interpolated US RVUs in lieu of rankings
Specialties can be shown either separately or together.

Specialty 1 Items ranked	US RVUs (core & extrapolated/interpolated)	Time estimates			Intensity rating			Formula generated RVUs
		Pre	Intra	Post	C	T	S	
1	65.5	25	320	10	8	7	7	74.1
2 (link item)	62.3	20	235	15	8	9	9	62.4
3	61.2	16	335	15	5	5	6	61.2
4	60.1	9	330	15	6	5	5	59.9
5 (core item)	58.7	15	235	20	8	9	7	58.6
6	53.6	30	310	10	6	3	5	52.2
7	46.8	15	300	15	5	4	4	47.7
8 (link item)	43.5	70	150	30	9	8	9	43.7
9	40.3	19	180	25	4	8	8	40.0
10 (link item)	37.9	25	170	15	8	5	7	37.7
11	32.0	15	210	10	5	5	5	37.0
12	28.4	21	65	10	7	9	9	17.8
13	21.7	10	90	16	6	4	5	16.6
14 (core item)	1.1	3	10	2	2	1	1	1.1

Formula generated estimates of US RVUs based on the results of the regression analysis:

Example: Item ranked 4:
 $MBS\ RVU = 0.008 \times 330 \times (6+5+5) + 0.05 \times (9+330+15) = 59.9$

FINAL FORMULA

Final formula to produce MBS RVUs based on regression using core item and interpolated US RVUs, times and ratings. A formula would not be accepted unless its concordance with US RVUs was greater than 99.5%.

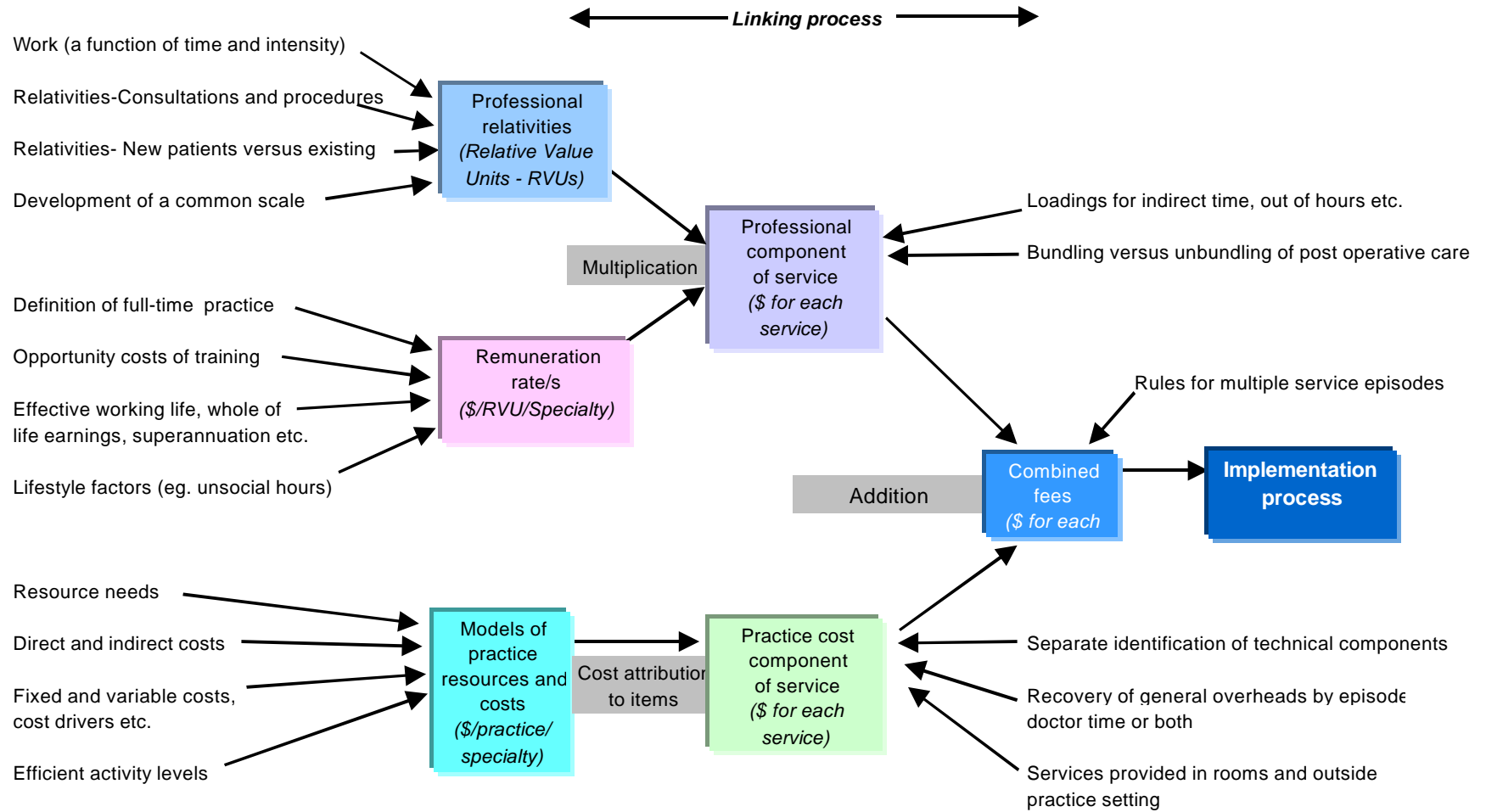
For this example:
 $MBS\ RVU = 0.008 \times \text{intra time} \times (C+T+S) + 0.05 \times \text{total time}$



APPENDIX B

Overview of Relative
Value Study – Stage 2

Overall View of Stage 2 of the RVS - Diagram



(Provided by: Medicare Schedule Review Task Force)

GENERAL FORMULA FOR COSTING MEDICAL FEES

Fee = [Professional Component] + [Practice Cost Component]

F = [RVUs_s x E_p] + [DC_s + OR_{p/s} + PI_{p/s} + WC_p]

RVUs_s = Relative Value Units assigned to each item of service. RVUs are a function of total professional time (T_{1/s} and T_{2/s}) and relative service intensity or effort (I_s). Intensity of a service (I_s) is a function of relative complexity (C_s) and risk or “sweat” (S_s).

T_{1/s} = Average efficient direct (face to face) service time by doctor.

T_{2/s} = Average efficient indirect (non face to face) service time by doctor.

C_s = Relative complexity factor for that service.

S_s = Relative risk or “sweat” factor for that service.

E_p = Standard or base earning rate per RVU for that specialty or class of practitioner taking into account the human capital investment, including training, duration or professional working life etc. that is relevant to that specialty or class.

DC_s = Direct costs such as direct staff (technicians etc.), consumables, dedicated facilities etc. attributable to that service and based on reasonably efficient practice.

OR_{p/s} = General overhead recovery attributable to that specialty/service/episode or mixture-based on the financial modelling of reasonably efficient practice.

PI_{p/s} = Professional indemnity recovery attributable to that specialty/service or activity.

WC_p = Allowance for working capital based on representative cost/billing/payment cycle and levels of debtors and creditors.

(Provided by: Medicare Schedule Review Task Force)



APPENDIX C

Time Estimates -
Method for Validation

ESTIMATION OF TIMES

Method for Validation

Background

The validation of times estimated by clinicians has been built into the PRS process to:

- Provide feedback to clinicians on the times estimated for Relative Value Unit (RVU) development;
- Ensure that times used in the development of a formula are valid in terms of current practice;
- Confirm times used for the PRS; and
- Facilitate time based recovery rates for the Practice Cost Study

Three time estimates for evaluating professional work have been provided by clinicians working on the PRS, these being: pre service time¹, intra service time² and post service time³. The combination of these times is the total professional time for a service.

It is intended to validate all three times through the following processes:

1. Check of intra service times
 - Check of overall intra service time bias
 - Check for intra service time outliers
2. Check of pre and post times
 - Between specialty consistency checks
 - Reconciliations of total time checks
3. Check of link item times

These specific checks have been outlined in more detail in the following pages. They will be undertaken by the NCCH and feedback will be provided to the Consensus Groups who provided the times.

¹ Pre service time = Time taken to prepare for a specific service

² Intra service time = For procedures: time in which the provider is in direct contact with the patient in the procedure room. For consultations: face to face time with the patient.

³ Post service time = For procedures: closure or end of service to completion of normal aftercare. For consultations: time spent on a specific service after cessation of face to face contact.

Check of Intra Service Times

Data have been received from several sources to check the intra service times estimated by clinicians. These include theatre time data from private and public hospitals, data from Australian studies such as the Deloitte's Theatre Service Weights Study, the Australian Private Hospitals Association Banding Study and the Casemix Protocol Database.

All data received will be screened for consistency prior to the validation process. Outlier data (ie times which deviate substantially from the mean times received) will be removed to increase the reliability of the data.

This mainly applies to procedures, as for most attendance items the intra service times are specified in the descriptions.

As stated, the two level of checks for intra service times are:

- a) a check to see whether there is any overall bias in the specialty's intra time estimates; and once bias (if any) in the data has been removed
- b) an examination of the specialty's individual item intra time estimates to check for outliers.

Check of Overall Intra Service Time Bias

The simplest way to undertake the first check is to examine the ratios of the specialty's average intra time estimate to each of the other average estimates with the averages taken over those items for which both estimates are available.

This has been done for hypothetical Specialty X in the first of the two tables (Table 1). This table shows that Specialty X's estimates are highly inflated being higher on average than all 17 other estimates. The margin varies from 6.8% for MBS Anaesthetic time to 94.6% for Casemix Public Theatre time. A priori we could have anticipated that Specialty X's average intra time would be lower than most of the other average times because direct patient contact times (with the proceduralist) are in general smaller than anaesthetic times and theatre times.

Table 1
Comparison of Specialty X's Intra Times with Other Time Estimates

Other Time Estimate (OTE)	No. of Items In Common	Average Time In Minutes		Ratio 100x Sp X/OTE
		Specialty X	OTE	
MBS Anaesthetic Time	237	114.5	107.2	106.8
D'lte Anaesthetic Time	62	91.5	65.5	139.7
D'lte Anaesthetist Time	62	91.5	67.4	135.8
D'lte Procedure Time	63	91.7	55.3	165.8
Deloitte Surgeon Time	59	90.0	79.2	113.6
H1 Op Time	49	95.6	50.2	190.4
H1 An + Op Time	52	94.6	64.8	146.0
H2 Theatre Time	81	96.5	69.9	138.1
H3 Primary Av. Mins	4	85.7	56.4	152.0
H4 Op Time	59	98.9	51.8	190.9
H4 An + Op Time	65	97.1	78.9	123.1
H5 Op Time	85	95.4	66.8	142.8
APHA Procedure Time	61	93.3	63.8	146.2
C'mix Pub. Theatre Time	68	71.4	36.7	194.6
C'mix Priv. Theatre Time	130	82.7	44.4	186.3
C'mix Other Theatre Time	22	73.0	39.6	184.3
H6 Op Room Time	227	112.5	80.4	139.9

Check for Intra Service Time Outliers

It is intended that all specialty intra service time estimates will be checked for outliers, however, this can only take place once any overall bias has been removed.

The checking for outliers is accomplished by performing a regression analysis using the specialty's intra time estimate as the dependent variable and all other time estimates as the independent variables in order to generate a predictor of the specialty's intra time estimate. The outliers can then be identified as the specialty's intra time estimates which differ by more than a specified amount (eg three standard deviations or 70%) from this predictor.

The reason why **this check should not be carried out if there is a bias in the intra time data** is that this bias will also be incorporated in the predictor. In this event half or more of the outliers identified will not be outliers. The reverse is true; they will be good data which are free of the bias. This should be evident from Table 2 which shows an outlier analysis invalidly undertaken for Specialty X. In 180 cases (38%), Specialty X's intra time estimates were precisely the same as the MBS anaesthetic times. In 223 cases (47%), they were greater, and in 71 (15%), they were less. They should be less more than 50% of the time. The table shows 16 "outliers". Twelve of these are cases where Specialty X's intra time is less than the MBS anaesthetic time. Could it be that it is really these 12 which are "right" and the vast majority of the remaining cases which are "wrong" rather than the other way around?

Table 2
Specialty X Theatre Times Outlier Analysis

Item No.	Specialty X Intra Time	NCCH Predicted Time	Supporting Data				
			MBS AT*	H4 OAT*	CMX PUTT*	CMX PVTT*	H6 ORT*
A	240	315	285				240
B	300	406	370				300
C	240	342	315				240
D	300	376	370				180
E	300	391	370				240
F	240	398	370				
G	150	221	180				240
H	120	185	165				150
I	120	192	165				180
J	180	254	225				210
K	240	171			39		150
L	240	316	270				300
M	240	316	270				300
N	120	56		65		37	30
O	160	89					60
P	210	103				65	

* Refer Table 1 for clarification of codes

Check of pre and post times

While data relevant to intra times are available for a number of studies, we are not aware of any corresponding data for pre and post service times. Accordingly we propose the following two checks for these times.

Between specialty consistency checks involving the ratios of pre and post times to total times⁴, and Reconciliations of total times (ie pre + intra + post)⁵ with total professional hours worked for each specialty and for all specialties combined⁶.

Type A checks can be accomplished using only the Professional Relativities Study time estimates. But Type B checks require ancillary data; these being the rates at which specialists provide services. We recommend that these data be sought from the Health Insurance Commission in the form of item frequencies for a given period. The reasons for using this source of data are:

- It covers the full range of providers;
- It covers the full range of procedural items;
- It can be reconciled with hours worked either through use of the KPMG Medical Practitioner Survey or other survey data; and
- It would provide excellent common data for other participants in the Relative Value Study, in particular the Practice Costs Study which is committed to using the PRS times.

We recognise that there may still be problems with the new attendance items. However, it should be possible via the KPMG Survey data to predict the equivalent frequencies for these items, as the KPMG data were reconciled with HIC frequencies.

Check of link item times

Whenever specialties provide differing estimates for pre, intra and post times for common (link) items, we will endeavour to facilitate the attainment of consensus. The NCCH does not envisage any difficulty in resolving small differences in times because of the assurance given that the development of item specific relative values for professional work is independent of total specialty remuneration. Where there are major differences, the possibility of the items concerned being fundamentally heterogeneous will be explored. Any unresolved differences will be referred to the Task Force and MSRB.

⁴ This check applies to both procedural and attendance items

⁵ Because intra service times will have already been checked, this check is for the pre and post service times.

⁶ This check applies to procedures and to a lesser degree attendance items (due to the inherent difficulties in reconciling the current MBS item frequencies against the new items)



APPENDIX D

Anaesthetic MBS Items

ANAESTHETIC MBS ITEMS

Development of Professional Relativities

Background & Issues

The development and evaluation of Relative Value Units (RVUs) for Anaesthetic MBS items 17701–17799 requires some modification to the Professional Relativities Study (PRS) methodology so that the process for developing and assessing RVUs across specialties is meaningful and because there are no US RVUs for anaesthesia.

Pending the outcome of the Australian Society of Anaesthetists (ASA) Feasibility Study outlined below, the Medicare Schedule Review Board has determined that the current structure of Anaesthetic items in the MBS be used for the purpose of the PRS. This will require evaluation of the work components of anaesthetic administration (i.e. time and intensity). RVUs which are comparable across specialty cannot be developed for Anaesthesia without such information.

A Relative Value Guide (RVG) has been developed by the Australian Society of Anaesthetists (ASA) to assist individual Anaesthetists to develop their fee schedules on a logical basis. These relative values have the following three components which when added together comprise the relative value of the service.

- a. a basic unit value
- b. a time unit value
- c. modifying units (related to physical status and age of patient or emergency status)

ASA Feasibility Study

The ASA, Australian Medical Association and Commonwealth are currently reviewing the feasibility of incorporating the RVG in the MBS. A consultancy is being negotiated with these groups to examine this proposal. There is potential for evaluating and using these base units in developing relative values, however, a greater understanding of their origin is required. It is possible that base unit values and other components of the RVG could be incorporated and tested, once an understanding of their origin is reached.

Anaesthetic items, particularly the unit values (i.e. 17701–17799) are unlike the procedural items, as each unit value may pertain to several specialty areas and vary for each surgical procedure. Consequently, when developing RVUs, these unit values (comprising a base unit (B) and a time unit (T)), cannot be considered independently of the surgical procedure to which they apply. Further, the range of base unit values to time units can vary for each unit value (e.g. $17710 = 3B + 7T$ or $17710 = 5B + 5T$).

The condition and age of the patient directly affect the intensity of administration of an anaesthetic in addition to the intensity and difficulty of the procedure. This means that ratings of intensity for Anaesthesia for the simplest of procedures could be affected by age only. The intensity of procedures and the intensity of anaesthetic administration may not always align.

Some important policy issues that need to be addressed in terms of Anaesthetic RVU development are:

- a. extra time for anaesthesia items
- b. an understanding of how the base units in the RVG and the MBS were derived
- c. use of patient modifiers

It is also important that the additive approach for using base and time units in the MBS is tested as part of the PRS and that Anaesthesia unit values align with relative values developed for procedural items.

Method

Following a meeting held with the Medicare Schedule Review Task Force, the National Centre for Classification in Health and the Australian Society of Anaesthetists, the following method was adopted for Anaesthetic RVU development.

The method will provide a definition of base and time units which will cover the current range 17701-17799 of Anaesthetic items. The critical component is the estimation by Anaesthetists of times and intensities for the full range of Anaesthetic services (i.e. as for other specialties). It will also be necessary to establish links between anaesthesia and other specialty groups in order to develop RVUs¹. The process comprises the following 11 steps: (*see over page*)

¹ Since some GPs are trained to undertake a limited range of anaesthetic services, GP Anaesthetists have been asked to rank and rate an appropriate selection of anaesthetic items once initial rankings and ratings have been completed by the Anaesthetists. This will ensure that linkage with anaesthetic items is established.

Method for Anaesthetic Items

1. Select approximately 200 proxy items, (representative of the range of all the more frequent procedure items and the range of ratios B:T - base units to time units) for Anaesthetic active MBS numbers 17701–17799 based on base and time units which equate to the equivalent Anaesthetic base and item units (ie 01–99) – **NCCH statistician**
2. Check the proxy items for appropriateness and to ensure a good spread in terms of Anaesthetic Administration – **ASA**
3. Provide a map between each MBS proxy item selected and the RVG (this will assist in the regression analysis) – **ASA**
4. Provide rankings, time estimates and ratings for these proxy items (as per PRS definitions) on the assumption that there are no patient modifiers – **Clinician Consultants**
5. Analyse (through multiple regressions) the relationships between the rankings, ratings, base and time units. *This will demonstrate the efficacy of base and time units used in the MBS and RVG against the rankings and the efficacy of adding base and time units on a common scale* – **NCCH statistician**
6. Interpolate rankings and ratings using base units and time units for remaining procedural items – **NCCH statistician**
7. Provide rankings, time estimates and ratings for other Anaesthetic items in the MBS (i.e. 13020–13030 and 17965–18298) – **Clinician Consultants**
8. Incorporate results of proxy item rankings into rankings of other Anaesthetic items – **Clinician Consultants**
9. Review rankings, time estimates and ratings for proxy and Anaesthetic items and interleave new consultation items – **Consensus Group**
10. Select core and link items for RVU development (*Note: mappings will be available for items 13020–13030 and 17965–18298*) – **NCCH**
11. **Proceed as per Stages 7-9 of the PRS methodology**



APPENDIX E

Non-Standalone MBS
Items

NON-STANDALONE MBS PROCEDURAL ITEMS Development of Professional Relativities

There are two distinguishable categories of items which are referred to as non-stand alone items in this paper. These are:

- 1) Items listed in the Schedule which are performed in association with procedures covered by other items (eg 31340 - *muscle, bone, cartilage removal in association with...*)
- 2) Items which are listed as stand alone items in the schedule but are never claimed on their own (evident from 96/97 Benefits data) (eg 38709 - *Aorta anastomosis/repair...*)

It is difficult for clinicians to rate intensity and particularly to estimate time for these items given that they are always done in conjunction with other items. Estimating time twice would provide an inflated value. Ratings of intensity might also vary depending on the combination of the items eg. excision of muscle bone or cartilage (performed in association with excision of malignant tumour) from the facial area could rate higher in terms of intensity than excision from a limb. In terms of developing relativities, it is important to ensure that relativities are valued on realistic work components.

Method for developing RVUs for Non-standalone items

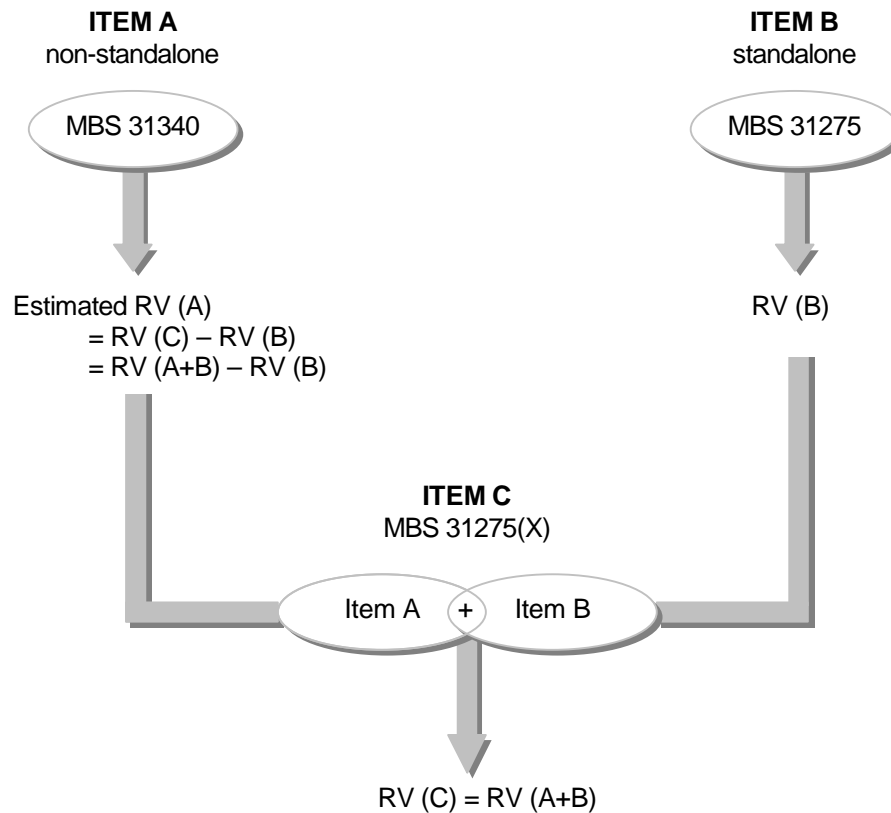
Key for MBS item type

- Item A - Associated item - item always performed in association with other items
- Item B - Standalone item - item can be performed on its own or with other items
- Item C - Proxy item - combination of Item A and Item B - using the most common or frequently linked standalone item (Item B)

- 1) Create a combination item (Item C) using the most common or frequently linked standalone item (Item B) in conjunction with the associated item (Item A) - **based on clinical advice**
- 2) Develop rankings, ratings of intensity and time estimates for Item C.
- 3) Determine the difference in relative value between Item C and the standalone item (Item B).
- 4) This difference would then provide an estimate of the relative value for item A.

See also *Figure 1* over page.

Figure 1
Development of relativities for non-standalone MBS items



The above method can be applied both to items listed in the schedule as non-standalone and to items identified from Medicare Benefits data as never being performed on their own (i.e. standalone frequency of zero), if considered appropriate by the Consensus Groups.

Limitations and Application of Multiple Operation Rule

There is really only one limitation of this proposed method. It is the possibility that Item A has a different incremental effect when combined with Item B1 than it does when combined with Item B2, or Item B3 etc. In this respect, it should be apparent that the best stand alone Item B to use (to ultimately determine RV (A)) is the one which gives closest to the weighted average D of the incremental effects:

$$D1 = RV (A + B1) - RV (B1)$$

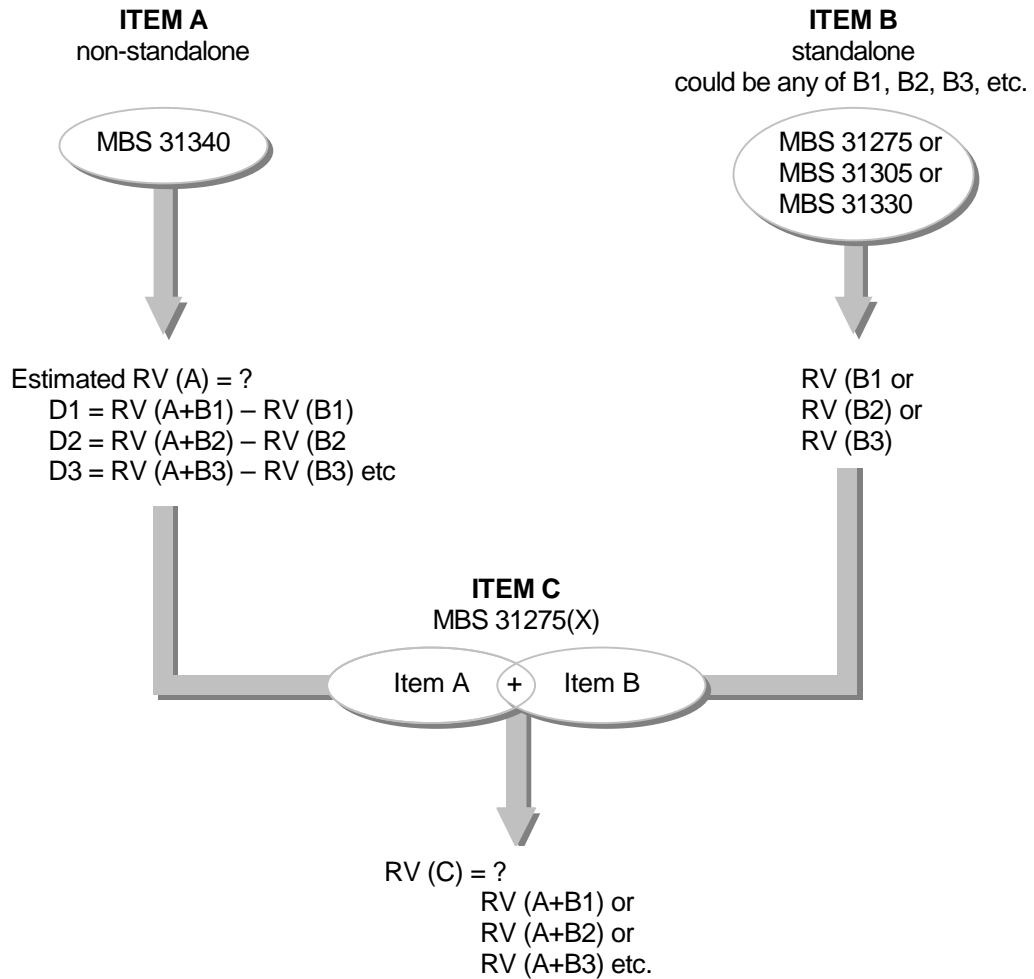
$$D2 = RV (A + B2) - RV (B2)$$

$$D3 = RV (A + B3) - RV (B3)$$

etc

for all the alternative items B1, B2, B3 etc used in combination with Item A (see Figure 2).

Figure 2
Evaluation of alternative incremental effects



Note that where the variation between the D1, D2, D3 etc. is unacceptably high, it may be possible to split them on logical (a priori) grounds into two or more subgroups, say {D1, D2, D3} and {D4, D5, D6} so that the difference within these subsets is very small when compared to the difference between the subsets. This would involve the creation of not one but two (or more) items A: one for example for use with say cardio thoracic surgery items and another for use with neurosurgery items.

A second point to note is that there is no logical reason why the partner items B1, B2, B3 etc cannot themselves be a combination of several MBS items. Suppose, for example that item B2 is a combination of several MBS items (eg. MBS 31275 *Basal or squamous cell carcinoma removal* + MBS 45200 *single stage local flap*). The method implies that the relative value to be used for B2 in combination with item A is:

$$RV(B2) + DX;$$

just as the relative value to be used for single item B1 is

$$RV(B1) + DX.$$

Clearly DX (ie the assumed value of RV(A)) is the same whether Item A is used in combination with the single item B1 or the combination of items B2. It follows therefore that the application of a multiple operation rule for the assessment of RV(B2) must take place prior to any consideration as to the additional effect of Item A.¹

In summary, the proposed method should in no way interfere with the application of other multiple operation rules, **provided that these rules are applied prior to the application of the new system**. In other words, there will be no effect on the relative value of non standalone items under the multiple operation rule if these items are identified as always being provided as a standalone service or rather, are always paid at 100%.

This is in line with the current method of collating items that are often done in combination and referring to them as one item (as per explanatory note T8.5.4 ² in the schedule). Adopting this approach could provide a further alternative mechanism for administering the system with the new relative values for non-standalone items. The use of HIC data concerning the items which fall into the category of T8.5.4 to identify items commonly done in combination would be useful for this exercise.

¹ This is implicit in any case through use of the notation RV(B2), as the multiple operation rule must be viewed as a means of measuring the relative values of combinations of items.

² T8.5.4 If the operation comprises a combination of procedures which are commonly performed together and for which a specific combined item is provided in the Schedule, it is regarded as the one item and service in applying the multiple operation rule.