

NATIONAL HEALTH REFERENCE PRICE LIST 2007

SUBMISSION BY THE

RADIOLOGICAL SOCIETY OF SOUTH AFRICA

FOR

SPECIALIST RADIOLOGY and NUCLEAR MEDICINE TARIFFS

(Practice numbers "038" and "025")

MAY 2006

TABLE OF CONTENTS

1) EXECUTIVE SUMMARY

2) AUTHORITY OF THE RADIOLOGICAL SOCIETY OF SOUTH AFRICA TO MAKE THE SUBMISSION

3) THE CONSULTANTS

- a) Allnutt Lüttich and Franklin (ALF) Management Consultants**
- b) Deloitte Touche & Tohmatsu**
- c) University of Stellenbosch Department of Actuarial Science and Statistics**

4) THE SCOPE OF RADIOLOGY AND NUCLEAR MEDICINE PRACTICE

5) THE STRUCTURE OF THE RADIOLOGY REFERENCE PRICE LIST

6) NON-PROPRIETARY NATURE OF THE SUBMISSION

7) ACTIVITY TIME, COMPLEXITY AND OVERHEAD COST SURVEYS

- a) Introduction**
- b) Representative sample size**
- c) Activity Times**
 - i) Introduction
 - ii) Radiologist Times
 - iii) Radiographer and Sister Times
 - iv) Equipment / procedure room times
 - v) Modification of time input data

d) Activity Complexity and Responsibility Values

- i) Introduction
- ii) Radiologist Ratings
- iii) Radiographer Ratings
- iv) Responsibility rating methodology

e) Overhead Administration costs

- i) Varying size of radiology practices
- ii) Data collected

f) Industry Procedure Frequency Data

g) Participating Practices

8) PRICING METHODOLOGY

a) Methodology in Accordance with CMS Guidelines

b) 2005 Costs versus 2007 Prices

c) Confidence levels of time data submitted

d) Manual modification of time data

- i) Radiologists times
- ii) Radiographer times
- iii) Sister times
- iv) Equipment / room times.

e) Comparison of input times with international benchmarks

f) Basic calculation model

- i) Introduction
- ii) The Calculation Formula

g) Direct Labour costs

- i) Introduction
- ii) Radiologist
- iii) Radiographer
- iv) Responsibility rating

h) Direct equipment costs

- i) Introduction
- ii) Standard volume
- iii) Cost of Equipment
- iv) Equipment cost calculation

i) Overhead costs

- i) Standardization of overhead costs
- ii) Applicable standard volume and time allocations

j) Return on Investment

- i) Introduction
- ii) ROI Administration Overhead
- iii) ROI Radiology Equipment

9) IMPACT STUDIES AND CROSS SUBSIDAZATION PROPOSAL

- a) Introduction
- b) The intra discipline impact
- c) Cross subsidization of administration overhead in the existing specialist radiology tariff prices
- d) Proposal for reversing the intra modality impacts

10)NEW CODES

- a) Applications made in 2005 for new codes, not yet approved.
- b) Application for new codes for 2007

CONCLUSION

APPENDIX A – Statistical formulae used

APPENDIX B – Written guarantee - non-proprietary nature of the submission

1) EXECUTIVE SUMMARY

The Council of Medical Schemes (CMS), the custodian of the National Health Reference Price List (NHRPL) invited all medical disciplines to submit a proposal for their medical tariffs for 2007. This document, prepared under the auspices of the Radiological Society of South Africa (RSSA) by their appointed consultants, accompanies the detailed tariff price calculation (spreadsheet) document.

The radiology submission follows the recommend guidelines of the CMS, with variation in the method of calculating the administration overhead and return on investment for equipment. The medical specialist remuneration is included at a higher level than the CMS guideline and is motivated accordingly.

The procedure times used in the calculations are statistically adjusted estimated times submitted by a sample of practices in the South Africa. These procedure times used in the calculations are conservative when compared with the international benchmark of the time used in the USA.

Impact studies are included in the submission, and it is of importance to note that the new price calculations show significant intra modality variances when compared with the exiting prices. CMS and the industry are asked to take special cognizance of these swings in their review. At the request of CMS, a proposal and method of reversing or softening the impact if these swings, is included in this document.

The RSSA and its consultants are available to discuss the details of this submission.

2) AUTHORITY OF THE RADIOLOGICAL SOCIETY OF SOUTH AFRICA TO MAKE THE SUBMISSION

- a. The Radiological Society of South Africa (RSSA) is the professional association representing specialist radiologists and nuclear physicians in South Africa.
- b. The RSSA is a voluntary association available to all specialist radiologists and nuclear physicians (private sector, public sector, registrars and retired persons).
- c. The RSSA membership represents in excess of eighty percent of a eligible persons registered with the Health Professional Council of South Africa
- d. The RSSA is not a sub group of the South African Medical Association
- e. The RSSA officially represents the Nuclear Medicine physicians and the Nuclear Medicine Association is an official affiliate of the RSSA.
- f. In matters of general comment, the term “radiology” and “radiologist” will be deemed to include “nuclear medicine” and nuclear physician” unless otherwise stated.
- g. This document, being part of the submission, was prepared by J J Calitz and T H Allnutt, consultants appointed for the project.

3) THE CONSULTANTS

a. Allnutt Lüttich and Franklin (ALF) Management Consultants

- i. Allnutt Lüttich and Franklin (ALF) Management Consultants were commissioned by the RSSA to prepare and organize the costing survey.
- ii. ALF have submitted to CMS the required Declaration of Interest. In addition a supporting document has been submitted by the RSSA to CMS detailing the appointment of consultants for the radiology submission.
- iii. Personnel within ALF have a combined 40 years experience in the management of medical practices in South Africa and have a good working knowledge of private radiology practice in this country. Furthermore they have previously been involved in tariff calculation and verification exercises for private medical practice.
- iv. Contact details of persons involved with the submission

J F Calitz – [B. Com. Mathematics] and
T H Allnutt – [B.Sc (Civ) Eng (Hons); MBA]

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b. Deloitte Touche & Tohmatsu

- i. On the advice of the CMS, the RSSA appointed Deloitte to conduct a review of the work done by ALF in order to determine consistency with the CMS procedure and to verify and comment on the independent nature of data collection and independent status of the work done by ALF.
- ii. A detailed report from the independent Deloitte (Special Services Group) will be forwarded to the CMS.
- iii. Contact person at Deloitte:

Munya Chiwara
Special Services Group
Deloitte & Touche
PO Box 578
Cape Town, 8000

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c. University of Stellenbosch Department of Actuarial Science and Statistics

- i. The University of Stellenbosch Department of Statistics and Actuarial Sciences were consulted by ALF for input on appropriate statistical testing models to evaluate applicability of the date sample sizes.
- ii. Contact person at the University of Stellenbosch:

Prof. Daan G. Nel
Director: Centre of Statistical Consultation
University of Stellenbosch

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4) THE SCOPE OF RADIOLOGY AND NUCLEAR MEDICINE PRACTICE

- a. Diagnostic Radiology and Nuclear Medicine is predominantly a procedure based diagnostic and interventional discipline.
- b. All radiologists and nuclear medicine physicians are specialist medical doctors having undergone four years of training and internship in their chosen specialty.
- c. The operations in a radiology and nuclear medicine practice involve:
 - i. Receiving a request from a referring doctor for a diagnosis based on an image produced by an item of imaging equipment, or using an interventional procedure.
 - ii. The actual imaging is done (mainly) by radiographers, who are trained in imaging techniques at a technical college or a university
 - iii. The radiologist makes a diagnosis from viewing the images produced or treats a patient with an interventional procedure.
- d. The scope of practice of a radiologist and a nuclear physician is well defined and there is little cross over with other disciplines (vascular surgeons being the main exception, and this only in the limited impact field of angiography and interventional studies)
- e. The chief modalities used in imaging are:
 - i. General x-rays
 - ii. Mammography
 - iii. Fluoroscopy
 - iv. Ultrasound
 - v. CT scanning (Computerized Tomography)
 - vi. MRI scanning (Magnetic Resonance)
 - vii. Angiography and Interventional studies
 - viii. Nuclear medicine studies (gamma camera)

5) THE STRUCTURE OF THE RADIOLOGY REFERENCE PRICE LIST

- a. The Radiology Reference Price List (RRPL) was developed in 2003 by the RSSA and introduced successfully into the South African private medical environment in 2004.
- b. The list was developed to provide a clear and comprehensive procedure and tariff structure based on anatomical regions, with minimal modifiers. In essence, the tariff structure achieves the objective of one procedure code per procedure. The structure

is not too dissimilar to the that used in CPT4 (Current Procedural Terminology Version 4) as developed in the USA)

- c. The tariff structure has been well received by the practitioners who use it and the funding industry, and is acknowledged as a vast improvement on the previous structure (which still exists in the NHRPL for “non-radiologists”).
- d. The current RRPL as published by CMS has been used in this submission.

6) NON-PROPRIETARY NATURE OF THE SUBMISSION

- a. Please see the attached written guarantee from the Radiological Society of South Africa regarding the non-proprietary nature of the submission.

7) ACTIVITY TIME, COMPLEXITY AND OVERHEAD COST SURVEYS

a. Introduction

- i. Data input templates were constructed using as a basis the 2005 specialist radiology and nuclear medicine NHRPL. The radiology / nuclear medicine NHRPL comprises approximately 1055 individual procedures.
- ii. These data input templates, along with explanatory documentation, were made available / sent to the private practice members of the RSSA.
- iii. Data requested from the practices included the following:
 - 1. General practice info (contact details, address, practice number etc)
 - 2. Radiographer cost to company & number of full time radiographers for a certain timeframe
 - 3. Overhead expenses & number of billable procedures for a certain timeframe
 - 4. Time spent per procedure by a radiologist, radiographer(s) & sister, and the time the equipment / room was occupied.
 - 5. Responsibility ratings per procedure for radiologists & radiographers
- iv. Data collected from the practices that participated in the survey, were merged into one central MS-Excel database.

b. Representative sample size

- i. There are approximately seventy unique private sector radiologist and nuclear physician practices in South Africa, comprising approximately four hundred practitioners.
- ii. Responses were received from 22 practices, representing a total of 161 practitioners. In some instances practices made more than one individual submission of activity times.
- iii. The effective response rates were therefore either 30%, based on the number of practices (22/74), or 40%, based on the number of practitioners represented by the submissions (161/400).
- iv. In all instances (activity times, complexity ratings and overhead costs) statistical methods were applied to determine adequacy of data. See section on pricing methodology below.

c. Activity Times

i. Introduction

1. Due to the large number of procedures in the radiology tariff schedule (1055), the fact that the pareto principle applies to the usage and funder payout of the procedure codes (20% of codes are used for 80% procedures done), plus 5 sets of individual time data being required for each procedure code, it was not practical to rely on times taken by actual work studies for the data set. Accordingly the time data set in the submission is done using “extrapolated” or “estimated” times. These estimated times were completed by both radiologists and radiographers whose daily routine work is the execution of the procedures in the departments.
2. Actual work study time surveys were requested (see complexity note below) from practices on a voluntary basis. There was only one voluntary submission, which was nowhere near complete. The sample times are not statistically adequate for inclusion in this submission as a meaningful reference.
3. The absence of broad based actual activity times is motivated as follows:
 - a. There are 1055 procedure items in the radiology tariff schedule

- b. The average weighted radiographer (1) time is approximately 30 minutes.
 - c. In order for one radiology department to accurately record times for all 1055 procedures, it would take approximately 1055×30 minutes = 31,650 minutes = 520 hours (= 3 months) .This is neither practical or financially feasible. Assuming a student or data capturer costing R30 per hour, the exercise would cost R 15,600 per radiology department. The total cost for the time studies for all 22 submissions would be in the region of R 343,000.
 - d. Furthermore, the chances of getting reliable data from such an exercise, especially if it is done by persons not well versed in radiology procedures, is questionable.
 - e. It is submitted that a better reflection of activity times is obtained by allowing day to day users / operators to provide good estimates.
4. Data was sourced from the Centre for Medicare and Medicaid Services (CMMS) in the USA for comparison of radiologist and radiographer times.
- a. The CMMS maintains the database of radiologist and radiographer procedure times used in the calculation of prices and price adjustments for the Medicare and Medicaid tariffs in the USA. The data is available in the public domain section of their web site.
 - b. The RSSA has done a cross walk, where possible, the procedure codes in the CPT4 (USA) and RSSA specialist radiology tariff structures
 - c. An analysis was done comparing the direct labour costs (radiologists and radiographers) using the CMMS times and the RSSA survey times. For this exercise the top 80% of payout codes were used, a crosswalk between the 2 tariff structures being able to be done on the approximately 80 procedure codes.
 - d. The results of the times and labour payout comparisons are the following:
 - i. The RSSA radiologist total times are 3.8% lower that USA CPT radiologist times.

- ii. The RSSA radiographer times are 41% lower than the USA radiographer times.
 - iii. Total labour cost (using RSSA labour cost per minute for radiologist and radiographer applied to the RSSA and CPT USA times) shows the RSSA cost being 15.8% lower than the CPT USA cost.
- e. It is therefore concluded that against a recognized international benchmark, the direct labour times used in the radiology calculations are conservative.

ii. Radiologist Times

1. The respondents were instructed to submit the time taken to complete all the activities done by radiologists when doing a procedure.
2. These activities include (where applicable for each procedure):
 - a. Review of referral and case history and consult with referring doctor if necessary.
 - b. Consult with patient if necessary prior to the procedure or the diagnosis
 - c. Instruct radiographer on procedure.
 - d. Perform procedure, if required (e.g. screening, ultrasound, inject contrast, biopsy, review preliminary images taken during the procedure)
 - e. Check quality of x-ray images produced.
 - f. Study the images produced and make a diagnosis/differential diagnosis or obtain further images or studies if more information is needed to make the diagnosis. Where necessary, consult reference literature to assist in arriving at the correct diagnosis. This is particularly prevalent in complex and / or infrequent studies.
 - g. Perform post processing / reconstructions on digital images if required (e.g. 3D reconstructions on CT angiography studies)
 - h. Dictate the diagnosis report and check report and sign off after report typed.

- i. Consult with patient and referring doctor if necessary.
- j. Do and / or review billing of procedure.
- k. Provide ICD10 code.

iii. Radiographer and Sister Times

1. The respondents were instructed to submit the time taken to complete all the activities done by a radiographer when doing a procedure.
2. These activities include (where applicable for each procedure):
 - a. Collect patient from reception
 - b. Review case and referral history
 - c. Consult with radiologist prior to examination
 - d. Arrange for pre authorization if responsibility of that work station
 - e. Perform imaging, take x-ray
 - f. Submit images for processing
 - g. Review / quality control of images after processing
 - h. Take images for processing
 - i. Perform post processing / reconstructions on digital images if required (e.g. 3D reconstructions on CT angiography studies)
 - j. Discuss images with radiologist
 - k. Redo, perform additional imaging if required
 - l. Escort patient back to reception
 - m. Clear and clean procedure room
 - n. Arrange for pre authorization if responsibility of that work station
3. In certain procedures a second radiographer is used to perform the examination and these times were requested as well.

- a. Two radiographers are usually required and rostered for certain procedures e.g. CT, MRI and Angiography and Interventional studies.

4. Sister times

- a. In certain practices and for certain procedures, a trained theatre sister is employed to perform certain activities and monitoring
 - i. Injection of contrast, if not done by radiologist
 - ii. Observation of patient and control of monitoring equipment
 - iii. Presence and patient comfort in specific procedures where it is not appropriate for the radiologist to perform a procedure alone on the patient.
 - iv. In the case of angiography and interventional procedures, the sister is normally required to consult the patient prior to the examination and after the examination is required to accompany the patient back to the ward and visit the patient again to ensure stability.

iv. Equipment / procedure room times

- 1. The majority of radiology imaging procedures is done on equipment defined as specialist equipment for the purposes of this submission and as defined in Circular 69.
- 2. Although radiology procedures routinely make use of equipment, the cost and utilization parameters of each type and category of equipment are sufficiently different to require that the equipment usage activity is specifically and independently costed, and that such equipment is not included under the general administration / overhead costing item.
- 3. The procedure / room time includes
 - a. Total time the room is occupied / not available to others due to a procedure being done
 - b. Time to clean and prepare room and equipment for use for the following patient / examination.

v. Modification of time input data

1. See later section on the statistical tools applied, and manual modification done to selected input times to ensure reasonableness of the final calculation input figures.

d. Activity Complexity and Responsibility Values

i. Introduction

1. Responsibility values were calculated from responsibility ratings for radiologists / radiographers.
2. A responsibility element was included in the relative costing of a procedure to take into account complexity, training, experience, and judgement required in performing the procedure. The ratings were used to modify the relativity of the actual procedure times submitted in the time survey to account for increased / decreased responsibility / complexity as defined below.

3. Rating scale

- a. Each element was rated on a scale of 1 to 8 where:

1= low, easy

8 = high, difficult

ii. Radiologist Ratings

1. For RADIOLOGISTS the following two elements were rated

- a. "Experience and knowledge" being "The actual observation or practical acquaintance required to provide the service. This is analogous to the level of education or training required to provide the service."
- b. "Judgement and mental effort" being "The mental exertion or striving involved in the formation of an opinion or notion concerning the provision of the service"

- c. Examples of Radiologist ratings were:

X-ray forearm = 1

Chest X-ray = 3

Mammogram = 5

MR Lumbar = 4

MDCT abdomen and pelvis with contrast = 7
High resolution CT chest = 8
MR shoulder = 7

iii. Radiographer Ratings

1. For RADIOGRAPHERS the element of “experience and knowledge and additional training” required were rated.

a. Examples of ratings were:

X-ray forearm = 1
Chest X-ray = 2
Mammogram = 5
MR Lumbar = 6
MDCT angiography with post processing = 8

iv. Responsibility rating methodology

1. A responsibility value was determined for the responsibility rating to ensure that total payout associated with total radiologist and radiographer labour costs remain the same before and after the implementation of the responsibility value.
2. Mathematical techniques together with the “Goal seeking” function of MS-Excel were used to ensure that intervals between responsibility values were the same.
3. See the calculation spreadsheet for tables where responsibility ratings are associated with responsibility values.

e. Overhead Administration costs

i. Varying size of radiology practices

1. Radiology practices have their rooms located in most instances in hospitals. The size of the practice, the spread of services and associated equipment within each location depends largely on the size and location of the hospital, the range of services supplied by the hospital, and the mix of referring specialties associated with the hospital.
2. Radiology practices vary in size themselves, ranging from one partner practice, operating a small single location radiology department, to multi partner – multi location practices.

3. The administration and back office operations of the practices also vary greatly in size. In the case of the larger practices, the administration offices are often located away from the hospital based radiology departments.
4. Due to the varying size of the radiology practices, the total administration and overhead costs vary greatly.
5. It was therefore necessary to standardize the administration overhead cost for each practice

ii. Data collected

1. Each respondent was requested to provide a detailed listing of actual administration overhead costs for a defined period, using a detailed explanation template to ensure conformity.
2. In order to standardize the data, each practice was required to submit the total number of billable procedures done during the defined period.
3. The administration overhead costs were deemed to include and exclude the following items (all costs excluding VAT):

a. Included items

- Film and chemistry
- General consumables
- Accounting and audit fees
- Printing and stationery
- Telephones and data lines
- General office furniture and business equipment
 - Please note that the amortized depreciation amounts of these fixed assets as supplied by the practices were used. It is assumed (not tested) that the amortization periods were either those stipulated by SARS or Generally Accepted Accounting Practice.
 - Due to the size of radiology practices, it was not practical to list individual items in this category.
- Image processing (processors) and PACS systems
- Administration, reception, typing and support staff
- Floor space rentals and related costs
- Legal, debt collection and consulting fees
- Professional membership costs and subscriptions

- Insurance of non imaging equipment assets and business risk
- Professional indemnity insurances
- Training
- Levies
- Transport and delivery (excluding doctors motor vehicle expenses)
- Security
- Bank charges, interest on overdraft
- Bad debts

Excluded items:

- All radiologist earnings and total cost to company of partners and assistants
- Remuneration of the radiographers and sisters performing the radiology procedure
- All imaging equipment ownership and running costs (i.e. all costs relating to depreciation, financing, interest, equipment rentals, repairs and maintenance, service contracts, QA testing, insurance on equipment, etc)
- All costs of consumable items that are billed to patients (e.g. contrast, drugs, syringes etc)

f. Industry Procedure Frequency Data

- For certain elements of the calculations, frequencies of procedures are required. Use has been made of the frequency data compiled by Nikela Consulting in 2003 / 2004 for checking the impact of the new radiology tariff structure (RRPL) in 2004. This frequency data set was compiled from 3 major funders in the country.
- Procedure frequencies are required for calculating:
 1. Application of responsibility ratings to direct labour costs
 2. Distribution of overhead cost
 3. Impact studies

g. Participating Practices

- 22 Radiology and Nuclear Physician practices participated in the data collection exercise.
- These practices are distributed throughout South Africa with good representation in both metropolitan and rural areas.

- iii. The practice details are included in the calculation worksheets.

8) PRICING METHODOLOGY

a. Methodology in Accordance with the CMS Guidelines

- i. The methodology used in this submission does not differ significantly from the principles of the methodology laid out in the CMS guidelines.
- ii. The scope and size of radiology practice dictates that elements of the CMS methodology are not applicable or appropriate for use in the radiology pricing model.
- iii. Elements of the Radiology model that differ from the CMS model (these differences are described in detail in the relevant section).
 - 1. Calculation of administration overhead
 - 2. Calculation of return on investment on equipment
 - 3. Calculations based on 2005 input cost data

b. 2005 Input Costs versus 2007 Prices

- i. 2005 Cost Surveys
 - 1. The cost surveys, with respect to radiographer salaries, administration overhead costs and the price and maintenance costs of specialized radiology equipment were requested and received for 2005 figures. (These cost surveys were requested in January 2006)
- ii. 2006 and 2007 Prices
 - 1. The prices for 2007 have not been submitted in a Rand / Cent format.
 - 2. Application of agreed normal or medical CPI increases from 2005 to 2006 to 2007 can be applied to the 2005 data / prices to arrive at the 2007 prices.
 - 3. The Relative Value Units is calculated by applying the 2005 Radiology Rand Conversion Factor to the 2005 prices in this submission.
 - 4. Alternatively, those reviewing this submission may wish to apply CPI increases (industry or medical) to input costs, and where appropriate, apply current BA and Exchange Rate values.

c. Confidence levels of time data submitted

- i. The Department of Statistics and Actuarial Science at the University of Stellenbosch was consulted regarding the statistical adequacy of the sample sizes in the data set.
- ii. The department advised that the appropriate statistical tool in this instance was the test of “Grubb” to detect outlying observations in samples.
 1. The “Grubb” test identifies outlier(s) in an applicable data set.
 2. Two “test statistics” (based on the largest and smallest observations) are calculated and compared to percentage points that are then used to identify outliers. These outliers are either the largest and / or smallest observation(s) at a 95% confidence level assuming that the data is normally distributed.
 3. The methodology allows for the removal of observations which is deemed to be identified as “outlying data”.
 4. The process of testing and removal of outlying observations (i.e. largest and / or smallest observations) is continued until such time that the remaining data falls within the test parameters as per “Grubbs”.
 5. After statistical elimination of data, an average over the remaining observations is calculated to be used as input into the pricing calculation.
 6. Where the initial data set, or the application of the Grubb test, resulted in less than three observations, the average over the data was applied.
- iii. The principle data sets in the submission (i.e. activity times for radiologists, radiographer (1), equipment room times, and the complexity values of the radiologists and radiographers) was analyzed for statistical adequacy and data removed where necessary and in accordance with the above.
- iv. In a very few cases (mostly procedures very rarely done) was the sample size too small to achieve the 95% confidence level as per the “Grubb” test. These data sets are highlighted as “sample size too small”. This occurred in less than 10% of all data submitted.
- v. See Appendix A for the statistical formulae used.

d. Manual modification of time data

- i. The time data for each tariff code was reviewed by experienced radiologists and nuclear physicians in private practice, as a “reasonableness” test. It is acknowledged that this review is subjective.

- ii. Radiologists times

1. Where the radiologist time data appeared incorrect (mostly too high), data was sequentially removed from the set of data that had already had the statistical adequacy “Grubb” test applied, until a time was achieved with which the reviewing radiologist was comfortable. It is clear that the Grubb test in some instances did not result in the removal of all “unreasonable” data.
2. No comment is made on why some data submissions included data which could be considered “unreasonable”, except to say that either the person(s) supplying the data had not applied their minds correctly, or that the manner of practice by that respondent was substantially different from the expected norm, as determined by an experienced reviewer.
3. In some instances, radiologist times had to be removed from data submissions where the respondent had supplied radiologist times, when in fact a radiologist is not used in a particular procedure, misinterpretation of the tariff code being the reason.
4. In a very few instances, mainly in high impact codes, radiologist times have been reduced arbitrarily in order to achieve acceptable impacts, or in cases where the existing tariff has been artificially reduced for specific reasons, known to and accepted by the industry. These cases are noted in the data sheet. Specific cases include:

- a. Code 13300 - limited CT paranasal sinuses

- i. A normal xray of the paranasal sinuses provides very little diagnostic information. The correct and appropriate study is a limited CT scan. Applying a normal pricing methodology would result in a price of the CT scan that would deter referrals, resulting in a study not being done, or the inappropriate study being done (i.e. normal paranasal sinus xray). The CT fee is kept artificially low to allow it to be requested instead of the normal xray procedure, while minimizing the impact to the funder / patient.

iii. Radiographer times

1. Radiographer times were altered where appropriate (mostly reductions) where the resulting input times were deemed to be too high.
2. In some instances 2nd radiographer times were removed where normal practice dictates use of only one radiographer, in order to ensure consistency.
3. In some instances the data set did not have times for a second radiographer - this is normal practice. A time for a second radiographer was then manually introduced to provide consistency.

iv. Sister times

1. Sister times were requested from practices.
2. The existence or use of a sister during procedures varies widely between practices.
3. For consistency a sister was deemed to be used for the introduction of contrast in and patient monitoring on CT and MRI examinations requiring contrast. The deemed time was input as 10 minutes, being the lowest of the times tested statistically.
4. For angiography and interventional procedures, the statistically adjusted inputted sister time were used, unless otherwise noted. For these procedures, which are high risk for the patient, the sister is required for pre procedure patient preparation and post procedure patient monitoring.

v. Equipment / room times.

1. Equipment / room times were requested from practices.
2. In some instances, equipment / room times had to be removed from data submissions where the respondent had supplied room / equipment times, when in fact the room / equipment is not used in a particular procedure, misinterpretation of the tariff code being the reason.
3. In a very few and limited instances, the equipment room times were modified to ensure reasonableness.

vi. Special cases – Mammography

1. The mammography code in the RRPL is for a combined mammography and ultrasound procedure. This combined procedure code has been in the RRPL since its existence.
2. The international norm is that 45% of mammography examinations receive an ultrasound investigation as well.
3. Combined and weighted times and equipment costs are used as inputs into the calculation model. See separate calculation in the “Equipment Summary” worksheet

e. Comparison of input times with international benchmarks

- i. See previous section on the comparison of times with the Centre for Medicare and Medicaid Services.
- ii. The weighted averages of radiologist and radiographer times, as well as the weighted average of direct labour payouts, as used in the RSSA submission, are conservative when compared with the times and payout calculations of the CMMS time data.
- iii. It is recorded that the estimated times used in the calculations are therefore deemed reasonable and appropriate.

f. Basic calculation model

i. Introduction

1. The basic calculation model follows the principles as set out in Circular 69 i.e.

Item cost = Direct Labour Cost + Overhead Cost + Specialist Equipment Cost

and

a Return on Investment is applied to the Overhead Cost and the Specialist Equipment Cost

ii. The Calculation Formula

1. The elements of the formula and the actual formula are shown hereunder.

2. Each element is described in detail in the paragraphs below.

- Average time per procedure for a radiologist → A
- Average time per procedure for a radiographer and / or a second radiographer and / or a sister → B
- Average equipment / room time → C
- Responsibility values calculated from responsibility ratings for radiologists → D
- Responsibility values calculated from responsibility ratings for radiographers / sisters → E
- Labour cost per minute for radiologists → F
- Labour cost per minute for radiographers → G
- Equipment / room cost per minute → H
- Overhead / admin cost per minute → I
- Return on investment % Administration (ROIa) → J
- Return on investment % Equipment (ROLe) → K

$$\text{Item Fee} = \sum [(A \times F \times D) + (B \times G \times E) + (C \times I \times J) + (C \times H \times K)]$$

g. Direct Labour costs

i. Introduction

1. The cost of direct labour is calculated for radiologists, radiographers and the attending sister
2. The cost for each item of direct labour is calculated using the average time per procedure x the remuneration per minute x the responsibility rating
3. The time for each procedure for each element of direct labour cost is the average time as determined by the activity time survey.
4. For each category of labour a “standard volume” of minutes per annum is calculated.

ii. Radiologist

1. Standard volume

- a. The standard volume for a specialist radiologist is calculated by determining the available amount of minutes per annum, taking into account a productivity factor.
- b. The calculation follows the principles laid down by CMS.

2. Annual remuneration

- a. The annual remuneration of the specialist radiologist is set at a 2005 value of R1, 000,000 per annum.
- b. This remuneration is in excess of the upper level remuneration (total cost to company) paid in the public sector.
- c. The CMS guidelines deem the appropriate private sector medical specialist remuneration to be that of the equivalent public sector position.
- d. The RSSA believes however that the NHRPL for private sector radiology must be based on the average market related earnings in South Africa. This standpoint is motivated as follows:
 - i. The public sector salaries do not reward the specialist for the risk, time and effort taken in setting up and operating a private sector radiology facility. These risks are in excess of the risk factors built into the equipment and administration overhead parameters.
 - ii. Radiologists are a scarce resource worldwide due to the rapid expansion of scope of practice and advances in technology. South African radiologists are in demand internationally and are currently able to earn 3 to 4 times the South Africa public sector salary in overseas posts, with no risks and comparable work conditions.
 - iii. Predictions are that this resource shortage will not be filled in the near future, due to the length of time it takes to train a radiologist (12 years).
 - iv. South African practices have to be able to compete for this scarce resource in order to maintain the radiology facilities in this country.

- v. The relationship between public sector and private sector radiologists in other developed countries must be kept in mind.
- e. The remuneration of the medical specialist in this submission is based on the expected / market related remuneration level of such a person entering into private practice in this country.
- f. A survey of the remuneration of employed (not partners) full time radiologist consultants in private practice will reveal a total cost to company remuneration (risk free) of between R800.000 and R1,000,000. It is argued that a partner in a practice can expect a risk free remuneration in excess of that earned by an employed assistant.
- g. Productivity Factor
 - i. A productivity factor of 75% was used for radiologists
 - ii. Unproductive time is made up of
 - 1. Practice administration
 - 2. Idle time waiting for patients
 - 3. Repeats of procedures / images
 - 4. Difficult patients (e.g. claustrophobic patients not wanting to enter MRI scanner)
 - 5. Training
- h. The annual remuneration, the standard volume and the productivity factor are combined to determine a cost per minute for the radiologist.

iii. Radiographer

1. Standard volume

- a. The standard volume for a radiographer and sister is calculated by determining the available amount of minutes per annum, taking into account a productivity factor

2. Annual remuneration

- a. Respondents were sampled on the average radiographer remuneration (total cost to company).
- b. This remuneration includes:

- i. Basic salary
- ii. Annual and other bonuses
- iii. All professional, supervisor and travel allowances.
- iv. All overtime, call and standby costs
- v. All company paid contributions to pension fund, provident fund, medical aid, life and disability insurance

3. Productivity Factor

- a. A productivity factor of 75% was used for radiographers and sisters.
- b. Unproductive time is made up of:
 - i. Idle time waiting for patients
 - ii. Repeats of procedures / images
 - iii. Difficult patients (e.g. claustrophobic patients not wanting to enter MRI scanner)
 - iv. Training

4. Radiographer as Separate Cost Centre

- a. Because radiology is a procedure defined discipline, and radiographers are associated with each procedure, the radiographers have been removed from the administrative overhead into a direct labour cost element. This is appropriate.
- b. It must be noted however that in doing so, given the parameters of the CMS model, there is then no “overhead mark up” on the radiographer cost. If the radiographer costs had been included in the administration overhead, they would have attracted an overhead mark up.

iv. Responsibility rating

- 1. Complexity and responsibility ratings were surveyed amongst the respondents and statistically adequate averages obtained.
- 2. Responsibility ratings were converted to a responsibility factor which was used as a multiplier to the direct labour cost (remuneration rate x time for procedure)
- 3. In calculating the responsibility factor, the CMS guideline that the total remuneration must be the same including and excluding the factor, was adhered to. The industry frequency data set was used in the equalization calculation.

4. The MS-Excel “goal seek” function was used to determine the lower level and the intermediate values for the responsibility factors. The upper level was set at 2 (two).

h. Direct equipment costs

i. Introduction

1. Radiology equipment, although needed for all radiological diagnostic procedures, is defined as being specialist equipment.
2. The equipment costs are deemed to be direct costs applicable to each procedure.
3. The range of equipment is extensive, with varying specifications within a modality category.

ii. Standard volume

1. The standard volume calculation as proposed by CMS has been adopted in principle.
2. The productivity factor in the CMS guidelines for specialist equipment is 65%. It is submitted however that radiology imaging equipment is necessary and used in almost every diagnosis, and it should therefore attract a higher productivity factor. A productivity factor of 75% has been used in the equipment standard volume calculations for all equipment, except very specialized angiography equipment (see below). The 75% factor is the same as the productivity factors for staff and overheads, and is therefore a consistent factor in the submission.
3. The productivity factor for angiography equipment is entered as 50%. Prior tariff calculations for these items of equipment (codes 00510, 00520, 00530, 00540, 00550, 00560), were based on an agreed (SAMA) 50% productivity factor. The procedures need to be done on dedicated equipment in dedicated angiography suites, and the volume of procedures done in these facilities is very low. The equipment / facility are offered by the radiologists, on requests from the hospital and the referring doctors to provide a comprehensive service.

iii. Cost of Equipment

1. The major radiology equipment suppliers were approached for pro forma pricing of their equipment, based on the generic categories used in this submission.
2. The four major radiology equipment suppliers (representing in excess of 90% of the value of equipment sold) in South Africa responded to the survey:
 - a. General Electric Medical Systems
 - b. Philips Medical Systems
 - c. Siemens Medical Systems
 - d. Tecmed
3. The information collected included service contract pricing, exchange rate on which price was based, and the imported component of the equipment.
4. The equipment prices from each supplier were averaged for each category.
5. The life spans of the equipment were obtained from practical experience in the field.
6. The estimated life span of the equipment is used to amortize the capital cost of the equipment in the calculation.
7. The ZAR price of the equipment was standardized by converting the exchange rates (R / \$ and R / Euro) upon which the supplies prices were calculated, to a standard exchange rate in the price calculation. The standard exchange rate was based on the average of the month end exchange rates for 2005.
8. The input costs, annualized, were converted to a per minute cost, using the standard volume calculation.
9. Variance with the CMS specialized equipment model occurs in:
 - a. CMS instruct that the life span (write off period) of the (standard and specialized) equipment shall be consistent with the write periods allowed by SARS (Practice Note 15). It is noted that for X-ray equipment this (SARS) write off period is 5 years. In all instances the life span / write off period used in these calculations is in excess of 5 years, resulting in a lowering of per minute cost for the equipment.

- b. The CMS model for specialized equipment used the total repayment (capital and interest) as a cost item. No further return in investment / mark up is then added. In the RSSA submission, a mark up / return on investment is calculated, similar to the mark up / ROI on overhead. A return in excess of a risk free return is included in the calculation. See sections below on the detailed ROI calculation.
- c. Both approaches (CMS and RSSA) in a) and b) above give similar results.
- d. Radiology equipment has specific maintenance costs associated with the high tech nature and high utilization of the equipment. Each equipment supplier has standard full service contracts for its equipment and these prices are used in the calculation. Please note that these annual maintenance contracts are in the order of 5% - 10% of the purchase price.

iv. Equipment cost calculation

- 1. The appropriate return on investment percentage is applied to the actual cost per minute (see below).
- 2. The surveyed room times for the procedures are multiplied by the equipment costs per procedure to determine cost of the equipment cost per procedure.

i. Overhead costs

i. Standardization of overhead costs

- 1. Radiology practice is rarely a single practitioner business. Practices in South Africa have between 1 and 20 radiologist partners, more often than not operating from multiple venues.
- 2. The administration overhead of individual practices varies widely due to their size and multiple locations, often with central administration departments
- 3. The overhead costs therefore need to be standardized via a simple denominator for use in the calculations.
- 4. Radiology practice involves a relatively high volume of procedures meaning that the use of (procedure based) averages is statistically appropriate. It is therefore appropriate to use the number of

procedures as the standardizing denominator for administration overhead costs

5. Each participating practice was surveyed for their actual administration overhead for a specific period, and the sum of all these overheads were divided by the sum of billable procedures done during the same period (after statistical analysis), to determine an average overhead cost per procedure. This was done by annualizing all the overhead costs per practice and dividing it through the annualized number of procedures per practice. Overhead costs & billable procedures for all practices are totaled for periods in 2005.
6. Thus, the total overhead cost for a period (all practices), divided by the total number of billable procedures done during that same period (all practices) were calculated.
7. Statistical tests were used to ensure adequacy of data.
 - a. The “Grubb” test was applied to identify possible outliers (none found).
 - b. The lower 95% confidence level value, based on a normal distribution, was used as the final administration overhead, as per the CMS guidelines. The lower 95% confidence value was calculated on both the overhead cost (x) and the summed procedures done (y).
 - c. The average overhead cost per procedure was determined using these lower 95% confidence interval values (x / y).

ii. Applicable standard volume and time allocations

1. This overhead cost per procedure was then converted to an overhead cost per procedure per minute, by dividing the average overhead cost per procedure by the average per procedure room time
2. The average per procedure room time was calculated by using the frequency data set to determine a weighted average procedure room time i.e.

Average per procedure room time = $\sum (f_n \times t_n) / F$ where:

f_n = frequency of procedure ‘n’,
 t_n = room time of procedure ‘n’ and
 $F = \sum f_n$

3. In calculating the administration overhead part of the procedure cost, the average overhead cost per procedure per minute was multiplied by the room time for the procedure. Where a room time was not available (i.e. no equipment used in the procedure, or the price of a particular procedure did not include room time) then the appropriate radiologist or radiographer time was used.
4. As per the principles of the CMS model, a 75% productivity factor (as part of the standard volume calculation) was built into the administration overhead cost calculation.

j. Return on Investment

i. Introduction

1. Return on investment (or “mark up”) is used in two places in the calculations.
 - a. A ROI on the administration overhead
 - b. A ROI in the specialized radiology equipment
2. The CMS guideline provides a basis for the calculation the ROI.
3. It is submitted that for specialized radiology equipment, additional risk factors must be incorporated
4. The BA rate is used in this calculation. The average of the 12 month end BA rates for 2006 is calculated and used.

ii. ROI Administration Overhead

1. The CMS guidelines prescribe the use of a pre-tax risk free rate, the calculation being based on the BA rate as the after tax risk free rate.
2. The RSSA believes that a risk free rate is inappropriate in this instance, as there must be risk in setting up and operating an administration department.
3. However in wishing to keep the submission in line with the CMS guidelines, the calculations in this instance are based on the methodology provided by CMS.

iii. ROI Radiology Equipment

1. The risk of establishing and running a radiology equipment infrastructure is higher than a risk free rate, and higher than establishing and operating an administration infrastructure.
2. The reasons for this increased risk (i.e. risk above risk free rate) are
 - a. The relatively high cost of equipment
 - b. The relatively short life cycle of the equipment
 - c. The limited market for resale of equipment and low resale value
 - d. Equipment is not easily transportable
 - e. The short lease periods offered to radiology practices
 - f. Radiology practice relies on lease agreements with hospitals. If lease agreements are not renewed, or tenancy is suddenly terminated, the practice normally has to cease, as the opportunity for obtaining another space in which to operate and use the equipment is extremely limited.
 - g. The high technology nature of equipment. New technologies render older items of equipment questionable or obsolete in terms of available quality.
3. Increased risk percentage
 - a. The increased risk rates, after tax, (and added to the BA rate) used in the submission for specialized radiology equipment are:
 - i. Short life span cycle (1%)
 - ii. Rate of change of equipment / technology (1%)
 - iii. Risk of tenancy (1%)
 - iv. Low resale value (1%)
 - v. Total risk above risk free rate (after tax) = 4%

9) IMPACT STUDIES AND CROSS SUBSIDAZATION PROPOSAL

a. Introduction

- i. Using the industry frequency data set, an analysis is made of the impact the new tariffs prices versus the existing tariff prices.
- ii. Two impacts are important:
 1. The overall payout impact of the new item prices versus the old item prices.
 2. The impact on a modality basis, to determine the changes in the intra discipline totals.

b. The overall impact

- i. The total payout of the new item prices compares favorably with the total payout of the existing prices.
- ii. The impact using the industry frequency data set 19.1%.
- iii. It is noted that in the impact study, the price of billable radiology consumables is not included. These prices are common to both sides of the impact study comparison, and therefore have no effect. For the sake of clarity it is noted that general billable consumables are priced at the Single Exit Prices as per the suppliers invoice plus a mark up as allowed by the industry, where applicable. Contrast material does not attract a markup.

c. The intra discipline impact

- i. The intra discipline (inter modality) impacts and variances are substantial and need to be addressed.
- ii. The intra discipline, inter modality impacts / variances are:

3 rd digit	Modality	% Change
"0"	General	+ 258%
"1"	X-ray	+ 43%
"2"	Ultrasound	+ 83%
"3"	CT	- 17%
"4"	MR	- 37%
"5" and "6"	Angiography and interventional	Nil %
"9"	Nuclear Medicine	+ 9%
Overall		+ 19.1%

iii. Concern has been expressed (at CMS, funder and service provider level) that the industry may not be able to absorb the intra modality pricing swings

iv. Areas of concern are:

1. General "1"

- a. General practitioners and clinics make use of general x-ray equipment to supply non specialist services. General practitioners do not supply the "negative impact" modalities of CT and MRI, resulting in the total payouts to this group increasing.
- b. General x-rays form the bulk of imaging included in medical aid packages for the lower income market (possibly also the Prescribed Minimum Benefit market as well).
- c. Such a modality increase in the non specialist market will result in significant increased payout impacts. (The frequencies of such non specialist general x-ray are not known so no impact study has been included in this submission).

2. Ultrasound "2"

- a. General practitioners, certain non radiology specialists (gynecologists, urologists, cardiologists, pediatricians) and paramedical ultra-sonographers make use of ultrasound
- b. Previous studies by the funding industry have indicated that specialist radiology ultrasound makes up only 20% of the total ultrasound payout.

- c. Increases in the ultrasound pricing could have a significant impact on the total payout of ultrasound services
- 3. It is acknowledged that the CMS pricing of the general and ultrasound services may be different from the specialist pricing (different remuneration and overhead costs inputs), but the impact of the submissions prices will still be increased payouts.
- 4. Lack of regulatory control of imaging facilities
 - a. The lack of sufficient regulatory control or any effective form of accreditation processes in the ownership of imaging equipment will lead to a blow out in acquisition of general x-ray equipment and ultrasound equipment in the self referred private sector environment in SA. This will in turn lead to increased utilization without concomitant improvement in quality or outcomes.
- d. Cross subsidization of administration overhead in the existing specialist radiology tariff prices
 - i. The existing radiology prices (RRPL) include a cross subsidization of the administrative overhead from the high volume - low priced procedures to the low volume - high tech procedures.
 - ii. This cross subsidization model was developed in the 1990's by the then Coopers and Lybrand auditing firm, in conjunction with the South African Medical Association and the Radiological Society of South Africa, and was used in a 1990's tariff recalculation exercise initiated by SAMA. The recalculated tariffs were not introduced into the market place at that time.
 - iii. In 1996, the RSSA calculated new prices for the CPT tariff structure, also using the activity based costing model and the cross subsidization of the administration overhead. This CPT tariff structure was successfully introduced into the South Africa funding environment.
- e. Proposal for reversing the intra modality impact
 - i. It is proposed that any reversal of the intra-modality variances (swings) be done on a broad modality basis.
 - ii. It will be a simple mathematical exercise to apply "modality impact multipliers" (MIM) to each of the modality prices in order to reverse (either partially or fully) the intra modality swings.
 - iii. Such MIM's can be valued such that, by using a representative industry frequency data set, the overall payout impacts will remain the same.

- iv. It is acknowledged that price can have an effect on utilization, even in the medical services market (where the ability of the customer to make a choice is limited). The large swings (variances) in the intra modality pricing could have meaningful effects on the utilization of services but no comment or estimates are included in this submission.
- v. It is proposed therefore that the large intra modality swings that will occur if the prices as submitted are introduced, are reduced by the implementation of unique but constant MIM, applied to each set of separate modality prices, such that the overall impact remains nil.
- vi. Such MIM's could be calculated and implemented such that there is a gradual and increasing introduction of the intra modality swings.

10)NEW CODES

- a. Applications made in 2005 for new codes, not yet approved.
 - i. Submissions were made in 2005 for new codes for
 - 1. The PET-CT modality
 - 2. Code 00170 - Xray scan of whole body using low dose equipment
 - ii. These items are as yet not included in the NHRPL as CMS is awaiting feedback from the Health Technology Assessment committee of the Department of Health.
 - iii. These codes have not been included in this submission, neither as part repricing the existing structure, nor as part of the new code application hereunder.
 - iv. The price calculation methodology used for these applications was based on the activity based costing principles used in this submission
- b. Angiography and Interventional Codes
 - i. The CMS, in conjunction with the RSSA, will during 2006 introduce revised angiography and Interventional prices.
 - ii. Notwithstanding the above, this submission includes a new price calculation for these procedures.

c. Application for new codes for 2007

- i. The price calculation sheet includes price calculations for new codes required – these may be viewed at the end of the list of current codes.
- ii. These codes are:
 - 1. Nuclear Medicine - “White blood cell labeling using own equipment”
 - 2. Nuclear Medicine – “SPECT CT for attenuation correction”
 - 3. Radiology – “CT planning for radiotherapy including contrast”

CONCLUSION

The Radiological Society of South thanks the Council for Medical Schemes for the opportunity to submit this tariff calculation for 2007 and is available for discussion on the contents.

APPENDIX A - Extract from Applied Statistics: Analysis of Variance and Regression



SENTRUM VIR STATISTIESE KONSULTASIE

UNIVERSITEIT VAN STELLENBOSCH

DEPT. STATISTIEK EN AKTUARIELE WETENSKAP
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2006-05-18

Mnr. Jako Calitz
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Mnr Calitz

Toetse vir uitskieters.

Aangaande u navraag oor die identifisering van waarnemings wat as uitskieters gemerk kan word uit 'n steekproef van grootte n , het ons van die metode van Grubbs gebruik gemaak om die uitskieters te identifiseer, naamlik:

Bereken die gemiddeld van die n waarnemings naamlik: x_{gem}

Bereken die standaard afwyking van die n waarnemings naamlik: s

Bereken die toetsingswaarde vir die maksimum waarneming $x_{(n)}$ naamlik:

$$T_n = (x_{(n)} - x_{\text{gem}}) / s$$

Bereken die toetsingswaarde vir die maksimum waarneming $x_{(1)}$ naamlik:

$$T_1 = (x_{\text{gem}} - x_{(1)}) / s$$

Vergelyk hierdie toetsingswaardes met die 5% kritieke waarde soos gegee in Grubbs se tabel A7 p. 432-433 in O.J. Dunn & V.A Clark: Applied Statistics and Analysis of Variance (2nd Ed.) (1987), John Wiley. Indien T_n hierdie waarde oorskry word $x_{(n)}$ geïdentifiseer as 'n uitskieter en as T_1 hierdie waarde oorskry word $x_{(1)}$ geïdentifiseer as 'n uitskieter. Die metode is gebaseer op die aanname dat die data normaal verdeeld is.

Groete

A handwritten signature in black ink, appearing to read 'D.G. Nel', is written over a horizontal line.

Prof. D.G. Nel

Direkteur: Sentrum vir Statistiese Konsultasie

Applied Statistics: Analysis of Variance and Regression

Second Edition

OLIVE JEAN DUNN

Professor Emerita of Biostatistics and Biomathematics
University of California, Los Angeles

VIRGINIA A. CLARK

Professor of Biostatistics and Biomathematics
University of California, Los Angeles

JOHN WILEY & SONS

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Another test for outliers based on the same assumption of normality is Grubbs's test [16.20], which is useful when a single outlier is suspected. If the largest observation is suspect, we calculate the test statistic

$$T_n = \frac{Y_{(n)} - \bar{Y}}{s}, \quad (16.3)$$

where s is the standard deviation of the sample and $Y_{(n)}$ is the largest observation. To test whether the smallest observation $Y_{(1)}$ is an outlier, we use the statistic

$$T_1 = \frac{\bar{Y} - Y_{(1)}}{s}. \quad (16.4)$$

Several percentage points of the distribution of T_n and T_1 are given in Table A.7. If the calculated statistic for either test is larger than the tabled value, $Y_{(n)}$ (or $Y_{(1)}$) is an outlier.

Table A.7 - Applied Statistics: Analysis of Variance and Regression – Second Edition

$$* \quad T_n = \frac{Y_n - \bar{Y}}{s} ; \quad T_1 = \frac{\bar{Y} - Y_1}{s} \quad , \text{ where } Y_n (Y_1) \text{ are the largest}$$

(smallest) observations in a size n sample from a normal distribution.

Values in the table are from Grubbs, F. E., "Procedures for detecting outlying observations in samples," *Technometrics*, Vol. 11, p. 4 (1969).

TABLE A.7. PERCENTAGE POINTS OF T_n OR T_1^*

Number of Observations n	1 - α		
	.95	.975	.99
3	1.15	1.15	1.15
4	1.46	1.48	1.49
5	1.67	1.71	1.75
6	1.82	1.89	1.94
7	1.94	2.02	2.10
8	2.03	2.13	2.22
9	2.11	2.21	2.32
10	2.18	2.29	2.41
11	2.23	2.36	2.48
12	2.29	2.41	2.55
13	2.33	2.46	2.61
14	2.37	2.51	2.66
15	2.41	2.55	2.71
16	2.44	2.59	2.75
17	2.47	2.62	2.79
18	2.50	2.65	2.82
19	2.53	2.68	2.85
20	2.56	2.71	2.88
21	2.58	2.73	2.91
22	2.60	2.76	2.94
23	2.62	2.78	2.96
24	2.64	2.80	2.99
25	2.66	2.82	3.01
30	2.75	2.91	
35	2.82	2.98	
40	2.87	3.04	
45	2.92	3.09	
50	2.96	3.13	
60	3.03	3.20	
70	3.09	3.26	
80	3.14	3.31	
90	3.18	3.35	
100	3.21	3.38	



The Radiological Society of South Africa
Die Radiologiese Vereniging Van Suid-Afrika
Umbutho wenzululwasi ngeX-reyi woMzantsi-Afrika

The Professional Association of Radiologists in South Africa and Namibia

17 May 2006

The Council of Medical Schemes
PO Box
Hatfield

Dear Sirs

Radiology NHRPL 2007 Submission: Non-propriety Guarantee

The Radiological Society of South Africa (RSSA), the official and representative professional association of specialist radiologists and nuclear physicians in South Africa, and the body responsible for submission to the Council for Medical Schemes of the Radiology National Reference Price List for 2007, hereby guarantees that:

1. Publication of the NHRPL based on the proposals made in this submission will not constitute an infringement of copyright held by any party, and will require any licensing agreements of royalty payments
2. Parties making use of the NHRPL through software systems which facilitate billing between medical schemes and providers, or reproducing the NHRPL to publicize the benefits offered by medical schemes will not be in infringement of copyright; and will not require any licensing agreements or become subject to any royalty payments
3. By using the proposals made in the submissions, the NHRPL will not be restricted by any intellectual property interest or propriety restriction from maintaining or altering the relevant portion of the NHRPL
4. The RSSA indemnifies the NHRPL for any claims or damages arising from the undisclosed intellectual property violations arising from implementing of the proposals in this submission.

Yours Sincerely

Dr Richard Tuft
President