

# Queensland's Guidelines for evaluation of permanent impairment

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## Foreword

Queensland's *Guidelines for Evaluation of Permanent Impairment* (the Queensland Guide) are issued for the purpose of assessing the degree of permanent impairment that arises from an injury or disease within the context of workers' compensation. When a person sustains a permanent impairment it is intended that the Queensland Guide be used by medical assessors trained in the evaluation of permanent impairment to ensure an objective, fair and consistent method for evaluating the degree of impairment.

The Queensland Guide is based on a template guide that was developed through a national process facilitated by Safe Work Australia. This national guide was initially developed for use in the New South Wales workers' compensation system and incorporates numerous improvements identified by the WorkCover NSW Whole Person Impairment Coordinating Committee over its 13 years of continuous use. The many hours of dedication and thoughtful consideration that members of the WorkCover NSW Whole Person Impairment Coordinating Committee and South Australia Permanent Impairment Committee have given to the review and improvement of the provisions in this Guide that have been adapted into this version of the Queensland Guide is acknowledged and greatly appreciated (see Appendix 2).

The methodology in the Queensland Guide is largely based on the American Medical Association's *Guides to the Evaluation of Permanent Impairment*, Fifth Edition (AMA5). The AMA Guides are the most authoritative and widely used source for evaluating permanent impairment around the world. Extensive work by eminent Australian medical specialists representing Australian medical associations and Colleges has gone into reviewing the AMA5 to ensure they are aligned with clinical practice in Australia.

The Queensland Guide consist of an introductory chapter followed by a dedicated chapter for each body system.

The Introduction is divided into three parts. The first part outlines the background and development of the Queensland Guide including reference to the relevant legislative instrument that gives effect its use in Queensland's scheme. The second part covers general assessment principles intended for the use of medical practitioners who are applying the Queensland Guide in their assessment of permanent impairment that results from a work related injury or disease. The third part addresses administrative issues relating to the use of the Queensland Guide.

As the template national guide has been progressively adapted from the original NSW Guide and is to be adopted by other jurisdictions, some aspects have been necessarily modified and generalised. Some provisions may differ between different jurisdictions, for further information please see the *Comparison of Workers' Compensation Arrangements in Australia and New Zealand* report, which is available on Safe Work Australia's website.

Publications such as this only remain useful to the extent that they meet the needs of users and those injured who sustain a permanent impairment. It is therefore important that the protocols set out in the Queensland Guide are applied consistently and methodically. Any difficulties or anomalies need to be addressed through modification of the publication and not by idiosyncratic reinterpretation of any part. All queries about the Queensland Guide or suggestions for improvement should be addressed to the Office of Industrial Relations at: [wcpolicy@oir.qld.gov.au](mailto:wcpolicy@oir.qld.gov.au) or PO Box 69, Brisbane QLD 4001.

# 1. Introduction

## PART 1 – INTENT AND LEGISLATIVE BASIS FOR THE QUEENSLAND GUIDE

- 1.1 Queensland's *Guidelines for Evaluation of Permanent Impairment* (the Queensland Guide) is approved by the Workers' Compensation Regulator under section 183 of the *Workers' Compensation and Rehabilitation Act 2003* (the WCR Act) and is to be used within Queensland's workers' compensation scheme to evaluate and decide the degree of permanent impairment arising from work-related injuries or diseases, in accordance with section 179 of the WCR Act.

The Queensland Guide adopts the fifth edition of the American Medical Association's *Guides to the Evaluation of Permanent Impairment* (AMA5) in most cases. Where there is any deviation, the difference is defined in the Queensland Guide and the procedures contained therein are to prevail if there is any inconsistency with AMA5.

### Date of Effect

- 1.2 The Queensland Guide applies to the assessment of impairments arising from all injuries incurred on or after 15 October 2013.

When conducting a permanent impairment assessment in accordance with the Queensland Guide, assessors are required to use the version current at the time of the assessment.

### Development of this Guide

- 1.3 This Guide is based on a template guide that was developed through a national process facilitated by Safe Work Australia. The template national guide is based on a similar set of guidelines that was developed and used extensively in the New South Wales' workers compensation system. Consequently provisions of the Queensland Guide are the result of extensive and in-depth deliberations by groups of medical specialists convened to review the AMA5 in the Australian workers' compensation context. It has been adopted for use in multiple Australian jurisdictions.
- 1.4 Use of the Queensland Guide is monitored by the jurisdictions that have adopted it and may be reviewed if significant anomalies or insurmountable difficulties in their use become apparent.
- 1.5 The Queensland Guide is intended to assist a suitably qualified and experienced medical practitioner or assessor to assess a claimant's degree of permanent impairment.

## PART 2 – PRINCIPLES OF ASSESSMENT

- 1.6 The following is a basic summary of some key principles of permanent impairment assessments:
- (a) Assessing permanent impairment involves clinical assessment of the claimant as they present on the day of assessment taking account of the claimant's relevant medical history and all available relevant medical information in order to determine:
- Whether the condition is stable and stationary;

- Whether the claimant's compensable injury/condition has resulted in an impairment;
  - Whether the resultant impairment is permanent;
  - The degree of permanent impairment that results from the injury; and
  - The proportion of permanent impairment due to a previous impairment, if any, in accordance with diagnostic and other objective criteria as outlined in this Guide.
- (b) Assessors are required to exercise their clinical judgement in determining a diagnosis when assessing permanent impairment and when making deductions for pre-existing impairments.
- (c) In calculating the final level of impairment, the assessor needs to clarify the degree of impairment that results from the compensable injury/condition. Any deductions for pre-existing impairments are to be clearly identified in the report and calculated. If, in an unusual situation, a related injury/condition has not previously been identified, an assessor should record the nature of any previously unidentified injury/condition in their report and specify the causal connection to the relevant compensable injury or medical condition.
- (d) The referral for an assessment of permanent impairment is to make clear to the assessor the injury or medical condition for which an assessment is sought – see also paragraphs 1.43 and 1.44.
- 1.7 Medical assessors are expected to be familiar with Chapters 1 and 2 of the AMA5 in addition to the information contained in this Introduction.
- 1.8 The degree of permanent impairment that results from the injury/condition must be determined using the tables, graphs and methodology given in this Guide or the AMA5 or any other methodology referred to in this guide, where appropriate.
- 1.9 This Guide may specify more than one method that assessors can use to establish the degree of a claimant's permanent impairment. In that case, assessors should use the method that yields the highest degree of permanent impairment. (*This does not apply to gait derangement - see paragraphs 3.5 and 3.10*).

### **Body systems covered by this Guide**

- 1.10 The AMA5 is used for most body systems, with the exception of psychiatric and psychological disorders, chronic pain, visual and hearing injuries.
- 1.11 The AMA5 chapter on Mental and Behavioural Disorders (Chapter 14) is omitted. The Queensland Guide contain a substitute chapter on the assessment of psychiatric and psychological disorders (Chapter 11) which was written by a group of Australian psychiatrists.
- 1.12 The AMA5 chapter on pain (Chapter 18) is excluded entirely at the present time. Conditions associated with chronic pain should be assessed on the basis of the underlying diagnosed condition, and not on the basis of the chronic pain. Where pain is commonly associated with a condition, an allowance is made in the degree of impairment assigned in the Queensland Guide. Complex regional pain syndrome should be assessed in accordance with Chapter 17 of the Queensland Guide.

- 1.13 On the advice of medical specialists (ophthalmologists), assessments of visual injuries are conducted according to American Medical Association *Guides to the Evaluation of Permanent Impairment*, 4<sup>th</sup> Edition (AMA4).
- 1.14 Evaluation of permanent impairment due to hearing loss adopts the methodology indicated in the Queensland Guide (Chapter 9) with some reference to the AMA5 (Chapter 11, pp 245–251) but uses National Acoustic Laboratory (NAL) Tables from the NAL Report No 118, *Improved Procedure for Determining Percentage Loss of Hearing*, January 1988.

### **Stable and stationary**

- 1.15 Assessments are only to be conducted when the medical assessor considers that the degree of permanent impairment of the claimant is unlikely to improve further and is stable and stationary. This is considered to occur when the worker's condition is well stabilised and is unlikely to change substantially in the next year with or without medical treatment.
- 1.16 If the medical assessor considers that the claimant's treatment has been inadequate and maximum medical improvement has not been achieved, the assessment should be deferred and comment made on the value of additional/different treatment and/or rehabilitation – subject to paragraph 1.34.

### **Multiple impairments**

- 1.17 Impairments arising from the same injury are to be assessed together. Impairments that result from more than one injury arising out of the same incident are to be assessed together to calculate the degree of permanent impairment of the claimant.
- 1.18 The Combined Values Chart (pp 604-606, AMA5) is used to derive a % WPI that arises from multiple impairments. An explanation of its use is found on pp 9-10 of the AMA5. When combining more than two impairments, the Assessor should commence with the highest impairment and combine with the next highest and so on.
- 1.19 The exception to this rule is in the case of psychiatric or psychological injuries. Where applicable, impairments arising from primary psychological and psychiatric injuries are to be assessed separately from the degree of impairment that results from any physical injuries arising out of the same incident. The results of the two assessments cannot be combined.
- 1.20 In the case of a complex injury, where different medical assessors are required to assess different body systems, a 'lead assessor' should be nominated to coordinate and calculate the final degree of permanent impairment as a percentage of whole person impairment (% WPI) resulting from the individual assessments.

### **Psychiatric/ psychological injuries**

- 1.21 Psychiatric and psychological injuries in Queensland are defined as including both primary and secondary psychological injuries.
- 1.22 As referenced in paragraph 1.19, impairments arising from psychological and psychiatric injuries are to be assessed separately from the degree of impairment that

results from any physical injuries arising out of the same incident. The results of the two assessments cannot be combined.

### **Conditions which are not covered in this Guide – equivalent or analogous conditions**

- 1.23 The AMA5 (p11) states: “Given the range, evolution and discovery of new medical conditions, this Guide cannot provide an impairment rating for all impairments ... In situations where impairment ratings are not provided, the Guidelines suggest that medical practitioners use clinical judgment, comparing measurable impairment resulting from the unlisted condition to measurable impairment resulting from similar conditions with similar impairment of function in performing activities of daily living.” The assessor must stay within the body part/region when using analogy.

The assessor’s judgment, based upon experience, training, skill, thoroughness in clinical evaluation, and ability to apply the Guidelines criteria as intended, will enable an appropriate and reproducible assessment to be made of clinical impairment.”

### **Activities of Daily Living**

- 1.24 Many tables in the AMA5 (e.g. spine section) give class values for particular impairments, with a range of possible impairment values within each class. Commonly, the tables require the assessor to consider the impact of the injury/illness on activities of daily living in determining the precise impairment value. The activities of daily living which should be considered, if relevant, are listed in Table 1-2, p4, of the AMA5. The impact of the injury on activities of daily living is not considered in assessments of the upper or lower extremities.
- 1.25 The assessment of the impact of the injury/condition on activities of daily living should be verified wherever possible by reference to objective assessments, for example, physiotherapist or occupational therapist functional assessments and other medical reports.

### **Rounding**

- 1.26 Occasionally the methods of this Guide will result in an impairment value which is not a whole number (e.g. an assessment of peripheral nerve impairment in the upper extremity). All such values must be rounded to the nearest whole number before moving from one degree of impairment to the next (e.g. from finger impairment to hand impairment, or from hand impairment to upper extremity impairment) or from a regional impairment to a whole person impairment. Figures should also be rounded before using the combination tables. This will ensure that the final whole person impairment will always be a whole number. The usual mathematical convention is followed where rounding occurs - values less than 0.5 are rounded down to the nearest whole number and values of 0.5 and above are rounded up to the next whole number. The method of calculating levels of binaural hearing loss is shown in Chapter 9, paragraph 9.15 in this Guide.

### **Deductions for pre-existing impairment**

- 1.27 The degree of permanent impairment resulting from pre-existing impairments should not be included in the final calculation of permanent impairment if those impairments are not related to the compensable injury. The assessor needs to take account of all



available evidence to calculate the degree of permanent impairment that pre-existed the injury.

- 1.28 In assessing the degree of permanent impairment resulting from the compensable injury/condition, the assessor is to indicate the degree of impairment due to any previous injury, pre-existing condition or abnormality. This proportion is known as “the deductible proportion” and should be deducted from the degree of permanent impairment determined by the assessor. For the injury being assessed, the deduction is 1/10<sup>th</sup> of the assessed impairment, unless at odds with the available evidence.

### **Adjustment for the effects of orthoses and prostheses**

- 1.29 Assessments of permanent impairment are to be conducted without assistive devices, except where these cannot be removed. The assessor will need to make an estimate as to what is the degree of impairment, without such a device, if it cannot be removed for examination purposes. Further details may be obtained in the relevant chapters of this Guide.
- 1.30 Impairment of vision should be measured with the claimant wearing their prescribed corrective spectacles and/or contact lenses, if this was usual for them before the injury. If, as a result of the injury, the claimant has been prescribed corrective spectacles and/or contact lenses for the first time, or different spectacles and/or contact lenses than those prescribed pre-injury, the difference should be accounted for in the assessment of permanent impairment.

### **Adjustment for the effects of treatment**

- 1.31 In circumstances where the treatment of a condition leads to a further, secondary impairment, other than a secondary psychological impairment, the assessor should use the appropriate parts of this Guide to evaluate the effects of treatment, and use the Combined Values Chart (pp 604-606 AMA5) to arrive at a final percentage Whole Person Impairment.
- 1.32 Where the effective long term treatment of an illness or injury results in apparent substantial or total elimination of the claimant’s permanent impairment, but the claimant is likely to revert to the original degree of impairment if treatment is withdrawn, the assessor may increase the percentage of whole person impairment by 1, 2 or 3% WPI. This percentage should be combined with any other impairment percentage, using the Combined Values Chart. This paragraph does not apply to the use of analgesics or anti-inflammatory medication for pain relief.
- 1.33 Where a claimant has declined treatment which the assessor believes would be beneficial, the impairment rating should be neither increased nor decreased – see paragraph 1.35 for further details.

### **Refusal of treatment**

- 1.34 If the claimant has been offered, but has refused, additional or alternative medical treatment that the assessor considers is likely to improve the claimant's condition, the medical assessor should evaluate the current condition, without consideration of potential changes associated with the proposed treatment. The assessor may note the potential for improvement in the claimant's condition in the evaluation report, and the

reasons for refusal by the claimant, but should not adjust the level of impairment on the basis of the claimant's decision.

### **Future deterioration of a condition**

- 1.35 Similarly, if a medical assessor forms the opinion that the claimant's condition is stable for the next year, but that it may deteriorate in the long term, the assessor should make no allowance for this deterioration but notes its likelihood in the report.

### **Inconsistent presentation**

- 1.36 The AMA5 states: “Consistency tests are designed to ensure reproducibility and greater accuracy. These measurements, such as one that checks the individual’s range of motion are good but imperfect indicators of people’s efforts. The assessor must use their entire range of clinical skill and judgment when assessing whether or not the measurements or test results are plausible and consistent with the impairment being evaluated. If, in spite of an observation or test result, the medical evidence appears insufficient to verify that an impairment of a certain magnitude exists, the assessor may modify the impairment rating accordingly and then describe and explain the reason for the modification in writing.” (p 19). This paragraph applies to inconsistent presentation only.

### **Ordering of additional investigations**

- 1.37 As a general principle, the assessor should not order additional radiographic or other investigations purely for the purpose of conducting an assessment of permanent impairment.
- 1.38 However, if the investigations previously undertaken are not as required by this Guide or are inadequate for a proper assessment to be made, the medical assessor should consider the value of proceeding with the evaluation of permanent impairment without adequate investigations.
- 1.39 In circumstances where the assessor considers that further investigation is essential for a comprehensive evaluation to be undertaken and deferral of the evaluation would considerably inconvenience the claimant (e.g. when the claimant has travelled from a country region specifically for the assessment), the assessor may proceed to order the appropriate investigations provided that there is no undue risk to the claimant. The approval of the referring body for the additional investigation will be required to ensure that the costs of the test are met promptly.

## **PART 3 – ADMINISTRATIVE PROCESS**

### **Medical Assessors**

- 1.40 An assessor will be a medical practitioner with qualifications, training and experience relevant to the body system being assessed who has undertaken the requisite training in use of this Guide. For the purpose of industrial deafness assessments, the assessor

may be a registered audiologist who has undertaken the requisite training in the use of this Guide.

- 1.41 Assessors may be one of the claimant's treating practitioners or an assessor engaged to conduct an assessment for the purposes of determining the degree of permanent impairment.

### **Information required for assessments**

- 1.42 Information for claimants regarding independent medical examinations and assessments of permanent impairment should be supplied by the referring body when advising the appointment details.
- 1.43 On referral, the medical assessor should also be provided with all other relevant medical and allied health information, including results of all clinical investigations related to the injury/condition in question.
- 1.44 Most importantly, assessors must have available to them all information about the onset, subsequent treatment, relevant diagnostic tests, and functional assessments of the person claiming a permanent impairment. The absence of required information could result in an assessment being discontinued or deferred. Section 1.5 of Chapter 1 of the AMA5 (p10) applies to the conduct of assessments and expands on this concept.
- 1.45 This Guide and the AMA5 indicate the information and investigations that are required to arrive at a diagnosis and to measure permanent impairment. Assessors must apply the approach outlined in this Guide. Referrers must consult this publication to gain an understanding of the information that should be provided to the assessor in order to conduct a comprehensive evaluation.

### **Reports**

- 1.46 A report of the evaluation of permanent impairment should be accurate, comprehensive and fair. It should clearly address the question/s being asked of the assessor. In general, the assessor will be requested to address issues of:
- current clinical status, including the basis for determining whether the injury is stable and stationary;
  - the degree of permanent impairment that results from the injury/condition; and
  - the proportion of permanent impairment due to any previous impairment, if applicable.
- 1.47 The report should contain factual information based on all available medical information and results of investigations, the assessor's own history taking and clinical examination. The other reports or investigations that are relied upon in arriving at an opinion should be appropriately referenced in the assessor's report.
- 1.48 As this Guide is to be used to assess permanent impairment, the report of the evaluation should provide a rationale consistent with the methodology and content of this Guide. It should include a comparison of the key findings of the evaluation with the impairment criteria in this Guide. If the evaluation was conducted in the absence of

any pertinent data or information, the assessor should indicate how the impairment rating was determined with limited data.

- 1.49 The assessed degree of permanent impairment is to be expressed as a % WPI.
- 1.50 The report should include a conclusion of the assessor, including the final % WPI. This is to be included as the final paragraph in the body of the report, and not as a separate report or appendix.

The report must state the matters taken into account, and the weight given to the matters, in deciding the degree of permanent impairment. The report should contain:

- a medical history
- clinical evaluation details such as the range of movement, neurological findings and any relevant investigations
- whether the injury is stable and stationary, that is, the worker's condition is well stabilised and is unlikely to change substantially in the next year with or without further medical or surgical treatment
- methodology used (with reference to AMA Guides chapter, section and table)
- conclusions with reasons
- the nature of the permanent impairment (description of work related medical injury/illness) and calculated applicable % WPI
- any other issues which are relevant to the impairment assessment, for example, whether the clinical findings and/or degree of impairment is medically consistent with the injury's stated mechanism; and
- any pre-existing impairment considerations.

Assessors should not comment on whether the claim should have been accepted or not. This is not in the scope of the impairment assessment. Once the insurer has accepted the claim, the decision cannot be reversed even with medical evidence to the contrary. Assessors are to use whatever reporting template is provided by the insurer or referring body. A suggested DPI report template complying with these instructions is available at [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au).

Reports that comply with these requirements are paid at a higher level than other assessment reports. If the assessment report does not comply, the insurer or referring body may request further details before payment is processed.

- 1.51 Reports are to be provided within ten working days of the assessment being completed, or as agreed between the referrer and the assessor.

### **Quality assurance**

- 1.52 The degree of permanent impairment that results from the injury must be determined using the tables, graphs and methodology given in this Guide, as presented in the training in the use of this Guide and the applicable legislation. If it is not clear that a

report has been completed in accordance with this Guide, clarification may be sought from the assessor who prepared the report.

- 1.53 An assessor who is identified as frequently providing reports that are not in accord with this Guide may be asked to show cause as to why their name should not be removed from the list of trained assessors.

### **Code of conduct**

- 1.54 Assessors are referred to the Medical Board of Australia's *Good Medical Practice: A Code of Conduct for Doctors in Australia*, 8.7 *Medico-legal, insurance and other assessments*.

- 1.55 Assessors are reminded that they have an obligation to act in an ethical, professional and considerate manner when examining a claimant for the determination of permanent impairment.

- 1.56 Effective communication is vital to ensure that the claimant is well-informed and able to maximally cooperate in the process. Assessors should:

- Ensure that the claimant understands who the assessor is and the assessor's role in the evaluation;
- Ensure that the claimant understands how the evaluation will proceed;
- Take reasonable steps to preserve the privacy and modesty of the claimant during the evaluation; and
- Not provide any opinion to the claimant about their claim.

- 1.57 Complaints received in relation to the behaviour of an assessor during an evaluation initially will be handled by the referring insurer or body. If complaints recur or the initial review reveals that a problem potentially exists, the complaint will be referred to the Workers' Compensation Regulator, who may refer the matter to the appropriate agency (either the Australian Health Practitioner Regulations Agency or the Audiology registration body) for its investigation and appropriate action.

### **Disputes over assessed degree of permanent impairment**

- 1.58 If inconsistencies are identified between a DPI report and the provisions Queensland Guide, the insurer should resolve or clarify the inconsistency directly with the author/s of the report in the first instance.

- 1.59 If a worker disagrees with their assessed degree of impairment, the worker must advise the insurer within 20 business days after the insurer issues the notice of assessment that the worker does not agree with the assessment. All DPI decisions of the Medical Assessment Tribunals are final.

## **2. Upper extremity**

**Chapter 16, AMA5 (page 433) applies to the assessment of permanent impairment of the upper extremities, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions in this Guide take precedence over AMA5.

### **Introduction**

- 2.1 The upper extremities are discussed in AMA5, chapter 16 (pp 433-521). This chapter provides guidelines on methods of assessing permanent impairment involving these structures. It is a complex chapter that requires an organised approach with careful documentation of findings.
- 2.2 Evaluation of anatomical impairment forms the basis for upper extremity impairment assessment. The ratings reflect the degree of impairment and its impact on the ability of the person to perform ADL. There can be clinical conditions where evaluation of impairment may be difficult. Such conditions are evaluated by their effect on function of the upper extremity, or, if all else fails, by analogy with other impairments that have similar effects on upper limb function.

### **The approach to assessment of the upper extremity and hand**

- 2.3 Assessment of the upper extremity mainly involves clinical evaluation. Cosmetic and functional evaluations are performed in some situations. The impairment must be permanent and stable. The claimant will have a defined diagnosis that can be confirmed by examination.
- 2.4 The assessed impairment of a part or region can never exceed the impairment due to amputation of that part or region. For an upper limb, therefore, the maximum evaluation is 60 per cent WPI, the value for amputation through the shoulder.
- 2.5 Range of motion is assessed as follows:
- A goniometer or inclinometer must be used where clinically indicated.
  - Passive range of motion may form part of the clinical examination to ascertain clinical status of the joint, but impairment should only be calculated using active range of motion measurements. Impairment values for degree measurements falling between those listed must be adjusted or interpolated.
  - If the assessor is not satisfied that the results of a measurement are reliable, repeated testing may be helpful in this situation.
  - If there is inconsistency in range of motion then it should not be used as a valid parameter of impairment evaluation. Refer to section 1.36 of this Guide.
  - If range of motion measurements at examination cannot be used as a valid parameter of impairment evaluation, the assessor should then use discretion in considering what weight to give other available evidence to determine if an impairment is present.

- 2.6 To achieve an accurate and comprehensive assessment of the upper extremity, findings should be documented on a standard form. AMA5 figures 16-1a and 16-1b (pp 436-437) are extremely useful both to document findings and to guide the assessment process.
- 2.7 The hand and upper extremity are divided into regions: thumb, fingers, wrist, elbow, and shoulder. Close attention needs to be paid to the instructions in figures 16-1a and 16-1b (pp 436-437 AMA5) regarding adding or combining impairments.
- 2.8 Table 16-3 (p 439 AMA5) is used to convert upper extremity impairment to WPI. When the combined values chart is used, the assessor must ensure that all values combined are in the same category of impairment (that is WPI, upper extremity impairment percentage, hand impairment percentage and so on). Regional impairments of the same limb (e.g. several upper extremity impairments), should be combined before converting to percentage WPI. (Note that impairments relating to the joints of the thumb are added rather than combined-AMA5, p 454, 16.4d thumb ray motion impairment.)

## **Specific Interpretation of the AMA5 – The Hand and Upper Extremity**

### **Impairment of the upper extremity due to peripheral nerve disorders**

- 2.9 If an upper extremity impairment results solely from a peripheral nerve injury, the assessor should not also evaluate impairment(s) from section 16.4, abnormal motion (pp 450-479 AMA5) for that upper extremity. Section 16.5 should be used for evaluation of such impairments.

For peripheral nerve lesions use table 16-15 (p 492 AMA5) together with tables 16-10 and 16-11 (pp 482 and 484 AMA5) for evaluation.

The assessment of carpal tunnel syndrome post-operatively is undertaken in the same way as assessment without operation.

- 2.10 When applying tables 16-10 (pp 482 AMA5) and table 16-11 (p 484 AMA5) the examiner must use clinical judgement to estimate the appropriate percentage within the range of values shown for each severity grade. The maximum value is not applied automatically.

### **Impairment due to other disorders of the upper extremity**

- 2.11 The section 'Impairment of the upper extremity due to other disorders' (AMA5 section 16.7 pp 498-507) should be used only when other criteria (as presented in sections 16.2-16.6 (pp 441-498 AMA5)) have not adequately encompassed the extent of the impairments. Impairments from the disorders considered in section 16.7 are usually estimated using other criteria. The assessor must take care to avoid duplication of impairments.
- 2.12 In section 16.7 (impairment of the upper extremities due to other disorders) AMA5 notes 'the severity of impairment due to these disorders is rated separately according to table 16-19 through 16-30 and then multiplied by the relative maximum value of the unit involved as specified in table 16-18'. This statement should not include tables

16-25 (carpal instability), 16-26 (shoulder instability) and 16-27 (arthroplasty), noting that these tables are already expressed in terms of upper extremity impairment.

- 2.13 Strength evaluation, as a method of upper extremity impairment assessment, should only be used in rare cases and its use justified when loss of strength represents an impairing factor not adequately considered by more objective rating methods. If chosen as a method, the caveats detailed on AMA5 p 508, under the heading '16.8a Principles' need to be observed, i.e. decreased strength cannot be rated in the presence of decreased motion, painful conditions, deformities and absence of parts (e.g. thumb amputation).

### Conditions affecting the shoulder region

- 2.14 Most shoulder disorders with an abnormal range of movement are assessed according to AMA5 Section 16.4 - Evaluating Abnormal Motion. (Please note that AMA5 indicates that internal and external rotation of the shoulder are to be measured with the arm abducted in the coronal plane to 90 degrees and with the elbow flexed to 90 degrees. In those situations where abduction to 90 degrees is not possible, symmetrical measurement of rotation is to be carried out at the point of maximal abduction).

Rare cases of rotator cuff injury, where the loss of shoulder motion does not reflect the severity of the tear, and there is **no associated pain**, may be assessed according to AMA5 Section 16.8c – strength evaluation. Other specific shoulder disorders, where the loss of shoulder motion does not reflect the severity of the disorder, **associated with pain** should be assessed by comparison with other impairments that have similar effect(s) on upper limb function.

As noted in AMA5 16.7b 'Arthroplasty', "In the presence of *decreased motion*, motion impairments are derived separately and *combined* with the arthroplasty impairment". This includes those arthroplasties in Table 16-27 designated as (isolated).

Please note that in Table 16-27 (p506 AMA5) the figure for resection arthroplasty of the distal clavicle (isolated) has been changed to 5% upper extremity impairment, and the figure for resection arthroplasty of the proximal clavicle (isolated) has been changed to 8% upper extremity impairment.

Please note that in Table 16-18 (p499 AMA5) the figures of impairment suggested for the sternoclavicular joint have been changed from 5% upper extremity impairment and 3% whole person impairment, to 25% upper extremity impairment and 15% whole person impairment.

- 2.15 Ruptured long head of biceps shall be assessed as an upper extremity impairment (UEI) of three per cent UEI or two per cent WPI where it exists in isolation from other rotator cuff pathology. Impairment for ruptured long head of biceps cannot be combined with any other rotator cuff impairment or with loss of range of movement.
- 2.16 Diagnosis of impingement is made on the basis of positive findings on appropriate provocative testing and is only to apply where there is no loss of range of motion. Symptoms must have been present for at least 12 months. An impairment rating of three per cent UEI or two per cent WPI shall apply.



## **Fractures involving joints**

- 2.17 Displaced fractures involving joint surfaces are generally to be rated by range of motion. If, however, this loss of range is not sufficient to give an impairment rating, and movement is accompanied by pain and there is 2mm or more of displacement, allow two per cent UEI (one per cent WPI).

## **Epicondylitis of the elbow**

- 2.18 This condition is rated as two per cent UEI (one per cent WPI). In order to assess impairment in cases of epicondylitis, symptoms must have been present for at least 18 months. Localised tenderness at the epicondyle must be present and provocative tests must also be positive. If there is an associated loss of range of movement, these figures are not combined, but the method giving the highest rating is used.

## **Resurfacing procedures**

- 2.19 No additional impairment is to be awarded for resurfacing procedures used in the treatment of localised cartilage lesions and defects in major joints.

## **Calculating motion impairment**

- 2.20 When calculating impairment for loss of range of movement, it is most important to always compare measurements of the relevant joint(s) in both extremities. If a contralateral 'normal/uninjured' joint has less than average mobility, the impairment value(s) corresponding to the uninvolved joint serves as a baseline and is subtracted from the calculated impairment for the involved joint. The rationale for this decision should be explained in the report (AMA5, p 543, 16.4c).

## **Complex regional pain syndrome (upper extremity)**

- 2.21 Complex regional pain syndrome types 1 and 2 should be assessed using the method in this Guide, chapter 17.

### 3. Lower extremity

**Chapter 17, AMA5 (page 523) applies to the assessment of permanent impairment of the lower extremities, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

#### Introduction

3.1 The lower extremities are discussed in AMA5 chapter 17 (pp 523-564). This section is complex and provides a number of alternative methods of assessing permanent impairment involving the lower extremity. An organised approach is essential and findings should be carefully documented on a worksheet.

#### The approach to assessment of the lower extremity

3.2 Assessment of the lower extremity involves physical evaluation, which can use a variety of methods. In general, the method should be used that most specifically addresses the impairment present. For example, impairment due to a peripheral nerve injury in the lower extremity should be assessed with reference to that nerve rather than by its effect on gait.

3.3 There are several different forms of evaluation that can be used, as indicated in AMA5 sections 17.2b to 17.2n (pp 528–554). AMA5 Table 17-2 (p 526) indicates which evaluation methods can be **combined** and which cannot. It may be possible to perform several different evaluations, as long as they are reproducible and meet the conditions specified below and in AMA5. The most specific method of impairment assessment should be used. (Please note that in Table 17-2 the boxes in the fourth row (on muscle strength) and seventh column (on amputation) should be a closed box  rather than an open box .

3.4 It is possible to use an algorithm to aid in the assessment of lower extremity impairment. Use of a worksheet is essential. [Table 3.5](#) at the end of this chapter on page 27 is such a worksheet and may be used in assessment of permanent impairment of the lower extremity.

3.5 In the assessment process, the evaluation giving the highest impairment rating is selected. That may be a combined impairment in some cases, in accordance with the Guide to the appropriate combination of evaluation methods table (table 17-2, p 526 AMA5), using the combined values chart (pp 604-606 AMA5).

3.6 When the combined values chart is used, the assessor must ensure that all values combined are in the same category of impairment rating (i.e. percentage of WPI, lower extremity impairment percentage, foot impairment percentage, and so on). Regional impairments of the same limb (e.g. several lower extremity impairments) should be combined before converting to percentage WPI.

- 3.7 Table 17-2 (p 526 AMA5) needs to be referred to frequently to determine which impairments can be combined and which cannot. The assessed impairment of a part or region can never exceed the impairment due to amputation of that part or region. For the lower limb, therefore, the maximum evaluation is 40 per cent WPI, the value for proximal above knee amputation.

### Specific interpretation of AMA5 — the lower extremity

#### Leg length discrepancy

- 3.8 When true leg length discrepancy is determined clinically (AMA5 section 17.2b, p 528), the method used must be indicated (e.g. tape measure from anterior superior iliac spine to the medial malleolus). Clinical assessment of leg length discrepancy is an acceptable method but if full length computerised tomography films are available they should be used in preference. Such an examination should not be ordered solely for determining leg lengths.
- 3.9 When applying table 17-4 (p 528, AMA5), the element of choice should be removed and impairments for leg length discrepancy should be read as the higher figure of the range quoted.

Note that the figures for lower limb impairment in table 17-4 (p 528, AMA5) are incorrect and the correct figures are shown below.

**Table 17-4 Impairment Due to Limb Length Discrepancy**

Discrepancy (cm)	Whole person (Lower Extremity) impairment (%)
0 - 1.9	0
2 - 2.9	3 (8)
3 - 3.9	5 (13)
4 - 4.9	7 (18)
5+	8 (19)

#### Gait derangement

- 3.10 Assessment of gait derangement is only to be used as a method of last resort. Methods of impairment assessment most fitting the nature of the disorder should always be used in preference. If gait derangement (AMA5 section 17.2c, p 529) is used, it cannot be combined with any other evaluation in the lower extremity section of AMA5.
- 3.11 Any walking aid used by the subject must be a permanent requirement and not temporary.
- 3.12 In the application of table 17-5 (p 529 AMA5), delete item b, as the Trendelenburg sign is not sufficiently reliable.

#### Muscle atrophy (unilateral)

- 3.13 This section (AMA5 section 17.2d, p 530) is not applicable if the limb other than that being assessed is abnormal (e.g. if varicose veins cause swelling, or if there is another injury or condition which has contributed to the disparity in size).
- 3.14 In the use of table 17-6 (p 530 AMA5) the element of choice has been removed in the impairment rating and only the higher figure used.

Note that the figures for lower limb impairment in table 17-6 (p 530 AMA5) are incorrect and the correct figures are shown below.

**Table 17-6 Impairment Due to Unilateral Leg Muscle Atrophy**

Difference in circumference (cm)	Impairment degree	Whole person (Lower Extremity) impairment (%)
<b>a. Thigh:</b> The circumference is measured 10cm above the patella with the knee fully extended and the muscles relaxed.		
0 – 0.9	None	0 (0)
1 – 1.9	Mild	2 (6)
2 – 2.9	Moderate	4 (11)
3+	Severe	5 (12)

Difference in circumference (cm)	Impairment degree	Whole person (Lower Extremity) impairment (%)
<b>b. Calf:</b> The maximum circumference on the normal side is compared with the circumference at the same level on the affected side.		
0 – 0.9	None	0 (0)
1 – 1.9	Mild	2 (6)
2 – 2.9	Moderate	4 (11)
3+	Severe	5 (12)

### Manual muscle strength testing

- 3.15 The Medical Research Council (MRC) gradings for muscle strength are universally accepted. They are not linear in their application, but ordinal. Only the six grades (0-5) should be used, as they are reproducible among experienced assessors. The descriptions in table 17-7 (p 531 AMA5) are correct. The results of electrodiagnostic methods and tests are not to be considered in the evaluation of muscle testing which can be performed manually. Table 17-8 (p 532 AMA5) is to be used for this method of evaluation.

### Range of motion

- 3.16 Although range of motion (ROM) (AMA5 section 17.2f, pp 533-538) appears to be a suitable method for evaluating impairment, it may be subject to variation because of pain during motion at different times of examination, possible lack of cooperation by the person being assessed and inconsistency. If there is such inconsistency then ROM cannot be used as a valid parameter of impairment evaluation. In table 17-10

(knee impairment) (p537 AMA5) the sentence should read ‘Deformity measured by femoral-tibial angle; 3° to 9° valgus is considered normal.

Table 17-10 (p 537 AMA5) is misleading as it has valgus and varus deformity in the same table as restriction of movement, possibly suggesting that these impairments may be combined. This is not the case. Any valgus/ varus deformity present which is due to the underlying lateral or medial compartment arthritis, cannot be combined with loss of range of movement. Therefore, when faced with an assessment in which there is a rateable loss of range of movement as well as a rateable deformity, calculate both impairments and use the greater. Valgus and varus knee angulation are to be measured in a weight-bearing position using a goniometer. It is important to bear in mind that valgus and/or varus alignments of the knee may be constitutional. It is also important to always compare with the opposite knee.

- 3.17 If range of motion is used as an assessment measure, then tables 17-9 to 17-14 (p 537 AMA5) are selected for the joint or joints being tested. If a joint has more than one plane of motion, the impairment assessments for the different planes should be added. For example, any impairments of the six principal directions of motion of the hip joint are added (p 533 AMA5).

Please note that in table 17-11 (ankle motion) (p 537 AMA5) the range for mild flexion contracture should be one to 10 degrees, for moderate flexion contracture should be 11 to 19 degrees, and the figure for severe flexion contracture should be 20 degrees plus.

The revised table 17-11 is as follows:

Table 17-11: Ankle motion impairment estimates

Motion	Whole person (lower extremity) [foot impairment]		
	Mild 3% (7%) [10%]	Moderate 6% (15%) [21%]	Severe 12% (30%) [43%]
Plantar flexion capability	11° – 20°	1° - 10°	None
Flexion contracture	1° - 10°	11° - 19°	20°+
Extension	10°- 0° (neutral)	-	-

When calculating impairment for loss of range of movement, it is most important to always compare measurements of the relevant joint(s) in both extremities. If a contralateral 'normal/uninjured' joint has less than average mobility, the impairment value(s) corresponding to the uninvolved joint serves as a baseline and is subtracted from the calculated impairment for the involved joint. The rationale for this decision should be explained in the report (AMA5, p 454, 16.4c).

## Ankylosis

- 3.18 Ankylosis is to be regarded as the equivalent to arthrodesis in impairment terms only. For the assessment of impairment, when a joint is ankylosed (AMA5 section 17.2g, pp 538-543), the calculation to be applied is to select the impairment if the joint is ankylosed in optimum position (see table 3.1 below), and then if not ankylosed in the optimum position by adding (not combining) the values of percentage of WPI using tables 17-15 to 17-30 (pp 538-543 AMA5).

**Table 3.1 Impairment for ankylosis in the optimum position**

Joint	Whole person	Lower extremity	Ankle or foot
Hip	20%	50%	–
Knee	27%	67%	–
Pantalar	19%	47%	67%
Ankle	15%	37%	53%
Triple	6%	15%	21%
Subtalar	4%	10%	14%

Note that the figures in table 3.1 suggested for ankle impairment are greater than those suggested in the AMA5.

Ankylosis of the ankle in the neutral/optimal position equates with 15 (37) [53] per cent impairment as per table 3.1. Table 3.1(a) is provided below as guidance to evaluate additional impairment owing to variation from the neutral position. The additional amounts at the top of each column are added to the figure for impairment in the neutral position. In keeping with AMA5, p 541, the maximum impairment for ankylosis of the ankle remains at 25 (62) [88] per cent impairment.

**Table 3.1(a) Impairment for ankylosis in variation from the optimum position**

Position	Whole person (lower extremity) [foot] impairment (%)			
	2 (5) [7]	4 (10) [14]	7 (17) [24]	10 (25) [35]
1. Dorsiflexion	5 - 9 °	10 - 19 °	20 - 29 °	30 °+
2. Plantar flexion	-	10 - 19 °	20 - 29 °	30 °+
3. Varus	5 - 9 °	10 - 19 °	20 - 29 °	30 °+
4. Valgus	-	10 - 19 °	20 - 29 °	30 °+
5. Internal rotation	0 - 9 °	10 - 19 °	20 - 29 °	30 °+
6. External rotation	15 - 19 °	20 - 29 °	30 - 39 °	40 °+

## Arthritis

- 3.19 Impairment due to arthritis (AMA5 section 17.2n, pp 544-545) following a work-related injury is uncommon, but may occur in isolated cases. The presence of arthritis

may indicate a pre-existing condition and this should be assessed and an appropriate deduction made (see Chapter 1).

- 3.20 The presence of osteoarthritis is defined as cartilage loss. Cartilage loss can be measured by properly aligned plain x-ray, or by direct vision (arthroscopy) but impairment can only be assessed by the radiologically determined cartilage loss intervals in AMA5, table 17-31 (p 544). When assessing impairment of the knee joint which has three compartments, only the compartment with the major impairment is used in the assessment. That is, measured impairments in the different compartments cannot be added or combined.
- 3.21 Detecting the subtle changes of cartilage loss on plain radiography requires comparison with the normal side. All joints should be imaged directly through the joint space, with no overlapping of bones. If comparison views are not available, AMA5 table 17-31 (p 544) is used as a guide to assess joint space narrowing.
- 3.22 One should be cautious in making a diagnosis of cartilage loss on plain radiography if secondary features of osteoarthritis, such as osteophytes, subarticular cysts or subchondral sclerosis are lacking, unless the other side is available for comparison. The presence of an intra-articular fracture with a step in the articular margin in the weight bearing area implies cartilage loss.
- 3.23 The accurate radiographic assessment of joints always requires at least two views. In some cases, further supplementary views will optimise the detection of joint space narrowing or the secondary signs of osteoarthritis.

**Sacro-iliac joints:** Being a complex joint, modest alterations are not detected on radiographs, and cross-sectional imaging may be required. Radiographic manifestations accompany pathological alterations. The joint space measures between 2mm and 5mm. Osteophyte formation is a prominent characteristic of osteoarthritis of the sacro-iliac joint.

**Hip:** An anteroposterior view of the pelvis and a lateral view of the affected hip are ideal. If the affected hip joint space is narrower than the asymptomatic side, cartilage loss is regarded as being present. If the anteroposterior view of pelvis has been obtained with the patient supine, it is important to compare the medial joint space of each hip as well as superior joint space, as this may be the only site of apparent change. If both sides are symmetrical, then other features, such as osteophytes, subarticular cyst formation, and calcar thickening should be taken into account to make a diagnosis of osteoarthritis.

**Knee:**

- **Tibio-femoral joint:** The best view for assessment of cartilage loss in the knee is usually the erect intercondylar projection, as this profiles and stresses the major weight bearing area of the joint which lies posterior to the centre of the long axis. The ideal x-ray is a posteroanterior view with the patient standing, knees slightly flexed, and the x-ray beam angled parallel to the tibial plateau (Rosenberg view). Both knees can readily be assessed with the one exposure. In the knee it should be recognised that joint space narrowing does not necessarily equate with articular cartilage loss, as deficiency or displacement of the menisci can also have this effect. Secondary features, such as subchondral bone change and past surgical history, must also be taken into account.

- **Patello-femoral joint:** Should be assessed in the “skyline” view, again preferably with the other side for comparison. The x-ray should be taken with 30 degrees of knee flexion to ensure that the patella is load-bearing and has engaged the articular surface femoral groove.

Footnote to Table 17-31 (p544 AMA5) regarding patello-femoral pain and crepitation: This item is only to be used if there is a history of direct injury to the front of the knee, or in cases of patellar translocation/dislocation without there being direct anterior trauma. This item cannot be used as an additional impairment when assessing arthritis of the knee joint itself, of which it forms a component. If patello-femoral crepitus occurs in isolation (i.e. no other signs of arthritis) following either of the above, then it can be combined with other diagnosis based estimates (table 17-33, AMA5, p 546). Signs of crepitus need to be present at least one year post injury.

Note: Osteoarthritis of the patello-femoral joint cannot be used as an additional impairment when assessing arthritis of the knee joint itself, of which it forms a component.

**Ankle:** The ankle should be assessed in the mortice view (preferably weight-bearing), with comparison views of the other side, although this is not as necessary as with the hip and knee.

**Subtalar:** This joint is better assessed by CT (in the coronal plane) than by plain radiography. The complex nature of the joint does not lend itself to accurate and easy plain x-ray assessment of osteoarthritis.

**Talonavicular and calcaneocuboid:** Anteroposterior and lateral views are necessary. Osteophytes may assist in making the diagnosis.

**Intercuneiform and other intertarsal joints:** Joint space narrowing may be difficult to assess on plain radiography. CT (in the axial plane) may be required. Associated osteophytes and subarticular cysts are useful adjuncts to making the diagnosis of osteoarthritis in these small joints.

**Great toe metatarsophalangeal:** Anteroposterior and lateral views are required. Comparison with the other side may be necessary. Secondary signs may be useful.

**Interphalangeal:** It is difficult to assess small joints without taking secondary signs into account. The plantar-dorsal view may be required to get through the joints, in a foot with flexed toes.

- 3.24 If arthritis is used as the basis for assessing impairment, then the rating cannot be combined with gait disturbance, muscle atrophy, muscle strength or range of movement assessments. It can be combined with a diagnosis-based estimate (table 17-2, AMA5, p 526).

## **Amputation**

- 3.25 Where there has been amputation of part of a lower extremity, table 17-32 (p 545 AMA5) applies. In that table the references to three inches for below-the-knee amputation should be converted to 7.5cm.



## Diagnosis-based estimates (lower extremity)

- 3.26 Section 17.2j (pp 545-549 AMA5) lists a number of conditions that fit a category of diagnosis-based estimates. They are listed in tables 17-33, 17-34 and 17-35 (pp 546-549 AMA5). When using this table it is essential to read the footnotes carefully. The category of mild cruciate and collateral ligament laxity has inadvertently been omitted in table 17-33 of AMA5. The appropriate rating is 5 (12) percent whole person (lower extremity) impairment.
- 3.27 It is possible to combine impairments from tables 17-33, 17-34 and 17-35 for diagnosis-related estimates with other components (e.g. nerve injury) using the combined values chart (pp 604-606 AMA5) after first referring to this Guide to the appropriate combination of evaluation methods (see table 3.5).
- 3.28 **Pelvic fractures:** Pelvic fractures are to be assessed as per table 4.3 in this Guide and not using the reference to the pelvis in table 17-33 (p 546 AMA5).

**Hip:** The item in relation to femoral neck fracture 'malunion' is not to be used in assessing impairment. Use other available methods.

**Femoral Osteotomy:** Good result: 10 (25) whole person (lower extremity) impairment. Poor result: Estimate according to examination and arthritic degeneration

**Tibial plateau fractures:** The following table 3.2 replaces the instructions for tibial plateau fractures in table 17-33 (p 546 AMA5).

### Table 3.2 Impairment for tibial plateau fractures

In deciding whether the fracture falls into the mild, moderate or severe categories, the assessor must take into account:

- (i) The extent of involvement of the weight bearing area of the tibial plateau.
- (ii) The amount of displacement of the fracture/s.
- (iii) The amount of comminution present.

Grade	WPI (LEI)%
Undisplaced	2 (5)
Mild	5 (12)
Moderate	10 (25)
Severe	15 (37)

**Patello-femoral joint replacement:** Assess the knee impairment in the usual way and combine with nine per cent WPI (22 per cent lower extremity impairment) for isolated patello-femoral joint replacement.

## Total Ankle Replacement:

### Table 3-3: Rating for ankle replacement results

The points system for rating total ankle replacements is to be the same as for total hip and total knee replacements, with the following impairment ratings:

Result (LEI) WPI %

Good result, 85-100 points: (30) 12

Fair result, 50-84 points: (40) 16  
 Poor result, < 50 points: (50) 20

	Number of Points		Number of Points
<b>a. Pain</b>		<b>DEDUCTIONS (minus) d and e</b>	
None	50	<b>d. Varus</b>	
Slight		<5°	0
Stairs only	40	5° – 10°	10
Walking and stairs	30	>10°	15
Moderate		<b>e. Valgus</b>	
Occasional	20	<5°	0
Continual	10	5° – 10°	10
Severe	0	>10°	15
<b>b. Range of motion</b>		<b>SUB-TOTAL</b>	
(i) Flexion:			
>20°	15		
11° – 20°	10		
5° – 10°	5		
<5°	0		
(ii) Extension			
>10°	10		
5° – 10°	5		
<5°	0		
<b>c. Range of motion</b>			
(i) Limp			
None	10		
Slight	7		
Moderate	4		
Severe	0		
(ii) Supportive Device			
None	5		
Cane	3		
One Crutch	1		
2 Crutches	0		
(iii) Distance Walked			
Unlimited	5		
Six blocks	4		
Three blocks	3		
Indoors	2		
Bed or Chair	0		
(iv) Stairs			
Normal	5		
Using rail	4		
One at a time	2		
Unable to climb	0		

**Tibia-os calcis angle:** The table given below for the impairment of loss of the tibia-as calcis angle is to replace table 17-29 (p 542 AMA5) and the section in table 17-33 (p 546 AMA5) dealing with loss of tibia-as calcis angle. These two sections are contradictory, and neither gives a full range of loss of angle.

**Table 3.4 Impairment for loss of the tibia-os calcis angle**

Angle (degree)	Whole Person (lower extremity) [foot] impairment (%)
110 – 100	5 (12) [17]
99 – 90	8 (20) [28]
< 90	+1 (2) [3] per ° up to 15 (37) [54]

**Hindfoot Intra-articular fractures:** In the interpretation of table 17-33 (p 547 AMA5), reference to the hindfoot, intra-articular fractures, the words subtalar bone, talonavicular bone, and calcaneocuboid bone imply that the bone is displaced on one or both sides of the joint mentioned. To avoid the risk of double assessment, if avascular necrosis with collapse is used as the basis of impairment assessment, it cannot be combined with the relevant intra-articular fracture in table 17-33 column 2. In table 17-33 column 2, metatarsal fracture with loss of weight transfer means dorsal displacement of the metatarsal head.

**Plantar fasciitis:** If there are persistent symptoms and clinical findings after 18 months, this is rated as two per cent lower extremity impairment (one per cent WPI).

**Resurfacing procedures:** No additional impairment is to be awarded for resurfacing procedures used in the treatment of localised cartilage lesions and defects in major joints.

- 3.29 Table 17-34 and table 17-35 (pp 548-549 AMA5) use a different concept of evaluation. A point score system is applied, and then the total of points calculated for the hip (or knee) joint is converted to an impairment rating from table 17-33. Tables 17-34 and 17-35 refer to the hip and knee joint replacement respectively. Note that, while all the points are added in table 17-34, some points are deducted when table 17-35 is used. (Note that hemi-arthroplasty rates the same as total joint replacement.)
- 3.30 In respect of 'distance walked' under 'b. Function' in table 17-34 (p 548 AMA5), the distance of six blocks should be construed as 600m, and three blocks as 300m.

Note that Table 17-35 (p 549 AMA5) is incorrect. The correct table is shown on the following page. Refer to the unaffected limb to take into account any constitutional variation.

**Table 17-35 Rating Knee replacement Results**

	<b>Number of Points</b>
<b>a. Pain</b>	
None	50
Mild or occasional	45
Stairs only	40
Walking and stairs	30
Moderate	
Occasional	20
Continual	10
Severe	0
<b>b. Range of Motion</b>	
Add 1 point per 5 ° up to 125 °	25 (maximum)
<b>c. Stability</b>	
(maximum movement in any position)	
Anteroposterior	
< 5 mm	
5-9 mm	10
> 9 mm	5
	0
Mediolateral	
5 °	
6-9 °	15
10-14 °	10
> 14 °	5
	0
Subtotal	
<b>Deductions (minus) d, e, f</b>	
<b>d. Flexion contracture</b>	
5-9 °	2
10-15 °	5
16-20 °	10
> 20 °	20
<b>e. Extension Lag</b>	
< 10 °	5
10-20 °	10
> 20 °	15
<b>f. Tibio-femoral alignment *-&gt; 15°</b>	
valgus	20
11-15° valgus	3 points per degree
<b>5-10 ° valgus</b>	0
<b>0-4 ° valgus</b>	3 points per degree
Any varus	20
Deductions subtotal:	

### **Skin loss (lower extremity)**

- 3.31 Skin loss (p 550 AMA5) can only be included in the calculation of impairment if it is in certain sites and meets the criteria listed in table 17-36 (p 550 AMA5).

### **Peripheral nerve injuries (lower extremity)**

- 3.32 When assessing the impairment due to peripheral nerve injury (pp 550-552 AMA5) assessors should read the text in this section. Note that the separate impairments for the motor, sensory and dysaesthetic components of nerve dysfunction in table 17-37 (p 552 AMA5) are to be combined.
- 3.33 Note that the (posterior) tibial nerve is not included in table 17-37, but its contribution can be calculated by subtracting ratings of common peroneal nerves from sciatic nerve ratings
- 3.34 Peripheral nerve injury impairments can be combined with other impairments, but not those for gait derangement, muscle atrophy, muscle strength or complex regional pain syndrome, as shown in table 17-2 (p 526 AMA5). Motor and sensory impairments given in table 17-37 are for complete loss of function and assessors must still use table 16-10 and 16-11 in association with table 17-37.

### **Complex regional pain syndrome (lower extremity)**

- 3.35 Complex regional pain syndrome types 1 and 2 are to be assessed using the method in chapter 17 of this Guide.

### **Peripheral vascular disease (lower extremity)**

- 3.36 Lower extremity impairment due to vascular disorders (pp 553-554 AMA5) is evaluated using table 17-38 (p 554 AMA5). Note that table 17-38 gives values for lower extremity not WPI. In that table there is a range of lower extremity impairments within each of the classes 1 to 5. As there is a clinical description of which conditions place a person's lower extremity in a particular class, the assessor has a choice of impairment rating within a class, the value of which is left to the clinical judgement of the assessor.

### **Measurement of selected joint motion**

- 3.37 When measuring dorsiflexion at the ankle, the test is carried out initially with the knee in extension and then repeated with the knee flexed to 45 degrees. The average of the maximum angles represents the dorsiflexion range of motion (figure 17-5, p 535 AMA5).

**Table 3.5: Lower extremity worksheet**

Item	Impairment	AMA5 Table	AMA5 page	Potential impairment	Selected impairment
1	Limb length discrepancy	17-4	528		
2	Gait derangement	17-5	529		
3	Unilateral muscle atrophy	17-6	530		
4	Muscle weakness	17-8	532		
5	Range of motion	17-9 to 17-14	537		
6	Joint ankylosis	17-15 to 17-30	538-543		
7	Arthritis	17-31	544		
8	Amputation	17-32	545		
9	Diagnosis-based estimates	17-33 to 17-35	546-549		
10	Skin loss	17-36	550		
11	Peripheral nerve deficit	17-37	552		
12	Complex regional pain syndrome	Section 16.5e	495-497		
13	Vascular disorders	17-38	554		
<b>Combined impairment rating</b> (refer to Table 17-2, p 526 AMA5 for permissible combinations)					

Potential impairment is the impairment percentage for that method of assessment. Selected impairment is the impairment, or impairments selected, that can be legitimately combined with other lower extremity impairments to give a final lower extremity impairment rating.

## 4. The spine

**Chapter 15, AMA5 (page 373) applies to the assessment of permanent impairment of the spine, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### Introduction

- 4.1 The spine is discussed in chapter 15 (pp 373-431 AMA5). That chapter presents two methods of assessment, the diagnosis-related estimates method and the range of motion method. Evaluation of impairment of the spine is only to be done using diagnosis-related estimates (DREs).
- 4.2 The DRE method relies especially on evidence of neurological deficits and less common, adverse structural changes, such as fractures and dislocations. Using this method, DREs are differentiated according to clinical findings that can be verified by standard medical procedures.
- 4.3 The assessment of spinal impairment is made when the person's condition is stable and stationary. This is considered to occur when the worker's condition is well stabilised and unlikely to change substantially in the next year with or without medical treatment. If surgery has been performed, the outcome of the surgery as well as structural inclusions must be taken into consideration when making the assessment.

### Assessment of the spine

- 4.4 The assessment should include a comprehensive, accurate history, a review of all pertinent records available at the assessment, a comprehensive description of the individual's current symptoms and their relationship to daily activities, a careful and thorough physical examination, and all findings of relevant laboratory, imaging, diagnostic and ancillary tests available at the assessment. Imaging findings that are used to support the impairment rating should be concordant with symptoms and findings on examination. The assessor should record whether diagnostic tests and radiographs were seen or whether they relied solely on reports.
- 4.5 The DRE model for assessment of spinal impairment should be used. The range of motion model (sections 15.8-15.13 inclusive, AMA5 pp 398-427) should not be used.
- 4.6 If a person has spinal cord or cauda equina damage, including bowel, bladder and/or sexual dysfunction, he or she is assessed according to the method described in section 15.7 and table 15.6 (a) to (g) (pp 395-398 AMA5).
- 4.7 If an assessor is unable to distinguish between two DRE categories, then the higher of those two categories should apply. The reasons for the inability to differentiate should be noted in the assessor's report.

- 4.8 Possible influence of future treatment should not form part of the impairment assessment. The assessment should be made on the basis of the person's status at the time of interview and examination, if the assessor is convinced that the condition is stable and permanent. Likewise, the possibility of subsequent deterioration, as a consequence of the underlying condition, should not be factored into the impairment evaluation. Commentary can be made regarding the possible influence, potential or requirements for further treatment, but this does not affect the assessment of the individual at the time of impairment evaluation.
- 4.9 All spinal impairments are to be expressed as a percentage of WPI (% WPI).
- 4.10 Section 15.1a (pp 374-377 AMA5) is a valuable summary of history and physical examination, and should be thoroughly familiar to all assessors
- 4.11 The assessor should include in the report a description of how the impairment rating was calculated, with reference to the relevant tables and/or figures used.
- 4.12 The optimal method to measure the percentage compression of a vertebral body is a well centred plain x-ray. Assessors should state the method they have used. The loss of vertebral height should be measured at the most compressed part and must be documented in the impairment evaluation report. The estimated normal height of the compressed vertebra should be determined where possible by averaging the heights of the two adjacent (unaffected and normal) vertebrae.

### **Specific interpretation of AMA5**

- 4.13 The range-of-motion (ROM) method is not used, hence any reference to this is omitted (including table 15-7, p 404 AMA5).
- 4.14 Motion segment integrity alteration can be either increased translational or angular motion, or decreased motion resulting from developmental changes, fusion, fracture healing, healed infection or surgical arthrodesis. Motion of the individual spine segments cannot be determined by a physical examination, but is evaluated with flexion and extension radiography.
- 4.15 The assessment of altered motion segment integrity is to be based upon a report of trauma resulting in an injury, and not on developmental or degenerative changes.
- 4.16 When routine imaging is normal and severe trauma is absent, motion segment disturbance is rare. Thus, flexion and extension imaging is indicated only when a history of trauma or other imaging leads the physician to suspect alteration of motion segment integrity.
- 4.17 The preferred method for recording of the range of motion is as a fraction or percent of the range or loss of the range. For example, either 'cervical movement was one half (or 50 per cent) of the normal range of motion' or 'there was a loss of one half (or 50 per cent) of the normal range of movement of the cervical spine'.

### **DRE definitions of clinical findings**



4.18 DRE II is a clinical diagnosis based upon the features of the history of the injury and clinical features. Clinical features which are consistent with DRE II and which are present at the time of assessment include radicular symptoms in the absence of clinical signs (that is, non-verifiable radicular complaints), muscle guarding or spasm, or asymmetric loss of range of movement. Localised (not generalised) tenderness may be present. In the lumbar spine additional features include a reversal of the lumbosacral rhythm when straightening from the flexed position and compensatory movement for an immobile spine such as flexion from the hips. In assigning category DRE II, the assessor must provide detailed reasons why the category was chosen.

4.19 Asymmetric or non-uniform loss of range of motion may be present in any of the three planes of spinal movement. Asymmetry during motion caused by muscle guarding or spasm is included in the definition.

Asymmetric loss of range of motion may be present for flexion and extension. For example, if cervical flexion is half the normal range (loss of half the normal range) and cervical extension is one third of the normal range (loss of two-thirds of the range), asymmetric loss of range of motion may be considered to be present.

4.20 While imaging and other studies may assist medical assessors in making a diagnosis, the presence of a morphological variation from 'normal' in an imaging study does not confirm the diagnosis. To be of diagnostic value, imaging studies must be concordant with clinical symptoms and signs. In other words, an imaging test is useful to confirm a diagnosis, but an imaging study alone is insufficient to qualify for a DRE category (excepting spinal fractures).

4.21 The clinical findings used to place an individual in a DRE category are described in box 15-1 (pp 382-383 AMA5).

The reference to 'electro-diagnostic verification of radiculopathy' should be disregarded.

(The use of electro-diagnostic procedures such as electromyography is proscribed as an assessment aid for decisions about the category of impairment into which a person should be placed. It is considered that competent assessors can make decisions about which DRE category a person should be placed in from the clinical features alone. The use of electro-diagnostic differentiators is generally unnecessary).

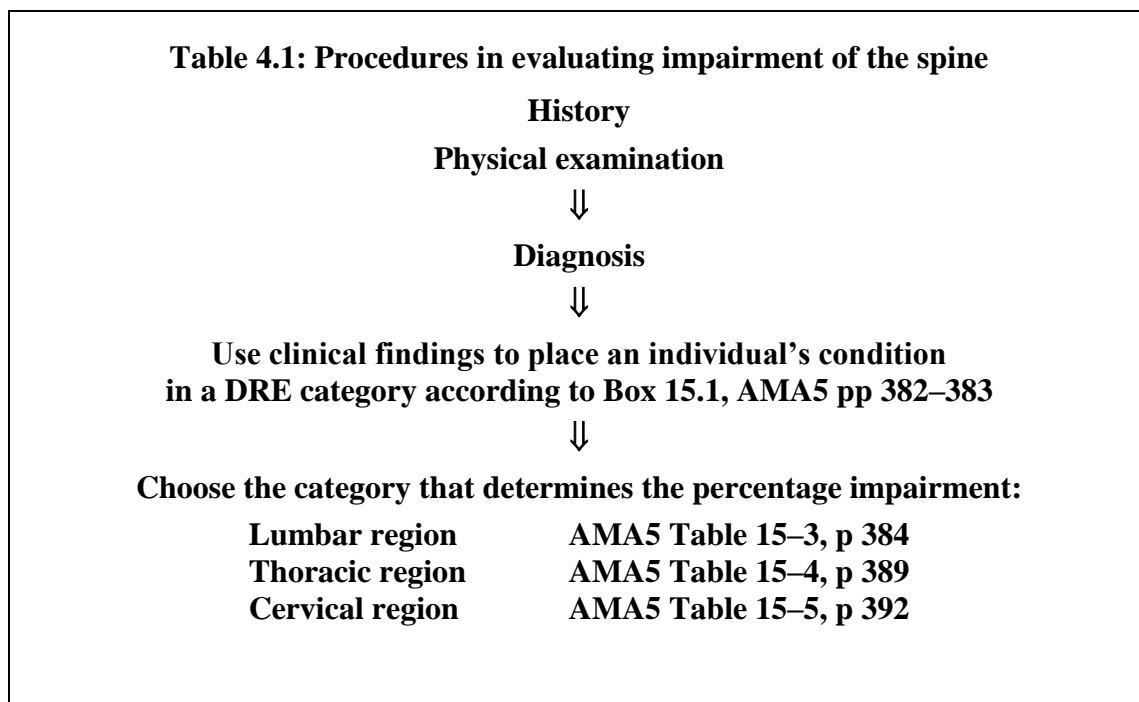
4.22 The cauda equina syndrome is defined in AMA5 (Chapter 15, p 383, Box 15.1) as 'manifested by bowel or bladder dysfunction, saddle anaesthesia and variable loss of motor and sensory function in the lower limbs'. For a cauda syndrome to be present there must be bilateral neurological signs in the lower limbs and sacral region. Additionally, there must be a radiological study which demonstrates a lesion in the spinal canal causing a mass effect on the cauda equina with compression of multiple nerve roots. The mass effect would be expected to be large and significant. A lumbar MRI scan is the diagnostic investigation of choice for this condition. A cauda equina syndrome may occasionally complicate lumbar spine surgery when a mass lesion will not be present in the spinal canal on radiological examination.

4.23 The cauda equina syndrome and neurogenic bladder disorder are to be assessed by the method prescribed in the spine chapter of AMA5, section 15.7, pp 395-398. For

an assessment of neurological impairment of bowel or bladder, there must be objective evidence of spinal cord, or cauda equina injury.

### Applying the DRE method

- 4.24 The specific procedures and directions section of AMA5 (section 15.2a, pp 380-381) indicates the steps that should be followed to evaluate impairment of the spine (excluding references to the ROM method). Table 4.1 is a simplified version of that section, incorporating the amendments listed above.



- 4.25 Common developmental findings, spondylosis, spondylolisthesis and disc protrusions without radiculopathy occur in seven per cent, three per cent, and up to 30 per cent respectively in individuals up to the age of 40 (p 383 AMA5). Their presence does not of itself mean that the individual has an impairment due to injury.
- 4.26 Loss of sexual function should only be assessed where there is other objective evidence of spinal cord, cauda equina or bilateral nerve root dysfunction. The ratings are described in table 15-6 (pp 396-397 AMA5). There is no additional impairment rating system for loss of sexual function in the absence of objective neurological findings. Loss of sexual function is not assessed as an ADL
- 4.27 Radiculopathy is the impairment caused by malfunction of a spinal nerve root or nerve roots. In general, in order to conclude that radiculopathy is present, two or more of the following criteria should be found, one of which must be major (major criteria in bold):
- **Loss or asymmetry of reflexes**
  - **Muscle weakness that is anatomically localised to an appropriate spinal nerve root distribution**
  - **Reproducible impairment of sensation that is anatomically localised to an appropriate spinal nerve root distribution**
  - Positive nerve root tension (Box 15-1, p382 AMA5)
  - Muscle wasting – atrophy (Box 15-1, p382 AMA5)

- Findings on an imaging study consistent with the clinical signs (p382 AMA5)

4.28 Radicular complaints of pain or sensory features that follow anatomical pathways but cannot be verified by neurological findings (somatic pain, non-verifiable radicular pain) do not alone constitute radiculopathy.

4.29 Global weakness of a limb related to pain or inhibition or other factors does not constitute weakness due to spinal nerve malfunction.

4.30 Vertebral body fractures and/or dislocations at more than one vertebral level are to be assessed as follows:

- Measure the percentage loss of vertebral height at the most compressed part for each vertebra, then
- Add the percentage loss at each level:
  - Total loss of more than 50% = DRE IV
  - Total loss of 25% to 50% = DRE III
  - Total loss of less than 25% = DRE II
- If radiculopathy is present then the person is assigned one DRE category higher

One or more end plate fractures in a single spinal region without measurable compression of the vertebral body are assessed as DRE category II.

Posterior element fractures (excludes fractures of transverse processes and spinous processes) at multiple levels are assessed as DRE III.

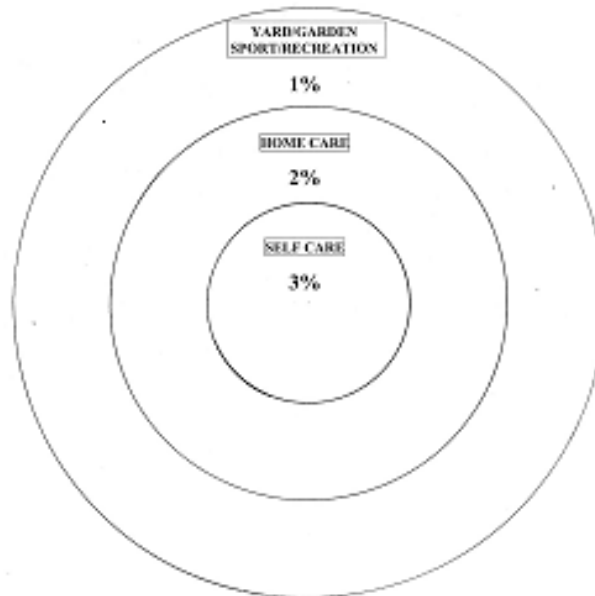
4.31 Displaced fractures of transverse or spinous processes at one or more levels are assessed as DRE category II because the fracture does not disrupt the spinal canal (p 385 AMA5) and do not cause multilevel structural compromise.

4.32 Within a spinal region separate spinal impairments are not combined. The highest value impairment within the region is chosen. Impairments in different spinal regions are combined using the combined values chart (AMA5, pp 604-606).

If there are adjacent vertebral fractures at the transition zones (C7/T1, T12/L1), the methodology in paragraph 4.30 is to be adopted. For fractures of C7 and T1, use the WPI ratings for the cervical spine (AMA5 chapter 15, page 392, Table 15-5). For fractures of T12 and L1 use the WPI rating for the thoracic spine (AMA5 chapter 15, page 389, Table 15-4).

4.33 **Impact of ADL.** Tables 15-3, 15-4 and 15-5 of AMA5 give an impairment range for DREs II to V. Within the range, zero, one, two or three per cent WPI may be assessed using paragraphs 4.34 and 4.35 below. An assessment of the effect of the injury on ADLs is not solely dependent on self-reporting, but is an assessment based on all clinical findings and other reports.

4.34 The following diagram should be used **as a guide** to determine whether zero, one, two or three per cent WPI should be added to the bottom of the appropriate impairment range. This is only to be added if there is a difference in activity level as recorded and compared to the worker's status prior to the injury.



4.35 The diagram is to be interpreted as follows:

Increase base impairment by:

- Three per cent WPI if worker's capacity to undertake personal care activities such as dressing, washing, toileting and shaving has been affected.
- two per cent WPI if the worker can manage personal care, but is restricted with usual household tasks such as cooking, vacuuming, making beds or tasks of equal magnitude such as shopping, climbing stairs or walking reasonable distances.
- one per cent WPI for those able to cope with the above, but unable to get back to previous sporting or recreational activities such as gardening, running and active hobbies etc.

4.36 For a single injury, where there has been more than one spinal region injured, the effect of the injury on ADL is assessed once only.

For injuries to one spinal region on different dates, the effect of the injury on ADL is assessed for the first injury. If, following the second injury, there is a worsening in the ability to perform ADL, the appropriate adjustments are made within the range. For example, if one per cent WPI for ADL is assessed following the first injury and three per cent after the second injury, then two per cent WPI is assessed for the ADL for the second injury.

For injuries to different spinal regions on different dates where there is a worsening of ADL after the second injury, additional impairment may be assessed. For example, if for an injury to the cervical spine one per cent for ADL was assessed, and following a subsequent injury to the lumbar spine three per cent WPI was assessed, then two per cent WPI is assessed for the lumbar injury.

4.37 Effect of surgery: Tables 15-3, 15-4 and 15-5 (pp 384, 389 and 392 AMA5) do not adequately account for the effect of surgery upon the impairment rating for certain disorders of the spine. The assessor should note that:

- Surgical decompression for spinal stenosis is DRE category III (AMA5 Table 15-3, 15-4, 15-5)
- Operations where the radiculopathy has resolved are considered under the DRE category III (AMA5, Tables 15-3, 15-4, 15-5);
- Operations for spinal fusion (successful or unsuccessful) are considered under DRE category IV (AMA5, Tables 15-3, 15-4, 15-5).
- DRE Category V is not to be used following spinal fusion, where there is a persisting radiculopathy. Instead use Table 4.2 in this Guide; and
- Radiculopathy persisting after surgery is not accounted for by AMA5 Table 15-3, and incompletely by Tables 15-4 and 15-5, which only refer to radiculopathy which has improved following surgery.

Table 4.2 indicates the additional ratings which should be combined with the rating determined using the DRE method where an operation for an intervertebral disc prolapse, spinal canal stenosis or spinal fusion has been performed.

Example 15-4 (p 386 AMA5) should therefore be ignored.

**Table 4.2: Modifiers for DRE categories following surgery**

Procedures	Cervical	Thoracic	Lumbar
Spinal surgery with residual symptoms and radiculopathy (refer to 4.27 in this Guideline)	3%	2%	3%
Second and further levels	1% each additional level	1% each additional level	1% each additional level
Second operation	2%	2%	2%
Third and subsequent operations	1% each	1% each	1% each

In summary, to calculate whole person impairment (WPI) for persisting radiculopathy (as per definition) following surgery:

- Select the appropriate DRE category from Table 15-3, 15-4, or 15-5;
- determine a WPI value within the allowed range in table 15-3, 15-4 or 15-5 according to the impact on the worker's ADL;
- Combine this value with the appropriate additional amount from Table 4.2 to determine the final WPI.

4.38 **Disc Replacement Surgery.** The impairment resulting from this procedure is to be equated to that from a spinal fusion.

4.39 **Arthritis:** See sections 3.19–3.24 of this Guide.

4.40 **Posterior spacing or stabilisation devices:** The insertion of such devices does not warrant any additional WPI.

4.41 **Spinal cord stimulator or similar device:** The insertion of such devices does not warrant any additional WPI.

4.42 Impairment due to **pelvic fractures** should be evaluated with reference to the following table 4.3, which replaces table 15-19 in AMA5.

**Table 4.3: Pelvic fractures**

Disorder	% WPI
1. Non-displaced, healed fractures	0
2. Fractures of the pelvic bones (including sacrum)	
(i) maximum residual displacement <1cm	2
(ii) maximum residual displacement 1 to 2 cm	5
(iii) maximum residual displacement >2cm	8
(iv) bilateral pubic rami fractures, as determined by the most displaced fragment	
a. maximum residual displacement ≤2cm	5
b. maximum residual displacement >2cm	8
3. Traumatic separation of the pubic symphysis	
(i) <1cm	5
(ii) 1 to 2 cm	8
(iii) >2cm	12
(iv) Internal fixation/ankylosis	5
4. Sacro-Iliac Joint dislocations or fracture dislocations	
(i) maximum residual displacement ≤1cm	8
(ii) maximum residual displacement >1cm	12
(iii) internal fixation/ankylosis	5
5. If two out of three joints are internally fixed/ankylosed	8
If all three joints are internally fixed/ankylosed	10
6. Fractures of the coccyx	
(i) Healed, (and truly) displaced fracture	1
(ii) Excision of the coccyx	5
7. Fractures of the acetabulum: Evaluate based on restricted range of hip motion	

The rating of WPI is evaluated based on radiological appearance at maximum medical improvement, whether or not surgery has been performed. Multiple injuries of the pelvis should be assessed separately and combined, with the maximum WPI for pelvic fractures being 20 per cent.

## 5. Nervous system

**Chapter 13, AMA5 (page 305) applies to the assessment of permanent impairment of the nervous system, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### Introduction

- 5.1 AMA5 chapter 13, the central and peripheral nervous system (pp 305-356), provides guidelines on methods of assessing permanent impairment involving the central nervous system. It is logically structured and consistent with the usual sequence of examination of the nervous system. Cerebral functions are discussed first, followed by the cranial nerves, station, gait and movement disorders, the upper extremities related to central impairment, the brain stem, the spinal cord and the peripheral nervous system, including neuromuscular junction and muscular system. A summary concludes the chapter.
- 5.2 Spinal cord injuries are to be assessed using AMA5 chapter 15. Table 15.6 (pp 396-397) is to be used for evaluation of spinal cord injuries. These impairments, once selected, are then combined with the corresponding additional spinal impairment from DRE categories II-V for cervical and lumbar impairment and categories II-IV for thoracic impairment to obtain an exact total value.
- 5.3 Impairments of the peripheral nervous system are assessed by using the relevant parts of the upper extremity, lower extremity and spine sections of AMA5.

### The approach to assessment of permanent neurological impairment

- 5.4 AMA5 chapter 13 disallows combination of cerebral impairments. However, for the purpose of this Guide, cerebral impairments should be evaluated and combined as follows:
- Consciousness and awareness
  - Mental status, cognition and highest integrative function
  - Aphasia and communication disorders
  - Emotional and behavioural impairments.

The assessor should take care to be as specific as possible and not to double-rate the same impairment, particularly in the mental status and behavioral categories.

These impairments are to be combined using the combined values chart (pp 604-606 AMA5). These impairments should then be combined with other neurological impairments indicated in AMA5 table 13-1 (p 308).

- 5.5 AMA5 sections 13.5 and 13.6 (pp 336-340) should be used for cerebral, basal ganglia, cerebellar or brain stem impairments. This section therefore covers

hemiplegia, monoplegia (arm or leg) and upper or lower limb impairment due to incoordination or movement disorder due to brain injury.

- 5.6 If a person has a spinal injury with spinal cord or cauda equina, bilateral nerve root or lumbosacral plexus injury causing bowel, bladder and/or sexual dysfunction, he or she is assessed according to the method described in section 15.7 and table 15.6 (a)-(g), pp 395-398, AMA5.
- 5.7 Complex regional pain syndrome types 1 and 2 are to be assessed using the method in Chapter 17 of this Guide.
- 5.8 The nervous system chapter of AMA5 (chapter 13) lists many impairments where the range for the associated WPI is 0-9 per cent or 0-14 per cent. Where there is a range of impairment percentages listed, the assessor should nominate an impairment percentage based on the complete clinical circumstances revealed during the consultation and in relation to all other available information.

### **Specific interpretation of AMA5**

- 5.9 In assessing disturbances of mental status and integrative functioning, and emotional or behavioural disturbances, disturbances in the level of consciousness and awareness, disturbances of sleep and arousal function and disorders of communication (sections 13.3a, 13.3c, 13.3d, 13.3e, 13.3f, AMA5 pp 309-311, 317-327), the assessor should make ratings based on clinical assessment and the results of neuropsychometric testing where available.

For traumatic brain injury, there should be evidence of a severe impact to the head or that the injury involved a high energy impact.

Clinical assessment must include at least one of the following:

- Significant medically verified abnormalities in the Glasgow Coma Scale score,
- Significant medically verified duration of post traumatic amnesia
- Significant intracranial pathology on CT scan or MRI.

Neuropsychological testing should be conducted by a registered clinical neuropsychologist who is a member, or is eligible for membership, of the Australian Psychological Society's College of Clinical Neuropsychology. Neuropsychological test data is to be considered in the context of the overall clinical history, examination and radiological findings and not in isolation.

- 5.10 **Assessment of arousal and sleep disorders (AMA5 section 13.3c, pp 317-319):** refers to assessment of primary sleep disorders following neurological injury. The assessor should make ratings of arousal and sleep disorders based on the clinical assessment that would normally have been done for clinically significant disorders of this type (i.e. sleep studies or similar tests).
- 5.11 **Olfaction and taste:** The assessor should use AMA5 Chapter 11, Section 11.4c (p 262) to assess olfaction and taste, for which a maximum of five per cent WPI is allowable for total loss of either sense. The effect on activities of daily living should be considered.



5.12 **Visual impairment assessment (chapter 8, pp 209-222 AMA4):** An ophthalmologist should assess all impairments of visual acuity, visual fields, extra-ocular movements or diplopia.

5.13 **Trigeminal nerve assessment (p 331 AMA5):** Sensory impairments of the trigeminal nerve should be assessed with reference to AMA5 table 13-11 (p 331). The words 'sensory loss or dysaesthesia' should be added to the table after the words 'neuralgic pain' in each instance. Lesions of the ophthalmic division of the trigeminal nerve with impairment of corneal sensation should be apportioned with extra weighting.

If present, motor loss for the trigeminal nerve should be assessed in terms of its impact on mastication and deglutition (p 262 AMA5).

For bilateral injury to the trigeminal nerves, assess each side separately and combine the assessed WPIs.

5.14 **Spinal accessory nerve:** AMA5 provides insufficient reference to the spinal accessory nerve (cranial nerve XI). This nerve supplies the trapezius and sternomastoid muscles. For loss of use of the nerve to trapezius, the assessor should refer to AMA5 chapter 16 on upper limb assessment, and a maximum of 10 per cent impairment of the upper limb may be assigned. For additional loss of use of sternomastoid, a maximum of three per cent upper limb impairment may be added.

5.15 Impairment of sexual function caused by severe traumatic brain injury is to be assessed by using table 13.21 (p 342 AMA5). For spinal cord, nerve root or more peripheral nerve injury, sexual impairment should only be assessed where there is appropriate objective evidence of spinal cord, cauda equina or bilateral nerve root dysfunction or lumbosacral plexopathy.

5.16 Impairment due to miscellaneous peripheral nerves should be evaluated with reference to the following table.

**Table 5.1 Criteria for Rating Miscellaneous Peripheral Nerves**

Peripheral Nerve	Whole Person Impairment Rating			
	0%	1%	2% - 3%	4% - 5%
Clinical features	No neuralgia	Sensory loss only in an anatomic distribution	Mild to moderate neurogenic pain and sensory alteration in an anatomic distribution	Severe neurogenic pain and sensory alteration in an anatomic distribution
Greater Occipital Nerve or Lesser Occipital Nerve or Greater Auricular Nerve				
Intercostal Nerve				
Genitofemoral				
Ilio-inguinal				
Ilio-hypogastric				
Pudendal				

## **6. Ear, nose, throat and related structures**

**Chapter 11, AMA5 (page 245) applies to the assessment of permanent impairment of the ear (with the exception of hearing impairment), nose, throat and related structures, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction of this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### **Introduction**

- 6.1 AMA5 chapter 11 (pp 245-275) details the assessment of the ear, nose, throat and related structures. With the exception of hearing impairment, which is dealt with in chapter 9 of this Guide, AMA5 chapter 11 should be followed in assessing permanent impairment, with the variations included below.
- 6.2 The level of impairment arising from conditions that are not work related needs to be assessed by the medical assessor and taken into consideration in determining the level of permanent impairment. The level at which pre-existing conditions and lifestyle activities such as smoking contribute to the level of permanent impairment requires judgement on the part of the clinician undertaking the impairment assessment. The manner in which any deduction for these is applied needs to be recorded in the assessing specialist's report.

### **The ear**

- 6.3 Equilibrium is assessed according to AMA5 section 11.2b (pp 252-255), but add these words to AMA5 table 11-4 (p 253) class 2: 'without limiting the generality of the above, a positive Hallpikes test is a sign and an objective finding'.

### **The face (AMA5, pp255–259)**

- 6.4 AMA5 table 11-5 (p 256) should be replaced with table 6.1 below when assessing permanent impairment due to facial disorders and/or disfigurement.

**Table 6.1: Criteria for rating permanent impairment due to facial disorders and/or disfigurement**

<b>Class 1 0%–5% impairment of the whole person</b>	<b>Class 2 6%–10% impairment of the whole person</b>	<b>Class 3 11%–15% impairment of the whole person</b>	<b>Class 4 16%–50% impairment of the whole person</b>
Facial abnormality limited to disorder of cutaneous structures, such as visible simple scars (not hypertrophic or atrophic) or abnormal pigmentation (refer to AMA5 Chapter 8 for skin disorders) or mild, unilateral, facial paralysis affecting most branches or nasal distortion that affects physical appearance or partial loss or deformity of the outer ear	Facial abnormality involves loss of supporting structure of part of face, with or without cutaneous disorder (e.g., depressed cheek, nasal, or frontal bones) or near complete loss of definition of the outer ear	Facial abnormality involves absence of normal anatomic part or area of face, such as loss of eye or loss of part of nose, with resulting cosmetic deformity, combine with any functional loss, e.g., vision (AMA4 Chapter 8) or severe unilateral facial paralysis affecting most branches or mild, bilateral, facial paralysis affecting most branches	Massive or total distortion of normal facial anatomy with disfigurement so severe that it precludes social acceptance, or severe, bilateral, facial paralysis affecting most branches or loss of a major portion of or entire nose

Note: Tables used to classify the examples in AMA5 section 11.3 (p 256-259) should also be ignored and assessors should refer to the modified table above for classification.

6.5 AMA5 example 11-11 (p 257): Add 'visual impairment related to enophthalmos must be assessed by an Ophthalmologist'.

### **The nose, throat and related structures**

#### **Respiration (AMA5 Section 11.4a, pp259–261)**

6.6 In regard to sleep apnoea (third paragraph, AMA5 section 11.4a, p 259), a sleep study and an examination by an ear, nose and throat specialist is mandatory before assessment by an approved assessor.

6.7 The assessment of sleep apnoea is addressed in AMA5 section 5.6 (p 105) and assessors should refer to this chapter, as well as paragraphs 8.8–8.10 in this Guide.

6.8 **AMA5 table 11-6 criteria for rating impairment due to air passage defects (p 260 AMA5)** should be replaced with table 6.2, below, when assessing permanent impairment due to air passage defects.

**Table 6.2: Criteria for rating permanent impairment due to air passage defects**

Percentage impairment of the whole person					
Class 1a 0%–5%	Class 1 0%–10%	Class 2 11%–29%	Class 3 30%–49%	Class 4 50%–89%	Class 5 90%+
There are symptoms of significant difficulty in breathing through the nose. Examination reveals significant partial obstruction of the right and/or left nasal cavity or nasopharynx or significant septal perforation.	Dyspnea does not occur at rest and dyspnea is not produced by walking freely on a level surface, climbing stairs freely, or performance of other usual activities of daily living and dyspnea is not produced by stress, prolonged exertion, hurrying, hill-climbing, or recreational or similar activities requiring intensive effort* and examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, bronchi, or complete (bilateral) obstruction of the nose or nasopharynx	Dyspnea does not occur at rest and dyspnea is not produced by walking freely on a level surface, climbing one flight of stairs, or performance of other usual activities of daily living but dyspnea is produced by stress, prolonged exertion, hurrying, hill-climbing, or recreational or similar activities (except sedentary forms) and examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, bronchi, or complete (bilateral) obstruction of the nose or nasopharynx	Dyspnea does not occur at rest and dyspnea is produced by walking freely more than one or two level blocks, climbing one flight of stairs even with periods of rest, or performance of other usual activities of daily living and dyspnea is produced by stress, prolonged exertion, hurrying, hill-climbing, or recreational or similar activities and examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea or bronchi	Dyspnea occurs at rest, although individual is not necessarily bedridden and dyspnea is aggravated by the performance of any of the usual activities of daily living (beyond personal cleansing, dressing or grooming) and examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, and/or bronchi	Severe dyspnea occurs at rest and spontaneous respiration is inadequate and respiratory ventilation is required and examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea or bronchi

\*Prophylactic restriction of activity, such as strenuous competitive sport, does not exclude subject from class 1.

**Note:** Individuals with successful permanent tracheostomy or stoma should be rated at 25 per cent WPI. AMA5 example 11-16 (p 261): Partial obstruction of the larynx affecting only one vocal cord is better linked to voice (AMA5 section 11.4e).

- 6.9 When using AMA5 Table 11-7 ‘Relationship of dietary restrictions to permanent impairment’ (p 262), the first WPI category is to be 0–19 per cent, not 5-19 per cent.

### **Speech (AMA5, pp 262–264)**

- 6.10 Regarding the first sentence of the 'examining procedure' subsection (pp 263-264 AMA5): the examiner should have sufficient hearing for the purpose- disregard 'normal hearing as defined in the earlier section of this chapter on hearing'.
- 6.11 Examining procedure (pp 263-264 AMA5), second paragraph: 'The examiner should base judgements of impairment on two kinds of evidence: (1) attention to and observation of the individual's speech in the office- for example, during conversation, during the interview, and while reading and counting aloud- and (2) reports pertaining to the individual's performance in everyday living situations'. Disregard the next sentence: 'The reports or the evidence should be supplied by reliable observers who know the person well.'
- 6.12 Examining procedure (pp 263-264 AMA5): where the word 'American' appears as a reference, substitute 'Australian', and change measurements to the metric system (e.g. 8.5 inch = 22cm).

### **The voice (AMA5 Section 11.4e, pp 264–267)**

- 6.13 Substitute the word 'laryngopharyngeal' for 'gastroesophageal' in all examples where it appears.
- 6.14 Example 11.25 in AMA5 (p 269) ‘Impairment rating’, second sentence: add the words “including respiratory impairment” into the sentence to read 'Combine with appropriate ratings due to other impairments including respiratory impairment to determine whole person impairment'.

### **Ear, nose, throat and related structures impairment evaluation summary**

- 6.15 AMA5 table 11-10 (pp 272-275): Disregard this table, except for impairment of olfaction and/or taste, and hearing impairment as determined in this Guide.

## 7. Urinary and reproductive systems

**Chapter 7, AMA5 (page 143) applies to the assessment of permanent impairment of the urinary and reproductive systems, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction of this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5

### Introduction

7.1 AMA5 chapter 7 (pp 143-171) provides clear details for assessment of the urinary and reproductive systems. Overall the chapter should be followed in assessing permanent impairment, with the variations included below.

7.2 For both male and female sexual dysfunction, identifiable pathology should be present for an impairment percentage to be given.

### Urinary diversion

7.3 AMA5 table 7-2 (p 150) should be replaced with table 7.1, below, when assessing permanent impairment due to urinary diversion disorders. This table includes ratings for neobladder and continent urinary diversion.

7.4 Continent urinary diversion is defined as a continent urinary reservoir constructed of small or large bowel with a narrow catheterisable cutaneous stoma through which it must be emptied several times a day.

**Table 7.1: Criteria for rating permanent impairment due to urinary diversion disorders**

<b>Diversion type</b>	<b>% Impairment of the whole person</b>
Ureterointestinal	10%
Cutaneous ureterostomy	10%
Nephrostomy	15%
Neobladder/replacement cystoplasty	15%
Continent urinary diversion	20%

### Bladder

7.5 AMA5 table 7-3 (p 151) should be replaced with table 7. 2 below when assessing permanent impairment due to bladder disease. This table includes ratings involving urge and total incontinence (defined in 7.8 of this Guide).

**Table 7.2: Criteria for rating permanent impairment due to bladder disease**

<b>Class 1 0%–15% impairment of the whole person</b>	<b>Class 2 16%–40% impairment of the whole person</b>	<b>Class 3 41%–70% impairment of the whole person</b>
Symptoms and signs of bladder disorder and requires intermittent treatment and normal functioning between malfunctioning episodes	Symptoms and signs of bladder disorder e.g., urinary frequency (urinating more than every two hours); severe nocturia (urinating more than three times a night); urge incontinence more than once a week and requires continuous treatment	Abnormal (i.e. under- or over-) reflex activity (e.g., intermittent urine dribbling, loss of control, urinary urgency and urge incontinence once or more each day) and/or no voluntary control of micturition; reflex or areflexic bladder on urodynamics and/or total incontinence e.g., fistula

- 7.6 AMA5 example 7-16 (p151) should be reclassified as an example of class 2, as the urinary frequency is more than every two hours and continuous treatment would be expected.

### **Urethra**

- 7.7 AMA5 table 7-4 (p 153) should be replaced with table 7.3 below when assessing permanent impairment due to urethral disease. This table includes ratings involving stress incontinence.

**Table 7.3: Criteria for rating permanent impairment due to urethral disease**

<b>Class 1 0%–10% impairment of the whole person</b>	<b>Class 2 11%–20% impairment of the whole person</b>	<b>Class 3 21%–40% impairment of the whole person</b>
Symptoms and signs of urethral disorder and requires intermittent therapy for control	Symptoms and signs of urethral disorder; stress urinary incontinence more than three times a week and cannot effectively be controlled by treatment	Urethral dysfunction resulting in intermittent urine dribbling, or stress urinary incontinence at least daily

### **Urinary incontinence**

- 7.8 Urge urinary incontinence is the involuntary loss of urine associated with a strong desire to void. Stress urinary incontinence is the involuntary loss of urine occurring with clinically demonstrable raised intra-abdominal pressure. It is expected that



urinary incontinence of a regular or severe nature (necessitating the use of protective pads or appliances) will be assessed as follows:

**Stress urinary incontinence (demonstrable clinically):** 11–25% according to severity

**Urge urinary incontinence:** 16–40% according to severity

**Mixed (urge and stress) incontinence:** 16–40% according to severity

**Nocturnal enuresis or wet in bed:** 16–40% according to severity

**Total incontinence (continuously wet, e.g., from fistula):** 50–70%

The highest scoring condition is to be used to assess impairment — combinations are not allowed.

## **Male reproductive organs**

### **Penis**

- 7.9 AMA5 (p 157): the box labelled 'class 3, 21-35 per cent' should read 'class 3, 20 per cent impairment of the whole person' as the descriptor 'no sexual function possible' does not allow a range. (The correct value is shown in AMA5 Table 7-5, p. 156). Note, however, that there is a loading for age, so a rate higher than 20 per cent is possible.

### **Testicles, epididymides and spermatic cords**

- 7.10 AMA5 table 7-7 (p 159) should be replaced with table 7.4 below when assessing permanent impairment due to testicular, epididymal and spermatic cord disease. This table includes rating for infertility and equates impairment with female infertility (see table 7.5, in this Guide). Infertility in either sex must be considered to be of equal impact, age for age.
- 7.11 Male infertility is defined as azoospermia or other cause of inability to cause impregnation even with assisted contraception techniques.
- 7.12 Loss of sexual function related to spinal injury should only be assessed as an impairment where there is other objective evidence of spinal cord, cauda equina or bilateral nerve root dysfunction. The ratings described in table 13-21 on p 342 of AMA5 are used in this instance. There is no additional impairment rating system for loss of sexual function in the absence of objective clinical findings.

**Table 7.4: Criteria for rating permanent impairment due to testicular, epididymal and spermatic cord disease**

<b>Class 1 0%–10% impairment of the whole person</b>	<b>Class 2 11%–15% impairment of the whole person</b>	<b>Class 3 16%–35% impairment of the whole person</b>
Testicular, epididymal or spermatic cord disease symptoms and signs and anatomic alteration and no continuous treatment required and no seminal or hormonal function or abnormalities or solitary testicle	Testicular, epididymal or spermatic cord disease symptoms and signs and anatomic alteration and cannot effectively be controlled by treatment and detectable seminal or hormonal abnormalities	Trauma or disease produces bilateral anatomic loss of the primary sex organs or no detectable seminal or hormonal function or infertility

**Female reproductive organs**

**Fallopian tubes and ovaries**

- 7.13 AMA5 table 7-11 (p 167) should be replaced with table 7.5 below when assessing permanent impairment due to fallopian tube and ovarian disease. This table includes rating for infertility and equates impairment with male infertility (see [table 7.4](#) above). Infertility in either sex must be considered to be of equal impact, age for age.
- 7.14 **Female infertility:** a woman in the childbearing age is infertile when she is unable to conceive naturally. This may be due to anovulation, tubal blockage, cervical or vaginal blocking or an impairment of the uterus.

**Table 7.5: Criteria for rating permanent impairment due to fallopian tube and ovarian disease**

<b>Class 1 0%–15% impairment of the whole person</b>	<b>Class 2 16%–25% impairment of the whole person</b>	<b>Class 3 26%–35% impairment of the whole person</b>
Fallopian tube or ovarian disease or deformity symptoms and signs do not require continuous treatment or only one functioning fallopian tube or ovary in the premenopausal period or bilateral fallopian tube or ovarian functional loss in the postmenopausal period	Fallopian tube or ovarian disease or deformity symptoms and signs require continuous treatment, but tubal patency persists and ovulation is possible	Fallopian tube or ovarian disease or deformity symptoms and signs and total tubal patency loss or failure to produce ova in the premenopausal period or bilateral fallopian tube or bilateral ovarian loss in the premenopausal period; infertility

## 8. Respiratory system

**Chapter 5, AMA5 (page 87) applies to the assessment of permanent impairment of the respiratory system, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction of this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### Introduction

- 8.1 AMA5 chapter 5 provides a useful summary of the methods for assessing permanent impairment arising from respiratory disorders.
- 8.2 The level of impairment arising from conditions that are not work related needs to be assessed by the medical assessor and taken into consideration in determining the level of permanent impairment. The level at which pre-existing conditions and lifestyle activities such as smoking contribute to the level of permanent impairment requires judgement on the part of the clinician undertaking the impairment assessment. The manner in which any deduction for these is applied needs to be recorded in the assessing specialist's report.

### Examinations, clinical studies and other tests for evaluating respiratory disease (AMA5 section 5.4)

- 8.3 AMA5 tables 5-2b, 5-3b, 5-4b, 5-5b, 5-6b and 5-7b (pp95-100) give the lower limits of normal values for pulmonary function tests. These are used in table 5-12 to determine the impairment classification for respiratory disorders.
- 8.4 Classes 2, 3 and 4 in table 5-12 (p107) list ranges of WPI. The assessor should nominate the nearest whole percentage based on the complete clinical circumstances when selecting within the range.

### Asthma (AMA5 section 5.5)

- 8.5 In assessing permanent impairment arising from occupational asthma, the assessor will require evidence from the treating physician that:
- At least three lung function tests have been performed over a six month period and that the results were consistent and repeatable over that period;
  - the worker has received maximal treatment and is compliant with his/her medication regimen.
- 8.6 Bronchial challenge testing should not be performed as part of the impairment assessment, therefore in AMA5 table 5-9 (p 104) ignore column four (PC20 mg/mol or equivalent, etc.).

- 8.7 Permanent impairment due to asthma is rated by the score for the best post-bronchodilator forced expiratory volume in one second (FEV1) (score in column 2, AMA5 table 5-9) plus per cent of FEV1 (score in column 3) plus minimum medication required (score in column 5). The total score derived is then used to assess the percent impairment in AMA5 table 5-10 (p 104).

#### **Obstructive sleep apnoea (AMA5 section 5.6)**

- 8.8 This section needs to be read in conjunction with AMA5 section 11.4 (p 259) and section 13.3c (p 317).
- 8.9 Before permanent impairment can be assessed, the person must have appropriate assessment and treatment by an ear, nose and throat surgeon and a respiratory physician who specialises in sleep disorders.
- 8.10 Degree of permanent impairment due to sleep apnoea should be calculated with reference to AMA5 table 13-4 (p 317).

#### **Hypersensitivity pneumonitis (AMA5 section 5.7)**

- 8.11 Permanent impairment arising from disorders included in this section are assessed according to the impairment classification in AMA5 table 5-12 (p107).

#### **Pneumoconiosis (AMA5 section 5.8)**

- 8.12 Permanent impairment due to pneumoconiosis is assessed according to the impairment classification in AMA5 Table 5–12.

#### **Lung cancer (AMA5 section 5.9)**

- 8.13 Permanent impairment due to lung cancer should be assessed at least six months after surgery. Table 5-12 (AMA5 p107) (not table 5-11) should be used for assessment of permanent impairment.
- 8.14 Persons with residual lung cancer after treatment are classified in respiratory impairment class 4 (table 5-12) (AMA5 p107).

#### **Permanent impairment due to respiratory disorders (AMA5 section 5.10)**

- 8.15 Table 5-12 (p 107 AMA5) should be used to assess permanent impairment for respiratory disorders. The pulmonary function tests listed in table 5-12 must be performed under standard conditions. Exercise testing is not required on a routine basis.
- 8.16 An isolated abnormal diffusing capacity for carbon monoxide (DCO) in the presence of otherwise normal results of lung function testing should be interpreted with caution and its aetiology should be clarified.

## 9. Hearing

**Chapter 11, AMA5 (page 245) applies to the assessment of permanent impairment of hearing, subject to the modifications set out below. Before undertaking an impairment assessment, users of the Guide must be familiar with the following:**

- The Introduction in the Guide
- The appropriate chapter/s of the Guide for the body system they are assessing.
- The National Acoustic Laboratory Report No. 118 *Improved procedure for determining percentage loss of hearing* (January 1988) and its associated tables.

The provisions of this Guide take precedence over AMA5.

### Assessment of hearing impairment (hearing loss)

- 9.1 A worker requiring assessment of permanent impairment resulting from a hearing injury must undergo an audiometric test for hearing conducted by an audiologist for the purposes of assessment.

In accordance with section 179 of the *Workers' Compensation and Rehabilitation Act 2003* (the Act), audiologists who have undertaken the required training in this Guide can assess a worker's degree of permanent impairment arising from an industrial deafness injury. For all other hearing injuries, the assessor should be an appropriately qualified medical specialist who has undertaken the required training in this Guide.

A worker may present for assessment of hearing loss for compensation purposes before having undergone all or any of the health investigations that generally occur before assessment of permanent impairment. For this reason and to ensure that conditions other than "occupational hearing impairment" are precluded, an audiologist who assesses a worker for impairment due to industrial deafness should alert the referring insurer or body if there is evidence (e.g. audiogram, history) of another possible cause to the worker's hearing impairment other than industrial deafness. In such cases, a further assessment by a specialist may be undertaken.

- 9.2 The worker's hearing levels must be determined separately for the left and right ears at audiometric test frequencies 500, 1000, 1500, 2000, 3000 and 4000Hz with an audiometer complying with AS IEC 60645.3-2002 (Electroacoustics – Audiological equipment – Auditory test signals of short duration for audiometric and neuro-ontological purposes). The test must be preceded by a period of quiet of at least 8 hours. For air conduction testing, the test must comply with AS/NZS 1269.4:2005 (Occupational noise management – Auditory assessment).
- 9.3 The assessment needs to be undertaken in accordance with the hearing impairment section of Table 11-10 in AMA5 (pp 272-275). The assessment must be based on a medical history and an examination of the worker, evaluation of relevant audiological tests and evaluation of other relevant investigations available to the assessor.

Some of the relevant tests are discussed in the AMA5 hearing impairment evaluation summary table 11-10 (pp 272-275). The relevant row is the one headed 'hearing impairment' with the exception of the last column headed 'degree of impairment'. The degree of impairment is determined according to this Guide.

- 9.4 Disregard AMA5 sections 11.1b and 11.2 (pp 246-255), but retain section 11.1a (interpretation of symptoms and signs, p 246).
- 9.5 The level of hearing impairment caused by non-work-related conditions is assessed by the assessor and considered when determining the level of work-related hearing impairment. This requires clinical judgement on the part of the assessor and any non-work-related deductions should be recorded in their report.
- 9.6 Disregard AMA5 tables 11-1, 11-2, and 11-3 (pp 247-250). For the purposes of this Guide, National Acoustic Laboratory (NAL) tables from the NAL report No. 118, 'improved procedure for determining percentage loss of hearing' (January 1988) are adopted as follows:
- Tables RB 500–4000 (pp 11–16)
  - Tables RM 500–4000 (pp 18–23)
  - Appendix 1 and 2 (pp 8–9)
  - Appendix 5 and 6 (pp 24–26)
  - Tables EB 4000–8000 (pp 28–30) (The extension tables)
  - Table EM 4000–8000 (pp 32–34) (The extension tables)

Where an assessor uses the extension tables, they must provide an explanation of the worker's "special requirement to be able to hear at frequencies above 4000Hz." (NAL Report no.118, p6).

In the presence of significant conduction hearing loss, the extension tables do not apply.

AMA5 table 11-3 is replaced by table 9.1 at the end of this chapter.

## **Hearing impairment**

- 9.7 Impairment of a worker's hearing is determined according to evaluation of the individual's binaural hearing impairment.
- 9.8 Permanent hearing impairment should be evaluated when the condition is stable. Prosthetic devices (that is, hearing aids) must not be worn during the evaluation of hearing sensitivity.
- 9.9 Hearing threshold level for pure tones is defined as the number of decibels above standard audiometric zero for a given frequency at which the listener's threshold of hearing lies when tested in a suitable sound attenuated environment. It is the reading on the hearing level dial of an audiometer that is calibrated according to Australian Standard AS 2586-1983.
- 9.10 Evaluation of binaural hearing impairment is determined by using the tables in the 1988 NAL publication with allowance for presbycusis according to the presbycusis correction table, if applicable, in the same publication.

The binaural tables RB 500-4000 (NAL no 118, pp11-16) are to be used. The extension tables EB 4000-8000 (pp28-30) may be used when the worker has a "special requirement to be able to hear at frequencies above 4000Hz" (NAL report no.118, p6). Where an assessor uses the extension tables, they must provide an

explanation of the worker's special requirement to be able to hear at frequencies above 4000Hz. For the purposes of calculating binaural hearing impairment, the better and worse ear may vary as between frequencies.

Where it is necessary to use the monaural tables, the binaural hearing impairment (BHI) is determined by the formula:

$$\text{BHI} = \frac{[4 \times (\text{better ear hearing loss})] + \text{worse ear hearing loss}}{5}$$

9.11 Presbycusis correction (NAL publication, p 24) only applies to occupational hearing loss contracted by gradual process (e.g. occupational noise induced hearing loss and/or occupational solvent induced hearing loss). Please note when calculating by formula for presbycusis correction (e.g. when the worker is above 81 years), use the formula at appendix 6 at line 160 (NAL publication, p 26) which uses the correct number of 1.79059. Note: there is a typographical error at Table P on p 25 of the NAL publication, with the number 1.79509 incorrectly used.

9.12 **Addition for severe tinnitus:** Once binaural hearing loss has been assessed, up to 5 percent may be added to the work-related binaural hearing impairment for severe tinnitus caused by a work-related injury:

- after legislated deduction of the first 5 percent of binaural hearing loss (if applicable);
- after presbycusis correction (if applicable);
- before proportion for time worked outside of Queensland (if applicable); and
- before determining the worker's WPI%.

If an audiologist is assessing a worker with industrial deafness and is unable to determine the severity of the worker's tinnitus or an appropriate addition for it, the worker may have a further assessment by another specialist.

9.13 **Only hearing ear:** A worker has an 'only hearing ear' if he or she has suffered a non-work-related severe or profound sensorineural hearing loss in the other ear. If a worker suffers a work-related injury causing a hearing loss in the only hearing ear of x dBHL at a relevant frequency, the worker's work-related binaural hearing impairment at that frequency is calculated from the binaural tables using x dB as the hearing threshold level in both ears. If applicable, any other adjustments to the assessed hearing loss (e.g. for presbycusis, severe tinnitus or any other legislated adjustments) are undertaken according to this Guide.

9.14 When necessary, binaural hearing impairment figures should be rounded to the nearest 0.1 per cent. Rounding up should occur if equal to or greater than 0.05 per cent, and rounding down should occur if less than 0.05 per cent.

9.15 Table 9.1 is used to convert the worker's final binaural hearing impairment, after any applicable adjustments for presbycusis, severe tinnitus or pre-existing hearing loss, to their WPI.

In accordance with section 125 of the Act, for cases of industrial deafness the assessor must also:

- deduct the first 5 percent of the worker's current binaural hearing impairment before adjusting for presbycusis and tinnitus; and
- as a final adjustment, apportion the worker's binaural hearing impairment for any work-related noise exposure not occurring in Queensland.

9.16 **Pre-existing hearing loss:** Where a worker previously has been compensated for a degree of work-related hearing impairment or there is objective evidence of a degree of binaural hearing impairment prior to their current injury, this percentage of prior hearing impairment is to be deducted by the assessor from their current assessed binaural hearing impairment. This deduction is to be done with other applicable adjustments but in assessments of industrial deafness, before apportioning for work-related noise exposure not incurred in Queensland.

This Guide's method of determining a worker's compensable binaural hearing impairment is consistent with the legislated method that preceded this Guide.

Although where a previous hearing impairment was not assessed in accordance with the method outlined in this Guide, the applicable method is set out in the following example:

- The current level of binaural hearing impairment is established by the relevant specialist.
- Convert this to WPI from Table 9.1 in this Guide.
- Calculate the proportion of the current binaural hearing impairment that was accounted for by the earlier assessment and express it as a percentage of the current hearing impairment.
- The percentage of current hearing impairment that remains is the amount to be compensated.
- This needs to be expressed in terms of WPI for calculation of compensation entitlement.

Example:

- The current binaural hearing loss is eight per cent.
- The WPI is four per cent.
- The binaural hearing impairment for which compensation was paid previously is six per cent, which is 75 per cent of the current binaural hearing impairment of eight per cent.
- The remaining percentage, 25 per cent, is the percentage of WPI to be compensated.
- 25 percent of the WPI of four per cent is one per cent WPI.



**Table 9.1: Relationship of binaural hearing impairment to whole person impairment**

<b>% Binaural hearing impairment</b>	<b>% WPI</b>	<b>% Binaural hearing impairment</b>	<b>% WPI</b>
0.0–1.1	0	50.1–52.7	21
1.2–2.5	1	52.8–55.0	22
2.6–4.7	2	55.1–57.7	23
4.8–7.6	3	57.8–60.0	24
7.7–9.7	4	60.1–62.5	25
9.8–12.6	5	62.6–65.0	26
12.7–15.0	6	65.1–67.7	27
15.1–17.6	7	67.8–70.0	28
17.7–19.8	8	70.1–72.8	29
19.9–22.6	9	72.9–75.0	30
22.7–24.8	10	75.1–77.8	31
24.9–27.4	11	77.9–80.0	32
27.5–29.9	12	80.1–82.8	33
30.0–32.6	13	82.9–85.1	34
32.7–34.9	14	85.2–87.8	35
35.0–37.7	15	87.9–90.2	36
37.8–39.9	16	90.3–92.7	37
40.0–42.7	17	92.8–95.1	38
42.8–44.9	18	95.2–97.6	39
45.0–47.7	19	97.7–100	40
47.8–50.0	20		

9.17 AMA5 examples 11.1, 11.2, 11.3 (pp 250-251) are replaced by the following examples 9.1-9.7. Table 9.2 gives a summary of the different elements of assessment addressed in each of these examples.

**Table 9.2: Element of assessment in examples**

<b>Element</b>	<b>Example No.</b>
General use of binaural table — NAL 1988	1,2
“Better ear”–“worse ear” crossover	1,2
Assessable audiometric frequencies	7 — also 1,2,4,5,6
Tinnitus	1,2,3,4
Presbycusis	All examples
Binaural hearing impairment	All examples
Conversion to WPI	All examples
Gradual process injury	3
Noise-induced hearing loss	1,2,3,5,6,7
Solvent-induced hearing loss	3
Acute occupational hearing loss	4,5
Acute acoustic trauma	5
Pre-existing non-occupational hearing loss	6
Only hearing ear	6
NAL 1988 Extension Table Use	7
Multiple Causes of Hearing Loss	3,5,6
Head injury	4

**Example 9.1: Occupational noise-induced hearing loss and severe tinnitus**

A 55-year-old man, who has worked as a boilermaker in Mackay for 30 years, gave a history of progressive hearing loss and tinnitus. He has previously seen a medical specialist about his tinnitus, who assessed it as severe. The external auditory canals and tympanic membranes were normal. Rinne test was positive bilaterally and the Weber test result was central. Clinical assessment of hearing was consistent with results of pure tone audiometry, which showed a bilateral sensorineural hearing loss. The medical specialist diagnosed noise induced hearing loss.

Presbycusis deduction	0			
Severe tinnitus addition	4			
Previously compensated BHI	NA			
Duration of noise exposure (years)	30			
Duration of noise exposure in Queensland (years)	30			
Frequency (Hz)	Left Ear (dB HL)	Right Ear (dB HL)	Binaural Hearing Impairment (%BHI)	Occupational %BHI
500	15	10	0	0
1000	20	20	0.8	0.8
1500	25	25	1.4	1.4
2000	35	35	3.4	3.4
3000	60	60	6.3	6.3
4000	75	75	8.2	8.2
Total Occupational BHI				20.1
Discount first 5% of total BHI			$20.1 - 5 = 15.1$	
Presbycusis deduction			Nil	
Addition for severe tinnitus			$15.1 + 4 = 19.1$	
Less previously compensated BHI			Nil	
Work-related noise exposure in Qld			$(30/30)*19.1 = 19.1$	
<b>Compensable BHI %</b>			<b>19.1%</b>	
<b>The current compensable BHI converts to 8% WPI according to Table 9.1</b>				

NB: In this example, the worker’s tinnitus was assessed as severe and a value given purely for the purposes of demonstrating how this is included in the calculation.

**Example 9.2: Occupational noise-induced hearing loss and mild tinnitus**

A 55-year-old man who has worked as a steelworker for 30 years (including 10 years in Northern England), gave a history of increasing difficulties with hearing and tinnitus. A medical specialist diagnosed occupational noise-induced hearing loss with mild tinnitus.

Presbycusis deduction		0		
Severe tinnitus addition		0		
Previously compensated BHI		NA		
Duration of noise exposure (years)		30		
Duration of noise exposure in Queensland (years)		20		
Frequency (Hz)	Left Ear (dB HL)	Right Ear (dB HL)	Binaural Hearing Impairment (%BHI)	Occupational %BHI
500	15	15	0.0	0.0
1000	15	15	0.0	0.0
1500	20	25	1.0	1.0
2000	30	35	2.5	2.5
3000	50	45	4.2	4.2
4000	55	55	5.2	5.2
Total Occupational BHI				12.9
Discount first 5% of total BHI			$12.9 - 5 = 7.9$	
Presbycusis deduction			$7.9 - 0 = 7.9$	
Addition for severe tinnitus			$7.9 + 0 = 7.9$	
Less previously compensated BHI			$7.9 - 0 = 7.9$	
Work-related noise exposure in Qld			$(20/30)*7.9 = 5.3$	
<b>Compensable BHI %</b>			<b>5.3%</b>	
<b>The current compensable BHI converts to 3% WPI according to Table 9.1.</b>				

**Example 9.3: Multiple gradual process occupational hearing loss**

A 63-year-old retired man who worked as a boat builder and printer over a total of 35 years gave a history of hearing difficulties and tinnitus. There has been marked chronic exposure to noise and solvents in both occupations. A medical specialist diagnosed bilateral noise-induced hearing loss and bilateral solvent-induced hearing loss with severe tinnitus, opining that the solvent exposure contributed to the hearing impairment as a gradual process injury. He has never had any other otological issues but the referral material states that in 1995 he was compensated for 4% binaural hearing loss due to industrial deafness.

Presbycusis deduction			1.7	
Severe tinnitus addition			2	
Previously compensated BHI			4	
Duration of noise exposure (years)			35	
Duration of noise exposure in Queensland (years)			35	
<b>Frequency (Hz)</b>	<b>Left Ear (dB HL)</b>	<b>Right Ear (dB HL)</b>	<b>Binaural Hearing Impairment (%BHI)</b>	<b>Occupational %BHI</b>
500	15	15	0.0	0.0
1000	15	15	0.0	0.0
1500	25	25	1.4	1.4
2000	35	40	3.8	3.8
3000	60	60	6.3	6.3
4000	60	60	6.0	6.0
Total Occupational BHI				17.5
Discount first 5% of total BHI			$17.5 - 5 = 12.5$	
Presbycusis deduction			$12.5 - 1.7 = 10.8$	
Addition for severe tinnitus			$10.8 + 2 = 12.8$	
Less previously compensated BHI			$12.8 - 4 = 8.8$	
Work-related noise exposure in Qld			$(35/35)*8.8 = 8.8$	
<b>Compensable BHI %</b>			<b>8.8%</b>	
<b>The current compensable BHI converts to 4% WPI according to Table 9.1.</b>				

**Example 9.4: Occupational hearing loss from head injury**

A 62-year-old housepainter sustained a head injury after falling from a ladder. He suffered left hearing loss and tinnitus unaccompanied by vertigo. A specialist has already assessed his tinnitus as severe. External auditory canals and tympanic membranes are normal. Rinne test is positive bilaterally and Weber test lateralises to the right. The CT scan of the temporal bones shows a fracture on the left. Clinical assessment of hearing is consistent with pure tone audiometry, which shows a flat left sensorineural hearing loss and mild right sensorineural hearing loss. He has no history of hearing difficulties or tinnitus prior to the accident.

Presbycusis deduction		NA		
Severe tinnitus addition		5		
Previously compensated BHI		0		
Duration of noise exposure (years)		NA		
Duration of noise exposure in Queensland (years)		NA		
Frequency (Hz)	Left Ear (dB HL)	Right Ear (dB HL)	Binaural Hearing Impairment (%BHI)	Occupational %BHI
500	50	15	2.3	2.3
1000	55	15	3.1	3.1
1500	60	20	3.4	3.4
2000	65	20	2.6	2.6
3000	65	25	2.2	2.2
4000	65	30	2.1	2.1
6000	65	20	-	-
8000	65	20	-	-
Total Occupational BHI				15.7
Discount first 5% of total BHI			NA – not industrial deafness	
Presbycusis deduction			NA – not gradual hearing loss	
Addition for severe tinnitus			$15.7 + 5 = 20.7$	
Less previously compensated BHI			$19.7 - 0 = 20.7$	
Work-related noise exposure in Qld			NA – not industrial deafness	
<b>Compensable BHI %</b>			<b>20.7%</b>	
<b>The current compensable BHI converts to 9% WPI according to Table 9.1.</b>				

NB: This example demonstrates how the table may still be used to calculate the final BHI for cases where the worker does not have gradual noise-induced hearing loss.

**Example 9.5a: Occupational noise-induced hearing loss with acute hearing loss**

A 65-year-old male production worker with 10 years in his current job was injured in an explosion at work. He reported immediate post injury otalgia and acute hearing loss in the left ear. His medical specialist diagnosed occupational noise-induced hearing loss and left acute acoustic trauma. The medical history provided in the referral does not mention any other hearing complaints or prior claims made by the worker. The worker’s medical specialist also had no evidence that immediately before the explosion the hearing in the left ear was significantly different from that in the right ear.

Presbycusis deduction		2.4		
Severe tinnitus addition		0		
Previously compensated BHI		NA		
Duration of noise exposure (years)		10		
Duration of noise exposure in Queensland (years)		10		
Frequency (Hz)	Left Ear (dB HL)	Right Ear (dB HL)	Binaural Hearing Impairment (%BHI)	Noise induced %BHI
500	30	15	1.0	0.0
1000	45	15	2.5	0.0
1500	55	15	2.5	0.0
2000	70	15	2.2	0.0
3000	80	25	2.4	0.7
4000	80	30	2.3	0.8
<b>Total BHI</b>			12.9	
<b>Noise induced BHI</b>				1.5
<b>Acute acoustic trauma BHI</b>			$12.9 - 1.5 = 11.4$	
Addition for severe tinnitus			0	
Less previously compensated BHI			0	
<b>Noise induced BHI calculation – Discount first 5%</b>				$1.5 - 5 = -3.5$ (equating to 0)
Presbycusis deduction				0
Work-related noise exposure in Qld				0
<b>Total Compensable BHI %</b>			<b><math>11.4 + 0 = 11.4\%</math></b>	
<b>The current compensable BHI converts to 5% WPI according to Table 9.1.</b>				

NB: This example demonstrates how the table may be altered to calculate the final BHI for cases where the worker has two different work-related causes of hearing loss. Assessors

should note the differences in the adjustments that need to be made to the BHI% before converting to WPI%.

**Example 9.5b: Occupational noise-induced hearing loss with acute hearing loss**

A 65-year-old male production worker has reported gradual hearing loss over the last 10 years he has been employed in his current job. He also reports that he was injured in an explosion while on a camping holiday about a year ago. He reported immediate post injury otalgia and acute hearing loss in the left ear as a result of this explosion. However, his medical specialist diagnosed occupational noise-induced hearing loss in addition to left acute acoustic trauma. The medical history provided in the referral does not mention any other hearing complaints or prior claims made by the worker. The worker’s medical specialist also had no evidence that immediately before the camping explosion the hearing in the left ear was significantly different from that in the right ear.

Presbycusis deduction			2.4	
Severe tinnitus addition			0	
Previously compensated BHI			0	
Duration of noise exposure (years)			10	
Duration of noise exposure in Queensland (years)			10	
<b>Frequency (Hz)</b>	<b>Left Ear (dB HL)</b>	<b>Right Ear (dB HL)</b>	<b>Binaural Hearing Impairment (%BHI)</b>	<b>Noise induced %BHI</b>
500	30	15	1.0	0.0
1000	45	15	2.5	0.0
1500	55	15	2.5	0.0
2000	70	15	2.2	0.0
3000	80	25	2.4	0.7
4000	80	30	2.3	0.8
<b>Total BHI</b>			12.9	
<b>Noise induced BHI</b>				1.5
Discount first 5% of total BHI				1.5 – 5 = -3.5 (0)
Presbycusis deduction				0
Addition for severe tinnitus				0
Less previously compensated BHI				0
Work-related noise exposure in Qld				0
<b>Total Compensable BHI %</b>			<b>0%</b>	



**As the worker currently has no compensable BHI%, he is assessed as having no permanent impairment according to the Guide (0% BHI = 0% WPI)**

NB: This example is intended to illustrate how the assessor is to assess industrial deafness or gradual work-related hearing loss when there is a history of traumatic/acute hearing loss that is not work-related. This example also shows that if a worker's current BHI resulting from the gradual hearing loss does not exceed the necessary deductions, they are assessed as having 0% BHI for the purposes of this Guide.

**Example 9.6: Occupational noise-induced hearing loss in an only hearing ear**

A 66-year-old woman has been a textile worker in Brisbane for 30 years. Childhood mumps had left her with profound hearing loss in the left ear. She gave a history of progressive hearing loss in her only hearing ear unaccompanied by tinnitus or vertigo. External auditory canals and tympanic membranes appeared normal. Rinne test was positive on the right and was false negative on the left. Weber test lateralised to the right. Clinical assessment of hearing is consistent with pure tone audiogram showing a profound left sensorineural hearing loss and a partial right sensorineural hearing loss.

Presbycusis deduction	0			
Severe tinnitus addition	0			
Previously compensated BHI	0			
Duration of noise exposure (years)	30			
Duration of noise exposure in Queensland (years)	30			
Frequency (Hz)	Left Ear (dB HL)	Right Ear (dB HL)	Binaural Hearing Impairment (%BHI)	Noise induced %BHI
500	>95	10	3.4	0.0
1000	>95	15	4.3	0.0
1500	>95	20	4.2	0.6
2000	>95	25	3.8	1.1
3000	>95	50	5.4	4.8
4000	>95	70	8.0	7.5
<b>Total BHI</b>			29.1	
<b>Occupational (noise induced) BHI</b>				14.0
Discount first 5% of total BHI				$14 - 5 = 9$
Presbycusis deduction				$9 - 0 = 9$
Addition for severe tinnitus				$9 + 0 = 9$
Less previously compensated BHI				$9 - 0 = 9$
Work-related noise exposure in Qld				$(30/30)*9 = 9$
<b>Total Compensable BHI %</b>			<b>9%</b>	
<b>The current compensable BHI converts to 4% WPI according to Table 9.1.</b>				

NB: This example demonstrates how the table may be used to calculate the final BHI for cases where the worker has an only hearing ear or one ear affected by something other than work. This demonstrates the process outlined in paragraph 9.14 of how to equate the non-hearing or affected ear with the hearing or non-affected ear.

**Example 9.7: Occupational noise-induced hearing loss where there is a special requirement for ability to hear at frequencies above 4000 Hz**

A 56-year-old female electronics technician who worked in a noisy factory for 20 years had increasing hearing difficulty. The diagnosis made was bilateral occupational noise-induced hearing loss extending to 6000 Hz or 8000 Hz. Her treating medical specialist was of the opinion that there was a special requirement for hearing above 4000 Hz. There was no conductive hearing loss.

Presbycusis deduction		0		
Severe tinnitus addition		NA		
Previously compensated BHI		NA		
Duration of noise exposure (years)		20		
Duration of noise exposure in Queensland (years)		20		
Frequency (Hz)	Left Ear (dB HL)	Right Ear (dB HL)	%BHI using the extension tables	%BHI not using extension tables
500	-	-	0.0	0.0
1000	15	15	0.0	0.0
1500	20	25	1.0	1.0
2000	30	35	2.5	2.5
3000	45	45	4.1	4.1
4000	45	50	2.2	3.6
6000	60	55	1.6	-
8000	50	20	0.2	-
Total Occupational BHI			11.6	11.2
The assessing medical specialist is of the opinion that the binaural hearing impairment in this matter is 11.6% rather than 11.2%				
Discount first 5% of total BHI			$11.6 - 5 = 6.6$	
Presbycusis deduction			$6.6 + 0 = 6.6$	
Addition for severe tinnitus			$6.6 + 0 = 6.6$	
Less previously compensated BHI			$6.6 - 0 = 6.6$	
Work-related noise exposure in Qld			$(20/20) * 6.6 = 6.6$	
<b>Compensable BHI %</b>			<b>6.6%</b>	
<b>The current compensable BHI converts to 3% WPI according to Table 9.1.</b>				

## 10. The visual system

**Chapter 8, AMA4 (page 209) applies to the assessment of permanent impairment of the visual system, subject to the modifications set out below. Before undertaking an impairment assessment, users of the Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA4 for the body system they are assessing.

The provisions of this Guide take precedence over AMA4 and AMA5.

### Introduction and approach to assessment

- 10.1 The visual system must be assessed by an ophthalmologist.
- 10.2 Chapter 8 (pp 209-222) of AMA4 are adopted for this Guide without significant change.
- 10.3 AMA4 is used rather than AMA5 for the assessment of permanent impairment of the visual system because:
- the equipment recommended for use in AMA5 is expensive and not owned by most privately practising ophthalmologists (e.g. the Goldman apparatus for measuring visual fields);
  - the assessments recommended in AMA5 are considered too complex, raising a risk that resulting assessments may be of a lower standard than if the AMA4 method was used.
  - there is little emphasis on diplopia in AMA5, yet this is a relatively frequent problem.
  - many ophthalmologists are familiar with the Royal Australian College of Ophthalmologists' impairment guide, which is similar to AMA4.
- 10.4 Impairment of vision should be measured with the injured worker wearing their prescribed corrective spectacles and/or contact lenses, if that was normal for the injured worker before the workplace injury. If, as a result of the workplace injury, the injured worker has been prescribed corrective spectacles and/or contact lenses for the first time, or different spectacles and/or contact lenses than those prescribed before injury, the difference should be accounted for in the assessment of permanent impairment.
- 10.5 The ophthalmologist should perform, or review, all tests necessary for the assessment of permanent impairment rather than relying on tests, or interpretations of tests, done by the orthoptist or optometrist.
- 10.6 An ophthalmologist should assess visual field impairment in all cases.
- 10.7 In AMA4 Section 8.5, 'other conditions' (p 222), the 'additional 10 per cent impairment' referred to means 10 per cent WPI, not 10 per cent impairment of the visual system.

## **11. Psychiatric and psychological disorders**

**AMA5 Chapter 14 is excluded and replaced by this chapter. Before undertaking an impairment assessment, users of this Guide must be familiar with the following (in this order):**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.

This Guide replace the Psychiatric and Psychological chapter in AMA5.

### **Introduction**

- 11.1 This chapter lays out the method for assessing psychiatric impairment. The evaluation of impairment requires a medical examination.
- 11.2 Evaluation of psychiatric impairment is conducted by a Medical Assessment Tribunal.
- 11.3 Psychiatric and psychological disorders may be a primary impairment or secondary to a physical impairment and are assessed in the same way.

### **Diagnosis**

- 11.4 The impairment rating must be based upon a psychiatric diagnosis (according to a recognised diagnostic system) and the report must specify the diagnostic criteria upon which the diagnosis is based. Impairment arising from any of the somatoform disorders (DSM IV TR, pp 485-511) are excluded from this chapter.
- 11.5 If pain is present as the result of an organic impairment, it should be assessed as part of the organic condition under the relevant table. This does not constitute part of the assessment of impairment relating to the psychiatric condition. The impairment ratings in the body organ system chapters in AMA5 make allowance for any accompanying pain.
- 11.6 It is expected that the psychiatrist will provide a rationale for the rating based on the injured worker's psychiatric symptoms. The diagnosis is among the factors to be considered in assessing the severity and possible duration of the impairment, but is not the sole criterion to be used. Clinical assessment of the person may include information from the injured worker's own description of his or her functioning and limitations, from family members and others who may have knowledge of the person. Medical reports, feedback from treating professionals, results of standardised tests, including appropriate psychometric testing performed by a qualified clinical psychologist, and work evaluations may provide useful information to assist with the assessment. Evaluation of impairment will need to take into account variations in the level of functioning over time. Percentage impairment refers to 'whole person impairment'.

## Permanent impairment

- 11.7 A psychiatric disorder is permanent, if in your clinical opinion, it is likely to continue indefinitely. Regard should be given to:
- the duration of impairment;
  - the likelihood of improvement in the injured workers' condition;
  - whether the injured worker has undertaken reasonable rehabilitative treatment;
  - any other relevant matters.

## Effects of treatment

- 11.8 Consider the effects of medication, treatment and rehabilitation to date. Is the condition stable? Is treatment likely to change? Are symptoms likely to improve? If the injured worker declines treatment, this should not affect the estimate of permanent impairment. The psychiatrist may make a comment in the report about the likely effect of treatment or the reasons for refusal of treatment.

## Co-morbidity

- 11.9 Consider co-morbid features (e.g. bi-polar disorder, personality disorder, substance abuse) and determine whether they are directly linked to the work-related injury or whether they were pre-existing or unrelated conditions.

## Pre-existing impairment

- 11.10 To measure the impairment caused by a work-related injury or incident, the psychiatrist must measure the proportion of WPI due to a pre-existing condition. Pre-existing impairment is calculated using the same method for calculating current impairment level. The assessing psychiatrist uses all available information to rate the injured worker's pre-injury level of functioning in each of the areas of function. The percentage impairment is calculated using the aggregate score and median class score using the conversion table below. The injured worker's current level of impairment is then assessed, and the pre-existing impairment level (%) is then subtracted from their current level to obtain the percentage of permanent impairment directly attributable to the work-related injury. If the percentage of pre-existing impairment cannot be assessed, the deduction is 1/10th of the assessed WPI.

## Psychiatric impairment rating scale (PIRS)

- 11.11 Behavioural consequences of psychiatric disorder are assessed on six scales, each of which evaluates an area of functional impairment:
1. Self-care and personal hygiene (Table 11.1)
  2. Social and recreational activities (Table 11.2)
  3. Travel (Table 11.3)
  4. Social functioning (relationships) (Table 11.4)
  5. Concentration, persistence and pace (table 11.5)
  6. Employability (Table 11.6)
- } Activities of daily living
- 11.12 Impairment in each area is rated using class descriptors. Classes range from 1 to 5, in accordance with severity. The standard form must be used when scoring the PIRS. The examples of activities are examples only. The assessing psychiatrist should take

account of the person's cultural background. Consider activities that are usual for the person's age, sex and cultural norms.

**Table 11.1: Psychiatric impairment rating scale — Self-care and personal hygiene**

Class 1	No deficit, or minor deficit attributable to the normal variation in the general population
Class 2	Mild impairment: able to live independently; looks after self adequately, although may look unkempt occasionally; sometimes misses a meal or relies on take-away food.
Class 3	Moderate impairment: Can't live independently without regular support. Needs prompting to shower daily and wear clean clothes. Does not prepare own meals, frequently misses meals. Family member or community nurse visits (or should visit) 2–3 times per week to ensure minimum level of hygiene and nutrition.
Class 4	Severe impairment: Needs supervised residential care. If unsupervised, may accidentally or purposefully hurt self.
Class 5	Totally impaired: Needs assistance with basic functions, such as feeding and toileting.

**Table 11.2: Psychiatric impairment rating scale — Social and recreational activities**

Class 1	No deficit, or minor deficit attributable to the normal variation in the general population: regularly participates in social activities that are age, sex and culturally appropriate. May belong to clubs or associations and is actively involved with these.
Class 2	Mild impairment: occasionally goes out to such events without needing a support person, but does not become actively involved (e.g., dancing, cheering favourite team).
Class 3	Moderate impairment: rarely goes out to such events, and mostly when prompted by family or close friend. Will not go out without a support person. Not actively involved, remains quiet and withdrawn.
Class 4	Severe impairment: never leaves place of residence. Tolerates the company of family member or close friend, but will go to a different room or garden when others come to visit family or flat mate.
Class 5	Totally impaired. Cannot tolerate living with anybody, extremely uncomfortable when visited by close family member.

**Table 11.3: Psychiatric impairment rating scale— Travel**

Class 1	No deficit, or minor deficit attributable to the normal variation in the general population: Can travel to new environments without supervision.
Class 2	Mild impairment: can travel without support person, but only in a familiar area such as local shops, visiting a neighbour.
Class 3	Moderate impairment: cannot travel away from own residence without support person. Problems may be due to excessive anxiety or cognitive impairment.
Class 4	Severe impairment: finds it extremely uncomfortable to leave own residence even with trusted person.
Class 5	Totally impaired: may require two or more persons to supervise when travelling.

**Table 11.4: Psychiatric impairment rating scale — Social functioning**

Class 1	No deficit, or minor deficit attributable to the normal variation in the general population: No difficulty in forming and sustaining relationships (e.g., partner, close friendships lasting years).
Class 2	Mild impairment: existing relationships strained. Tension and arguments with partner or close family member, loss of some friendships.
Class 3	Moderate impairment: previously established relationships severely strained, evidenced by periods of separation or domestic violence. Spouse, relatives or community services looking after children.
Class 4	Severe impairment: unable to form or sustain long term relationships. Pre-existing relationships ended (e.g., lost partner, close friends). Unable to care for dependants (e.g., own children, elderly parent).
Class 5	Totally impaired: unable to function within society. Living away from populated areas, actively avoiding social contact.

**Table 11.5: Psychiatric impairment rating scale — Concentration, persistence and pace**

Class 1	No deficit, or minor deficit attributable to the normal variation in the general population. Able to pass a TAFE or university course within normal time frame.
Class 2	Mild impairment: can undertake a basic retraining course, or a standard course at a slower pace. Can focus on intellectually demanding tasks for periods of up to 30 minutes, then feels fatigued or develops headache.
Class 3	Moderate impairment: unable to read more than newspaper articles. Finds it difficult to follow complex instructions (e.g., operating manuals, building plans), make significant repairs to motor vehicle, type long documents, follow a pattern for making clothes, tapestry or knitting.
Class 4	Severe impairment: can only read a few lines before losing concentration. Difficulties following simple instructions. Concentration deficits obvious even during brief conversation. Unable to live alone, or needs regular assistance from relatives or community services.
Class 5	Totally impaired: needs constant supervision and assistance within institutional setting.



**Table 11.6: Psychiatric impairment rating scale — Employability**

Class 1	No deficit, or minor deficit attributable to the normal variation in the general population. Able to work full time. Duties and performance are consistent with the injured worker's education and training. The person is able to cope with the normal demands of the job.
Class 2	Mild impairment. Able to work full time but in a different environment from that of the pre-injury job. The duties require comparable skill and intellect as those of the pre-injury job. Can work in the same position, but no more than 20 hours per week (e.g., no longer happy to work with specific persons, or work in a specific location due to travel required).
Class 3	Moderate impairment: cannot work at all in same position. Can perform less than 20 hours per week in a different position, which requires less skill or is qualitatively different (e.g., less stressful).
Class 4	Severe impairment: cannot work more than one or two days at a time, less than 20 hours per fortnight. Pace is reduced, attendance is erratic.
Class 5	Totally impaired. Cannot work at all.

### Using the PIRS to measure impairment

11.13 Rating psychiatric impairment using the PIRS is a two-step procedure:

1. Determine the median class score.
2. Calculate the aggregate score.

### Determining the median class score

11.14 Each area of function described in the PIRS is given an impairment rating which ranges from Class 1 to 5. The six scores are arranged in ascending order, using the standard form. The median is then calculated by averaging the two middle scores e.g.:

Example A:	1, 2, <b>3, 3</b> , 4, 5	Median Class = 3
Example B:	1, 2, <b>2, 3</b> , 3, 4	Median Class = 2.5 = 3*
Example C:	1, 2, <b>3, 5</b> , 5, 5	Median Class = 4

\*If a score falls between two classes, it is rounded up to the next class. A median class score of 2.5 thus becomes 3.

11.15 The median class score method was chosen, as it is not influenced by extremes. Each area of function is assessed separately. While impairment in one area is neither equivalent nor interchangeable with impairment in other areas, the median seems the fairest way to translate different impairments onto a linear scale.

### Median class score and percentage impairment

11.16 Each median class score represents a range of impairment, as shown below:

- Class 1 = 0–3%
- Class 2 = 4–10%

- Class 3 = 11–30%
- Class 4 = 31–60%
- Class 5 = 61–100%

### Calculation of the aggregate score

11.17 The aggregate score is used to determine an exact percentage of impairment within a particular median class range. The six class scores are added to give the aggregate score.

### Use of the conversion table to arrive at percentage impairment

11.18 The aggregate score is converted to a percentage score using the conversion table (table 11.7 below).

11.19 The conversion table was developed to calculate the percentage impairment based on the aggregate and median scores.

11.20 The scores within the conversion table are spread in such a way to ensure that the final percentage rating is consistent with the measurement of permanent impairment percentages for other body systems.

**Table 11.7: Conversion table**

		Aggregate score																																
		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30								
% Impairment	Class 1	0	0	1	1	2	2	2	3	3																								
	Class 2					4	5	5	6	7	7	8	9	9	10																			
	Class 3									11	13	15	17	19	22	24	26	28	30															
	Class 4													31	34	37	41	44	47	50	54	57	60											
	Class 5																			61	65	70	74	78	83	87	91	96	100					

#### Conversion table — explanatory notes

##### a. Distribution of aggregate scores

- The lowest aggregate score that can be obtained is:  $1+1+1+1+1+1=6$ .
- The highest aggregate score is  $5+5+5+5+5+5=30$ .
- The table therefore has aggregate scores ranging from six to 30.
- Each median class score has an impairment range, and a range of possible aggregate scores (e.g. class 3 = 11–30 per cent).
- The lowest aggregate score for class 3 is 13 ( $1 + 1 + 2 + 3 + 3 + 3 = 13$ ).
- The highest aggregate score for class 3 is 22 ( $3 + 3 + 3 + 3 + 5 + 5 = 22$ ).
- The conversion table distributes the impairment percentages across aggregate scores.

##### b. Same aggregate score in different classes

- The conversion table shows that the same aggregate score leads to different percentages of impairment in different median classes.
- For example, an aggregate score of 18 is equivalent to an impairment rating of
  - 10% in Class 2,
  - 22% in Class 3,
  - 34% in Class 4.

- This is due to the fact that an injured worker whose impairment is in median class 2 is likely to have a lower score across most areas of function. They may be significantly impaired in one aspect of their life, such as travel, yet have low impairment in social function, self-care or concentration.
- Someone whose impairment reaches median class 4 will experience significant impairment across most aspects of his or her life.

**Examples: (Using the previous cases)**

**Example A**

**PIRS scores**

1	2	3	3	4	5
---	---	---	---	---	---

**Median class**

= 3
-----

**Aggregate score**

1 +	2 +	3 +	3 +	4 +	5 =	18	22%
-----	-----	-----	-----	-----	-----	----	-----

**Total % Impairment**

**Example B**

**PIRS scores**

1	2	2	3	3	4
---	---	---	---	---	---

**Median class**

= 3
-----

**Aggregate score**

1 +	2 +	2 +	3 +	3 +	4 =	15	15%
-----	-----	-----	-----	-----	-----	----	-----

**Total % Impairment**

**Example C**

**PIRS scores**

1	2	3	5	5	5
---	---	---	---	---	---

**Median class**

= 4
-----

**Aggregate score**

1 +	2 +	3 +	5 +	5 +	5 =	21	44%
-----	-----	-----	-----	-----	-----	----	-----

**Total % Impairment**

**Table 11.8: PIRS rating form**

Name		Claim reference number	
D.O.B.		Age at time of injury	
Date of injury		Occupation before injury	
Date of assessment		Marital status before injury	
Psychiatric diagnoses	1.	2.	
	3.	4.	
Psychiatric treatment			
Is impairment permanent?	Yes No (Circle one)		
PIRS category	Class	Reason for decision	
Self-care and personal hygiene			
Social and recreational activities			
Travel			
Social functioning			
Concentration, persistence and pace			
Employability			

Score Class Median

--	--	--	--	--	--	--	--

Aggregate Score Total %

+	+	+	+	+	+	=	
Impairment (% WPI) from table 11.7							
Less pre-existing impairment (if any)							
Final Impairment (% WPI)							

## 12. Haematopoietic system

**Chapter 9, AMA5 (page 191) applies to the assessment of permanent impairment of the haematopoietic system, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### Introduction

- 12.1 AMA5 chapter 9 (pp 191-210) provides guidelines on the method of assessing permanent impairment of the haematopoietic system. Overall, that chapter should be followed when conducting the assessment, with variations indicated below.
- 12.2 Impairment of end organ function due to haematopoietic disorder should be assessed separately, using the relevant chapter of this Guide. The percentage WPI due to end organ impairment should be combined with any percentage WPI due to haematopoietic disorder, using the combined values table (pp 604-606 AMA5).

### Anaemia

- 12.3 Table 12.1 (below) replaces AMA5 Table 9–2 (p 193).

**Table 12.1: Classes of anaemia and percentage whole person impairment**

<b>Class 1: 0–10% WPI</b>	<b>Class 2: 11–30% WPI</b>	<b>Class 3: 31–70% WPI</b>	<b>Class 4: 71–100% WPI</b>
No symptoms and haemoglobin 100–120g/L and no transfusion required	Minimal symptoms and haemoglobin 80–100g/L and no transfusion required	Moderate to marked symptoms and haemoglobin 50–80g/L before transfusion and transfusion of 2 to 3 units required, every 4 to 6 weeks	Moderate to marked symptoms and haemoglobin 50–80g/L before transfusion and transfusion of 2 to 3 units required, every 2 weeks

- 12.4 The assessor should exercise clinical judgement in determining WPI, using the criteria in table 12.1. For example, if comorbidities exist which preclude transfusion, the assessor may assign class 3 or class 4, on the understanding that transfusion would under other circumstances be indicated. Similarly, there may be some claimants with class 2 impairment who, because of comorbidity, may undergo transfusion.
- 12.5 Pre-transfusion haemoglobin levels in [table 12.1](#) are to be used as indications only. It is acknowledged that for some claimants, it would not be medically advisable to

permit the claimant's haemoglobin levels to be as low as indicated in the criteria of table 12.1.

12.6 The assessor should indicate a percentage WPI, as well as the class.

### **Polycythaemia and myelofibrosis**

12.7 The level of symptoms (as in table 12.1) should be used a guide for the assessor in cases where non-anaemic tissue iron deficiency results from venesection.

### **White blood cell diseases**

12.8 In cases of functional asplenia, the assessor should assign three per cent WPI. This should be combined with any other impairment rating, using the combined values table (pp 604-606 AMA5).

### **Haemorrhagic and platelet disorders**

12.9 AMA5 table 9-4 (p 203) is to be used as the basis for assessing haemorrhagic and platelet disorders

12.10 For the purposes of this Guide, the criteria for inclusion in class 3 of AMA5 table 9-4 (p 203) is:

- Symptoms and signs of haemorrhagic and platelet abnormality
- Requires continuous treatment
- Interference with daily activities; requires occasional assistance.

12.11 For the purposes of this Guide, the criteria for inclusion in class 4 of AMA5 table 9-4 (p 203) is:

- Symptoms and signs of haemorrhagic and platelet abnormality
- Requires continuous treatment
- Difficulty performing daily activities; requires continuous care.

### **Thrombotic disorders**

12.12 AMA5 table 9-4 (p 203) is used as the basis for determining impairment due to thrombotic disorder.

## 13. The endocrine system

**Chapter 10, AMA5 (page 211) applies to the assessment of permanent impairment of the endocrine system, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### Introduction

- 13.1 AMA5 chapter 10 provides a useful summary of the methods for assessing permanent impairment arising from disorders of the endocrine system.
- 13.2 Refer to other chapters in AMA5 for related structural changes - the skin (e.g. pigmentation in Chapter 8), the central and peripheral nervous system (e.g. memory, in Chapter 13), the urinary and reproductive system (e.g. infertility, renal impairment, in Chapter 7), the digestive system (e.g. dyspepsia, in Chapter 6), the cardiovascular system (in Chapters 3 and 4) and the visual system (Chapter 8 AMA4).
- 13.3 The clinical findings to support the impairment assessment are to be reported in the units recommended by the Royal College of Pathologists of Australia. (See Appendix 13.1).
- 13.4 Westergren erythrocyte sedimentation rate (WSR) is equivalent to ESR.

### Adrenal cortex

- 13.5 AMA5 (p 222) first paragraph: disregard the last sentence, 'they also affect inflammatory response, cell membrane permeability, and immunologic responses, and they play a role in the development and maintenance of secondary sexual characteristics'. Replace with: 'immunological and inflammatory responses are reduced by these hormones and they play a role in the development and maintenance of secondary sexual characteristics'.
- 13.6 AMA5 example 10-18 (pp 224-225): see reference to ESR (13.4 above).
- 13.7 AMA5 example 10-20 (p 225): History: for 'hypnotic bladder' read 'hypotonic bladder'.

### Diabetes mellitus

- 13.8 AMA5 (p 231): refer to the *Australian Diabetes Association Guidelines* with regard to levels of fasting glucose. (Position statement from the Australian Diabetes Society, reprinted in Appendix 13.2).

- 13.9 AMA5 (p 231): insert at the end of the second paragraph: 'the goal of treatment is to maintain haemoglobin A 1c within one per cent of the normal range (four to 6.3 per cent)'.

### Mammary glands

- 13.10 AMA5 example 10-45 (p 239), current symptoms: disregard the last sentence, 'both bromocriptine and cabergoline cause nausea, precluding use of either drug' and replace with: 'routine use of bromocriptine and cabergoline is normal in Australia. It is rare that nausea precludes their use'.

### Criteria for rating permanent impairment due to metabolic bone disease

- 13.11 AMA5 (p 240): impairment due to a metabolic bone disease itself is unlikely to be associated with a work injury and would usually represent a pre-existing condition.
- 13.12 Impairment from fracture, spinal collapse or other complications may arise as a result of a work injury associated with these underlying conditions (as noted in AMA5, section 10.10c) and would be assessed using the other chapters indicated, with the exception of chapter 18 (pain) which is excluded by this Guide.

### Appendix 13 .1: Interpretation of pathology tests

From *Manual of use and interpretation of pathology tests*, third edition. Reprinted with kind permission of the Royal College of Pathologists of Australasia.

Reference ranges, plasma or serum, unless otherwise indicated		
Alanine aminotransferase (ALT)	(adult)	< 35 U/L
Albumin	(adult)	32–45 g/L
Alkaline phosphatase (ALP)	(adult, non-pregnant)	25–100 U/L
Alpha fetoprotein	(adult, non-pregnant)	< 10 g/L
Alpha-1-antitrypsin		1.7–3.4 g/L
Anion gap		8–16 mmol/L
Aspartate aminotransferase (AST)		< 40 U/L
Bicarbonate (total CO <sub>2</sub> )		22–32 mmol/L
Bilirubin (total)	(adult)	< 20 µmol/L
Calcium	(total)	2.10–2.60 mmol/L
	(ionised)	1.17–1.30 mmol/L
Chloride		95–110 mmol/L
Cholesterol (HDL)	(male)	0.9–2.0 mmol/L
	(female)	1.0–2.2 mmol/L
Cholesterol (total) (National Heart Foundation [Australia] recommendation)		< 5.5 mmol/L
Copper		13–22 µmol/L
Creatine kinase (CK)	(male)	60–220 U/L
	(female)	30–180 U/L



Reference ranges, plasma or serum, unless otherwise indicated		
Creatinine	(adult male)	0.06–0.12 mmol/L
	(adult female)	0.05–0.11 mmol/L
Gamma glutamyl transferase (GGT)	(male)	< 50 U/L
	(female)	< 30 U/L
Globulin	adult	25–35g/L
Glucose	(venous plasma) - (fasting)	3.0–5.4 mmol/L
	(venous plasma) - (random)	3.0–7.7 mmol/L
Lactate dehydrogenase (LD)	(adult)	110–230 U/L
Magnesium	(adult)	0.8–1.0 mmol/L
Osmolality	(adult)	280–300 m.osmoll/kg water
pCO <sub>2</sub>	(arterial blood)	4.6–6.0 kPa (35–45 mmHg)
pH	(arterial blood)	7.36–7.44 (36–44 nmol/L)
Phosphate		0.8–1.5 mmol/L
pO <sub>2</sub>	(arterial blood)	11.0–13.5 kPa (80–100 mmHg)
Potassium	(plasma)	3.4–4.5 mmol/L
	(serum)	3.8–4.9 mmol/L
Prolactin	(male)	150–500 mU/L
	(female)	0–750 mU/L
Protein, total	(adult)	62–80 g/L
Sodium		135–145 mmol/L
Testosterone and related androgens	<i>See Table A (below)</i>	

Therapeutic intervals		
Amitriptyline	150–900 nmol/L	60–250 µg/L
Carbamazepine	20–40 µmol/L	6–12 mg/L
Digoxin	0.6–2.3 nmol/L	0.5–1.8 µg/L
Lithium	0.6–1.2 mmol/L	
Nortriptyline	200–650 nmol/L	50–170 µg/L
Phenobarbitone	65–170 µmol/L	15–40 mg/L
Phenytoin	40–80 µmol/L	10–20 mg/L
Primidone	22–50 µmol/L	4.8–11.0 mg/L
Procainamide	17–42 µmol/L	4–10 mg/L

Therapeutic intervals		
Quinidine	7–15 µmol/L	2.3–4.8 mg/L
Salicylate	1.0–2.5 mmol/L	140–350 mg/L
Theophylline	55–110 µmol/L	10–20 mg/L
Valproate	350–700 µmol/L	50–100 mg/L
Thyroid stimulating hormone (TSH)		0.4–5.0 mIU/L
Thyroxine (free)		10–25 pmol/L
Triglycerides (fasting)		< 2.0 mmol/L
Triiodothyronine (free)		4.0–8.0 pmol/L
Urate	(male)	0.20–0.45 mmol/L
	(female)	0.15–0.40 mmol/L
Urea	(adult)	3.0–8.0 mmol/L
Zinc		12–20 µmol/L

**Table A: Reference intervals for testosterone and related androgens (serum)**

	Male		Female	
	Pre-pubertal	Adult (age related)	Pre-pubertal	Adult (age related)
Free testosterone (pmol/L)		170–510		< 4.0
Total testosterone (nmol/L)	< 0.5	8–35	< 0.5	< 4.0
SHBG (nmol/L)	55–100	10–50	55–100	30–90 (250–500 in the 3rd trimester)
Dihydrotestosterone (nmol/L)		1–2.5		

Reference ranges, urine		
Calcium		2.5–7.5 mmol/24 hours
Chloride (depends on intake, plasma levels)		100–250 mmol/24 hours
Cortisol (free)		100–300 nmol/24 hours
Creatinine	(child)	0.07–0.19 mmol/24 hours/kg
	(male)	9–18 mmol/24 hours
	(female)	5–16 mmol/24 hours
HMMA	(infant)	< 10 mmol/mol creatinine
	(adult)	< 35 µmol/24 hours
Magnesium		2.5–8.0 mmol/24 hours

Reference ranges, urine		
Osmolality (depends on hydration)		50–1200 m.osmol/kg water
Phosphate (depends on intake, plasma levels)		10–40 mmol/24 hours
Potassium (depends on intake, plasma levels)		40–100 mmol/24 hours
Protein, total	(pregnancy)	< 150 mg/24 hours < 250 mg/24 hours
Sodium (depends on intake, plasma levels)		75–300 mmol/24 hours
Urate	(male) (female)	2.2–6.6 mmol/24 hours 1.6–5.6 mmol/24 hours
Urea (depends on protein intake)		420–720 mmol/24 hours

Reference ranges, whole blood		
Haemoglobin (Hb)	(adult male)	130–180 g/L
	(adult female)	115–165 g/L
Red cell count (RCC)	(adult male)	4.5–6.5 x 10 <sup>12</sup> /L
	(adult female)	3.8–5.8 x 10 <sup>12</sup> /L
Packed cell volume (PCV)	(adult male)	0.40–0.54
	(adult female)	0.37–0.47
Mean cell volume (MCV)		80–100 fL
Mean cell haemoglobin (MCH)		27–32 pg
Mean cell haemoglobin concentration (MCHC)		300–350 g/L
Leucocyte (White Cell) Count (WCC)		4.0–11.0 x 10 <sup>9</sup> /L
Leucocyte differential count		
– Neutrophils		2.0–7.5 x 10 <sup>9</sup> /L
– Eosinophils		0.04–0.4 x 10 <sup>9</sup> /L
– Basophils		< 0.1 x 10 <sup>9</sup> /L
– Monocytes		0.2–0.8 x 10 <sup>9</sup> /L
– Lymphocytes		1.5–4.0 x 10 <sup>9</sup> /L
Platelet count		150–400 x 10 <sup>9</sup> /L
Erythrocyte sedimentation rate (ESR)	male 17–50 yrs	1–10 mm/hour
	male >50 yrs	2–14 mm/hour
	female 17–50 yrs	3–12 mm/hour
	female >50 yrs	5–20 mm/hour
Reticulocyte count		10–100 x 10 <sup>9</sup> /L (0.2–2.0%)

Reference ranges, plasma or serum, unless otherwise indicated		
Iron	(adult)	10–30 µmol/L
Iron (total) binding capacity (TIBC)		45–80 µmol/L
Transferrin		1.7–3.0 g/L
Transferrin saturation		0.15–0.45 (15–45%)
Ferritin	(male) (female)	30–300 µg/L 15–200 µg/L
Vitamin B12		120–680 pmol/L
Folate	(red cell) (serum)	360–1400 nmol/L 7–45 nmol/L

Reference ranges, citrated plasma	
Activated partial thromboplastin time (APTT)	25–35 seconds
– Therapeutic range for continuous infusion heparin	1.5–2.5 x baseline
Prothrombin time (PT)	11–15 seconds
International normalised ratio (INR)	
– Therapeutic range for oral anticoagulant therapy	2.0–4.5
Fibrinogen	1.5–4.0 g/L

Reference ranges, serum	
Rheumatoid factor (nephelometry)	< 30 IU/L
C3	0.9–1.8 g/L
C4	0.16–0.50 g/L
C-reactive protein	< 5.0 mg/L
Immunoglobulins:	
IgG	6.5–16.0g/L
IgA	0.6–4.0g/L
IgM	0.5–3.0g/L

Reference intervals for lymphocyte subsets	
	Adult
Total lymphocytes	1.5–4.0
CD3	0.6–2.4
CD4 (T4)	0.5–1.4
CD8 (T8)	0.2–0.7
CD19	0.04–0.5
CD16	0.2–0.4
CD4/CD8 ratio	1.0–3.2

## Appendix 13.2: New classification and criteria for diagnosis of diabetes mellitus

### Position Statement from the Australian Diabetes Society,\* New Zealand Society for the Study of Diabetes,† Royal College of Pathologists of Australasia‡ and Australasian Association of Clinical Biochemists§

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#### Introduction

Recently, there has been major growth in knowledge about the aetiology and pathogenesis of different types of diabetes and about the predictive value of different blood glucose levels for development of complications. In response, both the American Diabetes Association (ADA) and the World Health Organization (WHO) have re-examined, redefined and updated the classification of and criteria for diabetes, which have been unchanged since 1985. While the two working parties had cross-representation, they met separately, and differences have emerged between their recommendations.

The ADA published its final recommendations in 1997,<sup>1</sup> while the WHO group published its provisional conclusions for consultation and comment in June 1998.<sup>2</sup>

The WHO process called for comments on the proposal by the end of September 1998, with the intention of finalising definitive classification and criteria by the end of December 1998 and of publishing these soon thereafter. However, WHO publications need to go through an internal approval process and it may be up to 12 months before the final WHO document appears.

A combined working party of the Australian Diabetes Society, New Zealand Society for the Study of Diabetes, Royal College of Pathologists of Australasia and Australasian Association of Clinical Biochemists was formed to formulate an Australasian position on the two sets of recommendations and, in particular, on the differences between them. This is an interim statement pending the final WHO report, which will include recommendations on diabetes classification as well as criteria for diagnosis. We see it as very important to inform Australasian health professionals treating patients with diabetes about these changes.

#### What are the new diagnostic criteria?

#### Key messages

Diagnosis of diabetes is not in doubt when there are classical symptoms of thirst and polyuria and a random venous plasma glucose level  $\geq 11.1$  mmol/L.

The Australasian Working Party on Diagnostic Criteria for Diabetes Mellitus recommends:

- Immediate adoption of the new criterion for diagnosis of diabetes as proposed by the American Diabetes Association (ADA) and the World Health Organization (WHO) — fasting venous plasma glucose level  $\geq 7.0$  mmol/L;
- Immediate adoption of the new classification for diabetes mellitus proposed by the ADA and WHO, which comprises four aetiological types — type 1, type 2, other specific types, and gestational diabetes — with impaired glucose tolerance and impaired fasting glycaemia as stages in the natural history of disordered carbohydrate metabolism.
- Awareness that some cases of diabetes will be missed unless an oral glucose tolerance test (OGTT) is performed. If there is any suspicion or other risk factor suggesting glucose intolerance, the OGTT should continue to be used pending the final WHO recommendation.

The new WHO criteria for diagnosis of diabetes mellitus and hyperglycaemia are shown in [Box 1](#). The major change from the previous WHO recommendation<sup>3</sup> is the lowering of the diagnostic level of fasting plasma glucose to  $\geq 7.0$  mmol/L, from the former level of  $\geq 7.8$  mmol/L. For whole blood, the proposed new level is  $\geq 6.1$  mmol/L, from the former  $\geq 6.7$  mmol/L.

This change is based primarily on cross-sectional studies demonstrating the presence of microvascular<sup>4</sup> and macrovascular complications<sup>5</sup> at these lower glucose concentrations. In addition, the 1985 WHO diagnostic criterion for diabetes based on fasting plasma glucose level ( $\geq 7.8$  mmol/L) represents a greater degree of hyperglycaemia than the criterion based on plasma glucose level two hours after a 75 g glucose load ( $\geq 11.1$  mmol/L).<sup>6</sup> A fasting plasma glucose level of  $\geq 7$  mmol/L accords more closely with this 2 h post-glucose level.

*Recommendation: The ADA and the WHO committee are unanimous in adopting the changed diagnostic level, and the Australasian Working Party on Diagnostic Criteria recommends that healthcare providers in Australia and New Zealand should adopt it immediately.*

Clinicians should note that the diagnostic criteria differ between clinical and epidemiological settings. In clinical practice, when symptoms are typical of diabetes, a single fasting plasma glucose level of  $\geq 7.0$  mmol/L or 2 h post-glucose or casual postprandial plasma glucose level of  $\geq 11.1$  mmol/L suffices for diagnosis. If there are no symptoms, or symptoms are equivocal, at least one additional glucose measurement (preferably fasting) on a different day with a value in the diabetic range is necessary to confirm the diagnosis. Furthermore, severe hyperglycaemia detected under conditions of acute infective, traumatic, circulatory or other stress may be transitory and should not be regarded as diagnostic of diabetes. The situation should be reviewed when the primary condition has stabilised.

In epidemiological settings, for study of high-prevalence populations or selective screening of high-risk individuals, a single measure — the glucose-level 2 h post-glucose load — will suffice to describe prevalence of impaired glucose tolerance (IGT).

### 1: Values for diagnosis of diabetes mellitus and other categories of hyperglycaemia<sup>2</sup>

	Glucose concentration (mmol/L [mg/dL])			
	Whole blood		Plasma	
	Venous	Capillary	Venous	Capillary
Diabetes mellitus fasting	$\geq 6.1$ ( $\geq 110$ )	$\geq 6.1$ ( $\geq 110$ )	$\geq 7.0$ ( $\geq 126$ )	$\geq 7.0$ ( $\geq 126$ )
or 2 h post-glucose load	$\geq 10.0$ ( $\geq 180$ )	$\geq 11.1$ ( $\geq 200$ )	$\geq 11.1$ ( $\geq 200$ )	$\geq 12.2$ ( $\geq 220$ )
<b>or both</b>				
Impaired glucose tolerance (IGT)	$< 6.1$ ( $< 110$ )	$< 6.1$ ( $< 110$ )	$< 7.0$ ( $< 126$ )	$< 7.0$ ( $< 126$ )
Fasting (if measured) and 2 h post-glucose load	$\geq 6.7$ ( $\geq 120$ ) and $< 10.0$ ( $< 180$ )	$\geq 7.8$ ( $\geq 140$ ) and $< 11.1$ ( $< 200$ )	$\geq 7.8$ ( $\geq 140$ ) and $< 11.1$ ( $< 200$ )	$\geq 8.9$ ( $\geq 160$ ) and $< 12.2$ ( $< 220$ )
Impaired fasting glycaemia (IFG)	$\geq 5.6$ ( $\geq 100$ ) and	$\geq 5.6$ ( $\geq 100$ ) and	$\geq 6.1$ ( $\geq 110$ ) and	$\geq 6.1$ ( $\geq 110$ ) and
Fasting	$< 6.1$ ( $< 110$ )	$< 6.1$ ( $< 110$ )	$< 7.0$ ( $< 126$ )	$< 7.0$ ( $< 126$ )
2 h post-glucose load (if measured)	$< 6.7$ ( $< 120$ )	$< 7.8$ ( $< 140$ )	$< 7.8$ ( $< 140$ )	$< 8.9$ ( $< 160$ )

For epidemiological or population screening purposes, the fasting or 2 h value after 75 g oral glucose may be used alone. For clinical purposes, the diagnosis of diabetes should always be confirmed by repeating the test on another day, unless there is unequivocal hyperglycaemia with acute metabolic decompensation or obvious symptoms. Glucose concentrations should not be determined on serum unless red cells are immediately removed, otherwise glycolysis will result in an unpredictable underestimation of the true concentrations. It should be stressed that glucose preservatives do not totally prevent glycolysis. If whole blood is used, the sample should be kept at 0–4°C or centrifuged immediately, or assayed immediately. Table reproduced with permission from Alberti KGMM, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus. Provisional Report of a WHO Consultation. *Diabet Med* 1998; 15: 539–553. Copyright John Wiley & Sons Limited.

## What about the oral glucose tolerance test?

Previously, the oral glucose tolerance test (OGTT) was recommended in people with a fasting plasma glucose level of 5.5–7.7 mmol/L or random plasma glucose level of 7.8–11.0 mmol/L. After a 75 g glucose load, those with a 2 h plasma glucose level of < 7.8 mmol/L were classified as normoglycaemic, of 7.8–11.0 mmol/L as having IGT and of  $\geq 11.1$  mmol/L as having diabetes.

The new diagnostic criteria proposed by the ADA and WHO differ in their recommendations on use of the OGTT. The ADA makes a strong recommendation that fasting plasma glucose level can be used on its own and that, in general, the OGTT need not be used.<sup>1</sup> The WHO group<sup>2</sup> argues strongly for the retention of the OGTT and suggests using fasting plasma glucose level alone only when circumstances prevent the performance of the OGTT.

There are concerns that many people with a fasting plasma glucose level < 7.0 mmol/L will have manifestly abnormal results on the OGTT and are at risk of microvascular and macrovascular complications. This has major ramifications for the approach to diabetes screening, particularly when the Australian National Diabetes Strategy proposal,<sup>7</sup> launched in June 1998 by Dr Michael Wooldridge, then Federal Minister for Health and Aged Care, has early detection of type 2 diabetes as a key priority.

**Recommendation:** The Australasian Working Party on Diagnostic Criteria has major concerns about discontinuing use of the OGTT and recommends that a formal recommendation on its use in diabetes screening be withheld until the final WHO recommendation is made. However, in the interim, the OGTT should continue to be used.

## Diabetes in pregnancy

The ADA has retained its old criteria for diagnosis of gestational diabetes.<sup>1</sup> These differ from those recommended by both WHO<sup>2</sup> and the Australian Working Party on Diabetes in Pregnancy<sup>8</sup> and are generally not recognised outside the United States. The new WHO statement retains the 1985 WHO recommendation that both IGT and diabetes should be classified as gestational diabetes. This is consistent with the recommendations of the Australasian Diabetes in Pregnancy Society, which recommended a diagnostic 2 h venous plasma glucose level on the OGTT of  $\geq 8.0$  mmol/L. In New Zealand, a cut-off level of  $\geq 9.0$  mmol/L has been applied.<sup>8</sup>

## How has the classification of diabetes changed?

### 2: Aetiological classification of disorders of glycaemia\*

**Type 1** ( $\beta$ -cell destruction, usually leading to absolute insulin deficiency)

- Autoimmune
- Idiopathic

**Type 2** (may range from predominantly insulin resistance with relative insulin deficiency to a predominantly secretory defect with or without insulin resistance)

#### Other specific types

- Genetic defects of  $\beta$ -cell function
- Genetic defects in insulin action
- Diseases of the exocrine pancreas
- Endocrinopathies
- Drug or chemical induced
- Infections
- Uncommon forms of immune-mediated diabetes
- Other genetic syndromes sometimes associated with diabetes

#### Gestational diabetes

\* As additional subtypes are discovered, it is anticipated they will be reclassified within their own specific category. Includes the former categories of gestational impaired glucose tolerance and gestational diabetes. Table reproduced with permission from Alberti KGMM, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus. Provisional Report of a WHO Consultation. *Diabet Med* 1998; 15: 539-553. Copyright John Wiley & Sons Limited.

The proposed new classification encompasses both clinical stages and aetiological types of hyperglycaemia and is supported by numerous epidemiological studies. The classification by aetiological type (box 2) results from new knowledge of the causes of hyperglycaemia, including diabetes. The terms insulin-dependent and non-insulin-dependent diabetes (I00M and NIDDM) are eliminated and the terms type 1 and type 2 diabetes retained. Other aetiological types, such as diabetes arising from genetic defects of  $\beta$ -cell function or insulin action, are grouped as 'other specific types', with gestational diabetes as a fourth category.

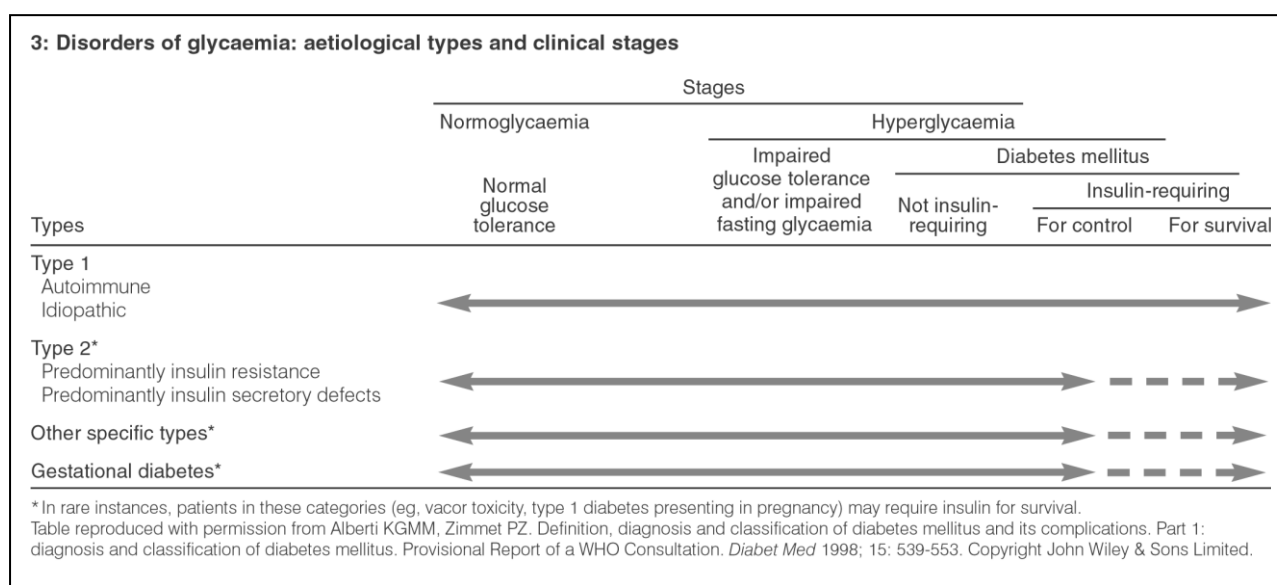
The proposed staging (box 3) reflects the fact that any aetiological type of diabetes can pass or progress through several clinical phases (both asymptomatic and symptomatic) during its natural history. Moreover, individuals may move in either direction between stages.

### Impaired glucose tolerance and impaired fasting glycaemia

Impaired glucose tolerance (IGT), a discrete class in the previous classification, is now categorised as a stage in the natural history of disordered carbohydrate metabolism. Individuals with IGT are at increased risk of cardiovascular disease, and not all will be identified by fasting glucose level.

In reducing the use of the OGTT, the ADA recommended a new category- impaired fasting glycaemia (IFG)- when fasting plasma glucose level is lower than that required to diagnose diabetes but higher than the reference range ( $< 7.0$  mmol/L but  $\geq 6.1$  mmol/L). Limited data on this category show that it increases both risk of progressing to diabetes<sup>9</sup> and cardiovascular risk<sup>5</sup>. However, data are as yet insufficient to determine whether IFG has the same status as IGT as a risk factor for developing diabetes and cardiovascular disease and as strong an association with the metabolic syndrome (insulin resistance syndrome)

IFG can be diagnosed by fasting glucose level alone, but if 2 h glucose level is also measured some individuals with IFG will have IGT and some may have diabetes. In addition, the number of people with OGTT results indicating diabetes but fasting plasma glucose level  $< 7.0$  mmol/L is unknown, but early data suggest there may be major variation across different populations.<sup>10</sup>





A number of studies, including the DECODE initiative of the European Diabetes Epidemiology Group, have reported that individuals classified with IFG are not the same as the IGT group.<sup>11-15</sup> The European Group believes that, on available European evidence, the ADA decision to rely solely on fasting glucose level would be unwise.

**Recommendation:** The Australasian Working Party on Diagnostic Criteria recommends immediate adoption of the new classification. However, clinicians should be aware that some cases of diabetes will be missed unless an OGTT is performed. Thus, if there is any suspicion or other risk factor suggesting glucose intolerance, the working party continues to recommend use of an OGTT pending the final WHO recommendation.

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## 14. The skin

**Chapter 8, AMA5 (page 173) applies to the assessment of permanent impairment of the skin, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### Introduction

- 14.1 AMA5 chapter 8 (pp 173-190) refers to skin diseases generally rather than work-related skin diseases alone. This chapter has been adopted for measuring impairment of the skin system, with the following variations.
- 14.2 Disfigurement, scars and skin grafts may be assessed as causing significant permanent impairment when the skin condition causes limitation in the performance of ADL
- 14.3 For cases of facial disfigurement, refer to table 6.1 in this Guide.
- 14.4 AMA5 table 8-2 (p 178) provides the method of classification of impairment due to skin disorders. Three components - signs and symptoms of skin disorder, limitations in ADL and requirements for treatment - define five classes of permanent impairment. The assessing specialist should derive a specific percentage impairment within the range for the class that best describes the clinical status of the claimant.
- 14.5 The skin is regarded as a single organ and all non-facial scarring is measured together as one overall impairment rather than assessing individual scars separately and combining the results.
- 14.6 A scar may be present and rated as zero per cent WPI.
- Note that uncomplicated scars for standard surgical procedures do not of themselves rate an impairment.
- 14.7 The table for the evaluation of minor skin impairment (TEMSKI) (see table 14.1) is an extension of table 8-2 in AMA5. The TEMSKI divides class 1 of permanent impairment (zero to nine per cent) due to skin disorders into five categories of impairment. The TEMSKI may be used by trained assessors (who are not trained in the skin body system), for determining impairment from zero to four per cent in the class 1 category, that has been caused by minor scarring following surgery. Impairment greater than four per cent must be assessed by a specialist who has undertaken the requisite training in the assessment of the skin body system.
- 14.8 The TEMSKI is to be used in accordance with the principle of 'best fit'. The assessor must be satisfied that the criteria within the chosen category of impairment best reflect the skin disorder being assessed. If the skin disorder does not meet all of the criteria within the impairment category, the assessor must provide detailed reasons as to why this category has been chosen over other categories.
- 14.9 Where there is a range of values in the TEMSKI categories, the assessor should use clinical judgement to determine the exact impairment value.

- 14.10 The case examples provided in AMA5 chapter 8 do not, in most cases, relate to permanent impairment that results from a work-related injury. Reference should be made to similar cases previously determined or provided in training, in addition to following examples and AMA5 examples 8.1-8.22 (pp 178-187).

**Table 14.1 Table for the Evaluation of Minor Skin Impairment (TEMSKI)**

Criteria	0% WPI	1% WPI	2% WPI	3 - 4% WPI	5 - 9% WPI*
<p><b>Description of the scar(s) and/or skin condition(s)</b>  (shape, texture, colour)</p>	<p>Claimant is not conscious or is barely conscious of the scar(s) or skin condition</p> <p>Good colour match with surrounding skin and the scar(s) or skin condition is barely distinguishable. Claimant is unable to easily locate the scar(s) or skin condition</p> <p>No trophic changes</p> <p>Any staple or suture marks are barely visible</p>	<p>Claimant is conscious of the scar(s) or skin condition</p> <p>Some parts of the scar(s) or skin condition colour contrast with the surrounding skin as a result of pigmentary or other changes.</p> <p>Claimant is able to locate the scar(s) or skin condition</p> <p>Minimal trophic changes</p> <p>Any staple or suture marks are visible</p>	<p>Claimant is conscious of the scar(s) or skin condition</p> <p>Noticeable colour contrast of scar(s) or skin condition with surrounding skin as a result of pigmentary or other changes.</p> <p>Claimant is able to easily locate the scar(s) or skin condition</p> <p>Trophic changes evident to touch</p> <p>Any staple or suture marks are clearly visible</p>	<p>Claimant is conscious of the scar(s) or skin condition</p> <p>Easily identifiable colour contrast of scar(s) or skin condition with surrounding skin as a result of pigmentary or other changes.</p> <p>Claimant is able to easily locate the scar(s) or skin condition.</p> <p>Trophic changes evident to touch</p> <p>Any staple or suture marks are clearly visible</p>	<p>Claimant is conscious of the scar(s) or skin condition</p> <p>Distinct colour contrast of scar(s) of skin condition with surrounding skin as a result of pigmentary or other changes</p> <p>Claimant is able to easily locate the scar(s) or skin condition</p> <p>Trophic changes are visible</p> <p>Any staple or suture marks are clearly visible</p>
<b>Location</b>	Anatomic location of the scar(s) or skin condition not clearly visible with usual clothing/hairstyle	Anatomic location of the scar(s) or skin condition is not usually visible with usual clothing/hairstyle.	Anatomic location of the scar(s) or skin condition is usually visible with usual clothing/hairstyle.	Anatomic location of the scar(s) or skin condition is visible with usual clothing/hairstyle.	Anatomic location of the scar(s) or skin condition is usually and clearly visible with usual clothing/hairstyle
<b>Contour</b>	No contour defect	Minor contour defect	Contour defect visible	Contour defect easily visible	Contour defect easily visible
<b>ADL / Treatment</b>	<p>No effect on any ADL.</p> <p>No treatment, or intermittent treatment only, required</p>	<p>Negligible effect on any ADL.</p> <p>No treatment, or intermittent treatment only, required</p>	<p>Minor limitation in the performance of few ADL.</p> <p>No treatment, or intermittent treatment only, required</p>	<p>Minor limitation in the performance of few ADL <b>AND</b> exposure to chemical or physical agents (for example, sunlight, heat, cold etc.) may temporarily increase limitation.</p> <p>No treatment, or intermittent treatment only, required</p>	<p>Limitation in the performance of few ADL (<b>INCLUDING</b> restriction in grooming or dressing) <b>AND</b> exposure to chemical or physical agents (for example, sunlight, heat, cold etc.) may temporarily increase limitation or restriction.</p> <p>No treatment, or intermittent treatment only, required</p>
<b>Adherence to underlying structures</b>	No adherence	No adherence	No adherence	Some adherence	Some adherence

**This table uses the principle of ‘best fit’.** You should assess the impairment to the whole skin system against each criteria and then determine which impairment category best fits (or describes) the impairment. Refer to 14.8 regarding application of this table.

### **Example 14.1: Cumulative irritant dermatitis**

<b>Subject:</b>	42-year-old man.
<b>History:</b>	Spray painter working on ships in dry dock. Not required to prepare surface but required to mix paints (including epoxy and polyurethane) with 'thinners' (solvents) and spray metal ships' surface. At end of each session, required to clean equipment with solvent. Not supplied with gloves or other personal protective equipment until after onset of symptoms. Gradual increase in severity in spite of commencing to wear gloves. Off work two months leading to clearance, but frequent recurrence, especially if the subject attempted prolonged work wearing latex or PVC gloves or wet work without gloves.
<b>Current:</b>	Returned to dry duties only at work. Mostly clear of dermatitis, but flares.
<b>Physical examination:</b>	Varies between no abnormality detected to mild dermatitis of the dorsum of hands.
<b>Investigations:</b>	Patch test standard + epoxy + isocyanates (polyurethanes). No reactions.
<b>Impairment:</b>	Zero per cent.
<b>Comment:</b>	No interference with ADL.

### **Example 14.2: Allergic contact dermatitis to hair dye**

<b>Subject:</b>	30-year-old woman.
<b>History:</b>	Hairdresser 15 years, with six month history of hand dermatitis, increasing despite beginning to wear latex gloves after onset. Dermatitis settled to very mild after four weeks off work, but not clear. As the condition flared whenever the subject returned to hairdressing, she ceased and is now a computer operator.
<b>Current:</b>	Mild continuing dermatitis of the hands which flares when doing wet work (without gloves) or when wears latex or PVC gloves. Has three young children and impossible to avoid wet work.
<b>Investigation:</b>	Patch test standard + hairdressing series. Possible reaction to paraphenylene diamine.
<b>Impairment:</b>	Five per cent.
<b>Comment:</b>	Able to carry out ADL with difficulty, therefore limited performance of some ADL

### **Example 14.3: “Cement dermatitis” due to chromate in cement**

<b>Subject:</b>	43-year-old man.
<b>History:</b>	Concreter since age 16. Eighteen month history of increasing hand dermatitis eventually on dorsal and palmar surface of hands and fingers. Off work and treatment led to limited improvement only.
<b>Physical examination:</b>	Fissured skin, hyperkeratotic chronic dermatitis.
<b>Investigation:</b>	Patch test. Positive reaction to dichromate.
<b>Current:</b>	Intractable, chronic, fissured dermatitis.
<b>Impairment:</b>	12 per cent.
<b>Comment:</b>	Unable to obtain any employment because has chronic dermatitis and on disability support pension. Difficulty gripping items including steering wheel, hammer and other tools. Unable to do any wet work (e.g. painting). Former home handyman, now calls in tradesman to do any repairs and maintenance. Limited performance in some ADL

### **Example 14.4: Latex contact urticaria/angioedema with cross reactions**

<b>Subject:</b>	Female nurse, age 40.
<b>History:</b>	Six month history of itchy hands minutes after applying latex gloves at work. Later swelling and redness associated with itchy hands and wrists and subsequently widespread urticaria. One week off led to immediate clearance. On return to work wearing PVC gloves, developed anaphylaxis on first day back.
<b>Physical examination:</b>	No abnormality detected or generalised urticaria/angioedema.
<b>Investigation:</b>	Latex radioallergosorbent test, strong positive response.
<b>Current:</b>	The subject experiences urticaria and mild anaphylaxis if she enters a hospital, some supermarkets or other stores (especially if latex items are stocked), at children's parties or in other situations where balloons are present, or on inadvertent contact with latex items including sport goods handles, some clothing, and many shoes (latex based glues). Also has restricted diet (must avoid bananas, avocados and kiwi fruit).
<b>Impairment:</b>	17 per cent.
<b>Comment:</b>	Severe limitation in some ADL in spite of intermittent activity.

#### **Example 14.5: Non-melanoma skin cancer**

- Subject:** 53-year-old married man.
- History:** Road worker since 17 years of age. Has had a basal cell carcinoma on the left forehead, squamous cell carcinoma on the right forehead (graft), basal cell carcinoma on the left ear (wedge resection) and squamous cell carcinoma on the lower lip (wedge resection) excised since 45 years of age. No history of loco-regional recurrences. Multiple actinic keratoses treated with cryotherapy or Efidix over 20 years (forearms, dorsum of hands, head and neck).
- Current:** New lesion right preauricular area. Concerned over appearance 'I look a mess.'
- Physical examination:** Multiple actinic keratoses forearms, dorsum of hands, head and neck. Five millimetre diameter nodular basal cell carcinoma right preauricular area, hypertrophic red scar 3cm length left forehead, 2cm diameter graft site (hypopigmented with 2mm contour deformity) right temple, non-hypertrophic scar left lower lip (vermilion) with slight step deformity and non-hypertrophic pale wedge resection scar left pinna leading to 30 per cent reduction in size of the pinna. Graft sites taken from right post auricular area. No regional lymphadenopathy.
- Impairment rating:** Six per cent.
- Comment:** Refer to table 6.1 (facial disfigurement)

#### **Example 14.6: Non-melanoma skin cancer**

- Subject:** 35-year-old single female professional surf life-saver.
- History:** Occupational outdoor exposure since 19 years of age. Basal cell carcinoma on tip of nose excised three years ago with full thickness graft following failed intralesional interferon treatment.
- Current:** Poor self-esteem because of cosmetic result of surgery.
- Physical examination:** One centimetre diameter graft site on the tip of nose (hypopigmented with 2mm depth contour deformity, cartilage not involved). Graft site taken from right post-auricular area.
- Impairment rating:** 10 per cent.
- Comment:** Refer to table 6.1 (facial disfigurement)

## 15. Cardiovascular system

**Chapters 3 and 4 AMA5 (page 23 and 65) apply to the assessment of permanent impairment of the cardiovascular system, subject to the modifications set out below. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### Introduction

- 15.1 The cardiovascular system is discussed in AMA5 chapters 3 (Heart and Aorta) and 4 (Systemic and Pulmonary Arteries) (pp 25-85). These chapters can be used to assess permanent impairment of the cardiovascular system with the following minor modifications.
- 15.2 It is noted that in this chapter there are wide ranges for the impairment values in each category. When conducting an assessment, assessors should use their clinical judgement to express a specific percentage within the range suggested.

### Exercise stress testing

- 15.3 As with other investigations, it is not the role of a medical assessor to order exercise stress tests purely for the purpose of evaluating the extent of permanent impairment.
- 15.4 If exercise stress testing is available, then it is a useful piece of information in arriving at the overall percentage impairment.
- 15.5 If previous investigations are inadequate for a proper assessment to be made, the Medical Assessor should consider the value of proceeding with the evaluation of permanent impairment without adequate investigations and data (see [chapter 1](#) of this Guide -ordering of additional investigations).

### Permanent impairment — maximum medical improvement

- 15.6 As for all assessments, maximal medical improvement is considered to have occurred when the worker's condition is well stabilised and unlikely to change substantially in the next year with or without medical treatment.

### Vascular diseases affecting the extremities

- 15.7 Note that in this section, AMA5 table 4-4 and table 4-5 (p 76) refer to percentage impairment of the upper or lower extremity. Therefore, an assessment of impairment concerning vascular impairment of the arm or leg requires that the percentages identified in tables 4-4 and 4-5 be converted to WPI. The table for conversion of the upper extremity is AMA5 table 16-3 (p 439) and the table for conversion of the lower extremity is AMA5 table 17-3 (p 527).

### Thoracic outlet syndrome

- 15.8 Impairment due to thoracic outlet syndrome is assessed according to Chapter 2 in this Guide and AMA5 chapter 16, the upper extremities.



## 16. Digestive system

**Chapter 6, AMA5 (page 117) applies to the management of permanent impairment of the digestive system. Before undertaking an impairment assessment, users of this Guide must be familiar with the following:**

- The Introduction in this Guide
- Chapters 1 and 2 of AMA5
- The appropriate chapter/s of this Guide for the body system they are assessing.
- The appropriate chapter/s of AMA5 for the body system they are assessing.

The provisions of this Guide take precedence over AMA5.

### Introduction

- 16.1 The digestive system is discussed in AMA5 chapter 6 (pp117-142). This chapter can be used to assess permanent impairment of the digestive system.
- 16.2 **AMA5, p 136: section 6.6 hernias.** Occasionally in regard to inguinal hernias there is damage to the ilio-inguinal nerve following surgical repair. Where there is loss of sensation in the distribution of the ilio-inguinal nerve involving the upper anterior medial aspect of the thigh, a one per cent WPI should be assessed as per Table 5.1 of this Guide. This assessment should not be made unless the symptoms have persisted for 12 months.
- 16.3 Where, following repair, there is severe dysaesthesia in the distribution of the ilio-inguinal nerve, a maximum of a five per cent WPI may be assessed as per Table 5.1. This assessment should not be made unless the symptoms have persisted for 12 months.
- 16.4 Where, following repair of a hernia of the abdominal wall, there is residual persistent excessive induration at the site, which is associated with significant discomfort, this should be assessed as a class 1 herniation (AMA5, Table 6-9, p 136). This assessment should not be made unless the symptoms have persisted for 12 months.
- 16.5 Impairments due to nerve injury and induration cannot be combined. The higher impairment should be chosen.
- 16.6 A person who has suffered more than one work related hernia recurrence at the same site and who now has limitation of ADL's should be assessed as herniation class 1 (AMA5, Table 6-9, p 136).
- 16.7 A diagnosis of a hernia should not be made on the findings of an ultrasound examination alone. For the diagnosis of a hernia to be made there must be a palpable defect in the supporting structures of the abdominal wall and either a palpable lump or a history of a lump when straining.
- 16.8 A divarication of the rectus abdominus muscles in the upper abdomen is not a hernia, although the supporting structures have been weakened, they are still intact.

16.9 Effects of analgesics on the digestive tract:

- Table 6-3 AMA5 (p 121) class 1 is to be amended to read 'there are symptoms and signs of digestive tract disease'.
- Nonsteroidal anti-inflammatory agents including Aspirin taken for prolonged periods can cause symptoms in the upper digestive tract. In the absence of clinical signs or other objective evidence of upper digestive tract disease, anatomic loss or alteration a zero per cent WPI is to be assessed.
- Effects of analgesics on the lower digestive tract:
  - Constipation is a symptom, not a sign and is generally reversible. A WPI assessment of zero per cent applies to constipation.
  - Irritable bowel syndrome without objective evidence of colon or rectal disease is to be assessed at zero per cent WPI.
- Assessment of colorectal disease and anal disorders requires the report of a treating doctor or family doctor which includes a proper physical examination with rectal examination if appropriate and/or a full endoscopy report.
- Failure to provide such reports may result in a zero per cent WPI.

16.10 Splenectomy. Post-traumatic splenectomy or functional asplenia following abdominal trauma should be assessed as a three per cent WPI.

16.11 Abdominal adhesions:

- Intra-abdominal adhesions following trauma requiring further laparotomy should be assessed under AMA5 Table 6-3, p121.

## 17. Evaluation of permanent impairment arising from chronic pain

### (Exclusion of Chapter 18, AMA5)

17.1. The International Association for the Study of Pain (IASP) has defined pain as:

*“An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage”.*

17.2. For chronic pain assessment using this Guide and AMA5, chapter 18 of AMA5, on pain, (p 565-591) is excluded.

17.3. The reasons for excluding chronic pain, as a separate condition from this Guide are:

- It is a subjective experience and is therefore open to exaggeration or fabrication in the compensation setting. Assessment depends on the credibility of the subject being assessed. In order to provide reliability, applicants undergoing pain assessments require more than one examiner at different times, concordance with the established conditions, consistency over time, anatomical and physiological consistency, agreement between the examiners and exclusion of inappropriate illness behaviour.
- Pain cannot be measured and no objective assessment can be made.
- Tools to measure pain are based on self-reports and may be inherently unreliable.
- Some impairment ratings take symptoms into account and some of the ranges of impairment e.g. WPI spine, may reflect the effect of the injury and pain on ADL. This is not so for impairment assessment of the upper and lower limb which is based on range of movement and diagnosis based estimates, other than for peripheral nerve injury.

17.4. Where there is a peripheral nerve injury and there is sensory loss, some of the sensory nerve impairment categories permit pain to be included (categories 1-5, table 16.10 p 482 AMA5).

17.5 The AMA5 section 17.2m, 'causalgia and complex regional pain syndrome (reflex sympathetic dystrophy)' (p 553 AMA5) should not be used. Table 16-16 AMA5 p 496 has been replaced by [table 17.1](#) in this Guide. The table is used to determine if complex regional pain syndrome (CRPS) is a rateable diagnosis. It is important to exclude diagnoses that may mimic CRPS, such as disuse atrophy, unrecognised general medical problems, somatoform disorders, and factitious disorder. Once the diagnosis is established, assess impairment as in AMA5.

### Complex Regional Pain Syndrome (CRPS) Type 1

17.6 For CRPS1 to be present for the purposes of assessment:

- The diagnosis is to be confirmed by criteria in Table 17.1
- The diagnosis has been present for at least one year (to ensure accuracy of the diagnosis and to permit adequate time to achieve MMI)
- The diagnosis has been verified by more than one examining physician
- Other possible diagnoses have been excluded

CRPS1 is to be assessed as follows:

- Apply the diagnostic criteria for complex regional pain syndrome type 1 (Table 17.1).

**Table 17.1 Diagnostic Criteria for Complex Regional Pain Syndrome (CRPS) types 1 and 2**

1. Continuing pain, which is disproportionate to any causal event.
2. Must report at least 1 symptom in each of the 4 following categories: <ul style="list-style-type: none"> <li>• Sensory: Reports of hyperaesthesiae and/or allodynia</li> <li>• Vasomotor: Reports of temperature asymmetry and/or skin colour changes and/or skin colour asymmetry</li> <li>• Sudomotor/oedema: Reports of oedema and/or sweating increase or decrease and/or sweating asymmetry</li> <li>• Motor/trophic: Reports of decreased range of joint motion and/or motor dysfunction ( tremor, dystonia) and/or trophic changes (hair, nail, skin)</li> </ul>
3. Must display at least 1 sign* at time of evaluation in all of the following 4 categories: <ul style="list-style-type: none"> <li>• Sensory: Evidence of hyperalgesia (to pin prick) and/or allodynia (to light touch and/or deep somatic pressure and/or joint movement)</li> <li>• Vasomotor: Evidence of temperature asymmetry and/or asymmetric skin colour changes</li> <li>• Sudomotor/oedema: Evidence of oedema and/or sweating asymmetry</li> <li>• Motor/trophic: Evidence of decreased active joint range of motion and/or motor dysfunction ( tremor, dystonia) and/or trophic changes (hair, nail, skin)</li> </ul>
4. There is no other diagnosis that better explains the signs and symptoms.
*A sign is included only if it is observed and documented at time of the impairment evaluation.

- If the criteria in each of the sections 1, 2, 3 and 4 in table 17.1 are satisfied, the diagnosis of CRPS1 may be made.
- Rate the extremity impairment resulting from loss of motion of each individual joint involved.
- Rate the extremity impairment resulting from sensory deficits and pain, according to the grade that best fits the degree or amount of interference with ADL described in AMA5 table 16.10a (p 482) . Use clinical judgement to select the appropriate severity grade and the appropriate percentage from within the range shown in each grade. The maximum value is not automatically applied. The value selected represents the extremity impairment. A nerve value multiplier is not used.
- Combine the extremity impairment for loss of joint motion with the impairment for pain or sensory deficit using the combined values chart (AMA5, p 604) to obtain the final extremity impairment.
- Convert the final extremity impairment to WPI using table 16.3 p 439 for the upper extremity and table 17.3 p 527 for the lower extremity in AMA5.

### **Complex Regional Pain Syndrome (CRPS) type 2, causalgia**

17.7 For CRPS2, the mechanism is an injury to a specific nerve. The methodology in AMA5 pp 496-497 is to be followed:

- If the criteria in each of the sections 1, 2, 3 and 4 in table 17.1 are satisfied and there is objective evidence of an injury to a specific nerve, the diagnosis of CRPS2 may be made.
- Rate the extremity impairment due to loss of motion of each individual joint involved.
- Rate the extremity impairment resulting from sensory deficits and pain of the injured nerves according to the determination methods described in section 16.5b and table 16-

10a (chapter 16) AMA5. Use clinical judgement to select the appropriate severity grade and the appropriate percentage from within each range shown in the grade.

- Rate the extremity impairment resulting from motor deficits and loss of power of the injured nerve according to the determination method in section 16.5b and table 16-11a (chapter 16) AMA 5.
- Combine the extremity impairment percents for loss of range of motion of the joints involved, pain or sensory deficits and motor deficits, if present, to determine the final extremity impairment, using the combined values chart (AMA5, p 604).
- Convert the final extremity impairment to WPI using table 16.3 p 439 for the upper extremity and table 17.3 p 527 for the lower extremity in AMA5

## **Appendix 1: Key definitions**

### **AMA5**

Means the Fifth Edition of the American Medical Association's (AMA) *Guides to the Evaluation of Permanent Impairment* and any published errata.

### **AMA4**

Means the Fourth Edition of the American Medical Association's (AMA) *Guides to the Evaluation of Permanent Impairment* and any published errata.

### **Assessor**

A medical practitioner with qualifications, training and experience relevant to the body system being assessed who has undertaken the requisite training in use of this Guide. For the purpose of industrial deafness assessments, the assessor may be a registered audiologist who has undertaken the requisite training in the use of this Guide.

### **The Act**

The Act refers to the *Workers' Compensation and Rehabilitation Act 2003*.

### **Combine**

Any direction in this Guide or the AMA4 or AMA5 to combine impairment values should be taken as a reference to use the Combined Values Chart.

### **Degree of permanent impairment (DPI)**

The Act defines degree of permanent impairment as "an estimate expressed as a percentage, of the degree of the worker's permanent impairment assessed and decided in accordance with the GEPI". Section 1.49 of this Guide states that a worker's DPI is to be expressed as a percentage of whole person impairment (% WPI).

### **Stable and Stationary**

The point at which a worker's injury can be assessed for DPI and the DPI decided. According to both the Act and section 1.15 of this Guide, a worker's injury or condition is considered to be stable and stationary when it is well stabilised and is unlikely to change substantially in the next year with or without medical treatment.

This concept is referred to as maximum medical improvement in the template national guide.

### **NSW Guide**

The *WorkCover Guides for the Evaluation of Permanent Impairment*, published by New South Wales' State Insurance Regulatory Authority. The fourth edition of the NSW Guide is the basis for the template national guide.

### **Template national guide**

The template guide developed by Safe Work Australia for jurisdictions to adapt and use according to their own legislation to achieve a nationally consistent approach to assessing permanent impairment across all Australian workers' compensation schemes.

## **Appendix 2: Working groups on permanent impairment**

### **Permanent Impairment Co-ordinating Group 2001**

<b>Name</b>	<b>Position</b>
Dr Jim Stewart	Chair
Ms Kate McKenzie	WorkCover
Mr John Robertson	Labor Council of NSW
Ms Mary Yaager	Labor Council of NSW
Dr Ian Gardner	Medical Representative to Workers Compensation and Workplace Occupational Health and Safety Council of NSW
Dr Stephen Buckley	Rehabilitation Physician
Prof Michael Fearnside	Professor of Neurosurgery
Dr John Harrison	Orthopaedic Surgeon
Dr Jonathan Phillips	Psychiatrist
Professor Bill Marsden	Professor of Orthopaedic Surgery
Dr Dwight Dowda	Occupational Physician
Associate Professor Ian Cameron	Assoc Professor of Rehabilitation Medicine
Dr Robin Chase	Australian Medical Association

### **2005 Revisions**

Dr Roger Pillemer	Orthopaedic Surgeon
Dr John Dixon Hughes	General Surgeon
Dr Yvonne Skinner	Psychiatrist

### **Permanent Impairment Co-ordinating Committee 2008**

<b>Name</b>	<b>Position</b>
Mr Rob Thomson	Chair
Ms Mary Yaager	Unions NSW
Dr Ian Gardner	Workers Compensation and Workplace Occupational Health and Safety Council of NSW
Associate Professor Michael Fearnside	Associate Professor of Neurosurgery, Neurosurgical Society of Australasia
Dr John Harrison	Orthopaedic Surgeon, Australian Orthopaedic Association, Australian Society of Orthopaedic Surgeons
Dr Yvonne Skinner	Psychiatrist, Royal Australian and New Zealand College of Psychiatrists
Professor Ian Cameron	Professor of Rehabilitation Medicine, Australasian Faculty of Rehabilitation Medicine
Dr Roger Pillemer	Approved Medical Specialist
Dr Michael Gliksman	Australian Medical Association
Dr Neil Berry	Royal Australasian College of Surgeons

### **Permanent Impairment Co-ordinating Committee 2013**

<b>Name</b>	<b>Position</b>
Mr Gary Jeffery	Chair
Mr Kim Garling	WorkCover Independent Review Officer
Ms Alisha Wilde/Mr Shay Degaura	Unions NSW
Dr Mark Burns	Australian Faculty of Occupational and Environmental Medicine
Associate Professor Michael Fearnside	Associate Professor of Neurosurgery, Neurosurgical Society of Australasia
Dr John Harrison	Orthopaedic Surgeon, Australian Orthopaedic Association, Australian Society of Orthopaedic Surgeons
Dr Yvonne Skinner	Psychiatrist, Royal Australian and New Zealand College of Psychiatrists
Professor Ian Cameron	Professor of Rehabilitation Medicine, Australasian Faculty of Rehabilitation Medicine
Dr Roger Pillemer	Workers Compensation Commission, Senior Approved Medical Specialist
Dr Michael Gliksman	Australian Medical Association
Dr Neil Berry	Australasian College of Surgeons
Mr Kevin Gillingham	WorkCover WA
Mr David Caulfield/ Mr Phil Waddas	WorkCover SA
Ms Meg Brighton	WorkSafe ACT



## **Working Groups**

### **Psychiatric and Psychological**

Dr Julian Parmegiani  
Dr Derek Lovell  
Dr Rod Milton  
Dr Yvonne Skinner  
Dr Jonathan Phillips  
Dr Chris Blackwell  
Dr Bruce Westmore  
Dr Susan Ballinger  
Ms Lyn Shumack  
Dr Jack White  
Ms Sandra Dunn  
Dr Tim Hannon

### **Spine**

Prof Michael Fearnside  
Dr John Cummine  
Prof Michael Ryan  
Dr Dwight Dowda  
Assoc Prof Ian Cameron  
Dr Hugh Dickson  
Dr Conrad Winer  
Dr Mario Benanzio  
Dr Jim Ellis  
Dr Jim Bodel  
Dr William Wolfenden  
Dr Kevin Bleasell  
Dr John Harrison  
Prof Sydney Nade

### **2005 Revisions**

Dr Roger Pillemer

### **2008 Revisions**

Dr Phillipa Harvey-Sutton  
Cassock Prof Michael Fearnside  
Dr Jim Bodel  
Assoc Prof Michael Ryan  
Dr Roger Pillemer  
Prof Ian Cameron

### **2012 Revisions**

Assoc Prof Michael Fearnside  
Dr Phillipa Harvey-Sutton  
Dr Jim Bodel  
Associate Professor Michael Ryan  
Dr Roger Pillemer  
Professor Ian Cameron

### **Hearing**

Dr Brian Williams  
Dr Joseph Scoppa  
Dr Stanley Styliis  
Dr Paul Niall  
Associate Professor Ian Cameron

### **Urinary and Reproductive**

Prof Richard Millard  
Dr Kim Boo Kuah  
Associate Professor Ian Cameron

### **Upper Limb**

Dr Dwight Dowda  
Assoc Prof Ian Cameron  
Prof Bill Marsden  
Assoc Prof Bruce Connelly  
Dr David Crocker  
Dr Richard Honner  
Dr Jim Ellis  
Dr Conrad Winer  
Dr David Duckworth  
**2005 Revisions**  
Dr Roger Pillemer  
Dr Graham McDougall  
Dr Brian Noll  
Dr Bruce Connelly

### **2012 Revisions**

Dr Roger Pillemer  
Dr John Harrison  
Dr Brian Noll  
Dr James Bodel  
Dr John Cross  
Dr Mark Burns  
Dr Michael Gliksman  
Dr Robert Breit  
Prof Ian Cameron

### **Respiratory, Ear, Nose and Throat**

Dr Julian Lee  
Prof David Bryant  
Dr Joseph Scoppa  
Dr Michael Burns  
Dr Frank Maccioni  
Dr Peter Corte  
Dr Brian Williams  
Associate Professor Ian Cameron

**Skin**

Dr Victor Zielinski  
Dr Scott Menzies

Dr Edmund Lobel  
Associate Professor Ian Cameron

**Cardiovascular**

Dr Thomas Nash  
Dr John Gunning  
Dr George Michell  
Dr Stephen Buckley  
Dr Melissa Doohan  
Dr Charles Fisher

**Endocrine**

Dr Alfred Steinbeck  
Prof Peter Hall  
Dr Stephen Buckley

**Vision**

Dr Michael Delaney  
Dr Peter Duke

Dr Peter Anderson  
Dr John Kennedy  
Dr Neville Banks  
Associate Professor Ian Cameron

**Digestive**

Prof Philip Barnes  
Dr David De Carle  
Dr Dwight Dowda  
**2012 Revisions**  
Dr Neil Berry  
Dr John Garvey  
Dr John Duggan  
Dr Nick Talley  
Dr David Johnson  
Dr John Dixon-Hughes

**Nervous System**

Dr Stephen Buckley  
Associate Professor Ian Cameron  
Dr Dwight Dowda  
Dr Ivan Lorentz  
Dr Keith Lethlean  
Dr Peter BLUM  
Professor Michael Fearnside  
Dr Tim Hannon  
**2012 Revisions**  
Associate Professor Michael Fearnside  
Dr Mark Burns  
Dr Ross Mellick  
Professor Ian Cameron

**Lower Limb**

Dr Dwight Dowda  
Associate Professor Ian Cameron  
Professor Bill Marsden  
Dr Peter Holman  
Dr Jay Govind  
Dr Jim Bodel

Dr Mario Benanzio  
Dr Jim Ellis  
Dr Conrad Winer

Dr Cecil Cass  
Dr John Harrison  
Dr John Korber

**2008 Revisions**

Dr Roger Pillemer  
Dr John Harrison  
Professor Ian Cameron  
Dr Michael Gliksman  
Dr Jim Bodel  
Dr Robert Breit  
Dr Ian Meakin

**2012 Revisions**

Dr Roger Pillemer  
Dr John Harrison  
Dr Brian Noll  
Dr James Bodel  
Dr John Cross  
Dr Mark Burns  
Dr Michael Gliksman  
Dr Robert Breit  
Professor Ian Cameron

**Haematopoietic**

Prof John Gibson  
Dr Stephen Flecknoe  
Dr Peter Slezak  
Prof John Dwyer  
Associate Professor Ian Cameron  
Evaluation of permanent impairment arising from chronic pain  
Associate Professor Michael Fearnside