

# Workers' Compensation Guidelines for Determining Impairment

First Edition, November 22, 2017



**Workers'**  
**Compensation**  
**Board**

## *Forward*

Legislation enacted in April 2017 [WCL§15(3)(x)] directed the Board to consult with “representatives of labor, business, medical providers, insurance carriers, and self-insured employers regarding revisions to permanency impairment guidelines, including permitting review and comment by such representatives’ chosen medical advisors...”, to adopt revised guidelines for the evaluation of medical impairment and determination of permanency with respect to injuries which are amenable to a schedule loss of use award pursuant to paragraphs (a) through (v) of subdivision 3 of section 15 of the WCL. As the law directs, these Guidelines are to be “...reflective of advances in modern medicine that enhance healing and result in better outcomes.” [WCL§15(3)(x)]

Therefore, these revised permanency guidelines supersede those sections of the Board’s 2012 Impairment Guidelines concerning medical evaluation of injuries amenable to a schedule loss of use (chapters 1 through 8 of the 2012 Guidelines), as well any other provision of the 2012 Impairment Guidelines which are inconsistent with these Guidelines.

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## **Chapter 1: Introduction**

Disability is a legal determination that reflects the impact of a workplace injury on a claimant's ability to work. The Workers' Compensation Law Judge establishes the level of disability based on the available medical evidence and other relevant information. Medical evidence may be submitted by the claimant's health provider, a medical consultant for the employer and/or an independent medical examiner.

A distinction is made between disability and impairment. Impairment is a purely medical determination made by a medical professional, and is defined as any anatomic or functional abnormality or loss. Competent evaluation of impairment requires a complete medical examination and accurate objective assessment of function. These Guidelines provide the medical provider with a uniform process for evaluating an individual's impairment resulting from a medically documented work related injury or illness.

### **1.1 Types of Disability Under the Workers' Compensation Law**

This law establishes the following types of disability in workers' compensation cases:

1. Temporary total disability
2. Permanent total disability
3. Temporary partial disability
4. Permanent partial disability

Evaluation of permanent disability occurs when there is a permanent impairment remaining after the claimant has reached maximum medical improvement (MMI). These Guidelines were created for purposes of determining impairment for permanent disabilities.

### **1.2 Maximum Medical Improvement (MMI)**

A finding of MMI is based on a medical judgment that (a) the claimant has recovered from the work injury or illness to the greatest extent that is expected and (b) no further improvement is reasonably expected. The need for palliative or symptomatic treatment does not preclude a finding of MMI. In cases that do not involve surgery or fractures, MMI cannot be determined prior to 6 months from the date of injury or disablement, unless otherwise agreed to by the parties.

### **1.3 Role of Examining Medical Providers**

Medical providers are obligated to provide the Board and the parties their best professional opinion of the claimant's medical condition, degree of impairment, and functional abilities. These Guidelines provide detailed criteria for determining the severity of a medical impairment, with a greater weight given to objective findings. It is the responsibility of the medical provider to submit medical evidence that the Board will consider in making a legal determination about disability.

Medical providers should not infer findings or manifestations that are not drawn from the physical examination or test reports, but rather medical providers should look to the objective

findings of the physical examination and data contained within the medical records of the patient. This methodology is intended to foster consistency, predictability and inter-rater reliability for determining impairment.

In order to prepare a report on permanent impairment, the medical provider should do the following:

1. Identify the affected body part or system (include chapter, table number, class, and severity level for non-schedule disabilities) and review the Guidelines (for body parts not covered by the Guidelines, see Chapter on Other Injuries and Occupational Diseases [Default Guideline]).
2. Review the relevant medical records and medical history.
3. Perform a thorough physical examination.
  - a. To measure active range of motion (ROM), medical providers should generally utilize a goniometer. In order to measure the maximum range of active motion, three repeat measurements should be taken.
  - b. Defects should be measured by comparing to the baseline reading of the contralateral member, if appropriate. Using the contralateral is not appropriate where the opposite side has been previously injured or is not otherwise available for comparison.
4. Report the work-related medical diagnosis(es) and examination findings, including appropriate specific references to the relevant medical history, examination, and test results.
5. Follow the recommendations to establish a level of impairment.
6. For a non-schedule permanent disability, evaluate the impact of the impairment(s) on claimant's functional and exertional abilities. See Medical Impairment and Functional Assessment Guidelines in the 2012 New York State Guidelines for Determining Permanent Impairment and Loss of Wage Earning Capacity.
7. When determining the value of a schedule loss of use, the total value of several range of motion defects should not exceed the value of full ankylosis of the joint. The sum of multiple ankylosed joints of a major member cannot exceed the value of amputation. However, digits may exceed these values due to loading.

## **1.4 Types of Final Evaluation Examinations**

Examining medical providers will conduct final evaluation examinations in connection with the following categories of awards:

1. A Schedule Award for:
  - a. Impairment of extremities (including nervous system impairment that impacts use of extremities)
  - b. Loss of vision
  - c. Loss of hearing
  - d. Facial disfigurement
2. Non-Schedule Award for:
  - a. Classification as permanent partial disability
  - b. Classification as permanent total disability

Medical providers evaluating a claimant located in New York, and medical providers located in New York who perform evaluations, must be authorized by the Workers' Compensation Board. For medical providers outside of New York, any evaluation performed must comport with these Guidelines, including the use of any forms prescribed by the Chair.

## **1.5 Schedule Awards**

A schedule award is given not for an injury sustained but for the residual permanent physical and functional impairments. Final adjustment of a claim by a schedule award must comply with the following medical requirements:

1. There must be a permanent impairment of an extremity, permanent loss of vision or hearing, or permanent facial disfigurement, as defined by law.
2. The impairment must involve anatomical or functional loss such as soft tissue, bone, sensation, atrophy, scarring deformity, mobility defects, loss of power, shortening, impaired dexterity or coordination.
3. The claimant must have reached maximum medical improvement.
4. No residual impairments must remain in the systemic area (i.e., head, neck, back, etc.) before the claim is considered suitable for schedule evaluation of an extremity or extremities involved in the same accident.

Workers' Compensation Law Section 15 prescribes the value for a percentage loss or loss of use of body members. See Appendix A: Weeks by Percentage Loss of Use of Body Part for a table containing the appropriate number of weeks of compensation provided by percentage of loss.

## **1.6 Non-Schedule Awards (Classification)**

Non-schedule awards include permanent impairments that are not covered by a schedule, such as conditions of the spine and pelvis, lungs, heart, skin, and brain, as well as impairments of the extremities that are not amenable to a schedule award as described below.

### *Schedule Impairments Subject to Classification*

Examples of impairments of the extremities not amenable to a schedule award:

1. Progressive and severe painful conditions of the major joints of the extremities such as the shoulders, elbows, hips and knees with one or more of the following:
  - a. Objective findings of acute or chronic inflammation of one or more joints such as swelling, effusion, change of color or temperature, tenderness, painful range of motion, etc.
  - b. X-ray evidence of progressive and severe degenerative arthritis.
  - c. Minimal or no improvement after all modalities of medical and surgical treatment have been exhausted.
2. Chronic painful condition of an extremity commonly affecting the distal extremities such as the hands and feet, with one or more of the following:
  - a. Complex regional pain syndrome (reflex sympathetic dystrophy), Sudeck's atrophy or chronic painful extremity syndrome.



- b. Objective findings or chronic swelling, atrophy, dysesthesias, hypersensitivity or changes of skin color and temperature such as mottling.
  - c. X-ray evidence of osteoporosis.
  - d. Minimal or no reported improvement after claimant has undergone all modalities of chronic pain treatment.
3. Mal-union of the long bones.
  4. Aseptic necrosis of the head of the femur or other bones.
  5. Severe and persistent instability of the knee joint or other major joints.
  6. Advanced Paget’s disease.
  7. Tumors.
  8. Caisson’s disease involving the joints.
  9. Persistent ulcerations, draining sinuses.
  10. Recurrent dislocations (shoulders).
  11. Amputees with neuromas or poorly healed stumps.
  12. Failed joint replacement such as total hip, total knee and shoulder replacements.

## 1.7 Abbreviation Codes

Acronym/Term	Definition
Mi	Mild
Mo	Moderate
Ma	Marked
F	Flexion defect
E	Extension defect
DIP	Distal interphalangeal joint
PIP	Proximal interphalangeal joint
MCP	Metacarpophalangeal joint
CMC	Carpo-metacarpal joint
MTP	Metatarsophalangeal joint
SLU	Schedule loss of use
ANCR	Accident Notice Casual Relation
ODNCR	Occupational Disease Notice Casual Relation
<b>Per NYS Statute:</b>	
Thumb	Thumb
First finger	Index finger
Second Finger	Middle / Long Finger
Third Finger	Ring Finger
Fourth Finger	Small / Little / Pinky Finger
<b>Symbols</b>	
<	Less than
≤	Less than or equal to
>	Greater than
≥	Greater than or equal to

## **Chapter 2: Upper Extremities – Thumb and Fingers**

### **2.1 Objectives for Determining Impairment for Thumb and Fingers**

The objective is to accurately assess the permanent residual physical defect a claimant suffered as a result of his/her injury. To the degree possible, the assessment should be based on objective findings determined by the history and physical examination, as well as the results of any appropriate diagnostic testing.

### **2.2 Methods Available to Assess Permanent Impairment**

Determination of the degree of permanent residual physical defect should be performed at the time of maximum medical improvement, the point at which no further healing is expected. Maximum medical improvement should be determined based on the outcome of the clinical course of treatment, the medical provider's expertise and any further treatment options available to the claimant. When evaluating the level of permanent residual physical defect, the medical provider should consider the contralateral extremity where appropriate and expected/normal values. The duration of time from the injury to maximum medical improvement may vary, but in most cases is one year from the injury or last surgery.

The severity of the permanent residual physical defect is not based on the mechanism of injury. It reflects the permanent residual physical defect at the time of medical maximum improvement and may include physical damage to bone, muscles, cartilage, tendons, nerves, blood vessels, and other tissues.

### **2.3 Maximum Rating of Body Part**

These Guidelines are to be used for evaluating permanent residual physical defects of the thumb and fingers. Single digit loss/impairment must be determined based on the impairment to the digit alone and not as part of the hand. The total value for the range of motion, if multiple joints are affected, cannot exceed the maximum value of the digit.

When multiple digit impairments are considered together in one comprehensive rating, the total impairment cannot exceed 100% of the next largest major member. Therefore, the loss of multiple digits, resulting in conversion to a hand impairment, may not exceed 100% schedule loss of use of the hand.

## 2.4 Thumb

The thumb works in conjunction with other fingers to reach, pinch, grasp or grip and manipulate objects. Thumb flexion, opposition and adduction are required for pinch, precision and some power grips.

The thumb deserves special consideration; it is the highest valued digit and the most important. The functional units of the thumb are the proximal and distal phalanges, the interphalangeal, metacarpal, and carpometacarpal joints. Impairment of hand function with loss of pinch and reduced grasping power is a significant presentation; furthermore, opportunity for reconstructive surgery is eliminated.

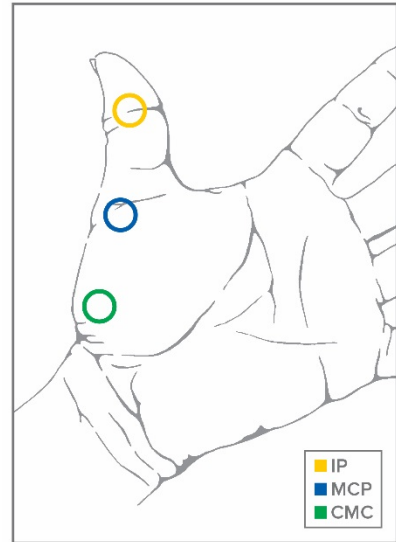


Figure 2.4 Joints of Thumb

### 2.4 (A) Thumb Range of Motion

#### 1. Measurement Position for Interphalangeal Joint (IP)

The hand is supine, palm up; the thumb is placed in full extension. The IP joint of the thumb is flexed to full extent. Normal range of motion is 80 degrees.

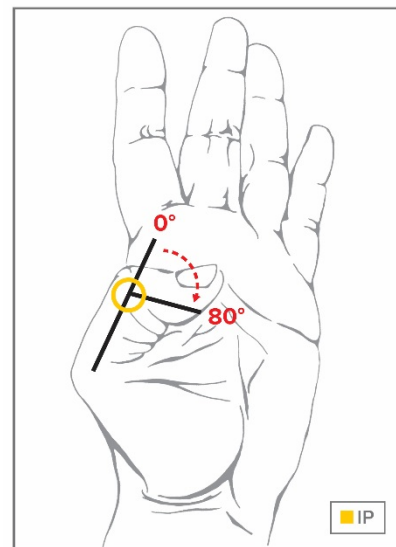


Figure 2.4 (A)(1) IP Joint

## 2. Measurement Position for Metacarpophalangeal Joint (MCP)

The hand is supine, palm up; the thumb is placed in full extension. Measure the angle between the first metacarpal and the proximal phalanx as the MCP joint is flexed to the full extent. Normal range of motion is 60 degrees.

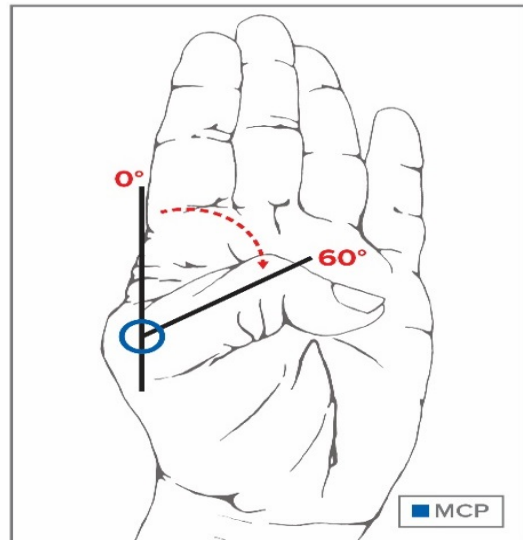


Figure 2.4 (A)(2) MCP Joint

## 3. Measurement Position for CMC Joint

### Flexion/Adduction/Opposition

These motions (flexion/adduction/opposition) are responsible for most of the activities of the hand. They allow for tip to tip contact for pinch, prehension and object manipulation. The measurement is as follows:

The hand is supine, palm up. As the thumb is flexed across the palm to the fullest extent possible, the thumb rotates. This is apparent as the thumbnail position changes. In this maneuver, the transition from full flexion to opposition is observed as additional degrees of rotation bring the thumb tip in contact with the MCP joints.

- Opposition is full if the tip of the thumb contacts the MCP of the pinky or little finger (4<sup>th</sup> finger).
- In a mild defect (1) the tip of the thumb contacts the MCP of the ring finger (3<sup>rd</sup> finger), but not the MCP of the pinky.
- In a moderate defect (2) the tip of the thumb contacts the MCP of the middle finger (2<sup>nd</sup> finger), but not the MCP of the ring finger.
- In a marked defect (3) the tip of the thumb contacts the MCP of the index finger (1<sup>st</sup> finger), but not the MCP of the middle finger.

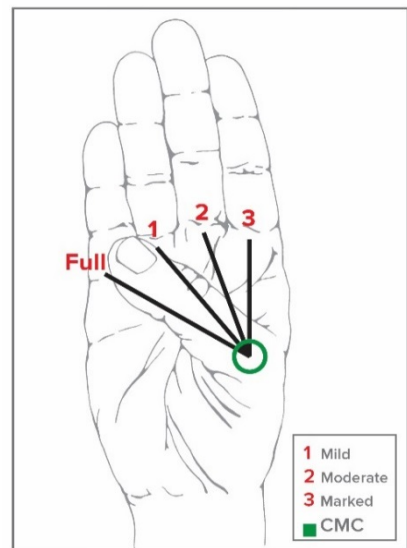


Figure 2.4 (A)(3) CMC Joint

#### 4. Measurement Position for Radial Abduction

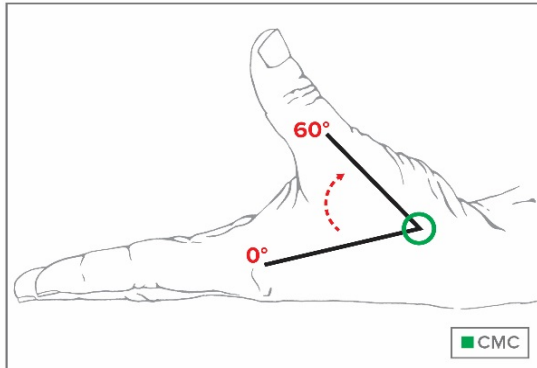


Figure 2.4 (A)(4) Radial Abduction

With the forearm resting in a neutral position, with the hand supine, with thumb in contact with the first finger, the thumb is moved outward (perpendicular to the palm) to maximum movement. Measure the angle as the MCP joint is abducted to the full extent. Normal range of motion is 60 degrees

#### 5. Measurement Position for Isolated Opposition

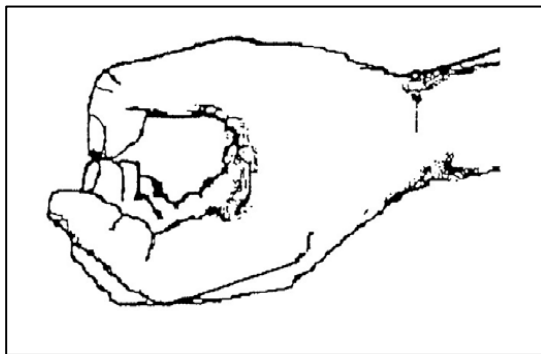


Figure 2.4 (A)(5) Isolated Opposition

The hand is supine, palm up; all thumb joints are extended to the fullest extent possible along the supine plane (radial extension) and the thumb is positioned perpendicular to the palm. Measure the thumb's ability to touch the tip of each finger.

### 2.4 (B) Calculating Loss of Use of Thumb

To determine the overall schedule loss of use of the thumb, first assess whether any special considerations apply. If not, to calculate the schedule loss of use of the thumb, each joint should be measured individually and any defect values (found in table below) are added together. If a single motion defect is involved (flexion or extension), the lower figure applies. If both flexion and extension are involved, the higher figure applies.

When using range of motion to determine schedule loss of use, a reduction to the sum of two major values may be in order and the total schedule loss of use of the thumb cannot exceed the value of ankylosis.

*Table 2.4(B) Thumb*

**Percent Loss of Use of Thumb**  
**Instructions: To the extent there are defects, add A+B unless a reduction to the sum of two major values is in order.**  
**Maximum value cannot exceed the value for ankylosis.**  
**Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.**

	ROM	Mild	Moderate	Marked	Ankylosis
<b>A</b>  (Select one)	IP*  (ROM =0-80°)	10 - 15%  (ROM 60°)	20 - 25%  (ROM 40°)	40 - 45%  (ROM 25°)	50% loss of use of the thumb
	MCP*  (ROM =0-60°)	15 - 20%  (ROM 45°)	25 - 30%  (ROM 30°)	45 - 50%  (ROM 15°)	75% loss of use of the thumb
	Both (IP and MCP) – utilized in the event a defect exists in both the IP and MCP joints	20 - 30%	40 - 50%	80 - 90%	
<b>B</b>	CMC Flexion as defined above (Figure 2.4(A)(3))	20 - 25%  To 3 <sup>rd</sup> Finger	30 - 40%  To 2 <sup>nd</sup> Finger	50 - 90%  To 1 <sup>st</sup> Finger	80% -100%

\*Use lower figure for one defect and higher when both are affected (flexion/extension)

NOTE: If no other defects exist:

- A mild impairment of thumb adduction is equal to 7½% loss of use of the thumb.
- A mild impairment of thumb opposition is equal to 10% loss of use of the thumb.
- A mild impairment of the radial abduction is equal to 10% loss of use of the thumb.
- More significant defects in adduction, opposition, or abduction may be given a higher schedule.

## 2.4 (C) Thumb Special Considerations

The following are special considerations in the final adjustment of the fingers.

1. Loss of active flexion or ankylosis at CMC joint is 100% loss of use of the thumb and is usually associated with a wrist defect in which case it becomes a hand schedule.
2. Abduction and opposition of the thumb is mainly centered on the CMC joint with possible defects at the MCP and IP joints, resulting in mild, moderate or marked impairment of pinch and grasp power of the hand. Such cases are given a hand schedule.

## 2.5 Fingers

The index through the small finger (fingers 1 – 4 as defined by WCB) each have three joints, the metacarpophalangeal (MCP joint), the proximal interphalangeal (PIP) and the distal interphalangeal (DIP). The MCP joint enables finger flexion and extension and is important for both grip and pinch activities.

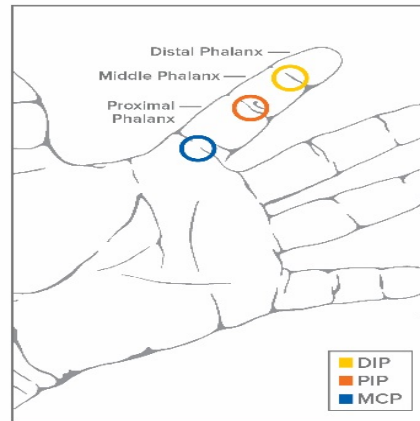


Figure 2.5 Fingers

## 2.5 (A) Finger Range of Motion

### 1. Measurement Position for Distal Interphalangeal (DIP) Joint (Normal range of motion is 90 degrees)

Flexion: Hand prone, fingers extended, measure the angle between the middle phalanx and the distal phalanx as the stabilized DIP joint is flexed towards the palm. Block flexion of the PIP during this maneuver.

Extension: Hand prone, DIP joints fully flexed. Measure the angle at the middle phalanx and distal phalanx joint as it is extended away from the palm.

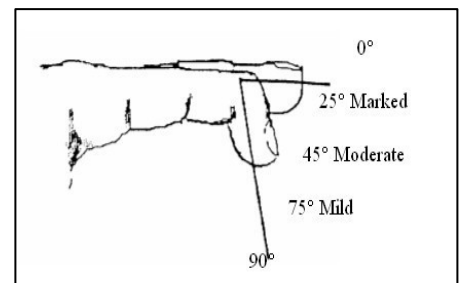


Figure 2.5(A)(1) DIP Joint

**2. Measurement Position for Proximal Interphalangeal (PIP) Joint  
(Normal range of motion is 100 degrees)**

Flexion: Fingers extended horizontal with palm and wrist. Measure the angle between the middle phalanx and the proximal phalanx as the PIP joint is flexed towards the palm. Block flexion of the MCP during this maneuver.

Extension: PIP joints fully flexed. Measure the angle as the PIP joint is extended towards horizontal position of the fingers.

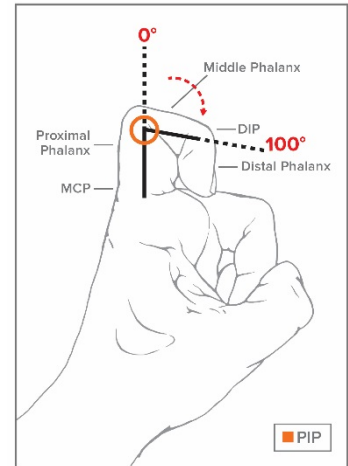


Figure 2.5(A)(2) PIP Joint

**3. Measurement Position for Metacarpophalangeal Joint (MCP)  
(Normal range of motion is 90 degrees)**

Flexion: Fingers extended, measure the angle between the metacarpal bone and the proximal phalanx as the MCP joint is flexed towards the palm.

Extension: MCP joints fully flexed. Measure the angle as the MCP joint is extended to the maximum extent possible.

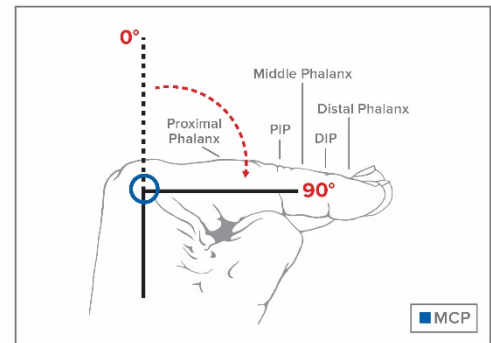


Figure 2.5(A)(3)  
MCP Joint

## 2.5 (B) Calculating Loss of Use of Finger

To determine the overall schedule loss of use of the finger, first assess whether any special considerations apply. If not, to calculate the schedule loss of use of the finger, each joint should be measured individually and the values (found in the table below) added together. If a single motion defect is involved (flexion or extension), the lower figure applies. If both flexion and extension are involved, the higher figure applies.

When using range of motion to determine schedule loss of use, a reduction to the sum of two major values may be in order for losses in all three joints and the total schedule loss of use of the finger cannot exceed of the value of ankylosis.



*Table 2.5(B) Finger*

**Percent Loss of Use of Finger**  
**Instructions: To the extent there are defects, add A+B+C unless a reduction to the sum of two major values is in order.**  
**Maximum value cannot exceed the value for ankylosis.**  
**Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.**

	ROM	Mild	Moderate	Marked	Ankylosis
<b>A*</b>	DIP (ROM 0 – 90°)	10 - 15% ROM 75°	20 - 25% ROM 45°	40 - 45% ROM 25°	Ankylosis of the DIP joint (loss of active flexion) is a 50% loss of use of the finger. Ankylosis of multiple joints cannot exceed 100%.
<b>B*</b>	PIP (ROM 0 – 100°)	15 - 20% ROM 75°	25 - 30% ROM 45°	45 - 50% ROM 25°	
<b>C*</b>	MCP (ROM 0 – 90°)	20 - 25% ROM 75°	30 - 40% ROM 45°	50 - 90% ROM 25°	

*\*Use lower figure for one defect and higher figure when both are affected.*

## 2.5 (C) Finger Special Considerations

The following are special considerations that have enumerated schedule loss of use values. Other defects may be added when specified. However, the maximum schedule loss of use value cannot exceed the value of ankylosis except under special consideration number 5 below.

1. Mallet deformity: Up to 33 $\frac{1}{3}$ % loss of finger depending on degree.
2. Trigger finger: Up to 33 $\frac{1}{3}$ % loss of finger. Use the maximum value (33 $\frac{1}{3}$ %) if the thumb or index finger is involved.
3. Flail DIP joint: 50% loss of finger.
4. Loss of half or more of the distal phalanx equals 50% loss of use of the finger.
5. Dupuytren’s Contracture - There must be an ODNCR and/or ANCR for Dupuytren’s Contracture before schedule evaluation thereof. Schedule loss of use should be limited to the accident or occupational disease. There is a 5% to 7 $\frac{1}{2}$ % loss of use of the hand if impairment is found in one finger only. A larger schedule may be given if two or three fingers are involved and function of the hand is compromised, such as grasp power. It is recognized that this may exceed the value of ankylosis of the affected finger.

## 2.6 Loading

Loading is the amount added to a schedule to allow for weakness of grasp or other major loss of function when multiple digits are affected. Where indicated, convert multiple digit loss to an overall hand schedule. Schedules below 50% in one or two digits remain in the digits.

To calculate the overall loading value:

1. Determine the number of weeks per digit by multiplying the percentage loss of use per digit by the statutory maximum weeks allowed per digit<sup>1</sup>;
2. Add the number of weeks per digit together to arrive at “total digit weeks”;
3. Multiply the “total digit weeks” by the appropriate loading percentage<sup>2</sup> to arrive at the overall number of “loading weeks” and add to “total digit weeks”; and
4. Divide this value by the maximum statutory weeks for a hand (244<sup>1</sup>). Multiply the quotient by 100 to arrive at the percentage loss of the hand.

Example: a 50% loss of use of the index finger and a 60% loss of use of the thumb is given a 60% load and converted to a hand schedule (Scenario C below).

1. (A) 50% Loss of Index	23 weeks (50% of 46 weeks)
(B) 60% Loss of Thumb	45 weeks (60% of 75 weeks)
2. Total Digit Weeks (A plus B)	68 weeks (23 + 45)
3. Total Weeks including 60% load	108.8 weeks ((68 x 60%)+68)
4. Converted to Hand Schedule	44.6% ((108.8/244) x 100)

<sup>1</sup> See Appendix A.

<sup>2</sup> See tables 2.6 [a], [b], and [c]

*Table 2.6(a) – Loading when two digits are affected*

Loading for Two Digits	Scenario A	Scenario B	Scenario C	Scenario D
One-digit loss	≥ 50%	100%	≥ 50%	Thumb or Index with 100% bone loss.
Second digit loss	< 50%	≥ 50%	≥ 50%	< 50%
Loading	0	60%	60%	60%
Convert to Hand	No	Yes	Yes	Yes

Per table above:

- Scenario A - No load is given when one digit has 50% loss of use and another has less than 50% loss of use; instead a separate percentage is given for each finger.
- Scenario B - The load is 60% and converted to a hand schedule when one digit has 100% loss of use and another digit has 50% loss of use.
- Scenario C - Schedules of 50% or more in two digits are loaded 60% and converted to a hand schedule.
- Scenario D - The load is 60% and converted to a hand schedule when there is a 100% bone loss in either the thumb or index finger and a second digit has less than 50% loss of use.

*Table 2.6(b) Loading when three or more digits are affected*

Loading for Three Digits	Scenario A	Scenario B
One-digit loss	< 50%	≥ 50%
Second digit loss	< 50%	≥ 50%
Third digit loss	< 50%	With or without loss
Fourth digit loss	n/a	With or without loss
Loading	30%	60%
Convert to Hand	Yes	Yes

Per table above:

- Scenario A - In cases of loss of three fingers with less than 50% loss of use in each finger, are given a 30% load and converted to a hand schedule.
- Scenario B - Schedules of 50% or more loss in two or more digits are loaded 60% and converted to a hand schedule.

*Table 2.6(c) Loading for Amputations*

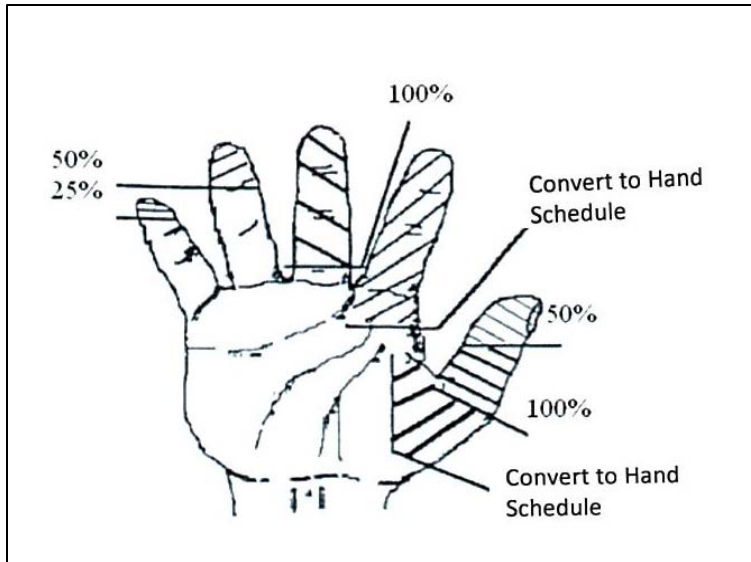
Loading for Amputation		Loading	Conversion to Hand
Scenario A	Amputation of ½ the distal phalanges <u>or</u> ankylosis of the DIP <u>plus</u> loss of active flexion of ≥ two fingers	60%	Yes
Scenario B	Amputation mid phalanges ≥ two digits	60%	Yes
Scenario C	Amputation through the proximal phalanges of ≥ two or more digits	120%	Yes
Scenario D	Amputation at first metacarpal of the thumb	120%	Yes

Per table above:

- Scenario A - Amputation of half of the distal phalanges of two or more digits or ankylosis of the DIP joints of two or more digits and loss of active flexion of two or more digits is loaded 60% and given a hand schedule.
- Scenario B - Amputation through the middle phalanges of two or more digits is loaded 60% and given a hand schedule.
- Scenario C - Amputation through the proximal phalanges of two or more digits is loaded 120% and given a hand schedule.
- Scenario D - An amputation involving the first metacarpal of the thumb is loaded 120% and given a hand schedule.

## 2.7 Amputation

Determination of residual impairment and functional loss depends on the level of amputation. Reliance on initial x-rays or reports may be misleading. The operative amputation is frequently performed at a higher level in order to obtain adequate closure or better function. If in doubt, new post-operative x-rays are needed to determine the degree of bone loss and the final level of amputation. This information will be needed in the calculation of schedule loss.



**Figure 2.7 Schedule Loss of Use of the Fingers Due to an Amputation**

1. Loss of all fingers at proximal phalanges equals 100% loss of use of the hand.
2. Loss of tip of tuft (with bone loss) of the distal phalanx equals 15% to 20% loss of use of the finger. Add percentage for mobility defect at the DIP joint if present.
3. Loss through the base of the tuft equals 33 ⅓% loss of use of the finger.
4. Loss of half or all of the distal phalanx of the finger equals 50% loss of use of finger (no additional values added for mobility impairment at the DIP joint).
5. Amputation through the DIP joint equals 50% loss of use of the finger.
6. Loss of any portion of the middle phalanx equals 100% loss of use of the finger.
7. Loss involving the proximal phalanx equals 100% loss of use of the finger.
8. A 100% loss of use of the thumb equals 75 weeks. In cases of amputation proximal to the MCP joint, there is a load of 120% and converted to a hand schedule
9. Loss involving the entire finger and any part of the ray (metacarpal) equals 100% loss of use of the digit and is loaded 120% and converted to a hand schedule.
10. In cases where 100% was given for a member, additional schedules may be given for subsequent injuries under certain circumstances, e.g., amputation above the elbow receives 100% loss of the arm.

## Chapter 3: Upper Extremities – Hand and Wrist

### 3.1 Objectives for Determining Impairment for Hand and Wrist

The hand and wrist are an integral part of the finger and thumb motion. In addition, the wrist acts as a bridge between the associated structures of the hand and the forearm. The wrist enables the hand to perform complex flexion/extension and radial/ulnar movements.

The objective is to accurately assess the permanent residual physical defects a claimant suffered as a result of his/her injury. To the degree possible, the assessment should be based on objective findings determined by the history and physical examination, as well as the results of any appropriate diagnostic testing.

### 3.2 Methods Available to Assess Permanent Impairment

Determination of the degree of permanent residual physical defect should be performed at the time of maximum medical improvement, the point at which no further healing is expected. Maximum medical improvement should be determined based on the outcome of the clinical course of treatment, the medical provider's expertise and any further treatment options available to the claimant. When evaluating the level of permanent residual physical defect, the medical provider should consider the contralateral extremity where appropriate and expected/normal values. The duration of time from the injury to maximum medical improvement may vary, but in most cases is one year from the injury or last surgery.

The severity of the permanent residual physical defect is not based on the mechanism of injury. It reflects the permanent residual physical defect at the time of medical maximum improvement and may include physical damage to bone, muscles, cartilage, tendons, nerves, blood vessels, and other tissues.

### 3.3 Wrist Range of Motion

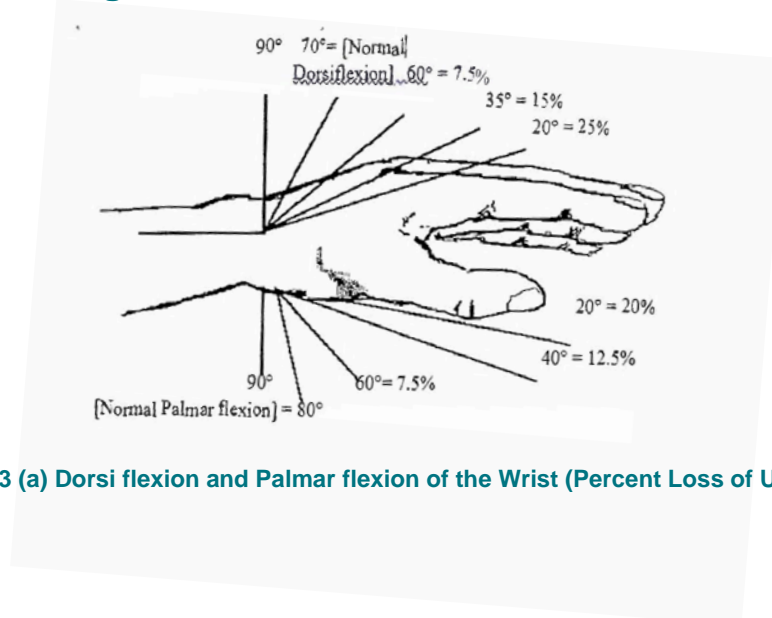


Figure 3.3 (a) Dorsi flexion and Palmar flexion of the Wrist (Percent Loss of Use of the Hand)

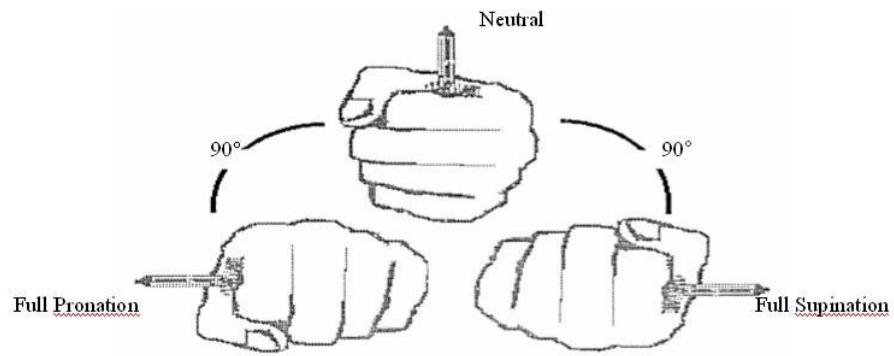


Figure 3.3 (b) Pronation – Supination of the Wrist (as measured with the elbow flexed to 90 degrees, and arm adducted along the chest wall).

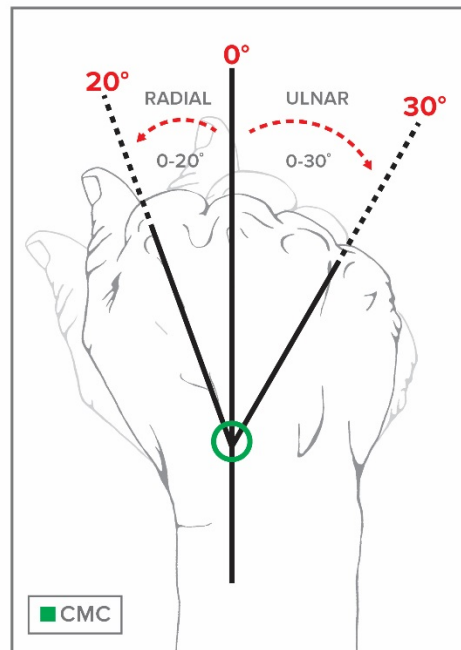


Figure 3.3 (c) Lateral Wrist Motion

### 3.4 Calculating Loss of Use

To determine the overall schedule loss of use of the wrist, first assess whether any special considerations apply. If not, to calculate the overall schedule loss of use of the wrist, add Palmar Flexion (A) + Dorsi Flexion (B) + Pronation/Supination (C), to the extent there are defects in these ranges of motion. However, where marked defects are present in all wrist motions the schedule loss of use cannot exceed 55%. For other defects see notes.

*Table 3.4 – Wrist*

**Percent Loss of Use of Wrist**  
**Instructions: To the extent there are defects, add A+B+C or values as indicated per notes.**  
**Maximum value for marked cannot exceed 55%.**  
**Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.**

	ROM	Mild	Moderate	Marked	Ankylosis
<b>A</b>	Palmar Flexion	7½%	12½%	20%	Position of function (mild dorsi flexion): 60% loss of the hand.  In any other position (palmar, marked dorsi flexion or lateral deviation): 70 – 90% loss of the hand.
	ROM 0 - 80°	ROM 60°	ROM 40°	ROM 20°	
<b>B</b>	Dorsi Flexion	7½%	15%	25%	
	ROM 0 – 70°	ROM 60°	ROM 35°	ROM 20°	
<b>C*</b>	Pronation / Supination	7½ - 10%	17½ - 20%	25 - 30%	
	ROM 0 – 90°	ROM 75°	ROM 45°	ROM 25°	

*\* Use lower figure for one defect and higher figure when both are affected.*

**Notes:**

- Complete loss of Palmar flexion equals 25% loss of the hand.
- Complete loss of Dorsi flexion equals 33⅓ % loss of the hand.
- Complete loss of both pronation and supination equals 35% loss of use of the hand.
- Defects in radial-lateral motion and ulnar motion may be separately considered if other findings in the wrist are normal.



### **3.5 Special Considerations**

The following are special considerations that have enumerated schedule loss of use values. Other defects may be added when specified or when no schedule value is provided. However, the maximum schedule loss of use value cannot exceed the value of ankylosis except for special consideration number one.

1. Complete wrist drop or radial nerve palsy equals 66 ⅔% loss of use of the hand; less is given for partial wrist drop.
2. Darrach procedure (resection distal ulna) equals 10% loss of use of the hand for bone loss and add for mobility defects.
3. Resection "proximal row" carpal bones equals 20% loss of use of the hand for bone loss alone and add for mobility defects if present.
4. Navicular fracture - Hold non-union cases for two years. Give a schedule loss of use of the hand if the X-rays provide evidence of clinical union (fibrous) and if the pain is not severe. In rare, very painful conditions, consider classification.
5. Kienböck's Disease (aseptic necrosis of carpal lunate): Hold until X-rays show static condition. Consider classification if condition is symptomatic.
6. Carpal Tunnel Syndrome: Schedule one-year post decompression if asymptomatic. If symptoms persist and become severe and disabling, consider classification. [For values see Nerve Section 10.3A]
7. De Quervain's Disease with or without surgical release equals 7½-20% loss of use of the thumb depending on impairments. If there is a residual defect of the wrist and the grip power of the hand is impaired, give a schedule loss of use of the hand.
8. Ganglion of wrist equals 0-7½% of hand depending on clinical findings.

### **3.6 Amputation**

Amputation at the wrist equals 100% loss of use of the hand (80% loss of use of the arm).

## Chapter 4: Upper Extremities - Elbow

### 4.1 Objectives for Determining Impairment for Elbow

The elbow plays an important role in positioning the hand and wrist to allow for functional use of the upper extremity. The most important function of the elbow joint is to position the hand, either moving the hand away from the body (elbow extension), towards the body (elbow flexion) or in a more precise hand movement (supination/pronation).

The objective is to accurately assess the permanent residual physical defect a claimant suffered as a result of his/her injury. To the degree possible, the assessment should be based on objective findings determined by the history and physical examination, as well as the results of any appropriate diagnostic testing.

### 4.2 Methods Available to Assess Permanent Impairment

Determination of the degree of permanent residual physical defect should be performed at the time of maximum medical improvement, the point at which no further healing is expected. Maximum medical improvement should be determined based on the outcome of the clinical course of treatment, the medical provider's expertise and any further treatment options available to the claimant. When evaluating the level of permanent residual physical defect, the medical provider should consider the contralateral extremity where appropriate and expected/normal values. The duration of time from the injury to maximum medical improvement may vary, but in most cases is one year from the injury or last surgery.

The severity of the permanent residual physical defect is not based on the mechanism of injury. It reflects the permanent residual physical defect at the time of maximum medical improvement and may include physical damage to bone, muscles, cartilage, tendons, nerves, blood vessels, and other tissues.

### 4.3 Elbow Range of Motion

Normal Range of Motion 0-150°

- **Flexion:** From the position of maximum extension, measure the angle between the extension position and the full flexion of the forearm. Normal flexion is 150 degrees.

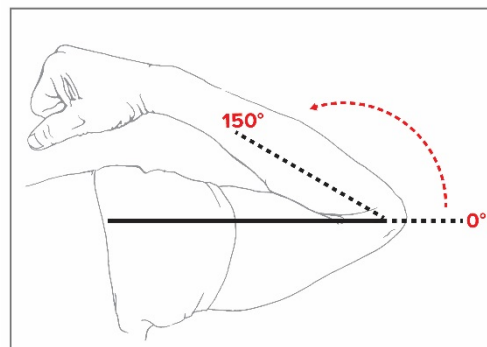
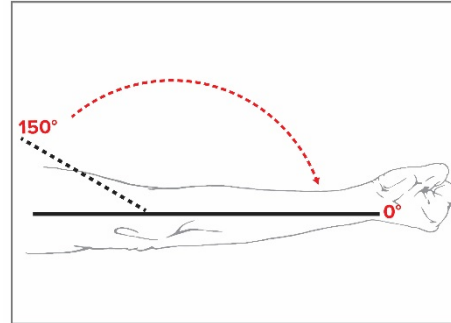


Figure 4.3(a) Elbow Flexion

- **Extension:** Starting at maximum flexion, measure the angle between the flexion position and the full extension of the forearm. Normal extension is to the zero degrees position as indicated in the figure.



**Figure 4.3(b) Elbow Extension**

## 4.4 Calculating Loss of Use

To determine the overall schedule loss of use of the elbow, first assess whether any special considerations apply. If not, overall loss of use of the elbow is calculated by combining any noted defects in extension and flexion. When evaluating based on range of motion, the maximum loss of use for the elbow cannot exceed ankylosis.

*Table 4.4 – Elbow*

**Percent Loss of Use of Elbow**  
**Instructions: To the extent there are defects, add A+B.**  
**Maximum value cannot exceed the value for ankylosis.**  
**Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.**

	ROM	Mild	Moderate	Marked	Ankylosis
A	Extension ROM: Full Flexion to 0°	25% ROM 45°	50% ROM 90°	85% ROM 125°	Position of function: 66 ⅔% loss of the arm. Higher percentage is given for extremes of flexion or rotation of the forearm.  Ankylosis at 0° (full extension) is a 90% loss of the arm.
B	Flexion ROM: Full Extension to 150°	7½% ROM 125°	33⅓% ROM 90°	66⅔% ROM 45°	

## 4.5 Special Considerations

The following are special considerations that have enumerated schedule loss of use values. Other defects may be added when specified or when no schedule value is provided. However, the maximum schedule loss of use value cannot exceed the value of ankylosis.

1. Loss of head of the radius equals 10% loss of use of the arm and add for mobility defects.
2. Laxity of the elbow with hyperextension defect equals 10-15% loss of use of the arm.

3. Medial and lateral epicondylitis are usually given a schedule, but if it becomes chronic, severe and disabling, consider classification.
4. Olecranon fracture and olecranon bursitis. Schedules depend on residual defects.
5. Olecranon excision equals 10% loss of the use of the arm for bone loss and add for mobility defects.

## **4.6 Amputation**

**Table 4.6 Percent Loss of Use of the Arm: Amputation at Different Levels**

<b>Amputation</b>	<b>% Loss of Use of the Arm</b>
At Elbow or Above	100%
Three Inches Below Elbow	95%
Mid-Forearm	90%
At Wrist Joint	80%

## Chapter 5: Upper Extremities - Shoulder

### 5.1 Objectives for Determining Impairment for Shoulder

The shoulder and elbow play important roles in positioning the hand in space to allow for functional use of the upper extremity. Injury can result in significant limitations and negatively impact the ability to perform work responsibilities.

The objective is to accurately assess the permanent residual physical defect a claimant suffered as a result of his/her injury. To the degree possible, the assessment should be based on objective findings determined by the history and physical examination, as well as the results of any appropriate diagnostic testing.

### 5.2 Methods Available to Assess Permanent Impairment

Determination of the degree of permanent residual physical defect should be performed at the time of maximum medical improvement, the point at which no further healing is expected. Maximum medical improvement should be determined based on the outcome of the clinical course of treatment, the medical provider's expertise and any further treatment options available to the claimant. When evaluating the level of permanent residual physical defect, the medical provider should consider contralateral extremity where appropriate and expected/normal values. The duration of time from the injury to maximum medical improvement may vary, but in most cases is one year from the injury or last surgery.

The severity of the permanent residual physical defect is not based on the mechanism of injury. It reflects the residual physical defect at the time of maximum medical improvement and may include physical damage to bone, muscles, cartilage, tendons, nerves, blood vessels, and other tissues.

### 5.3 Shoulder Range of Motion

Shoulder motions include:

1. **Flexion** (forward elevation) - Range of motion that is in the sagittal plane rotating about an axis of an imaginary line through the glenoid fossae with the arm moving in front of and above the body. The normal range of motion is to 180 degrees.

**Extension** - Range of motion that is in the sagittal plane rotating about an axis of an imaginary line through the glenoid fossae with the arm moving behind the body to 60 degrees.

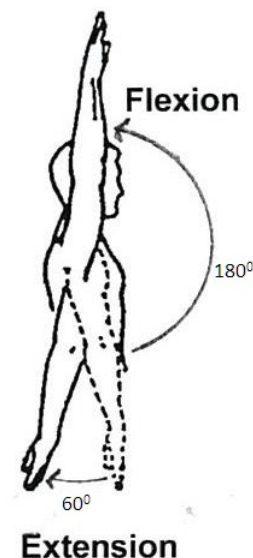


Figure 5.3(1) Shoulder Flexion and Extension

2. **Abduction** - Range of motion in the coronal plane rotating about an imaginary line of an axis through the glenohumeral joint. The normal range of motion is to 180 degrees. (The arm moves to the side away from the body.)

**Adduction** - Range of motion in the coronal plane rotating about an imaginary line of an axis through the glenohumeral joint. The normal range of motion is to 30 degrees. (The arm moves across in front of the body.)

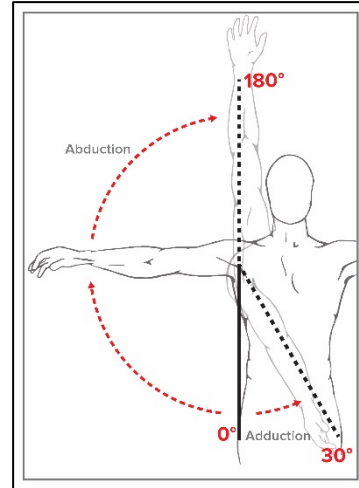


Figure 5.3(2) Shoulder  
Abduction and Adduction

3. **External Rotation** - The arm is at the side, the elbow is flexed to 90 degrees and rotated about an imaginary line along the axis of the humerus. The normal range of motion is 90 degrees.

**Internal Rotation** - The arm is at the side, the elbow is flexed to 90 degrees and rotated about the imaginary line along the axis of the humerus. The normal range of motion is 70 degrees.

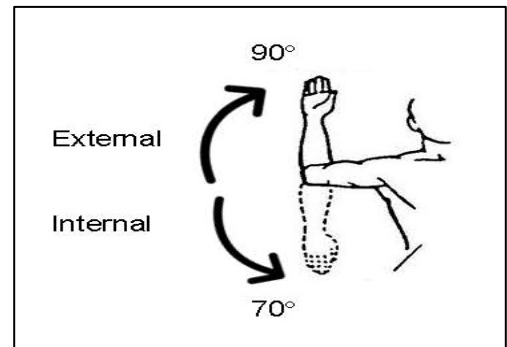


Figure 5.3(3) Shoulder  
External (Up) and  
Internal (Down)

## 5.4 Calculating Loss of Use

To determine the overall schedule loss of use of the shoulder, first assess whether any special considerations apply. If not, where defects are present in abduction and flexion see table below and use whichever defect is higher. See notes for additional considerations. When evaluating based on range of motion, the overall defect, when combined, cannot exceed the value of ankylosis.

*Table 5.4(a) Shoulder*

**Percent Loss of Use of Shoulder**  
**Instructions: To the extent there are defects select values per the chart and/or notes below.**  
**Maximum value cannot exceed the value for ankylosis.**  
*Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.*

ROM	Mild	Moderate	Marked	Ankylosis
Flexion/Abduction ROM: 0 – 180° (use greater defect)	<b>20%</b> ROM: 135°	<b>40%</b> ROM: 90°	<b>60%</b> ROM: 45°	Ankylosis at the scapulo-humeral joint at 0 degrees equals 80% loss of use of the arm.

**Notes:**

- If a defect of both flexion (forward elevation) and abduction are documented, the greater of the two defects must be utilized, not both. However, if the defect in both ranges of motion are moderate or higher, and the measures are within 10° of each other, up to 10% may be added to the overall schedule loss of use, not to exceed ankylosis.
- Do not add mild defects of internal and external rotation to avoid cumulative values. May add 10-15% for marked defects of rotation and muscle atrophy, not to exceed ankylosis.
- Mild defects of adduction equal 7½-10% loss of use of an arm.
- Mild defects of posterior extension equal 7½-10% loss of use of an arm.
- For isolated internal/external ROM defects use the table below.

*Table 5.4(b) Shoulder  
Internal and External Rotation Only*

Internal/External Rotation (Values below are only considered where no other ROM defects exist.)				
ROM	Mild	Moderate	Marked	Complete Loss
Internal Rotation ROM: 0 – 70°	7½% ROM: 55°	10% ROM: 35°	12½% ROM: 20°	15%
External Rotation ROM: 0 – 90°	7½% ROM: 75°	10% ROM: 45°	12½% ROM: 25°	15%
Both Internal and External	10%	15%	20 - 25%	30%

## 5.5 Special Considerations

The following are special considerations that have enumerated schedule loss of use values. Other defects may be added when specified or when no schedule value is provided. However, the maximum schedule loss of use value cannot exceed the value of ankylosis.

1. Dislocation of the shoulder may be amenable for a schedule loss of use evaluation provided that it has been at least one year from corrective surgery, or recurrent dislocation and that permanent impairment exists after one year. Pre-existent recurrent dislocation of the shoulder calls for an overall schedule and apportionment.
2. Fracture of the clavicle may equal 0-10% depending on degree of impairment.
3. Acromio-clavicular or sterno-clavicular separation equals 7½-10% loss of use of the arm.
4. Winged scapula due to Serratus Anterior Palsy and/or Trapezius Palsy may be given 15-20% loss of use of the arm depending on degree of functional impairment. For such cases do not evaluate for a schedule loss until two years' post-surgical repair of a major nerve.
5. Resection of the clavicle, either end, equals 10% for bone loss; entire clavicle equals 15% loss of use of the arm. Add for mobility defects of the single most notable in relation to functional defect if present.
6. Rupture of the long head of the biceps muscle is equal to 10-15% loss of use of the arm. Rupture at distal point of insertion of the biceps is equal to 20% loss of use of the arm. Taking into consideration mobility and muscle weakness, the schedule can vary up to 33 ⅓% loss of use of the arm depending on degree of impairment found.
7. Frozen shoulder and adhesive capsulitis (with or without surgery): if the condition is asymptomatic give a schedule loss of use of the arm. If extremely painful and all modalities of treatment exhausted, consider classification after two years.
8. The schedule given is focused on the highest valued part of the extremity. In case of a high schedule for one given part of the extremity calculate first for the major loss in part involved. For example, amputation at the wrist equals 100% loss of use of the hand or equals 80% loss of use of the arm. If there are additional defects of the elbow and/or shoulder add 10% to the 80% loss of use of the arm and the final schedule would be 90% loss of use of the arm.
9. Full or partial shoulder arthroplasty or replacement results are assessed no sooner than twelve months after surgery, as clinically significant changes in functions can occur before this timeframe. The schedule is given based upon the medical assessment of:
  - range of motion as measured by flexion or abduction, using the greatest degree of impairment;
  - atrophy as measured at the level of the mid arm and compared to the contralateral side, and
  - presence of chronic complications according to the table below (unless appropriate for classification).



Schedule loss of use values are determined using the chart below. A good outcome (as described in Row A below) is a 35% Schedule Loss of Use. Where defects exceed those described in Row A, add the value for the additional defect (using the value that most closely matches the defect in each column) to the base of 35% to calculate the total schedule loss of use award.

*Table 5.5 Shoulder Joint Replacement Schedule Loss of Use*

<b>Clinical Findings Following Partial or Total Shoulder Arthroplasty and Corresponding SLU Ratings of the Arm</b>				
<b>Overall Assessment Grade</b>	Shoulder flexion or abduction (degrees)	Atrophy (measured at mid-arm compared to the contralateral side)	Chronic complications requiring ongoing treatment e.g. chronic infection(s), revision, recurrent dislocation	SLU of arm
<b>Good (A)</b>	≥ 135	≤ 1 inch	N/A	35%
<b>Fair (B)</b>	90° (add up to 10%)	1.5 to 2 inches (add up to 5%)	N/A	
<b>Poor (C)</b>	≤ 45 (add up to 30%)	> 2.5 inches (add up to 10%)	Present (add up to 10%)	Maximum of 80%

**Example:**

An individual has a shoulder replacement surgery. At the time of maximum medical improvement, the medical provider found there was a good outcome with full range of motion but there was some atrophy present. Overall SLU value would be determined by starting with the initial value for a good outcome (35%) and if atrophy measurement was:

- 1.5 inches less than the contralateral side, add 5% for the atrophy (overall SLU value for this individual would be 40%).
- Greater than 2.5 inches from the contralateral side, add 10% (overall SLU of 45%).

**5.6 Amputation**

Amputation from elbow to shoulder equals 100% loss of use of arm.

## Chapter 6: Hip and Femur

### 6.1 Objectives for Determining Impairment for Hip and Femur

The hip joint with surrounding structures enables daily activities of walking, stair climbing and running. The hip is a ball and socket joint located where the femur meets the pelvis. The ball and socket construct gives a wide range of motion to the hip second only to the shoulder.

The objective is to accurately assess the permanent residual physical defects a claimant suffered as a result of his/her injury. To the degree possible, the assessment should be based on objective findings determined by the history and physical examination, as well as the results of any appropriate diagnostic testing.

### 6.2 Methods Available to Assess Permanent Impairment

Determination of the degree of permanent residual physical defect should be performed at the time of maximum medical improvement, the point at which no further healing is expected. Maximum medical improvement should be determined based on the outcome of the clinical course of treatment, the medical provider's expertise and any further treatment options available to the claimant. When evaluating the level of permanent residual physical defect, the medical provider should consider the contralateral extremity where appropriate and expected/normal values. The duration of time from the injury to maximum medical improvement may vary, but in most cases is one year from the injury or last surgery.

The severity of the permanent residual physical defect is not based on the mechanism of injury. It reflects the permanent residual physical defect at the time of maximum medical improvement and may include physical damage to bone, muscles, cartilage, tendons, nerves, blood vessels, and other tissues.

### 6.3 Hip Range of Motion

Hip motions include:

1. **Abduction** - Range of motion in the coronal plane rotating about an imaginary line of an axis through the head of the femur. The normal range of motion is through 45 degrees. (The lower extremity moves to the side away from the midline.)

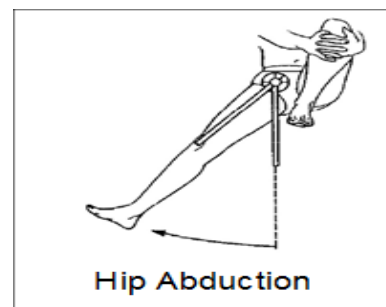


Figure 6.3(1)

- Adduction** - Range of motion in the coronal plane rotating about an imaginary line of an axis through the head of the femur. The normal range of motion is through 35 degrees. (The lower extremity moves across the midline.)



Figure 6.3(2)

- Internal Rotation** - The lower extremity is in partial flexion with the foot planted on the examination table. The hip is rotated so that the knee crosses over the opposite extremity. The normal range of motion is through 45 degrees.

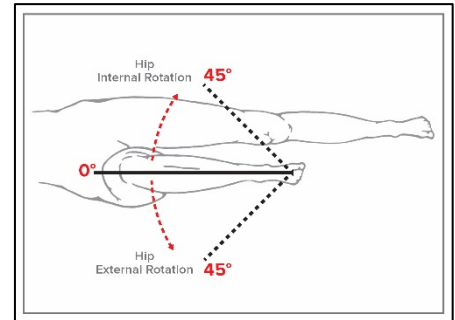


Figure 6.3(5) and (6)

- External Rotation** - The lower extremity is in partial flexion with the foot planted on the examination table. The hip is rotated so that the knee moves away from the opposite extremity. The normal range of motion is through 45 degrees.

- Flexion (forward elevation)** - Range of motion that is in the sagittal plane rotating about an axis of an imaginary line through the acetabulum with the flexed knee moving in front of and above the waist. The normal range of motion is through 120 degrees.

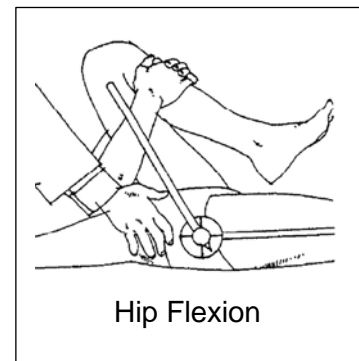


Figure 6.3(3)

6. **Extension** - Range of motion in the sagittal plane rotating about an axis of an imaginary line through the acetabulum with the leg moving behind the body to 30 degrees. Patient is in the prone position and the lower extremity is lifted off the examination table

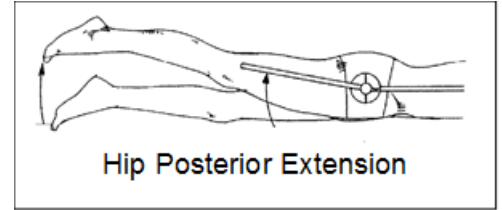


Figure 6.3(4)

## 6.4 Calculating Loss of Use

To determine the overall schedule loss of use of the hip, first assess whether any special considerations apply. If not, to determine the overall schedule loss of use of the hip, add abduction/adduction (A) + internal/external rotation (B) + flexion (C), to the extent there are defects in these ranges of motion. Other defects may be considered per notes below. When evaluating based on range of motion, schedule cannot exceed value for ankylosis.

*Table 6.4 Hip*

**Percent Loss of Use of Hip**  
**Instructions: To the extent there are defects add A+B+C; for other defect values see notes.**  
**Maximum value cannot exceed the value for ankylosis.**  
**Schedule loss of use percentages for ranges of motion values above/below**  
**those depicted here should be adjusted proportionally.**

	ROM	Mild	Moderate	Marked	Ankylosis
<b>A*</b>	Abduction ROM: 0 – 45°	7½ - 10%  ROM: 35°	15 - 17½%  ROM: 25°	20 - 25%  ROM: 15°	Ankylosis at 0 degrees at hip joint equals 80% loss of use of the leg. Higher schedule given for abnormal positions.
	Adduction ROM: 0 – 35°	ROM: 25°	ROM: 20°	ROM: 10°	
<b>B*</b>	Internal Rotation ROM: 0 – 45°	7½ - 10%  ROM: 35°	10 - 15%  ROM: 25°	20 - 25%  ROM: 15°	
	External Rotation ROM: 0 – 45°	ROM: 35°	ROM: 25°	ROM: 15°	
<b>C</b>	Flexion	10%  ROM: 90°	33 ⅓%  ROM: 45°	66 ⅔%  ROM: 25°	
	ROM: 0 – 120°				

*\*Use lower figure for one defect and higher figure when both are affected.*

**Notes:**

- Abduction and Adduction: Complete loss of both equals 33 ⅓% loss of use of the leg.
- Internal and External Rotation: Complete loss of both equals 30% loss of use of the leg.
- Defects in posterior extension equals 7½-10% loss of use of the leg.

## 6.5 Special Considerations

The following are special considerations that have enumerated schedule loss of use values. Other defects may be added when specified or when no schedule value is provided. However, the maximum schedule loss of use value cannot exceed the value of ankylosis.

1. Excision of the head and neck of the femur without prosthetic replacement equals 50% of use of the leg for anatomical loss. Add for mobility defects.
2. Synovitis of the hip, bursitis (Iliopsoas bursa, trochanteric bursa, ischiogluteal bursa) as identified on MRI study; schedule award is 0-7½% loss of use of the leg. Date of evaluation two or more years from the date of injury
3. Fractured pelvis could be given a schedule award at end of two years if there is residual impairment to the hip, such as restriction defects of mobility of the hip joint and atrophy of muscles of the thigh. (Schedule may be 15-20% loss of use of the leg.)
4. Shortening or lengthening of the leg equals 5% loss of use of the leg for 1/2 inch, 7½% for 3/4 inch and 10% for 1 inch.
5. Quadriceps rupture: allow 15 to 20% for deformity and weakness. Add for mobility defects. Average schedule is 20 to 25% loss of use of the leg. If laxity of the knee is present, consider a higher schedule.
6. Quadriceps atrophy with weakness of extension of the knee equals 10% loss of use of the leg.
7. Amputee with 100% loss of use of the leg can receive an additional schedule award for a second accident or consequential injury (e.g., hip fracture).
8. Hip fracture with or without surgery requires two years before final evaluation for schedule award. Request for up to date X-ray of the femoral head to evaluate bone stock and to investigate for loosening and displacement/malalignment of hardware. In the event metallic hardware is removed, evaluate for schedule no sooner than six months after removal; such evaluation shall be no sooner than two years from date of hardware insertion.
9. Total or partial osteotomy, hip arthroplasty or replacement: The objective is to restore function of the joint. Results are assessed after a minimum of twelve months after surgery, as clinically significant changes in functions can occur before this timeframe.

The schedule is given based upon the medical assessment of:

- range of motion (hip flexion),
- leg position (includes leg length discrepancy [as measured, in the supine position, from umbilicus to the tip of the distal medial malleoli] and/or mal-rotation),
- atrophy (measured at the mid-thigh as comparison for the contralateral side), and
- presence of chronic complications, according to the table below (unless appropriate for classification).

Schedule loss of use values are determined using the chart below. A good outcome (as described in Row A below) is a 35% schedule loss of use. Where defects exceed those described in Row A, add the value for the additional defect (using the value that most closely matches the defect in each column) to the base of 35% to calculate the total schedule loss of use award.

*Table 6.5*

**Full or Partial Hip Replacement Schedule Loss of Use**

<b>Clinical Findings following Hip Hemiarthroplasty, Total Hip Arthroplasty, and Hip Resurfacing and Corresponding SLU Ratings of the Leg</b>					
<b>Overall Assessment Grade</b>	Hip flexion (degrees)	Position (includes leg length discrepancy or mal-rotation, use whichever defect is greater)	Atrophy (measured at mid-thigh, compared to the contralateral side)	Chronic complications requiring ongoing treatment e.g. chronic infection(s), revision, recurrent dislocation	SLU of leg
<b>Good (A)</b>	≥ 90°	Leg length discrepancy < 0.5 inches and/or ≤ 10 degrees rotation	≤ 1 inch	N/A	35%
<b>Fair (B)</b>	45°	Leg length discrepancy of ≤ 0.75 inches and/or 10-15 degrees rotation	1.5 to 2.5 inches	N/A	
<b>Poor (C)</b>	(add up to 10%) ≤ 25°  (add up to 35%)	(add up to 5%) Leg length discrepancy ≥ 1 inches and/or > 15-degrees rotation  (add up to 10%)	(add up to 5%) > 3  (add up to 10%)	Present  (add up to 10%)	Maximum value is 80% (Ankylosis)

**Example:**

An individual has hip replacement surgery. At the time of maximum medical improvement, the medical provider found there was a fair outcome. Individual has more limited range of motion in flexion (ROM to 45 degrees), leg length discrepancy of .8 inches and 20 degrees mal-rotation present.

- Value of the replacement would start at 35%.
- Add 10% for higher flexion defect (45 degrees).

- Add 10% for the mal-rotation (20 degrees).
- The overall SLU value for this individual would be 55%.

## **6.6 Amputation**

Amputation at any level from the knee joint to the hip joint equals 100% loss of use of the leg.



## Chapter 7: Knee and Tibia

### 7.1 Objectives for Determining Impairment for Knee and Tibia

The knee functions to support body weight and enable the body to be lowered to the ground with knee flexion and raised with knee extension. Knee function enables ambulation and its rotational abilities enable the body to twist.

The objective is to accurately assess the permanent residual physical defect a claimant suffered as a result of his/her injury. To the degree possible, the assessment should be based on objective findings determined by the history and physical examination, as well as the results of any appropriate diagnostic testing.

### 7.2 Methods Available to Assess Permanent Impairment

Determination of the degree of permanent residual physical defect should be performed at the time of maximum medical improvement, the point at which no further healing is expected. Maximum medical improvement should be determined based on the outcome of the clinical course of treatment, the medical provider's expertise and any further treatment options available to the claimant. When evaluating the level of permanent residual physical defect, the medical provider should consider the contralateral extremity where appropriate and expected/normal values. The duration of time from the injury to maximum medical improvement may vary, but in most cases is one year from the injury or last surgery.

The severity of the permanent residual physical defect is not based on the mechanism of injury. It reflects the permanent residual physical defect at the time of maximum medical improvement and may include physical damage to bone, muscles, cartilage, tendons, nerves, blood vessels, and other tissues.

### 7.3 Knee Range of Motion

1. **Flexion** - Measured with the patient sitting, extend the knee forward to the fullest extent. Bringing the heel of the foot back towards the chair as far as possible, measuring the angle between the axis of the femur and the axis of the fibula. Total range of motion is from full extension (0 degrees) through 140 degrees (full flexion).

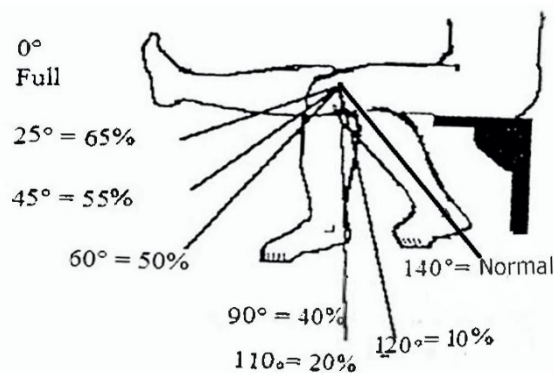
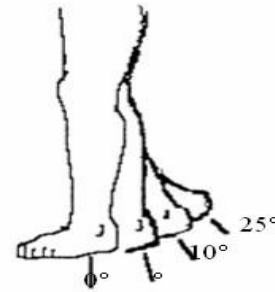


Figure 7.3(1) Knee Flexion

2. **Extension** - Measured with the patient standing and the knee straightened to the fullest extent; an extension defect is the angle of loss from zero (normal).



0° = Full Extension  
 10° = 7 1/2 - 10%  
 25° = 10% Leg

**Figure 7.3(2) Knee Extension**

## 7.4 Calculating Loss of Use

To determine the overall schedule loss of use of the knee, first assess whether any special considerations apply. If not, consider defects in flexion (A) or extension (B) per the chart below if applicable. When evaluating based on range of motion, schedule cannot exceed value for ankylosis.

**Table 7.4 – Knee**

**Percent Loss of Use of Knee**

**Instructions: To the extent there are defects select one from the table below.**

**Maximum value cannot exceed the value for ankylosis (70%).**

**Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.**

ROM	Mild	Moderate	Marked	Ankylosis
Flexion (A) ROM: 0-140°	10% ROM: 120°	40% ROM: 90°	55% ROM: 45°	Ankylosis at 0 degrees equals 70% loss of use of the leg.  Higher schedule is given for abnormal flexion ankylosis.
Extension (B) ROM: 0°	7½ - 10% ROM: 10 - 25°			
Both	10 - 15%	40 - 45%	66 ⅔%	

## 7.5 Special Considerations

The following are special considerations that have enumerated schedule loss of use values. Other defects may be added when specified or when no schedule value is provided. However, the maximum schedule loss of use value cannot exceed the value of ankylosis.

1. Patella: Total excision equals 15% loss of use of the leg; partial excision equals 7½ - 10%. Add for mobility defects and atrophy of muscles.
2. Patella fracture with internal fixation equals 7½ - 10% loss of use of the leg.
3. Recurrent dislocation of the patella with or without surgery equals 10-15% loss of use of the leg predicated upon the extent of residual impairment.
4. Chondromalacia patella, mild to marked degree, equals 7½ - 10% loss of use of the leg, depending on the defects of motion and atrophy of muscles found.
5. Prepatellar or infrapatellar bursitis equals 0 - 7½ % loss of use of the leg.
6. Rupture of the quadriceps tendon and patella ligament equals 10 - 15% loss of use of the leg.
7. Fracture of tibial plateau equals 10 - 15% loss of use of the leg.
8. Osteochondritis desiccans with or without surgery equals 7½ - 10% loss of use of the leg predicated upon the extent of residual impairment.
9. Instability of the knee cannot be scheduled unless corrected by surgical reconstruction. If surgery fails and instability persists which will require the use of a brace, consider classification. Laxity of the ligaments (anteroposterior or lateral medial) is given a schedule loss of use of the leg.
10. In non-functional prosthesis of an amputee with residual symptoms and complications, such as neuroma, phantom pain and chronic ulcers, consider classification.
11. Recurrent locking of the knee may not be amenable for schedule and should be disposed as a classification.
12. Tibial shaft fracture healed and no malalignment equal 0 - 10% loss of use of the leg.
13. Full or partial knee arthroplasty or replacement: The objective is to restore function of the joint. Results are assessed no sooner than twelve months after surgery, as clinically significant changes in functions can occur before this timeframe. Schedule is given based upon:
  - ROM as measured by flexion and extension (using whichever is greater degree of impairment);
  - Position:
    - alignment (varus or valgus deformity), or
    - stability (medial/ lateral [ML] laxity), or
    - anteroposterior (AP) motion; or
    - leg length (LL)
  - Atrophy (measured at mid-calf compared to the contralateral side); and
  - Presence of chronic complications, according to the table below (unless classification is appropriate).

Schedule loss of use values are determined using the chart below. A good outcome (as described in Row A below) is a 35% schedule loss of use. Where defects exceed those described in Row A, add the value for the additional defect (using the value that most closely matches the defect in each column) to the base of 35% to calculate the total schedule loss of use award.

**Table 7.5**

**Full or Partial Knee Replacement Schedule Loss of Use**

<b>Clinical Findings following Full or Partial Knee Arthroplasty/Replacement and Corresponding SLU Ratings of the Leg</b>					
<b>Overall Assessment Grade</b>	<b>ROM: • Flexion (F) or Extension (E)  Use whichever defect is greater.</b>	<b>Position: Measured by • alignment (Varus or valgus deformity), or • stability (medial/ lateral (ML) laxity) or • anteroposterior (AP) motion • Leg Length (LL)  Use whichever defect is greater.</b>	<b>Atrophy (measured at mid- calf compared to the contralateral side)</b>	<b>Chronic complications requiring ongoing treatment e.g. chronic infection(s), revision, recurrent dislocation</b>	<b>SLU of leg</b>
<b>Good (A)</b>	<ul style="list-style-type: none"> <li>• F: <math>\geq 105^\circ</math></li> <li>• E: <math>&lt; 10^\circ</math></li> </ul>	<ul style="list-style-type: none"> <li>• Malalignment <math>\leq 10^\circ</math>,</li> <li>• ML laxity <math>\leq 10^\circ</math>, or</li> <li>• AP: <math>\leq 5</math> mm</li> <li>• LL <math>&lt; 0.5</math>-inch shortening</li> </ul>	$\leq 1$ inch	N/A	35%
<b>Fair (B)</b>	<ul style="list-style-type: none"> <li>• F: <math>90^\circ</math></li> <li>• E: <math>15^\circ</math></li> </ul> (add up to 10%)	<ul style="list-style-type: none"> <li>• Malalignment <math>15^\circ</math>,</li> <li>• ML laxity <math>14^\circ</math></li> <li>• AP: 9 mm</li> <li>• LL 0.75-inch shortening (add up to 5%)</li> </ul>	1.5 to 2.5 inches  (adds up to 5%)	N/A	
<b>Poor (C)</b>	<ul style="list-style-type: none"> <li>• F: <math>30^\circ</math></li> <li>• E: <math>\leq 20^\circ</math></li> </ul> (Add up to 30%)	<ul style="list-style-type: none"> <li>• Malalignment <math>&gt;15^\circ</math>,</li> <li>• ML <math>&gt; 15^\circ</math>, or</li> <li>• AP: <math>&gt;10</math> mm</li> <li>• LL: <math>\geq 1</math>-inch shortening (add up to 10%)</li> </ul>	$> 3$  (add up to 10%)	Present  (add up to 10%)	Maximum capped at 80%

**Example:**

An individual has a knee replacement surgery. At the time of maximum medical improvement, the medical provider found there was a poor outcome with very limited flexion (limited to 30°) and a malalignment of 15°.

- Value of the replacement would start at 35%.
- Add 30% for high flexion defect (30°).
- Add 5% for malalignment (15 degrees).

The overall SLU value for this individual would be 70%.

## **7.6 Amputation**

Amputation at knee joint equals 100% loss of use of the leg; at six inches below the knee equals 95%; at mid-calf equals 90%. In case of subsequent injury an amputee who has received a 100% loss of use of leg may receive an additional schedule award.

## **Chapter 8: Lower Extremities – Ankle and Foot**

### **8.1 Objectives for Determining Impairment for Ankle and Foot**

The ankle is a mortise joint formed by the distal tibia and fibula that provides lower limb stability and facilitates ambulation through movement of the foot. The foot acts during the gait cycle as both a shock absorber during heel strike and rigid platform during toe off. Dorsiflexion of the ankle is required to climb and descend stairs while plantarflexion serves to elevate the body and depress pedals to operate vehicles or machinery.

The objective is to accurately assess the permanent residual physical defects a claimant suffered as a result of his/her injury. To the degree possible, the assessment should be based on objective findings determined by the history and physical examination, as well as the results of any appropriate diagnostic testing.

### **8.2 Methods Available to Assess Permanent Impairment**

Determination of the degree of permanent residual physical defects should be performed at the time of maximum medical improvement, the point at which no further healing is expected. Maximum medical improvement should be determined based on the outcome of the clinical course of treatment, the medical provider's expertise and any further treatment options available to the claimant. When evaluating the level of permanent residual physical defects, the medical provider should consider the contralateral extremity where appropriate and expected/normal values. The duration of time from the injury to maximum medical improvement may vary, but in most cases is one year from the injury or last surgery.

The severity of the permanent residual physical defect is not based on the mechanism of injury. It reflects the permanent residual physical defect at the time of maximum medical improvement and may include physical damage to bone, muscles, cartilage, tendons, nerves, blood vessels, and other tissues.

### 8.3 Ankle Range of Motion

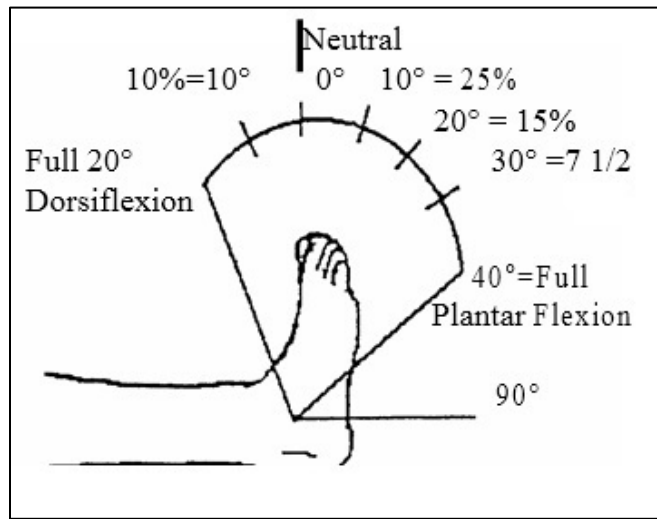


Figure 8.3 (a) Percent Loss of Use of the Foot: Flexion Defects of the Ankle

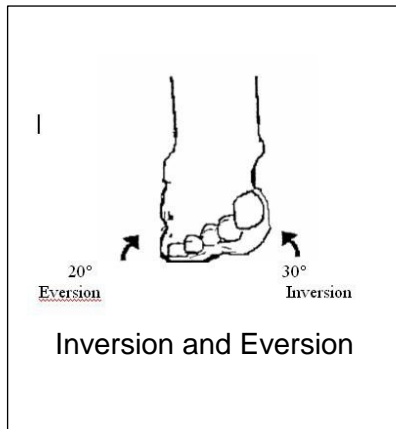


Figure 8.3 (b) Subtalar Joint Motion

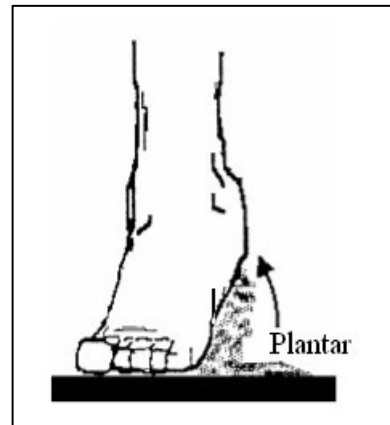


Figure 8.3 (c) Plantar Motion

## 8.4 Calculating Loss of Use of the Foot

To determine the overall schedule loss of use of the foot, first assess whether any special considerations apply. If not, add defects in plantar and dorsi flexion, if present. Other defects, if present, may be considered per the additional tables below. Range of motion values cannot exceed the value of ankylosis.

*Table 8.4(a) Foot*

**Percent Loss of Use of Foot**  
**Instructions: To the extent there are defects, add A + B; other defect values may be considered as noted below.**  
**Marked defects in all cannot exceed 50-55%.**  
**Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.**

ROM	Mild	Moderate	Marked	Ankylosis
Plantar Flexion (A) ROM: 0 - 40°	7 ½ % ROM: 30°	15% ROM: 20°	25% ROM: 10°	Ankylosis at 0° equals 60% loss of the foot. Give higher schedule when not in functional position.
Dorsi Flexion (B) ROM: 0 - 20°	7 ½ % ROM: 12.5°	15% ROM: 7.5°	25% ROM: 5°	

*Table 8.4(b) Other defects*

Defect	% Loss of Use of the Foot
Marked defects of both plantar and dorsi flexion	40%
Marked defects of both inversion and eversion	25%
Moderate defects of both inversion and eversion	17½%
Mild defects of both inversion and eversion	10%
Mild defect of inversion alone	7½%
Mild defect of eversion alone	7½%

*Table 8.4(c) Complete Loss*

Complete Loss	% Loss of Use of the Foot
Plantar flexion alone	35%
Doris flexion alone	35%
Inversion alone	20%
Eversion alone	10%
Both eversion and inversion	35%



## **8.5 Special Considerations**

The following are special considerations that have enumerated schedule loss of use values. Other defects may be added when specified or when no schedule value is provided. However, the maximum schedule loss of use value cannot exceed the value of ankylosis except for special considerations three and four.

1. Schedule losses must be substantiated by determination of residual permanent defects; consider tissue loss, mobility defects, sensory and motor loss, and impaired function.
2. Os calcis fracture equals an average schedule of  $33\frac{1}{3}$ -40% loss of use of the foot depending on residual mobility defects. If loss of height of the heel results in shortening of the leg, a leg schedule should be given.
3. Ankle fusion equals 75% loss of use of the foot which exceeds 60% for ankylosis if additional toe defects are present.
4. Complete foot drop equals  $66\frac{2}{3}$ % loss of use of the foot and partial foot drop equals  $20 - 33\frac{1}{3}$ %.
5. Consider a higher schedule award for severe residual neurological defect.
6. Rupture of the Achilles tendon equals an average 20-25% loss of the foot.
7. Malleolar fractures (bimalleolar or trimalleolar) equals an average 20-30% loss of the foot.

## **8.6 Amputation**

Amputation at the ankle joint equals 75% schedule loss of use of the leg.

## **Chapter 9: Lower Extremity – Great and Lesser Toes**

### **9.1 Objectives for Determining Impairment for Toes**

The toes, particularly the great toe, provide stability during regular walking and facilitate stance. They also provide support when attempting elevated reaching. When more than one toe is injured, it may be considered as an overall impact on the foot.

The objective is to accurately assess the permanent residual physical defect a claimant suffered as a result of his/her injury. To the degree possible, the assessment should be based on objective findings determined by the history and physical examination, as well as the results of any appropriate diagnostic testing.

### **9.2 Methods Available to Assess Permanent Impairment**

Determination of the degree of permanent residual physical defect should be performed at the time of maximum medical improvement, the point at which no further healing is expected. Maximum medical improvement should be determined based on the outcome of the clinical course of treatment, the medical provider's expertise and any further treatment options available to the claimant. When evaluating the level of permanent residual physical defect, the medical provider should consider the contralateral extremity where appropriate and expected/normal values. The duration of time from the injury to maximum medical improvement may vary, but in most cases is one year from the injury or last surgery.

The severity of the permanent residual physical defect is not based on the mechanism of injury. It reflects the permanent residual physical defect at the time of maximum medical improvement and may include physical damage to bone, muscles, cartilage, tendons, nerves, blood vessels, and other tissues.

### **9.3 Maximum Rating of Body Part**

These Guidelines are to be used for evaluating permanent residual physical defect of the great and lesser toes. Single toe loss/impairment must be determined based on the impairment to the great or lesser toe alone and not as part of the foot. When multiple toe impairments are considered together in one comprehensive rating, the total impairment cannot exceed 100% of the next largest major member. Therefore, the loss of multiple toes, resulting in conversion to a foot impairment, may not exceed 100% schedule loss of use of the foot.

## 9.4 Great Toe

The great toe provides stability during regular walking and facilitates unilateral stance. Extension of the toe provides significant support when attempting elevated reaching. It has two major joints:

- MTP - Metatarsophalangeal joint
- IP - Interphalangeal Joint

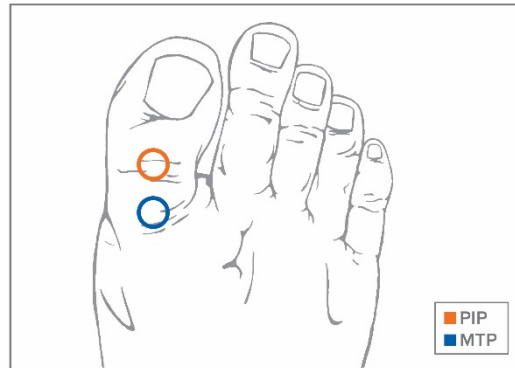


Figure 9.4 Great Toe

### 9.4 (A) Calculating Loss of Use of Great Toe

Table 9.4 (A) Great Toe

**Percent Loss of Use of Great Toe**

**Instructions:** To the extent that there are defects, select one from table below.  
Maximum value cannot exceed ankylosis.

Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.

Great Toe	Mild	Moderate	Marked	Ankylosis
IP Joint Normal ROM Flexion: 0 - 90°	10 - 15% ROM: 75 °	20 - 25% ROM: 45 °	40 - 45% ROM: 25°	Loss of active flexion or ankylosis at IP joint equals 50% loss of use of the great toe. Loss of active flexion and/or ankylosis at MTP joint equals 75% loss of use of the great toe.
MTP Joint* Normal ROM Flexion: 0 - 45° Extension: 0 - 70°	15 - 20% F - ROM: 35 ° E - ROM: 55 °	25 - 30% F - ROM: 25° E - ROM: 35 °	45 - 50% F - ROM: 15° E - ROM: 20°	
Both Joints	20 - 30%	40 - 50%	80 - 90%	

\* Use lower figure for one defect (flexion/extension) and higher figure for both.

## 9.5 Smaller Toes (Second, Third, Fourth & Fifth)

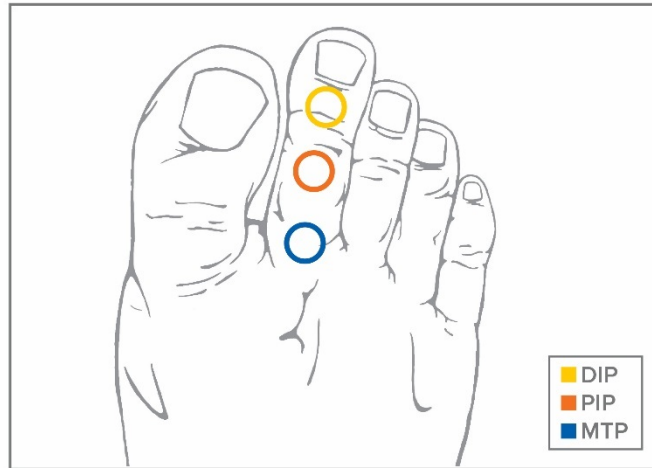


Figure 9.5 Great Toe

### 9.5 (A) Calculating Loss of Use of Smaller Toes

*Table 9.5(A)(1) Smaller Toes*

**Percent Loss of Use of Smaller Toes**

**Instructions: To the extent there are defects, add A + B + C.**

**Maximum value cannot exceed ankylosis (see table below).**

**Schedule loss of use percentages for ranges of motion values above/below those depicted here should be adjusted proportionally.**

	Joint	Mild	Moderate	Marked
A*	DIP	10 - 15%	20 - 25%	40 - 45%
B*	PIP	15 - 20%	25 - 30%	45 - 50%
C*	MTP	20 - 25%	30 - 40%	50 - 90%

Note: Marked, moderate, mild (DIP, PIP, MTP) are given the same schedule values as the DIP, PIP, MCP joints of the fingers.

\* Use lower figure for one defect (flexion/extension) and higher figure for both.

*Table 9.5 (A)(2)*  
**Percent Loss of Use of the Toe**  
**Amputations, Ankylosis or Loss of Active Motion**

At DIP Joint	50% loss of use of the involved toes
At PIP Joint	75% loss of use of the involved toes
At MTP Joint	90-100% loss of use of the involved toes

## **9.6 Amputations and Loading**

1. Great toe amputation of the distal phalanx/distal interphalangeal joint equals 50% loss of use of the great toe.
2. Great toe amputation of a major portion of the great toe distal phalanx equals 50% loss of use of the great toe.
3. Great toe amputation at the metatarsophalangeal joint and/or proximal phalanx equals 100% loss of use of the great toe.
4. Amputations of two or more toes are loaded 50% and converted to a foot schedule.
5. In the presence of bone loss through the metatarsals, the load is 100% of each affected toe.
6. When three or more toes have defects and without bone loss, the load is 25%.
7. Amputation through the five metatarsals is loaded to 100% and converted to a foot schedule.

(Note) Refer to Section 2.6 for instructions regarding loading.

# **Chapter 10: Central Nervous System Conditions, Peripheral Nerve Injuries and Entrapment / Compression Neuropathies**

## **10.1 Central Nervous System - Cranial Nerves**

### **A. First Nerve**

Anosmia may be a sequelae of frontal trauma (coup or contra coup) due to fracture of the cribriform plate or injury to the perforating filaments of cranial nerves. Most common cause of anosmia is an upper respiratory infection. Anosmia may be clinically related to a fracture of the ethmoid.

### **B. Third, Fourth & Sixth Nerve**

Anisocoria due to trauma with Third Nerve involvement and lid droop (ptosis) may occur as well as involvement of the ciliary ganglion branches (sphincter of iris) with dilatation and reflex iridoplegia. If complete, the eye is turned outward/downward and the pupil is dilated. Fourth Nerve palsy results in diplopia looking downward (palsy of the superior oblique). With Sixth Nerve palsy there is a weakness or paralysis of abduction with a convergent squint. The clouding of the cornea, aphakia or other sequelae of eye injury may result in a permanent facial disfigurement.

### **C. Fifth Nerve**

Any of the three branches: -- ophthalmic, maxillary or mandibular -- may be associated with a basal skull fracture due to trauma. Etiology of trigeminal neuralgia (douloureux) is not clear. Although disabling, it is not usually compensable. Bite function (masseters muscle) is the motor component of the Fifth Nerve.

### **D. Seventh Nerve**

Traumatic injuries in the upper neck or face may involve the facial nerve. There is a loss of volitional and emotional movement of the affected side. There is an inability to elevate the eyebrow, frown, close the eye, show teeth, whistle, or purse the lips. In attempting to close the eyes the globe rolls upwards (Bell's phenomenon); on drinking, fluid spills from the affected side. If the stapedius muscle is affected there may be hyperacusis. Etiology of Bell's Palsy is unknown. Possible cause could be swelling of the stylomastoid foramen. At times it is viral with eruptions (Herpes Zoster) in the external auditory canal (Ramsey Hunt Syndrome). The etiology is obvious and not compensable. As a rule it is not a compensable injury unless there is facial or appropriate neck injury. Loss of taste on up to  $\frac{2}{3}$  of the ipsilateral tongue may occur.

### **E. Eighth Nerve**

Eighth Nerve Components - cochlear (auditory) and vestibular (equilibrium). Unilateral loss is not that disabling but partially so. Bilateral loss is very disabling because of an impairment of communication. This can be a rather severe industrially related disability.

### **F. Ninth, Tenth and Eleventh Nerve**

Not usually related to compensable injuries.

### **G. Twelfth Nerve**

Unilateral loss is not really disabling and is usually related to a brainstem infarction and not trauma.

## **10.2 Peripheral Nervous System**

### **A. Plexopathies**

Brachial plexus injury is most frequently due to excessive stretching and compression, such as carrying heavy weights or being in a prolonged position during anesthesia, or to gunshot wounds. Avulsion of the cervical nerve root can produce a similar picture. Vehicular trauma may at times result in a complete brachial plexopathy with a paralyzed arm and total absence of reflexes.

A severe brachial plexopathy may cause a temporary total disability due to severe loss of function and pain. A milder involvement may result in a partial disability but wait for at least two years to see if defects ensue which might lead to a permanent disability or a schedule loss.

Upper brachial plexopathy affects the biceps, deltoid, supinator longus, brachialis, supraspinatus, infraspinatus and rhomboid muscles, and results in a sequelae with the arm hanging to the side and internally rotated. Hand motion is unaffected. Prognosis for recovery is good, although at times return of function is not complete. Reevaluate after two years for return of function, at which time it may be amenable for a schedule loss of use of the arm.

Lower brachial plexopathy can be associated with surgery or falls on the abducted arm. There is weakness and wasting of the small muscles of the hand and may result in a cases are usually given a high schedule loss of use of the hand.

Brachial plexopathies, even after a rib resection, usually lend themselves to a final adjustment after a two-year period. Persistent severe weakness and intractable pain might necessitate considering a partial disability which might lead to a classification.

### **B. Thoracic Outlet Syndrome**

Thoracic outlet syndrome may be related to an anomalous cervical rib, anterior scalene hyperplasia and to hyperabduction. An anomalous cervical rib arising from the 7th cervical vertebra can extend laterally between the anterior and medial scalene muscles disturbing the outlet and compressing the brachial plexus. The subclavian artery can also be compressed. Five tenths percent of the population have cervical ribs, ten percent of which are symptomatic. Sagging shoulders may have significance in women; occupational activities may play a part both in males and females. Pain and paresthesia are most commonly found. Adson's sign is helpful in making the diagnosis. The technique of performance of the test for obstruction of the subclavian artery by the scalenus anticus muscle is as follows: claimant is seated with elbows at sides and neck extended. During deep inspiration the chin is turned downwards towards the affected side while the radial pulse is palpated and there may be total obliteration. Nerve conduction studies and angiography may not be too helpful in making the diagnosis. It can be confused with cervical discs, carpal tunnel syndrome or ulnar nerve compression at the elbow. If corrected (e.g., through surgery or other modalities of treatment) and if mild symptoms and mild neurological defect remain, it is amenable to schedule loss of use of the arm; if symptoms and defects are severe and disabling, then consider classification.

## **10.3 Entrapment / Compression Neuropathies**

Pathophysiology: a nerve passing through a tight canal trapped and subjected to constant movement or pressure. The epi and perineurium become greatly thickened strangling the nerve with ischemic damage. Sensory, more than motor function, is impaired and symptoms fluctuate with activity and rest.

### **A. Median Nerve – Carpal Tunnel Syndrome**

This is the most common of peripheral nerve entrapment syndromes in the upper limb. The etiology is generally a compression of the median nerve due to thickening of the synovium around the flexor tendons at the wrist, i.e., hematoma, callus formation, malunited fractures, etc. Symptoms may include atrophy of the thenar eminence, tingling and numbness of the first three and one half fingers, weakness in opposition of the thumb, positive Tinel's test and positive Phalen's test.

Carpal Tunnel Syndrome with or without decompression is usually given a schedule loss of the hand, which usually averages 10-20% loss of use. If symptoms persist and condition becomes disabling, consider classification.

### **B. Ulnar Nerve – Cubital Tunnel Syndrome**

#### **Elbow**

The ulnar nerve is subject to direct trauma in the elbow because of its superficial position being covered by fascia and skin only. It can be one big trauma or multiple small traumata (i.e., constant pressure on the elbow). Pressure may occur during anesthesia but more commonly the nerve is injured by being drawn tightly against the ulnar groove. The nerve is tethered as it passes through the two heads of the carpi ulnaris. Signs and symptoms are (a) burning pains and hypesthesia in the ring and small fingers, (b) inability to separate fingers due to interosseous weakness - a major portion of intrinsic muscles of the hand affected, (c) ring and small fingers are cocked up due to weakness of the flexor digitorum profundus at the MCP joint (hyperextension), (d) the hypothenar eminence flattens out due to loss of bulk. Ulnar nerve transposition is the treatment of choice. Entrapment of the ulnar nerve at the elbow is usually given a schedule loss of use of the arm if accompanied with defects at the elbow. If neurological defects and defects of motion are confined to the hands and fingers, schedule loss of use of the hand is given.

#### **Wrist**

Wrist injury of the ulnar nerve: the palmar trunk and superficial branches are subject to direct trauma by force directed against the base of the hypothenar eminence as the bone rests on the thinly padded bone. The force may be a repetitive one as from use of a particular tool or instrument in industry such as pliers or a screwdriver. Another repetitive trauma can be from using a cane, crutches or pressure from using a splint. The most significant symptom at this level is weakness of the pinch power of the thumb and sensory loss occurs in the ring and small fingers.

### **C. Anterior Interosseous (Pronator Teres Syndrome)**

This syndrome can occur due to compression of the median nerve as it passes through the heads of the pronator teres muscles.



Etiology: Most common is direct trauma by a heavy blow to the upper forearm. Reactive swelling of the muscles in this area can be caused by compressing the median nerve against the sublimis edge. Occult trauma such as forceful repeated pronation accompanying forceful finger flexion causes a hypertrophy of the pronator muscle which tautens the sublimis edge and compresses the median nerve.

Sensory loss is over the radial side of the palm and palmar side of the thumb, index, middle and radial half of the ring finger.

Motor findings include inability to pronate the wrist and loss of flexion of the IP joint of the thumb. In the Pronator Teres Syndrome, thenar atrophy is not as severe as in carpal tunnel syndrome. Such cases are usually given a schedule loss of use of the hand depending upon motor and sensory defects.

#### **D. Posterior Interosseous**

Posterior Interosseous nerve syndrome is a neuropathy of the deep muscular branch of the radial nerve. This usually manifests into two distinct entities: a motor syndrome and a rarer entity, a pain syndrome. The pain syndrome is also called radial tunnel syndrome, resistant tennis elbow and clinically resembles a painful tennis elbow.

Etiology: The posterior interosseous nerve can be compressed by a tumor, ganglia, elbow synovitis or trauma. The traumatic injury may be a dislocation of the elbow, fracture of the ulna with dislocation of the radial head and radial head fractures. The posterior interosseous nerve can be injured by the compression plates used in the open reduction of fractures of the proximal radius. Compression of the nerve usually occurs at the point of entrance to the supinator muscle under the arcade of Frohse.

The clinical features of the posterior interosseous nerve motor syndrome may manifest with complete or partial weakness of the muscles supplied by the nerve, extensor carpi radialis, extensor digitorum communis, extensor indicis proprius, abductor policis longus and brevis and extensor policis longus. There is usually weakness in extension of the wrist and is deviated radially. There will be weakness of the extension of the MCP joints of the fingers and thumb and weakness of abduction of the thumb radially.

Any residual neurological and functional defect are the criteria for schedule loss of use and is usually given to the hands. If the examiner finds a defect of the elbow joint that is causally related, the schedule loss of use is given to the arms.

#### **E. Lateral Femoral**

The lateral femoral cutaneous nerve is vulnerable to an entrapment neuropathy in the region of the anterior superior spine where it passes through the lateral end of the inguinal ligament. This is the binding point of the nerve. If the extremity is adducted, the nerve is tensed against the entrapment point. The ensuing neuropathy causes the burning type pain over the anterolateral thigh with some hypaesthesia.

Etiology: It can follow a direct trauma to the area or a fracture of the anterior ilium. It can be caused by a shortened limb (i.e., post hip replacement) with a pelvic tilt. This causes adduction of the opposite hip stretching the deep fascia and nerve against the entrapment point. Secretaries sitting with legs crossed for prolonged periods of time may not have the same symptoms.

Meralgia Paresthetica is uncommon in workers' compensation. It is usually amenable for a schedule loss of use of the leg if there is a residual sensory defect.

#### **F. Tarsal Tunnel Syndrome (Posterior Tibial Entrapment)**

It occurs behind and immediately below the medial malleolus. In this area the nerve is accompanied by tendons of the posterior tibialis, flexor hallucis longus and flexor digitorum longus muscles. The laciniate ligament roofs over the structure and converts the passageway into an osseofibrous tunnel. Tenosynovitis in this area can cause swelling acting as a space occupying lesion within the tarsal tunnel compressing the nerve.

Signs and symptoms include burning pain involving the toes and sole of the foot. If calcaneal branches are involved, pain is primarily in the heel. Pain may be referred along the sciatic axis to the buttock. History may furnish relevant trauma. There may be impairment of the flexion at the MTP joints of all the toes.

Pressure over the nerve may cause pain into the distribution of the posterior tibial nerve. Holding the heel in various positions may alleviate symptoms. Treatment is severing the flexor retinaculum.

Tarsal Tunnel Syndrome is quite common in Workers' Compensation. With or without surgery it is amenable for schedule loss of use of the foot depending upon residual defects of motion and neurological defect.

#### **G. Plantar (Morton's Metatarsalgia)**

Entrapment is produced by hyperextension at the metatarsophalangeal joints in the foot. It produces pain most frequently between the 3rd and 4th toes (Morton's neuroma). There is anesthesia at the tip of the toes, also tenderness of the nerve (Interdigital) as it crosses the deep transverse ligament. These nerves come up from the sole of the foot to reach the more dorsal termination on the toes. These nerves are triggered against the transverse ligament when the toes are hyperextended at the MTP joints. Initially there is radiating pain into the 3rd and 4th toes only while walking, then pain recurs spontaneously at night.

Morton's metatarsalgia is usually given a schedule loss of use of the foot.

#### **H. Complications of Plexus and Peripheral Nerve Injury**

Pain as in sensory radiculopathies may be referred to the scleratome (i.e., muscle, fascia, periosteum and bone) and leads to an immobilization of the secondary changes in a joint; for example, a frozen shoulder may complicate cervical spondylosis.

# Chapter 11: Visual System/Auditory System/Facial Scars and Disfigurement

## 11.1 Visual System Introduction

The purpose of this chapter is to provide criteria for use in evaluating permanent impairment resulting from dysfunction of the visual system, which consists of the eyes, ocular adnexa and the visual pathways. A method is provided for quantifying visual impairment resulting from a work-related injury. This can then be translated into a payment schedule.

The parameters for scheduling are: (1) loss of uncorrected or corrected visual acuity for objects at distance, (2) visual field loss and (3) diplopia. Evaluation of visual impairment is based on these three functions. Although they are not equally important, vision is imperfect without the coordinated function of all three.

Where there is a visible deformity related to the eye and face, this is scheduled on a per case basis.

The following equipment is necessary to test the functions of the eye:

1. Visual acuity test charts for distance vision; the Snellen test chart with letters and numbers, the illiterate E chart, or Landolt's broken-ring chart is desirable.
2. Either a Goldmann type or automated perimeter where the extent of visual field is recorded in degrees.
3. Refraction equipment or report of a recent refraction or recently prescribed glasses.
4. A hand held light with a red glass.
5. A slit lamp.
6. An ophthalmoscope.

### 11.1.1 Criteria and Methods for Evaluating Permanent Impairment

#### Central Visual Acuity

The chart or reflecting surface should not be dirty or discolored. The far test distance simulates infinity at 6 m (20 ft.) or at no less than 4 m (13 ft. 1 in.).

The central vision should be measured and recorded for distance with and without wearing conventional spectacles. The use of contact lens may further improve vision reduced by irregular astigmatism due to corneal injury or disease. In the absence of contraindications, if the patient is well adapted to contact lenses and wishes to wear them, correction by contact lenses is acceptable.

Visual acuity for distance should be recorded in the Snellen notation, using a fraction— where the numerator is the test distance in feet or meters – and the denominator is the distance at which the smallest letter discriminated by the patient would subtend 5 minutes of arc, that is, the distance at which an eye with 20/20 vision would see that letter. The fraction notation is one of convenience that does not imply percentage of visual acuity.

The procedure for determining the loss of central vision in one eye is as follows:

1. Measure and record best central visual acuity for distance with and without conventional corrective spectacles or contact lens.
2. Schedule according to the Table 1 for uncorrected or corrected visual loss (in the injured eye) whichever is greater.

**Table 11.1 (a) Visual Loss**

Visual Acuity	Schedule %
20/20	0
20/20-1	5
20/20-2	7½
20/20-3	10
20/20-4	15
20/25	20
20/25-1	22½
20/25-2	25
20/30	33 ⅓
20/30-1	35
20/30-2	37½
20/30+1	30

Visual Acuity	Schedule %
20/30 + 2 or 3	27½
20/40	50
20/40+2	45
20/40+3	40
20/40-1 or 2	51½
20/40-3	55
20/50	60
20/60	65
20/70	70
20/70-1 or 20/70-2	75
Over 75%	100%

### Visual Fields

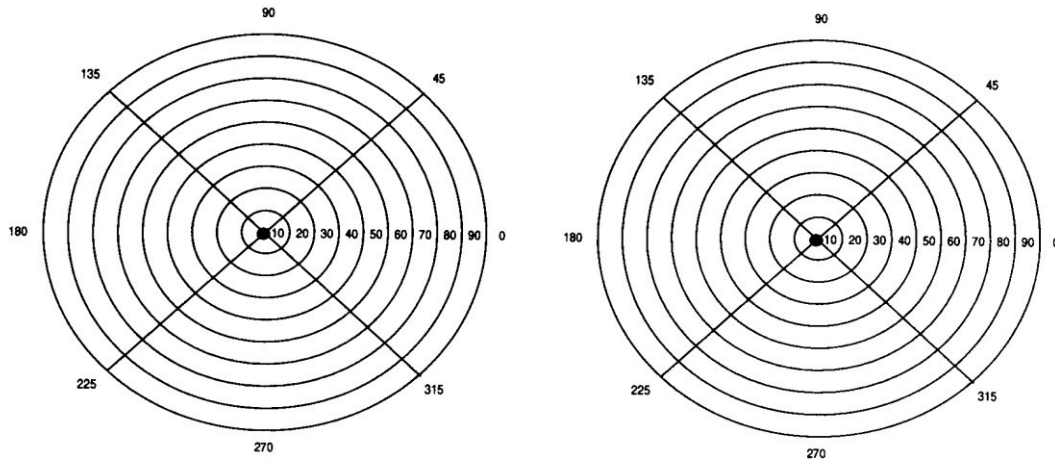
The extent of the visual field is determined by using a perimetric method with a white target. If the Goldmann 30 cm. radius bowl perimeter is used, the III/4 e target in the kinetic mode should be employed.

### Determining Loss of Visual Field

The following steps are taken to determine the loss of visual field:

1. Plot the extent of the visual field on each of the eight principal meridians of a visual field chart using Figure 11.2(a-2).
2. Determine the percentage loss to schedule according to Table 11.1(a-3)

**Figure 11.1(b) Example of Perimetric Charts**



Note: These charts are used to plot extent or outline of visual field along the eight principal meridians, separated by 45 degree intervals.

**Table 11.1(c) Visual Field Loss**

Loss of	Schedule-One Eye %
Upper	33 ⅓
½ of Upper	16 ⅔
Lower	66 ⅔
½ of Lower	33 ⅓

Also: Sum of 8 principal radii of peripheral field total 420. This is 100% industrial visual field efficiency. To calculate: Add 8 principal meridians of patient's peripheral field (x)

$$x/420 = \% \text{ Efficiency (y)}$$

$$100-y\% = \% \text{ Loss to Schedule for Eye}$$

#### Determining Schedule for Diplopia

Do red glass test, charting magnitude of diplopia within 30 degrees field and calculate according to Table

11.1(a-4). Schedule to loss for the injured eye. Combine the percentage loss for diplopia with the schedule for central vision loss and visual field loss in the injured eye.

**Table 11.1(d) Diplopia**

Diplopia In	Schedule-One Eye %
Entire Upper Field	33 $\frac{1}{3}$
Half of Upper Field	16 $\frac{2}{3}$
Entire Lower Field	66 $\frac{2}{3}$
Half of Lower Field	33 $\frac{1}{3}$

Consider for 30 degree field

## **11.2 Loss of Hearing**

The waiting period for a worker to file a claim for a job-related hearing loss is three months from the date the worker leaves employment or is removed from exposure to harmful noise in the workplace (can be by way of effective protective devices). The last day of the three-month period of removal is considered the worker's date of disablement.

### **11.2.1 Occupational Loss of Hearing**

Under these standards which in effect measure the ability to hear normal speech, audiometric tone tests at varying intensity of sound are conducted at frequency levels of 500, 1000, 2000, 3000 Hertz (Hz).

Results at the four frequency levels are averaged and if the threshold necessary for the individual to hear sound is 25 decibels (dB) or less, no hearing impairment is considered to be present.

For every decibel that the hearing level of an ear exceeds 25 dB, hearing loss is calculated at 1  $\frac{1}{2}$  percent, up to 100 percent at 92 dB. Thus, if the worker's hearing level is 41 dB, he or she would have a hearing loss of 24 percent in that ear.

The percentage of hearing loss in the worker's better ear is multiplied by 5, and the resulting figure is added to the percentage of hearing loss in the worker's poorer ear. The total is divided by 6 and this represents the worker's overall percentage of hearing loss for which benefits are awarded.

### **11.2.2 Traumatic Loss of Hearing**

Traumatic Hearing Loss - May occur as a result of a blow to the head, a strong blast of air into the ear, etc.

A different method is used to determine the degree of hearing loss as a result of trauma than as a result of occupational disease.

The scale used to measure percentage is based upon 250 Cycles Per Second (CPS) to 4000 CPS.

The schedule for complete loss of hearing for both ears is 150 weeks, and the schedule for each ear is 60 weeks. The method used to compute the loss is to take the percentage of loss in each ear, total it, and then divide it by 2.

For example:

25% in right ear  
40% in left ear  
65% total loss

Divide 65% by 2, which equals 32½ %.

### **11.3 Facial Scars and Disfigurement**

1. Permanent scars and disfigurement of the face and neck are usually evaluated one year post-injury and/or one year after the last surgical procedure was performed.
2. Scars and disfigurement involving the neck are limited to the region above the clavicle.
3. The scar and disfigurement should be described accurately, using such parameters as length, width, color, contour, and exact location.
4. Specific disfigurements of the eye, ear, nose and mouth are also to be noted.
  - a. Common disfigurements of the eye include corneal scarring; defects of the iris and insome instances total loss of the eye with use of a prosthesis.
  - b. Common disfigurements of the nose include nasal septal deviation, enlargement and tissue loss.
  - c. Common disfigurements of the lips include loss of soft tissue, enlargement, and alteration of normal contour of the lips.
  - d. Common disfigurements of the ear include loss of tissue and alteration of normal contour of the ear.
  - e. If teeth are damaged, the dentist's report should be consulted.

# APPENDIX A

**Table of Weeks by Percentage Loss of Use of Body Part:**

	5%	7 1/2%	8 1/3%	10%	12 1/2%	15%	16 2/3%	20%	25%	30%	33 1/3%	35%	37 1/2%	40%	45%
Arm	15 3/5	23 2/5	26	31 1/5	39	46 4/5	52	62 1/5	78	93 3/5	104	109 1/5	117	124 4/5	140 2/3
Hand	12 1/5	18 3/10	20 1/3	24 2/5	30 1/2	36 3/5	40 2/3	48 4/5	61	73 1/5	81 1/3	85 2/8	91 1/2	97 3/5	109 4/5
Thumb	3 3/4	5 5/8		7 1/2	9 3/8	11 1/4	12 1/2	15	18 3/4	22 1/2	25	26 1/4	28 1/8	30	33 3/4
First Finger	2 3/10			4 3/5	5 3/4	6 4/5	7 2/3	9 1/5	11 1/2	13 4/5	15 1/3	16 1/10	17 1/4	18 2/5	20 7/10
Second Finger	1 1/2			3	3 3/4	4 1/2	5	6	7 1/2	9	10	10 1/2	11 1/4	12	13 1/2
Third Finger	1 1/4			2 1/2	3 1/8	3 3/4	4 1/6	5	6 1/4	7 1/2	8 1/3	8 3/4	9 3/8	10	11 1/4
Fourth Finger	3/4			1 1/2	1 7/8	2 1/4	2 1/2	3	3 3/4	4 1/2	5	5 2/5	5 5/8	6	6 3/4
Leg	14 2/5	21 3/5		28 4/5	36	43 1/5	48	57 3/5	72	86 2/5	96	100 4/5	108	115 1/5	129 3/5
Foot	10 1/4	15 3/8	17 1/2	20 1/2	25 5/8	30 3/4	34 1/6	41	51 1/4	61 1/2	68 1/3	71 3/4	76 7/8	82	92 1/4
Great Toe	1 9/10	2 17/20		3 4/5	4 3/4	5 7/10	6 1/3	7 3/5	9 1/2	11 2/5	12 2/3	13 3/10	14 1/4	15 1/5	17 1/10
Other Toes	4/5			1 3/5	2	2 2/5	2 2/3	3 1/5	4	4 4/5	5 1/3	5 3/5	6	6 2/5	7 1/5
Eye	8	12		16	20	24	26 2/3	32	40	48	53 1/3	56	60	64	72
	<b>50%</b>	<b>55%</b>	<b>60%</b>	<b>62 1/2%</b>	<b>65%</b>	<b>66%</b>	<b>70%</b>	<b>75%</b>	<b>80%</b>	<b>83 1/3%</b>	<b>85%</b>	<b>87 1/2%</b>	<b>90%</b>	<b>95%</b>	<b>100%</b>
Arm	156	171 3/5	187 1/5	195	202 4/5	208	218 2/5	234	249 3/5	260	265 1/5	273	280 4/5	296 2/3	312
Hand	122	134 1/5	146 2/5	152 1/2	158 3/5	162 2/3	170 4/5	183	195 1/5	203 1/3	207 2/5	213 1/2	219 3/5	231 4/5	244
Thumb	37 1/2	41 1/4	45	46 7/8	48 3/4	50	52 1/2	56 1/4	60	62 1/2	63 3/4	65 5/8	67 1/2	71 1/4	75
First	23	25 3/10	27 3/5	28 3/4	29 9/10	30 2/3	32 1/5	34 1/2	36 4/5	38 1/3	39 1/10	40 1/4	41 2/5	43 7/10	46
Second	15	16 1/2	18	18 3/4	19 1/2	20	21	22 1/2	24	25	25 1/2	26 1/4	27	28 1/2	30
Third	12 1/2	13 3/4	15	15 5/8	16 1/4	16 2/3	17 1/2	18 3/4	20	20 5/6	21 1/4	21 7/8	22 1/2	23 3/4	25
Fourth	7 1/2	8 1/4	9	9 3/8	9 3/4	10	10 1/2	11 1/4	12	12 3/4	13 1/8	13 1/2	14 1/4	14 1/4	15
Leg	144	158 2/5	172 4/5	180	187 1/5	192	201 3/5	216	230 2/5	240	244 4/5	252	259 1/5	273 3/5	288
Foot	102 1/2	112 3/4	123	128 1/8	133 1/4	136 2/3	143 1/2	153 3/4	164	170 5/6	174 1/4	179 3/8	184 1/2	194 3/4	205
Great Toe	19	20 9/10	22 4/5	23 3/4	24 7/10	25 1/3	26 3/5	28 1/2	30 2/5	31 2/3	32 3/10	33 1/4	34 1/5	36 1/10	38
Other Toes	8	8 4/5	9 3/5	10	10 2/5	10 2/3	11 1/5	12	12 4/5	13 1/3	13 3/5	14	14 2/5	15 1/5	16
Eye	80	88	96	100	104	106 2/3	112	120	128	133 1/3	136	140	144	152	160