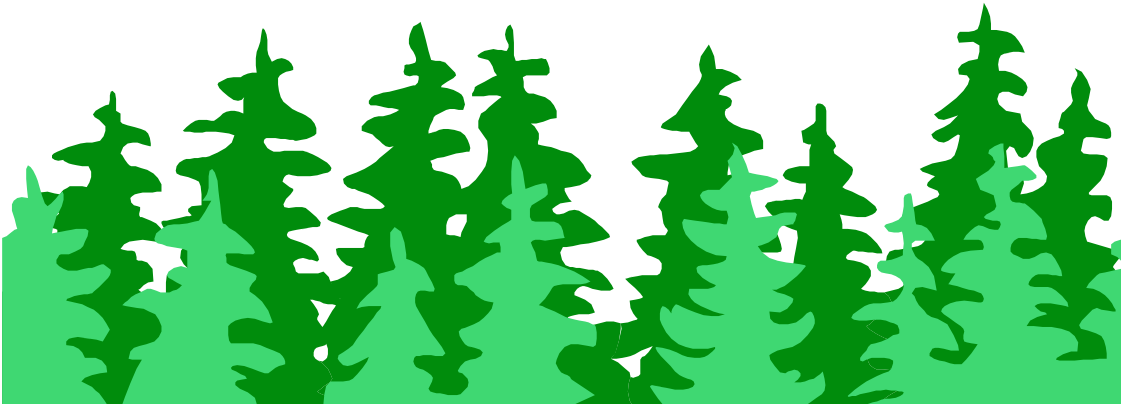


# 23(1) Calculator Specifications and Calculations



To be used with the Permanent Disability Evaluation Schedule revised effective January 1, 2015. The 23(1) Calculator is a tool to assist Officers in Disability Awards in calculating appropriate compensation under section 23 (1) of the *Workers Compensation Act*. This document outlines the calculations/ formulas used by the calculator to determine an impairment rating.



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# Calculations

**The overall impairment % allocated for each joint for restricted range of motion is based on the value of a fusion of the joint as outlined in the schedule.**

## Devaluation

Where the sum of the scheduled percentages allocated to several disabilities in the same limb exceeds their actual combined effect, a downward adjustment is required. This is known as “devaluation”.

Multiple disabilities involving one limb cannot exceed the amputation value of that limb. As a result, disabilities of the arm cannot exceed 70% and disabilities of the leg cannot exceed 65%.

## Norms

Normally, when calculating impairment based on restricted range of movement, the injured side is compared with the uninjured side. If both sides are impaired then the injured sites are compared to established normal range of joint motion values as listed in the PDES.

## NORMAL RANGE OF JOINT MOTION VALUES

<b>Site/Measurement Upper Limbs</b>	<b>Norm</b>
<b><u>THUMB</u></b>	
<b><i>IP JOINT</i></b>	
FLEXION	81
EXTENSION	0*
<b><i>MP JOINT</i></b>	
FLEXION	53
EXTENSION	0*
<b><i>CMC JOINT</i></b>	
EXTENSION	50
FLEXION	15
PALMAR ABDUCTION	50
<b><u>FINGERS</u></b>	
<b><i>DIP JOINT</i></b>	
FLEXION	80
EXTENSION	0*
<b><i>PIP JOINT</i></b>	
FLEXION	100
EXTENSION	0*
<b><i>MP JOINT</i></b>	
FLEXION	90
EXTENSION	0*

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<b><u>WRIST</u></b>	
FLEXION	73
EXTENSION	71
ULNAR DEVIATION	33
RADIAL DEVIATION	19
<b><u>FOREARM</u></b>	
PRONATION	71
SUPINATION	84
<b><u>ELBOW</u></b>	
FLEXION	146
EXTENSION	0
<b><u>SHOULDER</u></b>	
FLEXION	158
EXTENSION	53
ABDUCTION	170
ADDUCTION	50
INTERNAL ROTATION (ARM AT 90°)	70
EXTERNAL ROTATION (ARM AT 90°)	90

<b>Site/Measurement Lower Limbs</b>	Norm
<b><u>GREAT TOE</u></b>	
<b><i>IPJOINT</i></b>	
FLEXION	60
EXTENSION	0
<b><i>MP JOINT</i></b>	
FLEXION (PLANTAR FLEXION)	37
EXTENSION (DORSIFLEXION)	63
<b><u>OTHER TOES (2<sup>ND</sup> TO 5<sup>TH</sup>)</u></b>	
Measurement of range of motion of the 2 <sup>nd</sup> to 5 <sup>th</sup> toes is difficult. Therefore the impairment rating is reached using adjudicative judgment based on the medical information and the impairment limits for these toes as provided by the schedule.	
<b><u>FOREFOOT</u></b>	
MEASURED IN TERMS OF QUARTER MOVEMENTS	
<b><u>SUBTALAR JOINT</u></b>	
MEASURED IN TERMS OF QUARTER MOVEMENTS	
<b><u>ANKLE</u></b>	
PLANTAR FLEXION	40
DORSIFLEXION	18
<b><u>KNEE</u></b>	
FLEXION	134
EXTENSION	0*

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<b><u>HIP</u></b>	
FLEXION	113
EXTENSION	28
ABDUCTION	48
ADDUCTION	31
INTERNAL ROTATION	30
EXTERNAL ROTATION	45

<b>Site/Measurement Spine</b>	<b>Norm</b>
<b><u>CERVICAL SPINE</u></b>	
FLEXION	40
EXTENSION	40
LATERAL FLEXION	30
ROTATION	60
<b><u>THORACIC/DORSAL SPINE</u></b>	
ROTATION	45
<b><u>LUMBAR SPINE</u></b>	
FLEXION (12° equals 1 cm for modified Schober)	60
EXTENSION	25
LATERAL FLEXION	25

\* The Board's practice is to use zero as the norm for extension of the fingers, thumb, elbows and knees. Loss of hyperextension in an unusually flexible worker does not result in a disability.

**Tolerances**

In general, loss of range of motion of 5 degrees or less does not constitute an impairment. Loss of range of motion of 5 degrees or less will calculate as zero.

The only exception is:

1. movements of the spine where loss of range of motion of 3 degrees or less shall be treated as zero.

Loss of hyperextension of the elbow, knee and fingers is not considered an impairment, hyperextension is taken as zero in the calculations.

<p><b>Calculations:</b>  <b>G.S.</b> = ROM on Good Side  <b>I.S.</b> = ROM on Injured Side  <b>SA</b> = Scheduled Amount  <b>% allotted</b> = % allotted in the WCB schedule</p>
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**1) Hands**

Hand impairment can vary from simple, single joint stiffness to a complex combination of amputation, stiffness, deformity and nerve injury.

Hand impairment is always calculated starting with distal impairment and proceeding proximally. The injured side is usually compared to the normal side. If both sides are injured then the injured joints are compared to the Board's established normal range of motion values listed in the PDES.

The calculation process is as follows:

1. Determine the nature of the injuries to the affected hand or hands.
2. Select the hand chart which corresponds to the combination of hand impairments (amputations, loss of Range of Movement, sensory loss) for the complete hand. If thumb also involved, then calculations for thumb are done referencing hand chart #1.
3. For each finger affected at the most distal phalanx (ex. DIP joint) , calculated the impairment loss (for amputation, loss of range of movement, fusions, sensory loss) according to the selected chart.
4. Next, calculate the impairment for the next level (ex. PIP joint) , devaluing any impairment given on the previous level.
5. Proceed to the next phalanx (MP joint) and calculate impairment, devaluing for any impairment given on the previous level.
6. Loss of Hyperextension of a finger joint does not constitute an impairment, hyperextension is taken as zero.
7. Swan neck deformity of the finger, without surgical intervention is calculated on a single finger chart only and replaces the impairment calculation for amputation, restricted range of movement and sensory loss at the DIP joint of the affected digit.
8. Digital disability from active ulnar or radial deviation and Digital disability rotational deformity is calculated based on the degree of deviation or deformity. This is then multiplied by the amputation value of the digit(s), using the applicable Hand Chart, to determine the percentage of total disability due to deformity. This is then added to the other impairments of the digit(s).
9. A combination of impairments in a digit cannot exceed the amputation value of the digit on the applicable Hand Chart.

Basic Formula for fingers – start at most distal joint using appropriate hand chart

$$\frac{\text{Total ROM Normal Side} - \text{Total ROM Inj. side}}{\text{Total ROM Normal}} \times .75 \times \text{amputation value at joint concerned}$$

*A fused finger joint is equal to 3/4 of the value of an amputation at the same level. For each subsequent joint devaluation applies and the impairment granted at the prior joint is deducted.*

**Amputations (rules for thumb and fingers):**

- a) Complete amputation of the digital pulp is equivalent to one quarter of the distal phalanx.
- b) Amputations of a phalanx or a metacarpal will be assessed in fractions:
  1. One quarter loss
  2. One third loss
  3. One half loss
  4. Two thirds loss
  5. Three quarters loss
  6. Complete loss

**Restricted Movement of a Single Finger (use hand chart #2)**

**EX. 1 restricted ROM of DIP Joint of Right Index Finger**

$$R = \frac{10}{60} \quad L = \frac{0}{80}$$

$$\frac{80 - (60 - 10)}{80} \times .75 \times 1.60 \text{ amp. Value}$$

$$= \frac{(80 - 50)}{80} \times .75 \times 1.60 = \frac{30}{80} \times .75 \times 1.60 = \mathbf{0.45\%}$$

**EX. 2 restricted range of movement to all three joints of Right Index Finger**

Use Hand Chart #2. The distal joint is calculated first. The next more proximal joint is then calculated based on the remaining value (after subtracting any impairment for the more distal impairment, either the DIP or the DIP/PIP combined).

	<b>R</b>	<b>L</b>
<b>DIP</b>	0/60	0/80
<b>PIP</b>	10/80	0/100
<b>MP</b>	20/60	0/90

$$\mathbf{DIP} = \frac{(80 - 60)}{80} \times .75 \times 1.60 = \frac{20}{80} \times .75 \times 1.6 = \mathbf{.30}$$

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$$\text{PIP} = \frac{100 - (80 - 10)}{100} \times .75 \times (3.2 - .30) = \frac{30}{100} \times .75 \times 2.90 = .65$$

$$\text{MP} = \frac{90 - (60 - 20)}{90} \times .75 \times (4 - .30 - .65) =$$

$$\frac{50}{90} \times .75 \times 3.05 = \mathbf{1.27}$$

$$\text{TOTAL} = \mathbf{\underline{2.22}}$$

= 1.6DIP + 1.6 PIP

> Impairment already given.

≅ 1.6 DIP + 1.6 PIP + .8 MP

EX. 3 amputations and restricted range of movement to index and middle fingers at all three levels

If two or more fingers are involved the appropriate multiple finger chart is used to assess the impairment.

**Index Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	0/60	0/80
<b>PIP</b>	10/80	0/100
<b>MP</b>	20/70	0/90

**Middle Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	Amp	0/80
<b>PIP</b>	0/80	0/100
<b>MP</b>	Fused	0/90

In this example Hand Chart #3 is used for all the calculations as the injury is to the index and long fingers (i.e. two fingers involved).

Index Finger:

$$\text{HC \#3 DIP} \frac{(80 - 60)}{80} \times .75 \times 2.8 = \frac{20}{80} \times .75 \times 2.8 = \mathbf{.53}$$

$$\text{HC \#3 PIP} \frac{100 - (80 - 10)}{100} \times .75 \times (5.6 - .53) = \frac{30}{100} \times .75 \times 5.07 = \mathbf{1.14}$$



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$$\text{HC \#3 MP } \frac{90 - (70 - 20)}{90} \times .75 \times (7.0 - .53 - 1.14)$$

$$= \frac{40}{90} \times .75 \times 5.33 = \mathbf{1.78}$$

**TOTAL = 3.45%**

Middle Finger:

**HC #3 DIP** - Amputation at DIP Joint ∴ Impairment is 2.8% = **2.8%**

$$\text{HC \#3 PIP} - \frac{(100 - 80)}{100} \times .75 \times (5.6 - 2.8) = \frac{20}{100} \times .75 \times 2.8 = \mathbf{.42\%}$$

$$\text{HC \#3 MP} - \text{Joint Fused } \therefore \text{ Impairment is } (7 - 2.8 - .42) \times .75\%$$

$$= 3.78 \times .75\% = \mathbf{2.84\%}$$

**TOTAL = 6.06**

**TOTAL BOTH = 9.51**

EX. 4 amputations and restricted ranges of movement of the index, middle and ring fingers at various levels

If two or more fingers are involved the appropriate multiple finger chart is used to assess the impairment. In this example, there is impairment to three fingers, therefore, Hand Chart 4 is used.

**Index Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	AMP.	0/80
<b>PIP</b>	20/80	0/100
<b>MP</b>	0/70	0/90

**Middle Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	0/60	0/80
<b>PIP</b>	0/70	0/100
<b>MP</b>	0/90	0/90

**Ring Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	0/60	0/80
<b>PIP</b>	0/100	0/100
<b>MP</b>	0/90	0/90

Index Finger: Hand Chart #4

**DIP** – Amputation at DIP Joint of Right Index Finger ∴ impairment = **3.4%**

$$\text{PIP calculation} = \frac{100 - (80 - 20)}{100} \times .75 \times (6.8 - 3.4)$$

$$= \frac{40}{100} \times .75 \times 3.4 = \mathbf{1.02}$$

$$\text{MP calculation} = \frac{(90 - 70)}{90} \times .75 \times (8.5 - 3.4 - 1.02)$$

$$\frac{20}{90} \times .75 \times 4.08 = \mathbf{.68}$$

$$\text{TOTAL INDEX FINGER} = 3.4 + 1.02 + .68 = \mathbf{5.1}$$

Middle Finger: Hand Chart #4 (no impairment of MP)

$$\text{DIP Impairment} = \frac{(80 - 60)}{80} \times .75 \times 3.4$$

$$= \frac{20}{80} \times .75 \times 3.4 = \mathbf{.64}$$

$$\text{PIP calculation} = \frac{(100 - 70)}{100} \times .75 \times (6.8 - .64)$$

$$= \frac{30}{100} \times .75 \times 6.16 = \mathbf{1.39}$$

$$\text{TOTAL MIDDLE FINGER} = \mathbf{2.03}$$

Ring Finger: Hand Chart #4 (no impairment PIP and MP)

$$\text{DIP calculation} = \frac{(80 - 60)}{80} \times .75 \times 2.1$$

$$= \frac{20}{80} \times .75 \times 2.1 = \mathbf{.39}$$

$$\text{TOTAL RING FINGER} = \mathbf{0.39}$$

$$\text{TOTAL OF ALL THREE FINGERS} = 5.1 + 2.03 + .39 = \mathbf{7.52}$$

**Restricted Movement of Thumb (use hand chart #1):**

$$\text{Basic Formula} = \frac{\text{Restriction degrees}}{\text{Normal degrees}} \times .50 \times \text{amp. Value}$$

This calculation is for IP + MP Joints, the CMC Joint calculation is different (see example below). Rules are similar to finger calculations. Amputation rules same as fingers.

**EX. 5 Thumb restricted range of movement**

	<b>R</b>	<b>L</b>
<b>IP</b>	20/60	0/80
<b>MP</b>	0/40	0/50

$$\text{IP} = \frac{80 - (60 - 20)}{80} \times .50 \times 10$$

$$= \frac{40}{80} \times .50 \times 10 = \mathbf{2.5}$$

$$\text{MP} = \frac{(50 - 40)}{50} \times .50 \times (16 - 2.5^*)$$

$$= \frac{10}{50} \times .50 \times 13.50 = \mathbf{1.35}$$

$$\text{TOTAL IMPAIRMENT} = \mathbf{\underline{3.85\%}}$$

\* Impairment already given.

**CMC Joint of Thumb**

There are three separate movements measured for the CMC Joint. These are:

- Extension
- Flexion
- Palmar Abduction

**Note:** The total impairment value for the CMC joint is 20%. Each movement is assigned 1/3 of that ( $20 \div 3 = 6.67\%$ ) If there is impairment of the IP or MP joints this impairment must be taken into account for devaluation purposes. Where devaluation applies the amounts granted for the IP & MP joints are first deducted from the 20%, and the remainder is then divided by 3 and 1/3 is assigned to each CMC joint movement.

In this example the right CMC joint is injured. The injured side is always compared with the good side which is consisted with our practice for calculating impairment ratings. The Norms are only used when both sides are impaired. In the following example **only** the CMC joint is injured and the measurements are:

	<b>R (injured side)</b>	<b>L (good side)</b>	<b>Norms</b>
<b>Extension</b>	8	50	50
<b>Flexion</b>	9	15	15
<b>Palmar Abduction</b>	40	50	50

*Step 1: Calculation.*

**Extension:**

$$\begin{aligned} & \boxed{\text{Good-Injured}} \qquad \qquad \qquad \boxed{(20 \div 3 = 6.67)} \\ & (50 - 8) \div 50 \times .50 \times 6.67 \\ & = 42 \div 50 \times .50 \times 6.67 = \mathbf{2.80\%} \end{aligned}$$

**Flexion:**

$$\begin{aligned} & \boxed{\text{Good-Injured}} \\ & (15 - 9) \div 15 \times .50 \times 6.67 \\ & = 6 \div 15 \times .50 \times 6.67 = \mathbf{1.33\%} \end{aligned}$$

**Palmar Abduction:**

$$\begin{aligned} & \boxed{\text{Good-Injured}} \\ & (50 - 40) \div 50 \times .50 \times 6.67 \\ & = 10 \div 50 \times .50 \times 6.67 = \mathbf{0.67\%} \end{aligned}$$

**TOTAL = 4.80**

**Sensory Loss**

When calculating finger impairment, consideration is given first to any amputations, restricted movement, or fusions. An additional factor for sensory loss can be given up to 50% of the amputated value of a joint taking into consideration anything already calculated for reduced range of motion, fusions or amputations.

2 – point discrimination findings are measured on the radial and ulnar side of a phalanx. The ratings are recorded as follows:

- 3 = 6mm or less – 0%
- 2 = 7 – 15 mm – 12.5% value of the joint
- 1 = more than 15mm – 25% value of joint

The applicable Hand Chart would apply.

On the thumb, 2-point discrimination is normally only tested on the palmar surface of the IP joint. On the fingers, 2-point discrimination is normally only tested on the palmar surface of the DIP and PIP joints. The 2-point discrimination findings are only used in the calculation of the most distal prehensile surface. For example, if the IP joint of the thumb is completely amputated, there would normally be no impairment for 2-point discrimination loss on the MP joint palmar surface. If, the DIP joint of the index finger was amputated at the half way mark, any reduction in 2-point discrimination would be used in the impairment rating of the DIP joint, normally no consideration would be given for the PIP joint. Consideration of the PIP joint for 2-point discrimination normally would only be done if the DIP joint was completely amputated.

EX. 6 amputations, restricted ranges of movement and sensory loss to multiple fingers at various levels

If two or more fingers are involved the appropriate multiple finger chart is used to assess the impairment. In this example, there is impairment to three fingers, therefore, Hand Chart 4 is used. There is also sensory loss to each remaining distal surface.

**Index Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	AMP.	0/80
<b>PIP</b>	20/80	0/100
<b>MP</b>	0/70	0/90

**Middle Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	0/60	0/80
<b>PIP</b>	0/70	0/100
<b>MP</b>	0/90	0/90

**Ring Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	0/60	0/80
<b>PIP</b>	0/100	0/100
<b>MP</b>	0/90	0/90

**Sensory Testing**

	<b>Index</b>		<b>Long</b>		<b>Ring</b>		<b>Little</b>	
	<b>R</b>	<b>U</b>	<b>R</b>	<b>U</b>	<b>R</b>	<b>U</b>	<b>R</b>	<b>U</b>
<b>DIP</b>	A	A	2	3	2	1		
<b>PIP</b>	3	1	2	3	2	1		

Index Finger: Hand Chart #4

**DIP** – Amputation at DIP Joint of Right Index Finger ∴ impairment = **3.4%**

$$\text{PIP calculation} = \frac{100 - (80 - 20)}{100} \times .75 \times (6.8 - 3.4)$$

$$= \frac{40}{100} \times .75 \times 3.4 = 1.02$$

**PIP Sensory loss:** Radial side – no loss. Ulnar side (1) more than 15 mm.

Remaining value of PIP joint is:

$$3.4\% - 1.02\% = 2.38$$

Ulnar side sensory impairment would be  $2.38 \times 25\% = .60$

Total PIP impairment = **1.62 %**

$$\text{MP calculation} = \frac{(90 - 70)}{90} \times .75 \times (8.5 - 3.4 - 1.62)$$

$$\frac{20}{90} \times .75 \times 3.48 = .58$$

**TOTAL INDEX FINGER = 3.4 + 1.62 + .58 = 5.6**

Middle Finger: Hand Chart #4

$$\text{DIP calculation} = \frac{(80 - 60)}{80} \times .75 \times 3.4$$

$$= \frac{20}{80} \times .75 \times 3.4 = .64$$

**DIP Sensory loss:** Radial side (2) 7 to 15mm. Ulnar side (3) 6mm or less, no impairment.

Remaining value of DIP joint is:

$$3.4\% - .64\% = 2.76$$

Radial side sensory impairment would be  $2.76 \times 12.5\% = .35$

**Total DIP joint (ROM +Sensory) = .99**

$$\text{PIP calculation} = \frac{(100 - 70)}{100} \times .75 \times (6.8 - .99)$$

$$= \frac{30}{100} \times .75 \times 5.81 = 1.31$$

**TOTAL MIDDLE FINGER = 2.30**

Ring Finger: Hand Chart #4

$$\text{DIP calculation} = \frac{(80 - 60)}{80} \times .75 \times 2.1$$

$$= \frac{20}{80} \times .75 \times 2.1 = .39$$

**DIP Sensory loss:** Radial side (2) 7 to 15mm. Ulnar side (1) More than 15mm

Remaining value of DIP joint is:

$$2.1\% - .39\% = 1.71$$

Radial side sensory impairment would be  $1.71 \times 12.5\% = .21$

Ulnar side sensory impairment would be  $1.71 \times 25\% = .43$

$$\text{Total DIP joint (ROM +Sensory)} .39+.21+.43 = 1.03$$

$$\text{TOTAL OF ALL THREE FINGERS } 5.6 + 2.30 + 1.03 = \underline{8.93}$$

**Deformity**

**Swan Neck Deformity**

When the diagnosis of Swan neck deformity of a finger has been provided the 2% value will replace the value which may have been calculated for amputation, restricted range of movement or sensory loss at the DIP joint of the affected finger (on a single finger chart – chart #2). The reasoning is that a deformity of this nature impairs a workers functioning to a greater degree than a DIP amputation. This is because the deformity actually gets in the way of the functioning of the hand/fingers in mobility and practical use that does not occur when the DIP is amputated.

Swan neck deformity of the finger, without surgical intervention 2%

Digital disability from active ulnar or radial deviation:

Deviation	% Digit Disability*
Mild: < 10°	10
Moderate: 10° – 30°	20
Severe: > 30°	30

Multiply by the amputation value of the digit(s), using the applicable Hand Chart, to determine the percentage of total disability due to deformity.

Digital disability rotational deformity:

Digit Rotational Deformity	% Digit Disability*
Mild: < 15°	20
Moderate: 15° – 30°	40
Severe: > 30°	60

Multiply by the amputation value of the digit(s), using the applicable Hand Chart, to determine the percentage of total disability due to deformity.

### Swan neck deformity – single finger and other impairments

EX. 7 – restricted range of movement to all three joints of Right Index Finger including a swan neck deformity

Use Hand Chart #2. The distal joint is calculated first. The next more proximal joint is then calculated based on the remaining value (after subtracting any impairment for the more distal impairment, either the DIP or the DIP/PIP combined).

R	R	L
<b>DIP</b>	0/60	0/80
<b>PIP</b>	10/80	0/100
<b>MP</b>	20/60	0/90

**DIP** = Swan neck deformity value replaces value for amputation, restricted ROM and sensory at the DIP joint = **2.0**

$$\text{PIP} = \frac{100 - (80 - 10)}{100} \times .75 \times \frac{(3.2 - 2.0)}{100} = \frac{30}{100} \times .75 \times 1.2 = .27$$

$$\text{MP} = \frac{90 - (60 - 20)}{90} \times .75 \times (4 - 2.0 - .27) = \frac{50}{90} \times .75 \times 1.73 = \mathbf{0.72}$$

$$\text{TOTAL INDEX FINGER} = 2.0 + 0.27 + 0.72 = \mathbf{2.99\%}$$

### Ulnar or radial deviation or Rotational deformity

When there is evidence of active ulnar or radial deviation or rotational deformity, the value is added to other impairments in the digit using the applicable hand chart limited to the value of the digit amputated at MP joint.



**Restricted ROM and Ulnar deviation single finger**

EX. 8 - restricted range of movement to all three joints of Right Index Finger plus severe ulnar deviation

Use Hand Chart #2. The distal joint is calculated first. The next more proximal joint is then calculated based on the remaining value (after subtracting any impairment for the more distal impairment, either the DIP or the DIP/PIP combined). The deformity value is added after the restricted range of movement calculations are completed.

<b>R</b>	<b>R</b>	<b>L</b>
<b>DIP</b>	0/60	0/80
<b>PIP</b>	10/80	0/100
<b>MP</b>	20/60	0/90

$$\text{DIP} = \frac{(80 - 60)}{80} \times .75 \times 1.60 = \frac{20}{80} \times .75 \times 1.6 = .30$$

$$\text{PIP} = \frac{100 - (80 - 10)}{100} \times .75 \times (3.2 - .30) = \frac{30}{100} \times .75 \times 2.90 = .65$$

$$\text{MP} = \frac{90 - (60 - 20)}{90} \times .75 \times (4 - .30 - .65) = \frac{50}{90} \times .75 \times 3.05 = 1.27$$

**Total Index finger restricted ROM = 2.22%**

Deformity calculation:

Additional disability due to active ulnar deviation of the digit to a severe degree

Overall amputation value of digit on chart 2 is 4.0%

Severe ulnar deviation is 30% of the amputation value: 30% of 4.0 = 1.2%

**TOTAL INDEX FINGER WITH DEFORMITY = 2.22 + 1.2 = 3.42%**

**Rotational Deformity 2 fingers – no other restrictions**

EX. 9 – Residual deformity only of the left index and middle fingers

**Rotational deformity**

Index finger	Severe rotational deformity
Middle finger	Mild rotational deformity

Use Hand Chart #3.

Index finger

amputation value = 2.8 + 2.8 + 1.4 = 7.0

Severe rotational deformity =  $60\% \times 7.0 = 4.2\%$  total

Middle finger

amputation value =  $2.8 + 2.8 + 1.4 = 7.0$

Moderate rotational deformity =  $20\% \times 7.0 = 1.4\%$  total

**TOTAL OF BOTH FINGERS =  $4.2 + 1.4 = \underline{5.6\%}$**

**Rotational Deformity and ulnar deviation 2 fingers – no other restrictions**

EX. 10 – Radial deviation only of the left index finger and rotational deformity only of the left middle finger

Index finger	Severe radial deviation
Middle finger	Mild rotational deformity

Use Hand Chart #3.

Index finger

amputation value =  $2.8 + 2.8 + 1.4 = 7.0$

Severe radial deviation =  $30\% \times 7.0 = 2.1\%$  total

Middle finger

amputation value =  $2.8 + 2.8 + 1.4 = 7.0$

Mild rotational deformity =  $20\% \times 7.0 = 1.4\%$  total

**TOTAL OF BOTH FINGERS =  $2.1 + 1.4 = \underline{3.5\%}$**

**Partial amputation, restricted range of movement, sensory loss and deformities – 2 fingers**

EX.11 – Right Index Finger – partial amputation, restricted range of movement, sensory loss and moderate ulnar deviation - Right Ring Finger restricted range of movement and moderate rotational deformity

Using chart 3

**Index Finger**

	<b>R</b>	<b>L</b>
<b>DIP</b>	AMP.	0/80
<b>PIP</b>	20/80	0/100
<b>MP</b>	0/70	0/90

**Ring Finger**

	<b>R</b>	<b>L</b>

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<b>DIP</b>	0/60	0/80
<b>PIP</b>	0/100	0/100
<b>MP</b>	0/90	0/90

**Sensory Testing**

	Index		Ring			
	R	U	R	U		
<b>DIP</b>	A	A	2	1		
<b>PIP</b>	3	1	2	1		

**Index Finger:**

**DIP** – Amputation at DIP Joint of Right Index Finger ∴ impairment = **2.8%**

$$\text{PIP calculation} = \frac{100 - (80 - 20)}{100} \times .75 \times (5.6 - 2.8)$$

$$= \frac{40}{100} \times .75 \times 2.8 = 0.84$$

**PIP Sensory loss:** No sensory loss on radial side. Ulnar side (1) more than 15 mm.

Remaining value of PIP joint is:

$$2.8\% - .84\% = 1.96$$

Ulnar side sensory impairment would be  $1.96 \times 25\% = .49$

Total PIP impairment 1.33%

$$\text{MP calculation} = \frac{(90 - 70)}{90} \times .75 \times (7.0 - 2.8 - 1.33)$$

$$\frac{20}{90} \times .75 \times 2.87 = .48$$

Plus Moderate ulnar deviation:

Index finger amputation value chart  $3 = 2.8 + 2.8 + 1.4 = 7.0$

Moderate ulnar deviation =  $20\% \times 7.0 = 1.4\%$  total

**TOTAL INDEX FINGER = 2.8 + 1.33 + 0.48 + 1.4 = 6.01**

**Ring Finger:**

$$\text{DIP calculation} = \frac{(80 - 60)}{100} \times .75 \times 1.7$$

80

$$= \frac{20}{80} \times .75 \times 1.7 = .32$$

**DIP Sensory loss:** Radial side (2) 7 to 15mm. Ulnar side (1) More than 15mm

Remaining value of DIP joint is:

$$1.7\% - .32\% = 1.38$$

Radial side sensory impairment would be  $1.38 \times 12.5\% = .17$

Ulnar side sensory impairment would be  $1.38 \times 25\% = .35$

**Total DIP joint (ROM +Sensory)  $.32 + .17 + .35 = 0.84$**

Plus moderate rotational deformity:

Ring finger amputation value chart 3 =  $1.7 + 1.7 + 0.8 = 4.2$

Moderate rotational deformity =  $40\% \times 4.2 = 1.68\%$  total

**TOTAL RING FINGER =  $0.84 + 1.68 = 2.52$**

**TOTAL OF BOTH FINGERS  $6.01 + 2.52 = 8.53$**

**Partial amputation, restricted range of movement, sensory loss and deformities – 3 fingers**

EX. 12 – left index finger – restricted range of movement, sensory loss and mild rotational deformity; left middle finger – partial amputation, restricted range of movement, sensory loss and moderate ulnar deviation; left ring finger - partial amputation, restricted range of movement, sensory loss and severe radial deviation

USING CHART 4

#### Index Finger

	R	L
DIP	0/80	20/50
PIP	0/100	0/80
MP	0/90	0/80

#### Middle Finger

	R	L
DIP	0/80	AMP
PIP	0/100	0/80
MP	0/90	0/80

#### Ring Finger

	R	L
DIP	0/80	AMP

<b>PIP</b>	0/100	20/90
<b>MP</b>	0/90	0/90

**Sensory Testing**

	<b>Index</b>		<b>Middle</b>		<b>Ring</b>	
	<b>U</b>	<b>R</b>	<b>U</b>	<b>R</b>	<b>U</b>	<b>R</b>
<b>DIP</b>	<b>2</b>	<b>2</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>
<b>PIP</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>

Index finger	Mild rotational deformity
Middle finger	Moderate ulnar deviation
Ring finger	Severe radial deviation

**Index Finger:**

$$\text{DIP calculation} = \frac{80 - (50 - 20)}{80} \times .75 \times 3.4$$

$$= \frac{50}{80} \times .75 \times 3.4 = \mathbf{1.59}$$

**DIP Sensory loss:** Ulnar side (2) 7 to 15mm. Radial side (2) 7 to 15mm  
Remaining value of DIP joint is:

$$3.4\% - 1.59\% = 1.81$$

Ulnar side sensory impairment would be  $1.81 \times 12.5\% = .23$

Radial side sensory impairment would be  $1.81 \times 12.5\% = .23$

$$\text{Total DIP joint (ROM +Sensory)} \mathbf{1.59 + .23 + .23 = 2.05}$$

$$\text{PIP calculation} = \frac{100 - 80}{100} \times .75 \times (6.8 - 2.05)$$

$$= \frac{20}{100} \times .75 \times 4.75 = \mathbf{0.71}$$

$$\text{MP calculation} = \frac{90 - 80}{90} \times .75 \times (8.5 - .71 - 2.05)$$

$$\frac{10}{90} \times .75 \times 5.74 = \mathbf{.48}$$

Plus mild rotational deformity:

Index finger amputation value - chart 4=  $3.4 + 3.4 + 1.7 = 8.5$

Mild rotational deformity =  $20\% \times 8.5 = \mathbf{1.7}$

$$\text{TOTAL INDEX FINGER} = 2.05 + 0.71 + 0.48 + 1.7 = \underline{4.94}$$

**Middle Finger:**

**DIP calculation** Amputation at DIP Joint of Right Ring Finger ∴ impairment = 3.4%

$$\text{PIP calculation} = \frac{100 - 80}{100} \times .75 \times (6.8 - 3.4)$$

$$= \frac{20}{100} \times .75 \times 3.4 = \mathbf{0.51}$$

**PIP Sensory loss:** Ulnar side (2). Radial side (1)

Remaining value of PIP joint is:

$$3.4 - 0.51\% = 2.89$$

Ulnar side sensory impairment would be  $2.89 \times 12.5\% = \mathbf{.36}$

Radial side sensory impairment would be  $2.89 \times 25\% = \mathbf{.72}$

$$\text{Total PIP joint (ROM +Sensory)} \mathbf{.51 + .36 + .72 = 1.59}$$

$$\text{MP calculation} = \frac{90 - 80}{90} \times .75 \times (8.5 - 3.4 - 1.59)$$

$$\frac{10}{90} \times .75 \times 3.51 = \mathbf{.29}$$

Plus Moderate ulnar deviation:

Middle finger amputation value - chart 4 =  $3.4 + 3.4 + 1.7 = 8.5$

Moderate ulnar deviation =  $20\% \times 8.5 = \mathbf{1.7}$

$$\text{TOTAL MIDDLE FINGER} = 3.4 + 1.59 + 0.29 + 1.7 = \underline{6.98}$$

**Ring Finger:**

**DIP calculation** Amputation at DIP Joint of Right Ring Finger ∴ impairment = 2.1%

$$\text{PIP calculation} = \frac{100 - (90 - 20)}{100} \times .75 \times (4.2 - 2.1)$$

$$= \frac{30}{100} \times .75 \times 2.1 = \mathbf{0.47}$$

**PIP Sensory loss:** Ulnar side - no loss. Radial side (2)









$$\frac{(140^{\circ} - (120^{\circ} - 10^{\circ}))}{140} \times 20 = \frac{(140^{\circ} - 110^{\circ})}{140} \times 20 = \frac{30^{\circ}}{140} \times 20$$

**ELBOW TOTAL = 4.29%**

**Note: if there is also extension loss on the good side, the extension loss must be deducted from the flexion figure.**

**Example, if there is extension loss of 5 degrees on the good side this must be subtracted from the flexion figure on the good side. In the example above the total Range of movement on the good side would now be 135° (140 – 5).**

Loss of hyperextension is not considered an impairment, hyperextension is taken as zero.

**Elbow Replacement**

The impairment rating for this procedure has been set at 5.8 percent. Any loss of range of motion is awarded in addition to this item. Total impairment for a replacement and loss of range of motion can not exceed the amputation value.

**Radial Head Resection (with or without prosthetic replacement).**

The impairment for this procedure is set at 3 percent. Any loss of range of motion is awarded in addition to this item. The total impairment cannot exceed the amputation value.

**5) Shoulder**

Amputations:

1. Amputation: proximal, third of humerus or disarticulation at the Shoulder - 70 percent.

**Range of Motion** (a totally fused shoulder would be 35%)

*The total impairment granted for the loss of shoulder movement is 35%. Each movement is allocated with a portion of this overall percentage.*

<i>a. Flexion</i>	<i>14.0%</i>
<i>b. Extension</i>	<i>3.5 %</i>
<i>c. Abduction</i>	<i>7.0 %</i>
<i>d. Adduction</i>	<i>3.5 %</i>
<i>e. Internal Rotation</i>	<i>3.5 %</i>
<i>f. External Rotation</i>	<i>3.5 %</i>



<b><u>Abduction</u></b>	$\frac{R}{110}$	$\frac{L}{169}$
-------------------------	-----------------	-----------------

$$\frac{(169 - 110)}{169} \times 7 = \frac{59}{169} \times 7 = 2.44\%$$

<b><u>Adduction</u></b>	$\frac{R}{35}$	$\frac{L}{50}$
-------------------------	----------------	----------------

$$\frac{(50 - 35)}{50} \times 3.5 = \frac{15}{50} \times 3.5 = 1.05$$

<b><u>Internal Rotation</u></b>	$\frac{R}{20}$	$\frac{L}{65}$
---------------------------------	----------------	----------------

$$\frac{(65 - 20)}{65} \times 3.5 = \frac{45}{65} \times 3.5 = 2.42\%$$

<b><u>External Rotation</u></b>	$\frac{R}{50}$	$\frac{L}{80}$
---------------------------------	----------------	----------------

$$\frac{(80 - 50)}{80} \times 3.5 = \frac{30}{80} \times 3.5 = 1.31\%$$

**Total Shoulder (1.35 + 1.05 + 2.44 + 1.05 + 2.42 + 1.31) = 9.62%**

**Shoulder replacement arthroplasty**

The impairment rating for this procedure has been set at 6.5 percent. Any loss of range of movement is considered in addition to this item. Total impairment may not exceed the amputation value.

**Other Conditions and Surgical Procedures**

- a. Acromioclavicular (AC) or lateral clavicular joint resection 3.0%
- b. Distal clavicular joint resection 3.0%
- c. Sternoclavicular joint resection 3.0%

Any loss of range of movement is considered in addition to these items. Total impairment not to exceed the amputation value.

**Osteoarthritis – Lower limbs only****1. General**

The following principles apply to assessment of osteoarthritis in a lower extremity weight bearing joint generally:

- Osteoarthritis is classified as mild, moderate, moderately severe or severe based on imaging studies and/or operative reports.
- The available disability rating for osteoarthritis is compared to the total of the available disability ratings for loss of range of motion and loss of strength in the affected limb, and the higher of the two is awarded. That percentage is then added to any percentage of disability awarded for ligamentous laxity of the limb.

Note that osteoarthritis is only considered to result in a disability where it occurs in a lower extremity weight bearing joint. Osteoarthritis in other joints is not considered to result in a disability.

**2. Osteoarthritis in the Hip, Ankle or Foot**

Disability from osteoarthritis in the hip, ankle or foot is rated using the following table:

Class of Osteoarthritis	Grade of Chondromalacia	Percentage of Arthrodesis Value
Mild	0 (normal) and 1 (softening of cartilage)	0
Moderate	2 (fibrillation of cartilage)	10
Moderately Severe	3 (ulceration of cartilage)	20
Severe (full thickness cartilage loss)	4 (bone showing through)	30

**3. Osteoarthritis in the Knee**

The following additional principles apply to assessment of disability from osteoarthritis in the knee specifically:

- Osteoarthritis may exist in multiple compartments of the knee: the medial compartment, the lateral compartment and/or the patellofemoral compartment.
- Disability from osteoarthritis in the knee is assessed based on the compartment that results in the highest disability rating (not necessarily the compartment with the most severe class of osteoarthritis). Multiple ratings for osteoarthritis in multiple compartments of the knee are not added. Only the rating of the compartment that results in the highest disability rating is used.

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- For example, if a worker has severe osteoarthritis of the patellofemoral joint (assessed at 3% total disability) and moderately severe osteoarthritis of the medial compartment (assessed at 5% of total disability), the worker's disability rating for osteoarthritis in the knee would be 5% of total disability.

Class of Osteoarthritis	Grade of Chondromalacia	Percentage (of Total Disability)		
		Medial Compartment	Lateral Compartment	Patellofemoral Compartment
Mild	0 (normal) and 1 (softening of cartilage)	0	0	0
Moderate	2 (fibrillation of cartilage)	2.5	2.5	1
Moderately Severe	3 (ulceration of cartilage)	5	5	2
Severe (full thickness cartilage loss)	4 (bone showing through)	7.5	7.5	3

6) **Hip**

**Amputations**

Amputation near the hip (hip disarticulation or short stump) – 65 percent

**Range of Motion** (a totally fused hip would be 30%)

*The total impairment granted for the loss of hip movement is 30%. Each movement is allocated with a percentage of this overall impairment.*

- a. Flexion 9.0%
- b. Extension 2.0 %
- c. Abduction 7.0 %
- d. Adduction 3.0 %
- e. Internal Rotation 3.0 %
- f. External Rotation 6.0 %

$$\text{Flexion} = \frac{(\text{G.S.} - \text{I.S.})}{\text{G.S.}} \times \text{SA} \quad \text{Norm ROM} = 113$$

% allotted = 9

$$\text{Extension} = \frac{(\text{G.S.} - \text{I.S.})}{\text{G.S.}} \times \text{SA} \quad \text{Norm ROM} = 28$$

% allotted = 2

$$\text{Abduction} = \frac{(\text{G.S.} - \text{I.S.})}{\text{G.S.}} \times \text{SA} \quad \text{Norm ROM} = 48$$

% allotted = 7

$$\text{Adduction} = \frac{(\text{G.S.} - \text{I.S.})}{\text{G.S.}} \times \text{SA} \quad \text{Norm ROM} = 31$$

% allotted = 3

$$\text{Internal Rotation} = \frac{(\text{G.S.} - \text{I.S.})}{\text{G.S.}} \times \text{SA} \quad \text{Norm ROM} = 30$$

(In Flexion) % allotted = 3

$$\text{External Rotation} = \frac{(\text{G.S.} - \text{I.S.})}{\text{G.S.}} \times \text{SA} \quad \text{Norm ROM} = 45$$

% allotted = 6

**Example with injury on right side**

	Right	Left
Flexion	80	110
Extension	15	25
Abduction	20	45
Adduction	20	30
Internal Rotation	20	30
External Rotation	15	40

**Calculation of impairment:**

$$\begin{array}{l} \text{Flexion} \\ \frac{R}{80} \quad \frac{L}{110} \end{array}$$

$$\frac{(110 - 80)}{110} \times 9 = \frac{30}{110} \times 9 = \mathbf{2.45\%}$$

$$\begin{array}{l} \text{Extension} \\ \frac{R}{15} \quad \frac{L}{25} \end{array}$$

$$\frac{(25 - 15)}{25} \times 2 = \frac{10}{25} \times 2 = \mathbf{0.80\%}$$

$$\begin{array}{l} \text{Abduction} \\ \frac{R}{20} \quad \frac{L}{45} \end{array}$$

$$\frac{(45 - 20)}{45} \times 7 = \frac{25}{45} \times 7 = \mathbf{3.89\%}$$

$$\begin{array}{l} \text{Adduction} \\ \frac{R}{20} \quad \frac{L}{30} \end{array}$$

$$\frac{(30 - 20)}{30} \times 3 = \frac{10}{30} \times 3 = \mathbf{1.00\%}$$

$$\begin{array}{l} \text{Internal Rotation} \\ \frac{R}{20} \quad \frac{L}{30} \end{array}$$

$$\frac{(30 - 20)}{30} \times 3 = \frac{10}{30} \times 3 = \mathbf{1.00\%}$$

$$\begin{array}{l} \text{External Rotation} \\ \frac{R}{15} \quad \frac{L}{40} \end{array}$$

$$\frac{(40 - 15)}{40} \times 6 = \frac{25}{40} \times 6 = \mathbf{3.75\%}$$

$$\text{Total Hip } (2.45 + 0.80 + 3.89 + 1.0 + 1.0 + 3.75) = \mathbf{12.89\%}$$

**Hip Replacement (Total Hip Prosthesis (including Femoral Head Prosthesis))**

The impairment rating for this procedure has been set at 6.0 percent. Any loss of range of motion over and above the 6.0 percent is awarded in addition to this item. Total impairment may not be more than the amputation value.



**Shortening Causing a Difference in Leg Length**

Shortening of the leg less than 1.5cm is normally not considered an impairment. The impairment shall conform to the following table.

	<u>Percentage</u>
(a) 1.5 cm or less.....	0
(b) 1.6 cm to 2.5 cm.....	2
(c) 2.6 cm to 3.5 cm.....	3
(d) 3.6 cm to 4.5 cm.....	4
(e) 4.6 cm to 5.5 cm.....	6
(f) 5.6 cm to 6.5 cm.....	8
(g) 6.6 cm to 7.4 cm.....	10
(h) 7.5 cm or more.....	15

7) **Knee**

**Amputations**

1. Amputation of the thigh, sight of election or end bearing (requiring false knee joint) – 50 percent.

**Range of Motion (a totally fused knee would be 25%)**

Norm ROM = 134 Flexion  
0 Extension  
% allotted = 25

$$\frac{G.S. - I.S.}{G.S.} \times SA$$

**EX. 1** Loss of Flexion only

$$R: \frac{0}{100} \quad L: \frac{0}{130}$$

$$\frac{(130 - 100)}{130} \times 25 = \frac{30}{130} \times 25 = 5.77\%$$

**EX. 2** Loss of flexion plus extension deficit

$$R: \frac{15}{115} \quad L: \frac{0}{135}$$

$$\frac{(135 - (115 - 15))}{135} \times 25 = \frac{(135 - 100)}{135} \times 25 = \frac{35}{135} \times 25 = 6.48\%$$

**Note: if there is also extension loss on the good side, the extension loss must be deducted from the flexion figure.**





**Dorsiflexion**

R      L  
10      18

$$\frac{(18 - 10)}{18} \times 6 = \frac{8}{18} \times 6 = 2.67\%$$

**Total Ankle (2.00 + 2.67) = 4.67%**

**Ankle Ligamentous Laxity**

Impairment for ligament laxity is rated as 2 percent for medial or lateral laxity. This is granted in addition to awards for loss of range of movement or osteoarthritis. Total impairment shall not exceed the amputation value.

**Total Ankle Prosthesis/Complete Ankle Replacement**

The impairment rating for this procedure has been set at 5 percent. Any loss of range of movement, instability, deformity and osteoarthritis is awarded in addition to this item. Total impairment shall not exceed the amputation value.

**9) Subtalar (Talocalcaneal)**

- The Subtalar - Overall movement will be reported as **full**,  $\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $\frac{1}{4}$  or **none** (this will not be divided into inversion and eversion but will be provided as one overall movement).
- Total % of impairment is **4.25%** for complete immobility (fused).

The Medical Examiner indicates in the report how much movement there is in the subtalar. For example,  $\frac{1}{2}$  motion of the subtalar maybe recorded in the report. This is then selected in the software and the impairment rating given.  $\frac{1}{2}$  movement equals 2.125%.

**10) Midtarsal Amputation**

1. amputation throughmidtarsal (Chopart's Amputation) is 20%.
2. Tarsometatarsal (Lisfranc's Amputation) is 15 percent.

**Range of Motion**

- Forefoot not measured in degrees. Movement reported as **full**,  $\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $\frac{1}{4}$  or **none**.
- Total % of impairment is **2.75%** for complete immobility (fused).

The Medical Examiner indicates in the report how much movement there is in the forefoot. For example, ½ motion of the forefoot maybe recorded in the report. This is then selected in the software and the impairment rating given. ½ movement equals 1.375%.

**Lisfranc’s (tarsometatarsal) fusion**

Fusion of tarsometatarsal joint equals 4 percent.

**Triple Arthrodesis**

Fusion of the subtalar (talocalcaneal) and Midtarsal equals 7 percent.

**11) Great Toe**

**Amputation**

There are two amputation selections for the great toe.

1. Toes, great (at MP joint) – 2.5 percent. With the Head of the Metatarsal the rating is 5 percent.
2. Toes, great at IP joint – 1.0 percent.

If all the toes are amputated at the MP joint the impairment will show as 5 percent.

**Range of Motion**

$$\text{IP Joint} = \frac{(\text{G.S.FL.} - \text{G.S.Ex.}) - (\text{I.S.FL.} - \text{I.S.Ex.})}{(\text{G.S.Fl.} - \text{G.S.Ex.})} \times 1.00 \times .50$$

Norm ROM = 60 Flexion, 0 Extension

**Example with injury on right side IP joint only**

<u>R</u>	<u>L</u>
<u>0</u>	<u>0</u>
40	60

$$\begin{aligned} \text{IP calculation} &= \frac{(60 - 0) - (40 - 0)}{(60 - 0)} \times 1.0 \times .50 \\ &= \frac{(60 - 40)}{60} \times .50 = .17 \end{aligned}$$

**MP Joint**

Norm ROM = 37 Flexion  
63 Extension  
% allotted = 1.25

(When calculating the MP joint, any impairment value given for the IP joint must be subtracted)

$$\frac{\text{Total ROM G.S. (Ext. + Flex.)} - \text{Total ROM I.S. (Ext. + Flex.)}}{\text{Total ROM G.S.}} \times 2.50 \times .50$$

(example below only MP joint is injured)

**Example with injury on right side MP joint only**

	<u>R</u>	<u>L</u>
Ext.	50	60
Flex.	20	35
Total ROM =	70	95

$$\frac{(60 + 35) - (50 + 20)}{(60 + 35)} \times 2.5 \times .50$$

$$= \frac{(95 - 70)}{95} \times 1.25 = .33$$

**Example 1: Complete Amputation of Great Toe**  
(injury on the right side)

IP Joint Amputated = 1.00%

MP Joint Amputated = 1.50%

Total Impairment = 2.50%

**Example 2: Both joints having Restricted Movement**

IP joint restricted on the right side

	<u>R</u>	<u>L</u>
Extension	<u>0</u>	<u>0</u>
Flexion	40	60

$$\frac{(60 - 0) - (40 - 0)}{(60 - 0)} \times 1.0 \times .50$$

$$= \frac{(60 - 40)}{60} \times .50 = .17$$

MP Joint restricted on the right side

	<u>R</u>	<u>L</u>
Flexion	20	35
Extension	<u>50</u>	<u>60</u>
Total	70	95

$$\frac{(60 + 35) - (50 + 20)}{(60 + 35)} \times (2.5 - .17) \times .50 \quad (.17 \text{ is } \% \text{ calculated for IP})$$
$$= \frac{(95 - 70)}{95} \times 1.17 = .31$$

**TOTAL IMPAIRMENT = .48%**

## **12) Toes, other than Great**

### **Amputations**

There are two schedule items dealing with the other toes.

1. Toes, other than great, each - .5 percent.  
metatarsal, each - .5 percent.
2. Toes, little with metatarsal – 2 percent.

### **Range of Motion**

Although the toe motion of the other toes can be measured this is rarely done in the clinical setting. Measurement of the toes, other than the great, is difficult to perform. Therefore, any percentage given is a judgment award based on the Officer's review of the medical, often in consultation with a Disability Awards Medical Advisor. Any award given for an individual toe cannot exceed the amputation value.

## **13) SPINE**

The following principles apply to assessment of disability in the spine:

- Anatomical loss or damage resulting from injury or surgery may contribute to physical disability of the spine. When anatomic and/or surgical disability is present as well as loss of range of motion of the spine, the final disability rating is based on the greater of the two.
- Range of motion of the spine is difficult to assess on a consistent basis because the joints of the spine are small, inaccessible and not externally visible. Only movement of a region of the spine can be measured; it is not possible to measure mobility of a single vertebra.
- A loss of range of motion in the spine of less than three degrees generally does not impair a worker's earning capacity to an ascertainable degree.

Total paraplegia is rated as 100% of total disability.

Total quadriplegia is rated as 100% of total disability.

A vertebrectomy merits an award equivalent to the rating for a two-level fusion, plus the rating for total collapse of the removed vertebra.

**Anatomic/Surgical Impairment of Spine**

Anatomic and/or surgical impairment includes:

- compression fractures
- surgical loss of an intervertebral disc
- spine ankylosis (fusion)

For the cervical spine C1 level only – Jefferson fracture

**Compression Fractures:**

**Cervical Spine**

- up to 50% compression equals 0-2 percent
- greater than 50% compression equals 2-4 percent

**Thoracic Spine**

- up to 50% compression equals 0-1 percent
- over 50% compression equals 1-2 percent

**Lumbar Spine**

- up to 50% compression equals 0-2 percent
- over 50% compression equals 2-4 percent

**Surgical loss of intervertebral disc**

Cervical Spine – 2 percent per level (C1 to D1) to maximum of 21%  
Thoracic Spine – 1 percent per level to a maximum of 6% (T1 to T12)  
Lumbar Spine – 2 percent per level (T12 to S1) to maximum of 24%.

**Ankylosis (fusion) including surgical of intervertebral disc**

Cervical Spine – 3 percent per level (C1 to D1) to maximum of 21%  
Dorsal (Thoracic) Spine – 1 percent per level to a maximum of 6 percent  
(D1 to D12)  
Lumbar Spine – 4 percent per level (D12 to S1) to maximum of 24%.

C1 Jefferson Fracture.....2%

**10) Cervical Spine (Range of Movement Calculation)**

**Example injury of cervical spine**

Flexion	25
Extension	20
Lateral flexion – right	20
Lateral flexion – left	30
Rotation – right	40
Rotation - left	60





**11) Thoracic Spine** (*Range of Movement Calculation*)

Rotation (*Right & Left*)

Norm ROM = 45°

% allotted = 3

$$\frac{(\text{Norm} - \text{I.S.})}{\text{Norm}} \times \text{SA}$$

**Example** - Measured Rotation on Right side is 30°, on Left, Rotation is Normal.

$$\frac{(45 - 30)}{45} \times 3 = \frac{15}{45} \times 3 = \mathbf{1.00\%}$$

**TOTAL IMPAIRMENT THORACIC SPINE: = 1.00%**

**12) Lumbar Spine** (*Range of Movement Calculation*)

**Example injury of lumbar spine**

Flexion	45
Extension	15
Lateral flexion – right	
Lateral flexion – left	

Flexion =  $\frac{(\text{Norm} - \text{I.S.})}{\text{Norm}} \times \text{SA}$

Norm ROM = 60°

% allotted = 9

**Flexion calculation** – flexion measured at 45°

$$\frac{(60^\circ - 45^\circ)}{60^\circ} \times 9 = \frac{15}{60} \times 9 = \mathbf{2.25}$$

Extension =  $\frac{(\text{Norm} - \text{I.S.})}{\text{Norm}} \times \text{SA}$

Norm ROM = 25°

% allotted = 5

**Extension calculation** – extension measured at 25°

$$\frac{(25 - 15)}{25} \times 5 = \frac{10}{25} \times 5 = \mathbf{2.00\%}$$

Section 23(1) Calculator Software Specifications and Calculations

Lateral Flexion (*Right & Left*)

Norm ROM = 25°

% allotted = 5

$\frac{(\text{Norm} - \text{I.S.})}{\text{Norm}} \times \text{SA}$

**Lateral Flexion - Measured Lateral Flexion on Right is 15°, on Left, Lateral Flexion is Normal.**

$$\text{Lat. Flexion Right} = \frac{(25 - 15)}{25} \times 5 = \frac{10}{25} \times 5 = \mathbf{2.00\%}$$

**TOTAL IMPAIRMENT LUMBAR SPINE: 2.25 + 2.0 + 2.0 = 6.25%**