

# Disability Assessment

## National Judicial Academy- Bhopal



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# Types of Disability

1. Locomotor / Orthopaedic Disability - MACT Cases
2. Visual Impairment
3. Speech and Hearing Disability
4. Mental Retardation
5. Multiple Disabilities

# Sequence of events leading to Disability

Physical impairment



Leads to

Functional Limitation



Leads to

**DISABILITY**

# Definition of Impairment

Defined as a permanent or transitory psychological, or anatomical loss and /or abnormality



# Functional Limitation

Functional limitations is a condition which can be partial or total inability to perform those activities necessary for motor, sensory, or mental functions within the range and manner of which a human being is normally capable such as walking, lifting loads, seeing, speaking, bearing, reading, writing, counting, taking interest in and making contact with surroundings.

Short Term

Reversible

Progressive

Long Term

Permanent

Regressive

**Must be Quantifiable whenever possible**

## Disability definition

**A disability is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.**

# Medico legal Definition

## Medical Definition

disability is physical impairment and inability to perform physical functions normally.

## Legal Definition

disability is a permanent injury to body for which the person should or should not be compensated.

# Motor Accident Claims Tribunal involves



Upper Limb Injuries



Lower Limb Injuries



Amputees



Spinal Injuries



# Assessment of Upper Limb Disability

## Functional Assessment

Arm Component 90%

Hand component 90%

Assessment of Disability



**OFFICE OF THE CHIEF  
COMMISSIONER FOR PERSONS WITH  
DISABILITIES**

**MANUAL FOR DOCTORS TO EVALUATE  
PERMANENT  
PHYSICAL IMPAIRMENT**

# Assessment of Disability

## **DISABILITY**

(PERMANENT PHYSICAL IMPAIRMENT)

## **ASSESSMENT**

AND

## **CERTIFICATION**

*GUIDELINES & EXPLANATIONS BY DR RATNESH KUMAR, DIRECTOR,  
NIIH, KOLKATA*

**BASED ON**

### **GUIDELINES & GAZETTE NOTIFICATION**

*(Committee under chairmanship of DGHS, GOI) issued by  
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(In the interest of persons with disability, to sensitize medical doctors.)

# Disability assessment of Extremities- PPI

Upper Extremity



Functional assessment



Lower Extremity



Mobility  
&  
Stability



Aim is to Evaluate Permanent Physical Impairment- PPI

# Guidelines for Evaluation of PP I-Upper Limb.

1. Depends upon the measurement of functional impairment and **not expression of a personal opinion.**
2. Should be made when maximum improvement of clinical condition is achieved **(12-18 Months)**
3. The upper limb **Arm Component and 'Hand Component'.**
4. **Arm Component' assess ROM , Muscle Strength and Co-ordinate Activities.**
5. **Measurement of loss of function of Hand Component assess Prehension, Sensation & Strength**
6. **The impairment of the entire extremity depends on the combination of the functional impairments of both components.**

Always remember

The Combination  
Formula

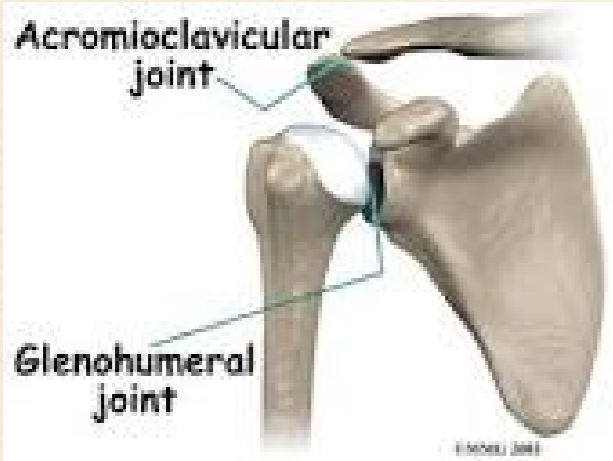
$$\frac{a + b + (90 - a)}{90}$$

Where “a” is always the higher value

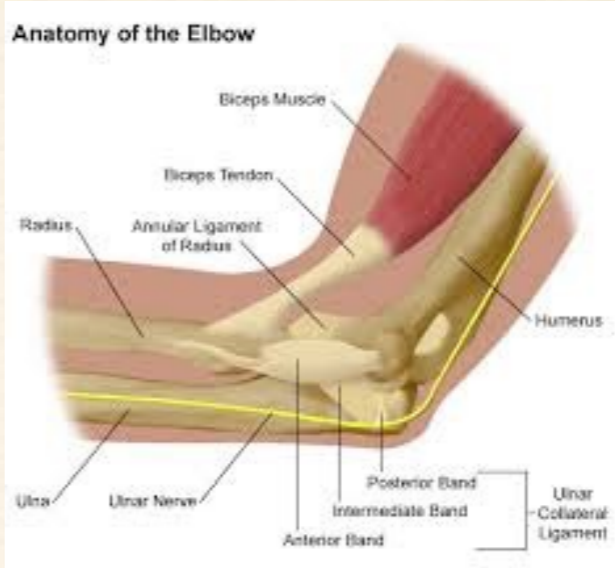
90 is a constant

# Disability Assessment of Upper Limb

## Arm Component - 90%



- Shoulder Joint 30%
- Elbow Joint 30%
- Wrist Joint 30%



## Hand Component 90%

- Loss of Prehension 30%
- Loss of Sensation 30%
- Loss of Strength 30%

## Assessment of Arm component - PPI

### 3 Components

#### Example- Shoulder Joint

- |                            |                      |
|----------------------------|----------------------|
| 1. Range of Motion -       | Shoulder/Elbow/Wrist |
| 2. Muscle Strength -       | MRC Grading (0-5)    |
| 3. Coordinated Activities- | 10 Variables         |



# Principles of Assessing Range of Motion

Arm Component- Total Value 90%

## Principles of evaluation of 'Range of Motion' (ROM) of joints

1. The value of maximum ROM in the Arm Component is 90%

2. Each of the three joints of the Arm is weighed equally (30%)

Example

Shoulder Joint - Normal ROM ( Range of Motion)

ROM	Normal	Active	Loss
Forward Flexion	180"	90"	50%
Abduction	180"	90"	50%
Rotations	90"	45"	50%

Hence the mean loss of ROM of shoulder will be  $(50 + 50 + 50) / 3 = 50\%$

Shoulder movements constitute 30% of the Motion of the Arm Component; therefore the loss of Motion for Arm Component will be  $50 \times 0.30 = 15\%$

# Principles of Assessing Muscle Strength

## MRC - Medical Research Council Grading

Loss of muscle power can be given percentages as follows:

	Manual muscle Strength grading	Loss of Strength in Percentage
No Movement	0	100%
Flicker of Movement	1	80%
Gravity Eliminated	2	60%
Against Gravity	3	40%
Against Resistance	4	20%
NORMAL	5	0%

The mean percentage of loss of muscle strength around a joint is multiplied by 0.30.

Example

$$\text{MRC Grade of 3} = 40\% \times 0.30 = 12\%$$

# Coordinated Activities Assessment

A. The total value for coordinated activities is 90%

Each activity has a value of 9%

C. Ten different coordinated activities should be tested as given below.

- |  |    |                            |    |
|--|----|----------------------------|----|
| 1. Lifting overhead objects remove and placing at the same place |    | 6. Holding glass of water  | 9% |
| 2. Touching nose with end of extremity                           | 9% | 7. Drinking Glass of water | 9% |
| 3. Eating Indian Style   | 9% | 8. Buttoning               | 9% |
| 4. Combing and Plaiting  | 9% | 9. Tie Nara Dhoti          | 9% |
| 5. Putting on a shirt/kurta                                      | 9% | 10. Writing                | 9% |

## Combining values for the Total Arm Component %

Total Loss of Function

- |                                       |        |                         |
|---------------------------------------|--------|-------------------------|
| <b>a</b> Loss of ROM                  | 16.5 % | <b>a</b> = Higher value |
| <b>b</b> Loss of Muscle Strength      | 8.3 %  | <b>b</b> = Lower Value  |
| <b>c</b> Loss of Coordinated Movement | 5.0%   |                         |

Formula  $\frac{a+b (90 - a)}{90}$   $\frac{16.5 + 8.3 (90 - 16.5)}{90} = 20.25$

= **d**

To add loss of coordination (**d&c**)  $\frac{d + c (90 - d)}{90}$   $\frac{20.25 + 5 (90 - 20.25)}{90} =$

19.5%

**So total value of loss of functions in Arm Component 19.5%**

# Assessment of disability- Hand

**Total value of Hand Component is 90%**

**The functional impairment of Hand is expressed as**

**loss of Prehension 30%**

**loss of Sensation 30%**

**loss of Strength. 30%**

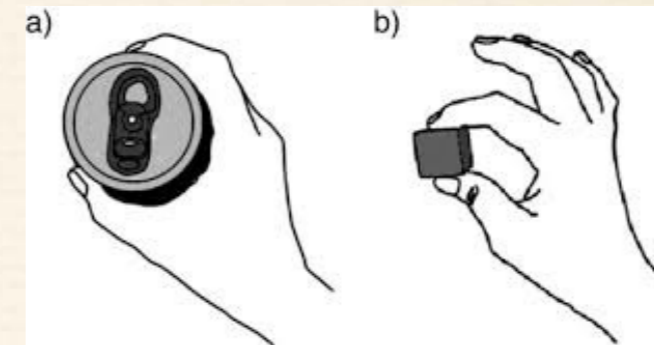
# Assessment of Hand Prehension

**Total value of Prehension is 30%.**

It includes: a) **Opposition 8%**

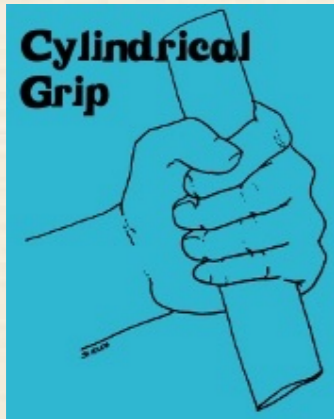
Tested against

- Index finger 2%
- Middle finger 2%
- Ring finger 2%
- Little finger 2%



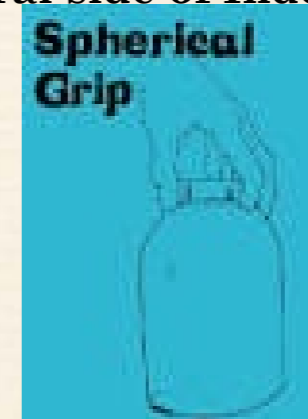
b) **Lateral pinch 5%**

(Tested by asking patient to hold a key between thumb & lateral side of Index finger)



c) **Cylindrical grasp 6%** tested for

- i) Large object of 4" size (diameter) 3%
- ii) Small object of 1" size (diameter) 3%



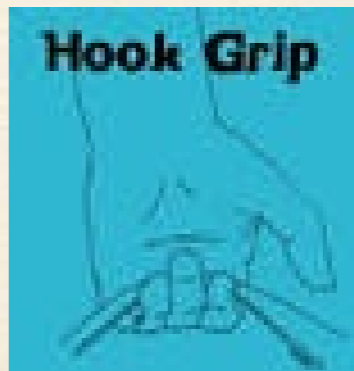
d) **Spherical grasp 6%** tested for

- i) Large object of 4 inches size 3%
- ii) Small object of 1 inch size 3%



e) **Hook grasp 5%**

Tested by asking the patient to lift a bag



# Assessment of Hand Sensation

**Total value of Sensation in Hand is 30%**

**It should be assessed according to distribution as below:**

## **i) Complete loss of Sensation**

**Thumb ray      9%**

**Index finger   6%**

**Middle finger  5%**

**Ring finger    5%**

**Little finger   5%**

**ii) Partial loss of Sensation: Assessment should be made according to percentage of loss of Sensation in thumb/finger (s)**

# Assessment of Hand Strength

**Total value of Strength is 30%**

It includes:

- . i) Grip Strength      20%
- . ii) Pinch Strength    10%

Done with Dynamometer or clinical method

**Combining values of Hand Component is similar to Arm Component**

**Combining values for the Extremity = Arm component% + Hand component Percentage**

**a = Higher value**

**b = Lower value**

$$a+b \times 90 - a$$

$$\frac{\quad}{90} = \% \text{ PPI of Extremity}$$



# Additional weightage

**A total of 10% additional weightage can be given to following accompanying factors, if they are continuous and persistent despite treatment.**

- 1. Pain (Mild /Moderate /Severe)**
- 2. Infection - Chronic?**
- 3. Deformity**
- 4. Mal-alignment**
- 5. Contractures**
- 6. Cosmetic disfiguration**
- 7. Dominant extremity-4%**
- 8. Shortening of upper limb - First 1" no weightage, for each 1" beyond first 1" 2% disability.**

**The extra points should not exceed 10% of the total Arm Component and total PPI should not exceed 100% in any case.**

## Assessment of Lower Limb Disability

2 Components

Mobility 90%

Stability 90%

# Assessment of Lower Limb Disability- PPI

## Mobility component

1. Total value of Mobility component is 90%

2. Assessment includes **Range of Movement (ROM) and Muscle Strength**

Hip Joint 30%

Knee Joint 30%

Ankle Joint 30%

Evaluation of Muscle strength- using MRC grading

Combining values for Mobility component formula

$$\frac{a+b (90-a)}{90}$$

# Assessment of Stability Component

**STABILITY COMPONENT (Total Value 90%)**

**Based CLINICAL METHOD of Evaluation**

- 1. Walking on plain surface 10%**
- 2. Walking on slope 10 %**
- 3. Climbing Stairs 10%**
- 4. Standing on both legs 10%**
- 5. Standing on affected leg 10 %**
- 6. Squatting on floor 10 %**
- 7. Sitting Cross leg 10 %**
- 8. Kneeling 10 %**
- 9. Taking turns 10 %**

## Extra Points to be considered

- 1) Deformity
  - a. In functional position 3%
  - b. In non-functional position 6%
  
- 2) Pain
  - a. Severe (grossly interfering with function) 9%
  - b. Moderate (moderately interfering with function) 6%
  - c. Mild (mildly interfering with function) 3%
  
- 3) Loss of Sensation
  - a. Complete Loss 9%
  - b. Partial Loss 6%
  
- 4) Shortening

First 1/2" Nil  
(For every additional 1/2" shortening 4%)
  
- 5) Complications
  - a. Superficial complications 3%
  - b. Deep complications 6%

# Disability Assessment of Amputees

## **Guidelines for Evaluation of Permanent Physical Impairment in Amputees:**

1. In cases of multiple amputees if the total sum of permanent physical impairment is above 100%, it should be taken as 100% only.
2. If the stump is unfit for fitting the prosthesis additional weightage of 5% should be added to the value.
3. In case of amputation in more than one limb percentage of each limb is added by combining formula and another 10% will be added but when only toes or fingers are involved only 5% will be added
4. Any complication in form of stiffness of proximal joint, neuroma infection, etc., should be given upto a total of 10% additional weightage.  
Dominant upper extremity should be given 4% additional weightage.

# Assessment of Amputees

## A M P U T E E S

### Upper Limb Amputations

	PPI & loss of Physical Function each limb
1. Fore-quarter amputation	100%
2. Shoulder Disarticulation	90%
3. Above Elbow up to upper 1/3 of Arm	85%
4. Above Elbow up to lower 1/3 of fore Arm	80%
5. Elbow disarticulation	75%
6. Below Elbow up to 1/3 of Forearm	70%
7. Below Elbow up to 1/3 of Forearm	65%
8. Wrist disarticulation	60%
9. Hand through carpal bones	55%
10. Thumb through C.M. or 1st MC joint	30%
11. Thumb disarticulation through M-C Joint or. Phalanx	25%
12. Thumb disarticulation through IP joint or distal phalanx	15%

### Lower Limb

#### Amputations

#### PPI & loss of Physical function each limb

1. Hind quarter	100%
2. Hip disarticulation	90%
3. Above Knee up to upper 1/3 of thigh	85%
4. Above Knee up to lower 1/3 of thigh	80%
5. Through Knee	75%
6. B. K. up to 8 cm	70%
7. B. K. up to lower 1/3 of leg	60%
8. Through Ankle	55%
9. Syme's amputation	50%

10. Up to mid-foot	40%
11. Up to fore-foot	30%
12. All toes	20%
13. Loss of first toe	10%
14. Loss of second toe	5%
15. Loss of third toe	4%
16. Loss of fourth toe	3%
17. Loss of fifth toe	2%



## Guidelines for Evaluation of PPI in Amputees

Total Sum is 100%

Unfit for Prosthesis -add 5%

More than one limb?- Use combination formula and add 10%

Stump complication add 5% - **Not an ideal stump**

Dominant upper extremity add 4%

Combination Formula  
(to be applied if more than one limb is involved)

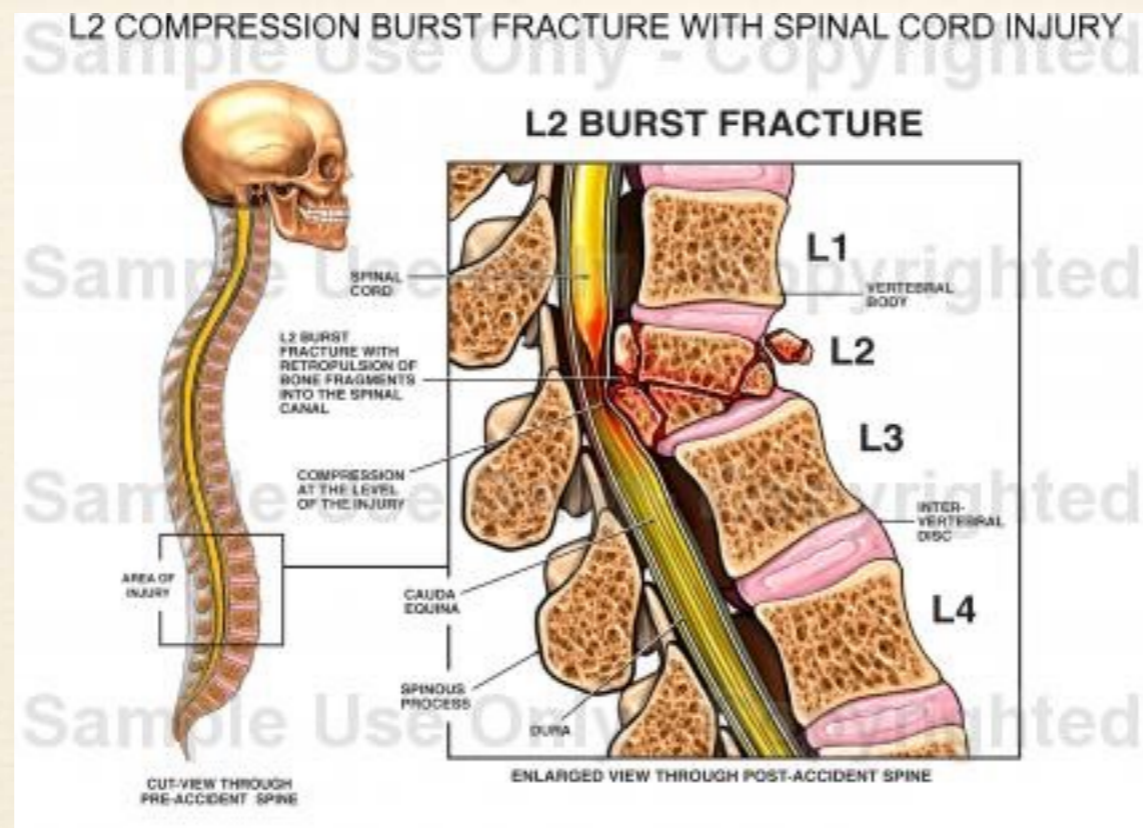
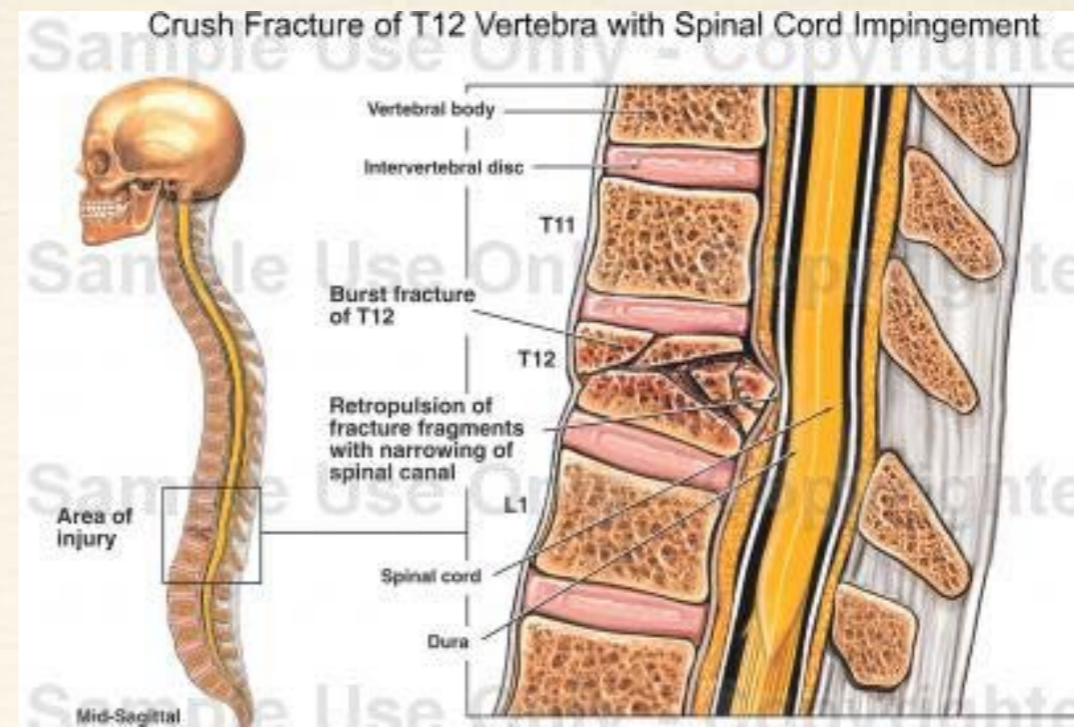
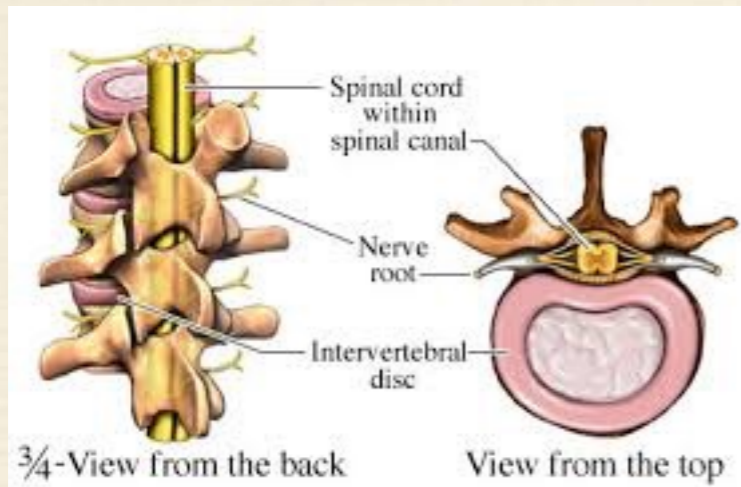
$$\frac{a+b \times (90-a)}{90}$$

# Assessment of Spinal Disability

## **Guidelines for Evaluation of Permanent Physical Impairment of Trunk (Spine)**

1. As permanent physical impairment caused by spinal deformity tends to change over the years, the certificate issued in relation to spine should be reviewed as per the standard format of the certificate given at **Annexure -B of Appendix.III.**
2. Permanent physical impairment should be awarded in relation to spine and not in relation to whole body.
3. Permanent physical impairment due to neurological deficit in addition to spinal impairment should be added by combining formula. The local effects of the lesions of the spine can be conventionally divided into traumatic and non-traumatic. The percentage of PPI in relation to each situation should be valued as follows:

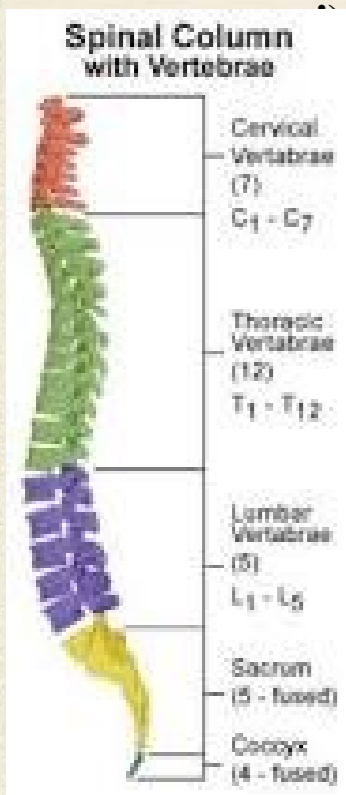
# SPINAL DISABILITY ASSESSMENT FOR PPI



# Cervical Spine injuries - Most Mobile

## TRAUMATIC LESIONS :

## % of PPI in relation of Spine



25% or more compression of one or two Bodies  
**No Neurology**

20%



### ii) Posterior element damage

a) With fusion healed, No permanent motor or sensory changes.

10%

b) Persistent pain with radiologically demonstrable instability.

25%

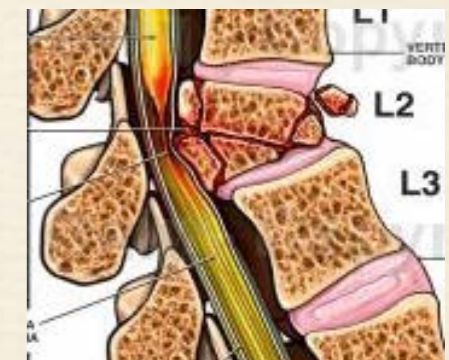
### i) Severe Dislocation :

a) Fair to good reduction with or without

fusion with no residual motor or sensory involvement : 10%

b) Inadequate reduction with fusion and persistent radicular pain.

15%



## Thoracic and Thoraco-Lumbar Spine Injuries

- |  |            |
|--|------------|
| <b>i) Compression of less than 50% involving one vertebral body with no neurological manifestation</b>   | <b>10%</b> |
| <b>ii) Compression of more than 50% involving single vertebra or more with involvement of posterior elements, healed, no neurological manifestations Persistent pain, fusion indicated</b> | <b>20%</b> |
| <b>iii) Same as (b) with fusion, pain only on heavy use of back</b>  | <b>15%</b> |
| <b>iv) Radiologically demonstrable instability with fracture or fracture dislocation with persistent pain.</b>   | <b>30%</b> |

## Lumbar and Lumbo-Sacral Spine : Fracture

- . a) **Compression of 25% or less of one or two adjacent vertebral bodies, No definite pattern or neurological deficit** **15%**
  
- . b) **Compression of more than 25% with disruption of posterior elements, persistent pain and stiffness, healed with or without fusion, inability to lift more than 10 kgs.** **30%**
  
- . c) **Radiologically demonstrable instability in low lumbar or Lumbo-sacral spine with pain.** **35%**

# *Take Home Message*

To consider before final judgement on disability compensation

Infection Burns for ever !!

Joint Replacements in Young invariably need Revision

/ReRevisions!



*Thank you for your kind Attention*



Sitting in a 3.8-metre sea  
kayak and watching  
a four-metre great  
white approach you is  
a fairly tense experience