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

Physical impairment

Leads to

Functional Limitation

Leads to

DISABILITY
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.

<table>
<thead>
<tr>
<th>Short Term</th>
<th>Long Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reversible</td>
<td>Permanent</td>
</tr>
<tr>
<td>Progressive</td>
<td>Regressive</td>
</tr>
</tbody>
</table>

Must be Quantifiable whenever possible
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%
OFFICE OF THE CHIEF COMMISSIONER FOR PERSONS WITH DISABILITIES

MANUAL FOR DOCTORS TO EVALUATE PERMANENT PHYSICAL IMPAIRMENT
DISABILITY
(PERMANENT PHYSICAL IMPAIRMENT)

ASSESSMENT
AND
CERTIFICATION

GUIDELINES & EXPLANATIONS BY DR. RATNESH KUMAR, DIRECTOR,

BASED ON
GUIDELINES & GAZETTE NOTIFICATION
(Committee under chairmanship of DGHS, GOI) issued by
Ministry of Social Justice & Empowerment, GOI,
Regd No. DL33004/99 (Extraordinary) Part II, Sec. 1, June 13, 2001

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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.
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%
3 Components

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

Example - Shoulder Joint
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

<table>
<thead>
<tr>
<th>ROM</th>
<th>Normal</th>
<th>Active</th>
<th>Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Flexion</td>
<td>180”</td>
<td>90”</td>
<td>50%</td>
</tr>
<tr>
<td>Abduction</td>
<td>180”</td>
<td>90”</td>
<td>50%</td>
</tr>
<tr>
<td>Rotations</td>
<td>90”</td>
<td>45”</td>
<td>50%</td>
</tr>
</tbody>
</table>

Hence the mean loss of ROM of shoulder will be \( \frac{50 + 50 + 50}{3} = 50\% \)

Shoulder movements constitute 30% of the Motion of the Arm Component; therefore the loss of Motion for Arm Component will be \( 50 \times 0.30 = 15\% \)
Loss of muscle power can be given percentages as follows:

<table>
<thead>
<tr>
<th>Manual muscle</th>
<th>Loss of Strength in Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Movement</td>
<td>100%</td>
</tr>
<tr>
<td>Flicker of Movement</td>
<td>80%</td>
</tr>
<tr>
<td>Gravity Eliminated</td>
<td>60%</td>
</tr>
<tr>
<td>Against Gravity</td>
<td>40%</td>
</tr>
<tr>
<td>Against Resistance</td>
<td>20%</td>
</tr>
<tr>
<td>NORMAL</td>
<td>0%</td>
</tr>
</tbody>
</table>

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

Example: MRC Grade of 3 = 40% x 0.30 = 12%
Coordinated Activities Assessment

A. The total value for coordinated activities is 90%

<table>
<thead>
<tr>
<th>Activity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifting objects, removing and placing at the same place</td>
<td>9%</td>
</tr>
<tr>
<td>Touching nose with end of extremity</td>
<td>9%</td>
</tr>
<tr>
<td>Eating Indian Style</td>
<td>9%</td>
</tr>
<tr>
<td>Combing and Plaiting</td>
<td>9%</td>
</tr>
<tr>
<td>Putting on a shirt/kurta</td>
<td>9%</td>
</tr>
<tr>
<td>Holding glass of water</td>
<td>9%</td>
</tr>
<tr>
<td>Drinking Glass of water</td>
<td>9%</td>
</tr>
<tr>
<td>Buttoning</td>
<td>9%</td>
</tr>
<tr>
<td>Tie Nara Dhoti</td>
<td>9%</td>
</tr>
<tr>
<td>Writing</td>
<td>9%</td>
</tr>
</tbody>
</table>

Each activity has a value of 9%

Ten different coordinated activities should be tested as given above.
Combining values for the **Total Arm Component %**

Total Loss of Function

a  Loss of ROM         16.5 %  a = Higher value
b  Loss of Muscle Strength  8.3 %  b = Lower Value
c  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

The functional impairment of Hand is expressed as:

- loss of Prehension 30%
- loss of Sensation 30%
- loss of Strength 30%

Total value of Hand Component is 90%
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%
   
   - i) Large object of 4” size (diameter) 3%
   - ii) Small object of 1” size (diameter) 3%

d) **Spherical grasp** 6%
   
   - 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

\[ \frac{a+b \times 90-a}{90} = \% \ PPI \ of \ Extremity \]

\[ a = \text{Higher value} \]
\[ b = \text{Lower value} \]
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 inch no weightage, for each 1 inch beyond first 1 inch 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%)

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%

Based CLINICAL METHOD of Evaluation
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

### Upper Limb Amputations

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

### Lower Limb Amputations

<table>
<thead>
<tr>
<th>Amputation</th>
<th>PPI &amp; loss of Physical function each limb</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hind quarter</td>
<td>100%</td>
</tr>
<tr>
<td>2. Hip disarticulation</td>
<td>90%</td>
</tr>
<tr>
<td>3. Above Knee up to upper 1/3 of thigh</td>
<td>85%</td>
</tr>
<tr>
<td>4. Above Knee up to lower 1/3 of thigh</td>
<td>80%</td>
</tr>
<tr>
<td>5. Through Knee</td>
<td>75%</td>
</tr>
<tr>
<td>6. B. K. up to 8 cm</td>
<td>70%</td>
</tr>
<tr>
<td>7. B. K. up to lower 1/3 of leg</td>
<td>60%</td>
</tr>
<tr>
<td>8. Through Ankle</td>
<td>55%</td>
</tr>
<tr>
<td>9. Syme’s amputation</td>
<td>50%</td>
</tr>
<tr>
<td>10. Up to mid-foot</td>
<td>40%</td>
</tr>
<tr>
<td>11. Up to fore-foot</td>
<td>30%</td>
</tr>
<tr>
<td>12. All toes</td>
<td>20%</td>
</tr>
<tr>
<td>13. Loss of first toe</td>
<td>10%</td>
</tr>
<tr>
<td>14. Loss of second toe</td>
<td>5%</td>
</tr>
<tr>
<td>15. Loss of third toe</td>
<td>4%</td>
</tr>
<tr>
<td>16. Loss of fourth toe</td>
<td>3%</td>
</tr>
<tr>
<td>17. Loss of fifth toe</td>
<td>2%</td>
</tr>
</tbody>
</table>
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)

\[
a + b \times (90 - a) \quad \frac{\text{——}}{90}
\]
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

Crush Fracture of T12 Vertebra with Spinal Cord Impingement

L2 COMPRESSION BURST FRACTURE WITH SPINAL CORD INJURY
TRAUMATIC LESIONS:

25% or more compression of one or two Bodies                              20%

No Neurology

- Posterior element damage
  - a) With fusion healed, No permanent motor or sensory changes. 10%
  - b) Persistent pain with radiologically demonstrable instability. 25%

- 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%

Cervical Spine injuries - Most Mobile

% of PPI in relation of Spine
Thoracic and Thoraco-Lumbar Spine Injuries

i) Compression of less than 50% involving one vertebral body with no neurological manifestation 10%

ii) Compression of more than 50% involving single vertebra or more with involvement of posterior elements, healed, no neurological manifestations Persistent pain, fusion indicated 20%

iii) Same as (b) with fusion, pain only on heavy use of back 15%

iv) Radiologically demonstrable instability with fracture or fracture dislocation with persistent pain. 30%
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.