

Review Article

Orthopaedic disability evaluation for general practitioners

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Orthopaedic disability involves the disability of both upper and lower limbs and spine. A simple evaluation of orthopaedic disability for graduate practitioners is described after enumerating the traumatic and non traumatic causes of orthopaedic disability. The trauma may result in amputations or disarticulations of upper or lower limb. This knowledge can be used in courts and while issuing the disability certificates to the orthopaedically handicapped individuals for getting the benefits from the Government and Non Government Agencies.

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The evaluation of orthopaedic disability for general practitioners and other specialists without post graduate qualification in orthopaedics, is rarely found in Indian Journals and Text Books of Orthopaedics. Hence, the orthopaedic disability evaluation is briefly presented in this special article in simple language.

Definition of Disability :

The state of being incapacitated or disabled is called disability. Orthopaedic disability is the physical disability involving both upper and lower limbs and spine. The disability is directly proportional to the functional loss and vice versa¹.

Causes of Orthopaedic Disability :

Trauma (the commonest) and non traumatic conditions- diabetic gangrene, gas gangrene, vascular gangrene (due to arteriosclerosis, thrombosis, thromboangitis obliterance), poliomyelitis, cerebral palsy, quadriplegia, hemiplegia, paraplegia and monoplegia, Hansen's disease, Burns, nerve disorders, spina bifida, chronic osteomyelitis, arthritis, myopathies, malignant bone tumours, dwarfism, polyarthritis, rickets, osteomalacia, osteogenesis imperfecta, multiple exostoses, fibrous dysplasia, congenital disorders-amelia, phocomelia, congenital dislocation of hip, congenital talipes equinovarus, congenital absence of femur, congenital shortening of lower limb, scoliosis, kyphosis. Due to the above traumatic and non traumatic causes, there may be amputation of a limb or part of limb or disarticulation or loss of function of limbs².

Types of Orthopaedic Disability³ :

The various causes detailed above result in temporary or permanent disability. In all cases of trauma, the temporary disability can be total or partial. THE TEMPORARY TOTAL

DISABILITY is found during the period, in which, the injured person is completely unable to do any work. The injured person is always admitted as inpatient. This period of temporary total disability is about 3 to 4 months, for all the fractures of long bones and dislocations of major joints in both upper and lower limbs and spine and it is about 1 to 2 months for the fractures of small bones or dislocations of small joints of hands and feet. During this period of temporary total disability, the injured workman should be paid full salary, as the percentage of disability is 100. The temporary partial disability is considered from the 5th month of injury date to a maximum of 12 months, ie, 8 months for all the fractures of the long bones or dislocations of larger joints in both upper and lower limbs and spine, when associated with complications of infection or joint stiffness. This period is from 3rd month after the injury date to 6th month (4 months) for all fractures of small bones and dislocations of small joints of hands and feet, in the event of complications of infection and joint stiffness. During this period, the disability is less than 100 percent. The patient is treated as outpatient and can do light work and can be paid full salary sympathetically, if workman was injured at the work place.

Permanent Disability :

After completion of orthopaedic treatment, physiotherapy and rehabilitation measures, including occupational therapy in a maximum period of 12 months from the injury date for all fractures of long bones and dislocations of all large joints and for 6 months for all fractures for small bones and dislocations of small joints of hands and feet, if the injured person (workman) has any residual disability, it is called permanent disability. In the case of disability due to non traumatic conditions, the temporary disability period may be extended upto 5 years from the starting date of the conditions depending on the type of disorder and after 5 years, the disability should be considered as permanent disability⁴.

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Evaluation of Permanent Orthopaedic Disability :

The permanent orthopaedic disability was earlier evaluated into mild disability (0% to 40%), Moderate disability (41% to 75%), severe disability (76% to 99%), total disability (100%)⁵. This kind of evaluation is obsolete and should be replaced with estimation of disability in exact percentage (not in the range) for all medicolegal purposes and for benefits from Government and Non Government Agencies.

All the causes of orthopaedic disability stated above may result in amputation of a limb or part of a limb or disarticulation. In the absence of amputation and disarticulation, there may be loss of function in terms of stiffness of joints with loss of normal movements, weakness of muscles, deformity or shortening of limbs⁶.

The evaluation of permanent orthopaedic disability is described under the headings of (1) Disability of amputation/disarticulation and (2) Disability in conditions other than amputations/disarticulations⁷.

Evaluation of Permanent Orthopaedic Disability of Amputations and Disarticulations

In earlier times, during amputations, optimum levels and minimum stumps were followed for fitting the conventional prostheses. Since the time of availability of modern total contact prostheses, the optimum levels of amputations and minimum stumps have become of less important. Hence, every effort is made by the surgeon to preserve and save as much normal tissues as possible without observing the optimum level of amputation and minimum stump. Hence this author has revised rationally the percentage of permanent orthopaedic disability as given below.

Lower Limb Amputations or Disarticulation⁸⁻¹⁰ :

- (1) Hind quarter amputation: 100%
- (2) Hip disarticulation: 90%
- (3) Above knee amputation : (a) Stump length $\frac{1}{4}$ or less than $\frac{1}{4}$ of length of thigh: 85%, (b) Stump length $\frac{1}{2}$ to $\frac{1}{4}$ of length of thigh : 80%, (c) Stump length $\frac{1}{2}$ to more than $\frac{3}{4}$ of length of thigh : 75%
- (4) Knee disarticulation : 70%
- (5) Below Knee amputation : (a) Stump length $\frac{1}{4}$ or less than $\frac{1}{4}$ of length of leg: 60%, (b) Stump length $\frac{1}{2}$ to $\frac{1}{4}$ of length of leg: 55%, (c) Stump length $\frac{1}{2}$ to more than $\frac{3}{4}$ of length of leg 50%
- (6) Ankle disarticulation: 45%
- (7) Symes amputation: 30%
- (8) Lisfranc's amputation: 25%

- (9) Loss of all toes due to disarticulation at metatarsophalangeal joints : 15%
- (10) Loss of all toes in the proximal/middle phalanges: 10%
- (11) Disarticulation of big toe at the metatarsophalangeal Joints : 10%
- (12) Amputation of big toe through proximal phalanx: 7%
- (13) Disarticulation of big toe through interphalangeal joint : 5%
- (14) Amputation of big toe through distal phalanx: 3%
- (15) Loss of 2nd toe due to disarticulation at metatarsophalangeal joint or amputation through proximal or middle phalanx : 2%
- (16) Disarticulation through metatarsophalangeal joint or Amputation through proximal/middle phalanx of 3rd toe or 4th toe or 5th toe : 1%

Upper Limb Amputations and Disarticulations :

- (1) Fore quarter amputation : 100%
- (2) Shoulder disarticulation : 90%
- (3) Above elbow amputation : (a) Stump length $\frac{1}{4}$ or less than $\frac{1}{4}$ of length of arm: 85%, (b) Stump length $\frac{1}{2}$ to $\frac{1}{4}$ of length of arm: 80%, (c) Stump length $\frac{1}{2}$ to more than $\frac{3}{4}$ of length of arm: 75%
- (4) Elbow disarticulation : 70%
- (5) Below elbow amputation : (a) Stump length $\frac{1}{4}$ or less than $\frac{1}{4}$ of fore arm: 60%, (b) Stump length $\frac{1}{2}$ to $\frac{1}{4}$ of forearm: 55%, (c) Stump length $\frac{1}{2}$ to more than $\frac{3}{4}$ of length of forearm: 50%
- (6) Disarticulation of wrist joint with loss of whole hand: 45%
- (7) Disarticulation of carpometacarpal joint of thumb: 30%
- (8) Amputation through first metacarpal of thumb: 20%
- (9) Disarticulation through metacarpophalangeal joint of Thumb 18%
- (10) Disarticulation through interphalangeal joint of thumb: 15%
- (11) Amputation through the distal phalanx of thumb: 10%
- (12) Disarticulation through carpometacarpal joints of all Fingers except thumb: 15%
- (13) Amputations through metacarpals of index, middle, ring and little fingers: 10%
- (14) Index finger and middle finger : (a) Disarticulation through metacarpophalangeal joint: 3%, (b) Amputation through proximal phalanx : 2%, (c) Disarticulation through proximal interphalangeal joint : 1 $\frac{1}{2}$ %, (d) Amputation through middle phalanx: 1%, (e) Disarticulation through distal interphalangeal joint or Amputation through distal phalanx: $\frac{1}{2}$ %

(15) Ring finger and little finger : (a) Disarticulation through metacarpophalangeal joint: 2%, (b) Amputation through proximal phalanx: 1 ½%, (c) Disarticulation through proximal interphalangeal joint : 1%, (d) Amputation through middle phalanx or disarticulation

Through distal interphalangeal joint or amputation

Through distal phalanx: ½%

Evaluation of Permanent Orthopaedic Disability in Conditions Other Than Amputations and Disarticulations:

The percentage of permanent orthopaedic disability should be evaluated as related to the limb/limbs/spine and whole body. The following method is followed. While evaluating it is important to remember that the orthopaedic disability is confined to the disability of both upper and lower limbs and spine due to the causes mentioned above⁹. In all disabled persons, history, clinical examination and if necessary X-ray, CT scan, MRI scan and relevant investigations are used to find out the cause of the affected limb/limbs and spine. As stated above, orthopaedic disability involves the four limbs and spine. The maximum disability percentage is 100. This one hundred percentage of disability is arrived by giving each limb 20%. Hence, the combined disability of four limbs is 80% disability and the spine is allotted 20% disability. This percentage of disability is related to the whole body. Thus the total percentage of orthopaedic disability of four limbs and spine is 100%.

The other method is to allot 100 points or 100% disability for each lower limb, upper limb and spine and express the percentage of disability related to the limb or spine. Thus the orthopaedic disability is expressed in two parts. The first part of the opinion consists of percentage of orthopaedic disability to the lower limb, upper limb or spine individually. The second part of the opinion contains the percentage of disability of one or more limbs and spine in relation to the whole body. It means that the first part of the opinion contains the rating of percentage in 100% for each lower limb, upper limb and spine. If only one of the four limbs or spine alone is involved, the first part of opinion gives an idea of the percentage of disability of each limb or spine, considering the rating of 100% disability. The second part of the opinion as the percentage of permanent disability related to the whole body, ie, four limbs and spine is obtained by dividing the percentage of disability limb or spine by the numerical of 5. This method of expressing opinion in two parts will avoid confusion. For example if the disability arrived at is 45% to the right lower limb alone considering 100 points or 100% disability to the lower limb, the final opinion of part one is 45% of lower limb. Part two $45/5=9\%$ of whole body.

Permanent Disability Evaluation of Lower Limb :

Disability evaluation of each affected lower limb is done separately. Each lower limb is divided into three segments as given below:

(1) Hip joint and thigh segment

(2) Knee joint and leg segment

(3) Ankle joint and foot segment

100% or 100 points allotted to each lower limb are divided as follows :

Range of movements of hip joint: 15 points—mild stiffness-5 points, moderate stiffness- 10 points, severe stiffness- 15 points.

Muscle power of muscles acting on hip joint : 15 points-3 points for loss of one grade of muscle power (3X5=15).

Range of movements of knee joint : 15 points – mild stiffness-5 points, moderate stiffness-10 points, severe stiffness-15 points.

Range of movements of ankle joint – 15 points – mild stiffness – 5 points, moderate stiffness – 10 points and severe stiffness –15 points.

Muscle power of muscles acting on ankle joint: 15points – 3 points for loss of one grade of muscle power.

One point for deformity of hip, knee and ankle totalling of 3 points.

One point for each inch of shortening of lower limb up to 7 inches totalling 7 points.

Thus the total of 100 points allotted to each lower limb for 100% disability.

Permanent Disability Evaluation of Upper Limb :

Disability evaluation of each affected upper limb is done separately. Each upper limb is divided into 3 segments as follows:

(1) Shoulder joint and arm segment

(2) Elbow joint and forearm segment

(3) Wrist joint and hand segment

100% or 100 points allotted to each upper limb are divided as given below :

Range of movements of shoulder joint: 15 points – mild stiffness-5 points, moderate stiffness-10 points and severe stiffness-15 points.

Muscle power of muscles acting at shoulder joint : 15 points. 3 points for loss of one grade of muscle power. (3X5=15)

Range of movements of elbow joint: 15 points—mild stiffness-5 points, moderate stiffness-10 and severe stiffness-15 points.

Muscle power of muscles acting at elbow joint : 15 points. 3 points for loss of one grade of muscle power. (3X5=15)

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Range of movements of wrist joint: 15 points—mild stiffness—5 points, moderate stiffness—10 points and severe stiffness—15 points.

Muscle power of muscles acting at wrist joint : 15 points. 3 points for loss of one grade of muscle power (3x5=15).

One point for deformity of each shoulder, elbow and wrist totalling 3 points.

One point for each inch of shortening of upper limb up to 7 inches totalling 7 points.

Thus the total 100 points allotted to each upper limb for 100% disability.

Permanent Disability Evaluation of Spine :

100% or 100 points allotted to the spine are divided as follows :

Range of movements of cervical spine : 30 points—mild stiffness—10 points, moderate stiffness—20 points and severe stiffness—30 points.

Range of movements of lumbar spine : 30 points—mild stiffness—10 points, moderate stiffness—20 points and severe stiffness—30 points.

Muscle power of muscle acting on cervical spine : 15 points. Loss of one grade of muscle power is allotted 3 points (3X5=15).

Muscle power of muscles acting on lumbar spine : 15 points. Loss of one grade of muscle power is allotted 3 points.

Deformity of scoliosis, kyphosis and lordosis: 10 points – mild deformity-3 points, moderate deformity—6 points and severe deformity—10 points.

Thus the total 100 points allotted for spine for 100% disability.

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