Impairment Rating

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Terminology

- **Body function :** physiological functions of body systems(including psychological functions)
- **Body structures :** anatomic parts of the body such as organs, limbs, and their components
- **Activity :** execution of a task or action by an individual
- **Participation :** involvement in a life situation

Terminology

- **Impairment :** problems in body function or structure such as a significant deviation or loss

- **Activity limitations :** difficulties an individual may have in executing activities

- **Participation restrictions :** problems an individual may experience in involvement in life situations

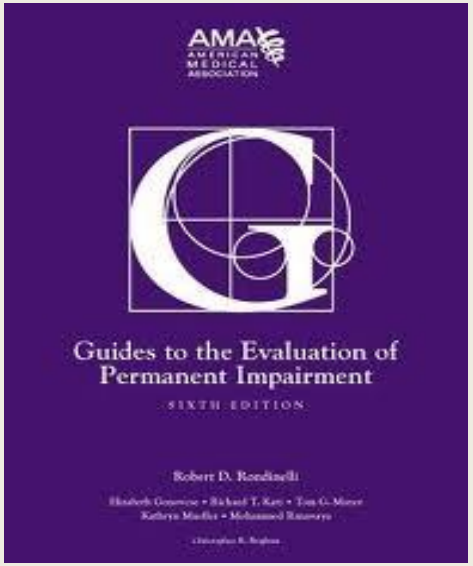
Operational Definitions

- **Disability :** activity limitation and/or participation restrictions in an individual with a health condition, disorder, or disease

Operational Definitions

- **Impairment Rating :** percentage estimate of loss of activity reflecting severity for a given health condition , and the degree of associated limitations in terms of ADLs

GUIDES TO THE EVALUATION OF PERMANENT IMPAIRMENT



Fundamental principles of the Guides:

- Only permanent impairment may be rated after Maximum Medical Improvement (MMI)
- Impairments must be rated in accordance with the chapter relevant to the organ or system where the injury primarily arose or where the greatest dysfunction consistent with objectively documented pathology remains
- No impairment may exceed 100% whole person impairment .
- No impairment arising from a member or organ of the body may exceed the amputation value of that member

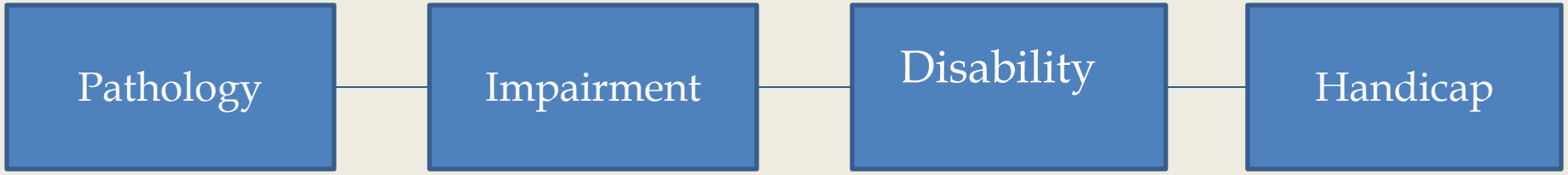
Fundamental principles of the Guides:

- All regional impairments in the same organ or body system shall be combined as described by the rule ,at the same level first and further combined with the other regional impairments at the whole person level
- A licensed physician must perform impairment evaluations
- The evaluating physician must use knowledge , skill, and ability generally accepted by the medical scientific community when evaluating an individual
- The Guides is based on objective criteria .The physician must use all clinical knowledge ,skill and abilities in determining whether the measurement ,test results ,or written historical information are consistent with the pathology being evaluated

Fundamental principles of the Guides:

- The Guides dose not permit the rating of future impairment
- If the Guides provides more than one method to rate a particular impairment or condition, the method producing the higher rating must be used
- Subjective complaints (eg : fatigue, difficulty in concentrating , sleep difficulties, and weakness) alone are generally not ratable under the Guides
- Round all fractional impairment ratings(numbers ending in 0.5 must be rounded up in favor of the patient)

World Health organisation"s international classification of illness



The underlying Disease or diagnosis

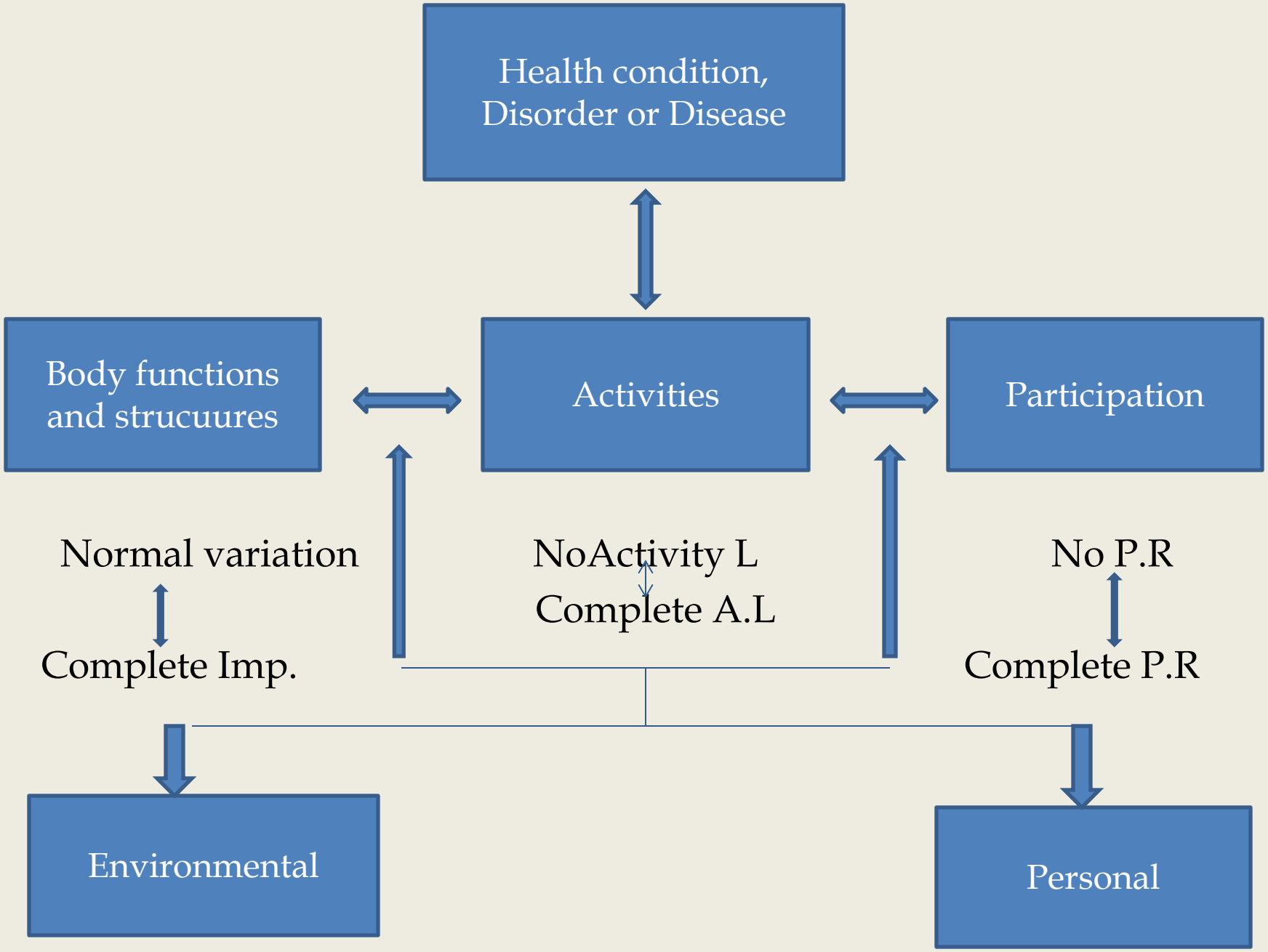
the immediate physiological consequences, symptoms,and sign

The functional consequences, abilities lost

social an societal consequence freedoms lost

ICF Model

- A comprehensive model of disablement
- Describing and measuring health and disability at the individual and population levels


Health condition,
Disorder or Disease
Body functions
and strucuures
Activities
Participation
Normal variation
Complete Imp.
NoActivity L
Complete A.L
No P.R
Complete P.R
Environmental
Personal

Domains of personal function that are most often affected by impairments

- **Mobility:**
  - **Transfer:** movement of one"s body position while remaining at the same point in space(eg : supine to side lying, supine to sit, sit to stand)
  - **Ambulation**: movement of one"s body from one point in space to another(eg : walking, stair climbing, wheelchair locomotion)

Domains of personal function

- **Self-care:**
  - **Activities of Daily Living(ADLs):**basic self-care activities performed in one"s personal sphere(eg : feeding, bathing, hygiene, dressing,…)
  - **Instrumental Activities(IADLs):** (eg : financial management, medications, meal preparation),which may be delegated to others

Self-care

ACTIVITIES OF ADLS

- Bathing, showering
- Bowel and Bladder management
- Dressing
- Eating
- Feeding
- Functional mobility
- Personal device care
- Personal hygiene and grooming
- Sexual activities
- Sleep/Rest
- Toilet hygiene

INSTRUMENTAL ADLS

- Care of others(including selecting and supervising caregivers)
- Care of pets
- Communication device use
- Community mobility
- Financial management
- Health management and maintenance
- Home establishment and maintenance
- Meal preparation and clean up
- Safety procedure and emergency responses
- shopping

Prescision and Accuracy

- **Precision :** the smallest unit of change that the measurement Instrument can distinguish

- Consideration must be given to feasibility and practicality of achieving a given level of precision . including cost and availability of equipment , and time required and ease of application in the field

- For example, a Thomas test can rapidly reveal presence of a hip flexion contracture to an examiner is less precise than standard goniometric assessment of ROM for impairment rating purposes

Prescision and Accuracy

Accuracy : the ability of a measurement to correctly assess the condition or process being measured

- the ability to do so depends on minimizing sources of error, which in human performance measurement include examiner training and skills required to use, the interface between subject and measurement device ,and the instrument itself

Hierarchy of study types

(based on ability of study design to minimize the possibility of bias and confounding influence)

- Systematic reviews and meta-analyses of randomized controlled trials
- Randomized controlled trial
- Nonrandomized intervention studies
- Observational studies
- Non experimental studies
- Expert opinion

Basic components of the Template

- Impairment class: 5 class(0-4)
- Impairment grade: range with in each respective impairment class
- Impairment criterion 1: history of clinical presentation
- Impairment criterion 2: physical findings

- Impairment criterion 3: clinical studies or objective test results
- Impairment criterion 4: functional history or assessment-evidence of symptomatic dysfunction loss due to impairment

TABLE 1-5 Generic Template for Impairment Classification Grids

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (%)	0	Minimal %	Moderate %	Severe %	Very Severe %
SEVERITY GRADE (%)		(ABCDE)	(ABCDE)	(ABCDE)	(ABCDE)
HISTORY OF CLINICAL PRESENTATION[a]	No current symptoms *and/or* intermittent symptoms that do not require treatment	Symptoms controlled with continuous treatment *or* intermittent, mild symptoms despite continuous treatment	Constant mild symptoms despite continuous treatment *or* intermittent, moderate symptoms despite continuous treatment	Constant moderate symptoms despite continuous treatment *or* intermittent, severe symptoms despite continuous treatment	Constant severe symptoms despite continuous treatment *or* intermittent extreme symptoms despite continuous treatment
PHYSICAL EXAMINATION OR PHYSICAL FINDINGS[b]	No current signs of disease	Physical findings not present with continuous treatment *or* intermittent, mild physical findings	Constant mild physical findings despite continuous treatment *or* intermittent moderate findings	Constant moderate physical findings despite continuous treatment *or* intermittent severe findings	Constant severe physical findings despite continuous treatment *or* intermittent extreme findings
CLINICAL STUDIES OR OBJECTIVE TEST RESULTS[c]	Testing currently normal	Consistently normal with continuous treatment *or* intermittent mild abnormalities	Persistent mild abnormalities despite continuous treatment *or* intermittent moderate abnormalities	Persistent moderate abnormalities despite continuous treatment *or* intermittent severe abnormalities	Persistent severe, abnormalities despite continuous treatment *or* intermittent extreme abnormalities

[a, b] Descriptors will be disease-specific; mild, moderate, severe, and extreme need to be defined.

[c] Descriptors will be disease-specific and based on the number of abnormalities found.

The following is used as a grade modifier in the musculoskeletal chapters:

FUNCTIONAL HISTORY[d]	Asymptomatic	Pain/symptoms with strenuous/ vigorous activity; Able to perform self-care activities independently	Pain/symptoms with normal activity; Able to perform self-care activities with modification but unassisted	Pain/symptoms with less than normal activity (minimal); Requires assistance to perform self-care activities	Pain/symptoms at rest; Unable to perform self-care activities

[d] Based on self-report or scores from the PDQ, *Quick*DASH, Lower Limb Outcomes Questionnaire, or other self-report tool.

The following will be added in selected chapters when compliance with treatment minimizes objective evidence of organ dysfunction but results in a significant compromise in ADLs:

BURDEN OF TREATMENT COMPLIANCE[e]	None	Will be based on factors such as number and route of medications taken or the need to regularly undergo diagnostic tests or invasive procedures if ***not*** already considered in the preliminary rating

[e] Based on information in Appendix B; depending on the score, the examiner can opt to add 1 to 3 percentage points.

Generic Template for impairment

1. The examiner will note which impairment criterion is held to be the "key factor" used to determine class for the conditions being rated at MMI

2. Each impairment class will have a corresponding range of available impairment ratings

3. With use of the key factor ,the patient will generally receive a rating that is midway between the top and bottom of the available range

4. The next step requires the examiner to adjust for factors other than that considered "key".

Generic Template for impairment

5. if adjustment of the impairment rating otherwise moves the rating to a higher or lower impairment class, the examiner should stop at the highest or lowest grade in the impairment class initially determined by the key factor

6. Use of the middle impairment grade in a given class as the default value under this new system would ordinarily leave one with no way to move a rating in the middle of class 4 to an even higher grade. in this situations, rating for non-key factors may be used to move the rating on a higher grade in class 4 if the information regarding the other factors denotes extreme pathology

Generic Template for impairment

7. some chapters will include an assessment of the functional history that will be used as one of the non-key factors to adjust the final impairment rating with in a class by using a self-report tool

8. some chapters will include an assessment of the BOTC in the impairment rating

combine the ratings from different organ systems to come up with a final impairment rating

When are impairment rating perform?

- After the status of MMI is determined (until a reasonable time has passed for the healing or recovery to occur)

- If the patient declines therapy for a permanent impairment, that decision dose not decrease or increase the estimated percentage of the individual's impairment, nor dose it preclude an impairment valuation per se.

- The physician should make a written comment in his or her report addressing the suitability of the therapeutic approach and the basis on the individual"s refusal

When are impairment rating perform?

- The physician should also indicate that the individual is at MMI without treatment due to declining treatment or treatment noncompliance

- The physician should estimate the impairment rating that would be likely if the patient had cooperated with the treatment recommendations(if the estimated rating is deferent from the one determined at the time of the examination)

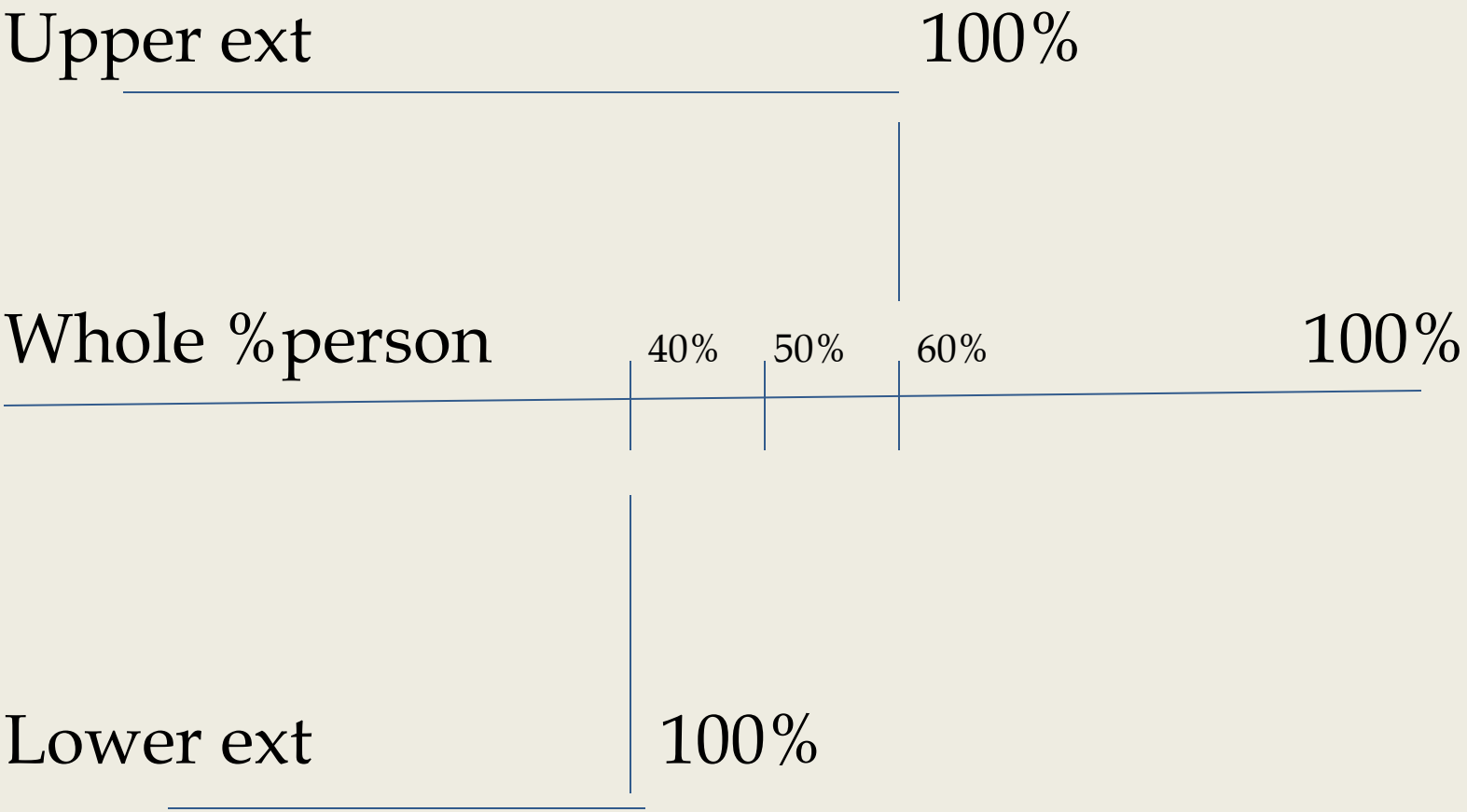
Organ system and whole body approch to impairment rating

Regional vs whole person impairments:

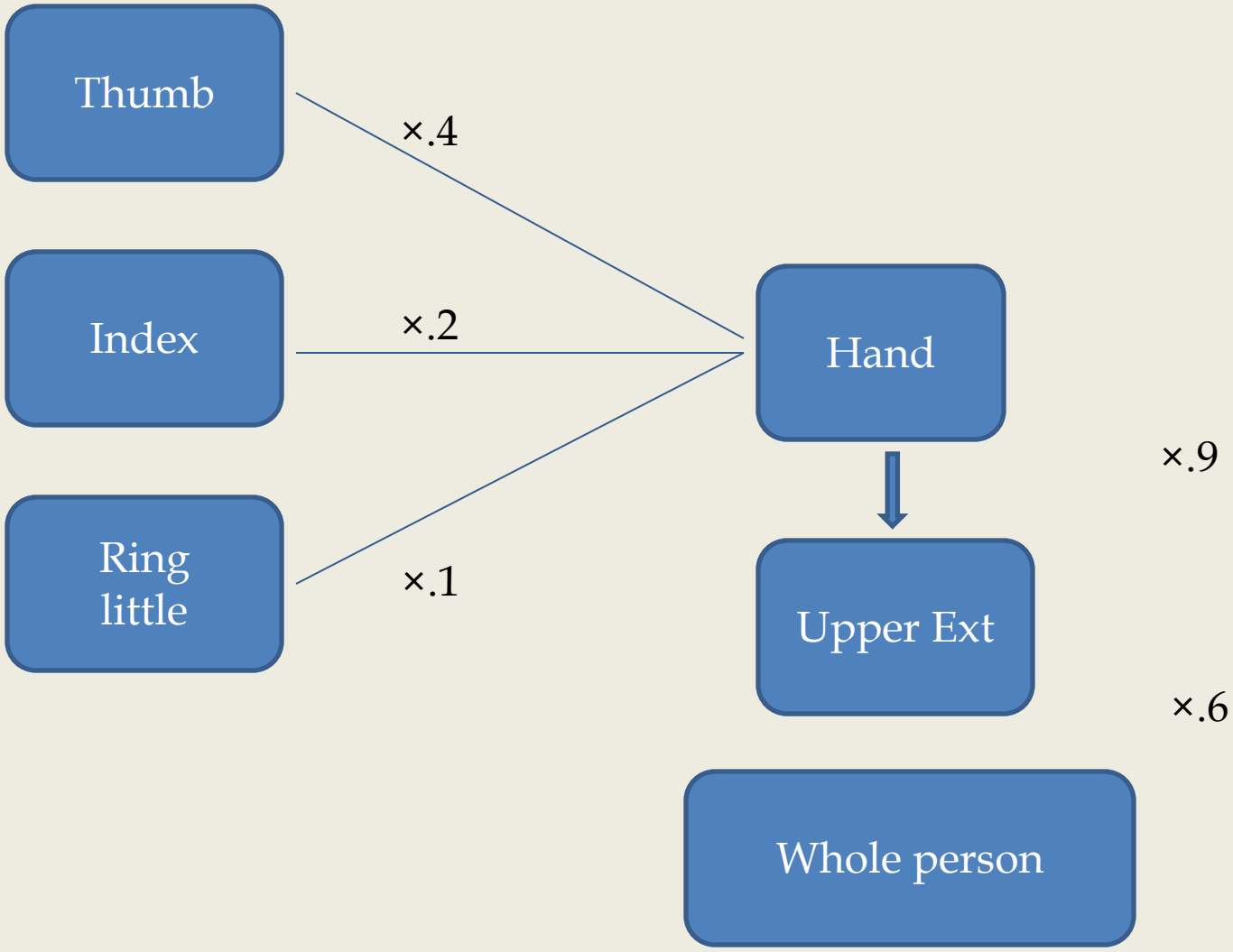
- The Guides"impairment rating reflect the severity of the organ or body system impairment and the resulting functional limitation of the whole person

- In some musculoskeletal regions, a hierarchy of various values ,from distal to proximal, is used to reflect the relative importance of certain parts in each region

Hierarchy in Whole person concept for upper and lower exterimities



Hierarchy in whole person concept for upper extremity and Hand



The combined values chart:

Various organ sys impairments in the same individual can be accounted for with 1 numerical value by using the **combined values chart**

- **Method of combination:**

Multiple impairments are combined using a mathematical formula, listed in the combined values chart

multiple impairments are successively combined by first combining the largest remaining nomber, and then further repeating the process until all given impairment numbers are combined

the resulting final impairment value is always $\leq$ the collective sum of all the impairment values

Combining impairments in and between organ systems

- To determine whole person impairment where multiple organ systems are involved, the physician should being with an estimate of the individual “s most significant(primary) impairment and evaluate other impairments in relation to it

- Related but separate conditions are rated separately and impairment ratings combind unless criteria for the second impairment are included in the primary impairment

Combining impairments in and between organ systems

- The examining physician should avoid duplication of the rating by careful consideration of the underlying pathophysiology in relation to the primary organ system

Whole person impairment:

- Is the result of an impairment evaluation
- WPI Rating Ranges: normal(0%) to totally dependent on others for care(90+%) to approaching death(100%)

مثال ۱

بیمار آقای ۴۸y ، که از حدود ۲ سال قبل دچار chest pain متناوب در روزهای کاری می شود.درد همراه تعریق و تنگی نفس بوده است.cholesterol:245 mg/dl

FH : پدر ۶۶ ساله ایشان مبتلا به CAD است

Current history : CP و Palpitation

PH/EX :
BP:140/90 mmHg
HR:76 ,occasional ectopic beats
Normal Heart sounds

Clinical studies : تست ورزش : در ۱۴ دقیقه کامل انجام شد ; حداکثر HR:172, ایسکمی (-)
آنژیوگرافی: stenosis RCA 50% , EF=60%

او به محل کارش بازگشت و علایم به مدت ۶ ماه دیگر ادامه یافت.هولتر مانیتورینگ شد که در زمان درد ST elevation نداشت.احتمال اسپاسم عروق کرونر مطرح شد که با تست ارگونووین اسپاسم RCA اثبات شد.تحت درمان با CCB قرار گرفت و در حال حاضر علامتی ندارد

DX: آنژین صدری وازواسپاستیک , وازواسپاسم عروق کرونری ناشی از استرس منتال

Impairment Rating :؟

TABLE 4-6 Criteria for Rating Impairment due to Coronary Artery Disease[a]

Coronary Artery Disease

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4[b]
WHOLE PERSON IMPAIRMENT RATING (%)	0	2%-10%	11%-23%	24%-40%	45%-65%
SEVERITY GRADE (%)		2 4 6 8 10 (A B C D E) (Minimal)	11 14 17 20 23 (A B C D E) (Mild)	24 28 32 36 40 (A B C D E) (Moderate)	45 50 55 60 65 (A B C D E) (Severe)
HISTORY	Asymptomatic	Equivocal history of chest pain NYHA class I	History of documented MI or exertional angina Requires medication to limit symptoms NYHA class II	History of documented MI, angina with exertion or significant changes to ADLs to prevent frequent angina and/or HF[c] NYHA class III	History of documented MI, angina can occur at rest Requires marked changes to ADLs and medication to remain free of symptoms at rest NYHA class IV
PHYSICAL FINDINGS	Normal physical exam	Normal physical exam	Normal physical exam with maximal exertion	Signs of HF[c] with moderate exertion	Signs of HF[c] with minimal exertion
OBJECTIVE TEST RESULTS[d]	Normal coronary angiography Normal echocardiography Equivocal or low-risk[e] myocardial perfusion scan or stress echo EBCT 0-100	Luminal irregularities on coronary angiogram (<50% stenosis) Normal echocardiography Normal or low-risk myocardial perfusion scan or stress echo EBCT >100 VO_2max>20	Obtained HR >90% maximum predicted with no ST-segment changes, VT, or hypotension METs >7 (may be omitted if unable to walk) Coronary angiograms shows ≥50%-70% fixed obstruction VO_2max 16-20 No or mildly reversible defect (<25%) on myocardial perfusion scan or stress echo Recovered from CABG or PCI; continues treatment	Stress testing shows 1-2mm ST-segment changes Coronary angiograms show ≥70% fixed obstruction ***and*** METs ≥5 but <7; VO_2max 10-15 ***or*** moderate (25%-50%) reversible defect on myocardial perfusion scan or stress echo Recovered from CABG or PCI, continues treatment	Stress testing shows >2 mm ST-segment changes Coronary angiograms show ≥70% fixed obstruction ***and*** METs <5; VO_2max <10 ***or*** severe (>50%) reversible defect on myocardial perfusion scan or stress echo Recovered from CABG or PCI, continues treatment

[a] NYHA indicates New York Heart Association; HF, heart failure; MI, myocardial infarction; CABG, coronary artery bypass grafting; PCI, percutaneous coronary intervention; EBCT, electron beam computed tomography calcium score; VO_2max, maximum oxygen uptake (in mL/min/kg); and VT, ventricular tachycardia.

[b] If all 3 factors are class 4, the impairment rating is 65%.

[c] For example, rales, JVD, S_3, and peripheral edema; for HF resulting from CAD, consult Table 4-7 and use worst impairment estimate of the 2 tables as final result.

[d] Key factor.

[e] Mild reversible defect or fixed defect with normal EF.[a]

Impairment : 17% whole person

یافته های تستهای objective بیمار را در کلاس 2c قرار میدهند.شرح حال علایم و معاینه فیزیکی هم با کلاس 2c همخوانی دارند.

مثال ۲

- مرد 28 y ← Auto body worker

در شروع کار سابقهء آسم نداشته .از ۱۰ سال قبل رنگهای پلی اورتان را که حاوی دی ایزوسیانات است اسپری کرده است .در طی چند سال اول استخدام متوجه شروع تدریجی chest tightness و سرفه های غیرپروداکتیو شد که بیشتر در محل کار ایجاد می شدند و با دوری از کار(در پایان هفته ها و تعطیلات) بتدریج بهبود می یافتند.

3 سال قبل به دلیل تنگی نفس و ویزینگ بستری ← تشخیص آسم ←شروع درمان آسم(نیاز به دوز بالای کورتون استنشاقی و گاها بتا آگونیست استنشاقی)

Current history : بعد از ۲ سال اجتناب از اسپری رنگ و استفاده درست از داروها ،فقط در صورت مواجهه با عطرها، دود تنباکو و اسپری مو دچار سرفه و ویزینگ می شود

Ph/Ex : نرمال

Clinical studies :

اسپیرومتری: reversible obstruction with maximal post bronchodilator FEV1: 69%

DX : آسم شغلی ناشی از مواجهه با رنگهای پلی اورتان

Impairment rating: ؟

TABLE 5-5 Criteria for Rating Permanent Impairment due to Asthma[a]

Asthma

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0	2%-10%	11%-23%	24%-40%	45%-65%
SEVERITY GRADE (%)		2 4 6 8 10 (A B C D E) (Minimal)	11 14 17 20 23 (A B C D E) (Mild)	24 28 32 36 40 (A B C D E) (Moderate)	45 50 55 60 65 (A B C D E) (Severe)
CLINICAL PARAMETERS (MINIMUM MEDICATION NEED, FREQUENCY OF ATTACKS, ETC)	No medication required	Occasional bronchodilator use (not daily use)	Daily low-dose inhaled steroid	Daily medium or high-dose (500 to 1000 mcg per day) inhaled steroid and/or short periods of systemic steroids and a long acting bronchodilator Daily use of steroids, systemic and inhaled, and daily use of maximum bronchodilators	Asthma not controlled by treatment
MAXIMUM POSTBRONCHO-DILATOR FEV_1 PERCENTAGE PREDICTED[b, c]	>80%	70%–80%	60%–69%	50%–59%	<50%
OBJECTIVE TESTS FOR DEGREE OF AIRWAY HYPERRESPON-SIVENESS PC_{20} mg/mL[b]	6–8	3–5	3–>0.5	0.5–0.25	0.24–0.125

[a] Modified from Ranavaya, MI. The challenge of evaluating asthma impairment and disability. *AMA Guides Newsletter.* May-June 1997:1-4.[48]

[b] The "key" factor PC_{20} indicates and measures the degree of airway hyperresponsiveness. Alternatively the postbronchodilator FEV_1 percentage predicted is used as Key factor

[c] Percent predicted FEV_1 after albuterol therapy

work exposures can also acutely exacerbate a preexisting underlying asthmatic condition, which typically returns to baseline status with removal from exposure. Such events are recognized as work-aggravated asthma. Although potentially very dangerous, this exacerbation is temporary. Irritant-induced asthma, known as RADS (reactive airways dysfunction syndrome),[52] may result from a single massive high-level exposure to a highly irritating gas, mist, or vapor.

A variety of sensitizers (allergens) or irritants can cause occupational asthma. Sensitizers are classified as either high molecular weight or low molecular weight. High-molecular-weight sensitizers of animal or plant origin include animal dander or grain dust. Such agents are of similar molecular weight to the common antigens associated with exacerbations of asthma outside of the workplace. Low-molecular-weight sensitizers, typically organic or inorganic chemicals, include diisocyanates. These agents are often peculiar to the workplace. Low-molecular weight sensitizers generally require a latency period for the development of immunologic responsiveness. This latency period may last from a few months to several years after first exposure.

بیمار ۲ سال بعد از ترک محل کار برای تعیین نقص عضو ارزیابی شد.

تستهای objective ← the maximum PB FEV1=69% ← Middle of class 2

اما نیاز به درمان روزانه با دوز بالای کورتون و گاها بتا-آگونیست استنشاقی ←class 3

بنابراین←class 2 اما یک گرید بالاتر از default ←2D ← 20% Whole person impairment

مثال ۳

آقای ۵۲Y
cc :تنگی نفس

از ۵ سال قبل که در حال حاضر باعث اختلال در انجام کارهای اصلی روزمره شده است.قبل از بالا رفتن از هر پله توقف کرده و استراحت می کند.همکارانش در محل کار کمکش می کنند والا کارش را از دست خواهد داد.
سرفه و ویزینگ و تنگی نفس ندارد.
به مدت ۳۵ سال عایق کار بوده که در ۲۰ سال اول پودرهای آزبست را با آب مخلوط می کرده

Nonsmoker-

Current history : تنگی نفس

Ph/Ex : قد=۱۷۰
وزن=۶۳
کلابینگ انگشتان
fine crackles انتهای دمی دوطرفه

▣ **Clinical studies :**

CXR : اپاسیته های خطی کوچک نامنظم در قاعده ریه ها
پلاکهای پلورال کوچک دو طرفه

PFT : FVC=55%
FEV1=60%
FEV1/FVC=75%
DLCO=50%

Exercise test : vo2 Max = 16ml/kg/min

DX : پنوموکونیوز شغلی (آزبستوزیس)

Impairment rating : ؟

TABLE 5-4 Criteria for Rating Permanent Impairment due to Pulmonary Dysfunction[a]

Pulmonary Dysfunction

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0	2%-10%	11%-23%	24%-40%	45%-65%
SEVERITY GRADE (%)		2 4 6 8 10 (A B C D E) (Minimal)	11 14 17 20 23 (A B C D E) (Mild)	24 28 32 36 40 (A B C D E) (Moderate)	45 50 55 60 65 (A B C D E) (Severe)
HISTORY	No current symptoms *and/or* intermittent Dyspnea that does not require treatment	Dyspnea controlled with intermittent or continuous treatment *or* intermittent, mild Dyspnea despite continuous treatment	Constant mild Dyspnea despite continuous treatment *or* intermittent, moderate Dyspnea despite continuous treatment	Constant moderate Dyspnea despite continuous treatment *or* intermittent, severe Dyspnea despite continuous treatment	Constant severe Dyspnea despite continuous treatment *or* intermittent, extreme Dyspnea despite continuous treatment
PHYSICAL FINDINGS	No current signs of disease	Physical findings not present with continuous treatment *or* intermittent, mild physical findings	Constant mild physical findings despite continuous treatment *or* intermittent, moderate findings	Constant moderate physical findings despite continuous treatment *or* intermittent, severe findings	Constant severe physical findings despite continuous treatment *or* intermittent, extreme findings
OBJECTIVE TESTS					
FVC	FVC ≥80% of predicted	FVC between 70% and 79% of predicted	FVC between 60% and 69% of predicted	FVC between 51% and 59% of predicted	FVC between 50% and 45% of predicted
	and	*or*	*or*	*or*	*or*
FEV_1	FEV_1 ≥80% of predicted	FEV_1 between 65% and 79% of predicted	FEV_1 between 64% and 55% of predicted	FEV_1 between 45% and 54% of predicted	FEV_1 below 45% of predicted
	and				
FEV_1/FVC (%)	FEV_1/FVC (%) lower limits of normal (>75% of predicted)				
	and	*or*	*or*	*or*	*or*
DLco	DLco ≥75% of predicted	DLco between 65% and 74% of predicted	DLco between 55% and 64% of predicted	DLco between 45% and 54% of predicted	DLco below 45% of predicted
	or	*or*	*or*	*or*	*or*
$\dot{V}o_2$ max	>25mL/(kg·min) or >7.1 METs	between 22 and 25 mL/(kg·min)	between 21 and 18 mL/(kg·min)	between 17 and 15 mL/(kg·min)	<15mL/(kg·min)
		or	*or*	*or*	*or*
		6.3–7.1 METs	5.1–6.0 METs	4.3–5.0 METs	<4.3 METs

[a] FVC indicates forced vital capacity; FEV_1, forced expiratory volume in the first second; DLco, diffusion capacity for carbon monoxide; Vo_2 max, maximum oxygen consumption; and METs, metabolic equivalents (multiples of resting oxygen uptake).

PFT(FVC=55%)→the middle of class 3

History & ph/ex→ class 4

} class3(E)


Thanks