

**Use of the International Classification of Functioning and Disability to Develop Evidence-Based Practice Guidelines for Treatment of Common Musculoskeletal Conditions**

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Sponsored by Orthopaedic Section  
American Physical Therapy Association

February 15, 2007  
Combined Sections Meeting  
Boston, MA

**Purpose of Project**

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- To use the International Classification of Functioning and Disability (ICF) to develop evidence-based practice guidelines to enhance diagnosis, intervention, prognosis and assessment of outcomes for a variety of musculoskeletal conditions commonly managed by physical therapists

**ICF**

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- Model of disablement developed by WHO in 2001
- Classifies function & disability in terms of:
  - Body structure
  - Body function
  - Activity
  - Participation

**ICF-Based Practice Guidelines**

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**Expected Benefits:**

- Advance orthopaedic physical therapist practice
- Guide for professional & post-professional education
- Establish agenda for future research

**ICF-Based Practice Guidelines**

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**Develop for 7 Body Regions:**

- Foot & ankle
- Knee
- Hip
- Lumbosacral spine
- Cervicothoracic spine
- Shoulder
- Elbow, wrist & hand

**Purpose of Presentation**

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**Objectives:**

- Overview of project
- Description of ICF Model
- Describe project methodology
- Present preliminary ICF-based practice guidelines for foot & ankle, hip and cervicothoracic spine

## Program Outline

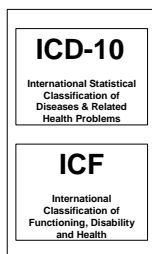
- **Introduction to Project & Overview of ICF** – Joe Godges DPT, MA OCS
- **Overview of Project Methodology** – James Irrgang PT PhD ATC
- **Guidelines for Hip Fractures** – Mike Cibulka PT OCS & Douglas White DPT
- **Guidelines for Cervicothoracic Conditions** – John Childs PT PhD OCS FAAOMPT & Joshua A. Cleland PT PhD OCS FAAOMPT
- **Guidelines for Plantar Fasciitis** – Thomas McPoil PT PhD ATC
- **Discussion – Questions & Answers**

World Health Organization  
Classification Assessment Surveys & Terminology Group



New Member in the  
WHO Family of  
International Classifications

## WHO Family of International Classifications



Main Classifications

ICF

International  
Classification of  
Functioning,  
Disability  
and  
Health

ICF  
Publications

ICF

International  
Classification of  
Functioning,  
Disability  
and  
Health

Short version



World Health  
Organization



World Health  
Organization

## Aims of ICF

- **to provide a scientific basis for consequences of health conditions**
- **to establish a common language to improve communications**

## Aims of ICF

- **to permit comparison of data across:**
  - countries
  - health care disciplines
  - services
  - time
- **to provide a systematic coding scheme for health information systems**

## Foundations of ICF

- Human Functioning - not *merely disability*
- Universal Model - not *a minority model*
- Interactive Model - not *linear progressive*
- Integrative Model - not *merely medical*

## Foundations of ICF

Human Functioning - not *merely disability*

Human Functioning      not disability alone

- Body functions      **vs impairments**
- Body structures
- Activities              **vs activity limitation**
- Participation          **vs handicap**

## Participation or Handicap?



neutral language

- "politically correct"

## Foundations of ICF

Universal Model - not *a minority model*

Universal Model      vs.      Minority Model



Everyone may have disability  
Continuum  
Multi-dimensional



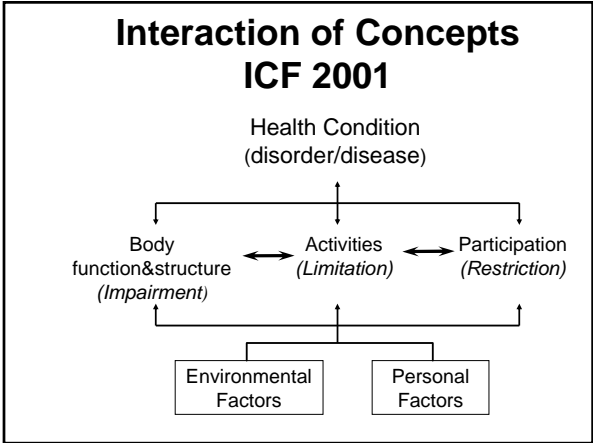
Certain impairment groups  
Categorical  
Uni-dimensional

**Foundations of ICF**

**Interactive Model - not a linear progression**

**Sequence of Concepts  
ICIDH 1980**




Disease  
or  
disorder    →    Impairments    →    Disabilities    →    Handicaps



**Foundations of ICF**

**Integrative Model - not merely medical**

**ICF Components**

Body Functions & Structures	Activities & Participation	Environmental Factors
		
<i>Functions</i>  <i>Structures</i>	<i>Capacity</i>  <i>Performance</i>	<i>Barriers</i>  <i>Facilitators</i>

<u>Body Functions</u>	<u>Structures</u>
Mental functions	Structures of the nervous system
<b>Sensory functions and pain</b>	The eye, ear and related structures
Voice and speech functions	Structures involved in voice and speech
Functions of the cardiovascular, haematological, immunological and respiratory systems	Structures of the cardiovascular, immunological and respiratory systems
Functions of the digestive, metabolic and endocrine systems	Structures related to the digestive, metabolic and endocrine systems
Genitourinary and reproductive functions	Structures related to the genitourinary and reproductive systems
<b>Neuromusculoskeletal and movement-related functions</b>	<b>Structures related to movement</b>
Functions of the skin and related structures	Skin and related structures

#### Activities and Participation

- 1 Learning & Applying Knowledge
- 2 General Tasks and Demands
- 3 Communication
- 4 **Movement**
- 5 Self Care
- 6 Domestic Life Areas
- 7 Interpersonal Interactions
- 8 Major Life Areas
- 9 Community, Social & Civic Life

#### **ICF Components with clear Orthopaedic Physical Therapy Implications**

Body Functions: **Sensory functions and pain Neuromusculoskeletal and movement-related functions**

Body Structures: **Structures related to movement**

Activities and Participation: **Movement**

#### Purpose of Ortho Section's ICF Project

**Use the ICF to develop evidence-based practice guidelines to enhance diagnosis, intervention, prognosis and assessment of outcomes for a variety of musculoskeletal conditions commonly managed by physical therapists**

#### **Potential Benefits of the Project**

- **Describe evidence-based practice guidelines for musculoskeletal disorders commonly managed by orthopaedic physical therapists**

#### **Potential Benefits of the Project**

- **Classify and define common musculoskeletal conditions using the World Health Organization's terminology**

#### **Potential Benefits of the Project**

- **Identify interventions supported by current best evidence to address impairments and activity restrictions associated with common musculoskeletal conditions**

### **Potential Benefits of the Project**

- Identify appropriate outcome measures to assess changes resulting from physical therapy interventions

### **Potential Benefits of the Project**

- Provide a description to policy makers, using internationally accepted terminology, of orthopaedic physical therapists as practitioners who examine, design plans of care, and provide interventions to address impairments of body structure and function, activity limitations and participation restrictions

### **Potential Benefits of the Project**

- Provide guidelines for payers and claims reviewers regarding the practice of orthopaedic physical therapy for common musculoskeletal conditions

### **Potential Benefits of the Project**

- Create a reference publication for orthopaedic physical therapy clinicians, academic instructors, clinical instructors, students, interns, residents and fellows regarding the best current practice of orthopaedic physical therapy

### **Overview of Project Methodology**

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James Irrgang PhD PT ATC  
Center for Sports Medicine  
University of Pittsburgh Medical Center  
and  
Department of Orthopaedic Surgery  
University of Pittsburgh



### **ICF Project Methodology**

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#### **Workgroups:**

- 7 workgroups established
- Each group has leader & 4 to 6 members with representation of individuals involved in clinical practice, research & education and a physician that can positively contribute to process.

## ICF Project Methodology

### **7 Workgroups & Leaders:**

- Foot & ankle - T. McPoil
- Knee - L. Snyder-Mackler
- Hip - M. Cibulka & D. White
- Lumbosacral spine - T. Delitto
- Cervicothoracic spine - J. Childs & J. Cleland
- Shoulder - P. McClure
- Elbow, wrist & hand - J. McDermitt

## ICF Project Methodology

### **5 Tasks:**

- Identify M-S conditions that affect body region
- Identify common impairments of body structure & function, activity limitations & participation restrictions associated with each condition
- Describe system to classify individuals into homogeneous subsets that will best respond to specific interventions
- Describe interventions with supporting evidence for subsets of patients based upon classification system
- Summarize & disseminate guidelines

## ICF Project Methodology

### **Identify M-S Conditions:**

- Workgroup to identify 2 to 4 M-S conditions that affect region that are commonly managed by PTs
- Examples:
  - Hip - fracture, OA, THA, labral tears
  - Foot & ankle - plantar fasciitis, ankle sprains, Achilles tendinopathy
  - Shoulder - adhesive capsulitis, impingement, rotator cuff tendinopathy

## ICF Project Methodology

### **For Each Condition - Identify:**

- Impairments in body structure & function
- Activity limitations
- Participation restriction

## ICF Project Methodology

### **Example – Adhesive Capsulitis:**

- Impairment of body structure:
  - Joint of shoulder region (s7200)
  - Ligaments & fasciae of shoulder region (s7204)
  - Muscles of shoulder region (s7203)

## ICF Project Methodology

### **Example – Adhesive Capsulitis:**

- Impairment of body function:
  - Pain in joints (b28016)
  - Pain in upper limb (b28014)
  - Mobility of single joint (b7100)
  - Mobility of several joints (b7101)
  - Mobility of scapula (b7200)
  - Power of isolated muscles & muscle groups (b7300)
  - Endurance of muscle groups (b7410)
  - Control of simple voluntary movements (b7600)
  - Control of complex voluntary movements (b7601)
  - Coordination of voluntary movements (b7602)

## ICF Project Methodology

### Example – Adhesive Capsulitis:

- Activity limitations & participation restrictions:
  - Lifting & carrying objects (d430):
    - Lifting (d4300)
    - Carrying in hands (d4301)
    - Carrying in arms (d4302)
    - Carrying on shoulders, hip or back (d4302)
  - Hand & arm use (d445)
    - Pulling (d4450)
    - Pushing (d4451)
    - Reaching (d4452)
    - Turning or twisting arms or hands (d4453)
    - Throwing (d4454)
    - Catching (d4455)

## ICF Project Methodology

### Example – Adhesive Capsulitis:

- Activity limitations & participation restrictions:
  - Washing oneself (d510)
    - Washing body parts (d510)
    - Washing whole body (d511)
    - Drying oneself (d512)
  - Caring for body parts (d520)
    - Caring for hair (d5202)
  - Toileting (d)
  - Dressing (d)
    - Putting on clothes (d5400)
    - Taking off clothes (d5401)
  - Eating (d550)
  - Drinking (d560)

## ICF Project Methodology

### Example – Adhesive Capsulitis:

- Activity limitations & participation restrictions:
  - Doing housework (d649)
  - Caring for household objects (d650)
  - Assisting others with self-care (d660)
  - Acquiring, keeping & terminating job (d845)
  - Remunerative employment (d850)
  - Community life (d910)
  - Recreation & leisure (d920)
    - Play (d9200)
    - Sports (d9201)
    - Crafts (d9203)
    - Hobbies (d9204)
    - Socializing (d9205)

## ICF Project Methodology

- **Impairments of body structure & function, activity limitation & participation restrictions are to be linked to the ICF**
- **Used to:**
  - Classify patient (i.e. diagnose)
  - Establish prognosis (i.e. prognostic factors)
  - Measure outcome

## ICF Project Methodology

### Data Dictionary:

- Variable name
- Type of variable
- Definition
- Measurement method
- Nature of variable
- Units of measurement
- Measurement properties

## ICF Project Methodology

### Example – Shoulder Internal Rotation:

- Variable name – passive internal rotation of shoulder
- Type of variable – mobility of single joint
- Definition – passive ROM of shoulder at 90° of abduction in supine position
- Measurement method – patient supine, end range passive IR with shoulder at 90° in frontal plane is measured with goniometer. Stationary arm aligned vertical. Moving arm aligned parallel to midline of arm at end range motion. Pressure applied to anterior aspect of shoulder to prevent scapular tipping
- Nature of variable – continuous
- Units of measurement – degrees
- Measurement properties – inter-tester reliability in patients with variety of shoulder condition revealed ICC of .50 with SEM of 15° (Irrgang et al 2004)



## ICF Project Methodology

### **Classification System:**

- Use measures of impairment of body structure & function, activity limitations & participation restrictions to classify patients into homogeneous subsets that will respond to specific interventions
- Supported by evidence - if no peer-reviewed evidence use collective clinical expertise to provide 1<sup>st</sup> approximation which then be the subject of further investigation
- Consider red flags - identify patients that are:
  - Inappropriate for PT
  - Appropriate for PT but would benefit from consultation with another health care provider

## ICF Project Methodology

### **Example – Adhesive Capsulitis:**

- Acute condition - at least 3 of the following:
  - VAS pain score at rest > 4
  - Pain at rest > 75% of time
  - Pain with active elevation of shoulder
  - Night pain or spasm end-feel
- Chronic condition defined as < 3 of above

Carette et al 2003

## ICF Project Methodology

### **Interventions:**

- Describe interventions & supporting evidence for specific subsets of patients within classification system
- Interventions typically focus on impairments

## ICF Project Methodology

### **Example – Adhesive Capsulitis:**

- Acute condition - treated with:
  - Pain relieving modalities
  - Active ROM exercises within pain free ROM
- Chronic condition - treated with:
  - Stretching exercises
  - Joint mobilization

Carette et al 2003

## ICF Project Methodology

### **Interventions:**

- Focus is on interventions provided by PTs, but guidelines should also consider adjunctive procedures &/or pharmacological considerations
- For example - guidelines for adhesive capsulitis should address considerations for intra-articular injection of corticosteroids

## ICF Project Methodology

### **Evidence for Interventions:**

- Greater emphasis given for clinical research involving patients
- If clinical evidence is lacking, evidence to support biological or biomechanical plausibility of evidence should be provided

## ICF Project Methodology

### Levels of Evidence - CEBM

	Therapeutic Studies	Prognostic Studies	Diagnostic Studies
<b>Level I</b>	<ul style="list-style-type: none"> <li>High-quality randomized controlled trial with statistically significant difference or no statistically significant difference but narrow confidence intervals</li> <li>Systematic review<sup>2</sup> of Level I randomized controlled trials (and study results were homogeneous)</li> </ul>	<ul style="list-style-type: none"> <li>High-quality prospective study<sup>1</sup> (all patients were enrolled at the same point in their disease with 100% follow-up of enrolled patients)</li> <li>Systematic review<sup>2</sup> of Level I studies</li> </ul>	<ul style="list-style-type: none"> <li>Testing of previously developed diagnostic criteria in series of consecutive patients (with universally applied reference "gold" standard)</li> <li>Systematic review<sup>2</sup> of Level I studies</li> </ul>
<b>Level II</b>	<ul style="list-style-type: none"> <li>Lesser-quality randomized controlled trial (e.g., &lt;90% follow-up, no blinding, or improper randomization)</li> <li>Prospective<sup>1</sup> comparative study<sup>2</sup></li> <li>Systematic review<sup>2</sup> of Level II studies or Level I studies with inconsistent results</li> </ul>	<ul style="list-style-type: none"> <li>Retrospective<sup>1</sup> study</li> <li>Unintended controls from a randomized controlled trial<sup>1</sup></li> <li>Lesser-quality prospective study (e.g., patients enrolled at different points in their disease or &lt;80% follow-up)</li> <li>Systematic review<sup>2</sup> of Level II studies</li> </ul>	<ul style="list-style-type: none"> <li>Development of diagnostic criteria on basis of consecutive patients (with universally applied reference "gold" standard)</li> <li>Systematic review<sup>2</sup> of Level II studies</li> </ul>
<b>Level III</b>	<ul style="list-style-type: none"> <li>Case-control study<sup>1</sup></li> <li>Retrospective<sup>1</sup> comparative study<sup>2</sup></li> <li>Systematic review<sup>2</sup> of Level III studies</li> </ul>	<ul style="list-style-type: none"> <li>Case-control study<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Study of nonconsecutive patients (without consistently applied reference "gold" standard)</li> <li>Systematic review<sup>2</sup> of Level III studies</li> </ul>
<b>Level IV</b>	<ul style="list-style-type: none"> <li>Case series<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Case series</li> </ul>	<ul style="list-style-type: none"> <li>Case-control study</li> <li>Peer reference standard</li> </ul>
<b>Level V</b>	<ul style="list-style-type: none"> <li>Expert opinion</li> </ul>	<ul style="list-style-type: none"> <li>Expert opinion</li> </ul>	<ul style="list-style-type: none"> <li>Expert opinion</li> </ul>

## ICF Project Methodology

### Strength of Evidence:

- Graded according to guidelines described by Sackett with modifications
- Consensus expert opinion considered as weak evidence
- Basic science evidence to demonstrate biomechanical or biological plausibility will be considered theoretical/foundational knowledge

## ICF Project Methodology

### Strength of Evidence:

- Strong** – supported by preponderance of Level I and II studies (including at least 1 Level I study). Includes clinical practice guidelines based on systematic reviews that include at least 1 Level I study
- Moderate** – supported by single Level I study or preponderance of Level II evidence
- Weak** – supported by single Level II study or preponderance of Level III and IV studies. Includes consensus expert opinion.

## ICF Project Methodology

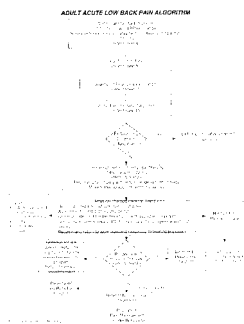
### Strength of Evidence:

- Conflicting Evidence** – disagreement among high quality studies
- Theoretical/Foundational Evidence** – supported by preponderance of basic science research including animal studies, cadaveric studies and modeling

## ICF Project Methodology

### Summarize Results:

- Creation of flow diagram to summarize classification & clinical decision making processes
- Quick reference summary as well as detailed description



## ICF Project Methodology

### Summarize Results:

- Develop tools to support use of guidelines:
  - Data collection forms
  - Outcome instruments
  - Patient education material

## **ICF Project Methodology**

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### **Dissemination:**

- Circulate to key stakeholders for review and comment
- Publish in peer reviewed journal - JOSPT