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

Sponsored by Orthopaedic Section
American Physical Therapy Association
February 15, 2007
Combined Sections Meeting
Boston, MA

Purpose of Project

- 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

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

ICF-Based Practice Guidelines

Expected Benefits:

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

ICF-Based Practice Guidelines

Develop for 7 Body Regions:

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

Purpose of Presentation

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

ICF as the New Member in the WHO Family of International Classifications

WHO Family of International Classifications

ICD-10
International Statistical Classification of Diseases & Related Health Problems

ICF
International Classification of Functioning, Disability and Health

Main Classifications

ICF Publications

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

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”

Universal Model vs. Minority Model

- Universal Model - not a minority model
- Everyone may have disability
- Certain impairment groups
- Continuum
- Categorical
- Multi-dimensional
- Uni-dimensional
Foundations of ICF
Interactive Model - *not a linear progression*

Sequence of Concepts
ICIDH 1980
Disease or disorder → Impairments → Disabilities → Handicaps

Interaction of Concepts
ICF 2001
Health Condition (disorder/disease)

Body function & structure (Impairment) → Activities (Limitation) → Participation (Restriction)

Environmental Factors → Personal Factors

Foundations of ICF
Integrative Model - *not merely medical*

ICF Components

<table>
<thead>
<tr>
<th>Body Functions &amp; Structures</th>
<th>Activities &amp; Participation</th>
<th>Environmental Factors</th>
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<tr>
<td>Functions</td>
<td>Capacity</td>
<td>Barriers</td>
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<tr>
<td>Structures</td>
<td>Performance</td>
<td>Facilitators</td>
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</tbody>
</table>

Body Functions
- Mental functions
- Sensory functions and pain
- Voice and speech functions
- Functions of the cardiovascular, haematological, immunological and respiratory systems
- Functions of the digestive, metabolic and endocrine systems
- Genitourinary and reproductive functions
- Neuromusculoskeletal and movement-related functions

Structures
- Structures of the nervous system
- The eye, ear and related structures
- Structures involved in voice and speech
- Structures related to the cardiovascular, immunological and respiratory systems
- Structures related to the digestive, metabolic and endocrine systems
- Structures related to the genitourinary and reproductive systems
- Structures related to movement
- 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

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

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 tendinopaty
  - Shoulder – adhesive capsulitis, impingement, rotator cuff tendinopathy

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For Each Condition - Identify:
- Impairments in body structure & function
- Activity limitations
- Participation restriction

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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)

Example – Adhesive Capsulitis:

• Activity limitations & participation restrictions:
  • Washing oneself (d510):
    • Washing body parts (d510)
    • 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)

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)

Example – Shoulder Internal Rotation:

• 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

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 1.3° (Irgang 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 1st 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

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

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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

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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

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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
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Levels of Evidence - CEBM

<table>
<thead>
<tr>
<th>Level I</th>
<th>Therapeutic Studies</th>
<th>Prognostic Studies</th>
<th>Diagnostic Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High-quality randomized controlled trials (including at least one Level I study)</td>
<td>Treatment of patients with all forms of clinical decision</td>
<td>Clinical and laboratory studies (including randomized controlled trials)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level II</th>
<th>Therapeutic Studies</th>
<th>Prognostic Studies</th>
<th>Diagnostic Studies</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Graded according to guidelines described by Sackett with modifications</td>
<td>Treatment of patients with all forms of clinical decision</td>
<td>Clinical and laboratory studies (including randomized controlled trials)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Level III</th>
<th>Therapeutic Studies</th>
<th>Prognostic Studies</th>
<th>Diagnostic Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consensus expert opinion considered as weak evidence</td>
<td>Treatment of patients with all forms of clinical decision</td>
<td>Clinical and laboratory studies (including randomized controlled trials)</td>
</tr>
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<thead>
<tr>
<th>Level IV</th>
<th>Therapeutic Studies</th>
<th>Prognostic Studies</th>
<th>Diagnostic Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic science evidence to demonstrate biomechanical or biological plausibility will be considered theoretical/foundational knowledge</td>
<td>Treatment of patients with all forms of clinical decision</td>
<td>Clinical and laboratory studies (including randomized controlled trials)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level V</th>
<th>Therapeutic Studies</th>
<th>Prognostic Studies</th>
<th>Diagnostic Studies</th>
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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.

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Summarize Results:

- Development of guidelines and clinical practice guidelines
- Summarize the literature review
- Create a flow diagram to summarize the classification and clinical decision making processes
- Quick reference summary as well as detailed description

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Summarize Results:

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

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