

Application of the ICF in Rehabilitation

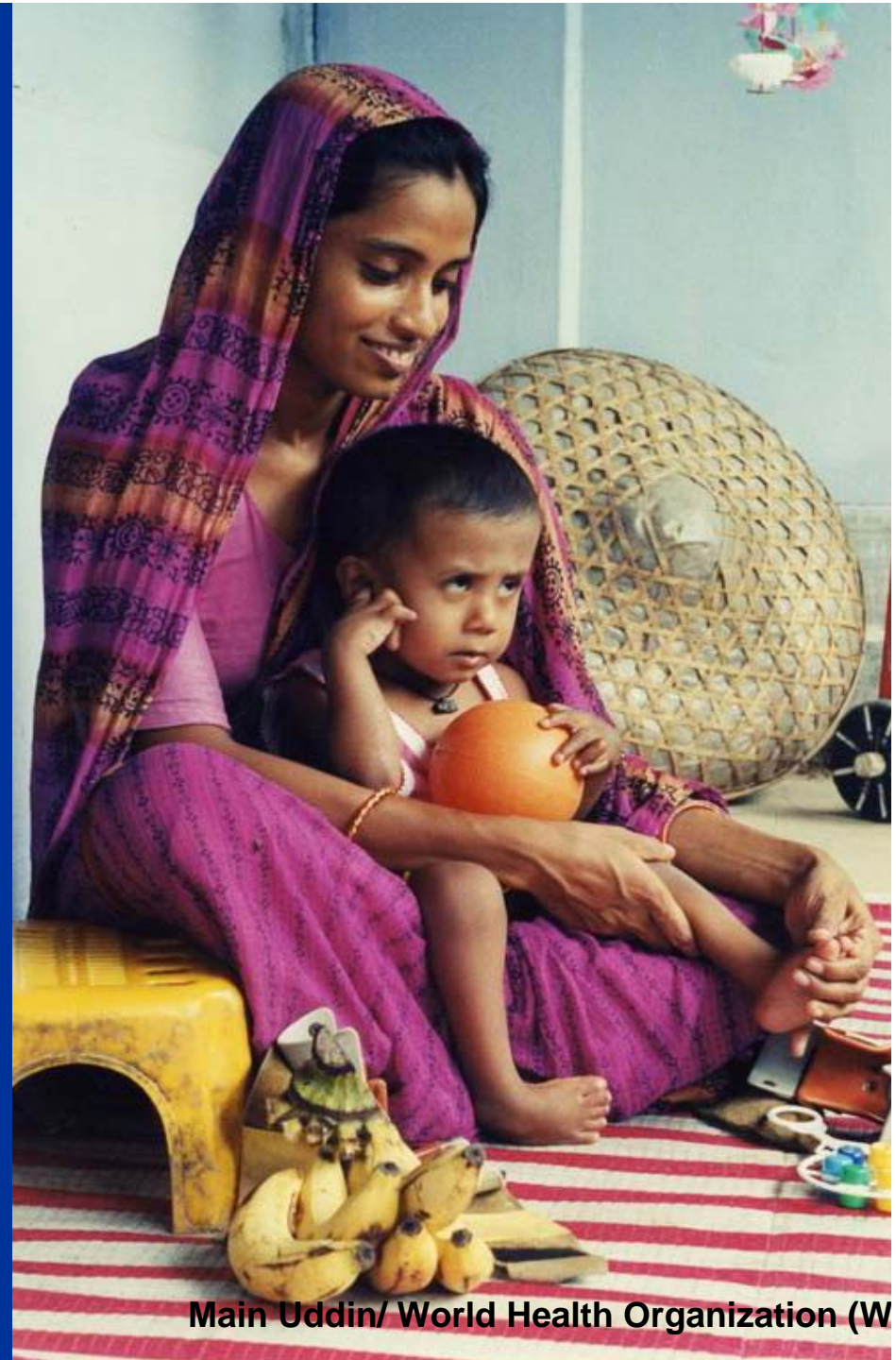
Gerold Stucki, MD, MS

**Professor and Chairman, Department of PRM
Director, ICF Research Branch, WHO FIC CC Germany
*Ludwig-Maximilians-University, Munich, Germany***

**Functioning, Disability and
Rehabilitation
in the UN and the WHO context**

UN

Convention on the Rights of Persons with Disabilities



Main Uddin/ World Health Organization (W

Application of the ICF in the UN Specialty Agencies

- **WHO**
 - Developer of the ICF
- **UNSTAT**
 - Disability statistics – Census, Surveys
 - Current focus on Seeing, Hearing
 - WHO: ask about **Activities** and **Participation**
- **ILO** and other agencies

New Emphasis of WHO on Functioning and Rehabilitation

Resolutions by the
World Health Assembly

2001 International
Classification of Functioning,
Disability and Health (ICF)

2005 Disability, including
prevention, management and
rehabilitation



Who is Who at WHO - ICF ?

- **CTS-Team**

- Responsible for Classification, Terminology and Standards at WHO
- *Bedirhan Üstün and Nenad Kostansjek*



Who is Who at WHO - ICF

- **WHO FIC CC Network**

Network of the **C**ollaboration **C**enters (**CC**) for the **F**amily of **I**nternational **C**lassifications (**FIC**)

4 Committees and 4 Reference Groups

Last Meeting: New Dehli – see CTS homepage

- **FDRG**

Functioning and **D**isability **R**eference **G**roup of the WHO FIC Network

Co-Chairs Ros Madden and Gerold Stucki

Functioning and Disability Reference Group

1 Principles of use, coding rules and guidelines

Case-based; Population-based

2 ICF update

User platform – submission of proposals

3 ICF implications for ICD

Key terms

Impact aspect of the Health Information Model

4 Measurement and statistical use of the ICF

ICF Core Sets and ICF Core Instruments

Qualitative and Quantitative Mapping

Statistical Modelling of ICF data

Functioning and Disability Reference Group

5 Educational materials

Curriculum – approved

Web-Based Tool – in the making

6 Ethical issues and ICF

Review of Appendix 6

7 Environmental factors

Operationalization approaches

8 Terminology / Electronic Health Records

ICF revision – third level classification

Main challenges for the ICF

- **Evolve towards a third level classification**
- **Link to the ICD**

- **Bridge to the world of measures**
- **Development of operationalizations and practical tools**

- **Development of successful use cases**
- **Application by the other UN agencies**

Who is Who - ICF

- **ICF Research Branch** - German WHO FIC CC (DIMDI)
 - Ludwig-Maximilians-University, Munich, Germany
 - Swiss Paraplegic Research, Nottwil, Switzerland**[www. icf-research-branch.org](http://www.icf-research-branch.org) and Newsletter**

ICF Core Sets and ICF Core Instruments

Bridging methodology

Web-based Education Tool

First terminology workshop in december

Approaches to operationalize Environmental Factors

Exploration of a Personal Factor Classification

Review of the use of Capacity and Performance

Cieza A, Stucki G

**The International Classification of
Functioning Disability and Health: its
development process and content validity**

Eur J Phys Med Rehabil, 2008, September

Stucki G, Kostanjsek N, Üstün B, Cieza A

**ICF-based classification and measurement
of functioning**

Eur J Phys Med Rehabil, 2008, September

Who is who at WHO - Rehabilitation

Disability and Rehabilitation (DAR) Team

Department of Violence and Injury
Prevention and Disability (VIP)

Coordinator: Alana Officer

A man in a light blue and white striped shirt is standing in profile, writing on a dark chalkboard. The background is a plain wall. The text of the slide is overlaid on the right side of the image.

Guiding documents

- **Resolution WHA58.23 on Disability**, including prevention, management and rehabilitation
- **UN Convention on the Rights of Persons with Disabilities**
- **ICF**: International classification of Functioning, Disability and Health
- WHO, ILO and UNESCO joint position paper on **CBR** 2004
- **DAR Plan of Action 2006 – 2011**
- ***ISPRM-WHO Plan of Action***

Vision: All persons with disabilities live in dignity, with equal rights and opportunities

Mission: To enhance the quality of life for persons with disabilities through local, national, regional and global efforts



Akash/ World Health Organization (WHO)

Partnerships

Aim: To enhance collaboration within WHO and with other stakeholders to enhance the quality of life of persons with disabilities

Next steps: Develop alliances and a network of active Collaborating Centres and partners



Dmitry Ukhanow, WHO

World Report on Disability and Rehabilitation



World Health
Organization

ISPRM
Partner in Official Relation with WHO

[Home](#)[About WHO](#)[Countries](#)[Health topics](#)[Publications](#)[Data and statistics](#)[Programmes and projects](#)[DAR Home](#)[Policies](#)[Medical care and rehabilitation](#)[Community-based rehabilitation \(CBR\)](#)[Assistive devices / technologies](#)[Capacity building](#)

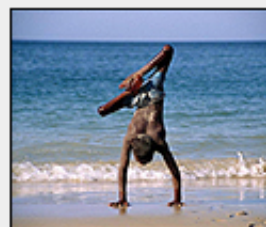
Disability and Rehabilitation Team (DAR)

[About us](#) | [Information resources](#) | [Media centre](#) | [Related links](#)[WHO](#) > [Programmes and projects](#)

Disability and Rehabilitation

An estimated 650 million people live with disabilities around the world

WHO's role is to enhance the quality of life, and promote and protect the rights and dignity of people with disabilities through local, national and global efforts. WHO guides and supports countries to increase awareness about disability issues, improve disability data, scale up public health programmes and community-based initiatives that promote health and rehabilitation and make assistive devices available to persons with disabilities. A six-year plan directs WHO's efforts.



WHO/Bernard Franck

- :: [WHO's key activities](#)
- :: [WHO action plan 2006-2011 \[pdf 49kb\]](#)

NEWS

8 April 2008

Task Force to mainstream disability across WHO
[Full text](#)

5 April 2008

Convention promoting and protecting the rights of people

UPCOMING EVENTS

19 - 22 May 2008

UN Convention on the Rights of Persons with Disabilities: a Call for Action on Poverty, Lack of Access and Discrimination. Addis Ababa, Ethiopia
[Leonard Cheshire Disability website](#)

HIGHLIGHTS

The Convention on the Rights of Persons with Disabilities has entered into force
[Statement by the Assistant Director-General, Noncommunicable Diseases and Mental Health](#)

World Report on Disability and Rehabilitation
[Concept paper \[pdf 98kb\]](#)

WHO Newsletter on Disability and Rehabilitation: Issue No. 4
[English \[pdf 1.29Mb\]](#)

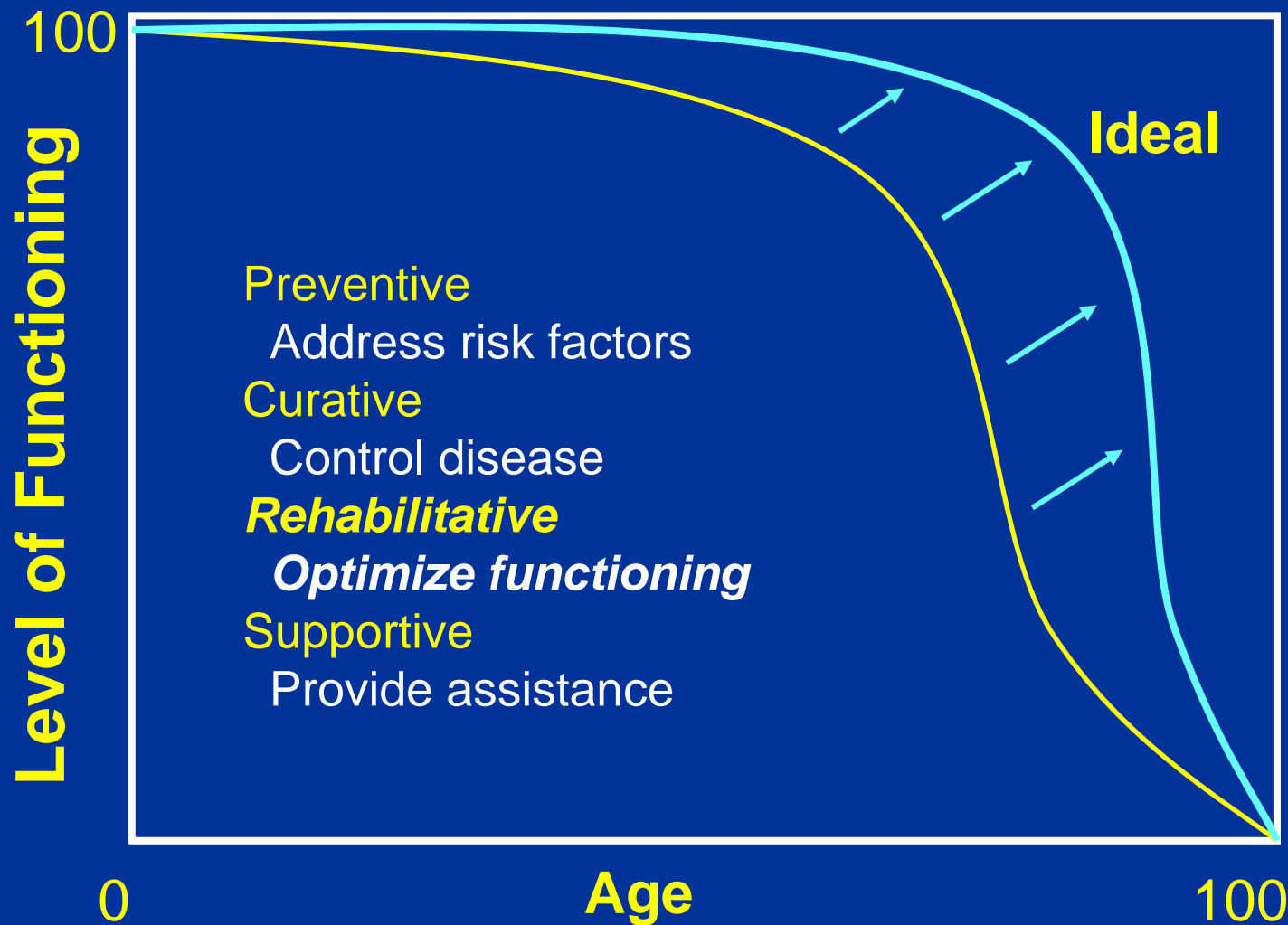
PHOTO GALLERY



[Images of health and disability](#)

The ICF and Rehabilitation

4 Health Strategies to optimize Functioning



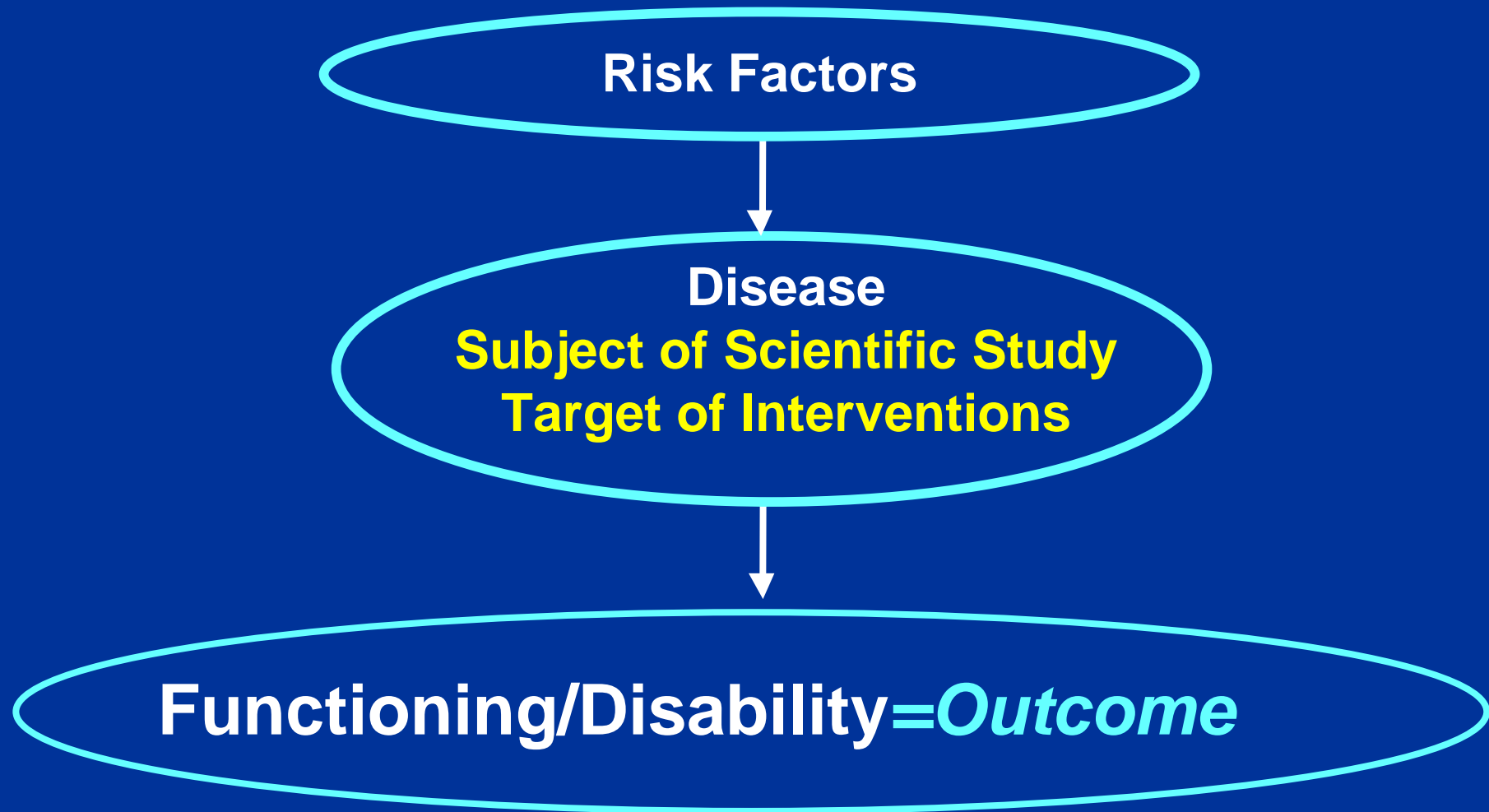
Stucki G et al. *The ICF: A unifying model for the conceptual description of the rehabilitation strategy.* J Rehabil Med 2007; 39(4):279-285

Stucki G et al. The ICF: A unifying model for the conceptual description of the rehabilitation strategy. J Rehabil Med 2007; 39(4):279-285

Please comment and send a letter to the editor of the Journal of Rehabilitation Medicine, Prof. Gunnar Grimby!

The Biomedical Perspective

Preventive and Curative Strategy



The Integrative Perspective

Rehabilitative and Supportive Strategy

Health Condition **ICD**
(disease, trauma, ageing, congenital anomalies)

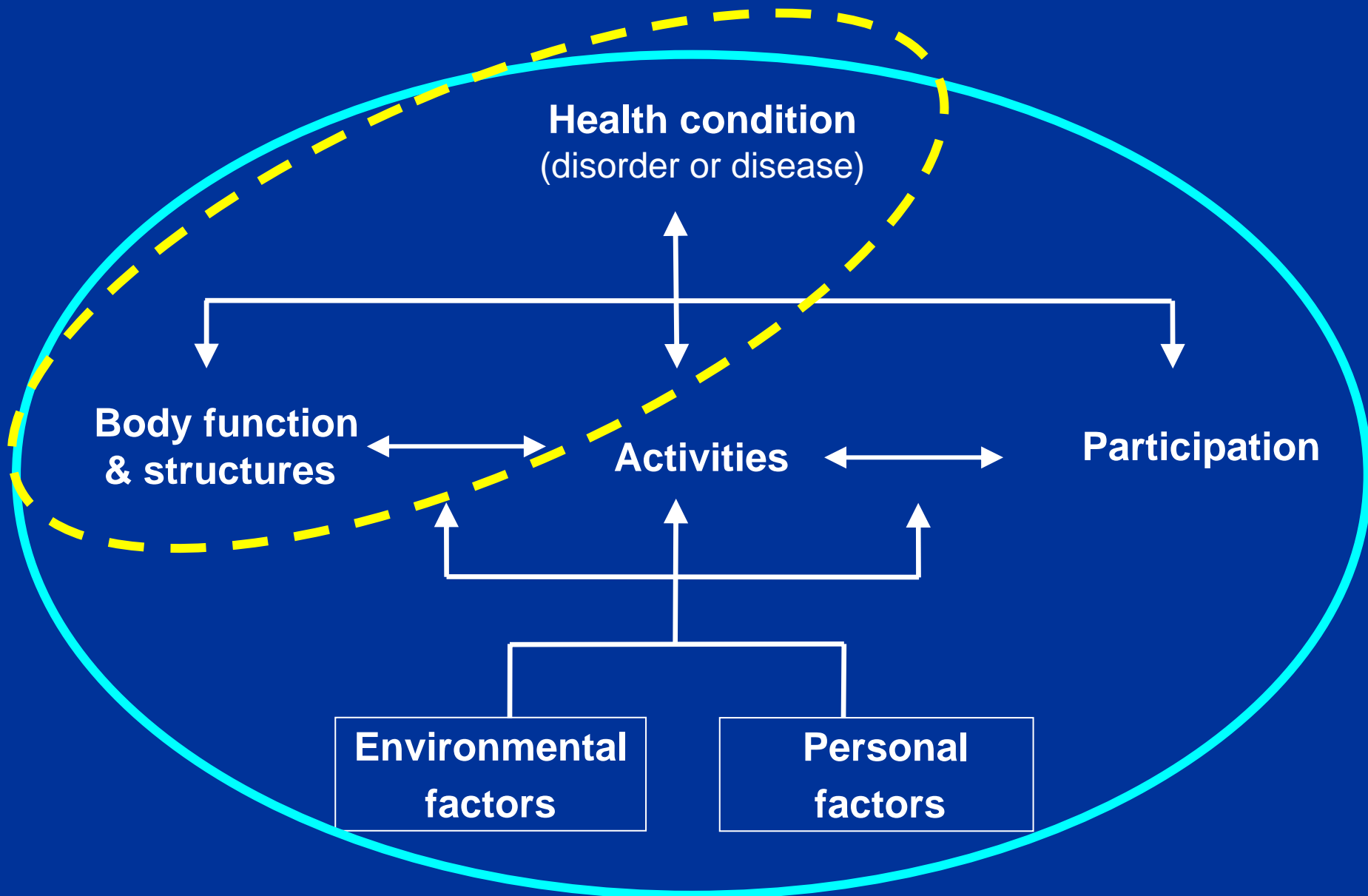


Functioning=Human Experience **ICF**
Subject of Scientific Study
Target and Outcome of Interventions



**Environmental
Factors**

**Personal
Factors**



Partial Perspective (Biomedical Aspects) vs
Comprehensive Perspective (Integrative Model)

ICF and Rehabilitation Research

- The 2005 WHO resolution urges member states to take action by “broadening their knowledge base”
- and specifically states the "importance of reliable information on various aspects of disability prevention, rehabilitation and care..”

Prof. Fineberg, Institute of Medicine

Investment in Care vs Research

- Vastly disproportionate investment
- **Care today** is in competition with **best care tomorrow**
- **We need to invest in research** to be able to provide best care in the future!

Fineberg HV: Science and medicine in the 21st century: Opportunities for rehabilitation medicine; Am J Phys Med Rehabil 2005;84:928–931

Prof. Fineberg Research Capacity

“Unfortunately, rehabilitation is an area in the health sector where current capacity in research is in large discordance with the acknowledged need”

Fineberg HV: Science and medicine in the 21st century: Opportunities for rehabilitation medicine; Am J Phys Med Rehabil 2005;84:928–931

The Problem

We currently lack

- a systematic organization and
- international standards

for **human functioning and rehabilitation research**

Frontera W: Rehabilitation Summit, 2005, Am J Phys Med Rehabil

Grimby G, Melvin J, Stucki G.

The ICF: A unifying model for the conceptualization, organization and development of human functioning and rehabilitation research. Foreword.

J Rehabil Med 2007; 39(4):277-278

Actions - One

Apply the ICF as unifying model for the

- conceptualization
- organization and
- development of

human functioning and rehabilitation research

Write a letter on your suggestions!

**J Rehab Med 2007;
Vol. 39, Issue 4:
<http://jrm.medicaljournals.se/issue/39/4>**

Journal of Rehabilitation Medicine
Vol. 39, 2007, Supplement 46

Journal of
**REHABILITATION
MEDICINE**

ISSN 1650-1977

Special issue No. 46
April 2007

Official journal of the
– UEMS European Board of Physical and Rehabilitation Medicine
– European Academy of Rehabilitation Medicine
– International Society of Physical and Rehabilitation Medicine (ISPRM)

**THE ICF: A UNIFYING MODEL FOR
THE CONCEPTUALIZATION,
ORGANIZATION AND DEVELOPMENT
OF HUMAN FUNCTIONING AND
REHABILITATION RESEARCH**

**Editors:
Gunnar Grimby, John Melvin and Gerold Stucki**

The Non-profit Foundation for
Rehabilitation Information

www.medicaljournals.se/jrm

Suggestions

- Develop the **Human Functioning Sciences** as the **basic sciences** from the **integrative perspective of functioning**

complementing the **biosciences**, the **basic sciences** which focus on the biomedical aspects of functioning

Stucki G, Grimby G. Organizing human functioning and rehabilitation research into distinct scientific fields. Part I: Developing a comprehensive structure from the cell to society. J Rehabil Med 2007; 39(4):293-298

Stucki G, Reinhardt JD, Grimby G.

Organizing human functioning and rehabilitation research into distinct scientific fields.

Part II: Conceptual descriptions and domains for research.

J Rehabil Med 2007; 39(4): 299-307

Suggestions

- Develop **Academic Training Programs** and interdisciplinary **collaboration centers for Human Functioning and Rehabilitation**

similar to the ubiquitous programs and centers for **Bio-Medicine**

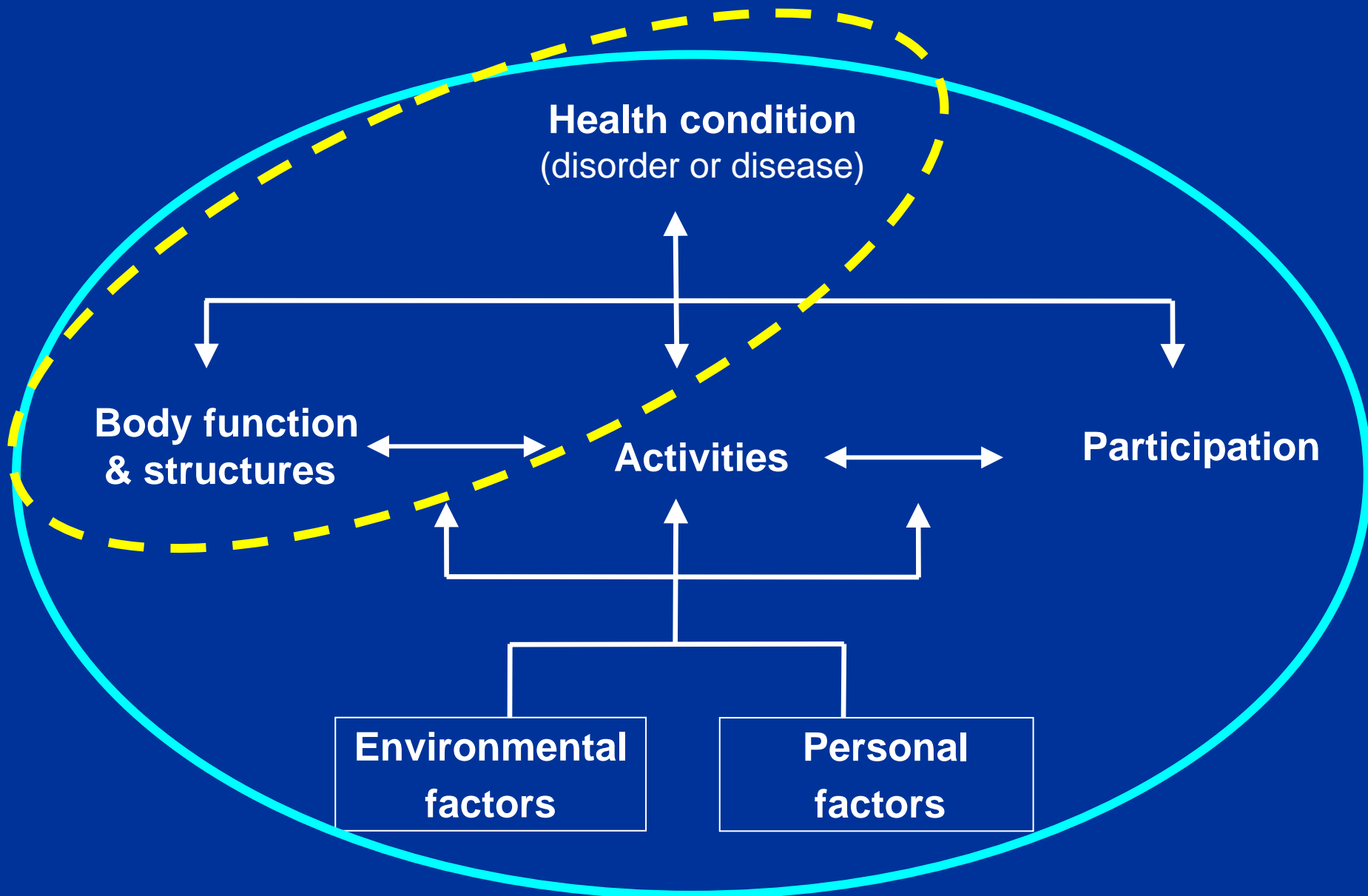
Stucki G. Developing human functioning and rehabilitation research.

Part I: Academic training programs. J Rehabil Med 2007; 39(4):323-333

Stucki G, Celio M. Developing human functioning and rehabilitation research.

Part II: Interdisciplinary university centers and national and regional collaboration networks.

J Rehabil Med 2007; 39(4): 334-342



Partial Perspective (Biomedical Aspects) vs Comprehensive Perspective (Integrative Model)

Related Scientific Disciplines

Health condition

Biology

Molecular
medicine

Body Functions and Structures

Exercise, applied physiology
Movement and sports science
Neurobiology

Activities

Movement sciences

Participation

Sociology
Social Psychology

Personal Factors

Anthropology
Behavioral science
Neurobiology
Psychology

Overarching perspective

Epidemiology
Health sciences
Human development
Philosophy and ethics
Public health

Environmental Factors

Economics
Sociology
Cultural and social anthropology
Political science
Health and social law
Environmental rehabilitation
engineering

Related Professional Disciplines

Health Condition

Pathology
Clinical medicine

Body Functions & Structures

Pharmacology
Physical medicine
Physiotherapy
Prosthetics
Neuropsychology
Speech therapy
Sports medicine

Activities

Medical rehabilitation
Occupational therapy
Physiotherapy
Orthotics

Participation

Rehabilitation counseling
Vocational rehabilitation
Social work
Occupational therapy

Personal Factors

Clinical psychology
Education

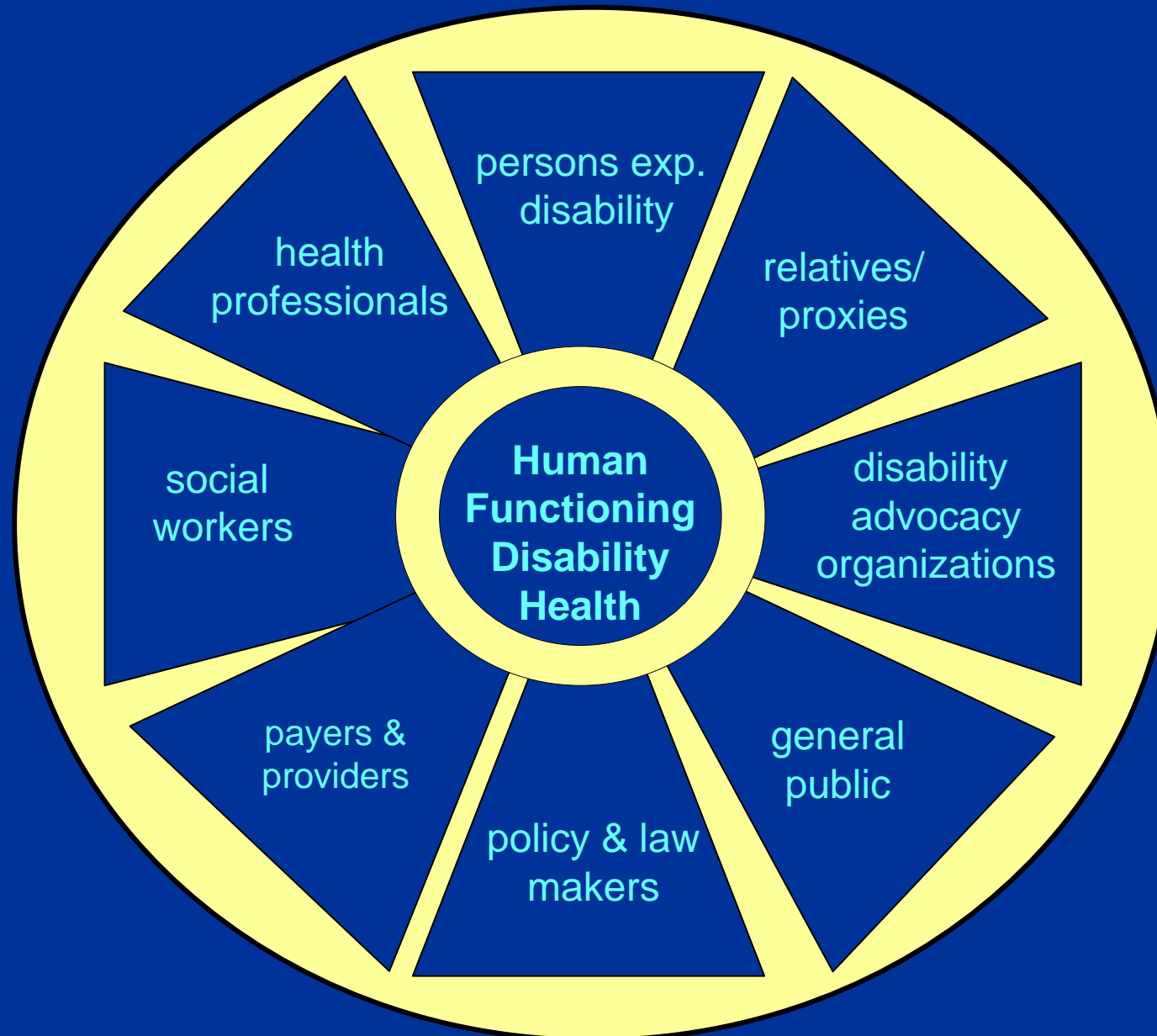
Environmental Factors

Construction and architecture
Design
Law
Politics

Overarching perspective

Rehabilitation medicine
Geriatric medicine
Nursing
Family and community medicine

Partners Collaboration Centers



Actions – Two

Develop and adopt
ICF based practical tools and
international standards
for research and practice

*Stucki G. ICF: A promising Framework and Classification for
Rehabilitation Medicine. Am J Phys Med Rehabil 2005;84:733-740*

Development of ICF Core Sets *Standards and Tools for Practice, Research and Statistics*

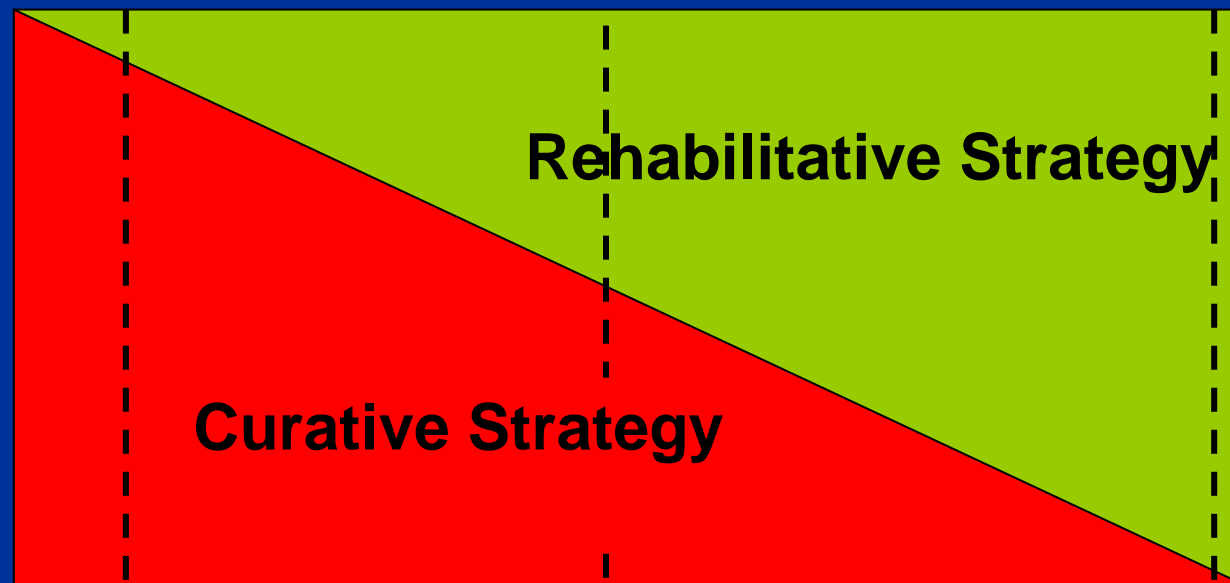
**WHO FIC CC Germany (DIMDI)
ICF Research Branch
Ludwig-Maximilian University Munich**

World Health Organization

**&
ISPRM and other Partner Organizations**

**&
International Collaboration Network 51 countries, 300 centers**

The Service and Care Continuum



Acute context
Acute care

(Early) post-acute context
Postacute rehabilitation

Long-term context
CBR, Re-Rehab



b1
b130
b134
b152
b180
b1801

s299
s710
s720
s730
s73001
s73011

d170
d230
d360
d410
d415
d430

e110
e115
e120
e125
e135
e150

1424



ICF Core Sets

**fractions of the ICF relevant
for specific health conditions
and/or a specific context**

Development of ICF Core Sets

Preparatory Phase

Focus groups
Patient's
Perspective

Empirical
multicenter study

Experts' survey
via email

Systematic
literature review

Phase I

International ICF
consensus
conference



1st version of the
ICF Core Sets

Phase II

Broad Testing and
validation
of the 1st version
of the
ICF Core Sets

Year 1

Year 2-3

Year 5

ICF Core Sets for Chronic Conditions

- **Chronic widespread pain**
- **Low back pain**
- **Osteoarthritis**
- **Osteoporosis**
- **Rheumatoid arthritis**
- **Chronic ischemic heart disease**
- **Diabetes**
- **Obesity**
- **Obstructive pulmonary diseases**
- **Depression**
- **Breast cancer**
- **Stroke**

Current Developments

Amputation	Sydney	Australia
Ankylosing Spondylitis	Maastricht	Netherlands
Bipolar disorders	Barcelona	Spain
Hearing	Stockholm	Sweden
Migraine	Milan	Italy
Multiple Sclerosis	Valens	Switzerland
Oropharyngeal Cancer	Munich	Germany
Psoriasis Arthritis	Wellington	New Zealand
Scleroderma	Vienna	Austria
SLE	Vienna	Austria
Sleep	Helsinki	Finland
Spinal Cord Injury	Nottwil	Switzerland
Traumatic Brain Injury	Barcelona	Spain
Vision	Munich	Germany

Starting Now

- **Vocational Rehabilitation**
 - **Leader: Prof. Jan Ekholm, Uppsala**
 - **Swiss Injury Insurance (SUVA**

Under Consideration

- *Neuromuscular Diseases*
- Neck and Shoulder Pain
- Parkinson
- Peripheral Arterial Disease
- HIV and Tuberculosis
 - Initiative South Africa

- Opportunities for PhD thesis
- Costs: average €200'000-300'000

Generic ICF Core Set

Common Metric
applicable

*across world regions
across health conditions
along the continuum of care
over the course of life*

*Cieza A, Geyh S, Chatterji S, Kostanjsek N, Ustun BT, Stucki G.
Identification of candidate categories of the ICF for a Generic ICF Core Set
based on regression modelling
BMC Med Res Methodol. 2006; 6:36*

Application of the ICF Core Sets

The example of Rheumatology

- Bring order in
„what to measure and Report“
- Can be the basis for
„how to measure“

Step 1

What to measure – Conceptually

Specify the OMERACT domains within ICF model

- RA Physical disability
- AS Physical function
- OA Physical functioning
- OP QoL
- SLE Health related QoL
- SCL Function and health related QOL

*Stucki G, Boonen A, Tugwell P, Cieza A, Boers M.
The ICF: A conceptual model and interface for the OMERACT process.
J Rheumatol. 2007;34(3):600-606*

Step 2

What to measure - Specifically

Specify *what to measure* within the domain functioning: **ICF Core Sets**

- Rheumatoid Arthritis
- Ankylosing Spondylitis
- Osteoarthritis
- Low Back Pain
- Chronic Widespread Pain
- Osteoporosis
- SLE
- Scleroderma

Step 3: How to measure

Option 1: Select a suitable Instrument

- Map and compare candidate instrument

Alarcos C et. al.

ICF linking rules: an update based on lessons learned. Journal of Rehabilitation Medicine 2005;37(4):212-218

Does a candidate instrument address specified ICF categories ?

Patient-oriented instruments
Clinical tests

ICF Core Set

ICF International Classification of Functioning, Disability and Health

- b1
- b130
- b134
- b152
- b180
- b1801

.....

s299
s710
s720
s730
s73001
s73011

d170
d230
d360
d410
d415
d430

e110
e115
e120
e125
e135
e150

1424

WHOQoL

Join Mob Mus Pair Stab Emc Eng Gait Stiff Mus Sex Slee

NHP

SF-36

INSTRUCTIONS: This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

Answer every question by marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

What to measure
Finite number of categories

How to measure
Infinite number of items and instruments

Step 3: How to measure

Option 2: Develop ICF based Instruments

- Clinical Measures
 - Aggregating ICF categories
- Self-Reported Measures
 - Mapping of Item Pool from existing measures
 - New items

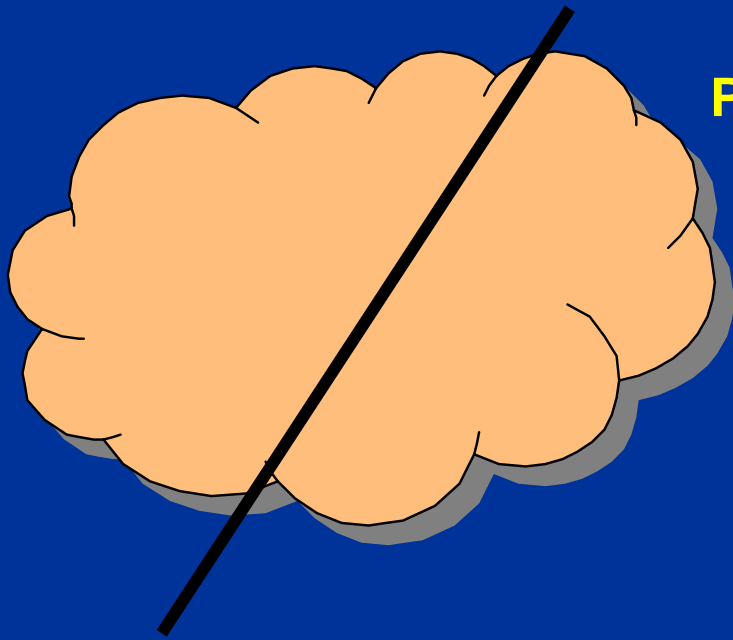
Stucki G, Kostanjsek N, Üstün B, Cieza A

ICF-based classification and measurement of functioning

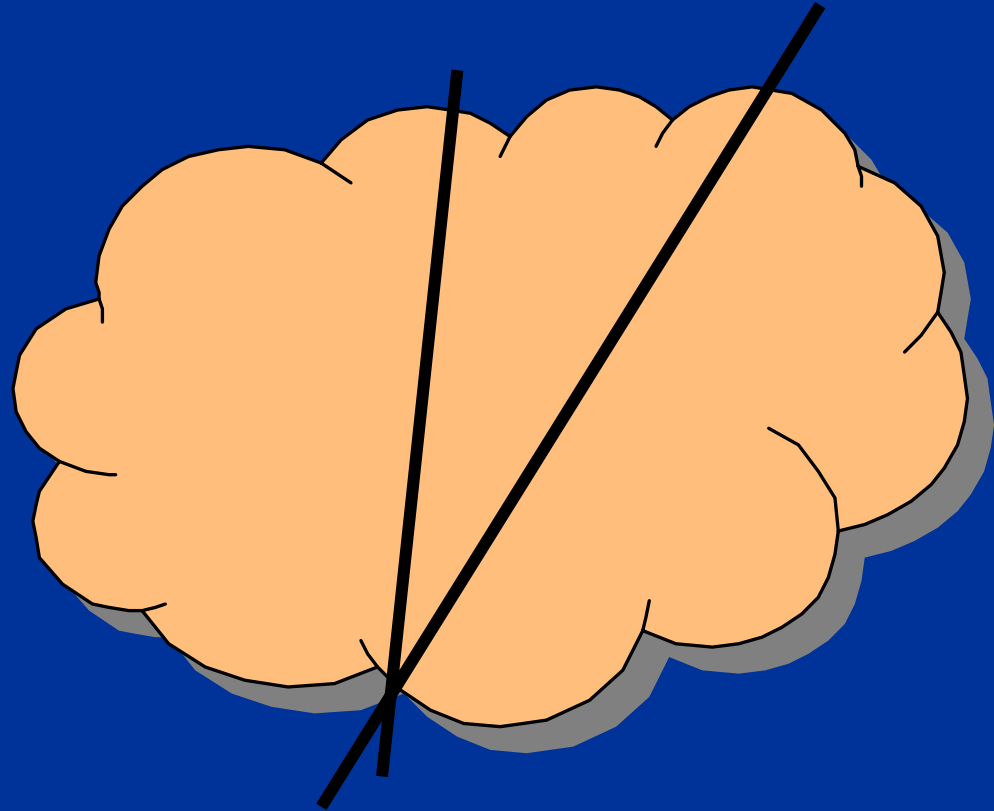
Eur J Phys Med Rehabil, 2008, September

It depends on the purpose!

Policy – Epidemiology – Disability Statistics



**Services and Clinical Care
Outcome Measurement**

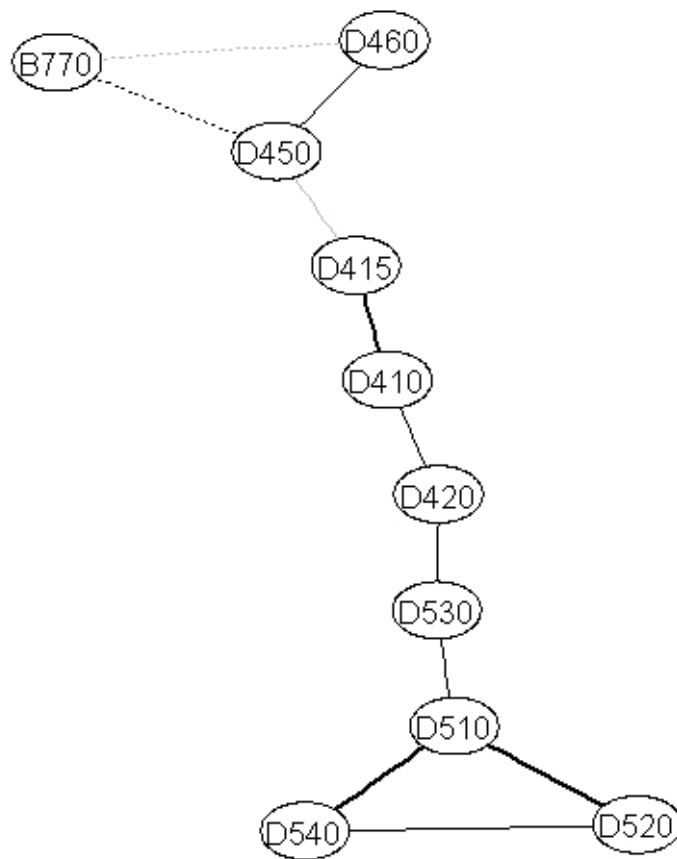


Grill E, Stucki G.

*Scales could be developed based on simple clinical ratings
of ICF Core Set categories.*

J Clin Epidemiol. 2008 Jul 9. [Epub ahead of print]

Measuring Targets of Rehabilitative Interventions



- **B770: Gait pattern**
- **D460: Moving around in different locations**
- **D450: Walking**
- **D415: Maintaining a body position**
- **D410: Changing body position**
- **D420: Transferring oneself**
- **D530: Toileting**
- **D510: Washing**
- **D520: Caring for body parts**
- **D540: Dressing**

Step 4: ICF based Reporting Grant Agencies and Journals

- **ICF Core Sets** serve as minimal international standard what to measure and report
- **The ICF Qualifier (0-4)** serves as quantitative reference scale



ICF Qualifier



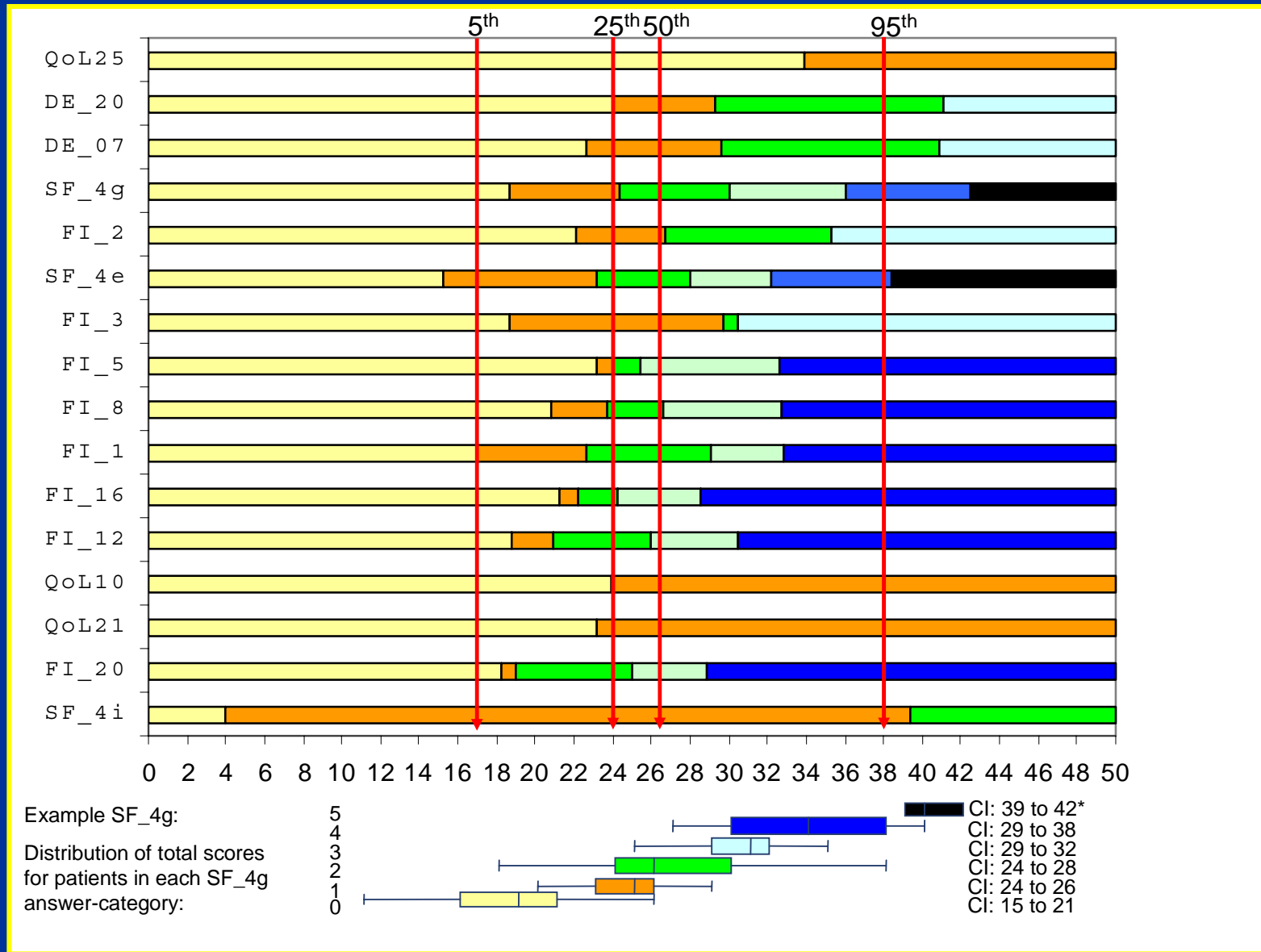
Clinical Test
Patient-oriented Instrument

**ICF category reference scale
(Interval scale)**

Cieza A et.al.

*Items from patient-oriented instruments can be integrated
into interval scales to operationalize categories of the ICF
J Clin Epidemiol; in press*

ICF category reference scale



Treshold map ,Energy and drive functions‘

Towards a true Epidemiology of Functioning

The Challenge ahead

**European and Worldwide
Day-to-day Implementation**

How to achieve day-to-day Implementation?

- Get first-hand experience by **participating in an Implementation Project**
 - ICF Core Set and Instruments Project
 - MHADIE and follow-up projects
- Become a champion and initiate a local or national **Implementation Project**
- Convince a government or insurance to fund and cooperate in an **Demonstration Project**

How to implement the ICF in daily Routine?

Rauch A et. al.

How to apply the International Classification of Functioning, Disability and Health (ICF) for rehabilitation management in clinical practice.

Eur J Phys Rehab Med 2008; in press.

ICF Evaluation Sheet

Assessment										
Global Goal: Independence in community						0				
Service-Programme-Goal: Participation in society						0				
Cycle goal 1: Independent mobility						0				
Cycle goal 2: Independent self-care						0				
Cycle goal 3: Health maintenance						0				
ICF categories		ICF Qualifier					Goal Re- lation	Goal value		
		problem								
		0	1	2	3	4				
b28013	Pain in back						CG1	0		
b4350	Immune response						CG3	0		
b735	Muscle tone functions						CG1	1		
b755	Involuntary movement reaction functions						CG1	1		
b810	Protective functions of the skin						CG3	0		
s810	Structure of areas of skin						CG3	0		
d240	Handling stress and other psychological demands						CG1	1		
d410	Changing basic body positions						CG1, 2	1		
d4153	Maintaining a sitting position						CG1, 2	0		
d420	Transferring oneself						CG1, 2	1		
d465	Moving around using equipment						CG1	0		
d475	Driving						CG1	0		
d540	Dressing						CG2	0		
		facilitator			barrier					
		4+	3+	2+	1+	0	1	2	3	4
e110	Products or substances for personal consumption						CG3	4+		
e115	Assistive products... for personal use in daily living						CG1, 2	4+		
		Influence								
		positive +		neutral 0	negative -					
pf	Ways of handling stress						CG1, 2	0		
pf	Ways of relating to the own body						CG1, 2	0		

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Introduction

To illustrate the use of the International Classification of Functioning, Disability and Health in rehabilitation practice, the project 'Case studies describing persons with Spinal Cord Injury and their health care based on the ICF and the Rehab-Cycle' was started in the Swiss Paraplegic Research. The results are presented on this website. [more...](#)

 [Learn more about the ICF.](#)

 [Find out about the ICF tools and the Rehab-Cycle.](#)



Join the *ICF Research Branch in*

**Munich, Germany
Nottwil, Switzerland**

**to perform an analysis and to
write a scientific paper!**

**ICF Research Branch
WHO CC FIC Germany (DIMDI)
at the University of Munich
and at SPF, Nottwil**



**University of Munich, Germany
Department of Rehabilitation Medicine**

**gerold.stucki@med.uni-muenchen.de
gerold.stucki@paranet.ch**

www.icf-research-branch.org



**Swiss Paraplegic Research (SPF)
Nottwil, Switzerland**