



# INTERFASE HUMANO COMPUTADOR

## VISUALISATION DES CONNAISSANCES MÉDICALES “VCM”



<http://vcm.univ-paris13.fr/svcm>

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# VISUALIZACION DE CONCEPTOS MEDICOS

## ANTECEDENTES

- Necesidad y dificultad de acceso a gran cantidad de información médica y a extensos registros clínicos
- Lectura de información médica en formato textual particularmente problemática
- Tiempo de lectura limitado
- Presentación gráfica podría ser más eficaz y eficiente para Registros Médicos Electrónicos; Sistemas de Soporte de Decisiones; y Motores de Búsqueda de Información

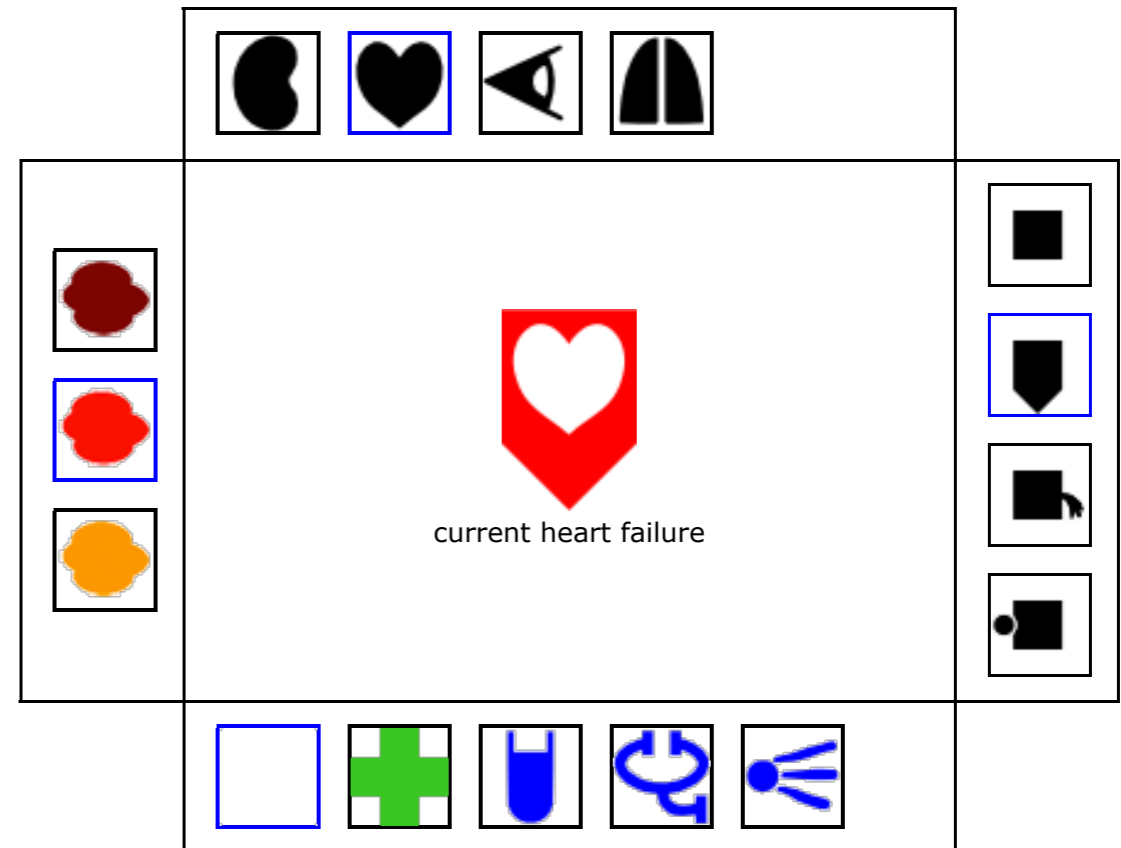
The screenshot shows the CISMef website interface. At the top, there is a search bar with the text 'insuffisance cardiaque' and a 'Rechercher' button. Below the search bar, there are navigation links: Accueil, Aide, Quoi de neuf, and Contact. The main content area displays search results for 'insuffisance cardiaque', indicating 13 resources found in 0.6 seconds. The results are categorized into 'Prise en charge' (Diagnostic, Traitement, Traitement médicamenteux), 'Pathologies associées' (Diabète, Maladies vasculaires, Angiopathies diabétiques), and 'Autres facteurs' (Personne âgée, traitement hypoglycémiant, Radiologie). Two search results are listed: 1. 'L'ultrafiltration appliquée au domaine de l'insuffisance cardiaque - Rapport du groupe d'experts en insuffisance cardiaque du Réseau québécois de cardiologie tertiaire' (Ministère de la Santé et des Services sociaux [québécois] 2008) and 2. 'Nouvelles recommandations en Suisse pour le diagnostic et le traitement de l'insuffisance cardiaque' (Forum Médical Suisse Swiss Medical Forum 2007). Each result includes a brief description and a 'pertinence' score of 100%.



# VISUALIZACION DE CONCEPTOS MEDICOS

## INTRODUCCION

- Interfase gráfica
- Combinación de sombras, pictogramas y colores
- Organización por anatomía y etiología de acuerdo a caracteres esquemáticos
- Lenguaje icónico para representar: condiciones clínicas, síntomas, enfermedades, estados fisiológicos, riesgos o antecedentes patológicos, tratamientos farmacológicos y otros, exámenes de laboratorio y procedimientos





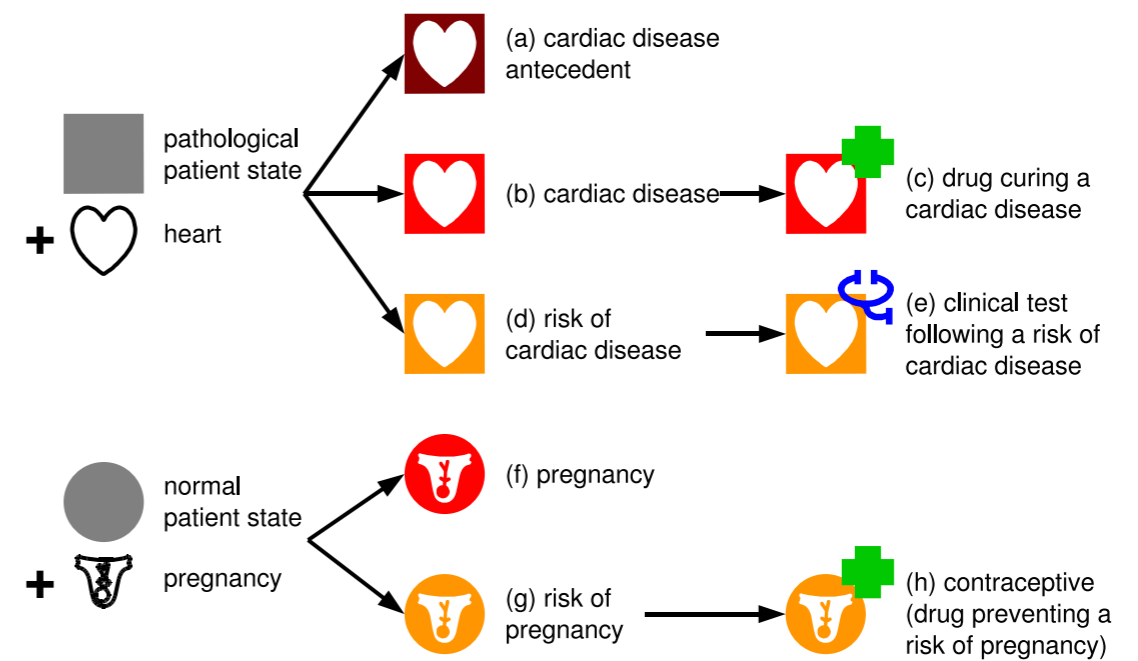
# PICTOGRAMAS PRIMITIVOS\_ICONOS

## METODO

Central colors	Top right colors	Top right pictogram
Medical history	Treatment	Oral drug
Current condition	Monitoring	Drug
Risk	Treatment history	Transplant

Central pictogram	Shape
Heart rate	Fungal infection
Lung	Pathological state
Nose and throat	Physiological state
Pregnancy	Inflammation

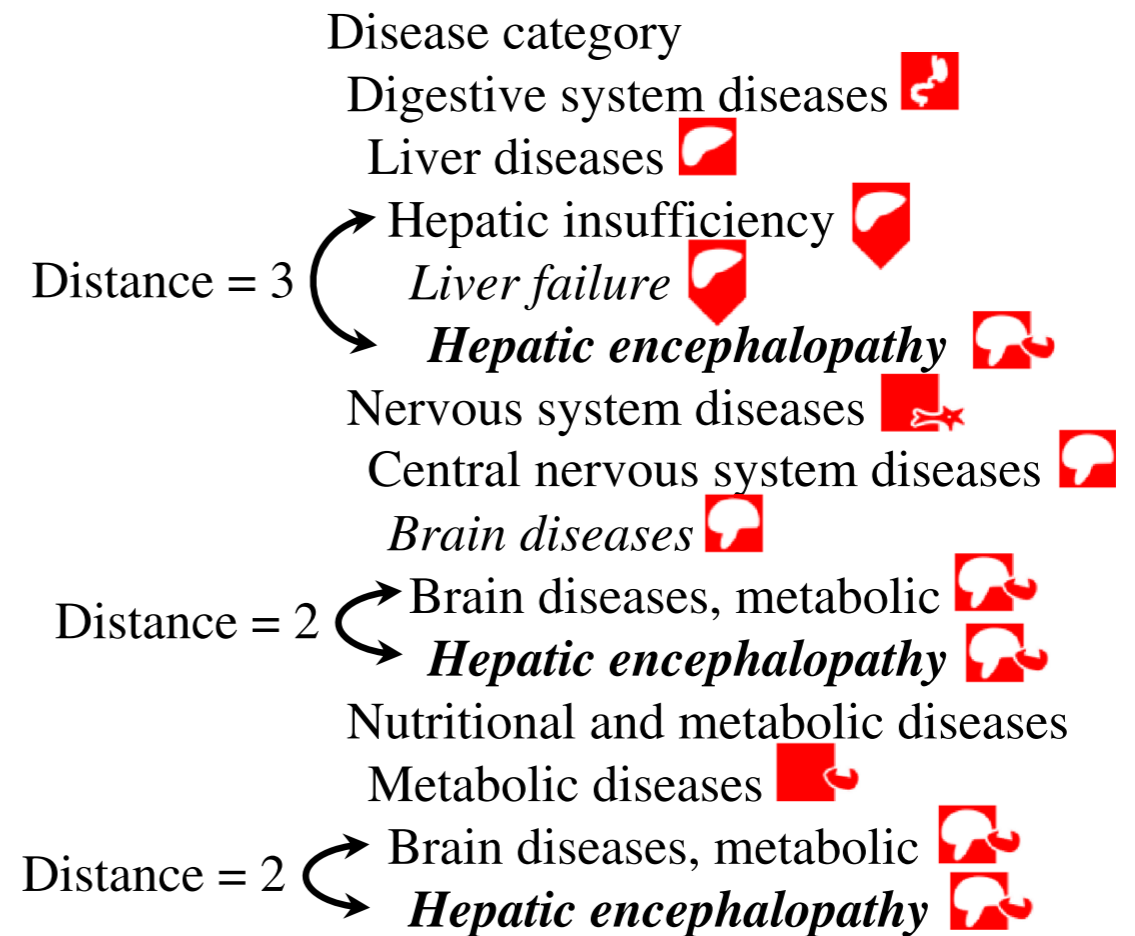




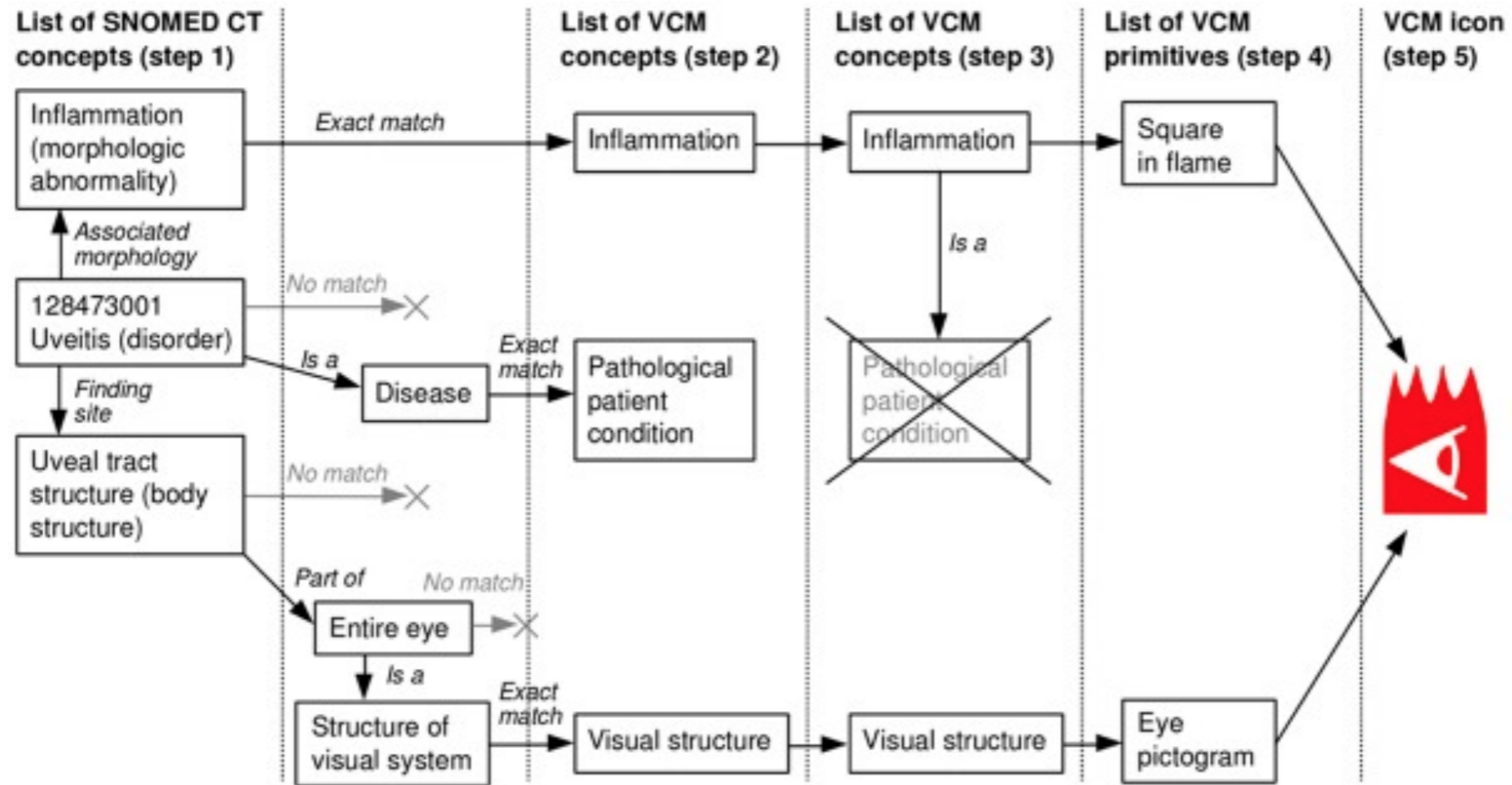
# VISUALIZACION DE CONCEPTOS MEDICOS

## MAPEO ICONICO

- International Classification of Diseases 10th (ICD10)
- Medical Subject Heading (MeSH)
- Standardized Nomenclature of Medicine Clinical terms (SNOMED CT)
- Foundational Model of Anatomy (FMA)
- National Cancer Institute (NCI) thesaurus
- Unified Medical Language System (UMLS)



Relationships between MeSH and VCM icons



# MAPEO ICONICO

# SNOMED-CT

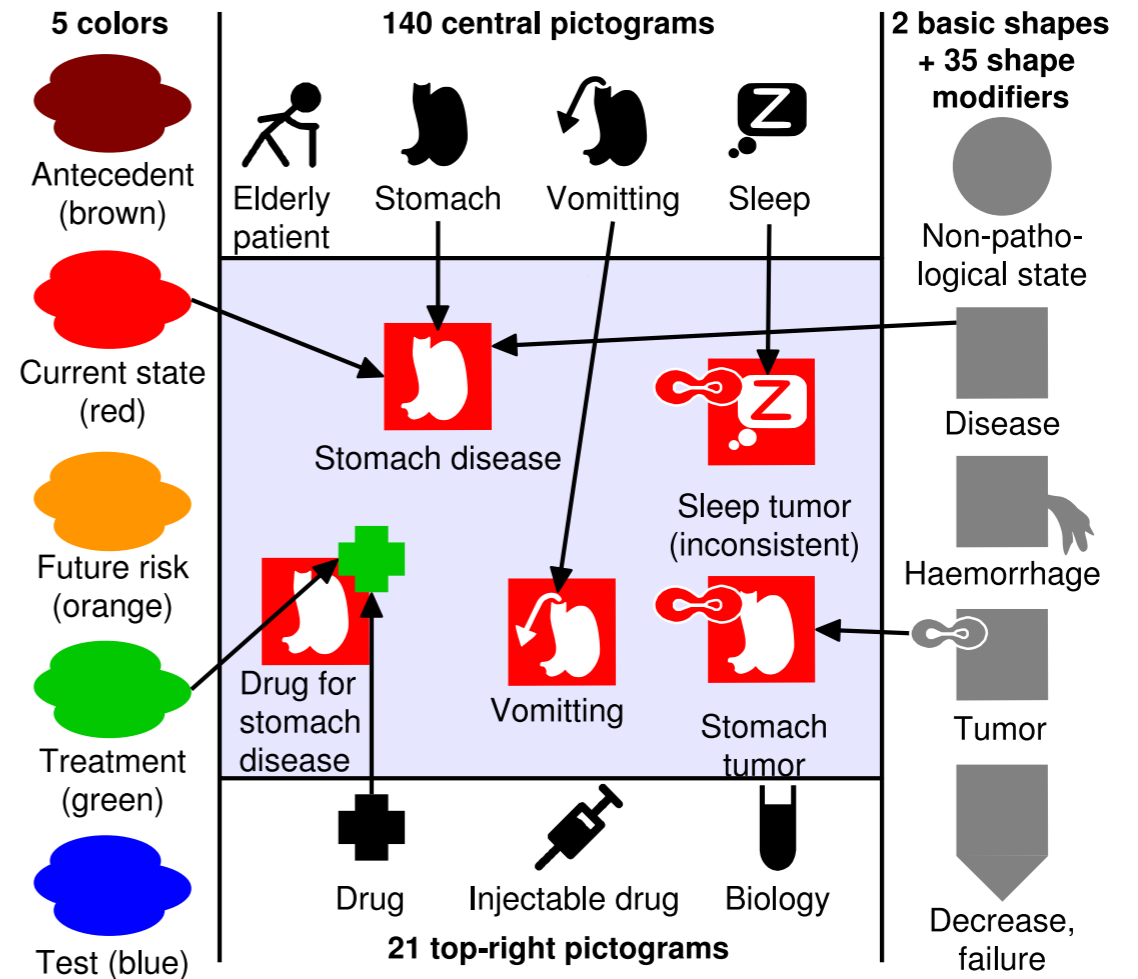


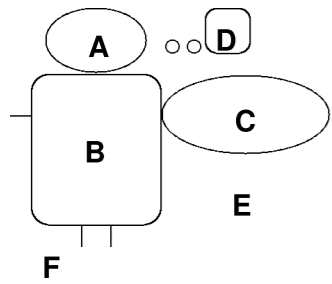
# VCM BASADO EN PROBLEMAS CLINICOS RESULTADO

“ENFERMEDAD ESTOMACAL”

- Rojo (Estado actual)
- Cuadrado (Enfermedad)
- Pictograma (Estómago)
- Pictograma cruz verde (En tratamiento farmacológico)
- Pictograma exacto (Vómito)
- Sombra modificadora (Célula en división / Tumor gástrico)

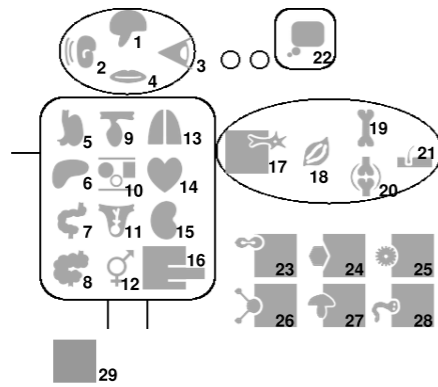
J.-B. Lamy et al. / Journal of Biomedical Informatics 46 (2013) 56–67





A: head  
 B: trunk  
 C: arm  
 D: mental functioning  
 E: etiology  
 F: age and life habits

I)



- 1: SNC
- 2: ear, audition
- 3: eye, vision
- 4: mouth, teeth
- 5: stomach
- 6: liver
- 7: small intestine
- 8: large intestine
- 9: endocrine system and metabolism
- 10: blood
- 11: pregnancy
- 12: sexual organs
- 13: respiratory system
- 14: heart
- 15: kidney, urinary system
- 16: circulatory system
- 17: peripheral nervous system
- 18: muscle system
- 19: bones
- 20: joints
- 21: conjunctive and cutaneous tissues
- 22: psychiatry, behaviour
- 23: tumorous process
- 24: viral infection
- 25: bacterial infection
- 26: allergy, hypersensitivity
- 27: fungal infection
- 28: parasitic infection
- 29: age and life habits

II)

Dossier 455666: DUPONT Martine - F 20 ans (22/91)

Tous	Significatifs	Non Significatifs	Parents				
Type Historique	Début	Fin	Problème	Familial	R	Code	S
Antécédents familiaux	2000		Cancer du sein	Tante			
Antécédents médicaux	2007	2007	Pneumonie due à Streptococcus pneun			J13	
Facteurs de risques	2010		Hypertension essentielle (primitive)			I10	*
Problème	2011		Grossesse extra-utérine			O00	
	2009		Dépression psychotique			P73	
	2004	2006	Ulcère de l'estomac aigu, avec perforati			K25.1	
Surveillance	2011		Tuberculose pulmonaire, avec confirmat			A15.2	

# VCM BASADO EN PROBLEMAS CLINICOS (REGISTRO MEDICO ELECTRONICO)

I) VARIAS AREAS

II) LOCALIZACIONES ANATOMICAS Y FUNCIONALES Y ETIOLOGIAS





# VISUALIZACION DE CONCEPTOS MEDICOS

## CONCLUSIONES

- Presenta mayor facilidad de lectura y aprendizaje en menor tiempo comparado con formato textual
- El diseño de interfases gráficas facilita el acceso a datos, textos, monografías (farmacología) o simplemente enriquece los textos
- Disminuye el tiempo requerido para encontrar información y el riesgo de error de medicación

## VCM language



Thousands of easily understandable icons, representing abstract concepts in medicine (signs, symptoms, current diseases, antecedents, physiological states, surgical procedures, drugs, lab tests, medical specialties, medical documents and more)



# REFERENCIAS

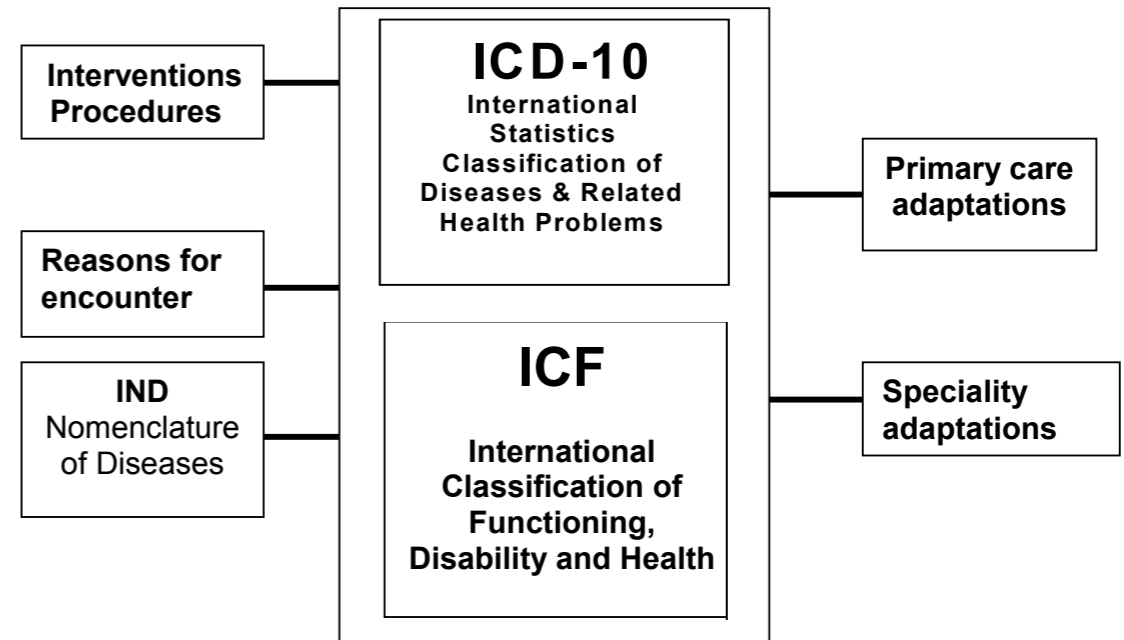
- Jean-Baptiste Lamy, Rosy Tsopra, Alain Venot, and Catherine Duclos. A semi-automatic semantic method for mapping SNOMED CT concepts to VCM Icons. *Stud Health Technol Inform.* 2013; 192: 42–46.
- Jean-Baptiste Lamy, Catherine Duclos, Avner Bar-Hen<sup>1</sup>, Patrick Ouvrard<sup>2</sup> and Alain Venot. An iconic language for the graphical representation of medical concepts. *BMC Medical Informatics and Decision Making* 2008, 8:16
- Jean-Baptiste Lamy, Alain Venot, Avner Bar-Hen, Patrick Ouvrard and Catherine Duclos. Design of a graphical and interactive interface for facilitating access to drug contraindications, cautions for use, interactions and adverse effects. *BMC Medical Informatics and Decision Making* 2008, 8:21
- Suzanne Pereira, Sylvain Hassler, Saliha Hamek, César Boog, Nicolas Leroy, Marie-Catherine Beuscart-Zéphir, Madeleine Favre, Alain Venot, Catherine Duclos and Jean-Baptiste Lamy. Improving access to clinical practice guidelines with an interactive graphical interface using an iconic language Pereira et al. *BMC Medical Informatics and Decision Making* 2014, 14:77
- J.-B. Lamy et al. / Validating the semantics of a medical iconic language using ontological reasoning. *Journal of Biomedical Informatics* 46 (2013) 56–67
- <http://www.chu-rouen.fr/cismef/>





# FAMILIA OMS CLASIFICACIONES INTERNACIONALES

MAPEO ICONICO

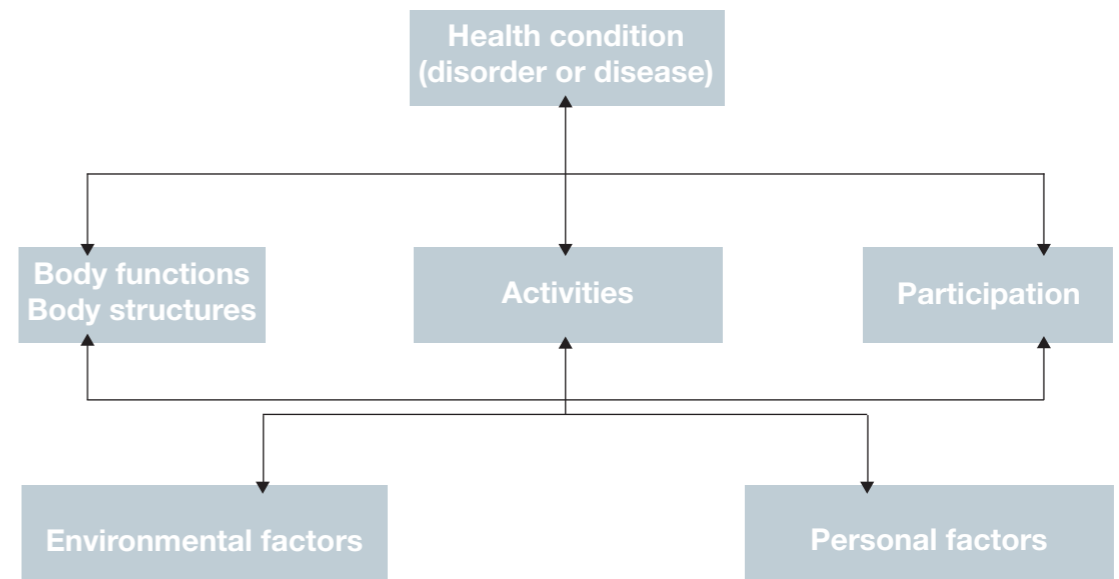




# CLASIFICACION INTERNACIONAL FUNCIONAMIENTO, DISCAPACIDAD Y SALUD

MAPEO ICONICO

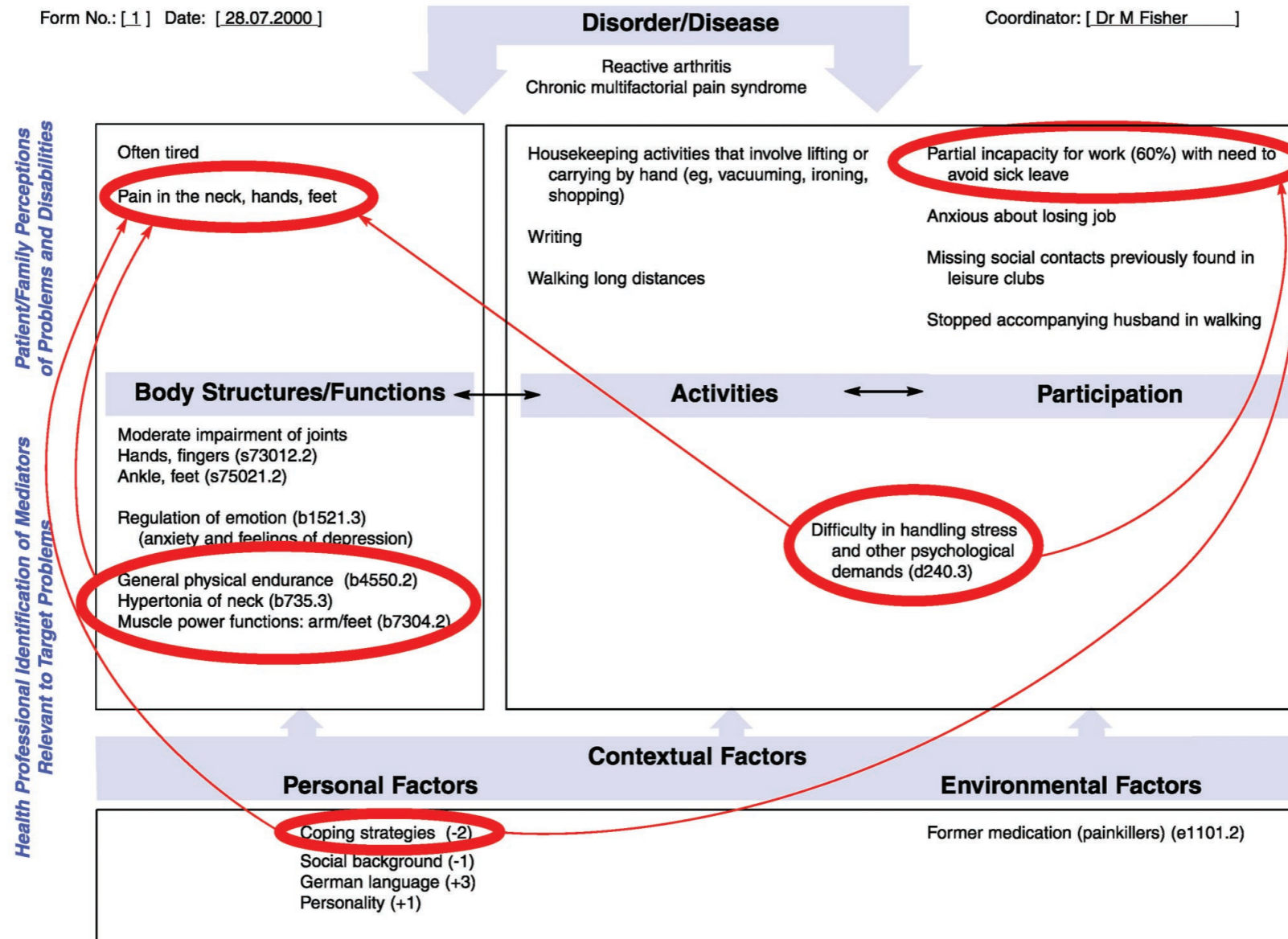
## The Integrative Bio-Psycho-Social Model of Functioning, Disability and Health



An example from the component Body Functions is presented below:

- b2**            Sensory functions and pain (first/chapter level)
- b280**        Sensation of pain (second level)
- b2801**       Pain in body part (third level)
- b28013**      Pain in back (fourth level)

The ICF classification comprises the so-called qualifiers, which quantify the level of functioning and health or the severity of the problem in the ICF categories from body functions, body structures, activities and participation. The WHO



## REHABILITACION BASADA EN SOLUCION DE PROBLEMAS (FORMATO-RBP) APLICADO A UN PACIENTE CON DOLOR CRONICO

Pat. No. [ 59834884.00176095 ]

Form No.: [ 1 ] Date: [ 28.07.2000 ]

Medication: [ NSAID ]

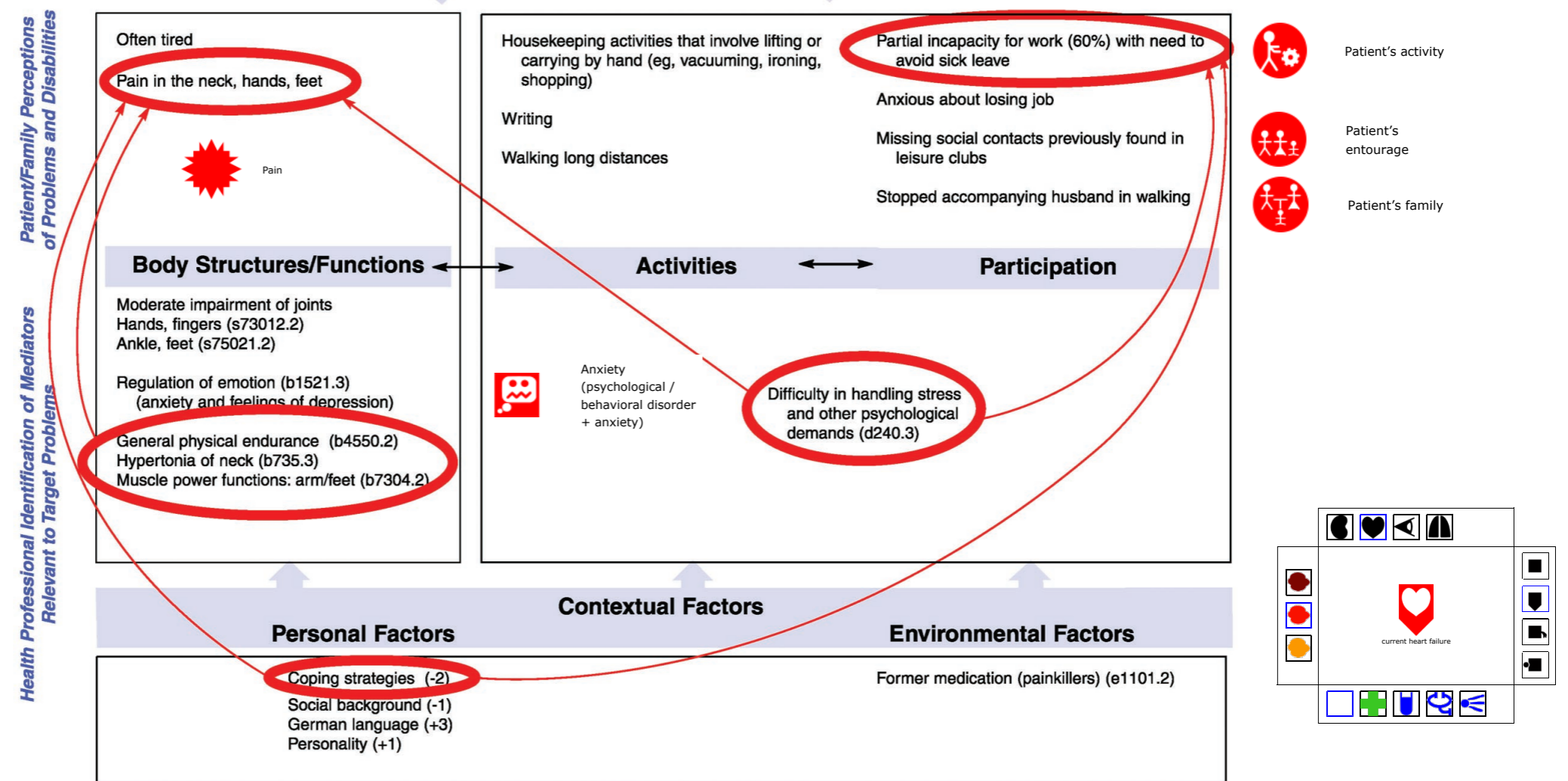


Inflammation

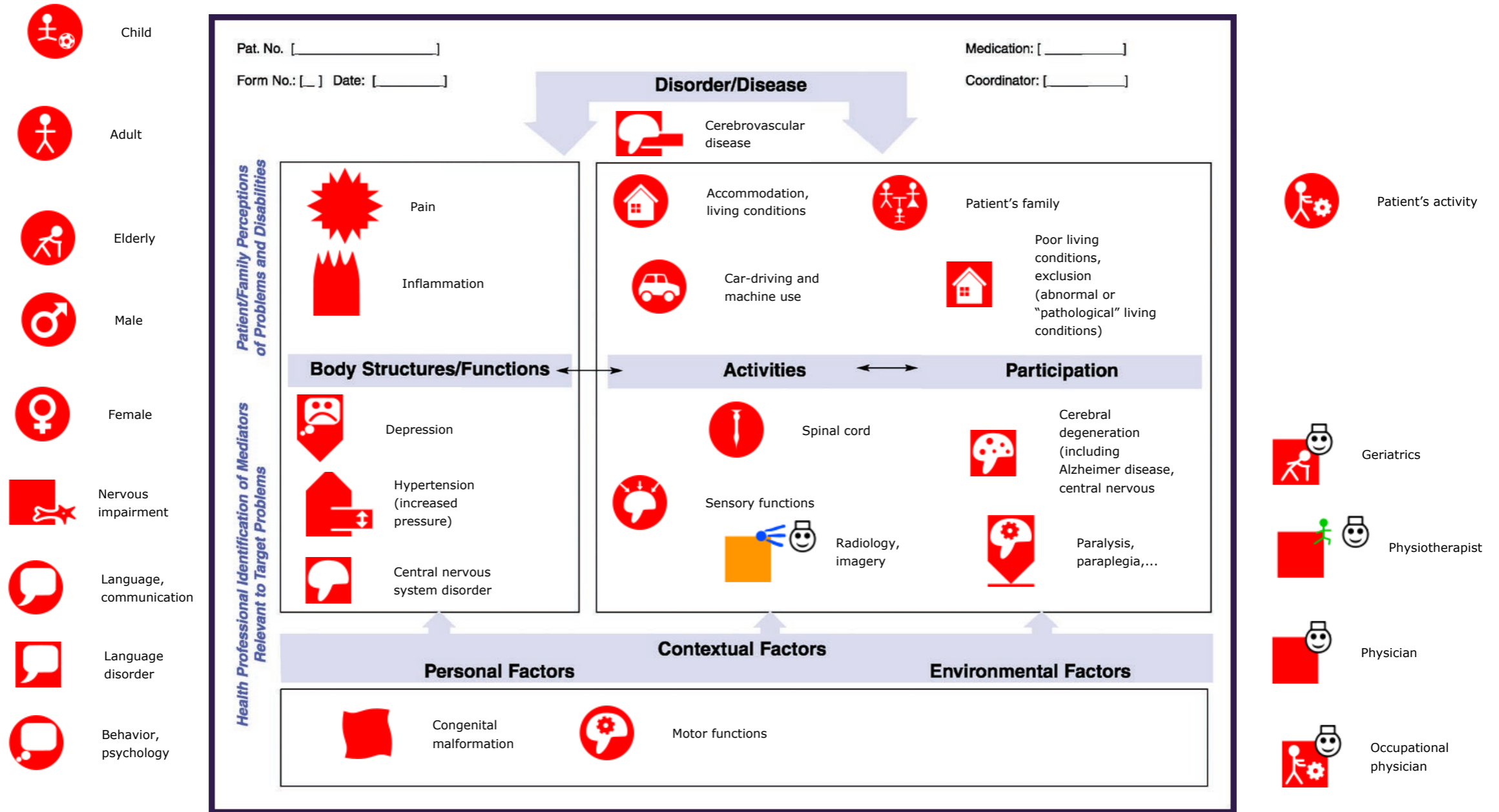
Coordinator: [ Dr M Fisher ]



Arthritis



# REHABILITACION BASADA EN SOLUCION DE PROBLEMAS (FORMATO-RBP) APLICADO A UN PACIENTE CON DOLOR CRONICO MAPEO ICONICO



# REHABILITACION BASADA EN SOLUCION DE PROBLEMAS (FORMATO-RBP) APLICADO A UN PACIENTE CON ACCIDENTE CEREBRO VASCULAR

¿?





# REFERENCIAS

- <http://www.who.int/classifications/icf/en/>
- [www.icf-casestudies.org](http://www.icf-casestudies.org)
- Kathy Giannangelo, RHIA, CCS; Sue Bowman, RHIA, CCS; Michelle Dougherty, RHIA, CHP; and Susan Fenton, MBA, RHIA. / ICF: Representing the Patient beyond a Medical Classification of Diagnoses. Perspectives in Health Information Management 2; 7; Fall 2005