

# Computational Psychiatry Course - Clinical Psychiatry

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## Psychosomatics

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# Content of this lecture

The challenge to cover «Psychosomatic Medicine» in a single lecture!

Topics covered	Specific challenges to deal with
Definition of „Psychosomatics“	Confusing terminology and misunderstandings
What persistent somatic symptoms tell us	Insufficient recognition of suffering and high costs
Clinical aspects	Prevention of communication breakdown between „difficult patients“ and „hostile doctors“
Explanations for persistent somatic symptoms	Search for mechanisms beyond mind-body dualistic views (role of computational psychosomatics!)
Developments of classification systems	Finding diagnostic names that are mechanism-driven and accepted by the medical field and patients
Treatments	Fatalism versus hope
Research agenda for the future	What remains to be done



## The patient's perspective

- I've been having *many years of pain*. The reason for my pain are the discs in my back and they need to be fused. I say to the ER doctors that *the problem is in my back* that has to be rebuilt.
- I went 2–3 times to the *emergency room* last month. Maybe *50 times* over the past two years, mostly for this problem. **They say “go home, it's nothing, nothing we can do”**. They don't listen. I want a consult with the orthopedic surgeon.
- The guy who did the MRI said *it is the last one* and I wanted to scream. However, I want them to take a myelogram. There is something that they are not seeing.
- I feel so terrible *I want to commit suicide* because that's now terrible pain. I do want to live if I have no pain.
- I hope the pain goes away, *I was hoping* they would find something that they could fix.

# We have a definition!

If this patient with chronic pain is «psychosomatic», then **the matter «Psychosomatics» deals with is «the nothing»**, because he has «nothing» and «nothing» can be done...

*GAME OVER WITH THIS «WHY BOTHER DEFINITION» OF PSYCHOSOMATICS?*



Psychosomatic Medicine actually deals with patients who have “**something**” – they have **somatic symptoms** for which traditional medical concepts typically have “**nothing**” to offer in terms of:

- ***making a diagnosis*** based on positive criteria (instead: diagnoses by exclusion of organic causes)
- ***mechanistic explanations*** patients can understand and accept (instead: realm of lay psychology)
- ***effective therapies*** (instead: trial and error process; inadequate, harmful and expensive interventions)

Definitions for **Psychosomatic Disorders** based on **persistent somatic symptoms** that occur in the absence of an organic cause (e.g. tissue damage) – Definitions are **not uniform!**

- **Medically unexplained physical symptoms:** defined by «something» that is missing (i.e., a medical explanation)!
- **Somatoform symptoms:** as if they were of somatic origin, but they are not!
- **Functional somatic symptoms:** disturbed functioning but no damage of an organ (system)
- **Somatic symptom disorder:** suffering from excessive psychological reactions to distressing symptom(s)
- **Bodily distress syndrome:** suffering from many somatic symptoms alone justifies the diagnosis

# Who's got somatic symptoms?

Eliassen et al, PLoS One 2016

## Prevalence of bothering somatic symptoms in the last 14 days (Danish population)

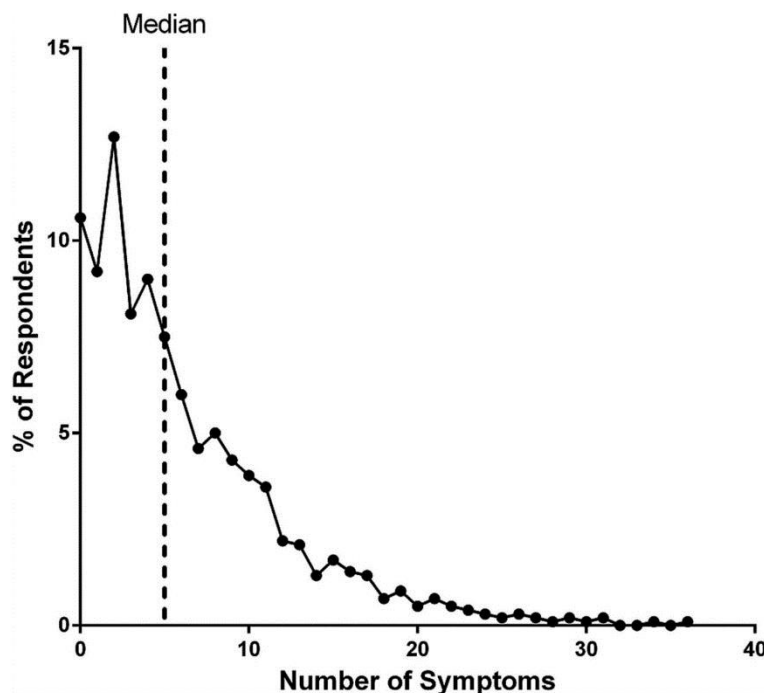
In total, **95%** (!) of ~36,000 respondents were bothered by one or more of 19 somatic symptoms.

Population from New Zealand (n=1,000)  
List of 46 symptoms in the last **7 days**

**89%** reported at least one symptom, median 5 symptoms

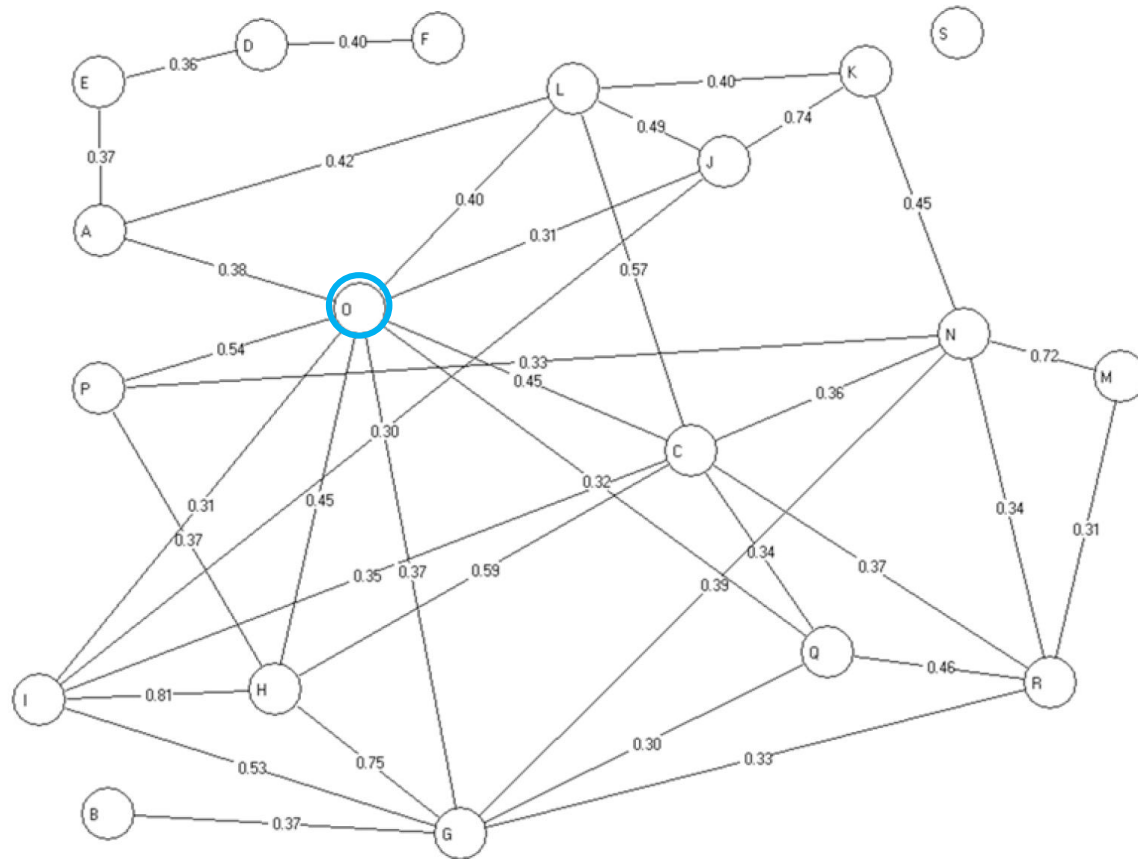
Most common symptoms were:  
back pain (38%), fatigue (36%),  
headache (35%), runny or stuffy  
nose (34%), joint pain (34%).

Petrie et al, BMJ Open 2014



Symptom	Prevalence in total population (%)		
	Bothered in total	Somewhat bothered	Considerably bothered
Tiredness	60.7	48.8	11.9
Neck or shoulder pain	50.6	38.6	12.0
Back pain	49.7	37.5	12.2
Pain in leg/hip/knee	44.2	32.4	11.8
Headache	41.2	34.4	6.8
Cold, running nose, coughing	33.6	27.2	6.4
Sleeplessness	33.5	26.9	6.6
Stomach pain/abdominal distension	32.5	27.2	5.3
Indigestion, loose/hard stools	27.8	23.0	4.8
Skin rash, itching, eczema	21.3	17.6	3.7
Respiratory distress	20.6	17.1	3.5
Dizziness	17.9	15.4	2.5
Impaired hearing	17.7	14.8	2.9
Impaired vision	17.0	14.6	2.4
Rapid heart beat	14.6	13.0	1.6
Urinary incontinence	12.7	10.5	2.2
Nausea	11.8	10.2	1.6
Chest pain/discomfort	11.1	9.8	1.3
Urinary retention	4.1	3.4	0.7

# Chain graph model showing the associations between 19 symptoms: Note that having more than one symptom is a common experience!

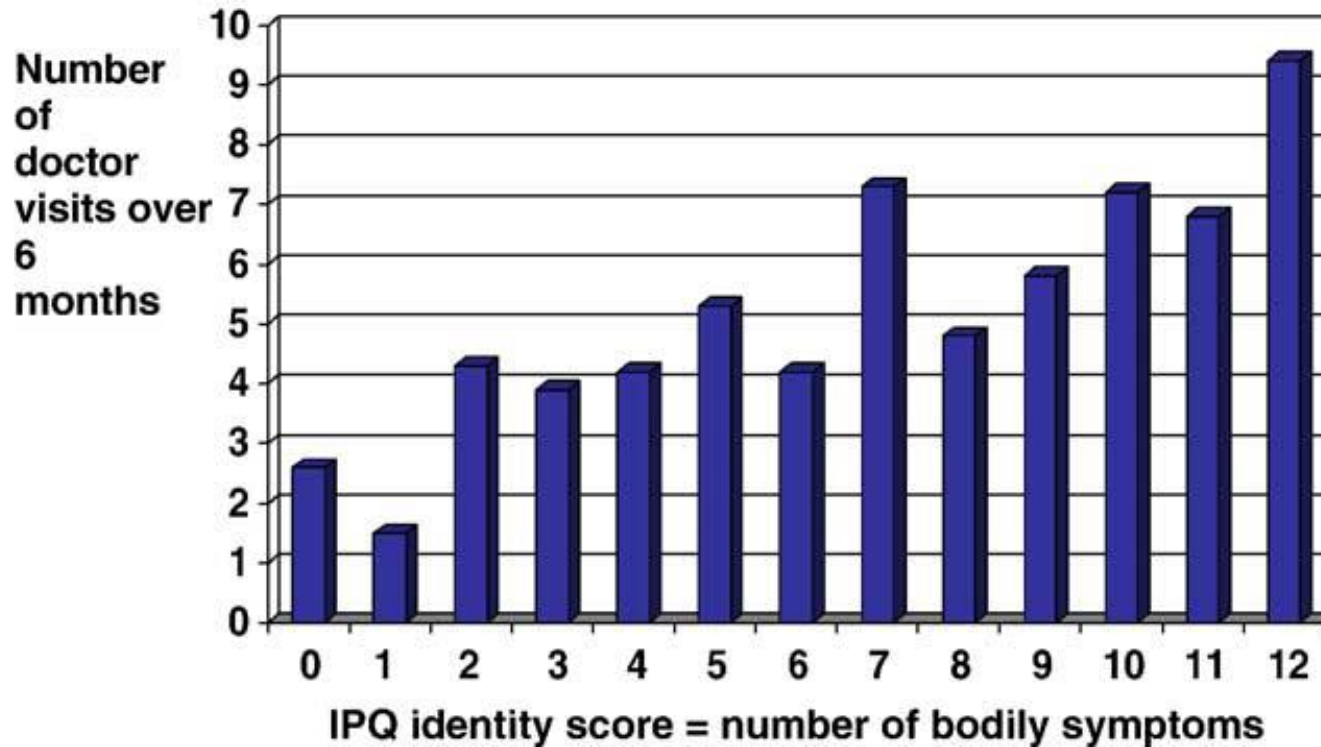


## Symptoms:

- A: Headache
- B: Cold, running nose, coughing
- C: Dizziness
- D: Back pain
- E: Neck or shoulder pain
- F: Pain in leg/hip/knee
- G: Respiratory distress
- H: Rapid heart beat
- I: Chest pain/discomfort
- J: Stomach pain/ abdominal distension
- K: Indigestion, loose/hard stools
- L: Nausea
- M: Urinary incontinence
- N: Urinary retention
- O: Tiredness**
- P: Sleeplessness
- Q: Impaired vision
- R: Impaired hearing
- S: Skin rash, itching, eczema

The number of medical consultations linearly increases with the number of somatic symptoms

This is independent (!) of whether the symptoms can «medically» be explained or not and also of symptoms of anxiety and depression.



295 patients with somatic symptoms from neurology, cardiology and gastroenterology outpatient departments.

Jackson et al, J Psychosom Res 2006



## How often is an organic cause of somatic symptoms? 3-year incidence of an emerging organic cause of the 10 most common somatic symptoms in out-patients of an internal medicine clinic

Although diagnostic testing was performed in more than two thirds of the cases, an **organic etiology** was demonstrated for any symptom **in only 16%!**

Somatic symptoms	Organic cause (%)
Chest pain	12
Fatigue	13
Dizziness	12
Headache	5
Edema	18
Back pain	3
Dyspnea	13
Insomnia	1
Abdominal pain	4
Numbness	5

### Additional sobering findings:

- **Costs** of discovering an organic diagnosis were high (particularly for headache and back pain)
- **Treatment** was often ineffective.
- **Improvement** in 50% of cases, although independent of treatment
- **Prognostic factors** with favorable outcome:
  - organic etiology of symptoms
  - symptom duration < 4 months
  - number of symptoms < 3



## Interim conclusion - A high number of somatic symptoms is associated with:

- Poor health status
- Poor functional status
- Sickness absence
- Increased health care use
- These relationships are independent of the etiology of the symptoms!
- Whether medically explained or not, somatic symptoms are an important aspect of the health status.
- Still, **focus** in health research has mostly been on somatic diseases/disorders or on a few specific somatic symptoms (e.g., chronic fatigue syndrome, irritable bowel syndrome, fibromyalgia) **instead of** focusing on multiple somatic symptoms in general.

Eliassen et al, PLoS One 2015; Tomenson et al, Br J Psychiatry 2013; Bruusgaard et al, BMC Public Health 2012;  
Kocalevent et al, BMC Psychiatry 2013; Poulsen et al, Scand J Public Health 2013



In spite of the clinical importance of persistent somatic symptoms, there are meanings the term «Psychosomatic» has to struggle with to this day

*It's nothing, not real, unimportant, all in your head, all in your mind, weird thinking...etc.*



# Original Research Reports

## “Psychosomatic”: A Systematic Review of Its Meaning in Newspaper Articles

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- Systematic text word search and consensus rating of the meaning of the word “psychosomatic” in articles published in 14 U.S. and U.K. newspapers 1996-2002.
- “Psychosomatic” had a pejorative meaning, such as “imaginary” or “made up,” in 74 of 215 (34%) of the articles in which the meaning could be judged.
- Most commonly, “psychosomatic” was used to describe a psychological problem or one in which the mind affects the body (56%) rather than a reciprocal interaction (5%).
- More needs to be done to educate the media about its actual meaning to make it attractive to patients.



## Oxford English Dictionary

Defines “psychosomatic” as caused or aggravated by a **mental factor** such as internal conflict or stress.

...and this meaning was (and still is) often *the one* attributed to the field by other doctors, trainees, and the lay public.

Boland et al, Psychosomatics 2018

## Somatoform Disorders are viewed as «classical psychosomatic disorders»

The ICD-10 defines *persistent somatoform pain* disorder as a “**psychogenic**” disorder: The predominant complaint is of persistent, severe, and distressing pain, which cannot be explained fully by a physiological process or a physical disorder, and *which occurs in association with **emotional conflict or psychosocial problems that are** sufficient to allow the conclusion that they are **the main causative influences**.*



# 12-month prevalence of somatoform disorders in Europe

Mental disorders in Europe in 2010

**20'400'000 (5%) Europeans suffer from somatoform disorders!**

(includes somatization disorder, undifferentiated somatoform disorder, pain disorder and hypochondriasis)

Only major depression (~30 mio), insomnia (~29 mio) and specific phobias (~23 mio) affect more Europeans than somatoform disorders.



# Research in the field that goes beyond «imaginary» and simple explanations of symptoms such as «psychogenic» – where should this happen anyways...in Nirvana?





# The *American Psychosomatic Society (APS)* was founded in 1942

Mission: «To advance and integrate the scientific study of biological, psychological, behavioral and social factors in health and disease»

- Psychosomatic Medicine is not equivalent with what is understood by the term psychiatry.

**Psychiatry** is concerned with the study and therapy of the *disturbances of the mind* whether these disturbances are the results of emotional experiences, or of anatomical changes (degenerative, inflammatory processes, or neoplasms) of the central nervous system.

**Psychosomatic Medicine** covers a different and broader field. Its object is to study in their interrelation the psychological and physiological aspects of *all normal and abnormal bodily functions* and thus to integrate somatic therapy and psychotherapy.

- Psychosomatic Medicine is not restricted to any specific field of pathology.

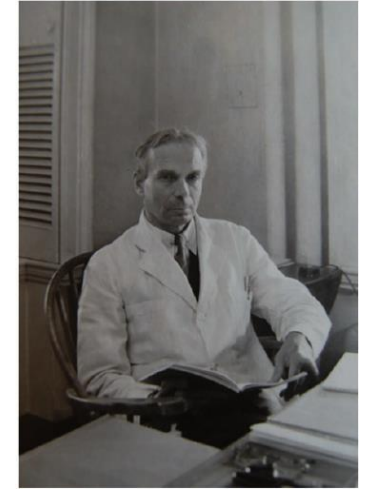
Medical specialties such as internal medicine, pediatrics, dermatology, ophthalmology, etc., may be so restricted. Psychosomatic Medicine, however, is not a medical specialty of this kind; it designates a *method of approach to the problems of etiology and therapy* rather than a delimitation of the area.





# Stanley Cobb in *Borderlands of Psychiatry* (1943) about Psychosomatic Medicine and the Mind-Body-Problem

- Psychosomatic medicine **concerns every physiological system** of the body.
- One might call psychosomatics the study of the ***physiology of the emotions***.
- ***I solve the mind-body problem by stating that there is no such problem, because – biologically - no such dichotomy can be made.***
- *The dichotomy is an **artefact**; there is no truth in it, and the discussion has no place in science in 1943.*
- **The difference between psychology and physiology is merely one of complexity.** The simpler bodily processes are studied in *physiological departments*; the more complex ones that entail the highest levels of neural integration are studied in *psychological departments*.
- **This division is simply an administrative affair**, so that the university president will know what salary goes to which professor!



Stanley Cobb, MD  
Neurologist  
Massachusetts  
General Hospital

# «Modern» Psychosomatic Medicine relies on the *Bio-Psycho-Social Model* of Health and Disease, both in clinical practice and research

Engel, Science 1977



- George L. Engel, MD
- University of Rochester Medical Center (NY)
- Department of Medicine & Department of Psychiatry
- Internist und Psychoanalyst

„The dominant model of disease today is *biomedical*, and it leaves no room within this framework for the *social*, *psychological*, and *behavioral* dimensions of illness.“

«The physician's basic professional knowledge and skills must span the social, psychological, and biological, for his decisions and actions on the patient's behalf involve all three.»

«Are the *fatigue and weakness* of the woman who recently lost her husband conversion symptoms, psychophysiological reactions, manifestations of a somatic disorder, or a combination of these?»

*Bio-psycho-social history* taking is needed to answer this problem, incl. a *landscape of somatic symptoms* (yields an accurate diagnosis in ~ 80%!)

Morgan & Engel. The Clinical Approach to the Patient. Saunders, 1969

# DD Chronic Fatigue (>6 months): somatic, psychological, and behavioral causes

## Chronic infectious diseases

Hepatitis C, HIV, Lyme borreliosis, gardiasis, EBV

## Sleep disorders

OSAS, restless legs syndrome, narcolepsy

## Endocrine and metabolic diseases

M. Addison, M. Cushing, poorly controlled diabetes, thyroid disorders, hypopituitarism

## General medical disorders

Anemia, iron deficiency, chronic hepatic or renal disease, malnutrition, medication side effects, chronic pain disorders

## Psychological causes

Depression, anxiety disorders, bipolar disorders, schizophrenia, PTSD, eating disorders, childhood trauma

## Rheumatological diseases

Rheumatoid arthritis, systemic lupus erythematosus, Sjögren syndrome, vasculitis, sarcoidosis

## Cardiopulmonary diseases

Chronic heart failure, idiopathic pulmonary hypertension, COPD, postural orthostatic tachycardia syndrome

## Gastrointestinal diseases

Celiac disease, IBD, autoimmune hepatitis, liver cirrhoses

## Malignancies

Lymphoma, occult tumors, cancer-related fatigue

## Neurological diseases

Multiple sclerosis, myasthenia gravis, Parkinson's disease, muscle dystrophy, beginning dementia

## Life-style-associated (behavior)

Overwork, chronic stress, morbid obesity, alcoholism / drugs, overtraining



## Prevalence of chronic fatigue (> 6 months) without medical or psychiatric causes

- Population-based studies: 2%
- Primary care: 9%

Buchwald et al, Ann Intern Med 1995

Bates et al, Arch intern Med 1993

## Prevalence of Chronic Fatigue Syndrome (CFS)

- Population-based studies (interview): 0.8% (95% CI: 0.2-1.3)
- Population-based studies (self-report): 3.5% (95% CI: 2.4-4.6)
- Primary care: 1.7% (95% CI: 0.4-1.4)

Johnston et al, Clin Epidemiol 2013



# Proposed Diagnostic criteria for Chronic Fatigue Syndrome (Myalgic Encephalomyelitis)

Clinically evaluated, unexplained, persistent or relapsing chronic fatigue for  $\geq 6$  months, which is not the result of ongoing exertion, not substantially alleviated by rest, and results in substantial reduction in previous levels of occupational, educational, social, or personal activities.

Plus at least 4 of the following symptoms ( $\geq 6$  months)

- Impaired memory or concentration
- Sore throat
- Tender cervical or axillary lymph nodes
- Muscle pain
- Multi-joint pain
- New headaches
- Unrefreshing sleep
- Post-exertion malaise

Centers for Disease Control and Prevention definition of CFS;  
Fukuda et al, Ann Intern Med 1994

Diagnosis requires that the patient have the following three symptoms:

1. A substantial reduction or impairment in the ability to engage in pre-illness levels of occupational, educational, social, or personal activities that persists for more than 6 months and is accompanied by fatigue, which is often profound, is of new or definite onset (not lifelong), is not the result of ongoing excessive exertion, and is not substantially alleviated by rest,
2. Post-exertional malaise, \* and
3. Unrefreshing sleep\*

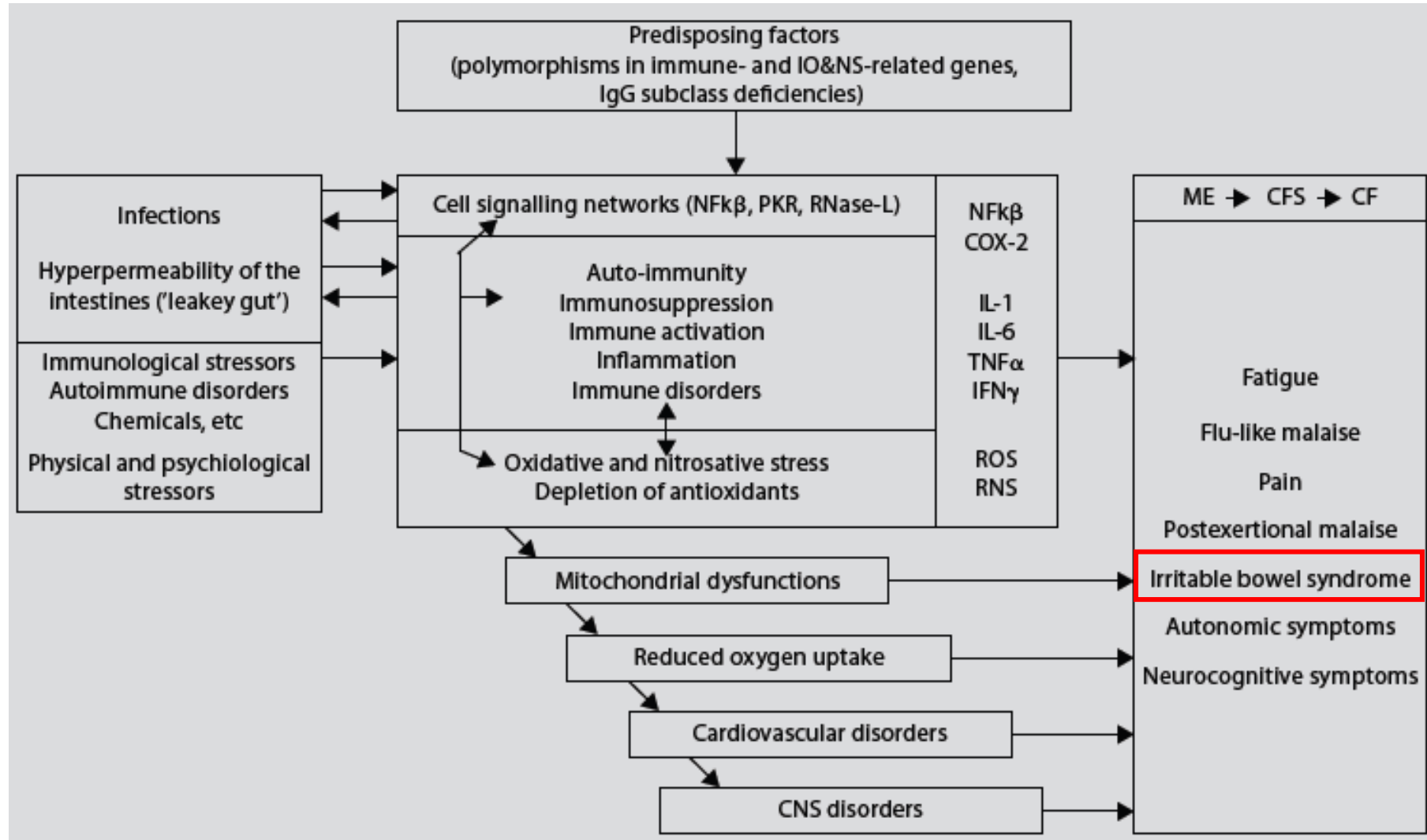
At least one of the two following manifestations is also required:

1. Cognitive impairment\* or
2. Orthostatic intolerance

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\* Frequency and severity of symptoms should be assessed. The diagnosis of ME/CFS should be questioned if patients do not have these symptoms at least half of the time with moderate, substantial, or severe intensity.

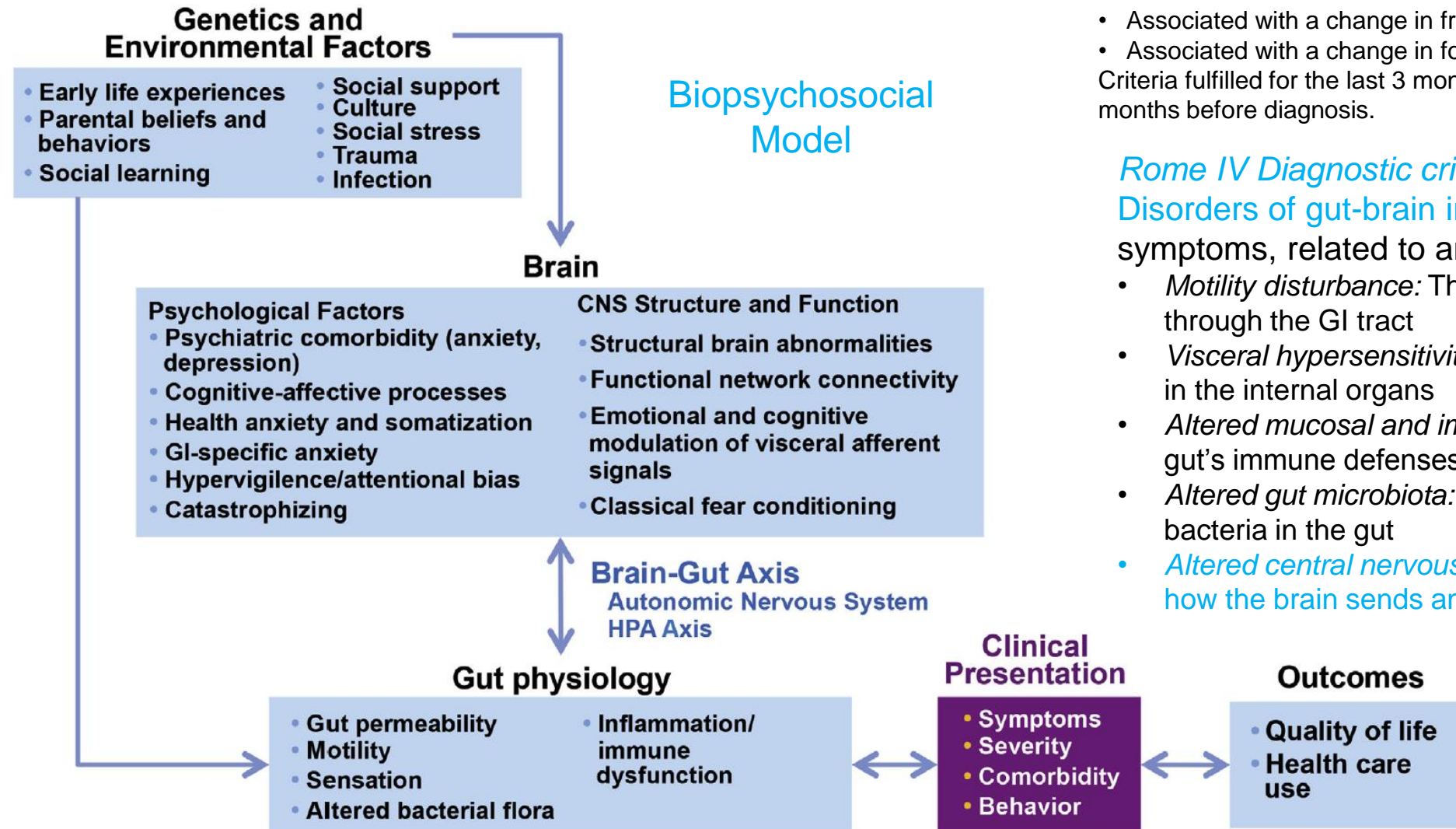


# Psychophysiological pathways involved in Chronic Fatigue, CFS, ME: Interactions between predisposing, triggering and perpetuating factors and oxidative + inflammatory mechanisms





# Functional gastrointestinal disorders (FGID)



## Rome IV Criteria for Diagnosing Irritable Bowel Syndrome (IBS)

Recurrent abdominal pain, on average, at least 1 day/week in the last 3 months, associated with two or more of the following criteria:

- Related to defecation
- Associated with a change in frequency of stool
- Associated with a change in form (appearance) of stool.

Criteria fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis.

## Rome IV Diagnostic criteria for FGID 2016

Disorders of gut-brain interaction, classified by GI symptoms, related to any combination of:

- *Motility disturbance*: The movement of food and waste through the GI tract
- *Visceral hypersensitivity*: Heightened experience of pain in the internal organs
- *Altered mucosal and immune function*: Changes in the gut's immune defenses
- *Altered gut microbiota*: Changes in the community of bacteria in the gut
- *Altered central nervous system processing*: Changes in how the brain sends and receives from the gut



# High comorbidity in functional gastrointestinal disorders

Psychiatric disorders, psychological distress, functional somatic symptoms and syndromes (incl. other FGIDs) and somatic diseases

- **Anxiety disorders:** in 30%- 50% of FGID patients.
- **Depression:** in about 30% of FGID patients in primary care settings; slightly higher in tertiary care.
- **Suicidal ideations:** in 15%-40% of patients with IBS.
- **Symptoms of other functional somatic syndromes:** incl. interstitial cystitis, chronic pelvic pain, headaches, and fibromyalgia in two-thirds of FGID patients, independent of psychiatric comorbidity.
- **Association with numerous somatic diseases:** e.g., osteoarthritis, stroke, cardiac arrhythmias, IBD



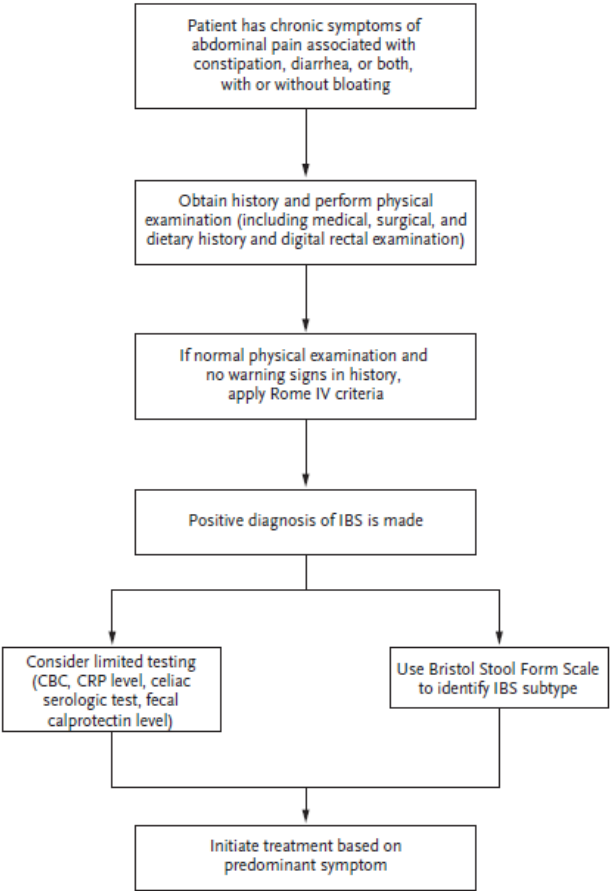
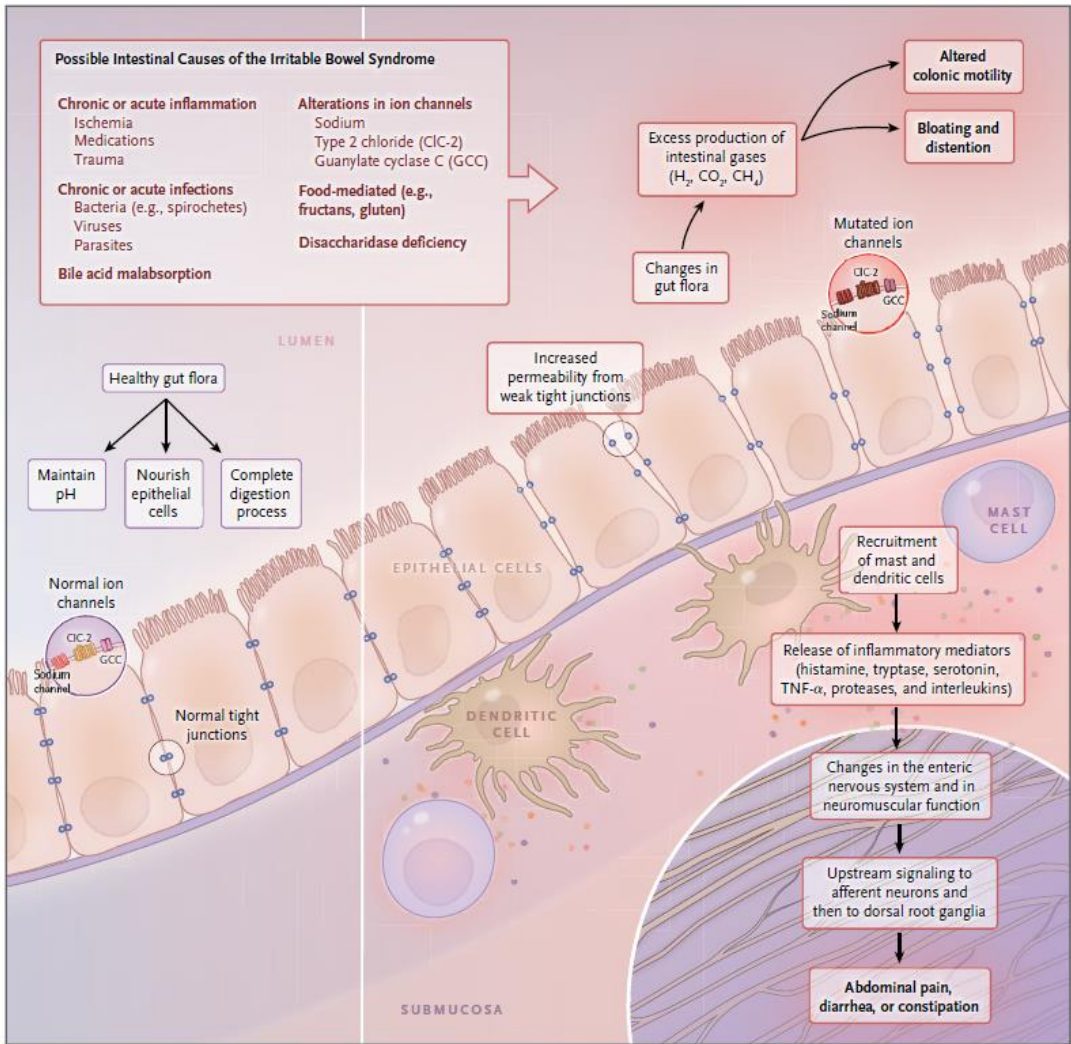
# Ironically, the biomedical model of IBS prevails in major medical journals to this date

«In susceptible persons, it is postulated that *infection* or consumption of certain *foods* (e.g., containing fructans or gluten) increases intestinal permeability by altering tight junctions. Localized inflammation then develops etc.»

No mentioning of the key role of psychosocial factors in pathogenesis, symptom presentation and history taking of IBS to better educate GPs!

Theoretical model of the pathophysiology of Irritable Bowel Syndrome

Ford et al, N Engl J Med 2017



Diagnostic algorithm for the IBS

# A purely biomedical model is an important reason for *communication breakdown* between physicians and IBS sufferers

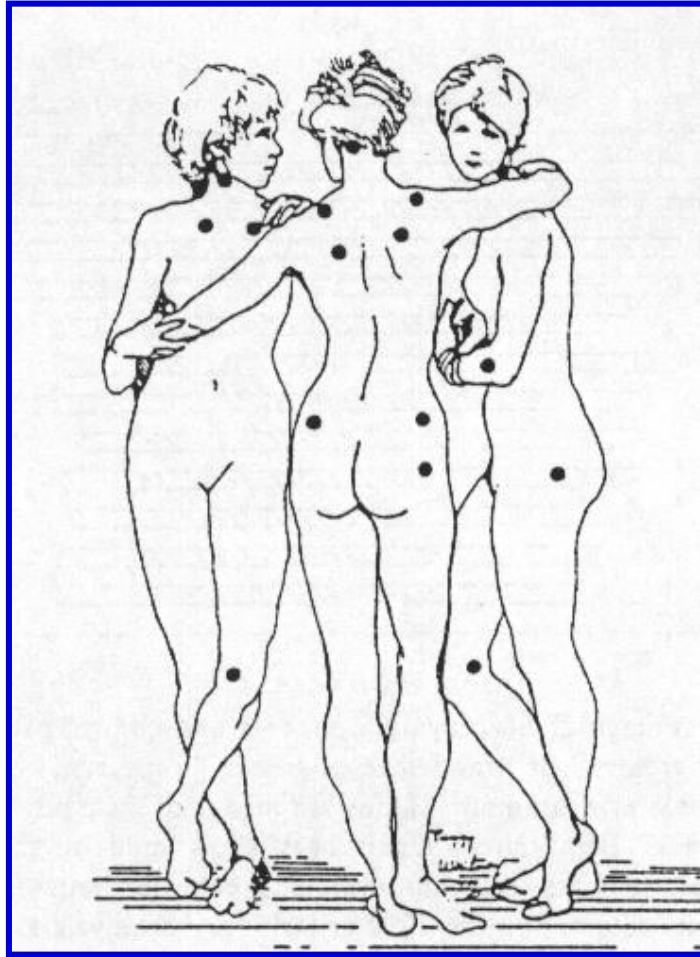
Can be overcome with communication skills and when considering psychosocial factors in the treatment plan!

- **Unmet expectations during the diagnostic process**
  - Patients find the diagnostic process confusing.
  - How does the doctor get from the test results to the diagnosis?
  - Why performing so many tests, if it is "nothing bad" and the diagnosis bases on symptoms?
- **Inappropriate dealing with the diagnosis of IBS**
  - Patients perceive that doctors do not give credence to the fact that they are ill.
  - Patients feel frustrated as their complaints are not taken seriously.
  - Many continue to fear that other diagnoses (cancer!) have been overlooked.
- **A lack of a clear therapeutic plan after diagnosis**
  - Some doctors view treatment for IBS as a trial-and-error process.
  - Patients may be offered reassurance, different medications, further tests or specialist referral.
  - Patients are prescribed anti-depressants without a proper explanation (to 'rewire' the gut-brain axis).
  - After all, patients get frustrated after repeatedly trying treatments that do not work.



# Fibromyalgia Diagnostic Criteria (American College of Rheumatology 2016)

No more tender points as in 1990



## Criteria

A patient satisfies modified 2016 fibromyalgia criteria if the following 3 conditions are met:

- (1) Widespread pain index (WPI)  $\geq 7$  and symptom severity scale (SSS) score  $\geq 5$  OR WPI of 4–6 and SSS score  $\geq 9$ .
- (2) Generalized pain, defined as pain in at least 4 of 5 regions, must be present. Jaw, chest, and abdominal pain are not included in generalized pain definition.
- (3) Symptoms have been generally present for at least 3 months.
- (4) A diagnosis of fibromyalgia is valid irrespective of other diagnoses. A diagnosis of fibromyalgia does not exclude the presence of other clinically important illnesses.

## Ascertainment

(1) WPI: note the number of areas in which the patient has had pain over the last week. In how many areas has the patient had pain? Score will be between 0 and 19

Left upper region (Region 1)

Jaw, left<sup>a</sup>  
Shoulder girdle, left  
Upper arm, left  
Lower arm, left

Right upper region (Region 2)

Jaw, right<sup>a</sup>  
Shoulder girdle, right  
Upper arm, right  
Lower arm, right

Axial region (Region 5)

Neck  
Upper back  
Lower back  
Chest<sup>a</sup>  
Abdomen<sup>a</sup>

Left lower region (region 3)

Hip (buttock, trochanter), left  
Upper leg, left  
Lower leg, left

Right lower region (Region 4)

Hip (buttock, trochanter), right  
Upper leg, right  
Lower leg, right

(2) Symptom severity scale (SSS) score

Fatigue  
Waking unrefreshed  
Cognitive symptoms

CFS!

For the each of the 3 symptoms above, indicate the level of severity over the past week using the following scale:

- 0 = No problem
- 1 = Slight or mild problems, generally mild or intermittent
- 2 = Moderate, considerable problems, often present and/or at a moderate level
- 3 = Severe: pervasive, continuous, life-disturbing problems

The symptom severity scale (SSS) score: is the sum of the severity scores of the 3 symptoms (fatigue, waking unrefreshed, and cognitive symptoms) (0–9) plus the sum (0–3) of the number of the following symptoms the patient has been bothered by that occurred during the previous 6 months:

(1) Headaches (0–1)

(2) Pain or cramps in lower abdomen (0–1)

IBS!

(3) And depression (0–1)

The final symptom severity score is between 0 and 12

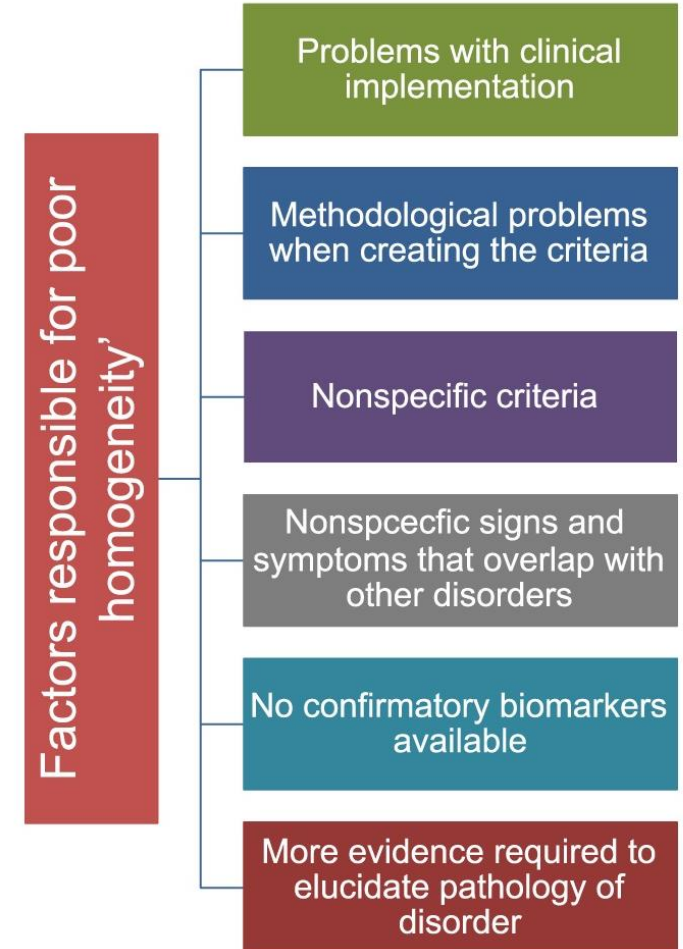
The fibromyalgia severity (FS) scale is the sum of the WPI and SSS



# We have a problem: Many doctors don't adhere to Fibromyalgia diagnostic criteria!

Survey in physicians who diagnose chronic pain conditions

- Only 51% of physicians used FM criteria.
- Specialist training was positively correlated with knowledge of the criteria.
- Poor knowledge and adherence may increase diagnosis delays, misdiagnoses, and inadequate treatments.
- Definite diagnosis remains elusive with no techniques demonstrating an underlying pathophysiology.
- Interaction between neurological, endocrine and immune systems results in the development of central sensitization.
- New diagnostic criteria based upon clinical and central sensitization attributes.



# Mechanisms (I): The underlying pathophysiology in functional somatic symptoms and syndromes (e.g. CFS, IBS, fibromyalgia), may seem central sensitization (CS)

- CS denotes **hyperexcitement of central neurons** through spinal and supraspinal structures due to an **amplification of neural signaling** involving various synaptic and neurotransmitter activities.
- CS manifests as hypersensitivity (e.g. hyperalgesia) to various **noxious** (eg, pressure and heat), as well as **nonnoxious** (eg, touch) **stimuli**.
- “Sentiment swings from CS absolutely requiring an afferent input to one where it can be completely autonomous - as low levels of input can sustain or increase CS but they are not necessary.”

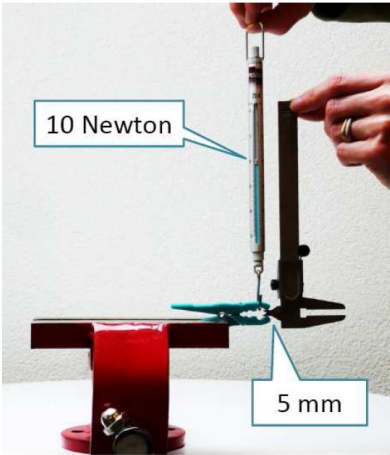
Woolf et al, J Physiol 1988; Yunus, Semin Arthritis Rheum 2007; Woolf, Pain 2011; Yunus, Curr Rheumatol Rev 2015

## Clinical examples:

- Algometry (e.g. with a clothes peg)
- Multiple widespread tender points (abandoned in current fibromyalgia diagnostic criteria)

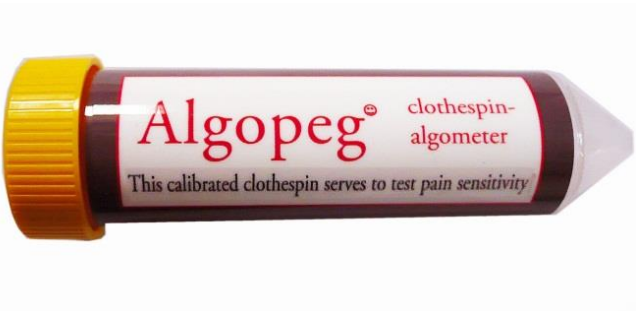
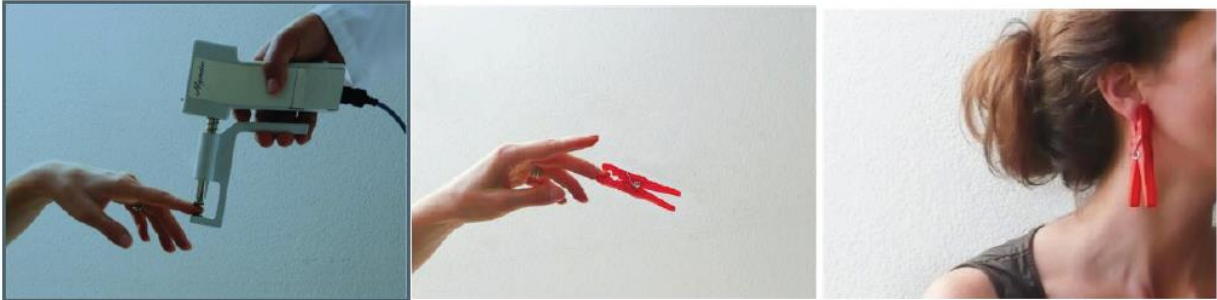


# Algometry with a clothes peg to assess central pain sensitivity in clinical practice

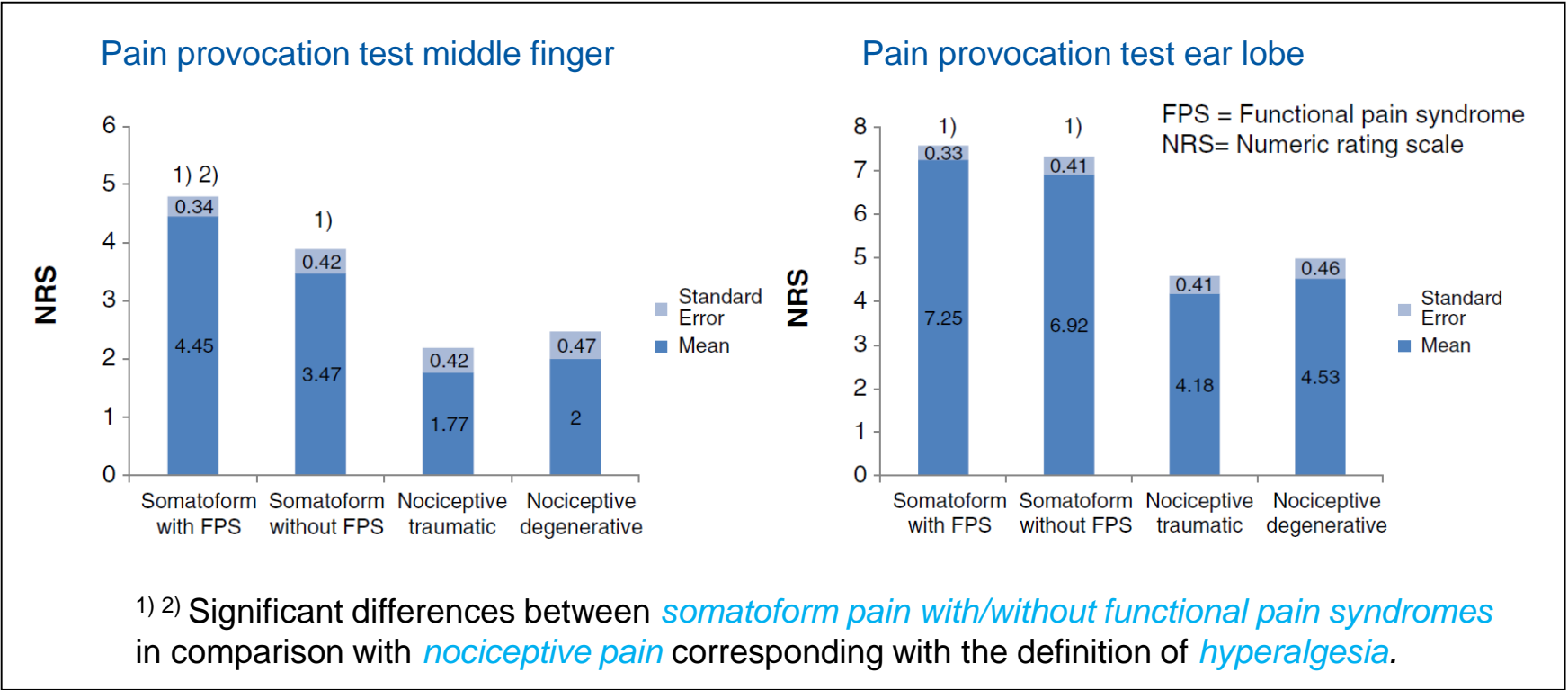


Calibrating the clothespin with a spring scale and a calipers.

Noninferiority comparison in discerning functional from nociceptive pain		
	AUC in % of a perfectly discerning test (95% CI)	
	Peg algometry	Electronic algometry
Finger measures	79 (71 to 86)	72 (64 to 80)
Ear measures	81 (74 to 88)	66 (57 to 75)

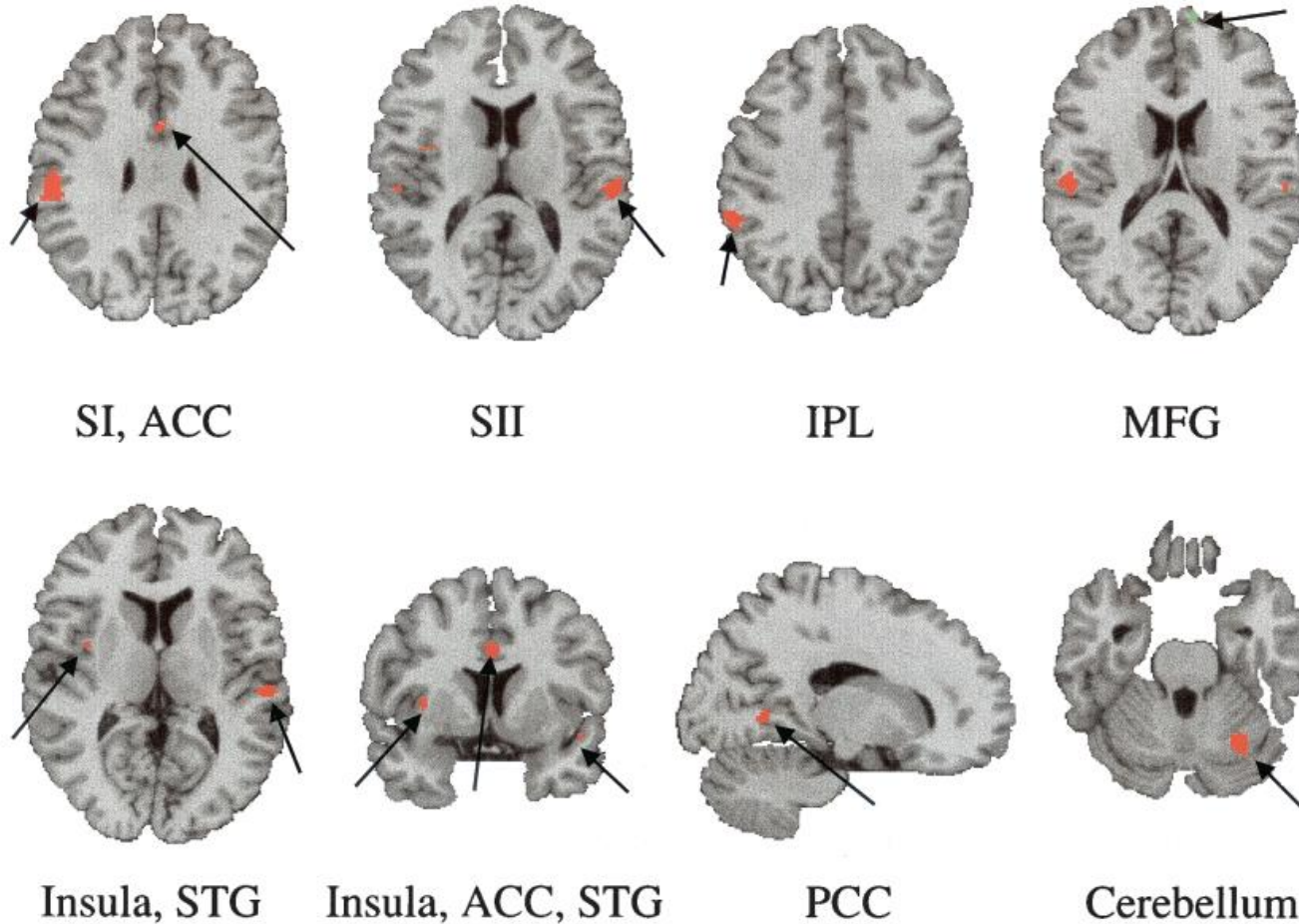


Egloff et al, BMC Musculoskelet Disord 2011  
 Egloff et al, Gen Hosp Psychiatry 2014  
 Cámara et al, Pain Res Treat 2016  
[www.algopeg.ch](http://www.algopeg.ch)





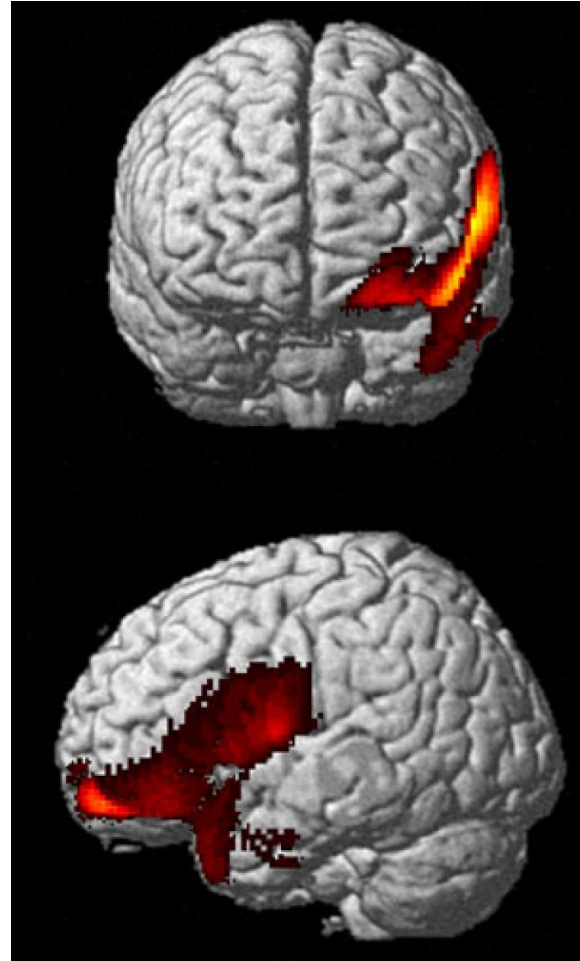
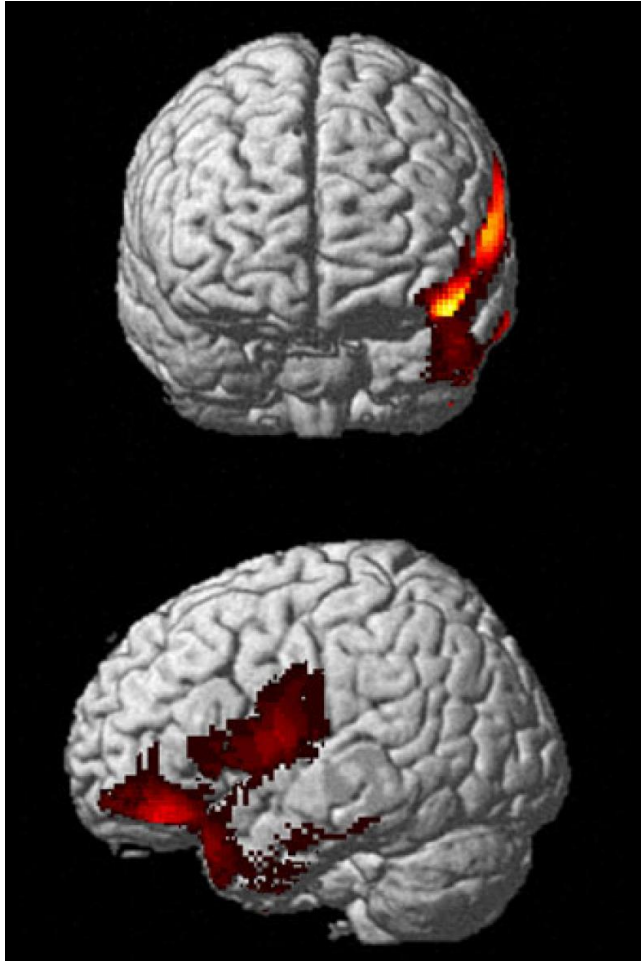
## *Hyperalgesia in fibromyalgia: Augmented pain processing in fibromyalgia as an evident sign for central hypersensitivity.*



- Similar *subjectively* painful conditions resulted in similar activation patterns in patients and controls (applied thumbnail pressure: 2.4 vs. 4.2 kg/cm<sup>2</sup>).
- Similar *objective* pain pressure resulted in greater effects in patients vs. controls (applied thumbnail pressure: 2.4 kg/cm<sup>2</sup>).
- Regions with significantly greater fMRI responses to pain pressure in patients vs. controls (regional cerebral blood flow).
- This activation pattern suggests sub/cortical augmentation of pain processing in fibromyalgia.

# Visceral hypersensitivity in functional dyspepsia: Overview of cluster activated during painful gastric distension in patients versus controls (with brain $\text{H}_2^{15}\text{O}$ -PET study)

Visceral hypersensitivity in FGID: processing of gastric sensation or pain (as an example)



The neurophysiology of painful gastric fundic distension point towards a **gastric sensation neuromatrix** consisting of:

- brainstem
- thalamus
- Insula
- anterior cingulate cortex
- orbito- and prefrontal cortex
- superior temporal cortex

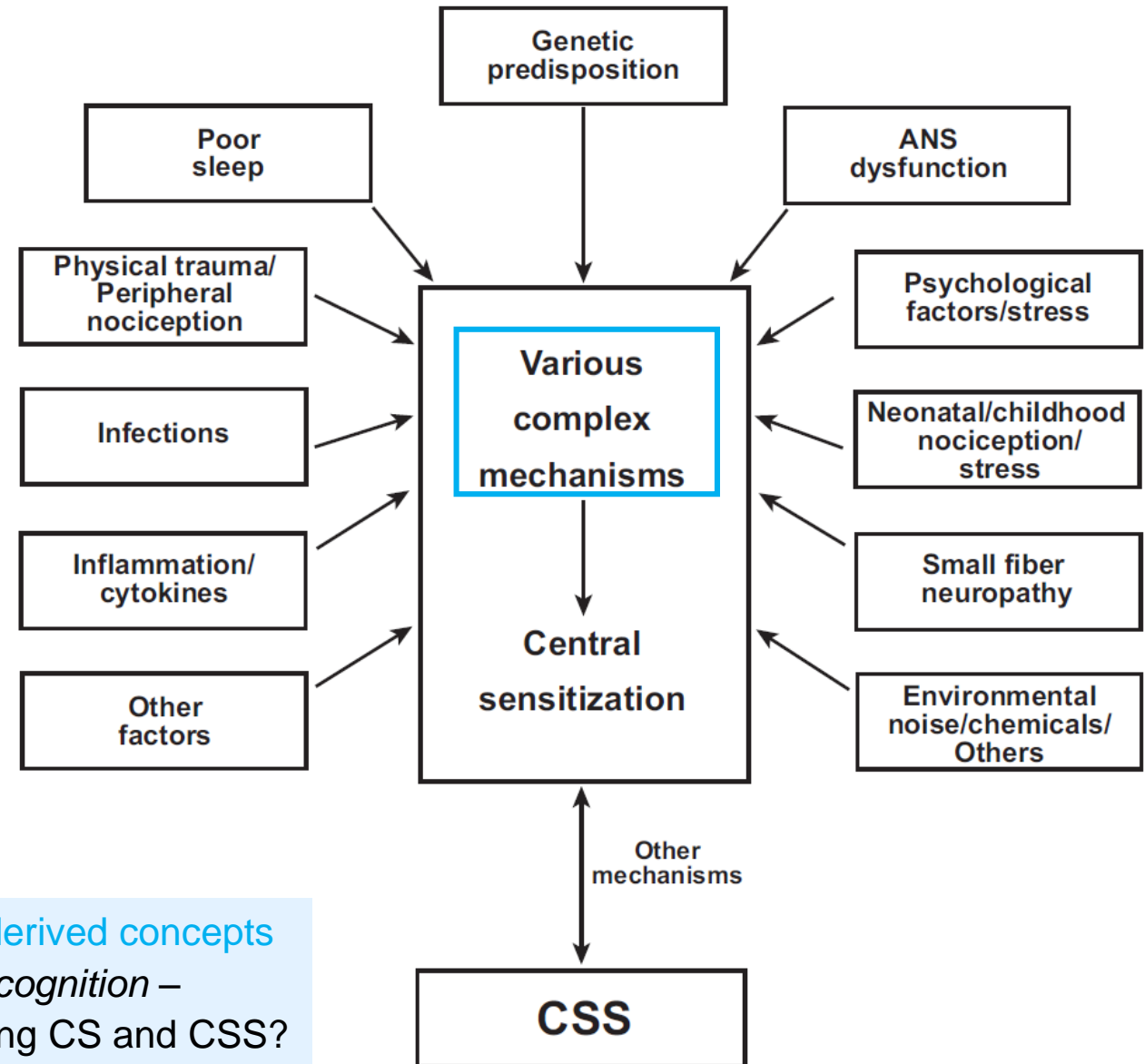
Van Oudenhove et al, Neurogastroenterol Motil 2008

## The complex pathophysiology of central sensitization (CS) and central sensitivity syndromes (CSS)

- Different peripheral and central factors contribute to CS and CSS through different and complex mechanisms.
- The relation between CSS and CS is likely to be bidirectional.
- Chronicity may enhance CS.

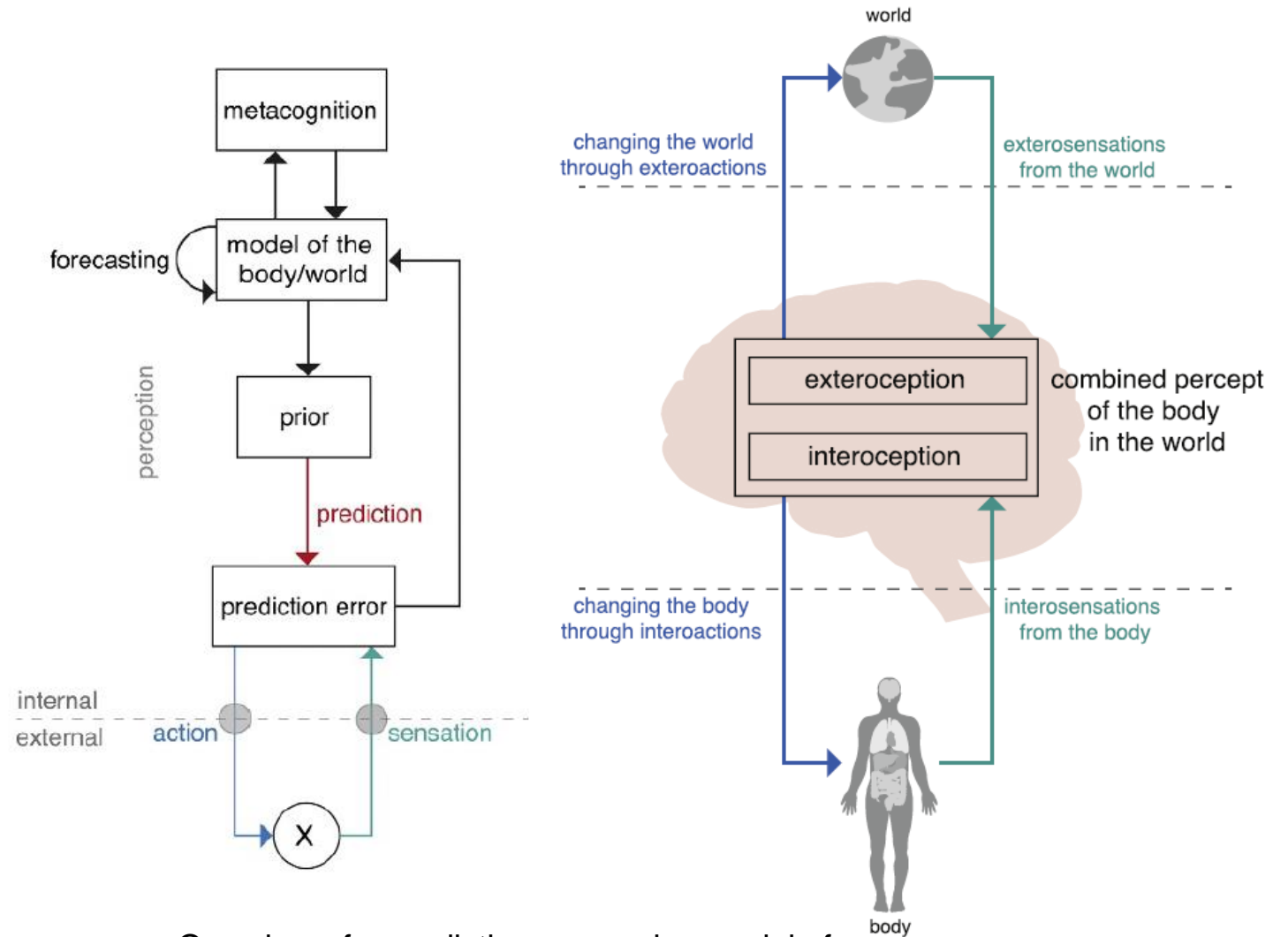
Yunus, Curr Rheumatol Rev 2015

Q: To what extent can [Hierarchical Bayesian Model-derived concepts](#) – *interoensation, interoception, exteroception, metacognition* – complement or even explain «mechanisms» underlying CS and CSS?



# Mechanisms (II): Perceptual dysregulation and failures of inference underlying persistent physical symptoms: A Neuropsychobehavioral Model

- In the model, the brain is seen as an active predictive processing or inferential device rather than one that is passively waiting for sensory input.
- The brain attempts to minimize prediction errors that result from **constant comparisons of predictions and sensory inputs**.
- Two possibilities exist: **adaptation of the generative model underlying the predictions** OR **alteration of the sensory input** via autonomic nervous activation (in the case of interoception).
- Persistent somatic symptoms can be described as **"failures of inference"**



Overview of a predictive processing model of perception. Petzschner et al, Biol Psychiatry 2017



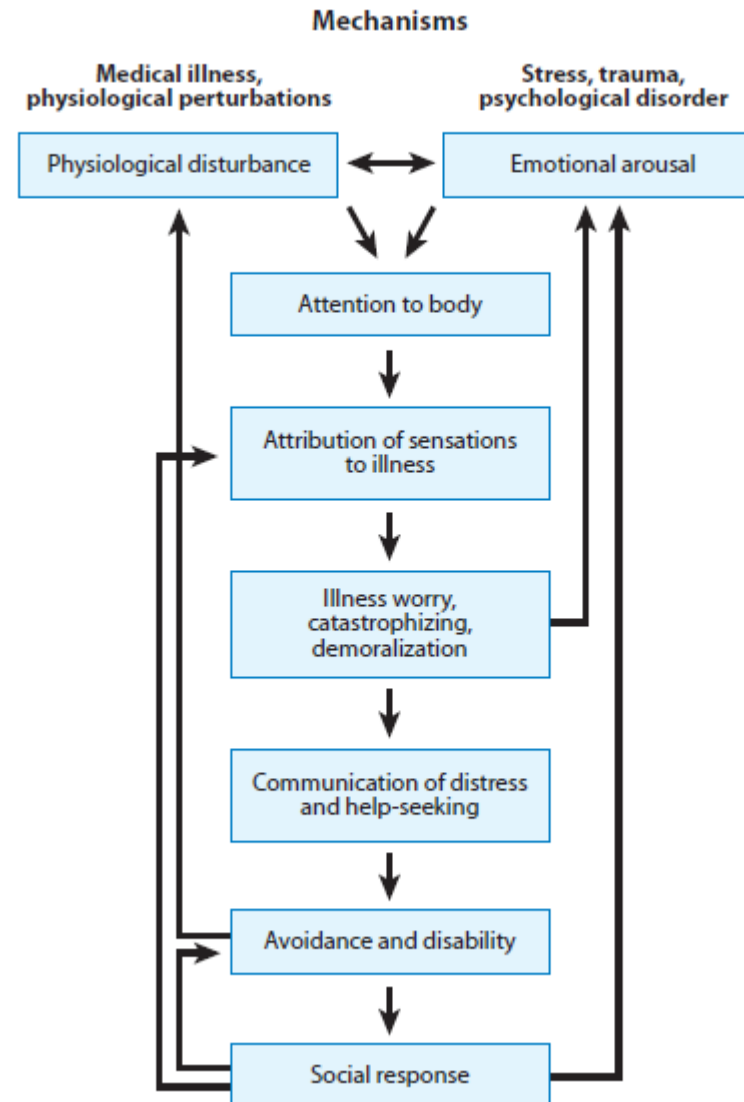
# Mechanisms (III): Somatosensory amplification of perception in somatoform disorders

## Neurocircuitry framework for somatosensory amplification

Identified brain regions:

- Anterior cingulate cortex
- Insula
- Amygdala
- Hippocampal formation
- Striatum

Perez et al, J Neuropsychiatry Clin Neurosci 2015



## Checking behavior:

Self-inspection of body functions for signs of disease

## Somatosensory amplification:

Amplifying perception of benign physiological sensations and their misattribution to serious diseases

Rief & Martin, Annu Rev Clin Psychol 2014  
Kirmayer & Taillefer, Wiley & Sons Inc. 1997  
Barsky et al, Psychosom Med 1988

# Developments in the classification of persistent somatic symptoms

## Confusion in terminology

- Functional somatic symptoms and syndromes
- Somatoform disorders
- Medically unexplained physical symptoms
- Somatic symptom disorder
- Bodily distress syndrome



## Functional somatic syndromes by speciality

Gastroenterology	Irritable bowel syndrome, non-ulcer dyspepsia
Gynaecology	Premenstrual syndrome, chronic pelvic pain
Rheumatology	Fibromyalgia
Cardiology	Atypical or non-cardiac chest pain
Respiratory medicine	Hyperventilation syndrome
Infectious diseases	Chronic (postviral) fatigue syndrome
Neurology	Tension headache
Dentistry	Temporomandibular joint dysfunction, atypical facial pain
Ear, nose, and throat	Globus syndrome
Allergy	Multiple chemical sensitivity

Wessely et al. Functional somatic syndromes: one or many? Lancet 1999

## Psychiatry

## Somatoform disorders Neurasthenia (Fatigue Syndrome)

Persistent somatoform pain disorder, incl.

- Headache, backache

Somatoform autonomic dysfunction: symptoms that are presented by the patient *as if they were due to a physical disorder* of a system or organ that is under autonomic control, incl. *psychogenic forms of*

- Diarrhea, dyspepsia, pylorospasm, IBS, hyperventilation, cardiac neurosis

Other somatoform disorders: disorders of sensation, function and behaviour, not due to physical disorders, not mediated through the ANS, associated with stress and problems, incl.

- Dysmenorrhoea, dysphagia, globus hystericus

Somatoform disorder, unspecified

- Psychosomatic disorder NOS

ICD-10 Version 2016 (online)

“The existence of specific functional somatic syndromes is largely an **artefact of medical specialization** rather than reflecting any real differences between patients and physiological mechanisms.”



University Hospital  
Zurich

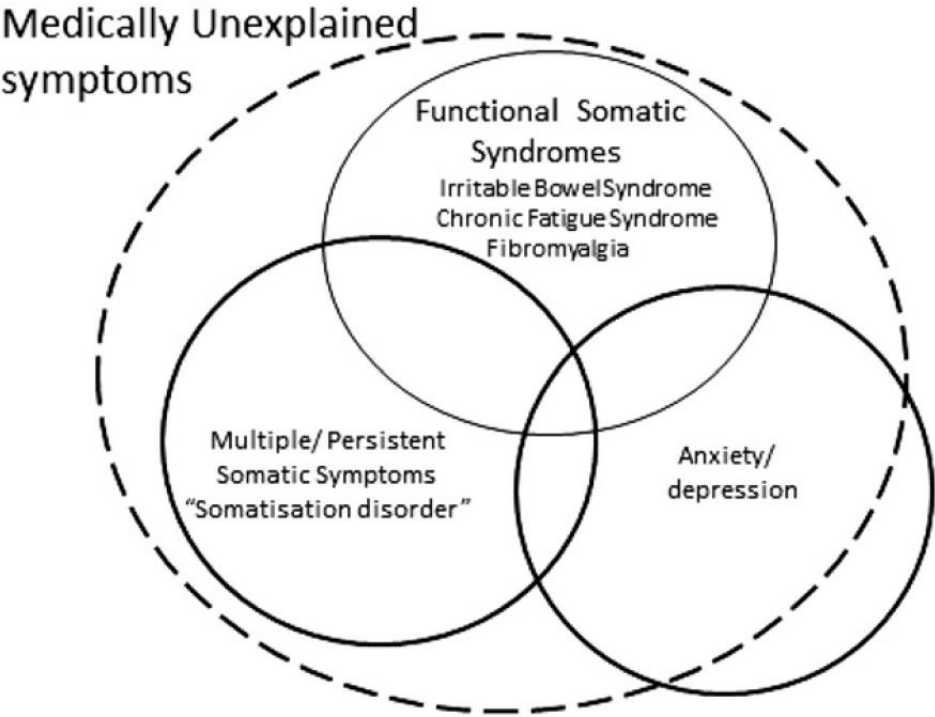


University of  
Zurich <sup>UZH</sup>

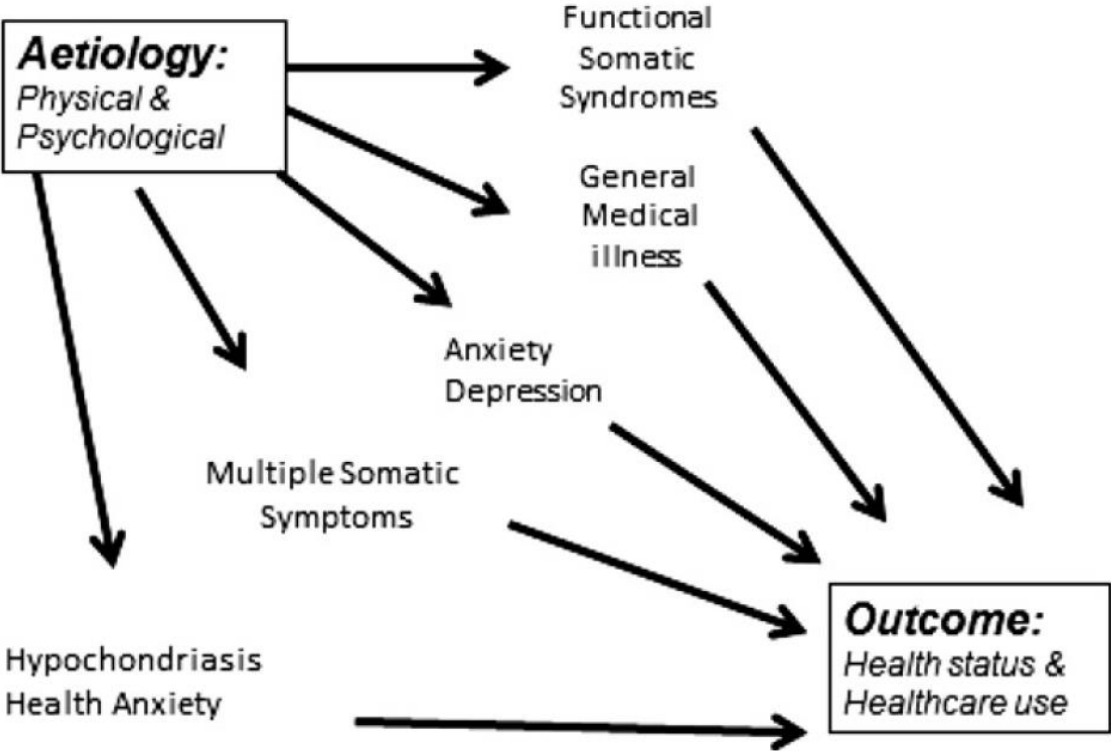


**Medically unexplained (physical) symptoms:** In clinical medicine, the term MUPS refers to the large proportion of patients seeking medical care whose symptom(s) cannot be explained by a recognised general medical illness (ca. 30-50% of new medical clinic patients!)

Diagnostic groups included under the term "Medically Unexplained Symptoms"



Variables that predict outcome



# Somatic Symptom Disorder (SSD): A «revolutionary» approach for DSM-5

Replaced: Somatoform disorder, somatization disorder, pain disorders, hypochondriasis

- A. One or more somatic symptom(s) that are distressing or result in significant disruption of daily life
- B. Excessive thoughts, feelings and behaviors related to these symptoms or associated health concerns. At least one of the following must be present (positive criteria):
  - 1) *Disproportionate and persistent thoughts about the seriousness of one's symptoms.*
  - 2) *persistently high level of anxiety about health or symptoms.*
  - 3) *excessive time and energy devoted to these symptoms or health concerns.*
- C. Chronicity: Although any one somatic symptom may not be continuously present, the state of being symptomatic is persistent – more than 6 months

The diagnosis includes conditions with no medical explanation and conditions where there is some underlying pathology but an exaggerated response! *“Forget about medically unexplained symptoms (Francis Creed)”*



# Somatic Symptom Disorder-B Criteria Scale (SSD-12)

#	Item	Feature
1	I think that my physical symptoms are signs of a serious illness.	T
2	I am very worried about my health.	F
3	My health concerns hinder me in everyday life.	B
4	I am convinced that my symptoms are serious.	T
5	My symptoms scare me.	F
6	My physical complaints occupy me for most of the day.	B
7	Others tell me that my physical problems are not serious.	T
8	I'm worried that my physical complaints will never stop.	F
9	My worries about my health take my energy.	B
10	I think that doctors do not take my physical complaints seriously.	T
11	I am worried that my physical symptoms will continue into the future.	F
12	Due to my physical complaints, I have poor concentration on other things.	B

Allows an assessment of the *psychological features* of DSM-5 SSD

Patients rate how frequently they experience each

- Thought (T)
- Feeling (F)
- Behavior (B)

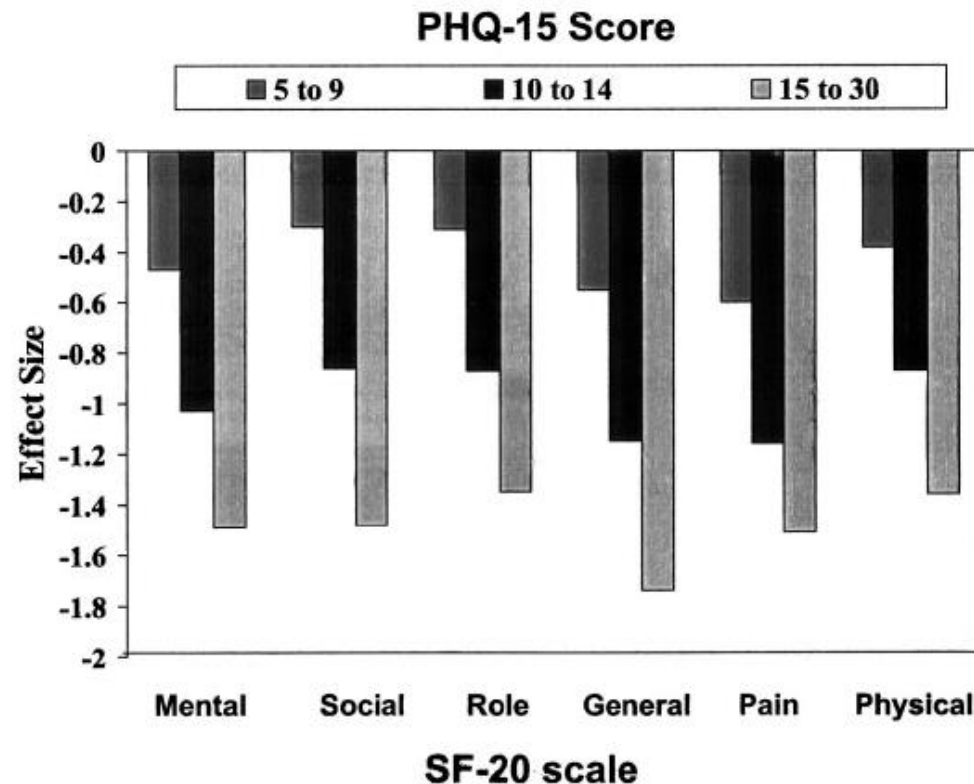
On a 5-point Likert scale

- “never” (0)
- “rarely” (1)
- “sometimes” (2)
- “often” (3)
- “very often” (4)

# Prevalence of distressing symptoms: PHQ-15 Item Somatic Symptom Severity Scale

Range of score: 0-30: cutoffs for high (15+), medium (10+) and low (5+) somatic symptom severity

During the <i>past 4 weeks</i> , how much have you been bothered by any of the following problems?	Not bothered at all	Bothered a little	Bothered a lot
a. Stomach pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Back pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Pain in your arms, legs, or joints (knees, hips, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Menstrual cramps or other problems with your periods [Women only]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Headaches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Chest pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Dizziness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Fainting spells	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Feeling your heart pound or race	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Shortness of breath	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Pain or problems during sexual intercourse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Constipation, loose bowels, or diarrhea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Nausea, gas, or indigestion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Feeling tired or having low energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Trouble sleeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Decline in functional status and quality of life increases with greater somatic symptom severity

Kroenke et al,  
Psychosom Med 2002

**Prevalence of somatic or bodily distress in 30% of patients** in primary care (n=3,000) and in obstetrics-gynecology (n=3,000): 10% reported high and 20% reported medium somatic symptom severity.

# Bodily Distress Syndrome (BDS): Long-term outcome in primary care of self-rated health, health care costs, and work disability

## Diagnostic criteria for BDS for ICD-11

1. The patient is **moderately to severely impaired by the stated number of symptoms** from at least one of the following symptom groups:

**≥3 Cardiopulmonary symptoms**

Palpitations/heart pounding, precordial discomfort, breathlessness without exertion, hyperventilation, hot or cold sweats, dry mouth, trembling or shaking, churning in stomach/"butterflies," flushing or blushing

**≥3 Gastrointestinal symptoms**

Abdominal pains, frequent loose bowel movements, feeling bloated/full of gas/distended, regurgitations, diarrhea, nausea, burning sensation in chest or epigastrium, constipation, vomiting (other than during pregnancy)

**≥3 Musculoskeletal symptoms**

Pains in arms or legs, muscular aches or pains, pains in the joints, feelings of paresis or localized weakness, backache, pain moving from one place to another, unpleasant numbness or tingling sensations

**≥3 General symptoms**

Concentration difficulties, impairment of memory, excessive fatigue, headache, dizziness

≥4 Symptoms from any of the above symptom groups

2. Illness duration ≥ 6 months

3. Relevant differential diagnoses have been ruled out

### Bodily Distress Syndrome (BDS)

#### Single-organ type

Fulfilling criteria for 1-3 symptom groups

#### Multi-organ type

Fulfilling criteria for at least 4 symptom groups

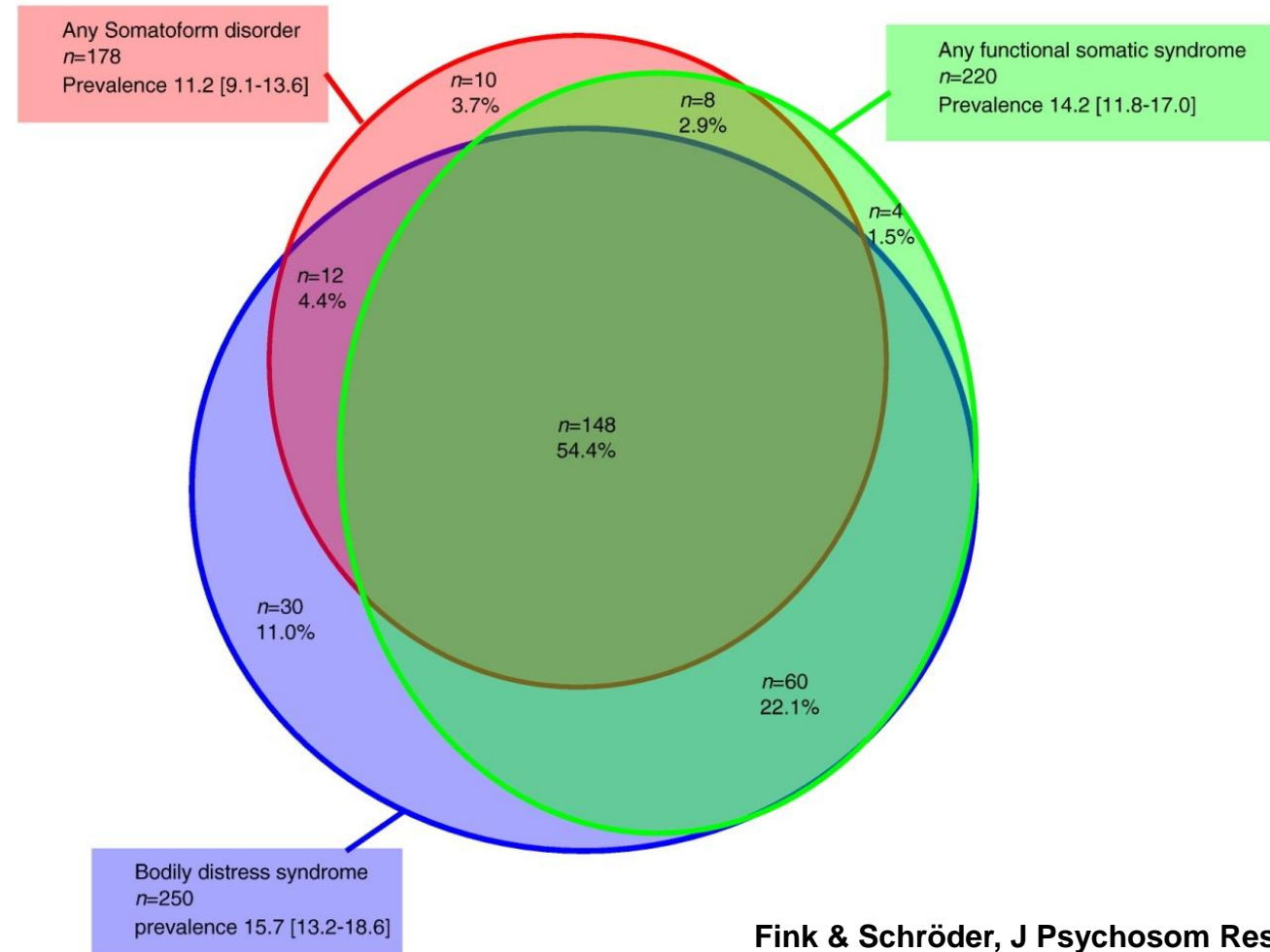
Patients with BDS vs. reference group (verified medical condition):

- Poorer self-rated health
- Higher illness worries at index consultation and throughout follow-up (2-10 yrs)
- Higher annual health care costs (4,066 USD vs 2,270 USD)
- 3-fold higher risk of sick leave during the first 2 yrs of follow-up
- Increased risk of newly awarded disability pension (5-fold: single-organ type, 9-fold: multi-organ type)



## *Is terminology confusion resolved?* One single diagnosis, bodily distress syndrome, succeeded to capture 10 diagnostic categories of functional somatic syndromes and somatoform disorders.

- 978 consecutive patients from **neurological** ( $n=120$ ) and **medical** ( $n=157$ ) departments and **primary care** ( $n=701$ ), with impairing illness.
- **Bodily distress syndrome** included
  - 100% of patients with FM, CFS, hyperventilation
  - 98% of patients with IBS
  - 90% of patients with noncardiac chest pain, pain syndrome, any somatoform disorder
- Overall agreement of bodily distress syndrome with any diagnostic category: 95% (95% CI 93.1–96.0;  $P<.0001$ ).



Fink & Schröder, J Psychosom Res 2010

# Treatment approach to the patient with somatic symptom disorder in *primary care*

- The primary goal is to **improve coping with physical symptoms**, which includes reducing health anxiety and behaviors related to the symptoms, rather than eliminating the symptoms entirely.
- Patients should try to **improve occupational and interpersonal functioning**. Clinicians will obtain better outcomes by focusing upon caring rather than curing.
- Schedule **regular outpatient visits** that are not contingent upon active symptoms.
- Establish a **therapeutic alliance** with the patient.
- **Legitimize the somatic symptoms**, communicate with specialists who are treating the patient.
- Evaluate for and treat **comorbid** medical diseases and psychopathology.
- **Limit tests** and referrals.
- **Reassure** patients that grave medical diseases have been ruled out.
- **Explain that the body can generate symptoms in the absence of disease!**
- Slowly discontinue **unnecessary medications**.
- Pursue clues offered by patients that they are struggling with **psychosocial problems**.



# Empirically tested & beneficial treatments for components of somatic symptom disorder

Diminishing physical symptoms, health-related anxiety, preoccupation and rumination about symptoms and health concerns

- Cognitive Behavioral Therapy (CBT)
- Treatment of comorbid anxiety and depression.
- Coping with the symptoms and improving daily activities and quality of life
- Psychotropic drugs (e.g. imipramine)
- Relaxation training and mindfulness
- Problem-solving approach
- Psychodynamic psychotherapy
- Psychoeducation
- Physical activity
- Case management and collaborative care

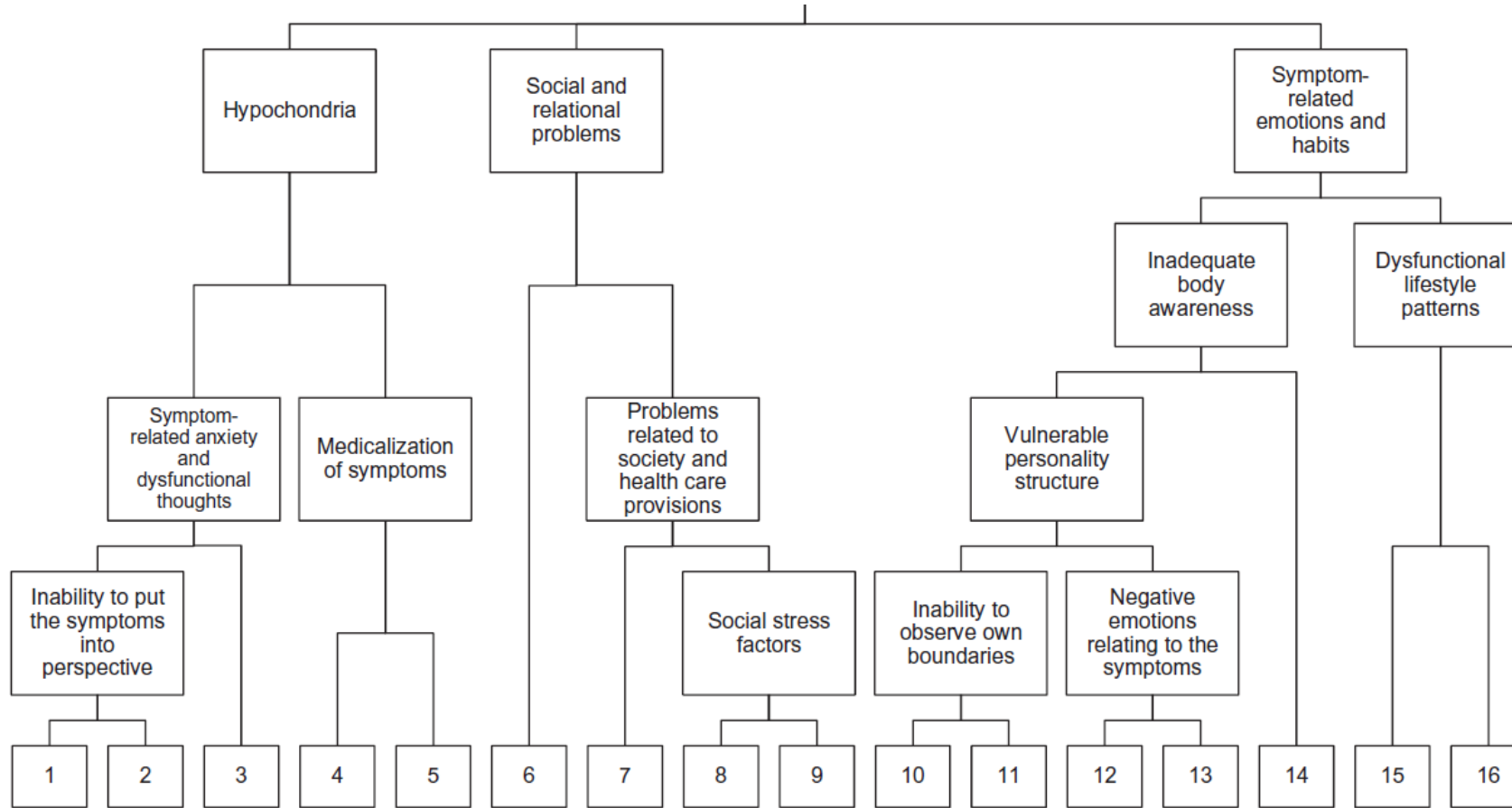
Dimsdale et al, J Psychosom Res 2013;  
Sharma & Manjula, Int Rev Psychiatry 2013;  
van der Feltz-Cornelis et al, Front Psychiatry 2018



# Therapeutic approach: Addressing 16 perpetuating factors of distressing symptoms

Experienced clinicians (n=61) were asked to sort 99 perpetuating factors of somatic symptoms with respect to content.

Hierarchical cluster analysis revealed **three overarching domains of perpetuating factors**.



1. Non-acceptance of the symptoms
2. Preoccupation with the symptoms
3. Excessive concerns about the symptoms
4. Somatic fixation
5. Excessive use of care facilities
6. Dysfunctional interactions with friends and relatives

7. Bad relationships with health care professionals
8. Problems fulfilling roles
9. Feeling too little acknowledgement of suffering and restrictions
10. Making unrealistic demands on yourself
11. Difficulty asking for help
12. Sense of shame and failure due to the symptoms

13. Frustration and despair regarding the symptoms
14. Difficulty perceiving and interpreting emotions and physical processes
15. Adverse physical factors or counterproductive lifestyle
16. Avoidance behaviour

A range of somatic, emotional, cognitive, behavioral, and social factors were identified.

These may guide the development of *personalized treatment of patients with distressing somatic symptoms*.



# Psychological interventions for somatoform disorders and medically unexplained physical symptoms in adults – *they work!*

Clinically relevant small-to-medium effects can be achieved

For all studies comparing some form of psychological therapy with usual care or a waiting list

the psychological therapy resulted in less severe symptoms (e.g., on the PHQ-15) at the end of treatment (10 studies, 1081 analyzed participants):

**SMD -0.34; 95% CI -0.53 to -0.16**

van Dessel et al, Cochrane Database Syst Rev 2014

Although much remains to be done, fatalism regarding treatment outcome of distressing somatic symptoms is inappropriate: instead of «nothing» can be done, «something» can actually be done!





# European research agenda for Somatic Symptom Disorders, Bodily Distress Disorders and Functional Somatic Disorders – *What needs to be done!*

**EURONET-SOMA:** European Network to improve diagnostic, treatment and health care for patients with persistent somatic symptoms <https://www.euronet-soma.eu/>

- (1) Identification of **diagnostic profiles** relevant to course and treatment outcome; incl. biomarkers (e.g., inflammation, neuroimmunology), psychological variables and social factors.
- (2) Development of **questionnaires and semi-structured interviews** to assess these conditions.
- (3) Identification of **mediators and moderators** of clinical course and treatment outcomes.
- (4) **Translational research** exploring how psychological and somatic symptoms develop from somatic conditions and biological and behavioral pathogenic factors.
- (5) Development of **effective interventions in different health care settings** - focus on **diminishing symptoms** and **personalized treatment**.
- (6) Research into **patient preferences** for diagnosis and treatment.

# Thank you for your attention

Any somatic symptoms during this lecture 😊?

How distressing were these symptoms 😊?



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