



Mind, brain and heart failure *a prognostic interdependence*

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2018



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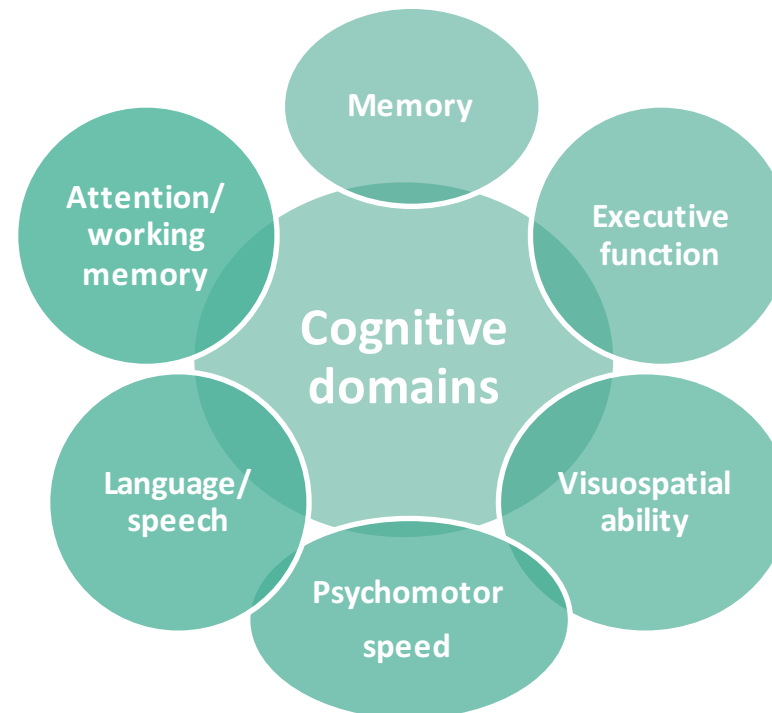
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Heart failure

- HF is not a single entity limited to the heart itself, but is in fact a **complex syndrome involving whole body systems.**

Cognitive (dys)function

- **Cognition:** superior cortical function involving multiple brain processes that allows an individual to perceive information, learn and remember specific knowledge and use them for problem solving and plan actions in the challenges of daily life.



Cognitive (dys)function

- **Mild cognitive impairment (MCI):**
 - A recent change in cognition in 1 or more cognitive domains;
 - Abnormal for the patient's age and educational level;
 - Ability to remain functionally independent and not demented.

Cognitive impairment in HF patients has reported prevalence rates of 25% - 80%

Cognitive impairment in HF

The exact mechanism and causal relationships remain **unclear**

Reduction in
cerebral
blood flow

Deranged
cerebral
metabolism

Neuro-hormonal activation
Hypercoagulability
Thromboembolic events

Systemic
inflammation

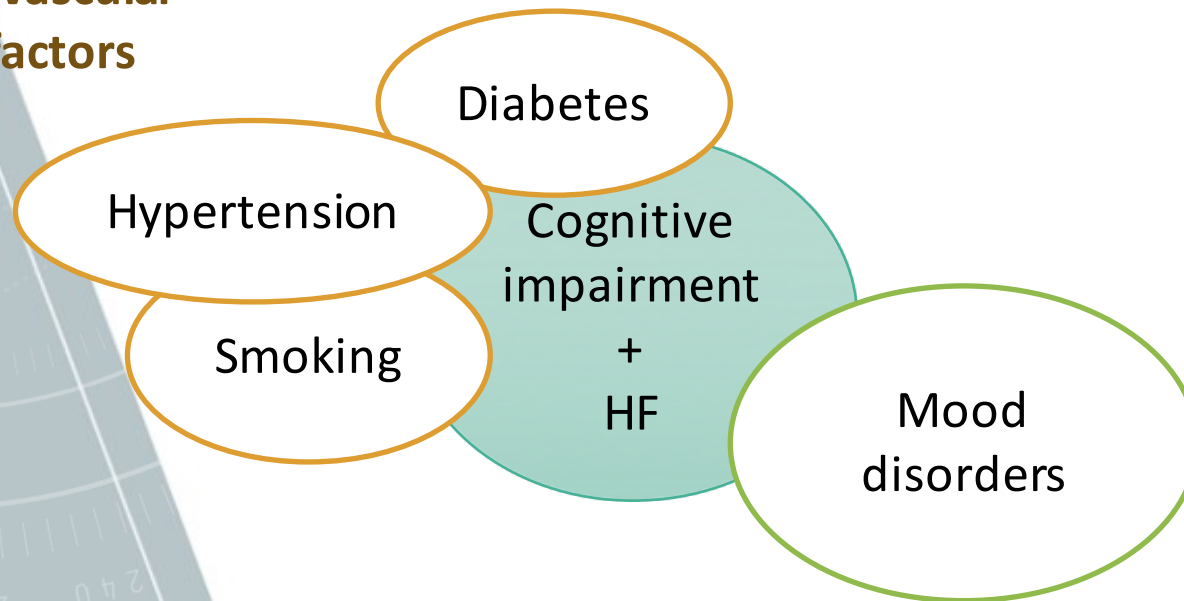
Medical
treatment

Rhythm
disorders

Invasive
procedures

Cognitive impairment in HF Pathophysiology

Cardiovascular risk factors



Depression:

- ~30% of HF patients
- Poor outcomes

Potentially treatable form of
cognitive decline

- **Dissecting the contribution of HF** from concomitant vascular risk and disease is **challenging** but is **essential** for future studies that wish to describe the cognitive component of HF;
- (Mild) Cognitive impairment **often underdiagnosed** in patients with HF.



Decreased quality of life



Worse adherence to therapy



Affect the ability to manage disease, recognise symptoms, make appropriate choices



Loss of functional independence



Hospital readmissions



Death

Assessment and documentation of cognitive impairment seemed to be important to improve patient care.



European Journal of Heart Failure (2017)
doi:10.1002/ejhf.1100

POSITION PAPER

Heart and brain interaction in patients with heart failure: overview and proposal for a taxonomy. A position paper from the Study Group on Heart and Brain Interaction of the Heart Failure Association

Wolfram Doehner^{1,2,3*}, Dilek Ural⁴, Karl Georg Haeusler^{1,5}, Jelena Čelutkienė⁶, Reinaldo Bestetti⁷, Yuksel Cavusoglu⁸, Marco A. Peña-Duque⁹, Duska Glavas¹⁰, Massimo Iacoviello¹¹, Ulrich Laufs¹², Ricardo Marmol Alvear¹³, Amam Mbakwem¹⁴, Massimo F. Piepoli¹⁵, Stuart D. Rosen¹⁶, Georgios Tsivgoulis¹⁷, Cristiana Vitale¹⁸, M. Birhan Yilmaz¹⁹, Stefan D. Anker^{2,3,20}, Gerasimos Filippatos²¹, Petar Seferovic²², Andrew J.S. Coats²³, and Frank Ruschitzka²⁴

Management of cognitive impairment in HF patients is poorly studied and further research is needed to investigate interventional concepts to improve self-care and outcomes.

recommend appropriate treatment of HF and team working with dementia specialists.³²

- There is no screening tool recommended for assessing cognitive deficit in patients with HF.

MONTREAL COGNITIVE ASSESSMENT (MOCA)					
VERSÃO PORTUGUESA – 7.1 VERSÃO ORIGINAL		Nome: _____ Idade: _____		Gênero: _____ Data de Nascimento: _____	
		Escolaridade: _____		Data de Avaliação: _____	
VISUO-ESPACIAL / EXECUTIVA Copiar o cubo Desenhar um Relógio (onze e dez) (3 pontos) [] [] [] Contorno Números Ponteiros		Pontos			
NOMEAÇÃO [] [] []		Pontos			
MEMÓRIA Leia a lista de palavras. O sujeito deve repetir. Realize dois ensaios. Solicite a evocação da lista 5 minutos mais tarde.	Boca Linho Igreja Cravo Azul 1º ensaio 2º ensaio	Sem Pontuação			
ATENÇÃO Leia a sequência de números. (1 número/segundo). O sujeito deve repetir a sequência.	[] 2 1 8 5 4 [] 7 4 2	Pontos			
Leia a série de letras (1 letra/segundo). O sujeito deve bater com a mão cada vez que for dita a letra A. Não se atribuem pontos se _ 2 erros [] FBACMNAAIKLBFAFKDEAAAAJAMOFAB		Pontos			
Subtrair de 7 em 7 começando em 100. [] 95 [] 86 [] 79 [] 72 [] 65 4 ou 5 subtrações corretas: 3 pontos; 2 ou 3 corretas: 2 pontos; 1 correta: 1 ponto; 0 corretas: 0 pontos		Pontos			
LINGUAGEM Repetir: Eu só sei que hoje devemos ajudar o João. [] O gato escondido-se sempre que os cães entram na sala. []		Pontos			
Fluência verbal: Dizer o maior número possível de palavras que comecem pela letra "P" (1 minuto). [] ____ (N ≥ 11 palavras)		Pontos			
ABSTRAÇÃO Semelhança p.a.s., entre banana e laranja = fruta [] combolo - bicicleta [] relógio - rigus		Pontos			
EVOCACAO DEFIKIDA Deve recordar as palavras SEM PISTAS Boca Linho Igreja Cravo Azul [] [] [] [] []	Pontuação apenas para evocação SEM PISTAS	Pontos			
Opcional Plata de categoria [] [] [] [] [] Plata de recolha múltipla [] [] [] [] []		Pontos			
ORIENTACAO [] Dia do mês [] Mês [] Ano [] Dia da semana [] Lugar [] Localidade		Pontos			

© Z.Nicredine MD Examinador: _____ TOTAL _____/30

Versão Portuguesa: Freitas, S.; Simões, M.R.; Santana, I.; Martins, C. & Nicredine, Z. (2013). Montreal Cognitive Assessment.

- Screening instrument for mild cognitive dysfunction (Sensitivity = 90%);
- ~ 10 to 15 minutes;
- Maximum possible score : 30;
- +1 point if < 12 years of education;
- > 26 – normal.

Cognitive screening does not replace a global clinical assessment or neuropsychological tests but gives important **indicators of early changes in brain functioning**

- Patients **admitted for new-onset or chronic decompensate HF** (index-admission), who gave written informed consent to be included in a post-discharge HF-program (by protocol).
 - Cognitive function was assessed **at hospital discharge and at 12 $\pm$ 3 months during follow-up**, using the validated Portuguese version of the Montreal Cognitive Assessment (**MoCA**).
 - **Exclusion criteria:** Language barriers (inability to speak and / or understand Portuguese); visual and auditory deficits; previously diagnosed neurological or psychiatric disease.
 - **Chronic anxiety / depression** were evaluated using Hospital Anxiety and Depression Scale (HADS), validated Portuguese version, at discharge and during follow-up period.

- **43** Patients included (mean age **67 $\pm$ 11.3** years, 68.9% **men**).

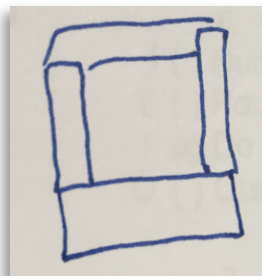
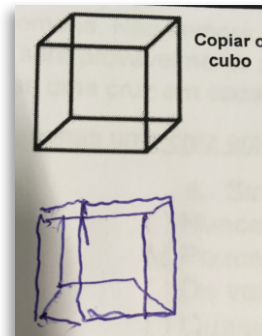
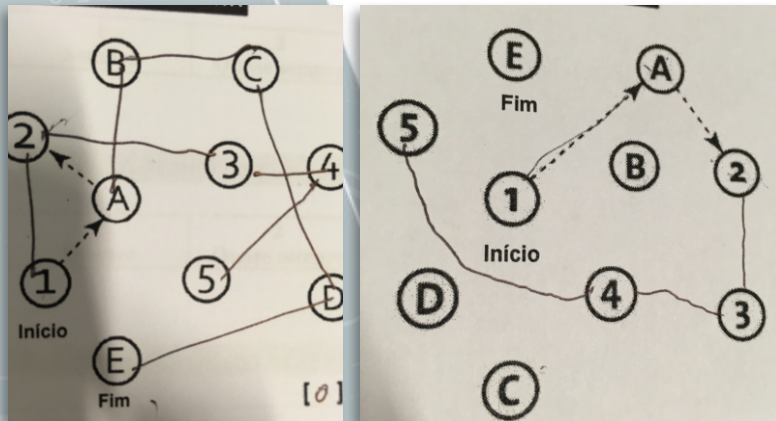
- **85%** - left ventricle ejection fraction **<40%**
- **95%** - NYHA functional **class I-II**
- **40% first hospitalization** due to **HF**

- **43** Patients included (mean age **67 $\pm$ 11.3** years, 68.9% **men**).

**Mild cognitive impairment:
48.9%**

Mainly affected cognitive domains:

- Visuospatial / executive
- Language
- Delayed recall



- **43** Patients included (mean age **67** $\pm$ 11.3 years, 68.9% **men**).

Better MoCA performance:

- **Men** ($p=0.026$);
- Patients medicated with **ACE inhibitors/ARB**; **prior** to index-hospitalization ($p=0.009$).

Anxiety and depression were **not associated** with
cognitive impairment

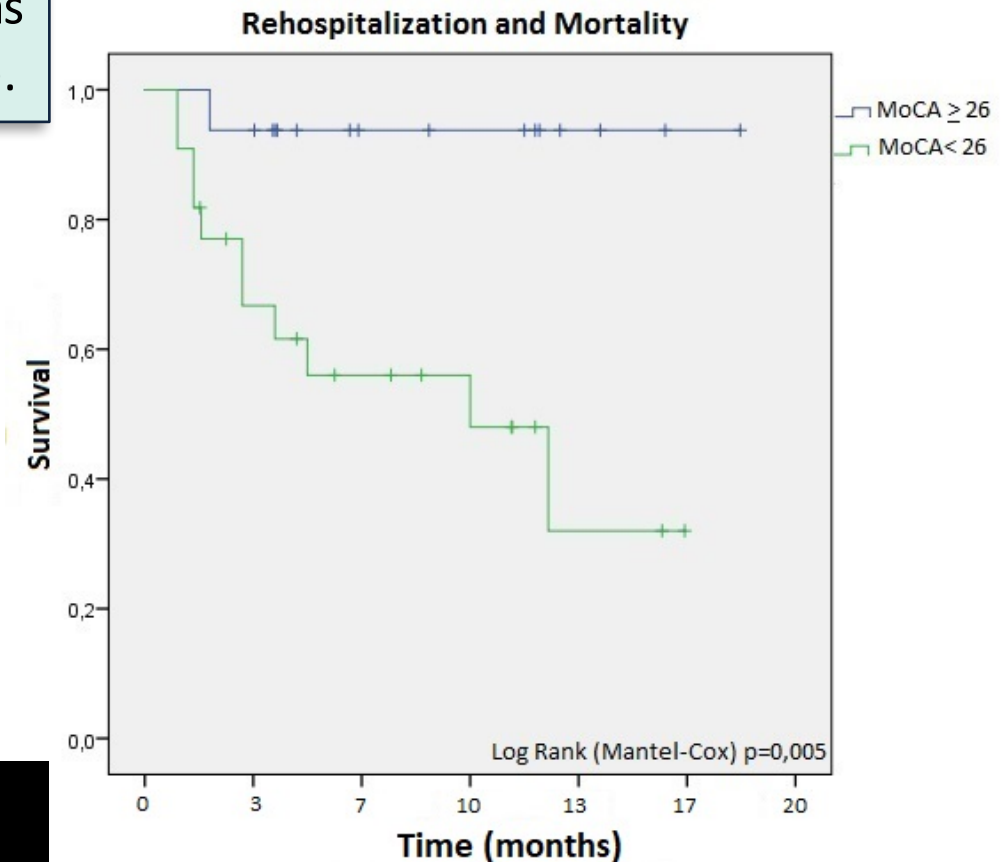
Better MoCA performance:

- **Greater ability to deal with their disease status** (assessed by the Kansas City Cardiomyopathy Questionnaire) ($p=0.038$).

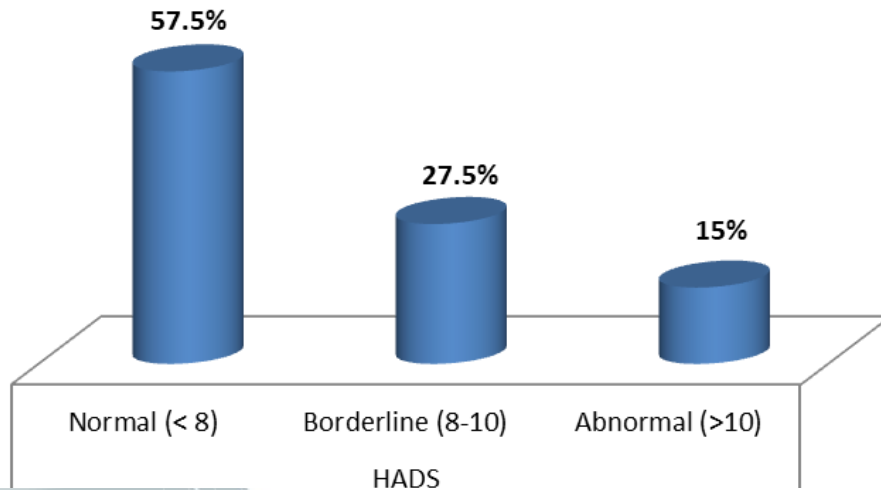
During **follow-up**:

- No significant difference in the MoCA score;
- ↓ **Naming ability** ($p=0.031$).
- **Rehospitalization**: 31%
- **Mortality**: 2.3%

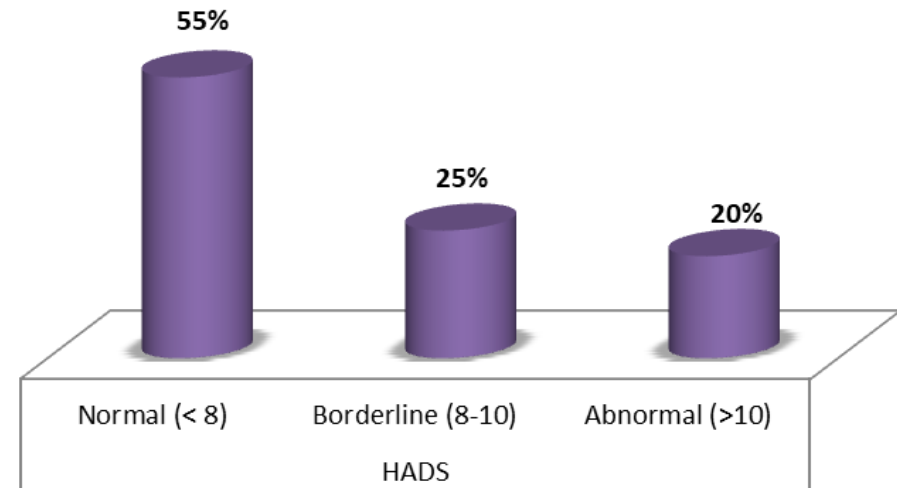
The presence of **cognitive impairment predicted the occurrence of rehospitalization/mortality** ($p=0.026$)



Depression



Anxiety



- **Anxiety and / or depression** were associated with a **more symptomatic state** ($p=0.023$, $r= -0.377$ and $p=0.002$, $r= -0.49$) **and overall poor quality of life** ($p=0.005$, $r= -0.459$ and $p=0.0001$, $r= -0.591$), evaluated by Kansas City Cardiomyopathy Questionnaire.
- There was **no improvement in anxiety or depression scores** during follow-up.
- An $HADS \geq 11$ for **depression was a predictor of rehospitalization for HF** ($p=0.048$); anxiety was not associated with events during follow-up.

- Mild cognitive impairment is **common** and **underdiagnosed** in patients with HF.
- Mild cognitive impairment correlates with **quality of life, hospital readmission and mortality rates**.
- In our population:
 - Mild cognitive impairment associated with a reduced capacity to deal with their HF condition;
 - Mild cognitive impairment predicted rehospitalization and/or mortality.



- There is **no** recommended **screening tool**.
- Global cognitive assessment tools (eg. MoCA) are useful to identify patients who are prone to poorer health outcomes.
 - Tighter follow-up;
 - Further neurologic diagnostic investigation.
- Assessment and documentation of cognitive impairment seemed to be important to improve patient care.





Thank you.

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