INSUFICIENTA CARDIACA

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DEFINITIE (ESC)

- Sd. caracterizat de:

SIMPTOME

Dispnee
Astenie fizica

SEMNE

Turgescenta jugulara
Raluri subcrepitante
Edeme gambiere
Hepatomegalie

- Cauzate de o afectare structurala/functionala a inimii, care determina:
  - ↓ a DC
    si/sau
  - ↑ pres. cardiace in repaus/efort

DEFINITIE (ACC/AHA)

- Sd. clinic complex, care rezulta din orice afectare str/ funct a umplerii ventriculare si/sau ejectiei sg.

- Manifestarile definitorii sunt:
  - dispneea
  - fatigabilitatea

  Rezultand:
  - limitarea tolerantei la efort
  - retentia de fluide => congestie pulm si/sau splahnica si/sau edeme periferice.

EPIDEMIOLOGIE

- Desi prevalenta BCV a scazut in tarile dezvoltate, IC este o exceptie
- In USA >1 milion externari cu IC annual, costul ingrijirii unui pacient $110 000 anual
- Afecteaza aprox. 10% din barbatii si 8% din femeile peste 60 ani
- Mortalitatea la 5 ani este de ~ 50 %, mai pesimista decat in multe neoplazii
- Reinternarea pts cu IC la 30 zile este de 20-25 %

ETIOLOGIE

- **Orice boala CV** poate duce la IC

- Afectarea miocardului:
  - pierderea miocitelor (IMA),
  - contractie ineficienta (asinconism – BRS, Pacemaker)
  - ↓ fortei contractile (cardiomiopatii)

- Afectarea valvulara

- Afectarea pericardului (pericardita constrictiva, tamponada cardiaca)

- Tulb. de ritm (ritmuri tahi sau bradicardice)

- Suprasarcina de presiune (HTA, st. aortica)

- Boli congenitale cardiace

ETIOLOGIE

- Etiologia IC variaza in functie de regiune geografica, varsta, rasa
- In tarile dezvoltate principalele cauze sunt CI (in special IMA) si HTA; a crescut prevalenta DZ si implicarea sa in aparitia IC
- In tarile sarace etiologia dominanta: valvulopatii reumatismale netratate, cardiomiopatii idiopatice si postpartum, HTA
- Rolul obezitatii in dezvoltarea IC in special la tineri
- **Factori precipitanti**
  - **Cardiaci**: tulburare de ritm, HTA necontrolata, embolie pulmonara, episod ischemic coronarian
  - **Extracardiaci:** infectie, exces de sare

MECANISME

- **Modelul hemodinamic** - IC = sd. ale carui simp si semne se datoreaza **incapacitatii inimii de a pompa** sg corespunzator necesitatilor metabolice ale tesuturilor in timpul activ obisnuite.
  - Este o **scadere a contractilitatii intrinseci** a miocardului, inclusiv a f. miocardice izolate.
  - Apare o **remodelare VS**, fie in sensul dilatarii, fie al hipertrofiei.

Matricea extracelulara = schelet intern al VS;

remodelarea ei apare dupa IMA, cu fibroza

↓

subtierea peretelui VS si **aparitia anevrismului**

↓

afectarea functiei de pompa VS

Cresterea sintezei matricei

↓

Rigiditate

↓

Afectarea relaxarii si a umplerii VS

Enzime implicate

- Matrixmetaloproteinaze (**MMS**) - degradeaza matricea
- **Inhibitori ai MMS**

*dezechilbrul dintre acestia det diferite forme de remodelare

MECANISME

- **Modelul cardiorenal = retentia hidrosalina** determina dispneea si edemele; regimul hiposodat si diureticele – esentiale in trat. IC

- **Modelul neurohormonal**: ↑ activitatii SN simpatic in timpul exercitiului fizic ↑ contractilitatea si DC

  - **Efect pozitiv**: in ICA prin SN simpatic => contractilitatea ↑ si se produce vasoconstrictie, ce mentine TA si perfuzia organelor vitale

  - **Efect negativ**: activarea prelungita a SNS si sist. RAA => remodelare adaptativa a VS => injurie miocardica

  - Sist. RAA, vasopresina, citokinele

  - Blocarea SNS si RAA - ↑ supravietuirii

MECANISME

- **Modelul ciclului anormal al Ca**:
  - contractia = rezultat al interactiunii dintre miofilamentele de actina si miozina, mediata de Ca citoplasmatic (care rezulta atat din influxul de Ca prin mb celulara, cat si prin eliberarea din reticulul sarcoplasmatic prin intemediul receptorilor specifici);
  - relaxarea apare datorita reintrarii Ca citoplasmatic in reticulul sarcoplasmatic (prin actiunea unei pompe, contrar gradientului de concentratie) si a efluxului Ca prin sarcolema prin actiunea pompei Na-Ca
- Dereglarea Ca a fost demonstrata in anumite forme de IC

MECANISME

- **Modelul mortii celulare:** in toate formele de IC ↑ rata de moarte celulara, datorita:
  - activ. neurohormonala
  - Inflamatie
  - stress oxidativ
  - toxine (alcool, chimioterapice)
  - procese infiltrative

  - **Apoptoza** = moartea celulara programata creste in suprasarcina de presiune
  - Pierderea celulara => scaderea functiei contractile => IC

- **Modelul genetic**: au fost identificate mutatii in diferite gene, conducand la anumite forme de cardiomiopatii: hipertrofice, dilatative, restrictive, CM aritmogena

- **Modelul biomecanic:** IC se dezvolta si progreseaza datorita alterarii functiei cardiace si a remodelarii, fiind implicata activarea neurohormonala

Niciun model nu poate explica singur fiziopatologia IC

CLASIFICARE

- Clasificarea functionala a IC (**NYHA**):
  - **Clasa I** activitățile fizice obișnuite nu produc simptome de IC ca dispnee sau fatigabilitate
  - **Clasa II** usoara limitare a activitatilor fizice obisnuite;
  - **Clasa III** limitare marcată a activității fizice; simptomele de IC apar la eforturi mai mici decât activitățile obișnuite; **fara simptome de repaus**
  - **Clasa IV** pacienți cu boală cardiacă care nu pot desfășura nicio activitate fizică fără a avea disconfort; simptomele de IC apar și **în repaus**
- Clasificare in functie de FEVS (**ESC**):
  - IC cu FE redusa (<40%)
  - IC cu FE medie (40-49%)
  - IC cu FE pastrata (>50%)

CLASIFICARE

- Clasificarea stadiala a IC (**ACC/AHA**):

  - **Stadiul A** - există riscul de IC, dar nu sunt boli structurale cardiace sau simptome de IC
  - **Stadiul B** - boală structurală cardiacă, dar fără simptome și semne de IC; include pacienții cu NYHA clasa I, care nu au avut și nu au în prezent simptome și semne de IC
  - **Stadiul C** - boală structurală cardiacă cu simptome de IC în trecut sau în prezent; include pacienții din orice clasă NYHA (inclusiv cei din NYHA I, dar care au fost simptomatici în trecut)
  - **Stadiul D** - IC refractară care necesită intervenție specializată; include pacienții cu clasa IV NYHA cu IC refractară

Comparație stadii IC ACC/AHA - clasificare funcțională NYHA

Stadii ACC/AHA	**Clase functionale NYHA**
A - pacient cu risc mare de IC, dar fără boală cardiacă structurală sau simptomatologie de IC	Fără corespondent
B - pacient cu boală cardiacă structurală, dar fără semne sau simptomatologie de IC	I – fără limitarea activității fizice; activitate obișnuită fără simptomatologie
C - pacient cu boală cardiacă structurală cu simptomatologie de IC (în prezent sau în antecedente)	I – fără limitarea activității fizice; activitate obișnuită fără simptomatologie
	II – limitare ușoară activității fizice, fără simptomatologie în repaus, dar activitatea obișnuită produce simptome de IC
	III – limitare importantă a activității fizice ; fără simptome în repaus, dar apar la eforturi mai mici decât cele uzuale
	IV – simptomatologie la orice nivel de activitate și în repaus
D – pacient cu IC refractară, ce necesită intervenție specializată	IV – simptomatologie la orice nivel de activitate și în repaus

CLINIC

- Simptome – Dispnea:
  - Progresiva de efort
  - Paroxistica noctruna
  - Repaus
  - Uneori dificil de interpretat la varstnici, obezi si pts cu afect. pulmonare

- Semne datorate retentiei de fluide, care determina congestie:
  - edeme gambiere bilateral,
  - jugulare turgescente,
  - hepatomegalie,
  - ascita,
  - hidrotorax

PARACLINIC

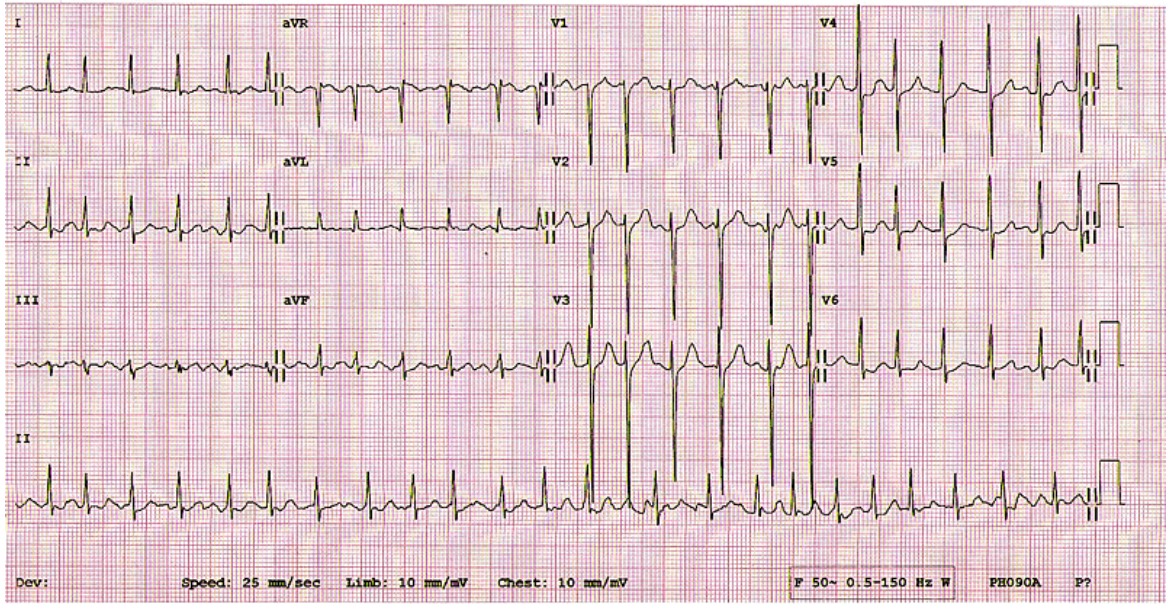
- **Biologic** - screening-ul obligatoriu: HL, ionograma serica, uree, creatinina, functia hepatica, glicemie, profil lipidic, coagularea

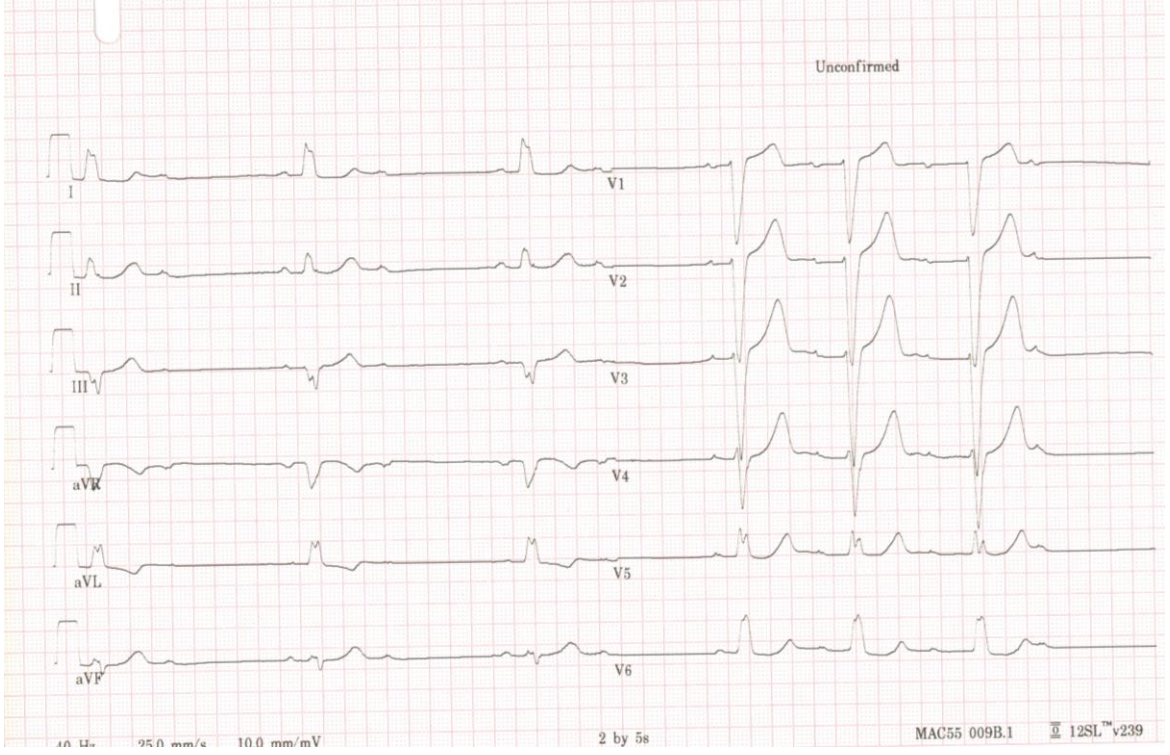
- **Peptidele natriuretice**:
  - **BNP** (N< 35pg/ml),
  - **NT-proBNP** (N< 125 pg/ml)
  - Valoare predictiv negativa (valorile normale practic exclud IC)
  - Limite - valori:
    - Crescute: BRC, FiA, varstnici
    - Scazute: obezi

PARACLINIC

Electrocardiograma - in majoritatea situatiilor este anormala:

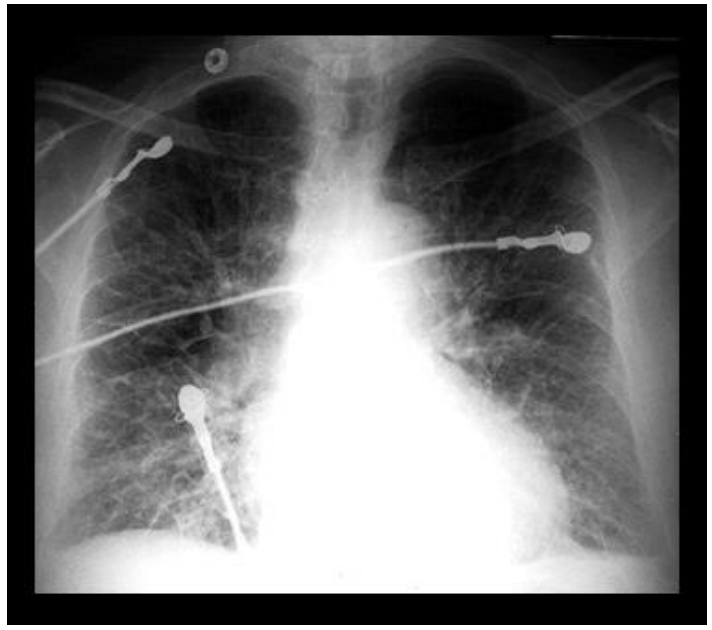
- necroza, ischemie
- hipertrofie ventriculara, suprasolicitare atriala
- tulb. de ritm si de conducere- fibrilatie atriala, bloc de ramura
- indicatii pentru terapie





PARACLINIC

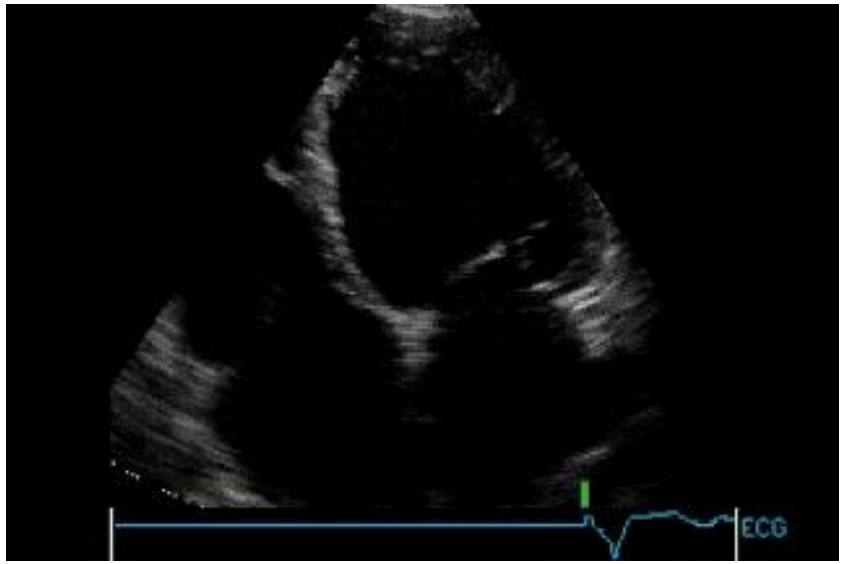
- **Radiografia cord-pulmon** - mai putin importanta astazi
  - Cardiomegalie, circulatia pulmonara
  - Evidentiaza patologie pulmonara

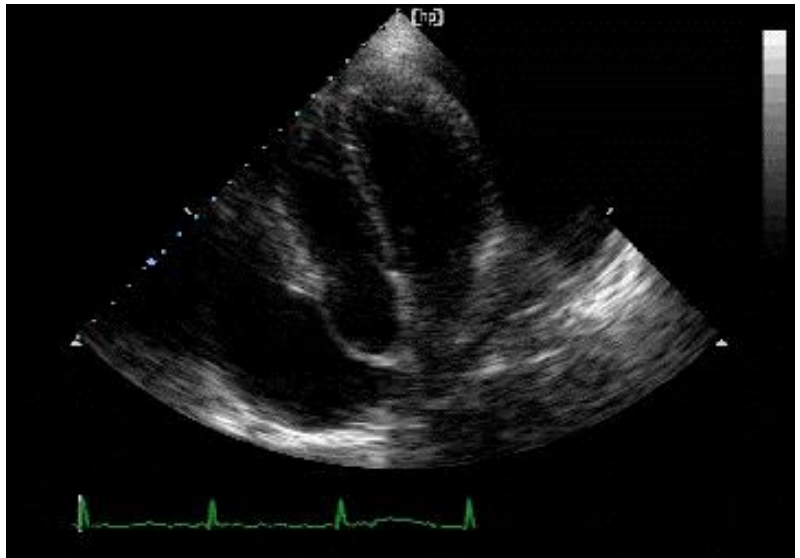


PARACLINIC

- **Ecocardiografie** – ofera informatii despre
  - cavitatile cardiace
  - grosimea peretilor
  - morfologia si functia valvelor
  - presiunea pulmonara
  - functia sistolica si diastolica VS, functia VD
  - contractilitate
  - pericard

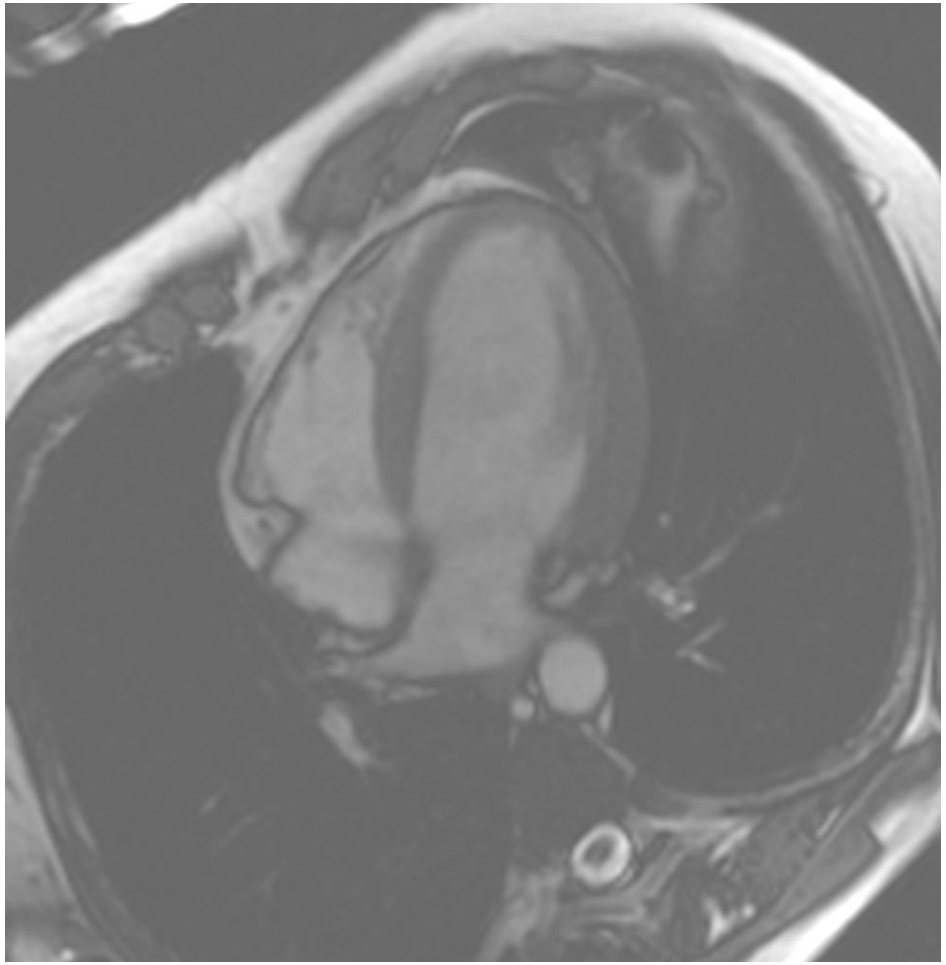
- Importanta pentru stabilirea etiologiei IC si a optiunilor terapeutice
- Determinarea FE clasifica IC si det trat





PARACLINIC

- **Rezonanta magnetica cardiaca** - ”gold standard” pt masurarea volumelor, masei si functiei
- Evidentiaza fibroza miocardica
  - DD intre etiologia ischemica si non ischemica a IC
  - Utila in dg. miocarditei, amiloidozei, hemocromatozei, b. Fabry etc.
  - Permite evaluarea ischemiei si viabilitatii miocardice



PARACLINIC

- Coronarografia si cateterismul cardiac - recomandata la pts. cu
  - IC si angina refractara la trat.
  - Aritmii ventriculare simpt. sau stop cardiac
  - IC si probabilitate intermediar-inalta de CI, pt stabilirea severitatii leziunilor

- Biopsia endomiocardica

- Teste genetice – la pts cu cardiomiopatii hipetrofice, dilatative (anumite forme), restrictive, aritmogena de VD

PARACLINIC

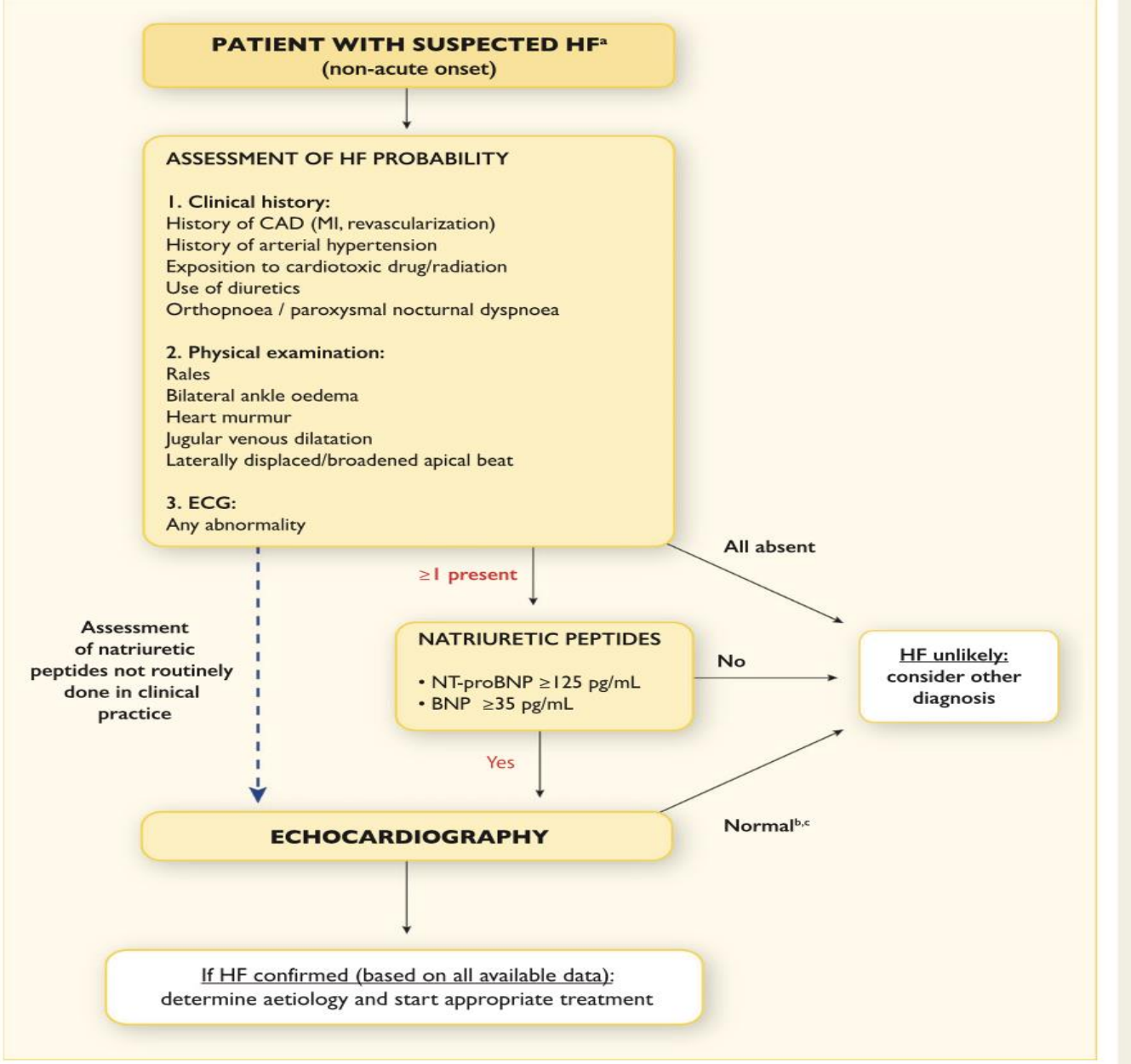


Figure 4.1 Diagnostic algorithm for a diagnosis of heart failure of non-acute onset
BNP = B-type natriuretic peptide; CAD = coronary artery disease; HF = heart failure; MI = myocardial infarction; NT-proBNP = N-terminal pro-B type natriuretic peptide.
[a]Patient reporting symptoms typical of HF (see *Table 4.1*).
[b]Normal ventricular and atrial volumes and function.
[c]Consider other causes of elevated natriuretic peptides (*Table 12.3*).

Classes of recommendations	Definition	Suggested wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended/is indicated
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	*Weight of evidence/opinion is in favour of usefulness/efficacy.*	Should be considered
Class IIb	*Usefulness/efficacy is less well established by evidence/opinion.*	May be considered
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended

Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

TRATAMENT

- Obiectivele tratamentului:
  1. Reducerea mortalitatii
  2. Prevenirea respitalizarilor
  3. Imbunatatirea capacitatii functionale si a statusului clinic
  4. Imbunatatirea calitatii vietii

- Tratament:
  1. Igieno-dietetic
  2. Medicamentos
  3. Dispozitive implantabile – ICD, CRT
  4. Chirurgical

TRATAMENT

INHIBITORII ENZIMEI DE CONVERSIE A ANGIOTENSINEI (IEC)

- Recomandati tuturor pts:
  - simptomatici cu IC cu FE redusa, daca nu sunt contraindicatii
  - cu disfunctie sistolica asimpt de VS
- Cu dovezi de reducere a mortalitatii si morbiditatii
- Adm. la dozele maxim tolerate
- In practica pts primesc doze suboptimale
- Reprezentanti: captopril, enalapril, lisinopril, ramipril, trandolapril

BLOCANTII DE RECEPTORI AI ANGIOTENSINEI II (ARBs)

- Recomandati doar in situatia cand pts au intoleranta la IEC
- Asocierea IEC+ ARB trebuie evitata, poate fi adm. doar in situatii speciale
- Reprezentanti: candesartan, valsartan, losartan

TRATAMENT

BETA-BLOCANTE

- Reduc mortalitatea si morbiditatea la pts cu IC cu FE scazuta
- Recomandate la pts cu:
  - istoric de IM si disfunctie VS asimpt.
  - cu IC si fibrilatie atriala, pt. contolul frecventei, in special dc AV>
- Beta-blocantele si IEC sunt complementare si trebuie adm impreuna cat mai rapid dupa ce IC a fost dg.
- Beta-blocantele adm la pts stabili , ”start low, go slow”, pana la doza max . tolerata
- Atentie la pts. cu ICA, trat. initiat in spital, dupa stabilizarea pts.
- Reprezentanti: carvedilol, metoprolol, bisoprolol, nebivolol

TRATAMENT

INHIBITORII RECEPTORILOR DE ANGIOTENSINA SI A NEPRILISINEI

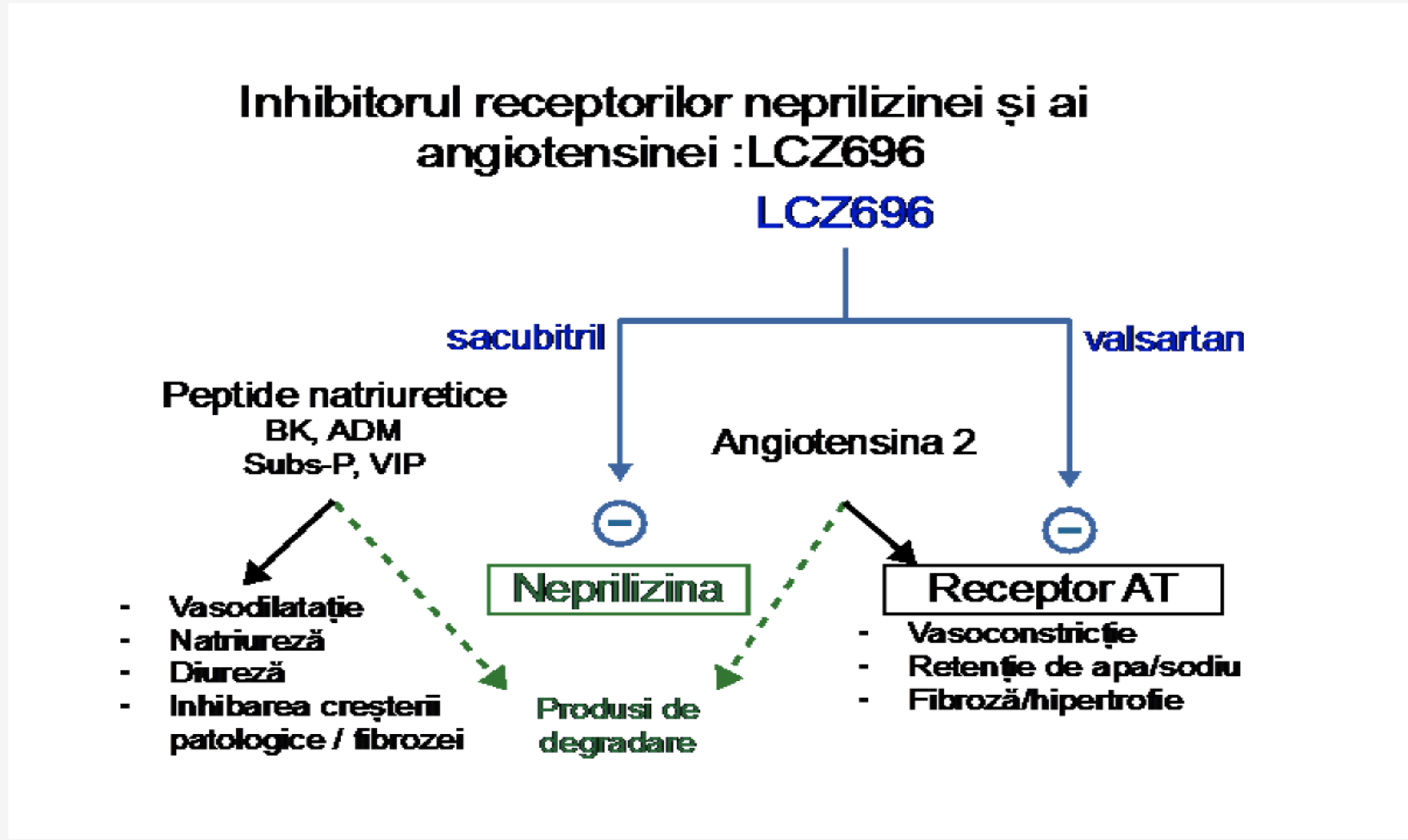
- O noua clasa de medicamente care actioneaza atat pe sistemul RAA, cat si pe sistemul endopetidazelor neutre

- Primul preparat LCZ 696, asociaza valsartanul cu sacubitril (inh. ai neprilizinei)

- Studiul Paradigm a comparat LCZ696 cu enalapril la pts cu IC simpt. cu FE redusa
  - superioritatea evidenta a LCZ 696 cu mortalitatii CV si a spitalizarilor cu 20%
  - A redus progresia clinica si biologica (masurata prin NT-proBNP) a IC
  - mai putine ef. advese la LCZ696
  - se poate adm in insuf. renala si hepatica, cu adaptarea dozelor
  - se evita in formele severe de afectare hepatica si renala

TRATAMENT

INHIBITORII AI ANGIOTENSINEI SI NEPRILISINEI



TRATAMENT

ANTAGONISTII RECEPTORILOR DE ALDOSTERON

- Blocheaza receptorii pt. aldosteron si in fctie de gradul de afinitate si receptorii pt alti hormoni steroizi (corticosteroizi,androgeni)
- Sunt recomandati la toti pts simpt. cu IC si FE redusa (<35%), impreuna cu betablocantele si IEC
- Au dovezi in reducerea mortalitatii si a spitalizarilor pt. IC
- Atentie la pts. Cu afectare renala si la K> 5 mmol/L
- E necesara monitorizarea functiei renale si a ionogramei serice
- Reprezentanti: spironolactona, eplerenona

TRATAMENT

Pharmacological treatments indicated in patients with symptomatic (NYHA Class II-IV) heart failure with reduced ejection fraction

Recommendations	Class [a]	Level [b]	Ref [c]
An ACE-I[d] is recommended, in addition to a beta-blocker, for symptomatic patients with HFrEF to reduce the risk of HF hospitalization and death.	I	A	2, 163 –165
A beta-blocker is recommended, in addition an ACE-I[d], for patients with stable, symptomatic HFrEF to reduce the risk of HF hospitalization and death.	I	A	167– 173
An MRA is recommended for patients with HFrEF, who remain symptomatic despite treatment with an ACE-I[d] and a beta-blocker, to reduce the risk of HF hospitalization and death.	I	A	174, 175

TRATAMENT

DIURETICELE

- Recomandate pt. reducerea simpt. si semnelor de congestie la pts cu IC si FE redusa
- Dovezile privitoare la reducerea mortalitatii si morbiditatii nu sunt certe, nefiind studiate in trialuri clinice
- Diureticele de ansa produc o diureza mai intensa si de durata mai scurta comparativ cu tiazidicele
- Scopul trat. cu diuretice este de a realiza si a mentine euvolemia cu cea mai mica doza posibila- dozele se vor ajusta individual in timp
- Pts trebuie educati pt ajustarea dozelor in functie de simpt/semnele de congestie si de greutatea corporala
- La pts cu congestie rezistenta se pot asocia sinergic diureticele de ansa si tiazidicele, dar cu multa atentie, fiind monitorizate posibilele ef. adverse
- Ionograma serica trebuie monitorizata periodic

TRATAMENT

Diuretics	Initial dose (mg)		Usual daily dose (mg)	
Loop diuretics [a]				
Furosemide	20–40		40–240	
Bumetanide	0.5–1.0		1–5	
Torasemide	5–10		10–20	
Thiazides [b]				
Bendroflumethiazide	2.5		2.5–10	
Hydrochlorothiazide	25		12.5–100	
Metolazone	2.5		2.5–10	
Indapamide[c]	2.5		2.5–5	
Potassium-sparing diuretics [d]				
	+ACE-I/ ARB	-ACE-I/ ARB	+ACE-I/ ARB	-ACE-I/ ARB
Spironolactone/ eplerenone	12.5–25	50	50	100–200
Amiloride	2.5	5	5–10	10–20
Triamterene	25	50	100	200

TRATAMENT

INHIBITORII DE CANALE If

- Reduc AV, prin inh. canalelor I_f de la nivelul NSA => sunt folosite doar la pts in ritm sinusal
- Reduc mortalitatea si spitalizarile pt IC la pts cu FE < 35%, cu AV>70/min
- Studiul SHIFT
- Se adm. la pts care sunt tratati cu betablocante (in doza eficienta, max tolerata), IEC, inh. ai aldosteronului

ASOCIEREA HIDRALAZINA-ISOSORBID DINITRAT

- La pts cu IC cu FE redusa- date dintr-un studiu anterior folosirii betabl si IEC in IC, studiu efectuat doar pe barbati
- Poate fi adm. la pts simpt. cu IC cu FE redusa, care nu tolereaza IEC sau ARBs

TRATAMENT

DIGOXINUL

- Controversat, datorita faptului ca unele studii au aratat cresterea mortalitatii, la pts cu IC si fia
- Poate fi adm. cu prudenta la pts cu:
  - IC simpt. si fia cu AV rapida, cand alte optiuni nu sunt posibile
  - IC simpt. cu FE redusa si in RS
- AV optima in repaus la pts cu fia este considerata 70-90/min
- Precautie in special la femei, batrani, pts cu insuf. renala
- Det. digoxinemiei- la pts . la care se adm. Digoxin

ACIZII GRASI POLINESATURATI (n-3 PUFA)

- Doar preparatele care contin acid eicosapentaenoic (EPA) si acid docosahexanoic (DHA) ca esteri etilici cel putin 85% (850mg/g) s-au dovedit a avea efect in reducerea mortalitatii CV si respitalizarilor
- Terapie adjuvanta pt pts. cu IC simpt. cu FE redusa si care primesc deja trat. cu betabl, IEC si antag. Ai aldosteronului

TRATAMENT

STATINELE (inh. 3- hidroxi-3-metilglutaril- CoA reductazei)

- Desi reduc mortalitatea si morbiditatea la pts cu boala aterosclerotica, nu sunt eficiente in imbunatatirea prognosticului pts cu IC
- Pts care au trat. cu statine pt boala coronariana sau dislipidemie trebuie sa continue trat.

ANTICOAGULANTE SI ANTIAGREGANTE PLACHETARE

- Fara dovezi de imbunatatire a prognosticului in IC
- Pts care au fia sau risc tromboembolic venos vor continua trat. anticoagulant
- Pts care au boala coronariana continua trat. cu aspirina sau alt antigregant plachetar
- Nu se recomanda trat. cu aspirina in absenta bolii coronariene

BLOCANTE DE CALCIU

- Nu sunt recomandate, efect daunator – diltiazem si verapamil
- Amlodipina si felodipina – singurele cu profil de siguranta la pts cu IC cu FE redusa, in conditiile si a unei afectiuni pentru care sunt recomandate

TRATAMENT

AGENTS	INITIATING DOSAGE	MAXIMAL DOSAGE
Angiotensin-Converting Enzyme Inhibitors		
Captopril	6.25 mg tid	50 mg tid
Enalapril	2.5 mg bid	10 mg bid
Lisinopril	2.5-5.0 mg qd	20 mg qd
Ramipril	1.25-2.5 mg qd	10 mg qd
Fosinopril	5-10 mg qd	40 mg qd
Quinapril	5 bid	40 mg bid
Trandolapril	0.5 mg qd	4 mg qd
Angiotensin Receptor Blockers		
Valsartan	40 mg bid	160 mg bid
Candesartan	4-8 mg qd	32 mg qd
Losartan	12.5-25 mg qd	50 mg qd
Beta Receptor Blockers		
Carvedilol	3.125 mg bid	25 mg bid (50 mg bid if body weight > 85 kg)
Carvedilol-CR	10 mg qd	80 mg qd
Bisoprolol	1.25 mg bid	10 mg qd
Metoprolol succinate CR	12.5-25 mg qd	200 mg qd
Aldosterone Antagonists		
Spironolactone	12.5-25 mg qd	25-50 mg qd
Eplerenone	25 mg qd	50 mg qd
Other Agents		
Combination of hydralazine/isosorbide dinitrate	10-25 mg/10 mg tid	75 mg/40 mg tid
Fixed dose of hydralazine/isosorbide dinitrate	37.5 mg/20 mg (one tablet) tid	75 mg/40 mg (two tablets) tid
Digoxin*	0.125 mg qd	≤0.375 mg/day [†]

TRATAMENT

Recommendations	Class [a]	Level [b]	Ref [c]
Diuretics			
Diuretics are recommended in order to improve symptoms and exercise capacity in patients with signs and/or symptoms of congestion.	I	B	178, 179
Diuretics should be considered to reduce the risk of HF hospitalization in patients with signs and/or symptoms of congestion.	IIa	B	178, 179
Angiotensin receptor neprilysin inhibitor			
Sacubitril/valsartan is recommended as a replacement for an ACE-I to further reduce the risk of HF hospitalization and death in ambulatory patients with HFrEF who remain symptomatic despite optimal treatment with an ACE-I, a beta-blocker and an MRA[d]	I	B	162
If-channel inhibitor			
Ivabradine should be considered to reduce the risk of HF hospitalization or cardiovascular death in symptomatic patients with LVEF ≤35%, in sinus rhythm and a resting heart rate ≥70 bpm despite treatment with an evidence-based dose of beta-blocker (or maximum tolerated dose below that), ACE-I (or ARB), and an MRA (or ARB).	IIa	B	180
Ivabradine should be considered to reduce the risk of HF hospitalization and cardiovascular death in symptomatic patients with LVEF ≤35%, in sinus rhythm and a resting heart rate ≥70 bpm who are unable to tolerate or have contra-indications for a beta-blocker. Patients should also receive an ACE-I (or ARB) and an MRA (or ARB).	IIa	C	181
ARB			
An ARB is recommended to reduce the risk of HF hospitalization and cardiovascular death in symptomatic patients unable to tolerate an ACE-I (patients should also receive a beta-blocker and an MRA).	I	B	182
An ARB may be considered to reduce the risk of HF hospitalization and death in patients who are symptomatic despite treatment with a beta-blocker who are unable to tolerate an MRA.	IIb	C	-
Hydralazine and isosorbide dinitrate			
Hydralazine and isosorbide dinitrate should be considered in self-identified black patients with LVEF ≤35% or with an LVEF <45% combined with a dilated LV in NYHA Class III–IV despite treatment with an ACE-I a beta-blocker and an MRA to reduce the risk of HF hospitalization and death.	IIa	B	183
Hydralazine and isosorbide dinitrate may be considered in symptomatic patients with HFrEF who can tolerate neither an ACE-I nor an ARB (or they are contra-indicated) to reduce the risk of death.	IIb	B	184
Other treatments with less-certain benefits			
Digoxin			
Digoxin may be considered in symptomatic patients in sinus rhythm despite treatment with an ACE-I (or ARB), a beta-blocker and an MRA, to reduce the risk of hospitalization (both all-cause and HF-hospitalizations).	IIb	B	185
N-3 PUFA			
An n-3 PUFA[e] preparation may be considered in symptomatic HF patients to reduce the risk of cardiovascular hospitalization and cardiovascular death.	IIb	B	186

TRATAMENT - DISPOZITIVE

- DEFIBRILATORUL IMPLANTABIL (ICD)
  - Pacientii cu IC au risc de moarte subita (ms) aritmica (ritmuri bradicardice, aritmii ventriculare maligne), in ciuda tratamentului medical optimal
  - Indicat pt profilaxia secundara a mortii subite cardiace la pts care au avut stop cardiac sau aritmii ventriculare simpt, cu conditia de a avea FE<35% si speranta de viata>1 an
  - Indicat pt profilaxia primara a mortii subite
    - trat. optim + amiodarana reduc mortal si riscul de ms
    - ICD reduce rata de ms aritmice, in special la pts cu boala ischemica
    - Pts cu QRS > 130ms – candidati pt CRT-D
    - nu se recomandata la pts cu comorbiditati severe sau IC refractara cu speranta de viata< 1 an
    - Defibrilator subcutanat sau “wearable” – solutii pt pts cu risc la care nu se poate implanta ICD

TRATAMENT -DISPOZITIVE

Recommendations for implantable cardioverter-defibrillator in patients with heart failure

Recommendations	Class [a]	Level [b]	Ref [c]
Secondary prevention An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients who have recovered from a ventricular arrhythmia causing haemodynamic instability, and who are expected to survive for >1 year with good functional status.	I	A	223–226
Primary prevention An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA Class II–III), and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than one year with good functional status, and they have:			
• IHD (unless they have had an MI in the prior 40 days – see below).	I	A	149, 156, 227
• DCM.	I	B	156, 157, 227
ICD implantation is not recommended within 40 days of an MI as implantation at this time does not improve prognosis.	III	A	158, 228
ICD therapy is not recommended in patients in NYHA Class IV with severe symptoms refractory to pharmacological therapy unless they are candidates for CRT, a ventricular assist device, or cardiac transplantation.	III	C	229–233
Patients should be carefully evaluated by an experienced cardiologist before generator replacement, because management goals and the patient's needs and clinical status may have changed.	IIa	B	234–238
A wearable ICD may be considered for patients with HF who are at risk of sudden cardiac death for a limited period or as a bridge to an implanted device.	IIb	C	239–241

CAD = coronary artery disease; CRT = cardiac resynchronization therapy; DCM = dilated cardiomyopathy; HF = heart failure; ICD = implantable cardioverter-defibrillator; IHD = ischaemic heart disease; LVEF = left ventricular ejection fraction; MI = myocardial infarction; NYHA = New York Heart Association, OMT = optimal medical therapy.
[a]Class of recommendation.
[b]Level of evidence.
[c]Reference(s) supporting recommendations

TRATAMENT- DISPOZITIVE

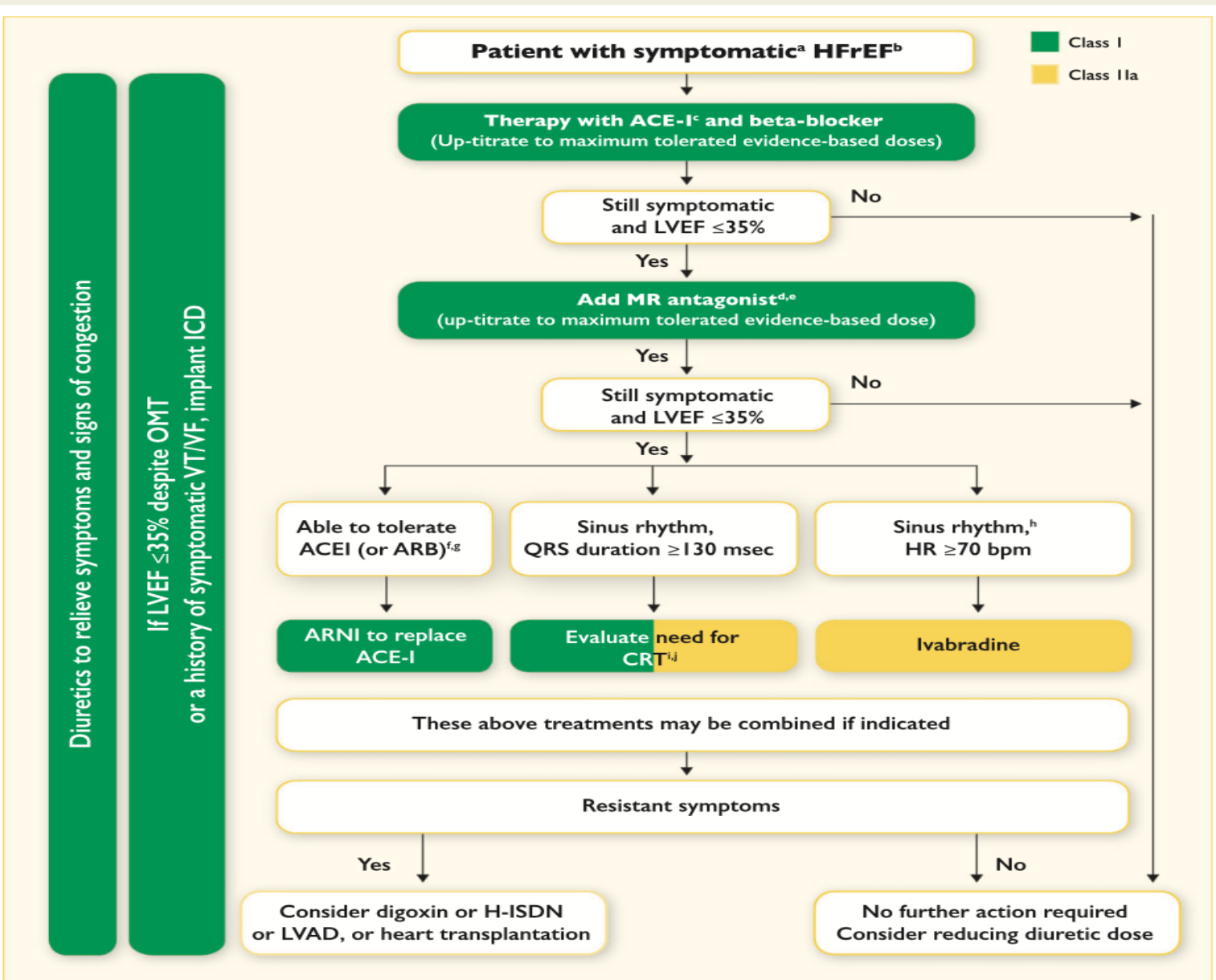
- CARDIOSTIMULAREA DE RESINCRONIZARE (CRT)
  - In IC – dissincronism intre cei doi ventriculi
  - CRT -efecte benefice:
    - Reduce mortalitatea si morbiditatea
    - Reduce simpt, imbunatatind calitatea vietii
  - Conditii pt CRT:
    - FE < 35%
    - QRS > 130 ms
    - Aspect de BRS complet
  - Cand FE este redusa, pacing-ul VD accentueaza disincronismul => CRT
  - Pts cu cicatrice post IM extinsa- prognostic mai rezervat

TRATAMENT- DISPOZITIVE

Recommendations for cardiac resynchronization therapy implantation in patients with heart failure

Recommendations	Class [a]	Level [b]	Ref [c]
CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration ≥150 msec and LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	I	A	261–272
CRT should be considered for symptomatic patients with HF in sinus rhythm with a QRS duration ≥150 msec and non-LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	IIa	B	261–272
CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 msec and LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	I	B	266, 273
CRT may be considered for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 msec and non-LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	IIb	B	266, 273
CRT rather than RV pacing is recommended for patients with HFrEF regardless of NYHA class who have an indication for ventricular pacing and high degree AV block in order to reduce morbidity. This includes patients with AF (see Section 10.1).	I	A	274–277
CRT should be considered for patients with LVEF ≤35% in NYHA Class III–IV[d] despite OMT in order to improve symptoms and reduce morbidity and mortality, if they are in AF and have a QRS duration ≥130 msec provided a strategy to ensure bi-ventricular capture is in place or the patient is expected to return to sinus rhythm.	IIa	B	275, 278–281
Patients with HFrEF who have received a conventional pacemaker or an ICD and subsequently develop worsening HF despite OMT and who have a high proportion of RV pacing may be considered for upgrade to CRT. This does not apply to patients with stable HF.	IIb	B	282
CRT is contra-indicated in patients with a QRS duration < 130 msec.	III	A	266, 283–285

STATEGIE DE MANAGEMENT AL IC



TRATAMENT

- IC CU FE PASTRATA (>50%) SI MEDIE (40-49%)
  - Fiziopatologie heterogena
  - Asociata cu comorbiditati:
    - CV (HTA, fia, CI, HTP)
    - non CV (DZ, boala renala cr., deficienta de FE, anemie,, BPOC, obezitate)
    - Frecvent intalnita la batrani
  - Mortalitatea si spitalizarile datorate majoritar comorbiditatilor necardiace
  - Niciun trat nu are dovezi convingatoare pt reducerea mortalitatii si morbiditatii
  - Trat. simpt folosind aceleasi clase de medicamente, in special diuretice la pts congestivi
  - Noi trialuri clinice promitatoare in desfasurare

PREVENTIA IC E POSIBILA?

- Trat FR modificabili si trat disfunctiei VS asimpt
  - Trat. HTA: betabl, IEC/ARBs, diuretice
    - Studiul SPRINT
  - Empaglifozin –reduce mortal si sptializ pt IC la pts cu DZ tip 2
  - Abandonarea fumatului
  - Consum redus de alcool
  - Activitatea fizica –efect favorabil
  - Evitarea obezitatii
  - Trat corect si precoce al IMA, PCI per primam, trat. medical optimin, inclusiv ICD (FE< 30%)

PREVENTIE IC

Recommendations to prevent or delay the development of overt heart failure or prevent death before the onset of symptoms

Recommendations	Class [a]	Level [b]	Ref [c]
Treatment of hypertension is recommended to prevent or delay the onset of HF and prolong life.	I	A	126, 129, 150, 151
Treatment with statins is recommended in patients with or at high-risk of CAD whether or not they have LV systolic dysfunction, in order to prevent or delay the onset of HF and prolong life.	I	A	137–140, 152
Counselling and treatment for smoking cessation and alcohol intake reduction is recommended for people who smoke or who consume excess alcohol in order to prevent or delay the onset of HF.	I	C	131–134
Treating other risk factors of HF (e.g. obesity, dysglycaemia) should be considered in order to prevent or delay the onset of HF.	IIa	C	130, 141, 153–155
Empagliflozin should be considered in patients with type 2 diabetes in order to prevent or delay the onset of HF and prolong life.	IIa	B	130
ACE-I is recommended in patients with asymptomatic LV systolic dysfunction and a history of myocardial infarction in order to prevent or delay the onset of HF and prolong life.	I	A	5, 144, 145
ACE-I is recommended in patients with asymptomatic LV systolic dysfunction without a history of myocardial infarction, in order to prevent or delay the onset of HF.	I	B	5
ACE-I should be considered in patients with stable CAD even if they do not have LV systolic dysfunction, in order to prevent or delay the onset of HF.	IIa	A	142
Beta-blocker is recommended in patients with asymptomatic LV systolic dysfunction and a history of myocardial infarction, in order to prevent or delay the onset of HF or prolong life.	I	B	146
ICD is recommended in patients: a) with asymptomatic LV systolic dysfunction (LVEF ≤30%) of ischaemic origin, who are at least 40 days after acute myocardial infarction, b) with asymptomatic non-ischaemic dilated cardiomyopathy (LVEF ≤30%), who receive OMT therapy, in order to prevent sudden death and prolong life.	I	B	149, 156–158

TEST

Barbat, 45 ani, cu dispnee la eforturi mici, cu edeme gambiere, hepatomegalie de staza , cu infarct miocardic in antecedente, TA=140/90 mmHg; NT-proBNP - 2300 pg/ml, eco-FEVS-30%

Care este diagnosticul ?

- IC cu FE pastrata
- IVS asimpt
- IM vechi
- IC cu FE redusa

TEST

Care sunt optiunile terapeutice?

- Inhibitori ai enzimei de converasie
- Betablocante
- Blocante de calciu
- Inhibitori ai aldosteronului
- CRT-D