CASE PRESENTATION

UNCOMMON PRESENTATION OF COMMON DISEASE

Dr. Fedor Saburov

OBJECTIVES

By the end of this presentation participants will be able

- Describe the standard treatment regimen of HFrEF
- List common barriers to implement this treatment in primary care
- Describe some practical aspects of HF treatment

No financial interests to disclose

CASE PRESENTATION

A 40 yo woman presented to the ER with a new onset of shortness of breath and orthopnea.

- PMH: HTN, the treatment was discontinued because of BP was normal/low
- DM, on Ozempic, Hgb A1C 5
- Depression and Anxiety
- Asthma, not on treatment

CASE PRESENTATION

Home medications

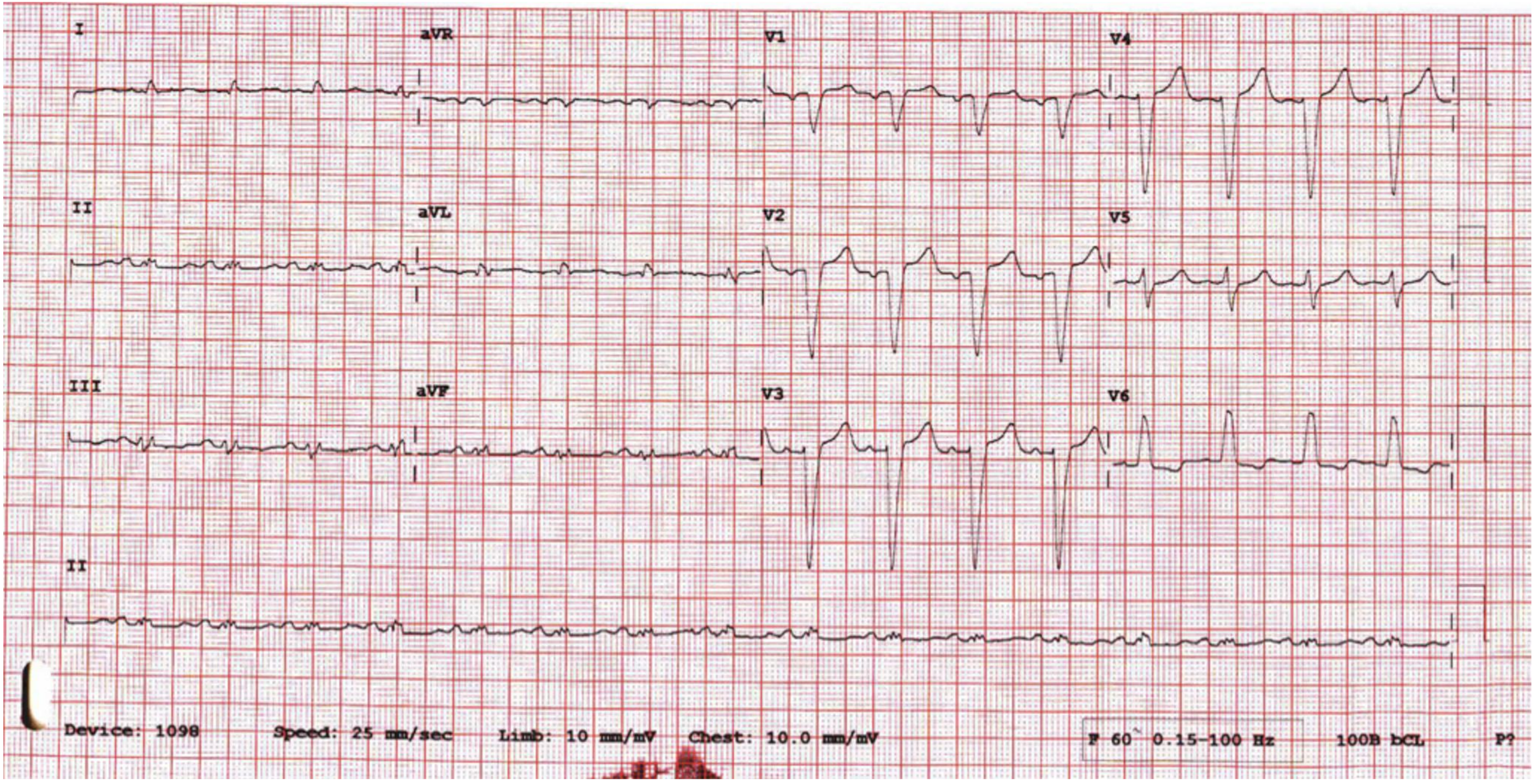
- Ozempic 1 mg SC weekly.
- Wellbutrin XL 300 mg daily.
- Effexor XR 300 mg daily.
- Lorazepam 0.5 mg as needed.
- Salbutamol 100 mcg one to two inhalations as needed.
- Trazodone 100 mg daily.
- Vitamin B12 1 mg IM monthly.

CASE PRESENTATION

- SOB with physical activities started a week prior to her presentation, gradually progressed to significant limitation and inability to lay flat. Dyspnea was accompanied by some chest pain.
- She was in good health prior to that. No acute illnesses, no vaccinations.
- She drank alcohol “too much” - 3 drinks a day 5 days a week; smoked a few cigarettes a day.
- FAMILY HISTORY: father died of a heart attack at the age of 53.

PHYSICAL EXAMINATION

- Looked well.
- VS: BP 111/81, HR 98/min, Sat 97% on ambient air.
- JVP +6 cm. Heart sounds were regular without murmurs.
- Few crackles in the lungs.
- No peripheral edema.
- POCUS Poor LVF


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
Device: 1098
Speed: 25 mm/sec
Limb: 10 mm/mV
Chest: 10.0 mm/mV
F 60 0.15-100 Hz
100B bCL
P?

CASE PRESENTATION

HEMATOLOGY		
WBC		6.9
RBC		4.27
HGB		138
HCT		0.403
MCV		94
MCH		32.4
MCHC		343
RDW		15.4
Platelet Count		221
MPV		7.9
Auto Neutrophils Abs		4.9
Auto Lymphocytes Abs		1.3
Auto Monocytes Abs		0.6
Auto Eosinophils Abs		0.1
Auto Basophils Abs		0.0
Auto Nucleated RBC		0
ESR (Sed Rate)		
COAGULATION		
INR		1.1 (f)
PTT		27
D Dimer Quantitative		707 H

CHEMISTRY		
Glucose Random		5.4
Urea (BUN)		1.9 L
Creatinine		43 (f) L
Sodium		133 L
Potassium		3.8
Chloride		103
CO2		24
Anion Gap		9.8 L
Bilirubin, Total		9
Bilirubin, Conjugated		0
Bilirubin, Unconjugatec		9
Calcium		
Corrected Calcium		
Phosphorus		
Albumin		36
Lipase Level		30
Alkaline Phosphatase		61 (f)
ALT (SGPT)		26
Troponin I (mcg/L)	<0.02 (f)	<0.02 (f)

NT-proBNP	3,632 (f) H

CASE PRESENTATION

CT ANGIO

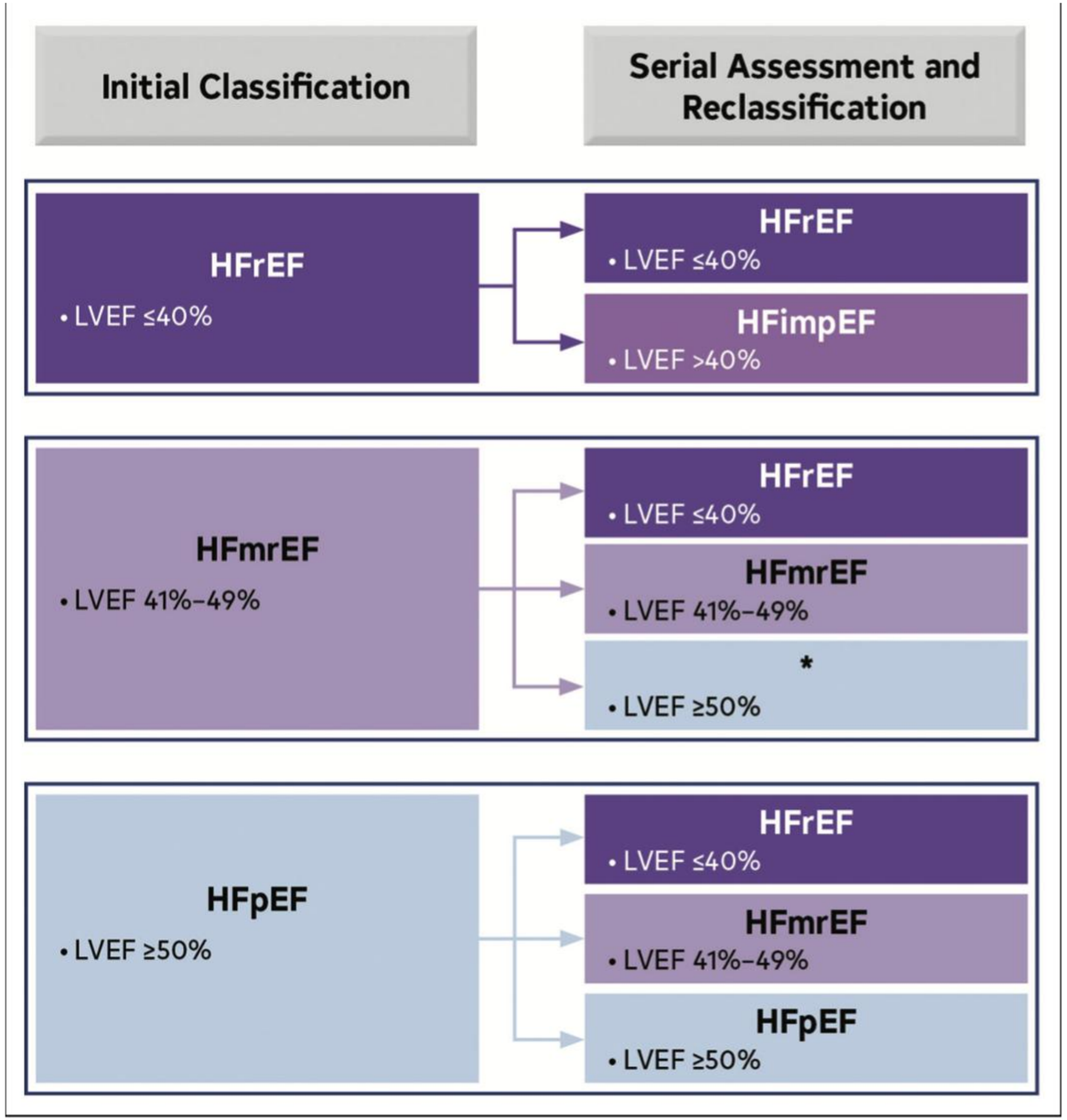
- No evidence of PE.
- The findings are suspicious for pulmonary edema with bilateral pleural effusions. Superimposed infection is difficult to exclude.

- Admitted with new HEART FAILURE

CASE PRESENTATION

ECHO

- Moderate LV cavity dilatation. Severe LV systolic dysfunction. EF 17%.
- Severe hypokinesis to akinesis. Increased left atrial pressure.
- Normal RV size and function. RVSP is mildly increased; 46.6 mmHg.
- Severe LA and mild RA enlargement.
- Moderate MR, mild TR.
- No significant pericardial effusion. Moderate bilateral pleural effusion.
- Suggestive of ischemic cardiomyopathy.


Initial Classification
Serial Assessment and Reclassification
HFrEF
• LVEF ≤40%
HFrEF
• LVEF ≤40%
HFimpEF
• LVEF >40%
HFmrEF
• LVEF 41%–49%
HFrEF
• LVEF ≤40%
HFmrEF
• LVEF 41%–49%
*
• LVEF ≥50%
HFpEF
• LVEF ≥50%
HFrEF
• LVEF ≤40%
HFmrEF
• LVEF 41%–49%
HFpEF
• LVEF ≥50%

JAMA | The Rational Clinical Examination

Does This Patient Have Volume Overload?
The Rational Clinical Examination

Benjamin Drum, MD, PhD; Bryce La Course, MD; Mark Kelly, MD; Audrey York, MD; Emily Worrall, MD; Jennifer Martins, MD; Stacy Johnson, MD; Edmund A. Liles Jr, MD

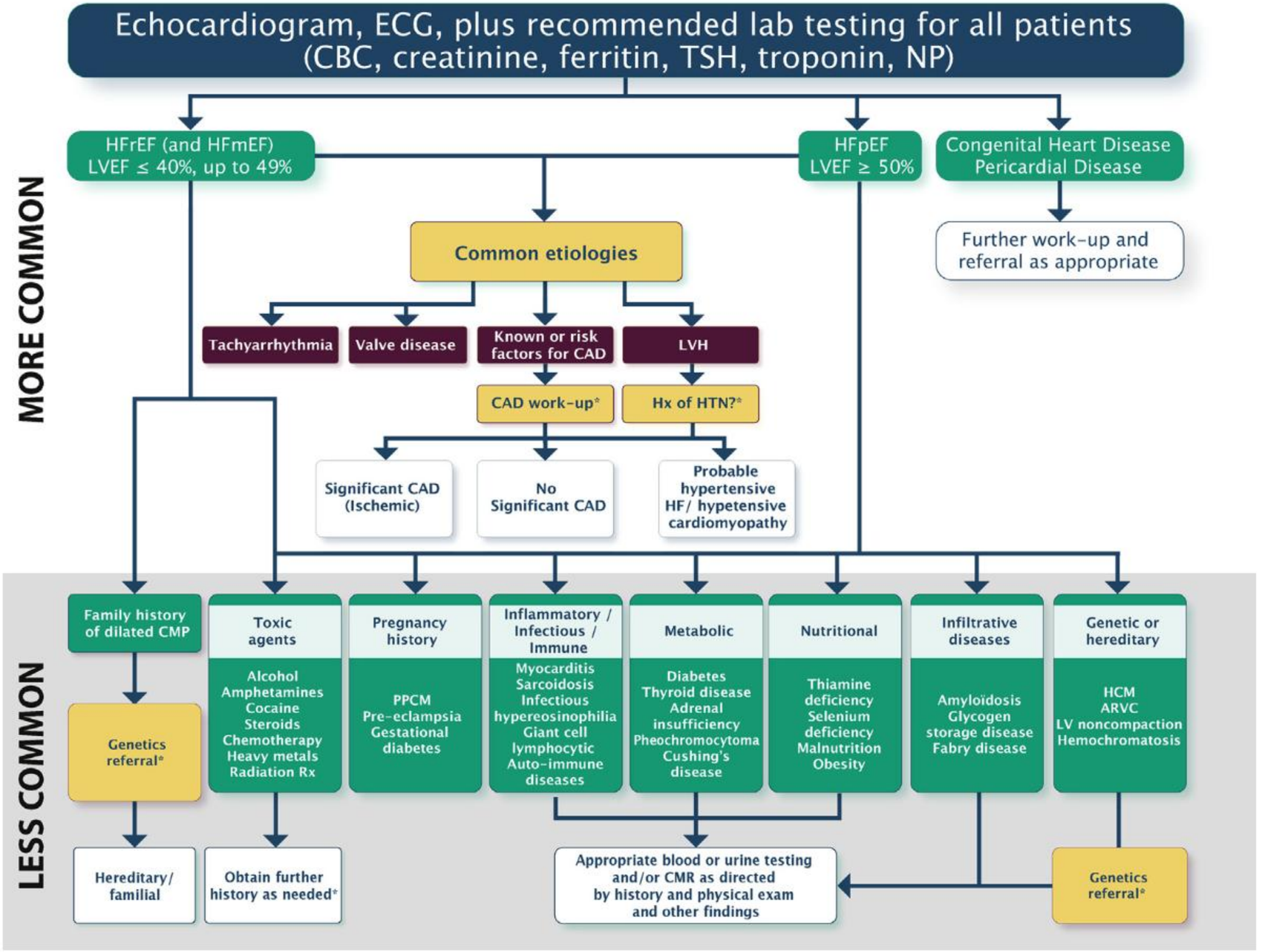
Table. Summary of Diagnostic Accuracy for Tests of Volume Overload[a]

Measures of volume overload	No. of studies	Prevalence of volume overload, No. (% range) of patients	Cutoff for measures	% (95% CI)		Likelihood ratio (95% CI)	
				Sensitivity	Specificity	Positive	Negative
Clinical examination							
Jugular venous pressure or distention	10	5041 (9-53)	>3 cm above sternal angle	35 (26-44)	92 (89-95)	4.1 (2.9-5.6)	0.72 (0.60-0.87)
Auscultation of crackles	3	2363 (12-63)	Present	56 (15-97)	81 (60-100)	2.7 (1.7-4.5)	0.56 (0.32-1.0)
Lower extremity edema	9	5335 (17-55)	Absent	44 (33-55)	80 (73-87)	2.2 (1.5-3.1)	0.67 (0.52-0.87)
Chest radiography							
Intravascular congestion	7	2584 (35-62)	Various[b]	51 (35-68)	91 (87-95)	5.9 (2.9-12)	0.53 (0.37-0.76)
Point-of-care ultrasonography							
Pulmonary B-lines	11	1182 (28-62)	>2 B-lines in 2 zones bilaterally	93 (83-97)	77 (67-85)	4.0 (2.6-6.1)	0.09 (0.04-0.23)
Inferior vena cava collapsibility index (<80%)	4	377 (39-59)	<50%	82 (65-92)	79 (66-88)	3.9 (2.5-6.1)	0.22 (0.11-0.45)
Ultrasonographic jugular venous pressure	6	592 (35-64)	>8 cm above right atrium	81 (76-87)	71 (65-78)	2.8 (2.2-3.5)	0.26 (0.20-0.33)
Laboratory findings							
Brain-type natriuretic peptide[c]	6	3494 (42-69)	≥100 ng/mL	87 (78-93)	87 (66-96)	6.9 (2.4-20)	0.14 (0.08-0.24)

[a] See eTable 2 in the Supplement for results from individual studies.

[b] Chest radiography cutoffs included peribronchial cuffing, presence of interstitial edema, and pulmonary congestion.

[c] N-terminal brain-type natriuretic peptide cutoff ranged from 283-817 for single-point cutoff and 450-1800 for age-related cutoff.


Echocardiogram, ECG, plus recommended lab testing for all patients (CBC, creatinine, ferritin, TSH, troponin, NP)
MORE COMMON
HFrEF (and HFmEF) LVEF ≤ 40%, up to 49%
HFpEF LVEF ≥ 50%
Congenital Heart Disease Pericardial Disease
Further work-up and referral as appropriate
Common etiologies
Tachyarrhythmia
Valve disease
Known or risk factors for CAD
LVH
CAD work-up*
Hx of HTN?*
Significant CAD (Ischemic)
No Significant CAD
Probable hypertensive HF/ hypetensive cardiomyopathy
LESS COMMON
Family history of dilated CMP
Genetics referral*
Hereditary/ familial
Toxic agents
Alcohol
Amphetamines
Cocaine
Steroids
Chemotherapy
Heavy metals
Radiation Rx
Obtain further history as needed*
Pregnancy history
PPCM
Pre-eclampsia
Gestational diabetes
Inflammatory / Infectious / Immune
Myocarditis
Sarcoidosis
Infectious hypereosinophilia
Giant cell lymphocytic
Auto-immune diseases
Metabolic
Diabetes
Thyroid disease
Adrenal insufficiency
Pheochromocytoma
Cushing's disease
Nutritional
Thiamine deficiency
Selenium deficiency
Malnutrition
Obesity
Infiltrative diseases
Amyloïdosis
Glycogen storage disease
Fabry disease
Genetic or hereditary
HCM
ARVC
LV noncompaction
Hemochromatosis
Appropriate blood or urine testing and/or CMR as directed by history and physical exam and other findings
Genetics referral*

ETIOLOGY OF HFrEF

ALCOHOL

- She reported 3 drinks a day 5 days a week ~ 15/w
- Heavy drinking per CCS HF Guidelines 2017 - W >1 /d, M >2/d

Binge drinking W>3/d, M >4 /d

GOVERNMENT of CANADA

Low risk alcohol consumption limits

Women:

limit alcohol to no more than:
2 drinks per day, 10 drinks per week, 3 drinks on special occasions.
avoid drinking alcohol on some days.

Men :
3 drinks per day, 15 drinks per week, 4 drinks on special occasions
avoid drinking alcohol on some days

MYOCARDITIS

ESC European Society of Cardiology

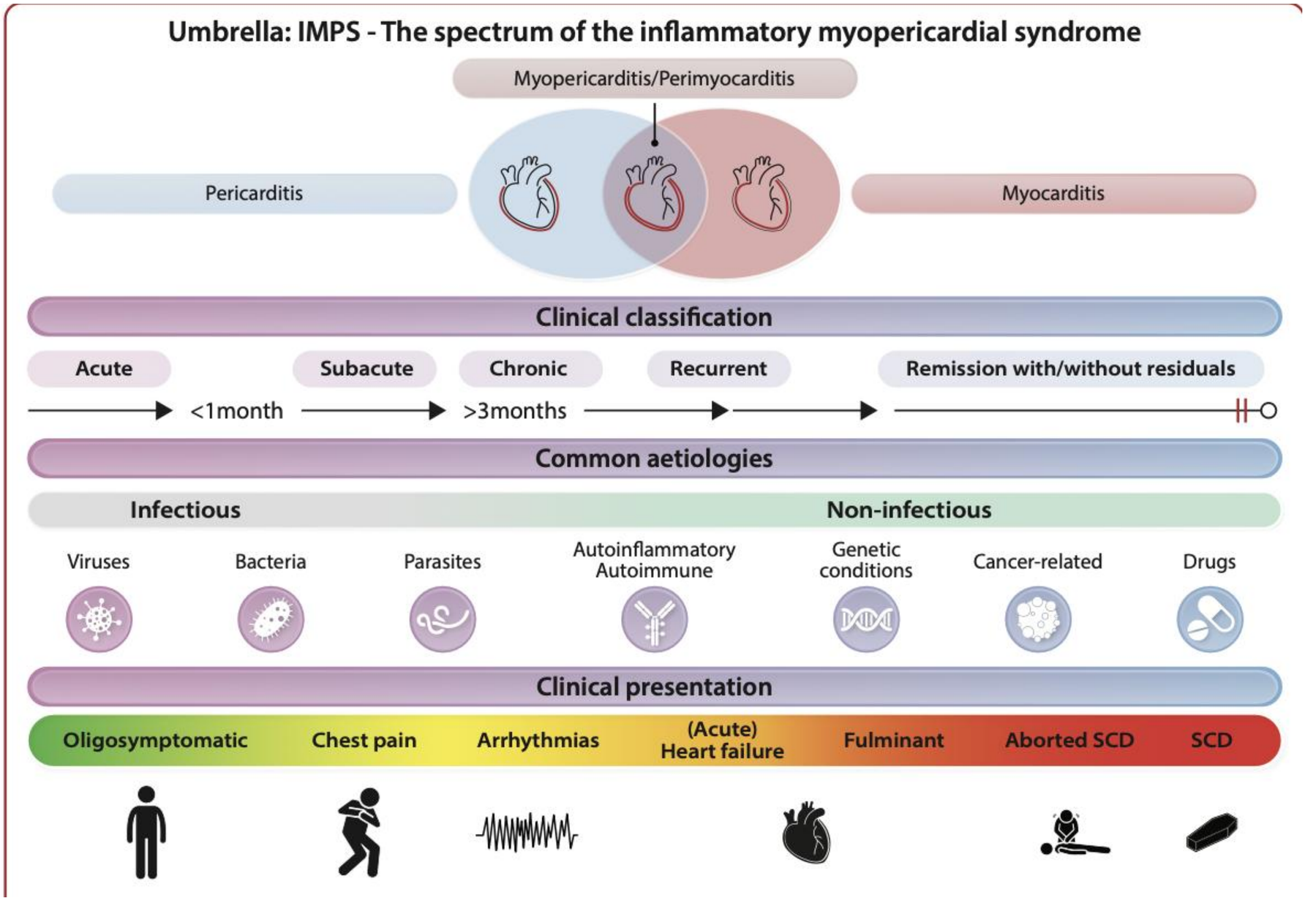
European Heart Journal (2025) **46**, 3952–4041
https://doi.org/10.1093/eurheartj/ehaf192

ESC GUIDELINES

2025 ESC Guidelines for the management of myocarditis and pericarditis

Developed by the task for ce for the management of myocarditis and pericarditis of the European Society of Cardiology (ESC)

Endorsed by the Association for European Paediatric and Congenital Cardiology (AEPC) and the European Association for Cardio-Thoracic Surgery (EACTS)


Umbrella: IMPS - The spectrum of the inflammatory myopericardial syndrome
Myopericarditis/Perimyocarditis
Pericarditis
Myocarditis
Clinical classification
Acute
<1month
Subacute
Chronic
>3months
Recurrent
Remission with/without residuals
Common aetiologies
Infectious
Non-infectious
Viruses
Bacteria
Parasites
Autoinflammatory
Autoimmune
Genetic
conditions
Cancer-related
Drugs
Clinical presentation
Oligosymptomatic
Chest pain
Arrhythmias
(Acute)
Heart failure
Fulminant
Aborted SCD
SCD

Myocarditis
Recent or concomitant flu-like syndrome or gastroenteritis
Infarct-like chest pain
Palpitations
HF symptoms
ECG changes[a]
Ventricular arrhythmias (isolated, complex)
Syncope
Haemodynamic instability
Elevated markers of myocardial lesion (hs-Tn, CK-MB elevation)
Elevated markers of HF (NT-proBNP)
Abnormal wall motion, increased wall thickness and/or impaired systolic function on imaging
CMR imaging with myocardial oedema and/or LGE

If diagnostic criteria for myocarditis and/or pericarditis are fulfilled[a]	
	Myocarditis
Definite	Clinical presentation[b] and CMR- or EMB-proven
Possible	Clinical presentation[b] with at least 1 additional criterion CMR- or EMB-uncertain or not available
Unlikely/rejected	Only clinical presentation[b] without additional criteria
Additional criteria beyond clinical presentations[b]	
	Myocarditis
Clinical[b]	Non-specific findings
ECG[c]	ST-T changes
Biomarkers	Troponin elevation
Imaging[d]	Abnormal strain, wall motion, reduced EF Myocardial oedema and/or LGE (CMR findings)

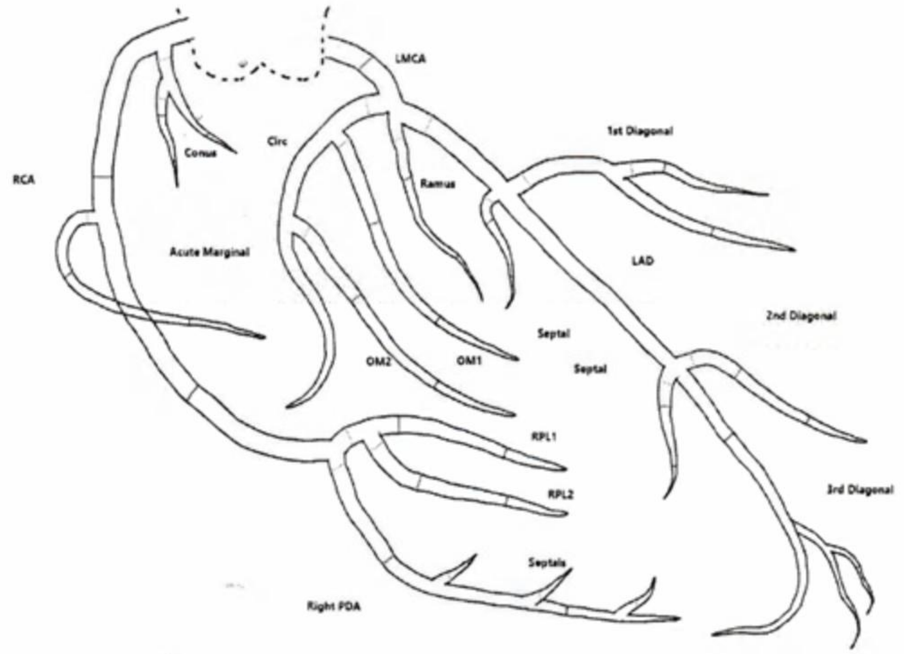
Myocarditis?

CRP 33
TnI < 0.02

OTHER ETIOLOGIES

- Hemochromatosis: Ferritin 24, TSAT 10%
- Sarcoidosis : no intra-thoracic lymphadenopathy, serum ACE 14
- TSH 0.77
- Familial - father died of a heart attack at 53.
- Idiopathic
- Chagas - can start decades after initial infection, no characteristic echo findings
- Cardiac amyloidosis, Fabri —> for cardiology

CORONARY ANGIOGRAPHY



Complications:
None

Outcome/Recommendation:
Radial approach. LVEDP 3 mmHg. LVEF < 20%. Coronary angiogram shows normal coronaries.

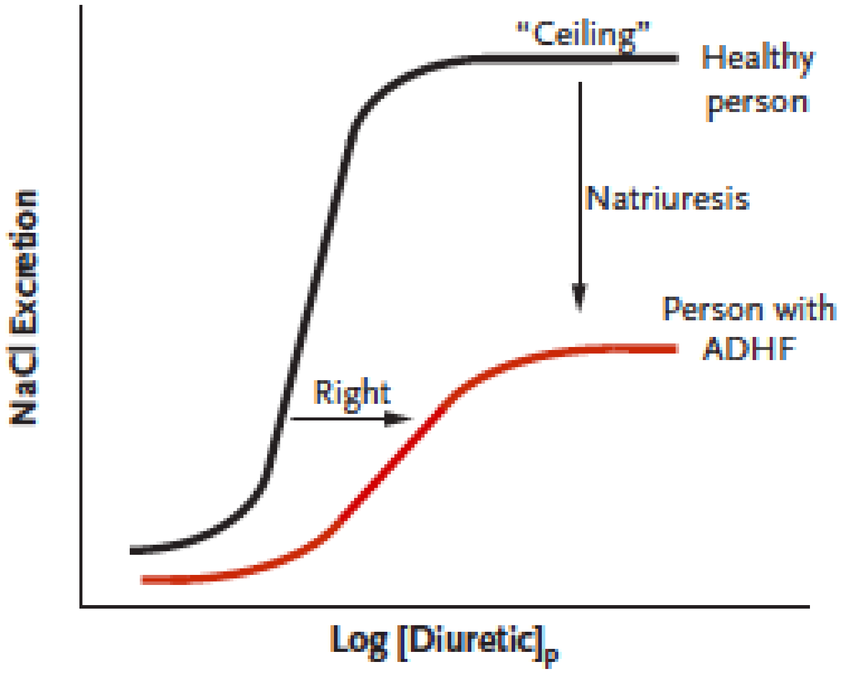
HF TREATMENT

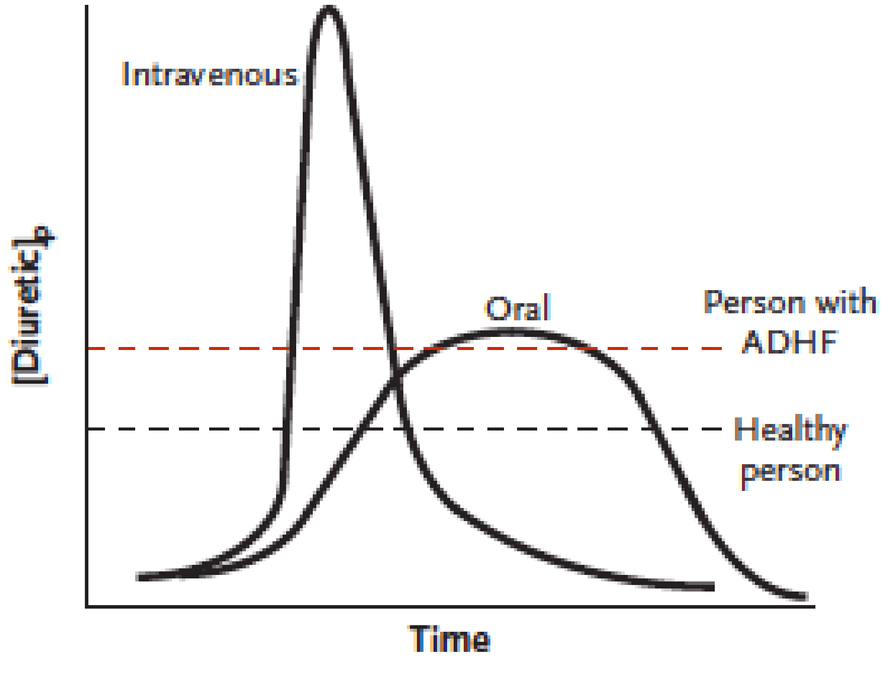
- ACE-I/ARNI[a]
- Beta-blocker
- MRA
- Dapagliflozin/Empagliflozin
- Loop diuretic for fluid retention

(Class I)

HF TREATMENT

DIURETICS





HF TREATMENT

DEGONGESTION

- Loop diuretics - Furosemide, Bumetanide, Torsemide.
- Oral Furosemide depends on the rate of GI absorption, bioavailability ~50% (10-90)
- Furosemide half-life < rate of GI absorption (absorption limited)
- IV x2 potent than PO
- Gut edema and low duodenal blood flow slow absorption, not bioavailability
- Bumetanide, Torsemide - higher bioavailability but no much clinical benefit.

HF TREATMENT

DEGONGESTION

- Furosemide increases NaCl exertion for a few hours
- Adaptations:

  post diuretics Na retention (should decreased Na intake)

  Braking phenomenon (activation of RAAS), nephron remodelling, extra-cellular fluid volume depletion.

- Furosemide - x2 oral dose or IV, better BID

HF TREATMENT

DEGONGESTION

- HypoNatremia - poor prognosis
- Vasopressin receptors antagonist Tolvaptan - improves hyponatremia, no long term clinical effect.

HF TREATMENT

ORIGINAL ARTICLE

Acetazolamide in Acute Decompensated Heart Failure with Volume Overload

ngestion,

CASE PRESENTATION

- She was started with:

  Lasix

  Bisoprolol

  Entresto

  Empagliflozin

HF TREATMENT

Evidence-Based Therapy	Relative Risk Reduction in All-Cause Mortality in Pivotal RCTs, %	NNT to Prevent All-Cause Mortality Over Time*	NNT for All-Cause Mortality (Standardized to 12 mo)	NNT for All- Cause Mortality (Standardized to 36 mo)
ACEi or ARB	17	22 over 42 mo	77	26
ARNi†	16	36 over 27 mo	80	27
Beta blocker	34	28 over 12 mo	28	9
Mineralocorticoid receptor antagonist	30	9 over 24 mo	18	6
SGLT2i	17	43 over 18 mo	63	22
Hydralazine or nitrate‡	43	25 over 10 mo	21	7
CRT	36	12 over 24 mo	24	8
ICD	23	14 over 60 mo	70	23

HF TREATMENT

CJC Open 7 (2025) 1–9

Original Article

The Canadian Heart Failure (CAN-HF) Registry: A Canadian Multicentre, Retrospective Study of Outpatients with Heart Failure

Dimitar Saveski, MD, FRCPC,[a] Melanie Kok, MSc, PhD,[b] Stephanie Poon, MD, MSc, FRCPC,[c] Carlos Rojas-Fernandez, PharmD,[b] Sean A. Virani, MD, MSc, MPH, FRCPC,[d] George Honos, MD, FRCPC,[e] and Robert McKelvie, MD, PhD, FRCPC[a]

[a] *St Joseph's Health Care, Western University, London, Ontario, Canada*

[b] *Novartis Pharmaceuticals Canada Inc., Montreal, Quebec, Canada*

[c] *Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Ontario, Canada*

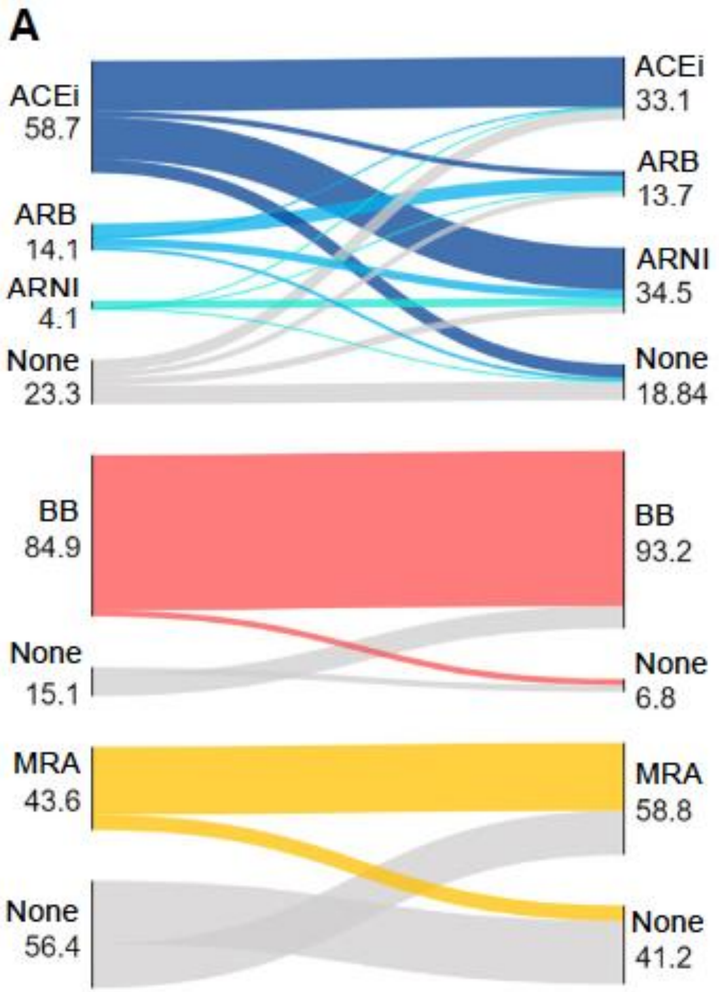
[d] *University of British Columbia, Vancouver, British Columbia, Canada*

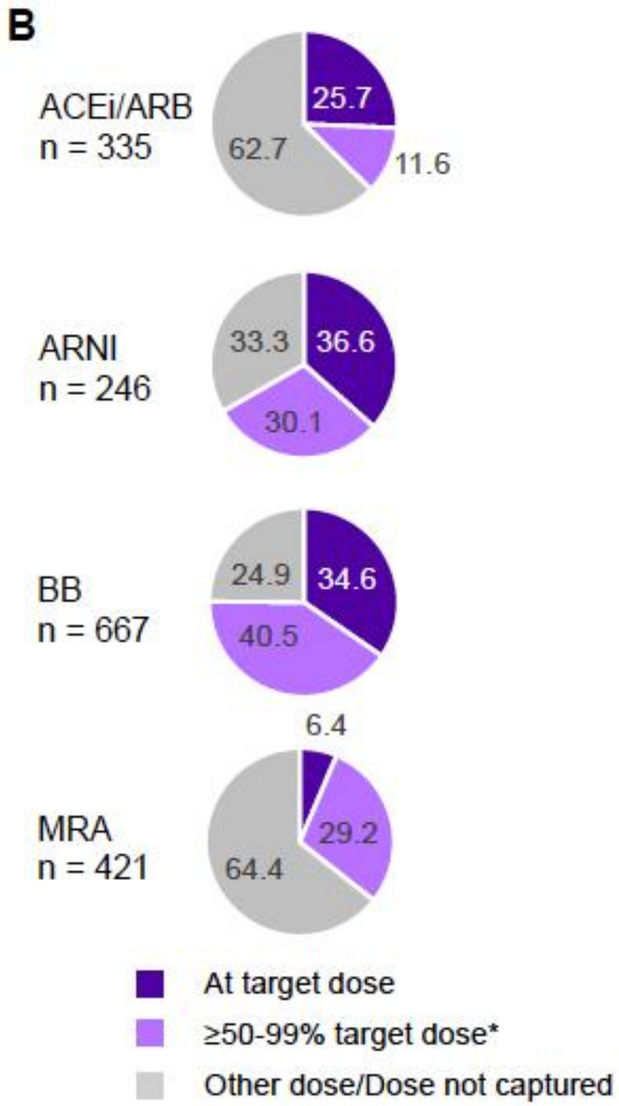
[e] *Center Hospitalier de l'Université de Montréal, Montreal, Quebec, Canada*

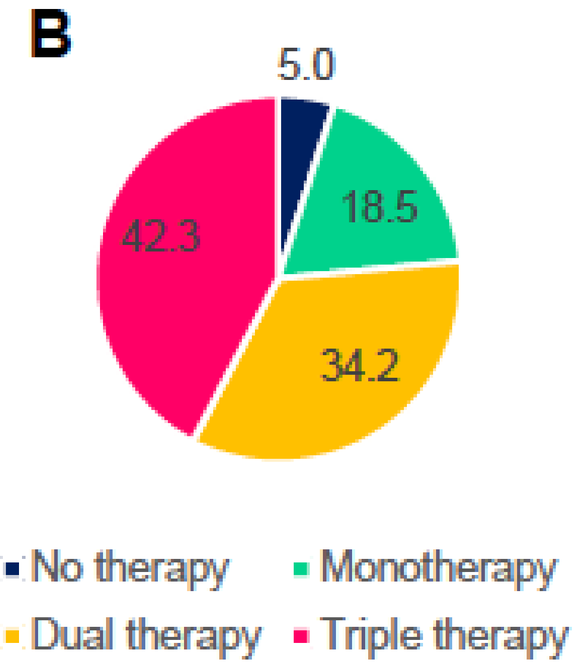
CAN-HF - HFrEF

- Median Age 71
- ~ 30% < 64
- Female 28%

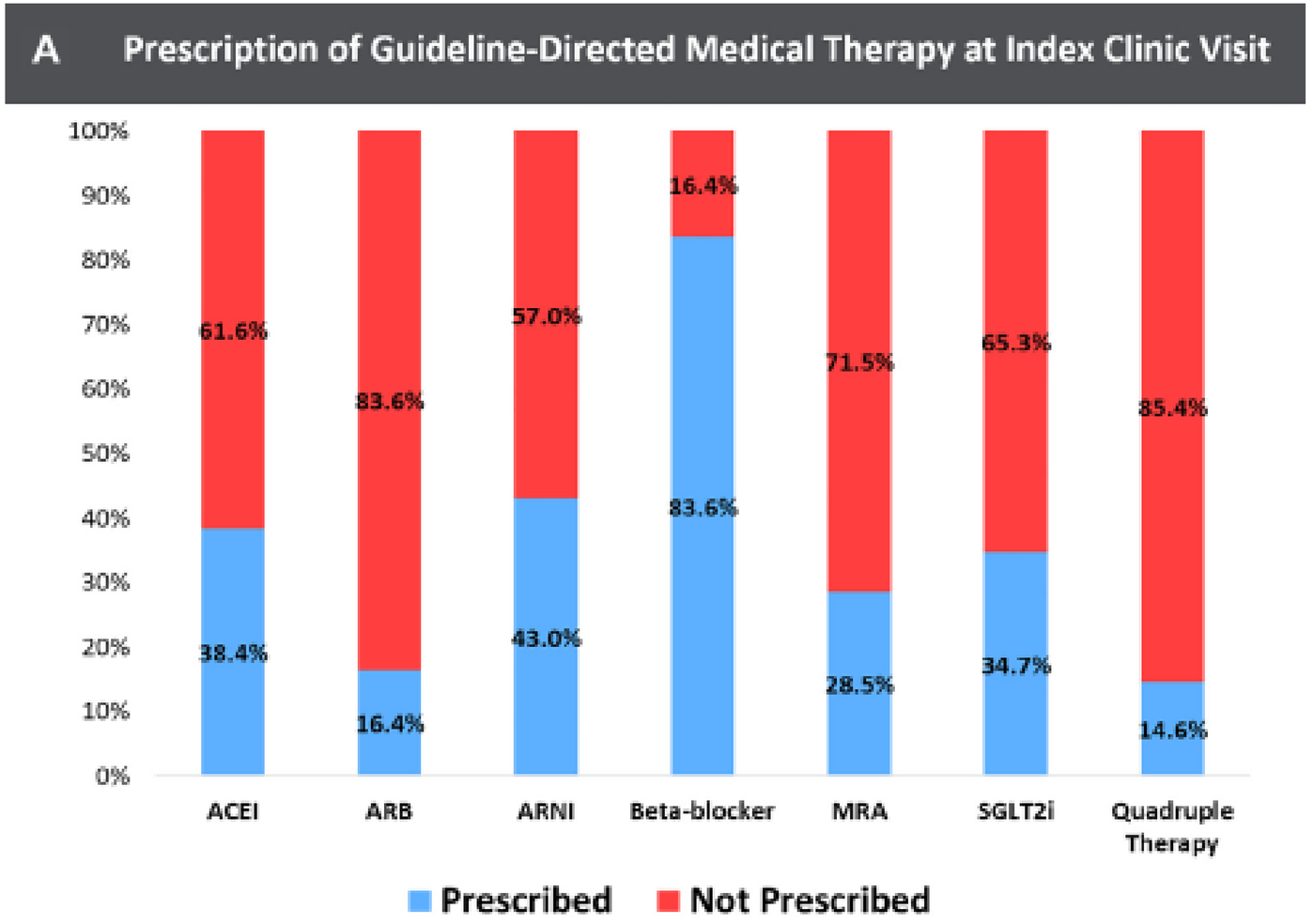
HF TREATMENT



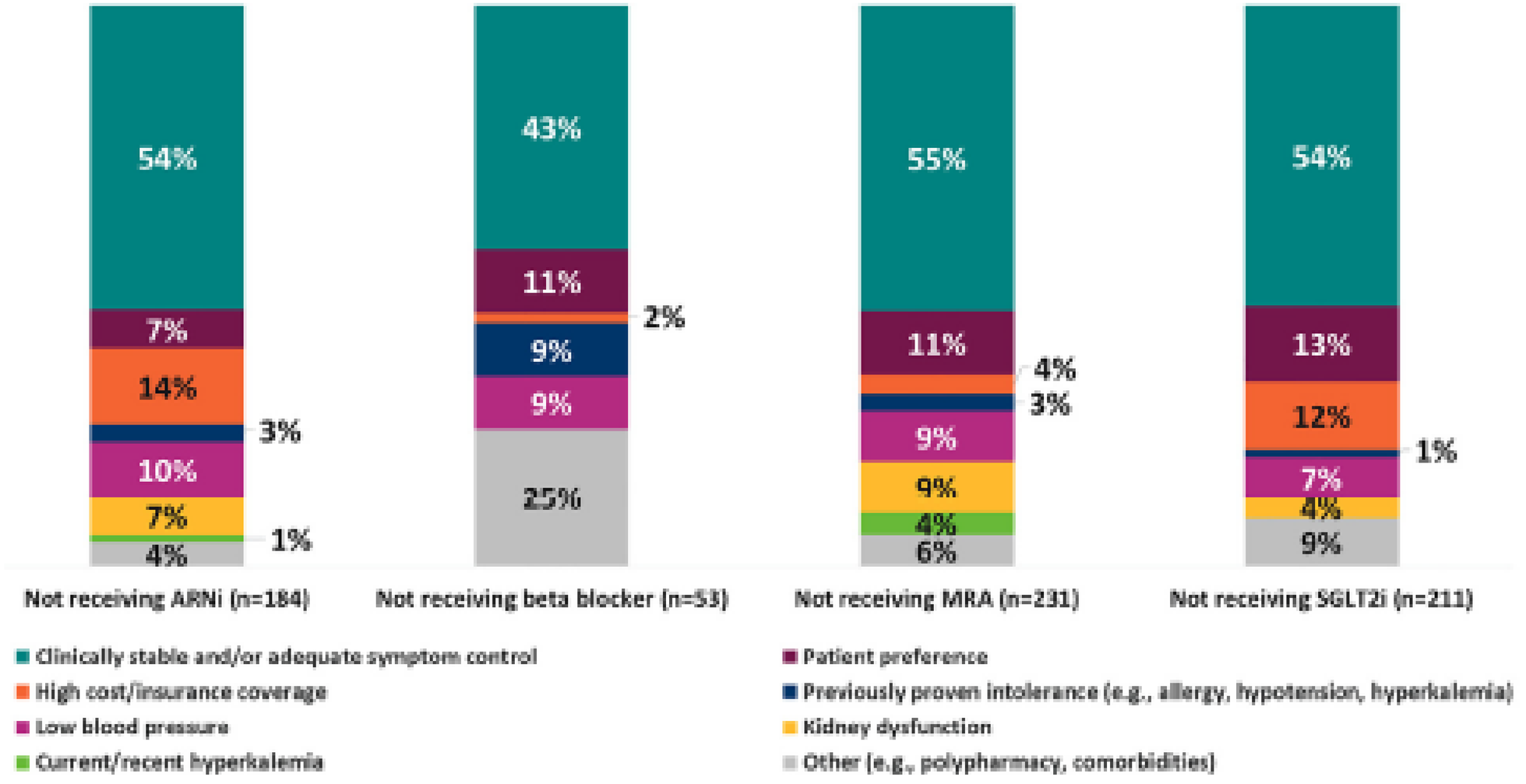




Adelphi Real World HF Disease Specific Programme



B Physician-Reported Reasons for Not Prescribing GDMT at Index Visit



CLINICAL INERTIA

- Might be different perspective of cardiologists vs primary care/ GIM.
- Much discrepancy between patients in clinical studies compared to “real world”
- Primary care pts - more co-morbidities, more medications, frailty
- Patients’ perspectives (quality vs quantity)
- Polypharmacy

HF TREATMENT

PRICE - ODB REIMBURSEMENT

- Entresto $3.70 ~ $220/mo
- Jardiance $2.76 ~ $ 80/mo
- Dapagliflozin $0.68 ~ $ 20/mo
- Ramipril 10 mg $0.1
- Perindopril 8 mg $0.28
- Spironolactone 25 mg $0.04 Aldactone 25 mg $0.27
- Eplerenone 25 mg $1.37 ~ $40/m0
- Metoprolol TARTRATE

TREATMENT BARRIERS

- Low BP - D/C Amlodipine, CCB
- CKD - ARNI and MRA excluded pts with eGFR<30, K >5.
- Polypharmacy - 5 or more medications

HF TREATMENT

SEQUENCE AND TITRATION

- No specific sequence, ACEi/ARBs well tolerated —>ARNI (if SBP>100)
- BB when euvolemic, maybe start later in the course.
- SGLT-2i - right away
- Start multiple medications at once
- Titrate every 1-2 weeks

CASE PRESENTATION

- She started feeling better, was discharged on Entresto, Bisoprolol, Jardiance and Spironolactone
- Referred to HF clinic
- She was doing better according to their note, with some improvement of LVF EF>30%
- Still waiting for cardiac MRI 5 mo after initial presentation.

HF IMPROVED EF

How to continue if HF improved or resolved.

SSC Guidelines 2017 - GDMT can be withdraw in:

- Tachycardia related
- Alcoholic
- Chemotherapy
- Peripartum
- Valve Sx

HF IMPROVED EF

- ACC/AHA/ESC - to continue

Withdrawal of pharmacological treatment for heart failure in patients with recovered dilated cardiomyopathy (TRED-HF): an open-label, pilot, randomised trial

Brian P Halliday, Rebecca Wassall, Amrit S Lota, Zohya Khalique, John Gregson, Simon Newsome, Robert Jackson, Tsveta Rahneva, Rick Wage, Gillian Smith, Lucia Venneri, Upasana Tayal, Dominique Auger, William Midwinter, Nicola Whiffin, Ronak Rajani, Jason N Dungu, Antonis Pantazis, Stuart A Cook, James S Ware, A John Baksi, Dudley J Pennell, Stuart D Rosen, Martin R Cowie, John GF Cleland, Sanjay K Prasad

HF IMPROVED EF

TRED-HF

- Asymptomatic, EF >50%, LVEDV normalized, NT pro-BNP <250.
- 44% had HF relapse after treatment withdrawal.

TEACHING POINTS

- Start with something, safest ACEi/ARBs, ARNI (If $ allow), BB, SGLT-2 (Dapa)
- Metoprolol Tartrate wasn’t used in clinical studies, consider switching to Bisoprolol but maybe it’s as good as succinate.
- Carvedilol and Spironolactone decreased BP
- Painful gynecomastia in 9% on men of Spironolactone
- Increase the dose in some patients
- Order cardiac MRI - my personal teaching point.