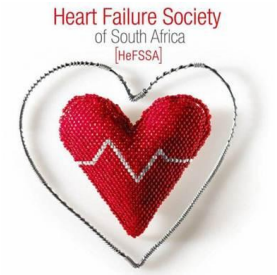
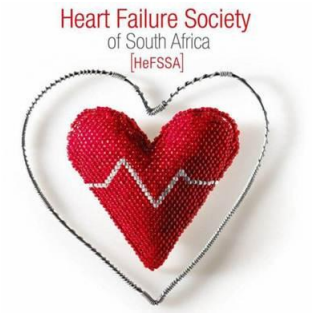


Program

- **Lecture 1:** Update on chronic heart failure –2012 ESC/HeFSSA guidelines
- **Lecture 2:** Update on acute heart failure –2012 ESC/HeFSSA guidelines
- **Lecture 3:** Update on the use of devices and end stage HF -2012 ESC/HeFSSA guidelines
- **Lecture 4:** Diagnosis and management of right heart failure

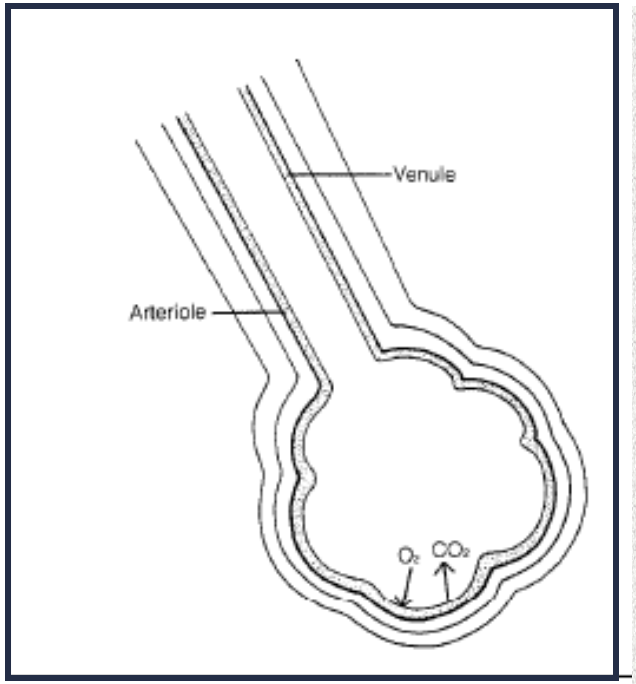


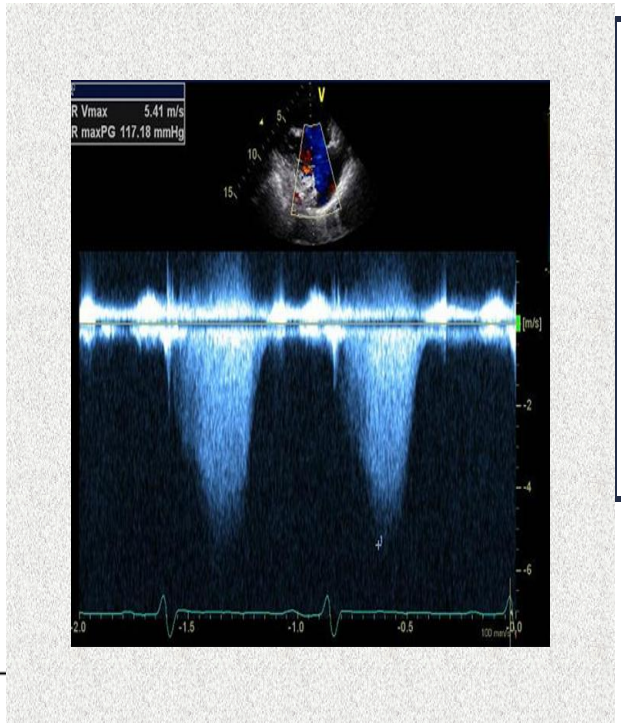
Program

Lecture 4:

UPDATE ON RIGHT HEART FAILURE

Recalcitrant Right Heart Failure



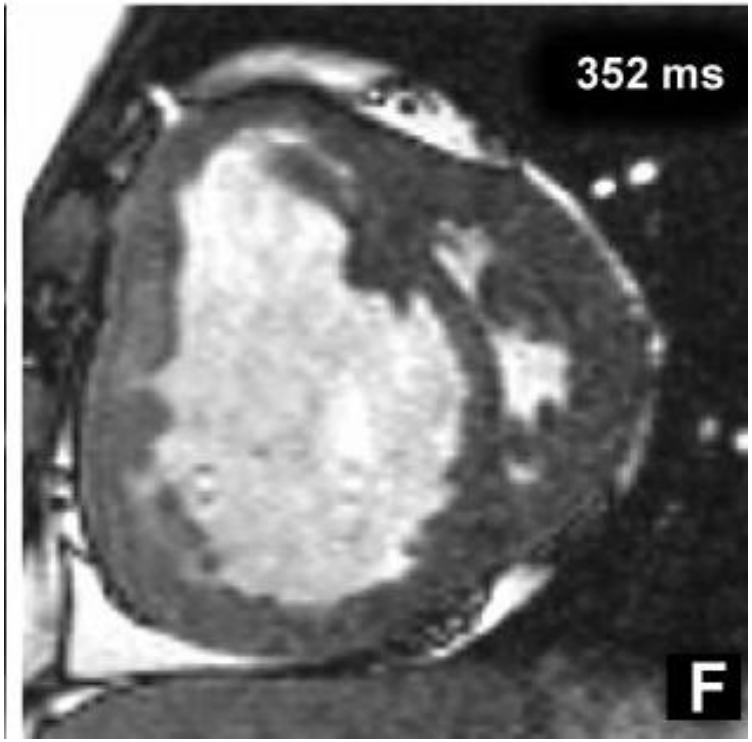


The most common cause of PH is that associated with LVF

Right heart disease

Relatively understudied

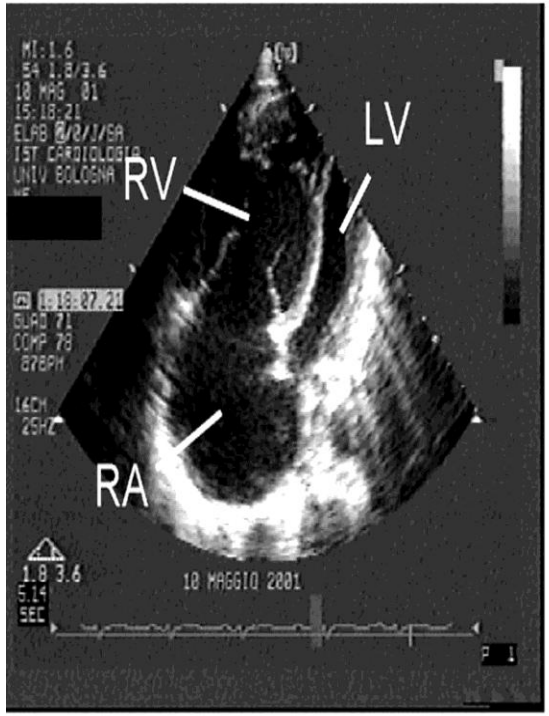
Poorly understood



Pulmonary hypertension prognosis in CHF

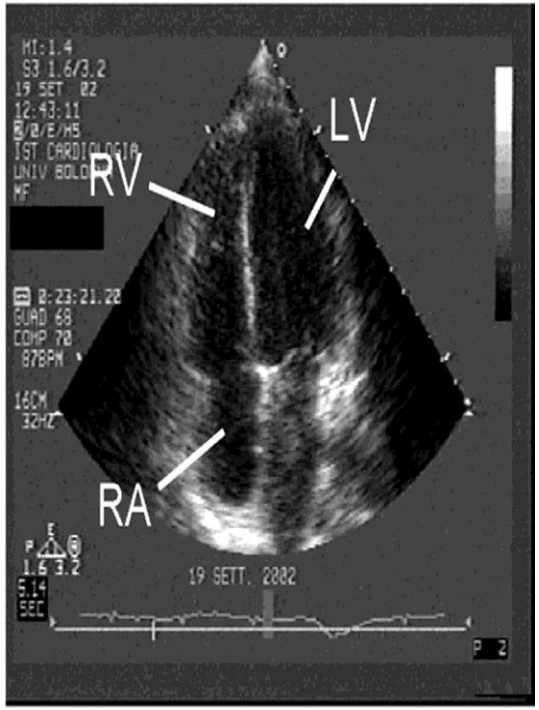
	PHT	NO PHT
Mortality at 28 months (%)	57	17

Ability of the Right Heart to Recover



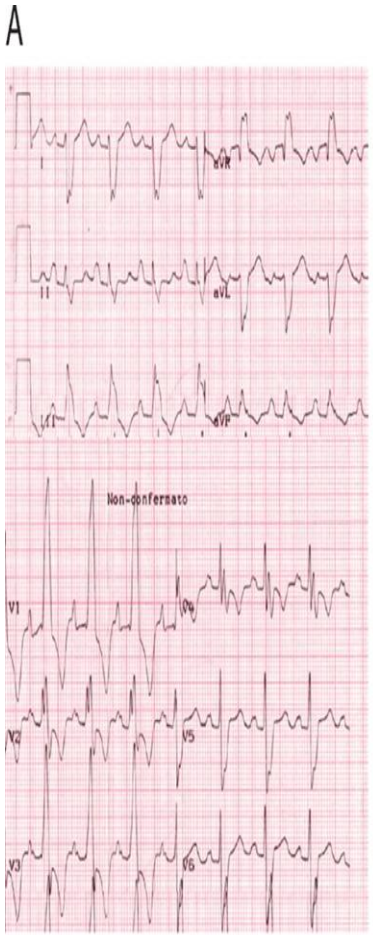
A

PVR = 20 WU



B

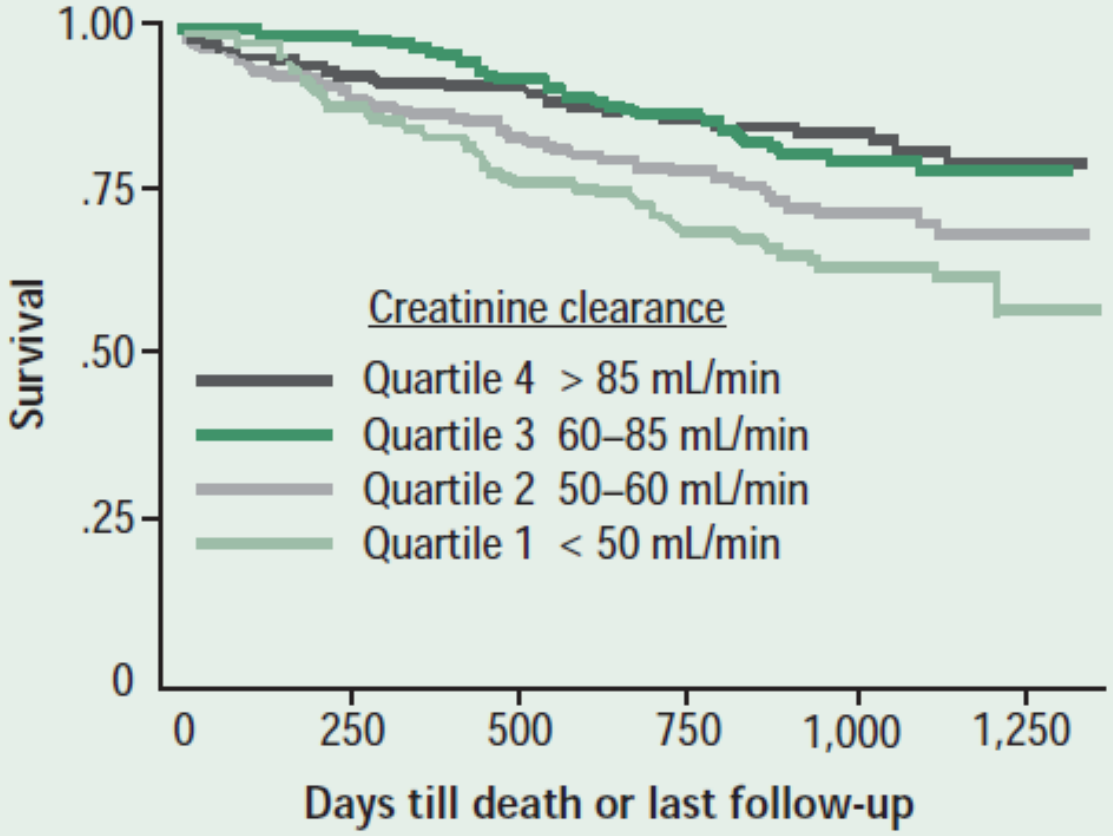
PVR = 1.2 WU



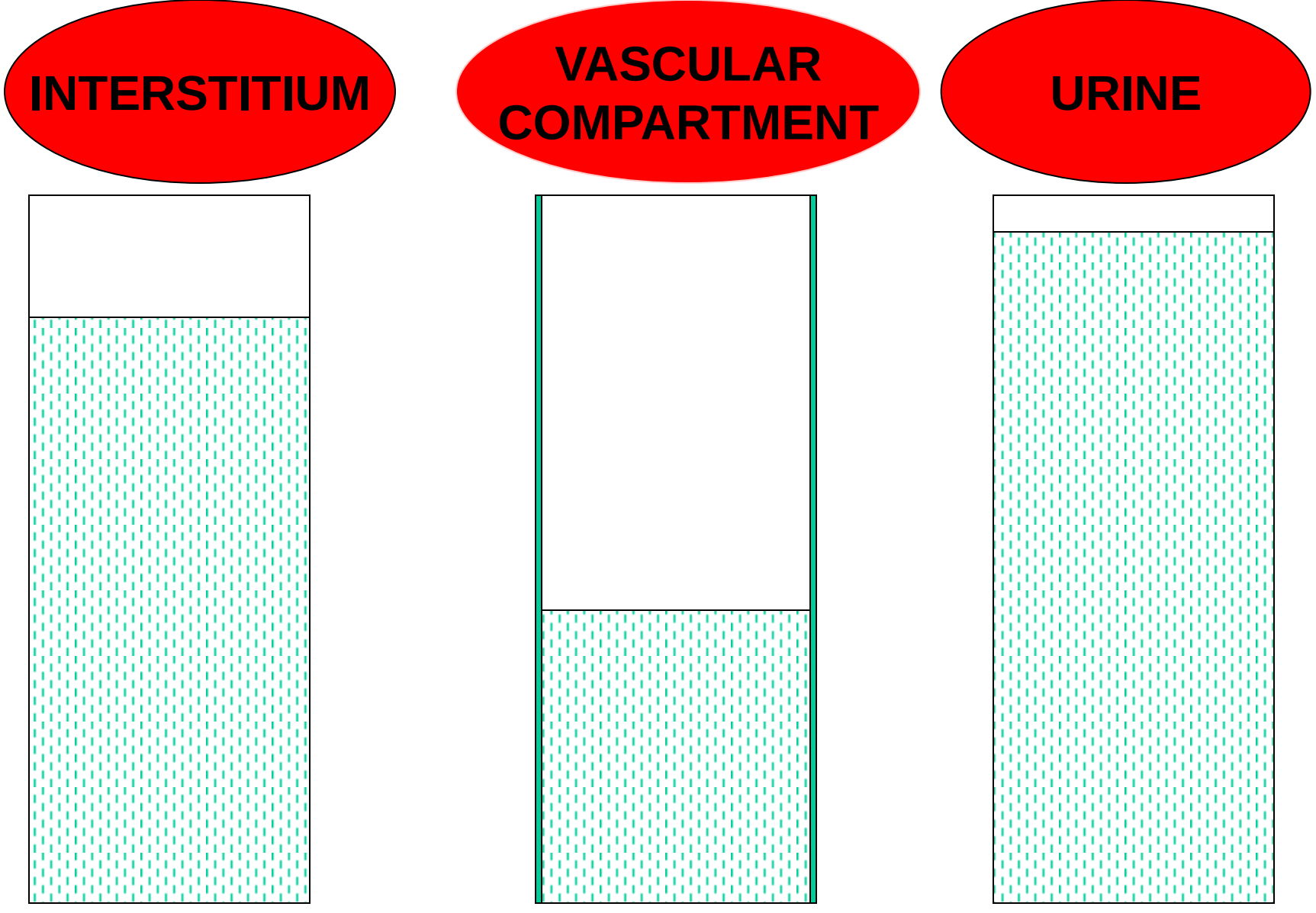
Galié N et al. Eur Heart J Suppl 2007;9:H68-H74

Heart Failure Society of South Africa [HeFSSA]

Mortality and creatinine clearance in heart failure patients: Cleveland Clinic experience



CLEVELAND CLINIC JOURNAL OF MEDICINE VOLUME 73 • SUPPLEMENT 2 JUNE 2006

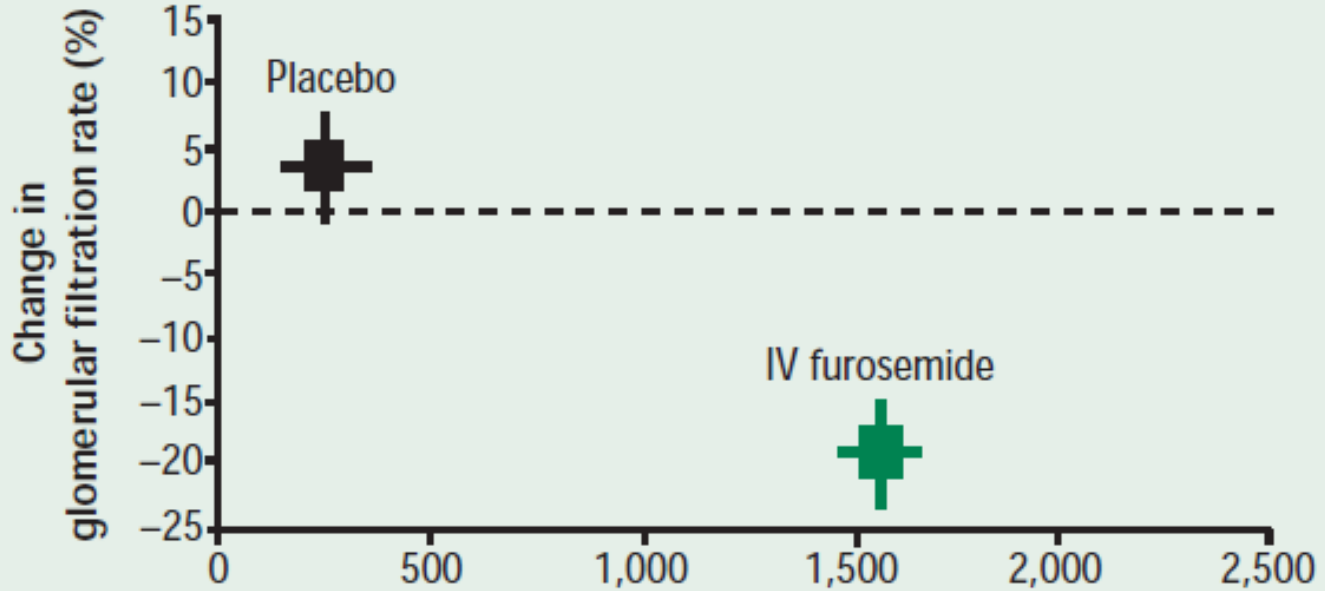


Diuretics and arterial underfilling

Heart Failure Society of South Africa [HeFSSA]

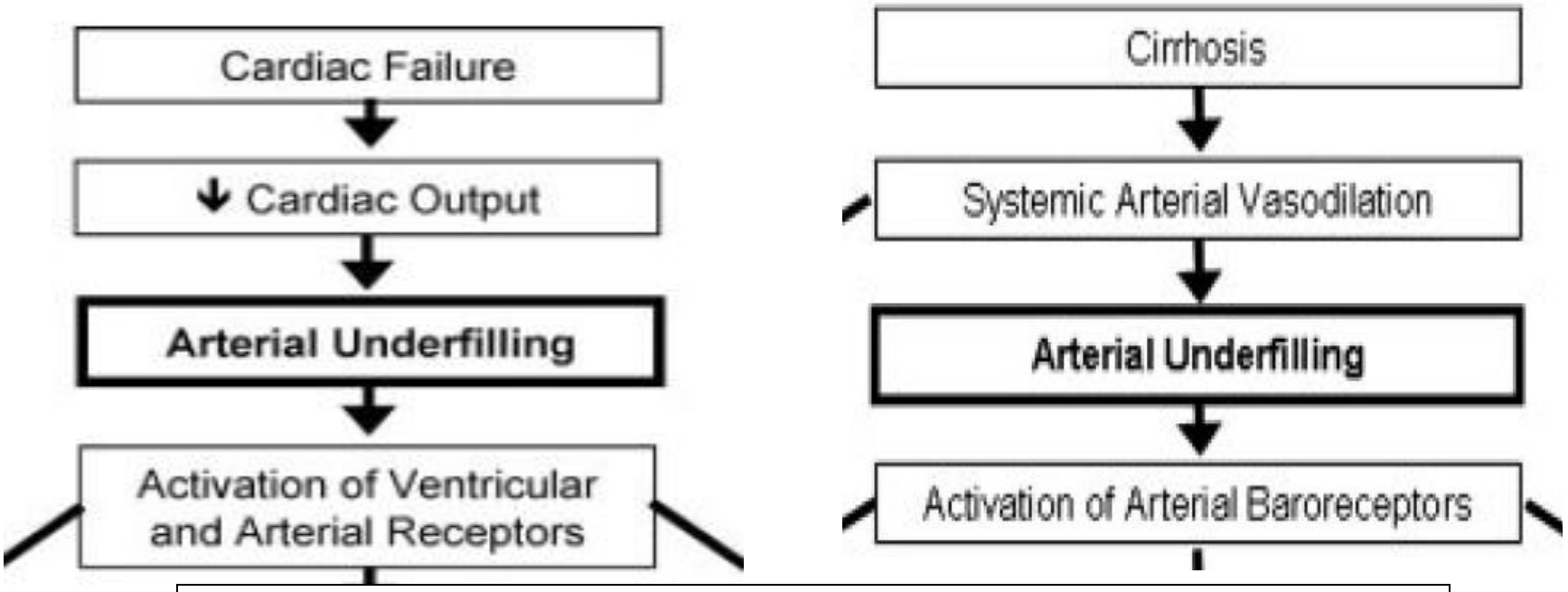
Heart Failure Society of South Africa [HeFSSA]

Furosemide monotherapy may cause significant decline in glomerular filtration rate



Heart Failure Society of South Africa [HeFSSA]

Common Pathophysiology of Cardiac Failure and Cirrhosis



Severe secondary hyperaldosteronism

Circ Heart Fail **2009;2;370-376**

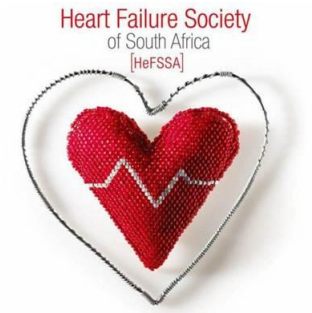
Heart Failure Society of South Africa [HeFSSA]

Case for high doses of MRA

- **Although natriuretic doses of spironolactone are standard therapy in the management of patients with cirrhosis, there has been no large clinical trial evaluating the role of natriuretic doses of MRA's in patients with HF**

- **Use of natriuretic doses of mineralocorticoid antagonists may be a better alternative to reverse diuretic resistance secondary to hyperaldosteronism.**

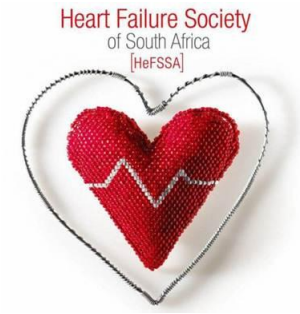
***Circ Heart Fail* 2009;2;370-376**



Normal Dietary Sodium vs. Low

- **Normal sodium diet and high diuretic doses have reduced readmissions, neurohormonal activation and mortality**
- **Restrict fluids to 1litre/day**
- **Keep sodium intake approx 120 mmol/day**

AJC 2009:103(1);93-102



β-Blocker Therapy in Patients Admitted With Recalcitrant RVF

- **Maintain "on admission" dose**
- **Reduce maintenance dose**
- **Stop treatment**

Heart Failure Society of South Africa [HeFSSA]

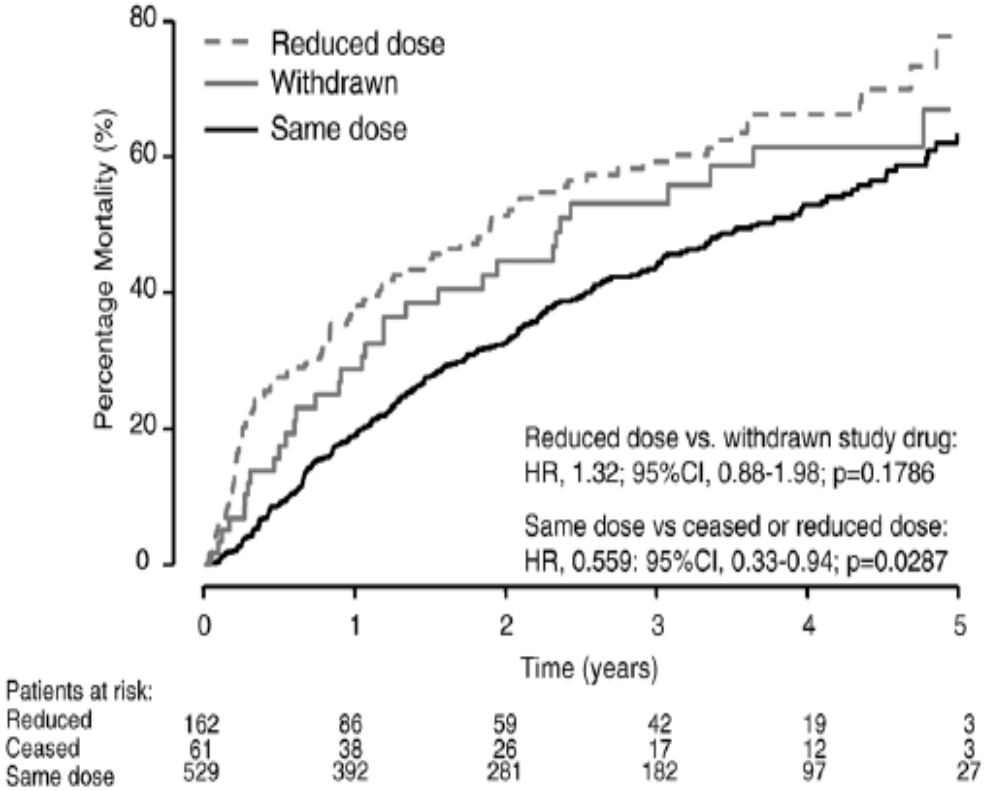
Effects of Carvedilol on RV EF in CHF

Age (yr) & Sex	Disease	NYHA	RVEF (%)		LVEF (%)	
			BSL	4 Mo	BSL	4 Mo
54 ± 13			0.27 ± 0.10	0.38 ± 0.09	0.23 ± 0.08	0.31 ± 0.08

AJC 1998;81:247

β-Blocker Therapy in Patients Admitted With Worsening CHF-Results from COMET

Pulmonary rales (%)	17
Peripheral oedema (%)	
Yes	24
No	76



Cause of WHF hospitalisation	
Ischaemia (%)	16.4
Atrial fibrillation (%)	14.8
Infection (%)	3.3
Non-compliance (%)	4.9
Renal dysfunction (%)	9.8
Other (%)	44.3
Alcohol excess (%)	1.6
Dietary salt excess (%)	3.3
Hypertension (%)	3.3
Iatrogenic (%)	11.5

European Journal of Heart Failure 9 (2007) 901–909

Predictors of vasodialtor and inotrope use in the ESCAPE trial

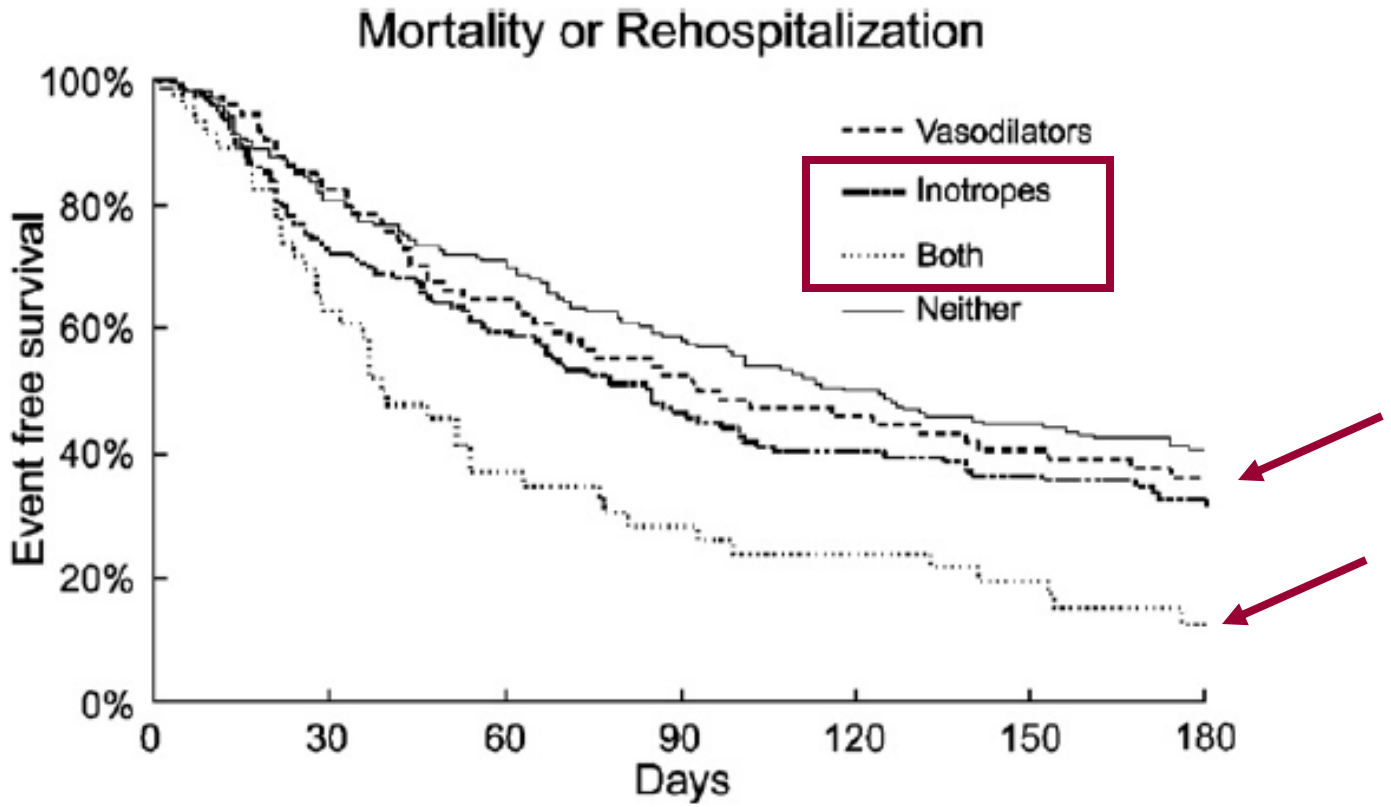
Table III. Multivariable predictors of vasodilator and inotrope use

	OR (95% CI)	P
Vasodilator use		
Site	NA	<.001
SUN (10 U)	1.19 (1.07-1.33)	.001
PCWP*	1.08 (1.03-1.13)	.003
Pulmonary artery systolic pressure*	1.00 (0.97-1.03)	.856
Inotrope use		
Site	NA	<.001
RAP*	1.06 (1.01-1.12)	.024
SUN (10 U)	1.13 (1.01-1.26)	.042
Systolic blood pressure <100 (dichotomous)	1.54 (0.92-2.57)	.097
Sodium	0.96 (0.91-1.02)	.143
PCWP*	1.00 (0.96-1.05)	.920
Pulmonary artery systolic pressure*	1.01 (0.98-1.03)	.729

OR, Odds ratio.
*In patients with a pulmonary artery catheter.

(Am Heart J 2007;153:98-104.)

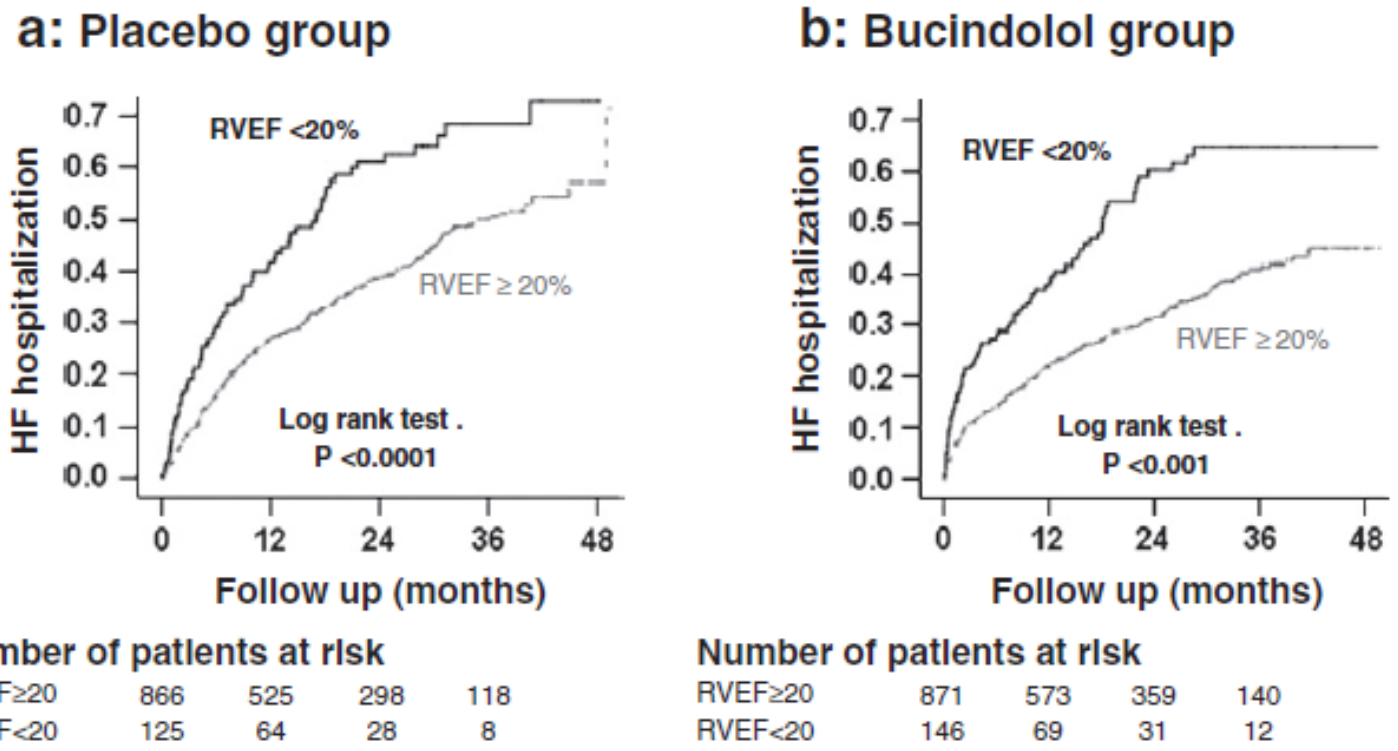
Mortality risk in the ESCAPE trial



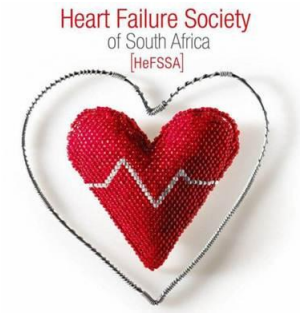
Kaplan-Meier survival curve for freedom from death or rehospitalization by intravenous vasoactive medication use.

(Am Heart J 2007;153:98-104.)

Stratified according to RVEF: K–M plots for all-cause mortality on (a) placebo or (b) bucindolol (BEST trial)



Int J Cardiol 2011-in press, accepted 13 May 2011



ESC
Eur J Heart Failure 2008:10;933

- **Class IIa, Evidence level B**
- **“In patients admitted to hospital due to worsening HF, a reduction in the β-blocker dose may be necessary. In severe situations, temporary discontinuation can be considered. Low-dose therapy should be re-instituted and up-titrated as soon as the patient’s clinical condition permits, preferably prior to discharge.”**

Putting guidelines into practice.

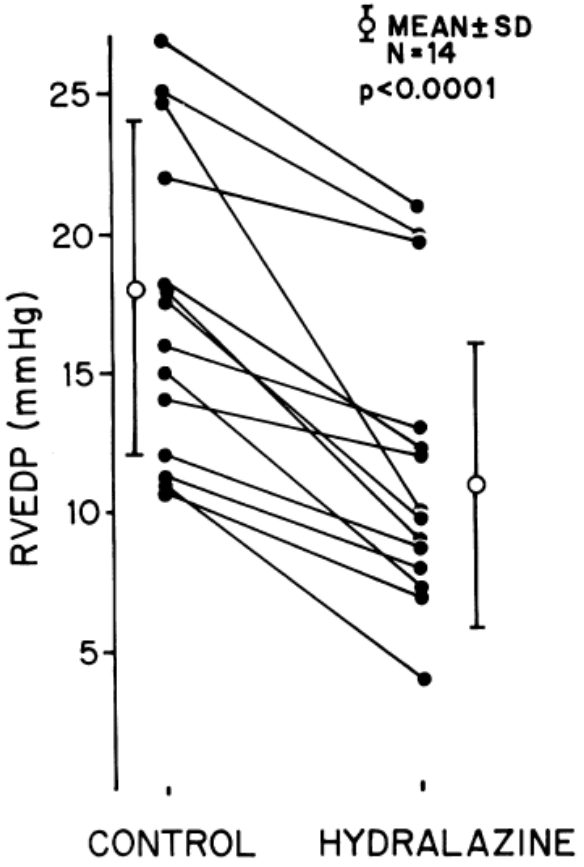
Eur J Heart Fail 2005;7:710–721.

- **When 'Worsening symptoms/signs (e.g. increasing dyspnoea, fatigue, oedema, weight gain) occur**:
  - If increasing congestion – increase dose of diuretic and/or halve dose of β-blocker (if increasing diuretic doesn't work)
  - If marked fatigue (and/or bradycardia) – halve dose of β-blocker (rarely necessary)'.

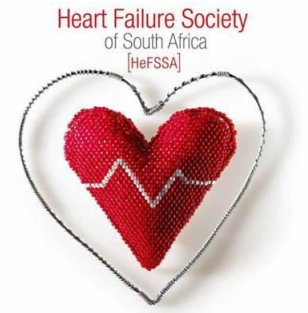
The effects of oral hydralazine on RVEDP in patients with RVF

The mean RVEDP decreased from 17.4 ± 5.6 to 11.6 ± 5.3 mm Hg

(p <0.0001).

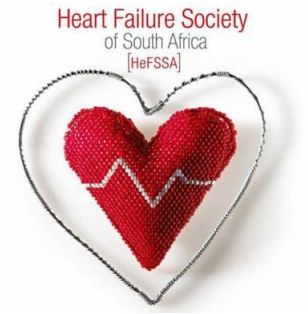


***Circulation* 1982, 65:1369-1373**



Nitrates

- **Complex cardiovascular responses**
- **Concept of preload reduction inadequate**
  - Dilate pulmonary and sytemic resistance vessels
  - Thereby, translocate blood volume from the pulmonary circulation and LV to the systemic circulation
  - Relieve subendocardial ischaemia
  - Favourably alter the P/V relationship in LV



Nitrates

- **Nitrates (either nitroglycerin or isosorbide dinitrate) have been shown to produce a substantial decrease in pulmonary artery pressure (30% to 50%)**

Ann Emerg Med. 2007;50:144-152.]

Digoxin

- **Complex beneficial mechanisms**
  - Positive inotropic properties
  - Sympatholytic effects
  - Normalise baroreceptor responsiveness

Cardiac glycosides reduce right-sided filling pressures and increase cardiac output when they are given acutely to patients with right-heart failure

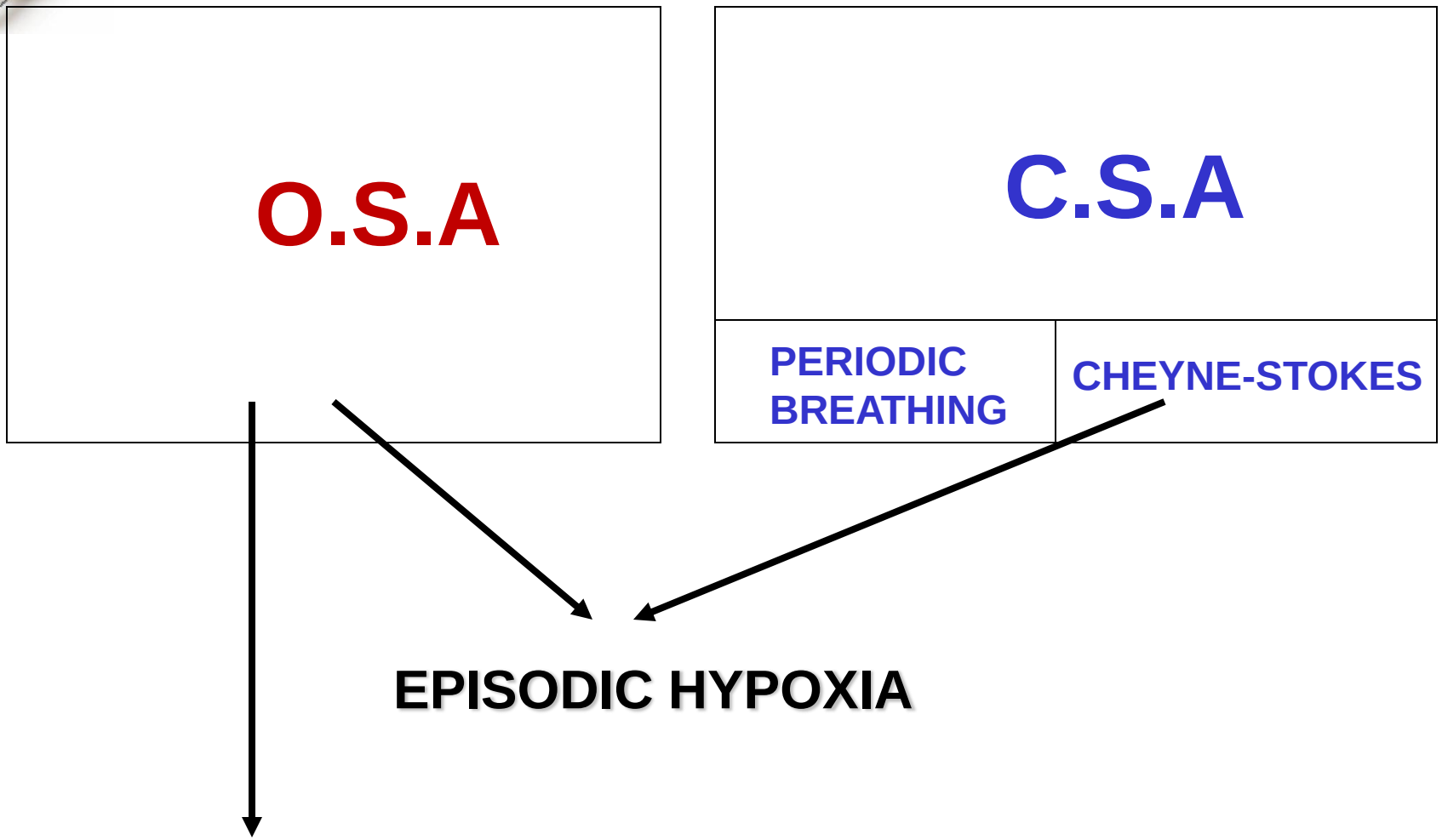
Plasma levels should be between 0.5-1.0 ng/ml

***Chest* 1998;114;787-792**

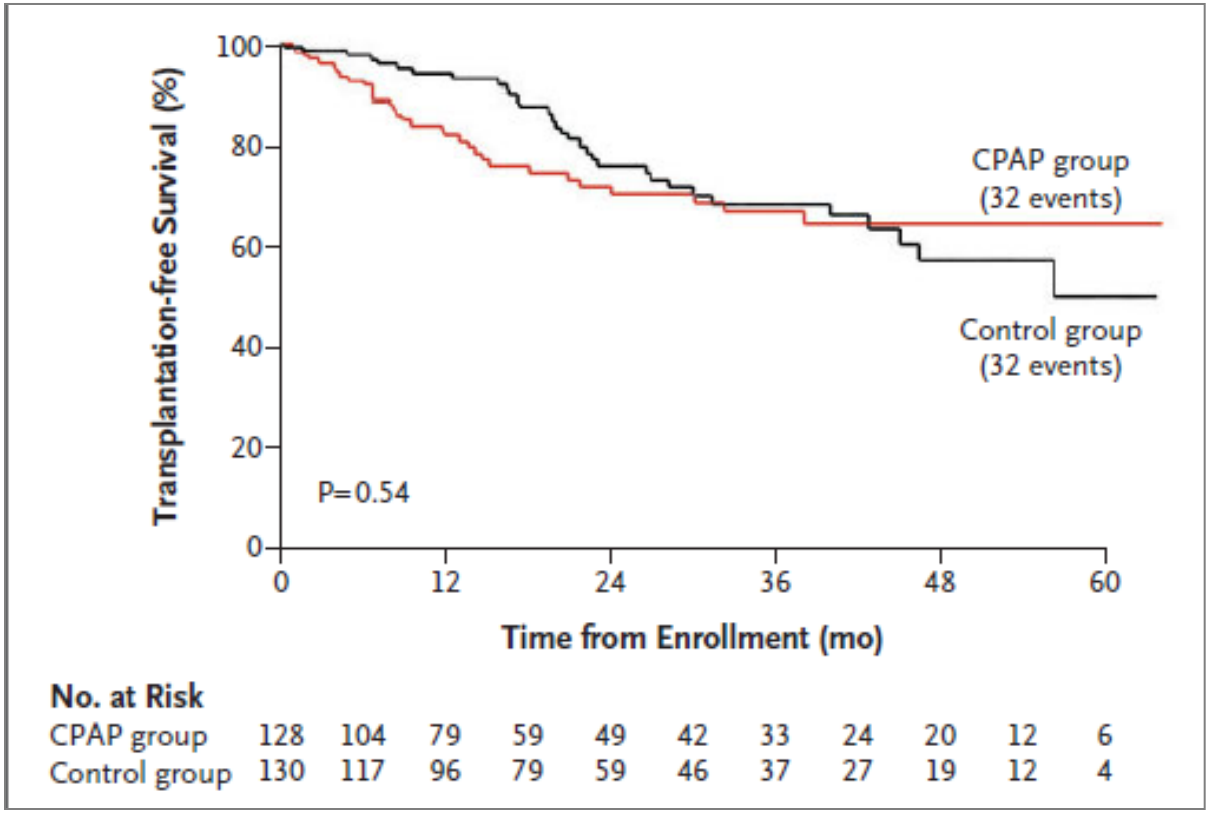
***Circulation* 1982, 65:1369-1373**

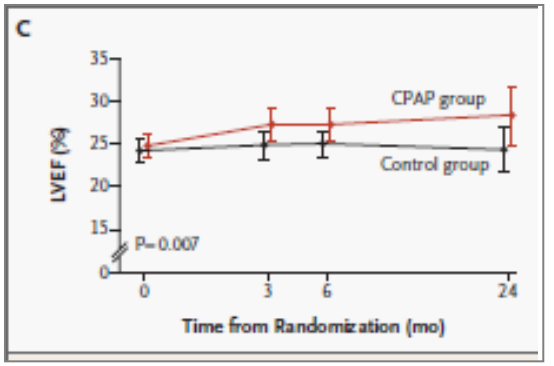
Heart Failure Society of South Africa [HeFSSA]

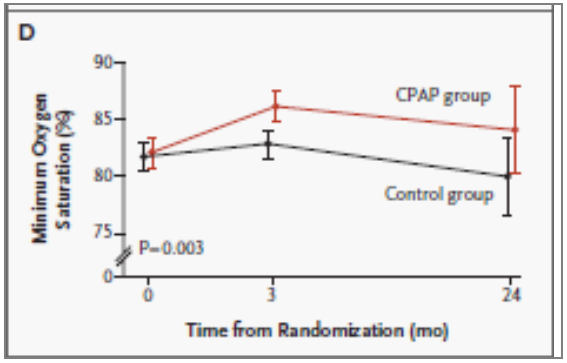
Sleep disordered breathing



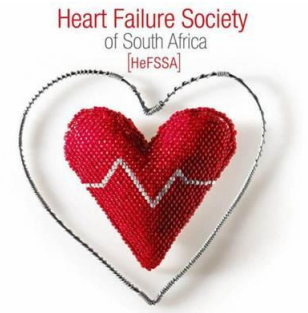
CPAP for central sleep apnea and CHF: Heart-Transplantation–free Survival







N Engl J Med 2005;353:2025-33

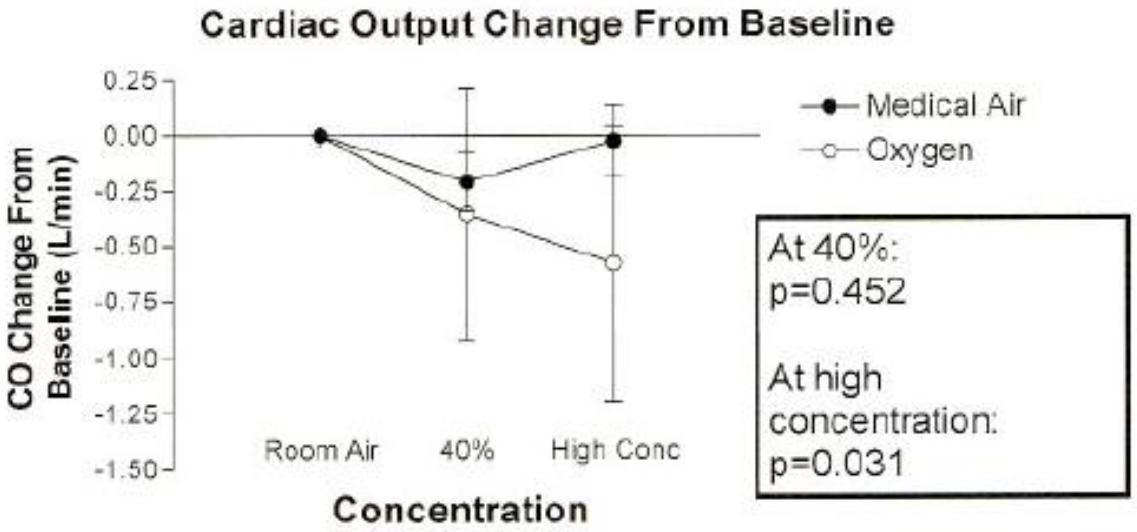


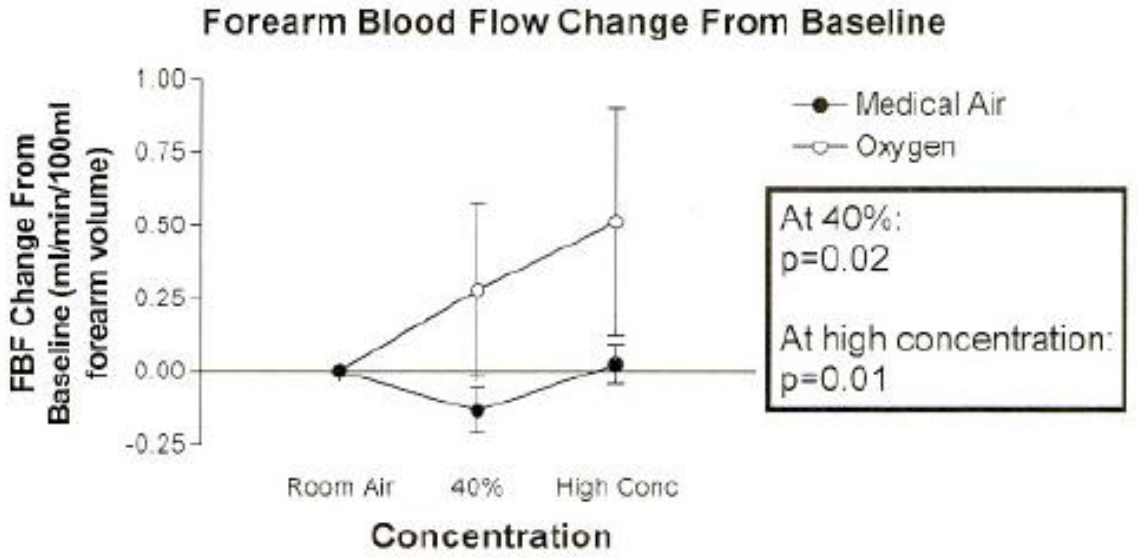
Hypoxia

- A responsive pulmonary vasoconstriction (can lead to RVH)
- In hospital, supplemental oxygen advised to maintain oxygen saturation > 90% (pO_2 > 60mmHg)
- HOT – no clear recommendation
  - Undergoing study in the UK

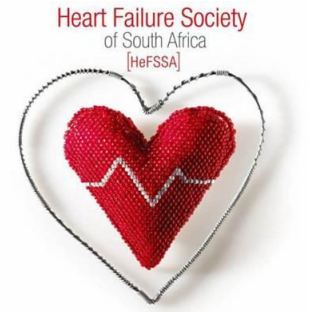
Respir Care 2006;51(4):403– 412

Non invasive evaluation of oxygen therapy in CHF





Heart 2010:96;533-538



Heart Failure Society of South Africa [HeFSSA]

Non invasive evaluation of oxygen therapy in CHF

	Medical air			Oxygen			
	Baseline	40%	High conc.	Baseline	40%	High conc.	p Value
Cardiac output (l/min)	5.24 (1.04)	5.03 (0.88)	5.22 (0.99)	5.71 (0.64)	5.36 (0.71)	5.05 (0.59)	**0.031**
Cardiac index (l/min/m^2)	2.66 (0.51)	2.54 (0.46)	2.63 (0.48)	2.91 (0.34)	2.74 (0.43)	2.55 (0.33)	**0.030**
Stroke volume (ml/beat)	80.38 (17.42)	80.38 (16.02)	79.97 (17.26)	83.27 (10.85)	82.36 (15.84)	80.00 (16.14)	0.462
Stroke volume index (ml/beat/m^2)	40.77 (8.03)	40.46 (7.47)	40.33 (8.39)	42.45 (5.82)	41.95 (8.37)	40.25 (8.17)	0.429
Heart rate (beats/min)	66.21 (10.66)	63.65 (9.87)	66.62 (11.54)	69.42 (10.77)	66.50 (10.80)	64.83 (10.64)	**0.021**
SVR (dyne/s/cm^5)	3940 (1017)	4319 (1280)	4175 (1128)	3418 (823)	3892 (1403)	4332 (1748)	**0.050**

Heart 2010:96;533-538

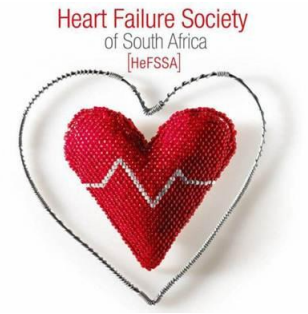
Heart Failure Society of South Africa [HeFSSA]

Enteral Nutrition-ESPEN Guidelines

Summary of statements: Chronic heart failure (CHF)

Subject	Recommendations	Grade[68]
Indication	EN is recommended in cardiac cachexia to stop or reverse weight loss on the basis of physiological plausibility. There is no indication for enteral nutrition (EN) in the prophylaxis of cardiac cachexia.	C
Contraindications	There are no specific contraindications. Avoid fluid overload.	

Clinical Nutrition (2006) 25, 311–318



Recalcitrant RHF:Concluding Ideas

- Normal sodium intake – 120 mmol/day
- Restrict oral fluid to 1-1,2 l/day
- Maximise MRA dose
- Reduce/stop β-blocker until "fluid neutral"
- Oxygen only if hypoxic
- CPAP for OSA – individualise
- Hydralazine/nitrate
- Digoxin
- Enteral nutrition


Heart Failure Society
of South Africa
[HeFSSA]