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ESC Council Stroke

The Role of the Cardiologist on the Stroke Unit

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Disclosures

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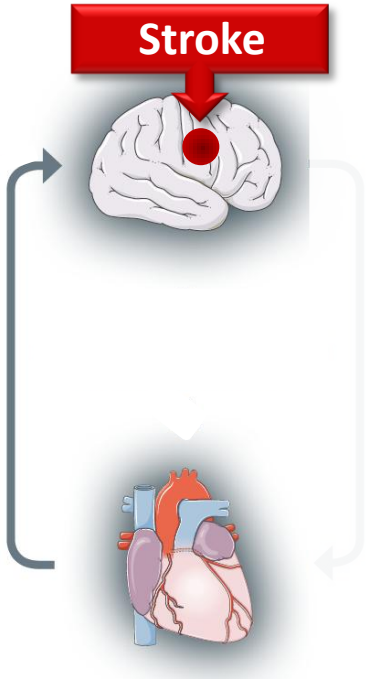
Nothing to disclose in relation to this presentation

The *bi-directional* heart - brain axis: Cause and sequela of acute stroke

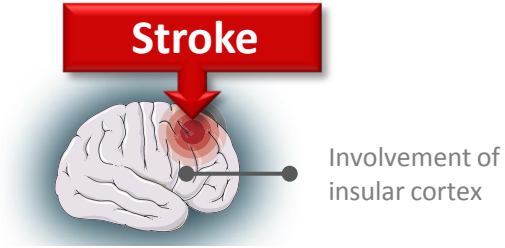
- **Atrial fibrillation**
- **Hypertension**
- **Atherosklerosis**
- Myocardial infarction
- Chronic heart failure
- Myocarditis
- Endocarditis
- LV Aneurysm
- Valvular disease
- Valve replacement
- Overt foramen ovale
- Congenital defects



- Contractile function
- Myocyte injury (Troponins ↑)
- Myocardial Infarction
- Tako Tsubo Cardiomyopathy
- Arrhythmias
- Hypertensive crisis
- Microvascular dysfunction
- Cardiac / vascular re-embolism
- CHF exacerbation

Doehner *et al.*, Eur J Prevent Cardiol 2019

Cardiac Complications in acute Stroke



The Stroke - Heart Syndrome

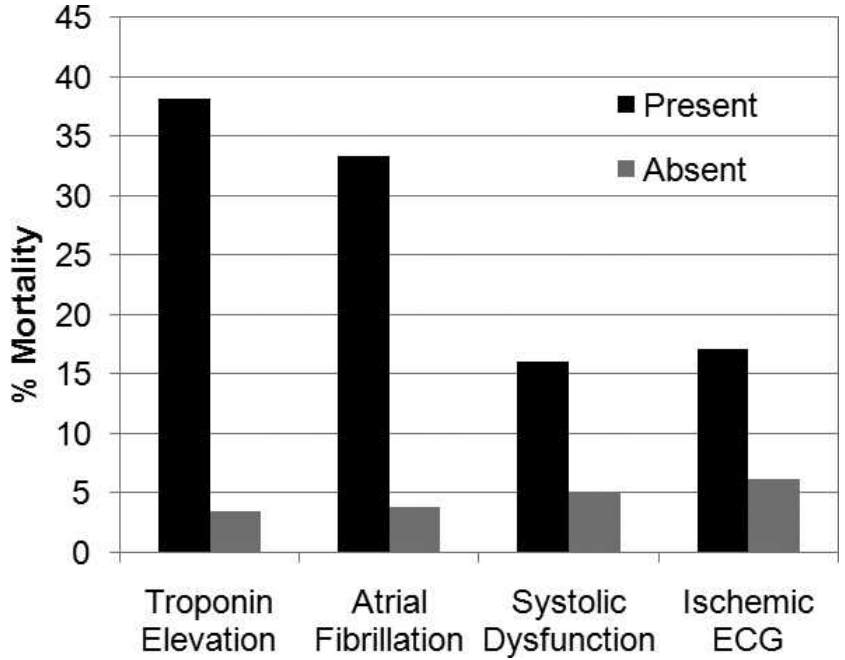
Scheitz, ... Doehner *et al.* Lancet neurology 2018

Acute coronary syndrome	Strain related cardiomyopathy	Ventricular Arrhythmia	Atrial fibrillation	Progression of HF
ACS	**Myopathy**	**VT**	**Afib**	**Heart failure**

Doehner et al. EJHF 2018

Cardiac Complications in acute Stroke

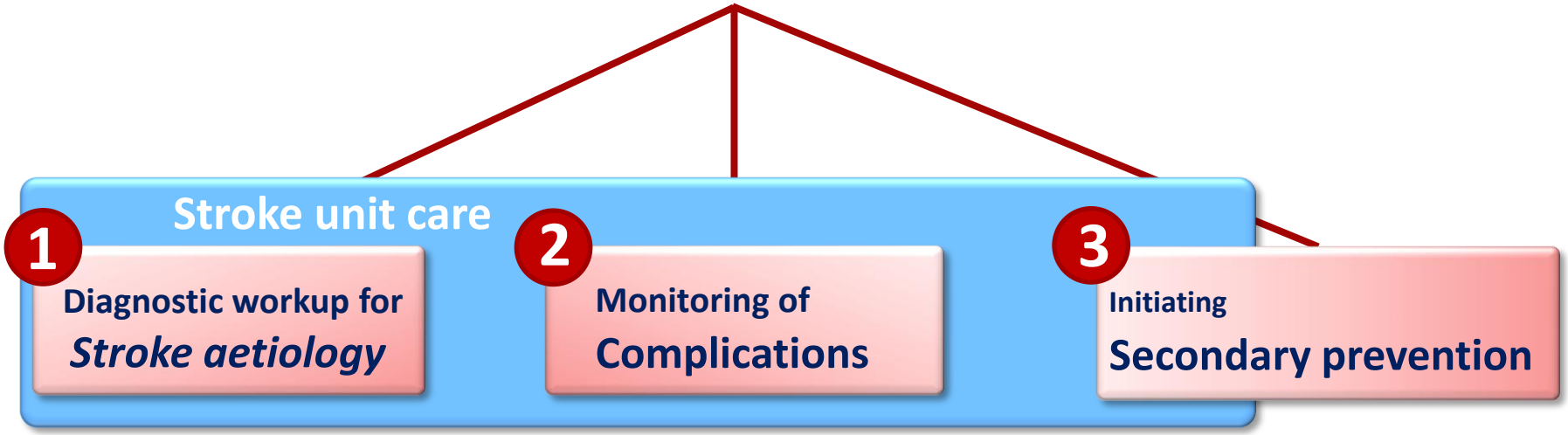
N=200
In hospital mortality after stroke: 8%



Higher mortality after stroke with cardiac complications

Wira CR *et al*., West J Emerg Med 2011

Cardiologists' tasks in comprehensive stroke care



- Atrial fibrillation
- Cardiac thrombus
- Heart failure
- Myocardial infarction
- Aneurysm
- Valvular disease
- Infective endocarditis
- PFO

Stroke - Heart Syndrome

- Acute arrhythmias
- Blood pressure deviation
- Secondary cardiac injury
- Acute coronary syndrome
- Cardiac decompensation

CV comorbidities

- cont. diagnostic workup
- Initiate therapy

CV risk factors

- Hyperlipidaemia
- Hypertension

Doehner *et al.* EHJ Suppl. 2020

1 Diagnostic cardiac workup of stroke patients

Key information - recommended *in each stroke patient:*

- **Cardiovascular history**
- **Cardiovascular risk profile**
- **Cardiovascular medication**
- **Acute cardiac symptoms (prior/ during the stroke)**

- **Cardiac structure and function ? ➔ Echocardiography**

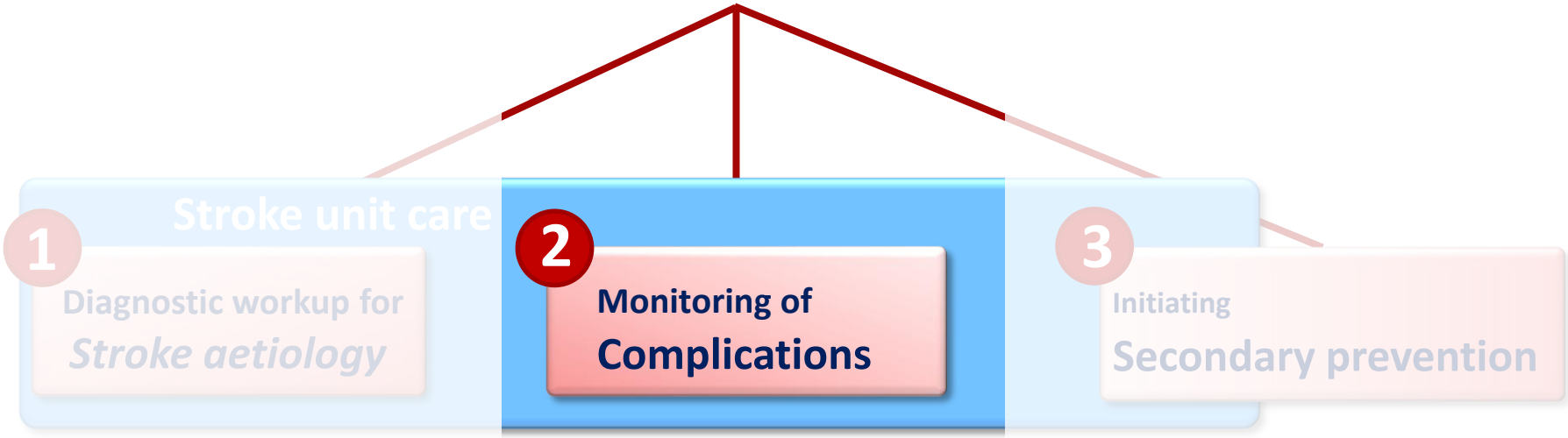
ESC Council Stroke

1 Echocardiography in acute stroke: *who, how and when ?*

	Trans-thoracic echo TTE	vs	Trans-esophageal echo TOE
Method	long distance lower resolution		short distance very high solution
Applicability	non-invasive fast, few resources no strain for patients almost no complications		Semi-invasive more resources needed patient discomfort some (few) complications
Preferred assessment of:	• LVEF • diameter of LV, LA, (RV, RA) • wall thickness • Regional contractility (apex) • valve function (global) • apical thrombus • ***No*** exclusion of LAA thrombus		• LA appendage • patent foramen ovale • endocarditis • detailed valve function • exclusion of LAA thrombus

Doehner *et al.* EHJ Suppl. 2020

Cardiologists' tasks in acute stroke care



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Stroke - Heart Syndrome

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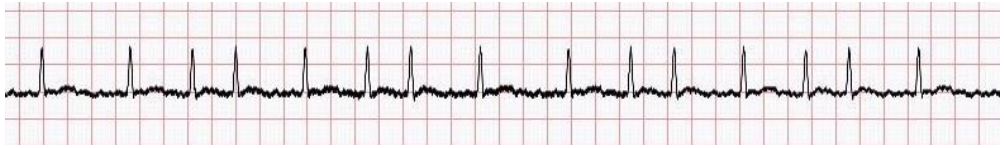
Doehner *et al.* EHJ Suppl. 2020

2 Cardiac Monitoring in acute Stroke

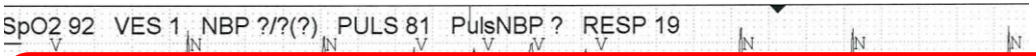
ECG	12 lead ECG Cont. monitoring	Arrhythmias Ischaemia
Blood pressure	Baroreflex impaired	Hypertensive crisis Hypotension
Biomarkers	Cardiac troponins Natriuretic peptides	Ischaemia Heart failure
LV Function	Clinical signs Echo	Cardiac decompensation Thrombus Takotsubo syndrome Acute coronary syndrome

2 Cardiac monitoring in acute stroke -1- ECG

Atrial fibrillation



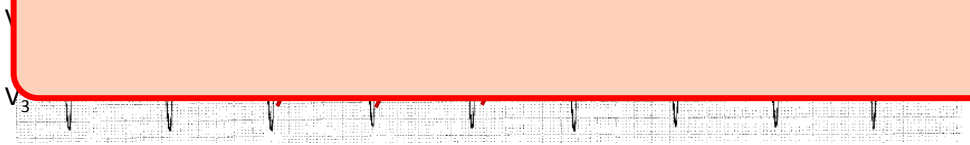
VES



Ventricular run

AV Block

Cardiac ischaemia



Cause of stroke

Complication

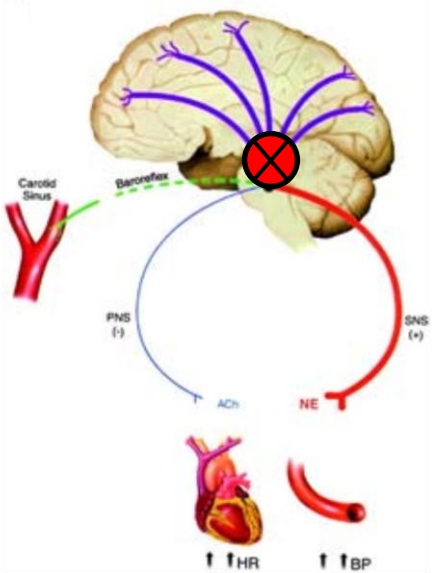
ECG monitoring after stroke

for 24h minimum, better 72h

- AF detection
- ventr. arrhythmias, SCD
- cardiac ischaemia

2 Cardiac monitoring in acute stroke -2- **Blood pressure**

Perfusion pressure vs haemorrhagic transformation



Hypertensive urgency

- Hypertensive crisis difficult to manage

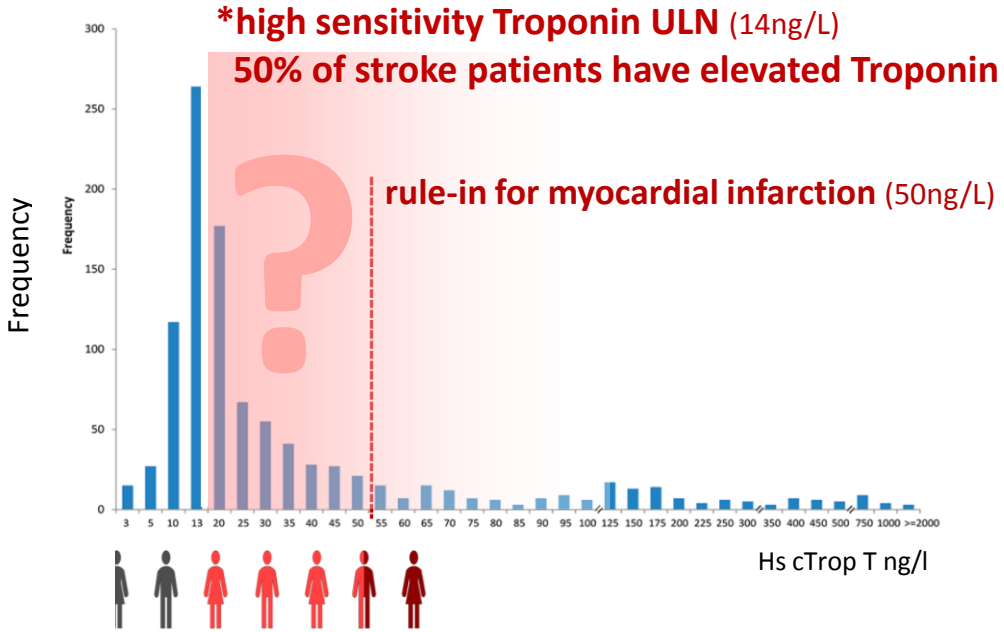
  (short acting drugs, iv., if needed)
- Regardless of blood pressure before the stroke
- Return to pre-stroke levels within 3-4 days

Hypotensive episode:

- Keep perfusion pressure high

2 Cardiac monitoring in stroke -3- **Biomarkers**

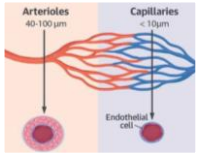
Troponin elevation is common in acute stroke



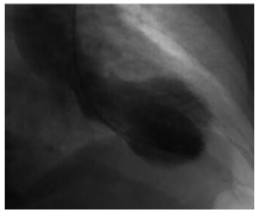
TnT elevation associated with: age, stroke severity (NIHSS score), comorbidities (CAD, CKD), leasion in insular cortex

Myocardial infarction

O2 demand/supply mismatch



Microcirculation failure



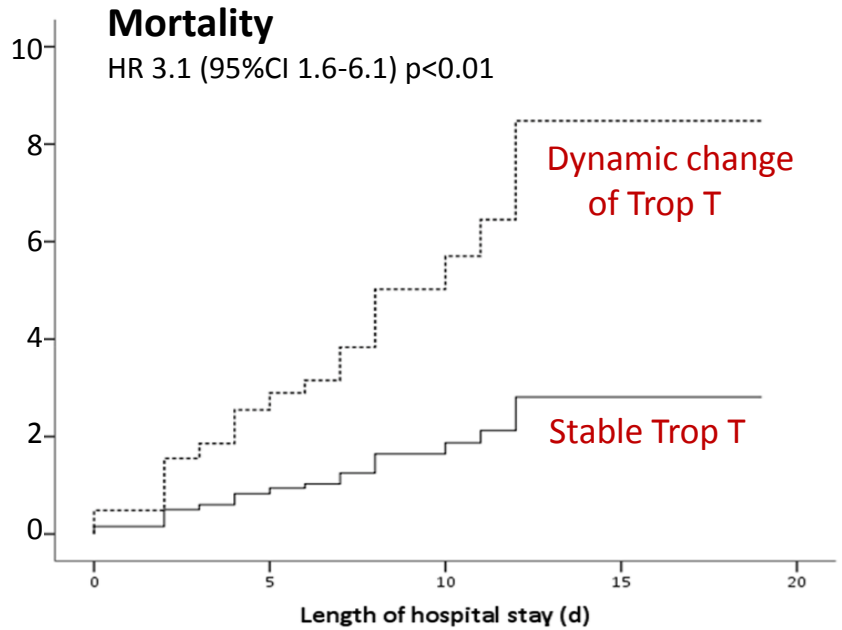
Takotsubo Syndrom

Scheitz et al, Int J Cardiol 2012, Scheitz et al, Int J Cardiol 2014

Elevated troponin in acute stroke - when is it relevant?

Dynamic troponin change and prognosis after stroke

N=1016,
mean age 75 years,
51% female



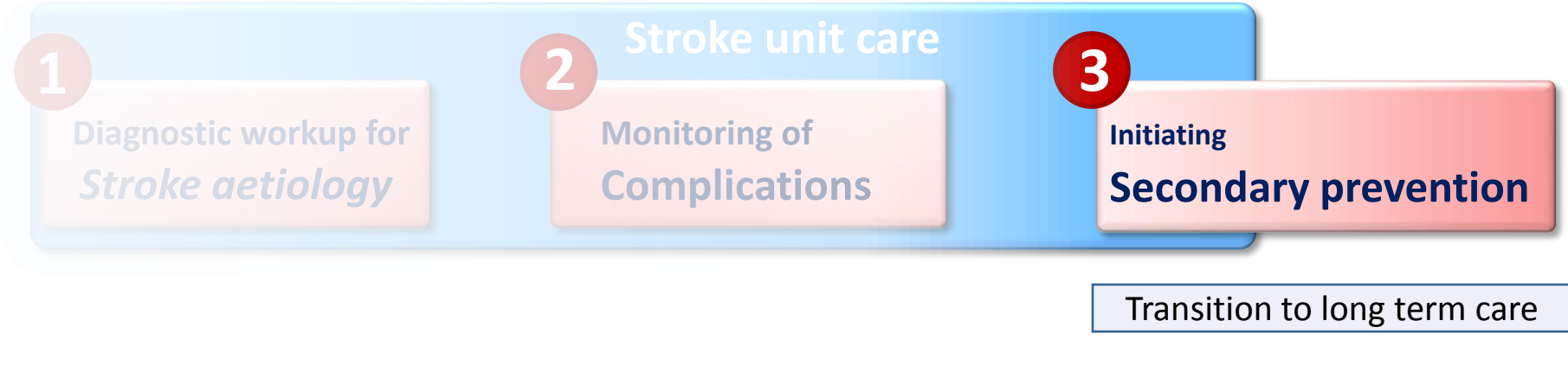
In combination with clinical findings :

- clinical signs, symptoms
- ECG
- Echo (abnormal wall motion)
- CV risk factors
- CV history

…needs cardiologist expertise

Scheitz JF. et al. Int J Cardiol 2014

Cardiologists' tasks in comprehensive stroke care



CV comorbidities

- cont. diagnostic workup
- Initiate therapy

CV risk factors

- Hyperlipidaemia
- Hypertension
- Diabetes
- Smoking

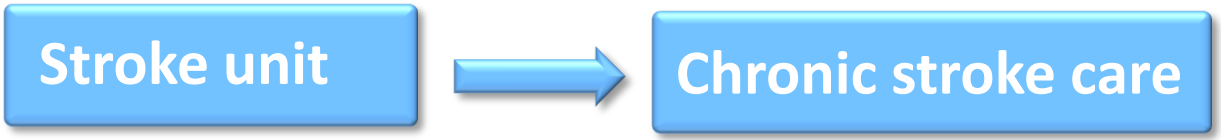
Doehner *et al.* EHJ Suppl. 2020

Summary and outlook

Cardiologist‘ expertise in comprehensive stroke care:

1. Diagnostic workup for *Stroke aetiology*
2. Monitoring of Complications
3. Secondary prevention

Going forward: Transition from acute to long-term stroke care



www. ESC council on stroke

free membership

THANK YOU

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