Name

Surname

Personal number

Gender: ☐ F ☐ M

ICCU – Department of Cardiology

Mild therapeutic hypothermia protocol

external mode

Date | Time

Inclusion criteria (mark ☑)

ROSC (mark first rhythm)	VF ☐
	pulseless VT ☐
	asystole ☐
	PEA ☐
time from CPR < 4 hours	☐
age >18 years	☐
SBP > 80 mm Hg (inotropes allowed)	☐
GCS ≤ 8	☐

Exclusion criteria (cross out ☒)

life expectancy < 6 months	☐
body temperature < 30°C	☐
unconscious before cardiac arrest	☐
active bleeding	☐
congenital coagulopathy	☐
hypoglycemia	☐
other known cause of unconsciousness (drug overdose, intoxication, stroke)	☐
pregnancy	☐

Neurologic assessment (☑)

Brain stem (reflexes)			**Eye opening**		**Verbal**		**Motor**	
Pupillary	☐ yes	☐ no	Spontaneously	☐ 4	Orientated	☐ 5	Obeys commands	☐ 6
Corneal	☐ yes	☐ no	Voice	☐ 3	Confused	☐ 4	Localizes	☐ 5
Vestibulo-ocular	☐ yes	☐ no	Pain	☐ 2	Inappropriate	☐ 3	Withdrawal	☐ 4
Spontaneous breath	☐ yes	☐ no	Does not open eyes	☐ 1	Incomprehensible	☐ 2	Flexion	☐ 3
			GCS suma:		no sound	☐ 1	Extension	☐ 2
							No movements	☐ 1

Current sedatives:

Medical information (risk stratification)

- Time:

CA : | CPR start : | ROSC :

- CPR conducted by: witness ☐ | paramedics ☐
- Place of cardiac arrest: street ☐ | home ☐ | work ☐ | hospital ☐
- Witnessed cardiac arrest: yes ☐ | no ☐
- Treatment: PCI ☐ | ASA ☐ | P2Y12 inhibitor ☐ | IIb/IIIa inhibitor ☐ IABP ☐ | thrombectomy ☐
- First diagnosis: STEMI ☐ | NSTEMI ☐ | CAD ☐ | DCM ☐ | HCM ☐ | HTN ☐ HF ☐ | other: _____

Risk scale	
CPR<10 min	1 ☐
ROSC < 20 min	1 ☐
In-hospital	1 ☐
Witnessed cardiac arrest	1 ☐
VF as first rhythm	1 ☐
Total:	

Phase 0 initial cooling (if treated in CathLab)

☐ Check start of cooling time and base temperature

:

☐ If body temperature > 33 ºC
add NaCl at 4 ºC according to body weight:

< 50 kg – 1000 ml
51 – 80 kg – 1500 ml
>80 kg – 2000 ml

°C

Phase I prepare for stationary cooling (all required ☑)

☐ Begin mechanical ventilation
☐ Placement of urinary catheter
☐ Central venous access + CVP
☐ Artery outline
☐ Esophageal temperature probe (38 – 42 cm)
☐ Attach 2 ArcticGel Pads to surround the upper thighs and 1 to each side of the chest (total of 4 Pads)
☐ Connect ArcticGel Pads to the ArcticSun fluid delivery lines
☐ Turn on the device but not start treatment at this point

Phase II analgosedation and muscle relaxation (all required ☑)

☐ Initiate analgosedation:
- Propofol bolus of 1,5 mg/kg/h *(check the dose in the table)*
- Fentanyl iv infusion 1-2 µg/kg/h + Propofol 1-2 mg/kg/h

Ramsey scale:	
1	Anxious or restless or both
2	Cooperative, orientated and tranquil
3	Responding to commands
4	**Brisk response to stimulus**
5	**Sluggish response to stimulus**
6	No response to stimulus

☐ Adjust the infusion by Ramsey scale to level of 4/5
☐ Give Vecuronium as infusion: 0,01 – 0,05 µg/kg/min (*check the dose in the tables*)

Phase III stationary cooling:

☐ Check the time and temperature at the baseline

: °C

☐ If the patient have not received cooled NaCl in the CathLab and **body temperature > 33 ºC**, give NaCl according to weight:

< 50 kg – 1000 ml NaCl
51 – 80 kg – 1500 ml NaCl
>80 kg – 2000 ml NaCl

☐ Set on the device

☐ Click Hypothermia (under New Patient)

☐ Click start under Cool Patient

☐ Check temperature after 60 minutes: °C

If temperature >34,5 °C:
☐ Give 500 ml 4°C NaCl

☐ Check time when temperature reaches 33°C: :

Phase IV pharmacotherapy:

- ☐ Give 5g $MgSO_4$ i.v. (infusion at 1 g/h)
- ☐ Initiate antibiotic prophylaxis (as per local hospital protocol)

Phase V monitoring:

- ☐ Change cooling speed to IMTERMIDAITE, set target temperature to 33°C
- ☐ Keep patient temperature 32-33°C (if needed adjust target temperature)
- ☐ Send laboratory tests (see *Table 1 „Laboratory tests")*
- ☐ Aim for SBP > 100 mm Hg:
  - ☐ Noradrenalin @ 0,05-0,8 µg/kg/min (max. 30 µg/min)
  - ☐ Dopamin @ 2 µg/kg/min (max 20 µg/kg/min)
  - ☐ Dobutamin @ 5 µg/kg/min (max 40 µg/kg/min)
- ☐ Aim for CVP 10-14 mm Hg i ScvO2 > 70%
  - ☐ If CVP < 10 mm Hg – give iv fluids
  - ☐ If Hb < 8 g/dl – consider blook transfusion

Phase VI Rewarming (target temp. 36,5°C)

- ☐ After 24 hours the system will automatically ask if to start rewarming (rewarm at 0.1°C / hour)
- ☐ Record the time and temperature for start of rewarming

  °C

  :
- ☐ Stop K+ (potassium) replacement
- ☐ Check and note temperature regularly (*Table 2 „Patient monitoring"*)
- ☐ Once 36,5°C is the rewarming will stop and system will control temperature in normothermia. Leave cooling pads on the patient and note the patient's temperature hourly.

  :
- 🌡 In patient's temperature >37°C:
  - ☐ Give Paracetamol iv @ 1 g every 4 h – max. 4 g/24 h, *if still >37°C:*
  - ☐ Continue temperature control at 36,5º C
- ☐ Monitor and note vital signs (*Table 2 „Patient monitoring")*

Phase VII Neurologic outcome

Assess neurologic (Modified Rankin scale):

	data	godzina	Neuo (Rankin scale)
☐ After 48 hours:	/ /	:	
☐ Before discharge	/ /	:	
☐ After 3 months	/ /	:	
☐ After 6 months	/ /	:	

Modified Rankin Scale

0 - No symptoms.
1 - No significant disability. Able to carry out all usual activities, despite some symptoms.
2 - Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities.
3 - Moderate disability. Requires some help, but able to walk unassisted.
4 - Moderately severe disability. Unable to attend to own bodily needs without assistance, and unable to walk unassisted.
5 - Severe disability. Requires constant nursing care and attention, bedridden, incontinent.
6 - Dead.

Tabela 1 – Laboratory tests

	cooling						rewarming (+ 0.2 °C / h)					
Tests	**Baseline**	**Target temp. reached**	**6 h from target**	**12 h from target**	**18 h from target**	**24 h from target**	**30 h from target**	**36 h from target**	**42 h from target**	**48 h from target**	**60 h from target**	**72 h from target**
Enter time:												
Blood cultures (x3, every 1h)	☑ ☐											
CXR	☑ ☐					☑ ☐						
ECG	☑ ☐					☑ ☐				☑ ☐		☑ ☐
Blood glucose	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐
Arterial and venous blood gases (central line)	A ☐ V ☐	A ☐	A ☐	A ☐ V ☐	A ☐	A ☐ V ☐	A ☐	A ☐ V ☐		A ☐ V ☐	A ☐	A ☐ V ☐
Full blood count	☑ ☐					☑ ☐				☑ ☐		
Mg, Ca	☑ ☐					☑ ☐				☑ ☐		☑ ☐
CRP, Procalcitonin	☑ ☐					☑ ☐				☑ ☐		☑ ☐
Creatinine, urea	☑ ☐			☑ ☐		☑ ☐				☑ ☐		☑ ☐
Coagulation (INR, APTT, fibrinogen, d-dimers)	☑ ☐					☑ ☐				☑ ☐		☑ ☐
Troponin (TnI), CK-MB	☑ ☐		☑ ☐			☑ ☐				☑ ☐		☑ ☐
NT-proBNP	☑ ☐											☑ ☐
AST, ALT	☑ ☐					☑ ☐				☑ ☐		☑ ☐
Albumins	☑ ☐											☑ ☐

Table 2 – Patient monitoring

	cooling						**rewarming (+0,1** °C / h)							
	Baseline	**Target temp. reached**	**6 h from target**	**12 h from target**	**18 h from target**	**24 h from target**	**30 h from target**	**36 h from target**	**42 h from target**	**48 h from target**	**60 h from target**	**72 h from target**	**66 h**	**72 h**
time:	**:**	**:**	**:**	**:**	**:**	**:**	**:**	**:**	**:**	**:**	**:**	**:**	**:**	**:**
Target temperature:	°C		°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
Current patient temperature:	°C		°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
Rhythm (SR, AF)														
HR (bpm)														
BP (SBP/DBP)														
Diuresis (ml)														
fiO_2 (%)														
sO2 (%)														
CVP (mm Hg)														
pH														
pO_2														
pCO_2														
BE														
Blood cultures														