

Case Report Form

FLOWVENTIN HEARTSURG

Version 1.4

Pseudonym: FVHS - _____

Date: _____ EuroSCORE: _____

Body weight: _____ kg

PBW: ☐ ♀: $45,5 + 0,91 * (\text{height} - 152,4) =$ _____ kg

Body height: _____ cm

☐ ♂: $50,0 + 0,91 * (\text{height} - 152,4) =$ _____ kg

KOF: _____ m²

EIT-Belt-Size: _____

Periop. V_T (6-8 ml/kg): _____ ml

Tick Boxes

CPB-End: _____

- ☐ **T_{Baseline}** (before intubation)
 - ☐ art.: BGA, 1 gr. EDTA, 1 Li-Hep., 1 Serum, 1 Diff.-BB, 1 kl. EDTA (BNP)
 - ☐ TTE
 - ☐ EIT
- ☐ **T₋₂** (after intubation)
 - ☐ EIT
 - ☐ art. BGA
 - ☐ zv-BGA, 1 gr. EDTA, 1 Li-Hep., 1 Diff.-BB (before skin incision)
 - ☐ TEE 1
 - ☐ ventilation + catecholamines

- ☐ **T₋₁** (15 min after thoracotomy)
 - ☐ art. BGA
 - ☐ zv-BGA, 1 gr. EDTA, 1 Li-Hep., 1 Diff.-BB
- ☐ ventilation + catecholamines (1x/h)

CPB

- ☐ catecholamines (1x/h)
- ☐ CPB + clamping duration

- ☐ **T₀**
 - ☐ catecholamines for CPB-weaning
 - ☐ art. BGA
 - ☐ zv-BGA, 1 gr. EDTA, 1 Li-Hep., 1 Diff.-BB
- ☐ ventilation + catecholamines

- ☐ **T₁**
 - ☐ art. BGA
 - ☐ zv-BGA, 1 gr. EDTA, 1 Li-Hep., 1 Diff.-BB
 - ☐ TEE 2
- ☐ ventilation + catecholamines

- T_{Baseline ITS}**
 - ☐ art. BGA
 - ☐ zv-BGA, EDTA (BNP)
 - ☐ EIT

ICU in process

- ☐ ventilation + catecholamines (1x/h)
- ☐ art. BGA + EIT: before extubation on CPAP + after extubation

- ☐ **T₆**
 - ☐ art. BGA
 - ☐ zv-BGA, 1 gr. EDTA, 1 Diff.-BB
- ☐ **T₁₂**
 - ☐ art. BGA
 - ☐ zv-BGA, 1 gr. EDTA
- ☐ **T₂₄**
 - ☐ art. BGA
 - ☐ zv-BGA, 1 gr. EDTA, 1 Li-Hep., 1 Diff.-BB, 1 kl. EDTA (BNP)
 - ☐ EIT

POD 1

- ☐ CK, CK-MB, Trop
- ☐ ICU-Scores

POD 3

- ☐ CK, CK-MB, Trop, BNP, DiffBB
- ☐ ICU-Scores

POD 5

- ☐ CK, CK-MB, Trop, BNP, DiffBB
- ☐ ICU-Scores

Hospitalisation in process

- ☐ Horovitz indices POD 1-7
- ☐ PPCs POD 1-7
- ☐ PEPCs POD 1-7
- ☐ length of ICU, IMC + normal ward stays
- ☐ infections with AB-treatment during hospitalisation

Telefonsurveys

- ☐ 1 month post surgery
- ☐ 6 months post surgery

Miscellaneous:

Parameter	Sub-Parameter	TTE	TEE 1	TEE 2
RIMP	TCOT Tricuspid Valve Closure to Opening Time	ms	ms	ms
	RVET RV Ejection time	ms	ms	ms
Pathologisch > 0,55				
S`		cm / s	cm / s	cm / s
	Echo-Mode			
Pathologisch < 10 cm/s	Schnittebene			
TAPSE		cm	cm	cm
	Echo-Mode			
Pathologisch ≤ 1,7	Schnittebene			
RVOT FS	RVOT enddiastolisch	cm	cm	cm
	RVOT endsystolisch	cm	cm	cm
		%	%	%
	Echo-Mode			
O.p.B. > 32 %	Schnittebene			
FAC	EDA End diastolic area of RV	cm ²	cm ²	cm ²
	ESA End systolic area of RV	cm ²	cm ²	cm ²
Pathologisch < 35 %		%	%	%
Speckle Tracking		File number:	File number:	File number:
	Echo-Mode			
	Schnittebene			

TTE / TEE

AT ≥ 120 ms: PA $\sim 79 - (0,45 \times \text{AT})$
 AT < 120 ms: PA $\sim 90 - (0,62 \times \text{AT})$

Mahan-Formel:

Parameter	Sub-Parameter	TTE					
RA Druck	VCI-Durchmesser	$\square \leq 2,1 \text{ cm}$	$\square \leq 2,1 \text{ cm}$	$\square > 2,1 \text{ cm}$	$\square > 2,1 \text{ cm}$		
	Kollaps in % bei Sniff	$\square > 50 \%$	$\square < 50 \%$	$\square > 50 \%$	$\square < 50 \%$		
	RAP	$\square 3 \text{ mmHg}$	$\square 8 \text{ mmHg}$	$\square 15 \text{ mmHg}$			
Parameter	Sub-Parameter	TTE		TEE 1		TEE 2	
ZVD / RA Druck		mmHg		mmHg		mmHg	
PAP _{syst}	Peak TR velocity [m/s]	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	$\text{PAP}_{\text{syst}} = 4 * V^2 + \text{ZVD}$	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
PAP _{diast}	End-diastolic PR velocity	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	$\text{PAP}_{\text{diast}} = 4 * V^2 + \text{ZVD}$	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
PAP _{mean}	Early PR velocity	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	$\text{PAP}_{\text{mean}} = 4 * V^2 + \text{ZVD}$	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	Mean gradient TR aus VTI TR-Jet	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	$\text{PAP}_{\text{mean}} = \text{mittl. Gradient} + \text{ZVD}$	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	Pulm. acceleration time	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	PAP_{mean} lt. Mahan-Formel	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	$\text{PAP}_{\text{mean}} = 1/3 \text{ PAP}_{\text{syst}} + 2/3 \text{ PAP}_{\text{diast}}$	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
PVR	Peak TR velocity [m/s]	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	VTI RVOT [cm]	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	$\text{PVR} = (\text{TRVmax}/\text{RVOT VTI}) * 10 + 0,16$	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:
	PVR in dyn*sec*cm ⁻⁵	Insp:	Exsp:	Insp:	Exsp:	Insp:	Exsp:

Ventilation

Intubation: _____

Begin Weaning: _____

Time on mechanical ventilation:_____min

Begin CPAP: _____

Extubation : _____

Weaning time: _____min

[illegible]

Catecholamines

CPB Begin: _____

Clamping: _____

CPB time : _____min

CPB End : _____

De-Clamping:_____

Clamping time: _____min

[illegible]

[illegible][illegible]

Data derived from BGAs + PAC

Parameter	Formula	T _{Baseline}	T ₋₂	T ₋₁	T ₀	T ₁	T _{Beginn ITS}	T ₆	CPAP	Extu- bation	T ₁₂	T ₂₄
Air pressure	hPa / mmHg											
Horovitz	PaO ₂ / FiO ₂											
AaDO ₂	PAO ₂ - PaO ₂											
CaO ₂	Hb*1,34*SaO ₂ + PaO ₂ *0,0031											
DO ₂	HZV* CaO ₂ * 10											
CvO ₂	Hb*1,34*SvO ₂ +PvO ₂ *0,0031											
VO ₂	HZV*(CaO ₂ - CvO ₂) * 10											
O ₂ -ER	VO ₂ / DO ₂											
PAO ₂	$(Patm - PH_2O) * FiO_2$ - (PaCO ₂ /RQ)											
CcO ₂	Hb*1,34*SaO ₂ + PAO ₂ *0,0031											
Qs/Qt	$\frac{CcO_2 - CaO_2}{CcO_2 - CvO_2}$											

Central lab

Parameter	T _{Baseline}	T ₋₂	T ₋₁	T ₀	T ₁	T _{Beginn ITS}	T ₆	T ₂₄	T _{3d}	T _{5d}
Date/Time										
CK	U/l					U/l		U/l	U/l	U/l
CK-MB	U/l					U/l		U/l	U/l	U/l
Troponin	pg/ml					pg/ml		pg/ml	pg/ml	pg/ml
BNP	pg/ml					pg/ml		pg/ml	pg/ml	pg/ml
Leukos	/nl	/nl	/nl	/nl	/nl		/nl	/nl		

Parameter	T _{Baseline}	T ₋₂	T ₋₁	T ₀	T ₁	T ₆	T ₂₄	POD 3	POD 5
Date / Time									
Segmentkernige	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl
Eosinophile	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl
Basophile	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl
Lymphos	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl
Monos	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl
Erythroblasten	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl	/nl
Segmentkernige	%	%	%	%	%	%	%	%	%
Eosinophile	%	%	%	%	%	%	%	%	%
Basophile	%	%	%	%	%	%	%	%	%
Lymphos	%	%	%	%	%	%	%	%	%
Monos	%	%	%	%	%	%	%	%	%
Erythroblasten	%	%	%	%	%	%	%	%	%

C-reactive protein

[illegible]

Filename : FVHS-001_Calibration

[illegible]

Filename : FVHS-001_Study

	T _{Baseline}		T ₋₂		T _{Begin ICU}		T _{CPAP}		T _{Extubation}		T _{POD1}	
Date/Time												
Event	Base		T-2		ICU		CPAP		Ext		POD1	
ROI setting	Layers	Quadrants	Layers	Quadrants	Layers	Quadrants	Layers	Quadrants	Layers	Quadrants	Layers	Quadrants
ROI 1												
ROI 2												
ROI 3												
ROI 4												
PEEP			mbar		mbar		mbar					
P _{Max}			mbar		mbar		mbar					
V _T			ml		ml		ml					
Tidalrate	/ min		/ min		/ min		/ min		/ min		/ min	
Compliance												
Resistance												

Fluid balances

Parameter	Intraop.	24 pm POD 0	24 pm POD 1	24 pm POD 3	24 pm POD 5
Date					
HLM-balance					
All infusions					
Free infusions					
Transfusions					
Urinary output					
TOTAL					

Art. BGA

Parameter	POD 1	POD 2	POD 3	POD 4	POD 5	POD6	POD7
Date / Time (~12 a.m.)							
F _i O ₂							
pH							
PaCO ₂							
PaO ₂							
PaO ₂ / F _i O ₂ (Horovitz)							

Timing	Within 1 week of a known clinical insult or new or worsening respiratory symptoms
Chest imaging ^a	Bilateral opacities—not fully explained by effusions, lobar/lung collapse, or nodules
Origin of edema	Respiratory failure not fully explained by cardiac failure or fluid overload Need objective assessment (eg, echocardiography) to exclude hydrostatic edema if no risk factor present
Oxygenation ^b	
Mild	200 mm Hg < $\text{PaO}_2/\text{FiO}_2 \leq 300$ mm Hg with PEEP or CPAP ≥ 5 cm H_2O ^c
Moderate	100 mm Hg < $\text{PaO}_2/\text{FiO}_2 \leq 200$ mm Hg with PEEP ≥ 5 cm H_2O
Severe	$\text{PaO}_2/\text{FiO}_2 \leq 100$ mm Hg with PEEP ≥ 5 cm H_2O

- New pulmonary infiltrate on chest x-ray

AND ≥ 2 following items

- temperature > 38.5 / $< 35.5^{\circ}\text{C}$
- Leucocytes > 12 / nl or < 4 / nl
- purulent secretions and AB

[illegible]

- Temperature > 38 or < 36°C
- Heart rate > 90 bpm
- Respiratory rate > 22 or PaCO₂ < 32 mmHg
- Leucocytes > 12 / nl or < 4 / nl

- acute Δ in SOFA-Score ≥ 2

- need for vasopressors for MAP ≥ 65
- AND
- lactate level > 2 mmol / L

Singer et al. The third international consensus definition for sepsis and septic shock. JAMA 2016; 315: 801-10.

[illegible]

Stay

	POD 0	POD 1	POD 3	POD 5
Date / Time				
Ward				

KDIGO-Score

Preop. Crea: _____

Parameter	POD 0	POD 1	POD 3	POD 5
Crea				
Urine				
KDIGO				

AKI-Stadium	S-Kreatinin	Urin-Ausscheidung
1	1,5- bis 1,9-facher Anstieg innerhalb von sieben Tagen oder Anstieg $\geq 0,3$ mg/dl innerhalb von 48 Stunden	< 0,5 ml/kg/h über mehr als sechs Stunden
2	2,0- bis 2,9-facher Kreatininanstieg	< 0,5 ml/kg/h über mehr als zwölf Stunden
3	≥ 3 -facher Kreatininanstieg oder Serum-Kreatinin ≥ 4 mg/dl mit einem akuten Anstieg $\geq 0,5$ mg/dl	< 0,3 ml/kg/h über mehr als 24 Stunden oder fehlende Urinausscheidung (Anurie) für $\geq$ zwölf Stunden

CAM-ICU

	Merkmal I	Merkmal II	Merkmal III	Merkmal IV	Delir	Ø Delir
POD 1	☐	☐	RASS:	☐	☐	☐
POD 3	☐	☐	RASS:	☐	☐	☐
POD 5	☐	☐	RASS:	☐	☐	☐

Point of care

	ICU	IMC	Normal ward	PODs until discharge	AHB	Hospital transfer
Duration	d	d	d	d	☐	☐

Telephone surveys

	1 Monat postop.	6 Monate postop
Datum		
Stationäre Aufnahme	☐	☐
In AHB	☐	☐
Stationär geblieben	☐	☐
Grund für Aufnahme		
Diagnose		
Freitext		