Perfusionist Practical Protocol

Implementation of Conventional (CUF) & Modified Ultrafiltration (MUF)

Version 1.0 | Approved for Clinical Use
Institution: [Your Hospital Name]
Department: Cardiovascular Perfusion
Effective Date: November 13, 2025

OBJECTIVE

To safely and effectively manage fluid balance, hemoconcentrate the patient, and remove inflammatory mediators during and after cardiopulmonary bypass (CPB).

PART 1: CONVENTIONAL ULTRAFILTRATION (CUF)

(Performed during CPB)

A. Pre-CPB Setup & Preparation

Step	Action
1	Integrate hemofilter into CPB circuit
2	Arterial Inlet: Connect to arterial line port (post-pump, pre-arterial filter)
3	Venous Outlet: Connect to venous reservoir port
4	Secure all lines with Luer-locks; clamp ultrafiltrate line
5	Connect ultrafiltrate line to calibrated collection bag

B. Initiation of CUF

Timing: After stable CPB flow & patient cooling (10–20 min post-CPB)
Activation: Open ultrafiltrate collection clamp
Flow Rate: 50–200 mL/hr (adjust per reservoir volume)
Safety: Never compromise venous reservoir level

C. Monitoring & Management

Parameter	Frequency	Action
Ultrafiltrate Volume	Continuous	Record on CPB sheet
Circuit Hct, ABG, Electrolytes	q30–60 min	Adjust rate if needed
Filter Pressure Drop	Continuous	↑ Pressure → suspect clotting

D. Termination of CUF

Timing: During CPB weaning phase
Procedure: Clamp ultrafiltrate line securely

PART 2: MODIFIED ULTRAFILTRATION (MUF)

(Performed after CPB – Arteriovenous Configuration)

A. Pre-Bypass Setup & Preparation

Prime MUF circuit with crystalloid
De-air meticulously (bubble trap + visual check)
Calibrate MUF roller pump
Keep circuit ready for immediate use

B. Pre-Initiation Checklist (Post-CPB)

Item	Confirmed?
CPB terminated	■
Hemodynamic stability (verbal confirmation)	■
Protamine complete	■
Arterial line → arterial cannula port	■
Venous line → venous cannula port	■

C. Initiation & Execution of MUF

Start Low: 50–100 mL/min
Ramp Up: To 100–200 mL/min (adults) over 1–2 min
Team Communication: Announce all flow changes
Monitoring:
- MUF pump flow & pressures
- Ultrafiltrate volume
- Hemodynamics (anesthesiologist)

D. Termination of MUF

Stop if ANY of the following:
• Duration: 10–20 minutes
• Target volume removed
• Hemodynamic instability
• Target Hct achieved

Procedure:
↓ MUF flow → 0 mL/min
Clamp arterial & venous lines
Disconnect from cannulae
Proceed to decannulation

SAFETY CONSIDERATIONS & CONTINGENCIES

Risk	Mitigation
Air Embolism	Full de-airing, bubble detector, stop if air seen
Hypotension	Start low, go slow; pause if MAP ↓

Circuit Clotting	Terminate if filter clots; do not force flow
Over-Hemoconcentration	Monitor Hct, NIRS; avoid hyperviscosity

Contraindications:

Ongoing bleeding
Complex anatomy (e.g., single ventricle)
Air in circuit

References

AmSECT Perfusion Practice Guidelines (2023)
Darling et al., J Extra Corpor Technol (2021)
Groom et al., Perfusion (2019)

Approved by:
Chief Perfusionist
Date: _____

How to Use This PDF
• Print in color for team training
• Laminate one-page summary for OR wall
• Include in perfusion orientation binder