

Hemodynamic management of critically ill burn patients: An International survey

1) Characteristics of your hospital:

- University hospital
- Public community hospital
- Private hospital
- Exclusive burn center
- Other, please specify:

2) Characteristics of your intensive care unit (ICU):

- Medical ICU
- Surgical ICU
- Mixed ICU
- Intensive care burn unit

3) Annual number of burns patients treated in the ICU (approximatively):

- ≥ 500 patients
- 200-500 patients
- 100-200 patients
- 50-100 patients
- < 50 patients

4) Total number of ICU beds (do not include medium care beds):

- > 20 beds
- 16-20 beds
- 11-15 beds
- 6-10 beds
- ≤ 5 beds

5) Number of ICU Beds devoted to burns patients (do not include medium care beds):

- > 20 beds
- 16-20 beds
- 11-15 beds
- 6-10 beds
- ≤ 5 beds

6) Your burned patients are:

- Only Adults
- Both children and adults
- Only children

7) Your main specialty (specialties) is (are): (More than one answer is possible)

- Intensive care

- Anesthesiology
- Surgery
- Other, please specify:

8) In which country do you work?

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9) Experience in treating burn patients

- < 2 years
- Between 2 and 5 years
- >5 years

10) Do you work full time with burns patients?

- Yes
- No

11) Do you use a protocol for fluid resuscitation for burns patients in your unit?

- Yes
- No

12) Which formula do you use to start volume therapy on admission in your burn patients?

- Classical Parkland formula (4ml/Kg/% TBSA)
- Modified Parkland formula (2ml/Kg/% TBSA)
- Other formula, please specify:
- I do not use any formula

13) Do you routinely increase fluid volume resuscitation in the case of inhalation injury?

- Yes No

14) What parameters do you usually use to guide your volume therapy in severely burn patients in your unit? (In descending order of importance n°.....) (If you do not use any of them, leave it unchecked)

- Urine output (n°.....)
- Mean arterial pressure (MAP) (n°.....)
- Central venous pressure/ Right atrial pressure (n°.....)
- Pulmonary capillary wedge pressure (PCWP) (n°.....)
- Global end diastolic volume (GEDV) / Intrathoracic blood volume (ITBV) (n°.....)
- Cardiac output (n°.....)
- Plasma lactate levels (n°.....)
- Plasma base deficit (n°.....)
- Central or mixed venous oximetry (ScvO₂ or SvO₂) (n°.....)
- Venous-to-arterial carbon dioxide difference (PCO₂ gap) (n°.....)
- Pulse pressure variation (PPV) / Stroke volume variation (SVV) (n°.....)
- Echocardiography based parameters (n°.....)
- Skin mottling (n°.....)
- Extravascular lung water (EVLW) (n°.....)
- Other, please specify: (n°.....)

15) Do you usually (> 50% of cases) monitor cardiac output in the first 48 hours after admission in your severe burn patients?

- Yes No

16) If yes, which technique do you use to monitor cardiac output continuously? (More than one answer is possible)

- Oesophageal doppler probe
 Transpulmonary thermodilution
 Pulse contour analysis
 Pulmonary artery catheter
 Other, please specify:

17) Do you use echocardiography to guide fluid resuscitation in your severe burn patients?

- Yes No

18) If yes, do you use: (More than one answer is possible)

- Transthoracic Echocardiography Transesophageal Echocardiography Both

19) Which crystalloids do you use for the primary resuscitation in the first 48 hours?

NaCl 0.9%	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
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Ringer's Lactate	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
Plasma-Lyte®	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
Isofundine®	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
Other, please specify:	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>

Almost never (0 to 20 %), 2) Rarely (21 to 40%), 3) Sometimes (41 to 60%), 4) Frequently (61 to 80%), 5) Almost always (81 to 100%)

20) Do you use colloids?

1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
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Almost never (0 to 20 %), 2) Rarely (21 to 40%), 3) Sometimes (41 to 60%), 4) Frequently (61 to 80%), 5) Almost always (81 to 100%)

21) Which colloids do you use for the primary resuscitation in the first 48 hours?

HES	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
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Gelatins	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
Dextrans	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
Albumin 20%	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
Albumin 5%	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
Fresh frozen plasma	1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>

HES= Hydroxyethylstarches

Almost never (0 to 20 %), 2) Rarely (21 to 40%), 3) Sometimes (41 to 60%), 4) Frequently (61 to 80%), 5) Almost always (81 to 100%)

22) If you use colloids, how long do you wait before colloid infusion initiation?

- 6-8 hours after burn injury
- 12 hours after burn injury
- 24 hours after burn injury

23) If you use colloids, what are the triggers to initiate colloid infusion? (More than one answer is possible)

- Systematically 6-8 hours after burn injury
- Fixed total burned surface area (e.g. TBSA > 30%)
- Persistent hypotension (MAP < 65 mmHg)

- High cristalloid volume requirement
- Acute respiratory distress syndrome (ARDS)
- Low plasma albumin levels (< 25 g/L)
- Inhalation injury
- Decreased urine output (< 0.5 ml/Kg/h)
- Other:

24) Do you use adjunctive therapies to reduce volume administration in the first 48 hours after burn injury? (More than one answer is possible)

- I use vasopressors early
- I use high dose Ascorbic acid (Vitamin C)
- I use early skin grafting surgery (<48 hours)
- I use corticoids
- Other, please specify:

26) What is your first line vasopressor in the initial treatment of your severe burn patients?

- Dopamine
- Norepinephrine
- Epinephrine
- Phenylephrine
- Vasopressin
- Metaraminol
- Other:

27) Which MAP do you generally target in a young severely burned patient without comorbidities?

- 60 mmHg
- 65 mmHg
- 70 mmHg
- 75 mmHg

28) Which Cardiac index (CI) do you generally target?

- 2-2.5 L/min/m²
- 2.5-3 L/min/m²
- 3-3.5 L/min/m²
- > 3.5 L/min/m²
- I consider CI variations rather than a specific number

30) Do you use vasodilators in the first 24 hours after burn injury?

1) Almost never <input type="checkbox"/>	2) Rarely <input type="checkbox"/>	3) Sometimes <input type="checkbox"/>	4) Frequently <input type="checkbox"/>	5) Almost always <input type="checkbox"/>
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Almost never (0 to 20 %), 2) Rarely (21 to 40%), 3) Sometimes (41 to 60%), 4) Frequently (61 to 80%), 5) Almost always (81 to 100%)

31) If yes, which vasodilators do you use for the primary resuscitation in the first 24 hours?

- Nitroglycerin
- Dobutamine
- Enoximone
- Prostacyclin
- pentoxifylline,
- Other: