Government of West Bengal
Department of Health & Family Welfare
State Family Welfare Bureau
Swasthya Bhavan, Sector V, Bidhannagar, Kolkata-700091

Memo No: ~~SFWB/~~ HFW-35099/376/2024-SFWB/1010 **Date:** 18/8/2025

To : **1. The Principal/Director (All MCH/Institute)**
Department of Health & Family Welfare
Govt. of West Bengal
2. The CMOH (All)/DFWO (Kolkata)/CMHO (KMC)
Department of Health & Family Welfare
Govt. of West Bengal

Subject: Dissemination and Implementation of the Protocol for Fluid Management for Pregnant women Undergoing Caesarean Section.

Sir/Madam

In continuation of the initiative to reduce preventable maternal morbidity and mortality as per SDG targets, and based on recommendations of the State Expert Committee constituted vide Memo Nos. HFW-35099/376/2024-SFWB/195 & 196 dated 06.02.2025, the Protocol for Fluid Management especially for mothers undergoing Caesarean section—as endorsed by the Expert Committee and approved by the competent authority of this department— is hereby circulated for strict adherence across all tiers of health facilities in the State.

This protocol is to be followed in all Government Medical Colleges & Hospitals, District Hospitals, Sub-Divisional Hospitals, Rural Hospitals, BPHCs, and other Delivery Points as applicable, with immediate effect.

All facility heads and District Health Authorities are requested to:

1. Ensure wide dissemination of the enclosed protocol among all concerned specialists, duty doctors, anaesthetists, and nursing staff.
2. Organise in-house orientation sessions at the earliest possible date.
3. Monitor compliance.

Thank you for your continued dedication and commitment to maternal and child health.

Enclosed herewith:
Annexure-I – ***Protocol for Fluid Management for Mothers Undergoing Caesarean Section***

The Director of Health Services
Health & family Welfare Department
Government of West Bengal

The Director of Medical Education
Health & family Welfare Department
Government of West Bengal

Memo No: ~~SFWB/~~ HFW-35099/376/2024-SFWB/1010/1(23) **Date:** 18.8.2025

Copy forwarded for information and necessary action please

1) The DME, Dept. of Health & Family Welfare, Govt. of West Bengal
2) The DHS, Dept. of Health & Family Welfare, Govt. of West Bengal
3) The MD, NHM & Secretary, Dept. of Health & Family Welfare, Govt. of West Bengal
4) The AMD, NHM & Spl. Secretary, Dept. of Health & Family Welfare, Govt. of West Bengal
5) The PO II & Jt. Secretary, Dept. of Health & Family Welfare, Govt. of West Bengal
6) The PO I & Sr. Dy. Secretary, Dept. of Health & Family Welfare, Govt. of West Bengal
7) The MSVP (All MCH/Institute), Dept. of Health & Family Welfare, Govt. of West Bengal
8) The Jt. DHS (HA),Dept. of Health & Family Welfare, Govt. of West Bengal
9) The Jt. DHS (Nursing),Dept. of Health & Family Welfare, Govt. of West Bengal
10) The DDHS (RCH) in the rank of Jt. DHS, Dept. of Health & Family Welfare, Govt. of West Bengal
11) The DDHS (HA), Dept. of Health & Family Welfare, Govt. of West Bengal
12) The DDHS (Nursing), Dept. of Health & Family Welfare, Govt. of West Bengal
13) The DDME, Dept. of Health & Family Welfare, Govt. of West Bengal
14) The ADME, Dept. of Health & Family Welfare, Govt. of West Bengal
15) The ADHS (Maternal Health), Dept. of Health & Family Welfare, Govt. of West Bengal
16) The Dy. CMOH III (All), Dept. of Health & Family Welfare, Govt. of West Bengal
17) The DMCHO (All), Dept. of Health & Family Welfare, Govt. of West Bengal
18) The DPHNO (All), Dept. of Health & Family Welfare, Govt. of West Bengal
19) The MO (G&O), MDSR Cell, Swasthya Bhawan, Dept. of Health & Family Welfare, Govt. of WB
20) The Sr. PA to The Principal Secretary to the Govt. of West Bengal, H&FW Department
21) The State Consultant-Maternal Health, RMNCH+A, SPMU, NHM, West Bengal
22) The DPM (All), DPMU, NHM, West Bengal
23) Office Copy

18/08/2025

SFWO & Jt. DHS (RCH)
Dept. of Health & Family Welfare
Govt. of West Bengal

Fluid Therapy in Caesarean Section: A Guideline

Introduction

Fluid therapy is an essential aspect of perioperative care in Caesarean section. The goal of fluid therapy is to maintain optimal fluid balance, prevent dehydration, and ensure adequate perfusion of vital organs. This guideline provides recommendations for fluid therapy in Caesarean section.

Which fluid in Pregnancy?

Whilst evidence is scarce, in the critically ill pregnant patient, isotonic crystalloids represent a safe initial choice in a wide variety of maternal conditions. Other synthetic colloids and starches have some significant risks associated with anaphylaxis, excess kidney injury and increased mortality and should be avoided in critical ill pregnant women. Cochrane review did not find a difference between crystalloids and colloids in preventing hypotension during caesarean section, rather less adverse effect in crystalloids. For fluid therapy in obstetric haemorrhage, generally isotonic crystalloids are used as first-line fluid resuscitation until appropriate blood and blood products become available

Preoperative Fluid Management

1. Clear liquids: Allow clear liquids up to 2 hours before induction of anesthesia.
2. Carbohydrate loading: Consider carbohydrate loading with clear liquids or carbohydrate-rich drinks 2-3 hours before surgery.

- a) Sports drinks.
- b) Fruit juice: Fruit juices like orange, apple, or grape juice
- c) Glucose drinks
- d) Coconut water
- e) Herbal teas with honey
- f) Homemade labor aid: A homemade labor aid drink can be made by mixing 1/2 cup of fruit juice, 1/4 cup of honey, and 1 cup of water.

3. Fasting guidelines: No solid food from 6 hours before surgery for planned caesarean sections.

Intraoperative Fluid Management

1. Crystalloids: Use crystalloids (e.g., Normal Saline, Ringer's Lactate) for volume resuscitation.
2. Co-loading: Consider co-loading with crystalloids to prevent post-spinal hypotension.
3. Colloids: Use colloids (e.g., hydroxyethyl starch, gelatin) judiciously, as they may increase the risk of anaphylaxis.

24/07/25 24/7/2025 Milan Chakraborty 24/7/2025 24/7/2025

4. Vasopressor agent (eg. Phenylephrine, Ephidrine) therapy is crucial component in minimizing spinal hypotension and are to be used by trained Anaesthaetist.
5. Fluid warming: Warm fluids to prevent hypothermia (Specially in winter months).

Postoperative Fluid Management

1. Crystalloids: Continue crystalloids at a rate of 100 mL/hour.(one 500 ml bottle to run in 5 hours)RL or NS : DNS = 1 : 2 can be used (Modify according to availability of fluid, but 5% dextrose is preferably avoided).
2. Restrict fluids: Restrict fluids to 70-80 mL/hour in patients with preeclampsia, eclampsia, or heart disease.(500 ml in 6 hours)
3. Monitor fluid status: Monitor blood pressure, pulse rate, urine output, and basal lung crepitations for signs of hypo- or hypervolemia.
4. Adjust fluid therapy: Adjust fluid therapy based on patient's clinical status, laboratory values, and urine output.
5. Start clear fluids orally as early as 6 hours after caesarean or as soon as intestinal peristaltic sound (IPS) returns and the patient does not vomit.

COMPLICATIONS OF FLUID THERAPY:

Fluid therapy may be harmful if the incorrect fluids are given, if fluids are given in inadequate amounts, or if too much fluid is administered. Correct timing of fluid resuscitation is also vital to maximize benefit and minimize harm.

Inappropriate fluid type: Colloids may be associated with anaphylaxis, whilst starches have been associated with excess renal Failure and mortality in ICU populations and should be avoided. Although starches have been used safely to prevent hypotension during caesarean section, any effects on the fetus from prolonged exposure in utero are unknown.

Excess crystalloid fluid administration in women with postpartum haemorrhage may result in worsening anaemia, shock and coagulopathy. Use of hypotonic (or less commonly hypertonic) fluids may lead to severe dysnatremias and other electrolyte abnormalities, with resultant potentially catastrophic neurological complications. Excessive administration of chloride-rich fluids may lead to a normal anion gap metabolic acidosis.

Inadequate fluid volume: Fluid resuscitation is an integral part of the treatment of a variety of complex and critical illnesses. In particular, sepsis, trauma and haemorrhage require early, balanced and focused fluid resuscitation in the early stages.

Excessive fluid volume: Normal pregnancy is marked by an increase in the maternal circulating volume. Both pre-existing and superimposed conditions such as cardiac disease and renal dysfunction may exacerbate this, and hypertensive disorders of

pregnancy may be associated with significant edema and varying degrees of volume state disturbance. Pre-eclamptic women are also at considerably increased risk of developing pulmonary edema, which has been associated with increased maternal mortality.

SPECIFIC SCENARIOS:

The hypertensive disorders of pregnancy are a unique group of disorders that are, along with obstetric haemorrhage & sepsis leading causes of maternal morbidity & mortality.

Hypertensive disorders of pregnancy:

Injudicious fluid management has been implicated as a contributor to maternal death. Intravascular volume state is contracted in pre-eclampsia and severe pre-eclampsia is associated with maternal cardiovascular changes, including altered maternal left ventricular (LV) morphology. Left ventricular systolic function may be impaired, but often the development of LV hypertrophy and reduced LV relaxation occurs, resulting in primarily diastolic dysfunction. This, combined with capillary leak, abnormal lung permeability and severe hypertension contributes to the increased risk of pulmonary edema.

Obstetric haemorrhage:

Management should focus on stopping the bleeding, replacing circulating volume, and avoiding/ameliorating the consequences of massive haemorrhage, including coagulopathy, acidosis, hypothermia and end organ dysfunction. A recent international consensus statement (incorporating FIGO) suggests initial restrictive resuscitation with crystalloid solutions, using 1–2 ml per ml of blood loss. Continuous resuscitation with crystalloid solutions at the expense of blood product replacement should be avoided as worsening oxygen delivery and dilutional coagulopathy will result. The ideal blood component ratio and fluid regime in massive obstetric haemorrhage is still under investigation and requires further research,

Bibek Mohan Pandit 24/07/25

Raymond Dy 29/07/25

Milan Chakraborty 24/7/2025

24/7/2025

Special Considerations

1. Preeclampsia: Avoid routine fluid preload before initiating neuraxial anesthesia.
2. Postpartum hemorrhage: Use hypotensive fluid resuscitation to maintain blood pressure lower than normal until control of bleeding is achieved.
3. Renal disease: Restrict fluid intake to output plus 500 mL.
4. Heart disease: Use caution with fluid therapy, as excessive fluid administration may worsen cardiac function.

Monitoring and Assessment

1. Vital signs: Monitor blood pressure, pulse rate, respiratory rate, and oxygen saturation.
2. Urine output: Monitor urine output hourly to assess renal perfusion. (At least 30 ml per hour but preferably more than 60 ml per hour; note in eclampsia 0r pre eclampsia initial output may be less).
3. Laboratory values: Monitor electrolytes, renal function, and hemoglobin levels where indicated.
4. Clinical assessment: Regularly assess patient's clinical status, including signs of fluid overload or dehydration.

Bibek Mohan Purohit 24/7/25

Reviewed by 24/7/2025

Milan Chakraborty 24/7/2025

24/7/2025

Alaka

POST OPERATIVE MONITORING CHART

Post-operative observation in a case of Caesarean Section done on ---------- under SA/EA/GA

Parameters	30mint	60mint	1.30hrs	2 hrs	2.5hrs	3hrs	3.5hrs	4hrs	5hr	6hrs	Comment
Level of Consciousness											
Pallor											
Pulse rate											
BP SBP/DBP											
Respiratory rate											
Heart sound											
Breath sound											
Spo2											
P/A findings											
Bleeding P/V											
Urine out put											
IV fluid											
Temperature											

Conclusion

Fluid therapy is a critical aspect of perioperative care in Caesarean section. This guideline provides recommendations for fluid therapy to ensure optimal patient outcomes. It is essential to individualize fluid therapy based on patient's clinical status, laboratory values, and urine output.

Date: **March, 2025**

References

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2. National Institute of Child Health and Human Development. (2017). Cesarean delivery and postoperative care.
3. Society for Obstetric Anesthesia and Perinatology. (2018). Guidelines for fluid management in obstetrics.
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5. Pandya S. Practical Guidelines on Fluid Therapy. 3rd ed. India; 2024. Chapter 52, Fluid management for cesarean delivery.

6. Pandya S. Practical Guidelines on Fluid Therapy. 3rd ed. India ; 2024. Chapter 53, Fluid management in pre-eclampsia and post-partum hemorrhage.