

Fibrinogen Replacement in Postpartum Hemorrhage due to Uterine Atony

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Background

- Postpartum hemorrhage (PPH) remains a significant cause of maternal mortality in the U.S¹

★ **2000-2019:** ↑ *rate of PPH*, ↑ *pregnancies with ≥1 risk factors for PPH*

- Fibrinogen** levels fall faster than other clotting factors during episodes of acute bleeding
 - Levels **<200 mg/dL** are associated with an increased risk of progression to **severe PPH**²

- Empiric treatment of PPH with fibrinogen concentrate:
 - Prevents further decrease in plasma fibrinogen levels³
 - ≠ improved outcomes^{3,4}

- However, **laboratory-guided** replacement of fibrinogen is recommended for plasma levels < 200mg/dL⁵



Normal Fibrinogen Levels

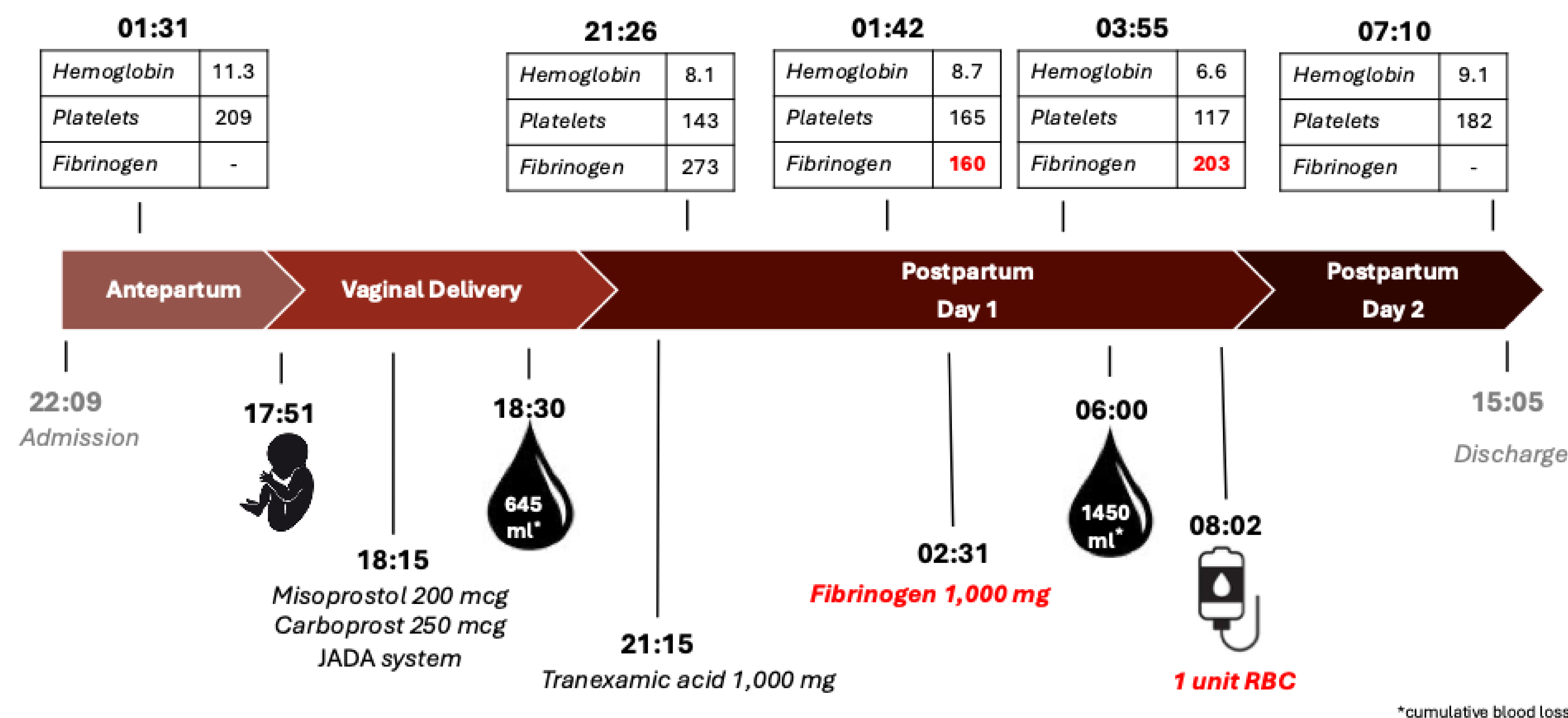
Non-pregnant	200-400 mg/dL
3rd Trimester	400-600 mg/dL

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2. Charbit B, Mandelbrot L, Samain E, et al. The decrease of fibrinogen is an early predictor of the severity of postpartum hemorrhage. *J Thromb Haemost.* 2007;5(2):266-273
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Case Report

- **37 year-old G4P3003**, vaginal birth after cesarean (VBAC)
- Course complicated by: uterine atony → **PPH**
 - *See figure 1 for full timeline*
- Repeat hemorrhage labs due to persistent bleeding
 - Postpartum plasma fibrinogen: **273mg/dL** → **160 mg/dL**
 - ↳ Tx: **1,000mg fibrinogen concentrate**
- Fibrinogen > 200mg/dL, however, bleeding persisted with 1.45L total quantitative blood loss (QBL)
 - Hgb 6.6 → **1 unit of red blood cells (RBC)**

Figure 1: Postpartum Hemorrhage Timeline



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Discussion

- Laboratory-guided replacement of fibrinogen in PPH:
 - Not associated with ↓ need for at least one blood transfusion¹
 - Associated with ↓ rates of massive hemorrhage (**≥ 2,500ml**) and large volume transfusion (**≥ 4 units RBC or ≥ 8 units of any blood products**)¹
- Benefits of fibrinogen replacement in PPH may vary by etiology of PPH
 - Hyperfibrinolysis likely not the primary mechanism underlying PPH in case of uterine atony²
 - More effective in consumption-driven etiologies (*e.g. placental abruption, amniotic fluid embolism/DIC*)? *Further research is needed*

Conclusion: Given the increase in pregnant patients at risk for PPH in the U.S., laboratory-guided fibrinogen concentrate administration should be considered as it may reduce massive blood loss and mass transfusion rates. However, it may not prevent the need for at least one RBC transfusion. Therefore, the benefits of fibrinogen concentrate administration should be carefully weighed against possible risks including thromboembolic events, anaphylaxis/hypersensitivity reactions, and increased cost of treatment.³

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