

Inherited Bleeding Disorders Carry a High Hemorrhage Burden

A Retrospective Cohort Study in a Large Healthcare System (2015–2025)

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Background

- Patients with inherited bleeding disorders (BD) are at increased risk for postpartum hemorrhage (PPH)
- Risk estimates are limited for non-Von Willebrand (VWD) BDs
- We used scalable phenotyping of electronic health records (EHR) integrating blood loss (BL), transfusion, and escalation procedures



Study Design & Methods

Study Overview

- Retrospective cohort (2015–2025)
- Large healthcare (EHR data)
- 165,393 deliveries (121,915 patients)

Population Groups

- von Willebrand disease
 - 315 deliveries (217 patients)

Non-VWD bleeding disorders

- 200 deliveries (138 patients)
- Reference group
- 164,878 deliveries

Methodological Innovations

- NLP-based identification of bleeding disorders
- Classification using ISTH-derived list
- Detailed hemorrhage measures (beyond ICD codes)

Hemorrhage Definitions

PPH

- Blood loss ≥ 1000 mL
OR
transfusion within 24 hrs

Severe PPH

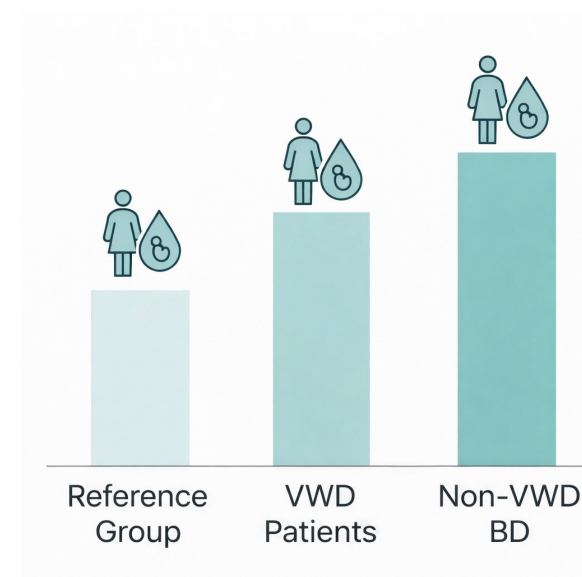
- Blood loss ≥ 1500 mL,
transfusion,
OR
escalation procedures

Key Findings: Non-VWD Disorders Show Highest Hemorrhage Risk

165,393 deliveries across three patient groups

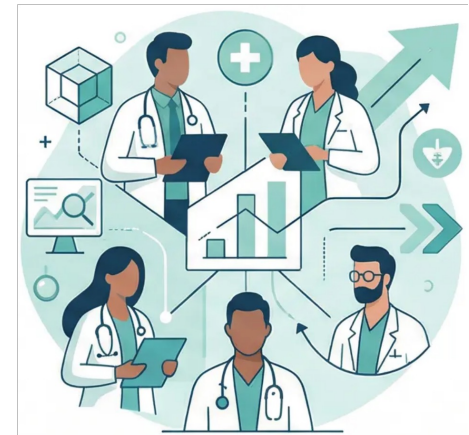
Hemorrhage Rates by Patient Group

Outcome/Metric	Reference (no BD)	VWD	Non-VWD BD
Deliveries, n	164,878	315	200
Unique patients, n	121,560	217	138
Any PPH, n (%)	16,323 (9.9%)	46 (14.6%)	39 (19.5%)
Severe PPH, n (%)	6,595 (4.0%)	21 (6.7%)	32 (16.0%)
Transfusion ≤ 24 hours, n (%)	1,970 (1.2%)	6 (1.9%)	24 (12.0%)
Hemorrhage escalation, n (%)	1,800 (1.1%)	4 (1.3%)	7 (3.5%)
Adjusted OR for any PPH (95% CI)	1.00 (ref)	1.47 (0.98–2.20)	2.46 (1.59–3.80)
Adjusted OR for severe PPH (95% CI)	1.00 (ref)	1.69 (0.97–2.95)	5.29 (3.27–8.57)



Conclusions & Clinical Implications

- Non-VWD showed significantly elevated hemorrhage risk
- Detailed EHR phenotyping revealed previously under-recognized high-risk population
- Risk-adjusted odds ratios significantly elevated for severe postpartum hemorrhage



Proactive multidisciplinary planning and obstetric anesthesia readiness is essential for patients with inherited bleeding disorders