

# BLOOD ON THE EDGE

CRITICAL CARE HEMATOLOGY UNPLUGGED



**Dr. Birupaksha Biswas, MD**



# **Blood on the Edge:** **Critical Care Hematology Unplugged**

**First Edition**

**Author**

Dr. Birupaksha Biswas



**Title of the Book:** Blood on the Edge: Critical Care Hematology Unplugged

**First Edition – 2025**

**Copyright 2025 © Dr. Birupaksha Biswas**, Senior Resident (Ex), Department of Pathology, Burdwan Medical College and Hospital, West Bengal.

No part of this book may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owners.

**Disclaimer**

The author is solely responsible for the contents published in this book. The publishers don't take any responsibility for the same in any manner. Errors, if any, are purely unintentional, and readers are requested to communicate such errors to the Author or publishers to avoid discrepancies in the future.

**E-ISBN: 978-93-7020-444-7**

**MRP Rs. 160/-**

**Publisher, Printer & Distributor:**

Selfypage Developers Pvt Ltd.,  
Pushpagiri Complex,  
Beside SBI Housing Board,  
K.M. Road Chikkamagaluru, Karnataka.  
Tel.: +91-8861518868  
E-mail: info@iipbooks.com

**IMPRINT: IIP Iterative International Publishers**

**For Sales Enquiries:**

Contact: +91- 8861511583  
E-mail: sales@iipbooks.com

# Preface

Critical care hematology is not for the faint of heart. It is the battlefield where clot and bleed, oxygen and anemia, immunity and destruction wage war at the cellular level—while the intensivist stands in the middle, armed with protocols, transfusion bags, and an uneasy sense of *déjà vu*. Every drop of blood tells a story, and in the ICU, these stories are never quiet.

This book was born from countless nights at the bedside, staring at labs that made no sense, transfusion bags that arrived too slowly, and patients who insisted on teaching us humility. It is written for those who have stood in the resuscitation bay, trying to decide whether to give blood, withhold it, or pray that the coagulation screen was wrong. It is written for those who secretly suspect that hemolysis has a wicked sense of humor.

You will find here not just the science but also the stories—the drama of crashing coagulopathies, the comedy of clerical errors narrowly averted, and the heroics of modern therapies ranging from AI to biologics and cellular medicine. The goal is simple: to make critical care hematology not only rigorous but also readable, to give you the tools to save lives without sacrificing your sanity.

If you are looking for dry textbook prose, you may be disappointed. If you are looking for lucid, precise explanations woven with wit and cautionary tales from the frontline, you are in the right place.

As William Osler once said, “Medicine is a science of uncertainty and an art of probability.” In critical care hematology, that uncertainty is painted in red. My hope is that this book helps you navigate it with clarity, courage, and perhaps even the occasional smile.

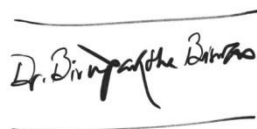
# Acknowledgement

Behind every unit of blood lies not just a donor, but an entire unseen orchestra. To the laboratory scientists who type and crossmatch at unholy hours, to the transfusion medicine specialists who argue with us (and save us from ourselves), and to the nurses who calmly spike yet another bag while the monitor screams—I owe you more than words can capture.

To my mentors, who patiently explained the coagulation cascade for the hundredth time without once rolling their eyes, and to my colleagues in critical care who reminded me that hematology is not just numbers on a page but lives in the balance, thank you.

To the patients and families who allowed their stories, triumphs, and even tragedies to become lessons for the rest of us, you are the true teachers.

And finally, to the coffee that kept me awake while writing these chapters, and to the quiet midnight hours when the best ideas arrived—you too deserve acknowledgment.

A handwritten signature in black ink, reading "Dr. Birupaksha Biswas", is centered between two horizontal lines.

***Dr. Birupaksha Biswas, MD***  
Clinical & Interventional Pathologist

# Contents

Chapter 1	Blood on the Edge – Hematology in the ICU Battlefield.....	1-6
Chapter 2	Crashing Coagulation: Navigating DIC and Beyond.....	7-13
Chapter 3	The Anemia Storm: Transfusions, Traps, and Triumphs.....	14-21
Chapter 4	White Cell Wars: Sepsis, Leukemoid Reactions, and Hyperleukocytosis.....	22-27
Chapter 5	Thrombosis Under Fire: When Clots Threaten Life.....	28-35
Chapter 6	Bleeding Out: The Art and Science of Hemostatic Rescue.....	36-43
Chapter 7	Bone Marrow in Crisis: The Malignant Invasions.....	44-51
Chapter 8	The Transfusion Tightrope: Precision, Perils, and Protocols.....	52-60
Chapter 9	Immunohematology at the Bedside: Hemolysis, Antibodies, and Emergencies...	61-71
Chapter 10	Futuristic Frontlines: AI, Biologics, and Cellular Therapies in Critical Care Hematology.....	72-77



## ABOUT THE BOOK

*Blood on the Edge: Critical Care Hematology Unplugged* journeys into the tumultuous theater where the physiology of blood collides with the urgencies of the intensive care unit. Here, hemorrhage and thrombosis, anemia and marrow collapse, transfusion perils and immunohematologic paradoxes enact their dramas with merciless speed. Each chapter dissects these crises with both scholarly gravitas and clinical candor, offering the reader not merely algorithms but a philosophy of discernment in moments where certainty dissolves. Yet the volume is not content with science alone; it entwines pathophysiology with bedside vignettes, interlaces evidence with experience, and anchors itself in strict protocols and clinically guided decisions. In its essence, the book is less a manual than a meditation: a call to humility for those who, in wrestling with blood's betrayals, learn that the true vocation of hematology at the edge is not mastery, but service. "Hematology in crisis is no theater for pride; it is the silent altar where the science of molecules kneels before the mystery of mortality, and where every act of rescue is, but a prayer disguised as protocol."

## ABOUT THE AUTHOR



**Dr. Birupaksha Biswas**, a Clinical & Interventional Pathologist, bears both the rigor of a clinician and the contemplative depth of a scholar. Armed with an MBBS and an MD in Pathology, he moves with ease across the dense thickets of disease, where the body's frailties become texts awaiting interpretation. With more than forty research publications in both national and international journals, he has cultivated an oeuvre that is as vast as it is integrative. His writings knit together diverse disciplines of medicine—oncology, hematology, infectious diseases, molecular diagnostics, deciphering therapeutic arms & critical care, into a single, cohesive fabric of scholarship. Each paper is less a fragment than a thread in a grand tapestry, linking clinical pragmatism with the philosophical weight of pathology. His special interests lie in diagnostic oncology and hematology, where the stakes are as grave as they are transformative. Here, he makes a robust attempt to employ molecular techniques, cytomorphology, and the interpretative arts of tissue pathology not merely to classify disease, but to decipher its hidden codes. The tumor cell, the malignant marrow, the aberrant antigen, under his gaze, these become semiotic signs in the silent narrative of illness. Yet his scholarship extends further still. From the delicate enigmas of thymic pathology and Myasthenia Gravis, to the sobering realities of diffuse alveolar damage in medicolegal necropsy, to the unspoken tragedies of stillbirth and diabetic foot disease, his research traverses the breadth of human suffering with an uncommon blend of technical acuity and humanistic insight. Dr. Biswas is also the author of recent scholarly monographs, where his reflective voice merges the empirical with the literary: *Pathology at the Edge of Certainty: Flesh, Code & the Semiotics of Diagnosis*, *Integrative Diagnostic Pathology*, and *The Alchemy of Lesions*. Together, they signal a thinker unafraid to situate the microscope within a larger philosophical and clinical horizon. In collaboration with peers across medicine's many domains, he has become a nexus of intellectual exchange, embodying the spirit of interdisciplinary pursuit. His humble journey is marked by a conviction that pathology is not merely the science of lesions, but the art of interpreting life in its most fragile form. Thus, through both his scalpel and his pen, he stands as a physician-scholar, an interpreter of the hidden languages inscribed upon cells, and a custodian of medicine's deepest dialogue between science, suffering, and the hope of healing.



Selfypage Developers Pvt Ltd

ISBN: 978-93-7020-444-7



MRP Rs. 160/-