

Chapter 17 Blood

Blood Content:

plasma + formed elements

formed elements - living blood

"cells" suspended in plasma

- **Erythrocytes** - (RBCs) red blood cells
- **Leukocytes** - (WBCs) white blood cells
- **platelets** - cell fragments



- plasma

(Buffy coat)
- WBCs + platelets

- RBCs

plasma - non living fluid matrix

90% water

60% albumin

36% Globulins

4% fibrinogen

- nutrients

- hormones

- wastes

- gases

- proteins

Sticky, opaque, metallic taste pH = 7.35 - 7.45

high O_2 - scarlet, low O_2 - dark red V = 5-6L men, 4-5L women

Blood function:

1. **Distribution** - delivering O_2 and nutrients to body cells; transporting metabolic wastes to lungs and kidneys for elimination; transporting hormones from endocrine organs to target organs
2. **Regulation** - maintaining body temp by absorbing and distributing heat; maintaining normal pH buffer; maintaining adequate fluid volume in circulatory system
3. **protection** - preventing blood loss - plasma proteins and platelets $\rightarrow$ clot formation; preventing infection

RBCs



Spectrin - provides flexibility to change shape

no nucleus

biconcave disks, **anucleate**, no organelles

RBC function: respiratory gas transport, hemoglobin binds with O_2

• 97% hemoglobin

form fib function

Hemoglobin - protein in RBC that carries oxygen

Hb

Globin:

Heme:

- 4 polypeptide chains
- pigment bonded to globin
- 2 alpha + 2 beta chains
- chain - gives blood red color

Oxyhemoglobin - ruby red - O_2 loading in lungs

deoxyhemoglobin - dark red - O_2 unloading in tissues

Carbamino hemoglobin - 20% CO_2 in blood binds to Hb

- heme iron (Fe) binds to 1 O_2
- RBC - 250mil Hb molecules
- Each Hb can produce 4 O_2

Hematopoiesis

- formation of blood cells in red bone marrow

hemocytoblasts - hematopoietic
Stem Cells

hematocrit - % of blood volume that
is in RBCs

47% $\pm$ 5% (males), 42% $\pm$ 5% (females)

Anatomy And Physiology Chapter Blood Notes

Minjie Lin



Anatomy And Physiology Chapter Blood Notes:

The Essentials of Anatomy, Physiology, and Hygiene Roger Sherman Tracy, 1884 **Human Form, Human Function: Essentials of Anatomy & Physiology, Enhanced Edition** Thomas H McConnell, Kerry L. Hull, 2020-03-27
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Today's Medical Assistant Kathy Bonewit-West, BS, MEd, Sue Hunt, Edith Applegate, MS, 2015-10-13 Launch your career in medical assisting with Today's Medical Assistant Clinical AIDS Hepatitis latex glove allergies vital signs pediatrics immunization information IM injection theory child abuse colonoscopies IV therapy CLIA waived tests Unique learning aids throughout the book include procedure charting examples outlines detailed learning objectives and key terms for each chapter Highlight boxes What Would You Do What Would You Not Do boxes Patient Teaching boxes On the Web boxes Putting It All into Practice boxes Memories from Practicum boxes glossary of key terms Arsenal of engaging activities on the Evolve companion site gives users a fun way to practice their medical assisting knowledge Over 120 procedures give readers clear illustrated guidance on each step of every procedure The procedural videos on the Evolve companion site enable users to view the procedures in action 8th grade reading level makes material approachable and easy to understand for all types of readers Full color design makes the book visually stimulating

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Handbook of Cardiac Anatomy, Physiology, and Devices Paul A. Iaizzo, 2010-03-11 A revolution began in my professional career and education in 1997 In that year I visited the University of Minnesota to discuss collaborative opportunities in cardiac anatomy physiology and medical device testing The meeting was with a faculty member of the Department of Anesthesiology Professor Paul Iaizzo I didn t know what to expect but as always I remained open minded and optimistic Little did I know that my life would never be the same During the mid to late 1990s Paul Iaizzo and his team were performing anesthesia research on isolated guinea pig hearts We found the work appealing but it was unclear how this research might apply to our interest in tools to aid in the design of implantable devices for the cardiovascular system As discussions progressed we noted that we would be far more interested in reanimation of large mammalian hearts in particular human hearts Paul was confident this could be accomplished on large hearts but thought that it would be unlikely that we would ever have access to human hearts for this application We shook hands and the collaboration was born in 1997 In the same year Paul and the research team at the University of Minnesota including Bill Gallagher and Charles Soule reanimated several swine hearts Unlike the previous work on guinea pig hearts which were reanimated in Langendorff mode the intention of this research was to produce a fully functional working heart model for device testing and cardiac research

Survival Guide for Anatomy & Physiology Kevin T. Patton, 2013-10-15 Don t be overwhelmed by the perils and pitfalls of learning A P Survival Guide for Anatomy Physiology 2nd Edition provides a quick and easy overview of tips strategies and key A P content to make studying more productive more fun and less time consuming A perfect on the go reference this handy guide is packed with colorful cartoons A P visuals illustrated tables and keen insights to help you prepare for even the most dangerous labs and exams Joining this excellent adventure are two new survival skills chapters plus strategies for using digital resources effectively Written by renowned author and educator Kevin Patton this book makes it easier to survive and conquer A P Plan a Learning Strategy section helps you study more effectively by showing how to tailor your learning activities to suit your learning style Part 2 Maps Charts and Shortcuts breaks the

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knowledge Application to EMR where appropriate prepares you for the real world by dealing with electronic medical records

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hundreds of high quality photographs and medical illustrations that highlight common and rare findings from the urine of dogs and cats Numerous algorithms suggest possible pathways for the diagnosis and treatment of urinary disorders This book is destined to be widely used in veterinary hospitals by seasoned and young attending veterinarians seeking to know more about urinalysis as well as by veterinary laboratory technicians Several sections of this book will be useful in the teaching of basic concepts to veterinary students The authors have also included An introduction to the philosophy of urinalysis and the detailed information about collection of urine from dogs and cats Comprehensive explorations of urine sample handling preparation and analysis Detailed aspects of USG as the most important physical property of canine and feline urine In depth discussions of urine chemistry dipstrip evaluation for pH protein occult blood glucose ketones and bilirubin Extensive detailing of urinary sediment microscopy Sections on FAQ and urinalysis case examples allow the reader to test their knowledge about urinalysis Urinalysis in the Dog and Cat is an essential reference for primary care veterinarians veterinary technicians veterinary students those in advanced training programs and specialists interested in learning more about disorders of the urinary tract

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