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Nota di contenuto	Preface -- Part I. Gases, bubbles and surroundings -- Perfect coffee and oxygen cylinders: the ideal gas law -- Boats, balloons, and air bubbles: Archimedes' principle -- Air bubbles in the blood sample: better or worse oxygenation? Dalton's law and Fick's law -- Cold, sparkling drinks, and blood gas analysis: Henry's law -- Bubbles, tracheal tube cuffs, and reservoir bags: surface tension and Laplace's law -- Part II. Fluids in motion: masks, tubes, and hemodynamics -- The Venturi mask works like an airplane: Bernoulli's theorem -- From tubes and catheters to the basis of hemodynamics: the Hagen–Poiseuille equation -- Part III. Hemodynamic monitoring -- Toothpaste, sea deeps, and invasive pressure monitoring: Stevin's law and Pascal's principle -- Heat, cardiac output, and what is the future: laws of thermodynamics -- Part IV. Forces in action -- Doors, steering wheels,

and central venous catheters: the moment of a force (torque) -- Friction, trigonometry, and Newton’s laws: all about Trendelenburg position -- Part V. Inhalation anesthesia -- Why a vaporizer is not exactly a vaporizer and why it weighs so much: saturated vapor pressure and heat of vaporization -- Thermal expansion: train tracks, thermostats and, again, vaporizers -- The voice of xenon: origin and propagation of sound -- Part VI. Electromagnetic waves -- Light, air pollution and pulse oximetry: the Beer-Lambert law -- Cerebral oximetry and why the sky is blue: Rayleigh scattering -- Catch me if you can: X-ray, Compton scattering and the inverse square law -- Part VII. Now we exaggerate -- Activated clotting time and… A brief look at the theory of relativity.

Sommario/riassunto

This book discusses, explains and provides detailed, up-to-date information on physics applied to clinical practice in anesthesiology, with the aid of simple examples from daily life. Almost everything that happens around us, including in the operating room and intensive care units, can be explained by physical laws. An awareness and understanding of relatively simple laws such as Bernoulli’s theorem, Hagen-Poiseuille equation and Pascal’s principle, to name just a few, offer anesthesiologists and intensivists fascinating insights into why they do what they do. Each of the 16 chapters starts with an everyday phenomenon, explains it with a physical law, and then shows why that law is important in anesthesia practice. Numerous illustrations are included for extra clarity. It is intended for anesthesiologists, intensivists, anesthesia teachers, anesthesia trainees, and medical students.