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| GENERAL ARTICLE |
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AMAZING INTERACTION OF VITALS – ORGAN CROSS TALK

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Abstract: *Air, water and energy are essential for sustaining life. Different systems, organs and tissues of the body function together to maintain homeostasis. The main function of the respiratory system is ventilation, oxygenation and acid base balance. Breathing is controlled by complex mechanisms involving respiratory centres, central and peripheral chemoreceptors. The function of the circulatory system is to provide adequate oxygen and nutrients to meet the metabolic demand of the tissues. The role of kidney is filtration, reabsorption, secretion, excretion as well as volume and osmoregulation, where as nutrition and energy is regulated by the gastrointestinal system. To maintain homeostasis all systems of the body are interacting with each other which can be assessed by the vital signs.*

Keywords: *Vital signs, Ventilation, Perfusion, Oxygenation. Circulation, Energy*

Points to Remember

- *Oxygen requirement is 5 ml / Kg/min.*
- *Normal healthy person of 50-60 kg needs 250- 300ml of O₂/ min for which tissue receives 5-6 litres of cardiac output/ min*
- *Alveolar volume: stroke volume is 4:1 , that is why RR: HR is 1: 4*
- *MAP is a better indicator for organ perfusion than systolic pressure.*
- *Normal urine output is 1 to 2 ml /Kg/hr.*
- *To arrive at normal fluid and calories requirement Holliday Segar formula is used.*
- *Oxygen consumption is lowest at neutral thermal environment*

Bibliography

1. Subramanyam L, Shivbalan So, Gowrishankar NC, Vijayasekeran D, Balachandran A. Pulmonary Dynamics. Essentials of Pediatric Pulmonology. 3rd edn, Chennai: Pediatric Pulmonology Foundation of India 2008; pp11-15.
2. Ilene M, scott M. Oxygen delivery and consumption. Website: Accessed 10.3.2018.
3. Nammalwar BR, Sudha E. Composition of body fluids and maintenance fluid therapy. Fluid and Electrolyte disturbance. Indian J Pract Pediatr 2018; 20(1):5-10.
4. Guyton AC. Overview of the circulation; Biophysics of pressure, flow and resistance. The Circulation. In: Guyton and Hall Textbook of Medical Physiology. 12th edn. 2011; pp157-166.
5. Sterns RH, Emmett M. (2017). General principles of disorders of water balance (hyponatremia and hypernatremia) and sodium balance (hypovolemia and edema). In: Forman JP (Ed). UpToDate. <https://www.uptodate.com/contents/search?> Accessed on 17th June, 2019.
6. Metabolic acid-base balance. In: Barry A Shapiro, Ronald A Harrison, Roy D Cane, Rozanna KT, eds, Clinical application of blood gases. 4th edn., Year book Medical Publishers Inc., Chicago, 1982; pp30-37.

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7. Butte NF, Motil KJ. Dietary energy requirements in adolescents. In: Hoppin AG (Ed.). UpToDate.<https://www.uptodate.com/contents/dietary-energy-requirements-in-adolescents?>
8. Martin L. Exercise Physiology. In: Pulmonary physiology in clinical practice. Ed. Martin L. The essentials for patient care and evaluation. The C.V. Mosby Company, Missouri, 1987;pp239-255.
9. Collins M. Fluids & electrolytes. Gastroenterology & Nutrition. Cross JT, Hannaman RA. 5th edn, Pediatric Board Review. Core curriculum. Med Study. 2012; pp14-4.
10. Narahari D. How much water do you need daily? & Dietary Carbohydrates-Starch and sugars. In: Food facts, myths and healthy diets. 2nd revised edn, Arul Achagam, Chennai, 2017;pp42-60.
11. Mark AW, Moren E, Mary MT. Fever in infants and children- pathophysiology and management. Website: uptodate.<https://www.uptodate.com/contents/fever-in-infants-and-children-pathophysiology-and-management>. Accessed 10.3.2018.
12. Amdekar YK, Khare RD, Chokhani RR, Shandilya AA. What is our priority at first contact with the patient? Lessons from the Grand Rounds, Health care for children, Chennai. 2014;pp1-22.
13. Martin L, Deopujari S, Buche V, Darvhekar N. Clinical problem solving: How much Oxygen is in the blood? PaO₂ SaO₂ and Oxygen content. J Pediatr Crit Care. 2018; 34-41.