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The ovulatory LH surge shifts granulosa cell hormone production pathways 709

The menstrual cycle links ovarian and uterine activities 710

Ovarian hormones have many targets and actions 714

Female sexual function parallels that of the male 715

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Fertilization is the fusion of sperm and egg 716

Blastocyst implantation saves the corpus luteum and leads to suspension of menses 716

The fetus and placenta interact to form steroid hormones 718

Several factors contribute to initiation of parturition 721

Lactation is initiated at parturition 723

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Why is arterial blood pressure so clinically important? 732

Arterial pressure drives tissue blood flow 733

There are really only four factors affecting arterial blood pressure 734

Arterial pressure is not steady 736

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Blood pressure and volume reflexes adjust autonomic output 739

Gravity presents the greatest acute challenge to arterial pressure regulation 741

Chemoreceptor reflexes "back up" the baroreflex 743

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The renin-angiotensin-aldosterone system (RAAS) increases TPR and BV 744

ADH regulates blood volume and osmolarity 745

Natriuretic peptides counter-balance the RAAS 745

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Acids are proton donors and bases are proton acceptors 754

pH is the negative logarithm of the hydrogen ion concentration 755

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Cellular metabolism produces acids 756

Cells possess effective buffering mechanisms 757

Chemical buffer systems work together 758

Not all intracellular buffering is chemical 758

Intracellular pH regulation requires addition and removal of cellular acid 758

A pH difference exists between the ICF and ECF 759

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ECF chemical buffering is dominated by the bicarbonate system 760

The Henderson-Hasselbalch equation can be used to estimate the pH of a buffer solution 762

Respiratory control of CO<sub>2</sub> exhalation helps maintain normal blood pH 763

The urinary system regulates blood pH chronically 765

Proximal convoluted tubules dramatically alter HCO<sub>3</sub><sup>-</sup> and H<sup>+</sup> clearance 765

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Urine buffering is essential to acid excretion and HCO<sub>3</sub><sup>-</sup> production 767

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Abnormal blood pH is categorized by the source of organ dysfunction 770

Clinical measurements are used to assess the ECF acid-base status 770

The Davenport diagram can be used to evaluate a patient's acid-base balance 771

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Glycogen depletion alters the metabolic fuel mixture and limits exercise endurance 779

Fat and glycogen utilization during exercise are interdependent 780

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Aerobic versus anaerobic contributions to exercise 785

VO<sub>2</sub> increases rapidly during exercise 787

Lactate is not a waste product! 787

Increased O<sub>2</sub> consumption following exercise serves multiple purposes 789

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Multiple mechanisms increase ventilation during exercise 790

Ventilation increases beyond  $O_2$  needs during steady rate exercise 791

Ironically, ventilation is often only limiting to exercise performance in elite athletes and those with pulmonary disease 792

Exercise decreases pH in the extracellular fluids and muscle cell cytoplasm 793

Increases in cardiac output during exercise match blood flow to metabolic demands 794

Blood flow is redistributed during exercise 794

Providing for increased  $O_2$  consumption during exercise is dependent on several factors 796

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Adaptations to endurance training 801

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