

LC

Life Cycle

Course Goals

Goals

1. Describe the normal biology of the male and female reproductive systems and breast.
2. Describe the pathogenesis, pathology, pathophysiology, pharmacology, and clinical correlation of the important diseases of the male and female reproductive systems and breast.
3. Describe the normal biology and important diseases of pregnancy - as they affect the fetus, placenta, and mother.
4. Describe the important features of childhood development - from newborn to adolescent - normal and abnormal.
5. Describe the important features of aging - normal and disease.
6. Describe the features and issues relating to end of life.
7. Describe the features and issues relating to domestic violence and child abuse.

Spring 2019

Life Cycle

Session Learning Objectives

LC - Aging: Biology and Pathology

1. Define aging, life expectancy, and life span.
2. Describe the features and underlying causes of progeria and Werner syndrome.
3. Characterize and contrast between the two major theories of aging "clock" and "rust."
4. Describe the potential roles played by longevity genes (IGF-1, mTOR, Sirtuins), telomeres, and the effect of calorie restriction on aging and lifespan.

LC - Anatomy Review

1. Review the boundaries and anatomical relationships of the subdivisions of the pelvis and their associated viscera.
2. Describe the structure and function of the pelvic diaphragms and the most common injuries to the pelvic floor during childbirth.
3. Name, identify and sequence the structures traversed by the spermatozoa from the seminiferous tubules of the testes to the navicular fossa of the penis.
4. Explain why an enlarged prostate (as in benign prostatic hypertrophy) leads to urinary symptoms.
5. Describe the peripheral neural pathways controlling penile erection, emission and ejaculation and identify common anatomic causes of penile dysfunction.
6. Describe the anatomic etiology and clinical implications of the testicular torsion and varicocele.
7. Characterize the structure, innervation and blood supply of the external genitalia and perineum in males and females.
8. Describe the boundaries and contents of the superficial and deep pouches.
9. Describe the anatomical relationship between the uterus, fallopian tubes and ovaries and the subdivisions of the broad ligament.

LC - Androgen Pharmacology

1. Review previously presented content regarding androgen physiology.
2. Apply knowledge of androgen physiology to determine appropriate targets (receptors - synthetic enzymes) for treatment of conditions of androgen excess (prostate cancer - benign prostatic hyperplasia - androgenetic alopecia - precocious puberty - hirsutism) and androgen deficiency (hypogonadism).
3. Describe the advantages and disadvantages of the different routes of administration for testosterone formulations used in physiological replacement doses.
4. Describe the pharmacologic actions, clinical uses, adverse effects and pharmacokinetic considerations (route and frequency of administration) of the following agents: finasteride-dutasteride, bicalutamide, leuprolide, spironolactone.

LC - Approach to the Geriatric Patient

1. Describe how illnesses may present differently in older versus younger adults.
2. Describe the key components of comprehensive geriatric assessment.
3. Explain differences in hospital care approaches to older patients.

LC - Breast Cancer Pathology

1. Classify malignant neoplasms of the breast.
2. Describe the clinical features and histology of in-situ breast carcinomas.
3. Describe the basic features of Paget's disease.
4. Compare and contrast the histology of different types of breast cancer.
5. Differentiate the clinical significance of breast cancer on the basis of histologic subtype.
6. List the factors which impact breast cancer prognosis, including staging.
7. Characterize the epidemiology of breast cancer.
8. List the risk factors for developing breast cancer.
9. Describe the known hereditary causes of breast cancer.
10. Describe the pathogenesis of breast cancer.
11. Characterize the basic features of male breast cancer and differentiate it from female breast cancer.

LC - Breast Cancer Screening: Primary Care Perspective

1. Describe desirable attributes of screening tests.
2. Review the perils of screening tests including issues related to lead time and overdiagnosis bias.
3. Identify commonly used screening tests for breast cancer and how to optimize their use by quantifying the benefits and harms as applied to an individual patient.
4. Clarify and apply biostatistics commonly used to describe screening tests including sensitivity, specificity, predictive values, likelihood ratios, relative risk, absolute risk, risk difference, number needed to screen and number needed to harm.
5. Assess an individual patient's risk of developing breast cancer and implement an appropriate preventive regimen including screening and chemoprevention.
6. Assess an individual patient's risk of being a BRCA mutation carrier and when to refer for additional testing and counseling.
7. Summarize differences in breast cancer screening guidelines from professional societies and recognize the origins of those differences.
8. Discuss the potential impact of public health messaging on how patients and clinicians perceive benefits and harms of breast cancer screening.

LC - Breast Development & Physiology

1. Describe the tissue, cellular and functional organization of the adult breast in the non-lactating and lactating state.
2. Define the stages of breast development and the key hormones that control the progression of this process.
3. Describe the hormonal basis of common developmental breast abnormalities in males and females.
4. Describe the neural and hormonal mechanisms that regulate lactation and define the feedback loop that controls lactation and identify the sources and actions of specific hormones.
5. Identify the cellular pathways involved in milk secretion.
6. Define the progression of lactation in terms of physiological changes of the breast and composition of milk.
7. Describe the physiological factors that affect lactation.

LC - Breast Histology and Benign Diseases

1. Characterize the terminal duct-lobular unit.
2. Compare and contrast breast histology in the following physiologic states: resting, pregnancy, lactation, and postmenopausal involution.
3. Recognize common congenital anomalies, including supernumerary nipple / breasts, accessory breast tissue, congenital inversion of nipples.
4. Describe the key histologic characteristics of the following lesions: apocrine metaplasia, blue-dome cysts, sclerosing adenosis, acute mastitis and abscess, chronic mastitis, mammary duct ectasis, plasma cell mastitis, granulomatous mastitis, fat necrosis of breast, fibroadenoma, lactating adenoma, intraductal papilloma, phyllodes tumor, and gynecomasti.
5. Differentiate between non-proliferative and proliferative fibrocystic changes.
6. Compare and contrast usual ductal hyperplasia and atypical ductal hyperplasia.
7. Describe atypical lobular hyperplasia.
8. Counsel patients about the cancer risk associated with the various forms of hyperplasia.

LC - Cervical Cancer Screening and Prevention

1. Name and identify the epithelial cell types of the cervix.
2. Name the HPV types associated with cervical warts, dysplasia, & carcinoma.
3. Describe the cervical cancer screening program.
4. Diagram changes accompanying cervical dysplasia & carcinoma.
5. Identify the common histologic types of cervical carcinoma and recognize the features of associated premalignant lesions.
6. Explain the basis and clinical utility of HPV vaccines.

LC - Child Abuse

1. Discuss the relative incidence of child abuse as a pediatric diagnosis and its impact on later development.
2. Diagnose physical and sexual abuse.
3. Discuss the possible diagnosis with the family of the child.
4. Explain your legal obligations to report suspected cases of child abuse.
5. Characterize principles of prevention of physical and sexual abuse of children.
6. Discuss the studies that suggest a biologic basis to abusive and neglectful behavior and the child's ability to "survive" it.

LC - Congenital Gynecologic Defects and Müllerian Anomalies

1. List and characterize the cardinal steps in Mullerian development: 1) elongation of the ducts, 2) fusion of the ducts, 3) canalization of the ducts, and 4) septal resorption between the ducts.
2. Associate common congenital defects of the female reproductive tract with the developmental origin.
3. Characterize common Mullerian anomalies as obstructive or non-obstructive and describe characteristic symptoms.
4. List the reproductive consequences of each defect.
5. Briefly describe the management of each defect.

LC - Development of Gender Identification

1. Describe the impact of development on gender and the impact of gender on development, including risk and resilience factors.
2. Define and differentiate between the terms sex, gender, gender role, gender identity, and sexual orientation.
3. Recognize behaviors in children that may indicate exposure to sexual abuse rather than simply the range of age appropriate developmental behaviors.

LC - Diseases of the Prostate, Testis and Penis

1. Describe the basic anatomy and histology of the testis.
2. Discuss the causes of testicular atrophy and male infertility including cryptorchidism and Klinefelter's syndrome.
3. Discuss inflammatory diseases of the testes with respect to causative organisms and basic morphology.
4. Discuss testicular tumors with respect to: epidemiology (clinical picture - including markers), classification (germ cell tumors and sex-cord-stromal tumors), major morphologic findings, and staging and treatment.
5. Describe the neoplastic conditions of the penis.
6. Describe the basic zonal anatomy of the prostate and its relationship with the urethra and ejaculatory ducts.
7. Compare and contrast acute and chronic prostatitis on the basis of their etiologies and histologic features.
8. Compare and contrast hyperplasia of the prostate and adenocarcinoma of the prostate in terms of prevalence, age distribution, characteristic anatomic location, gross and microscopic features, clinical symptoms and findings, treatment, complications and prognosis.
9. Discuss the importance of grade and stage for the prognosis of prostatic carcinoma.
10. Discuss the diagnostic approaches and treatment options for prostatic carcinoma.
11. Discuss the importance of prostatic intraepithelial neoplasia in regards to the development and diagnosis of prostatic carcinoma.

LC - Disorders of Puberty

1. Summarize the key physiologic and physical changes associated with puberty.
2. Define the normal age of pubertal onset and criteria for the diagnosis of precocious and delayed puberty.
3. List the features and causes of delayed puberty.
4. Recognize the features and causes of precocious puberty.
5. Distinguish between central and other causes of delayed and precocious puberty (based on testicular size and gonadotropin levels).
6. Explain the appropriate evaluation for delayed and precocious puberty.
7. List appropriate treatments for the different causes of precocious puberty.

LC - Domestic Violence

1. Define intimate partner violence.
2. Cite statistics regarding the epidemiology of IPV and its presentations.
3. List risk factors associated with being abused and describe why reliance on risk factors is considered controversial in the context of screening.
4. List risk factors associated with becoming an abuser.
5. Describe trauma and medical presentations of IPV.
6. Describe secondary prevention interventions and outcomes that are medically appropriate and effective for victims of IPV.
7. Define the legal and professional responsibilities of clinicians in management of the victim of abuse or IPV.

LC - Drug Use in Pregnancy and Lactation

1. Describe the normal progression of human labor and pharmacological approaches to its manipulation with oxytocic and tocolytic agents and agents for medical abortion.
2. Describe the transport and metabolism of drugs across the human placenta and the implications for fetal effects of maternally administered drugs as well as for fetal drug therapy.
3. Describe the pharmacodynamics (mechanism of action and adverse effects-drug drug interactions) and pharmacokinetics of phosphodiesterase inhibitors in the treatment of erectile dysfunction.
4. Identify the following drugs: Oxytocic Agents; [Dinoprostone, Misoprostol, Oxytocin, Methylergonovine]; Tocolytic Agents [Prostaglandin synthesis inhibitors (Indomethacin), β 2-adrenergic agonists (Terbutaline), Magnesium sulfate, Calcium channel blockers (nifedipine), Ethanol]; Abortifacient Agents [Mifepristone, Misoprostol, Methotrexate]; and Erectile Dysfunction Agents [Sildenafil, Vardenafil, Tadalafil].

LC - Embryology & CAH

1. Summarize the normal differentiation of the bipotential gonad differentiates into a testis or ovary.
2. Outline how the internal ducts and external genitalia become female or male.
3. Explain the most common causes of 46,XX DSD and 46, XY DSD.
4. Describe the external and internal reproductive anatomy for an XY individual with complete androgen insensitivity syndrome.
5. Categorize adrenal enzymatic blocks as: 1) salt-wasting / salt-retaining, and 2) virilizing / undervirilizing.
6. Describe the external and internal anatomy of the reproductive system in virilized females with 21-hydroxylase deficiency.
7. Describe the diagnosis and management of 21-hydroxylase deficiency.

LC - Endocrine Disorders in Pregnancy: Changes in Glucose Metabolism and Thyroid Physiology

1. List and describe the physiologic bases for the changes in carbohydrate and fat metabolism which accompany pregnancy.
2. Differentiate between pre-gestational and gestational diabetes.
3. List risk factors for gestational diabetes.
4. Describe three abnormalities in fuel metabolism which can lead to gestational diabetes.
5. Describe why women who are overweight are more likely to develop gestational diabetes than women of normal weight.
6. Characterize the fetal response to gestational diabetes.
7. List and discuss the complications of gestational diabetes to the mother, the fetus, and the infant.
8. List and describe the changes in thyroid physiology and maternal thyroid function test results which accompany normal pregnancy.
9. Discuss the association between beta-human chorionic gonadotropin (b-HCG) and thyroid stimulating hormone (TSH).
10. Discuss the causes and consequences of iodine deficiency in the context of pregnancy.
11. Describe the effects of pregnancy on the course and management of maternal thyroid disease.
12. Describe the effects of maternal thyroid disease on the pregnant woman, the fetus, and the infant.
13. Define and characterize post-partum thyroiditis.

LC - Endocrinology of Pregnancy

1. List and describe the hormonally mediated physiologic changes to the maternal endocrine, cardiovascular, hematologic, pulmonary, renal, and gastrointestinal systems which occur during pregnancy.
2. List the four major polypeptide releasing hormones produced by the placenta.
3. Name the major steroid hormones produced by the placenta.
4. Describe the structure, functions, mechanisms of action, and clinical relevance of human chorionic gonadotropin (hCG), human placental lactogen (hPL), human placental growth hormone (hPGH), progesterone, and estrogens during pregnancy.
5. Summarize how the amounts of estradiol, progesterone, prolactin, and human chorionic gonadotropin present in the maternal circulation vary over the course of a normal pregnancy.
6. Identify the trophoblastic cell type primarily responsible for hormone production.
7. Describe the relative maternal / fetal distributions of placentally derived hormones and the physiologic bases for those distributions.
8. Describe the roles of the placenta, the fetal compartment, and the maternal compartment in the biosynthesis and metabolism of progesterone, the estrogens, and androgens.

LC - Family Planning

1. Discuss the general principles of conception and how contraception works to prevent conception.
2. Relate the unintended pregnancy rate with the choice to use contraception.
3. Compare and contrast exogenous estrogen & progestin action on the HPO axis.
4. Characterize how differing routes of administration impact perfect and typical use profiles for hormonal contraceptives.
5. Characterize the mechanisms of action for emergency contraceptive options.

LC - Female Urinary Incontinence

1. Categorize urinary incontinence.
2. Explain the mechanism of action for pharmacologic therapy for overactive bladder.
3. Describe how urodynamic testing is performed and interpreted.
4. Correctly associate classic symptoms, exam findings, and urodynamic test results with each category of incontinence.
5. Describe how pelvic floor contraction exercises help reduce stress urinary incontinence.
6. Explain the anatomic and / or physiologic bases of each category of incontinence in women.
7. Characterize the normal micturition cycle.
8. Explain the anatomy, neuroanatomy, histology & physiology of normal micturition
9. Apply your knowledge to structured clinical cases.

LC - Fertilization

1. Identify the key parts of the sperm cell and describe their intracellular structures and functions with regard to fertilization: capacitation, acrosome reaction, zona reaction.
2. List the components of a semen analysis and provide examples of normal values.
3. Describe the roles of oocyte critical for fertilization: meiotic spindle, mitochondria, the zona pellucida and its glycoproteins, ZP1, ZP2, and ZP3, the sperm-oocyte fusion process, and oocyte activation.
4. Track the development of the human zygote and pre-embryo through its earliest stages.
5. Translate some of this basic science into relevant, current clinical issues in the field.

LC - Geriatric Pharmacology-ARS

1. Review clinical importance of effects of age on pharmacokinetics and pharmacodynamics.
2. Describe risk factors for adverse drug events for older patients and ways to mitigate them.
3. Review principles of prescribing for older patients to avoid polypharmacy.

LC - Human Sexuality: Function and Dysfunction

1. Describe the physiological basis of the human sexual response cycle.
2. Define the components of each phase of the response cycle.
3. Define the medical model of sexual function and dysfunction.
4. Apply the physiological models in a clinical setting.
5. Describe the etiologies of sexual dysfunctions.
6. Take a sexual history.
7. Formulate a differential diagnosis for sexual dysfunction.
8. Identify the common categories of sexual dysfunction and describe the diagnostic criteria for each.
9. Understand the components that determine a person's gender and describe the approach to patients with different gender identities.

LC - Implantation

1. Describe the time line of implantation.
2. Describe the process of hatching and decidualization.
3. State and explain the stages of implantation.
4. Describe types of abnormal implantation and their clinical implication.

LC - Introduction to Adolescent Medicine

1. Summarize adolescent morbidity statistic.
2. Define, compare and contrast the three developmental stages of adolescence.
3. Describe the physical, cognitive and psychosocial development of adolescents.
4. Discuss the various psychosocial tasks of adolescents.
5. Describe sexual maturity rating systems.
6. Compare and contrast pubertal development in boys and girls.
7. Name and explain the components of the Adolescent Interview using the HEADSSS mnemonic.

LC - Introduction to Geriatrics

1. Discuss the impact of the aging demographic imperative on the practice of medicine in the future.
2. Explain the concept of the compression of morbidity and mortality.
3. Describe how changes in body composition impact disease and function in older individuals.
4. Describe the concept of physiological reserve and explain its importance in older individuals.

LC - Introduction to the Life Cycle Block

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3. Describe the normal biology and important diseases of pregnancy - as they affect the fetus, placenta, and mother.
4. Describe the important features of childhood development - from newborn to adolescent - normal and abnormal.
5. Describe the important features of aging - normal and disease.
6. Describe the features and issues relating to end of life.
7. Describe features and issues relating to domestic violence and child abuse.

LC - Lactation

1. List six advantages of breast milk feeding over formula feeding (3 each for maternal and infant).
2. Describe the nutritional composition of breast milk and impact of maternal diet.
3. Cite published recommendations for infant feeding practices from delivery through two years of life, including Healthy People 2020 goals.
4. Differentiate between hospital practices that support and those that undermine successful breastfeeding.
5. Describe the newborn's adaptation to extra-uterine life in terms energy utilization.
6. Describe early pattern of weight loss and regain by the infant.
7. Compare and contrast WHO growth standards with the US/CDC growth references for infants through the age of 2.

LC - Maternal Physiology

1. Describe how and why maternal physiology changes throughout a normal pregnancy.
2. Identify and characterize the pathophysiology of pregnancy specific conditions such as hyperemesis and cholestasis of pregnancy.
3. Describe the impact pregnancy has on the symptoms and evaluation of specific medical illnesses.

LC - Mechanisms of Birth Defects

1. Compare and contrast descriptive and systems approaches to teratology.
2. Describe the threshold theory of environmental/genetic interactions in the etiology of human birth defects.
3. Classify simple human birth defects as malformations, deformations, or disruptions.
4. Describe the principal causes of human birth defects and their relative distribution.
5. Summarize how timing of exposure and developmental fields affect the impact of teratogens on human development.
6. Define “phenocopies” and give examples.
7. Explain the concept of hierarchical pathways in human development and provide examples.

LC - Microanatomy of the Male and Female Reproductive Systems

1. Identify and describe the functional relationships among cells in the seminiferous tubules during spermatogenesis, including spermatogonia, primary spermatocytes, spermatids, and Sertoli cells, and define the DNA content during development from spermatogonia to spermatids. Describe the blood-testes barrier and the relationship of Leydig cells outside the seminiferous tubules to the process of meiosis occurring within the tubules.
2. Describe the epithelial and underlying muscular structural components of the channels and ducts leading from the testes to the urethra: those of the Rete testes, the ductuli efferentes, the epididymis, and vas deferens.
3. Discriminate between the structural components of the male accessory glands, including the seminal vesicles and the prostate glands.
4. In the ovary, identify and describe the following components: the germinal epithelium, primordial, primary, antral and Graafian and atretic follicles, corpus luteum, and corpus albicans. Define the DNA content of the oocyte and describe the times and locations where the DNA content changes with release of the polar bodies. Identify and define the features of granulosa and thecal cells, luteal cells, the zona pellucida and corona radiata.
5. Describe the components of the mucosal lining and underlying musculature of the oviduct (Fallopian tube) and describe differences in the mucosal folds in proceeding from the infundibulum to the ampulla to the isthmus.
6. Describe and identify the layers of the uterine wall, and identify the differences in the endometrium during the proliferative, early secretory and late secretory stages of the cycle.
7. Describe differences in mammary glandular structure before and during lactation.

LC - Palliative Care: The Last Hours

1. Associate place of death with key outcomes for the dying patient and their survivors.
2. Discuss the ramifications of ICU care at the end-of-life (EOL).
3. Differentiate between hospice and palliative care.
4. Characterize the physiologic changes that accompany the dying process.
5. Describe communicating with a dying person.
6. Discuss the physician's role after a patient dies.

LC - Pathology of the Ovary

1. Identify the four categories of primary ovarian tumors based on the cell type they originate from.
2. List the common presenting symptoms for epithelial ovarian tumors.
3. Generate a differential diagnosis for ovarian neoplasms based on patient age and serum markers.
4. Describe the relationship between intraepithelial carcinoma of the fallopian tube and serous carcinomas of the fallopian tube, ovary and peritoneum.
5. Explain how lesions of presumed gynecologic origin spread throughout the peritoneum.
6. Define an ectopic pregnancy, its most common predisposing factors and clinical presentation.

LC - Pathology of the Vulva, Vagina and Uterus

1. Recognize photomicrographs of common non-neoplastic and infectious processes in the vulva and cervix.
2. Describe the pathogenesis of dysplasia and carcinoma in the vulva, vagina and cervix.
3. Identify the five most common epithelial and mesenchymal lesions of the uterine corpus and characterize their clinical presentation.
4. Differentiate between Type I and Type II endometrial carcinomas associating each their underlying molecular pathways.
5. Differentiate between staging and grading for cervical and uterine cancers.
6. Describe the relationship between hyperplasia and carcinoma of the endometrium.

LC - Pediatric Development Cases

1. Apply the content, concepts and other material contained in related lectures, distributed or posted lecture handouts, PowerPoints, and any required reading assignments to the cases, questions and other components included in this session.

LC - Pharmacology of Estrogens and Progestins

1. Describe the physiologic effects of estrogens and progestins, especially as related to their adverse effects when used as pharmacotherapy.
2. Describe the concept of selective estrogen receptor modulation and SERMs and the benefits vs risks of activating or blocking estrogen receptors in these specific tissues: CNS-hypothalamus, breast, uterus, bone, urogenital, vasomotor, and liver [lipids-clotting factors])
3. Describe the benefits and risks of menopausal hormonal therapy with estrogen and the role of non-hormonal alternatives.
4. Describe the mechanism of action of estrogens and progestins in contraception in relation to menstrual cycle.
5. List their side effects of combined oral contraceptives (estrogen vs progestin component) and contraindications.
6. Describe the mechanism of postcoital contraception and the currently available pharmacotherapeutic agents.
7. Identify the pharmacotherapeutic uses of these estrogens, SERMs, and progestins: estrogens [estradiol, ethinyl estradiol, estrone (conjugated estrogens)], SERMs [raloxifene, tamoxifen], progestins [progesterone, medroxyprogesterone, norethindrone, desogestrel, drospirenone]
8. Compare the generations of progestin (1st-2nd-3rd-4th) with respect to block or activation of hormonal receptors (androgen-MC) and risk of thromboembolic disorders.

LC - Physiologic Adaptations of the Newborn

1. Explain the cardiopulmonary changes at birth which allow the switch from placental-based to pulmonary-based gas exchange.
2. Identify the factors that modulate pulmonary vascular resistance around the time of birth.
3. Summarize the basic transitional events in glucose metabolism.
4. Compare and contrast the physiologic signs expected during normal transition and the clinical signs of an abnormal transition.
5. Describe the importance of adequate lung inflation, surfactant production, and lung liquid absorption to the physiology of transition to extrauterine life.
6. Describe the unique circulation of the fetus and how it differs from the newborn (adult) circulation.
7. Describe the concept of persistent pulmonary hypertension in the newborn.
8. Describe the signs of and identify risk factors for hypoglycemia in the immediate newborn period.

LC - Placental Pathology

1. Identify the four anatomic components of a normal term placenta and recognize their histology.
2. Correlate gross and histologic findings with clinical disorders of pregnancy and delivery.
3. State the genetic difference between a complete and partial mole; correlate this to the clinical significance of each diagnosis.
4. List the three most common causes of early miscarriage and three most common fetal anomalies in term gestations.

LC - Placental Physiology

1. Describe the development of the placenta.
2. Describe third-trimester placental anatomy.
3. Explain how amniotic fluid is produced and list causes of decreased or increased amniotic fluid volumes.
4. Explain the different functions of the placenta.
5. Diagram the steroid production by the maternal-placental-fetal unit.

LC - Prenatal Diagnosis

1. Describe the basic principles of prenatal diagnosis, and the differences between screening and diagnostic tests.
2. Differentiate between targeted and population based screening for prenatal diagnosis.
3. Describe screening programs for single gene defects including Tay Sachs, thalassemia, sickle cell disease, and cystic fibrosis.
4. Explain the importance of correct gestational age.
5. List the findings used to estimate gestational age and fetal weight.
6. Describe current screening programs for Down syndrome.
7. List strengths and weaknesses of screening approaches.
8. Describe DNA based prenatal screening.

LC - Principles in Pediatric and Geriatric Pharmacology

1. Describe the principles of drug dosing in children with regards to the effect of age on the volume of distribution and drug clearance, initial drug dosing, drug level monitoring, and dose adjustment.
2. Describe significant drug reactions specific to children for each of the following: glucocorticoids, CNS Stimulants, salicylates, tetracyclines.
3. Describe the physiologic changes associated with aging and their effect on the biodisposition of drugs in geriatric patients that impact dosing regimens, specifically effects on drug absorption, distribution, metabolism, and excretion.
4. Describe the pharmacodynamic contribution of various drugs to the following functional impairments in the elderly: 1) mobility (supporting structures, movement disorders, balance), 2) urinary continence (overflow (urinary retention), stress, urge, secondary (oversedation)), 3) constipation, and 4) mental state (metabolic alterations, cognitive impairment, behavioral toxicity, depression).

LC - Reproductive Disorders: Female

1. Describe the anatomy and physiology of the reproductive axis in the female.
2. Describe and apply a general approach to disorders of the hypothalamic-pituitary-ovarian axis.
3. Differentiate between hypo- and hyper-gonadotropic hypogonadism in the female.
4. List the etiologies which underlie hypo-gonadotropic hypogonadism in the female.
5. List the etiologies which underlie hyper-gonadotropic hypogonadism in the female.
6. Describe the pathophysiology of PCOS.
7. Describe the treatment of female hypogonadism.
8. List controversies surrounding hormone replacement therapy.

LC - Reproductive Disorders: Male

1. Describe the anatomy and physiology of the reproductive axis in the male.
2. Describe and apply a general approach to disorders of the hypothalamic-pituitary-testicular axis.
3. Differentiate between hypo- and hyper-gonadotropic hypogonadism in the male.
4. List the etiologies which underlie hypo-gonadotropic hypogonadism.
5. List the etiologies which underlie hyper-gonadotropic hypogonadism.
6. Describe the treatment of male hypo-gonadism.
7. Define and describe the pathophysiology of gynecomastia.
8. Define and describe the pathophysiology of and treatment options for erectile dysfunction.

LC - Reproductive Endocrinology in the Male

1. Define the role of Sertoli cells and Leydig cells.
2. Define feedback loops between testis and hypothalamus/pituitary in the male.
3. Define the forms to which testosterone is converted and their receptors and functions.
4. Describe the changes that take place in the male at puberty.
5. Define the roles of Growth hormone (GH) and sex steroids in bone growth.

LC - Small Groups: Amenorrhea/Menopause (REQUIRED)

1. Generate a broad differential diagnosis for a 23 year old presenting with acquired amenorrhea.
2. Differentiate between hypo-gonadotropic hypogonadism and hyper-gonadotropic hypogonadism.
3. List classical symptoms for each diagnosis that belong in a complete review of systems (ROS).
4. Recommend additional testing for each item on the differential.

LC - Small Groups: Geriatric Cases (REQUIRED)

1. List the three most common causes of weight loss in the elderly.
2. Stage decubitus ulcers.
3. Identify common causes of delirium in older patients.
4. Outline interventions that decrease falls in older adults.
5. Choose appropriate diabetes management in frail older adults.
6. Diagnose dementia using appropriate diagnostic criteria.

LC - Small Groups: Infertility/Contraception (REQUIRED)

1. Describe contraceptives from the standpoint of their various characteristics.
2. Generate a list of available contraceptives, and rank them into three tiers of efficacy.
3. Counsel patients about the non-contraceptive benefits associated with various methods.
4. Recommend additional testing for each item on the differential.

LC - Small Groups: Maternal Pathophysiology (REQUIRED)

1. Name and define the categories of Hypertension in Pregnancy.
2. Identify risk factors for pre-eclampsia in a structured case.
3. List and discuss the pathophysiology of selected complications diabetes and hypertension in pregnancy.

LC - Small Groups: Pathology of the Female Reproductive Tract (REQUIRED)

1. Apply the content, concepts and other material contained in related lectures, distributed or posted lecture handouts, PowerPoints, and any required reading assignments to the cases, questions and other components included in this session.

LC - Small Groups: Pathology of the Male Reproductive Tract (REQUIRED)

1. Apply the content, concepts and other material contained in related lectures, distributed or posted lecture handouts, PowerPoints, and any required reading assignments to the cases, questions and other components included in this session.

LC - Small Groups: Placenta and Breast Pathology (REQUIRED)

1. Apply the content, concepts and other material contained in related lectures, distributed or posted lecture handouts, PowerPoints, and any required reading assignments to the cases, questions and other components included in this session.

LC - Small Groups: Puberty (REQUIRED)

1. Apply the content, concepts and other material contained in related lectures, distributed or posted lecture handouts, PowerPoints, and any required reading assignments to the cases, questions and other components included in this session.

LC - Spermatogenesis

1. Briefly describe testicular anatomy and histology.
2. Describe the process of spermatogenesis and spermiogenesis.
3. Describe the functions of Leydig and Sertoli cells.
4. Describe the hormonal control of spermatogenesis.

LC - The Menstrual Cycle

1. Describe oogenesis and compare and contrast that process with spermatogenesis.
2. Name and describe the functional and histologic changes which occur in the ovarian follicle and corpus luteum.
3. Name and describe the structure, functions and mechanisms of action of the hormones involved in the hypothalamic - pituitary - gonadal axis in women.
4. Provide examples of the functions of the autocrine and paracrine factors which modulate follicular development.
5. Describe the emergence of the dominant follicle.
6. Describe the 2-cell theory of sex steroid production and name the gonadal cells responsible for the production of sex steroids in women.
7. Label a diagram of the ovarian/menstrual cycle.
8. Name and describe the histologic layers of the endometrium.
9. Differentiate between the spiral and straight arteries of the endometrium.
10. Differentiate between the secretory and proliferative phases of the endometrial cycle.

LC - The Physiology of Parturition

1. Describe the molecular mechanisms that maintain myometrial quiescence.
2. List the contraction activated proteins and describe how they contribute to myometrial contractility.
3. Describe the mechanisms by which myometrial calcium is increased near term.
4. Describe the roles of progesterone, CRH, cortisol, estrogens and oxytocin in the initiation of parturition.
5. Describe the role of the fetal hypothalamic-pituitary axis in parturition.
6. Define the 4 clinical stages of labor and 4 phases of myometrial activation
7. Describe the role of stretch in coordinating myometrial contraction.
8. Describe the functional histology of the cervix.
9. List possible signals that could control the normal and preterm activation of the molecular program of parturition
10. List and explain the mechanism of active of uterine tocolytics to delay labor and delivery in preterm labor.

LC - Theories of Development

1. Contrast critical and sensitive periods.
2. Identify the factors common to numerous developmental theories.
3. Compare the basic concepts and key terms in the developmental theories of Freud, Piaget, Erikson, Bowlby, Bronfenbrenner, and Kohlberg and attribute them to the correct theorist.
4. Differentiate the stages of development described by Freud, Piaget, Erikson, Bowlby, and Kohlberg, attributing them to the correct theorist and placing them in the correct chronological order.
5. Define the three levels of the mind as outlined by Freud.
6. Characterize and provide examples of defense mechanisms as defined by Freud.
7. Name and define the types of behavior used to classify an infant's attachment to his or her primary caregiver.
8. Summarize the four developmental domains which are tracked across the lifespan.
9. Compare and contrast the motor, cognitive, and social / emotional developmental abilities associated with each of the following age groups: newborns, infants, toddlers, preschoolers, school aged children, and adolescents.
10. Compare and contrast the motor, cognitive, and social / emotional developmental abilities among the following age groups: newborns, infants, toddlers, preschoolers, school aged children, and adolescents.
11. Characterize adulthood from a developmental and milestone perspective.

LC - Twinning

1. Describe how multiple gestations are classified and the timing of post-fertilization events leading to different types of twins.
2. Give examples of complications specific to each type.
3. Differentiate between zygosity and chorionicity.
4. State two modalities to determine chorionicity.
5. Define the underlying physiologic condition leading to twin-twin transfusion syndrome (TTTS).
6. List three possible treatments for twin-twin transfusion syndrome (TTTS).