



Research Education
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CHILD & FAMILY RESEARCH INSTITUTE

Mini Med School

Demystifying the research, engaging the public

Glossary

Spring 2010

**Conception, birth & beyond:
The challenges of life's beginnings**



Welcome to Mini Med School at the Child & Family Research Institute

On behalf of the Faculty and Staff at the Child & Family Research Institute (CFRI), we would like to welcome you to CFRI's 10th Mini Med School. We are looking forward to offering you an engaging program of activities and insights on cutting edge health research.


This semester you will be studying topics such as reproductive health and technologies, consequences of being born prematurely and the impact this has on health care, with some of the leading researchers and clinicians in the field. The curriculum of six sessions was designed by this term's Mini Med School Dean, **Dr. Philippe Chessex** along with members of the Mini Med School faculty. The Research Institute is pleased to support Dr. Chessex, along with all of the researchers and presenters who are donating their time and expertise over the next six weeks.

We are again pleased to welcome many local high school students into our program this term, and sincerely hope that Mini Med School might inspire these young and curious minds towards a future in health research. In fact, we invite high school students with good attendance records at the Mini Med School to apply for a summer studentship through the program. The studentship is an opportunity to gain research experience during the summer break. Details on this competition will be announced during the series.

As health researchers and clinicians, we know that the public is keenly interested in our work and its impact on the social wellbeing of children and families. It is not always easy to find the time and the best ways to convey this information. We hope that the Mini Med School series will be a step in this direction.

Enjoy your studies with us!

Sincerely,

A handwritten signature in black ink, appearing to read "G. Hammond", written over a horizontal line.

Dr. Geoff Hammond
Scientific Director,
Child & Family Research Institute

A

Assisted reproductive technologies (ART) – methods used to achieve pregnancy by artificial or partially artificial means.

Asphyxia – a condition of severely deficient supply of oxygen to the body that arises from being unable to breathe normally.

Autism – a complex developmental disability that appears in early infancy and affects a person's ability to communicate and interact with others.

B

Barker hypothesis – the concept that poor maternal nutrition leads to intrauterine growth restriction with long lasting effects on adult health.

Body mass index (BMI) – a measure used to estimate a healthy body weight using a person's weight and height.

Breech presentation – in this presentation the baby enters the birth canal with the buttocks or feet first as opposed to the head first presentation.

Bronchopulmonary dysplasia – a serious lung condition that affects premature infants characterized by inflammation and scarring in the lungs.

C

C-section (Caesarean section) – a surgical procedure in which incisions are made through a mother's abdomen and uterus to deliver one or more babies.

Elective or planned C-section – is performed prior to labor, on the basis of an obstetrical or medical indication or at the request of the pregnant woman.

Emergency C-section – is performed by necessity during labor when a vaginal delivery would put the baby's or mother's health at risk.

Capillary density – the number of capillaries (smallest blood vessels in the body) per unit of area.

Cerebral palsy (CP) – a group of permanent disorders that affect a person's ability to move and to maintain balance and posture, resulting from damage to the immature brain.

Cervix – the lower, narrow portion of the uterus that connects to the top of the vagina.

Chimerism – an individual who is a mixture of cells originating from two or more different fertilized eggs.

Choice – the mental process of judging the merits of multiple options and selecting one of them.

Chromosomes – an organized structure of DNA (deoxyribonucleic acid) and protein found in cells that contain genes.

Cognitive impairment – a condition which affects the ability to think, concentrate, formulate ideas, reason, and remember.

Continuous positive airway pressure (CPAP) – a specific type of ventilation (breathing) therapy.

Coronary heart disease – the most common form of disease affecting the heart and an important cause of heart attack (myocardial infarction) and premature death.

Corrected age (CA) – age adjusted for weeks of prematurity (age calculated from due date).

Cortisol – a stress hormone produced in response to physical and emotional stress by the HPA system.



Decision – the mental processes resulting in an outcome leading to the selection of a course of action among several alternatives.

Deoxyribonucleic acid (DNA) – a molecule present in cells that contains the genetic instructions used in the development and functioning of all living things.

Developmental co-ordination disorder – problems with gross and/or fine motor abilities significantly below the child's age, peers and intelligence.

Developmental origins – something that occurs during the early development of an organism that leads to later effects.

Disability – a gap in an individual's abilities and the demands of the environment such as not being able to drive a car because you can't see. A functional limitation may not be a disability if for example a person has glasses to be able to see.

Dyspareunia – painful sexual intercourse.

Dystocia – an abnormal or difficult childbirth or labour.



Economics – study of choice.

Eicosanoids – signaling molecules made from omega-3 and omega-6 fatty acids involved in many body systems including inflammation, immunity and onset of labor.

Endothelial dysfunction – systemic dysfunction of the endothelium (the inner lining of our blood vessels) characterized by an imbalance between vasodilating (widening of vessels) and vasoconstricting (narrowing of vessels) substances produced by, or acting on the endothelium.

Epigenetics – refers to the study of inherited changes in phenotype (appearance) or gene expression caused by mechanisms other than changes in the underlying sequence or structure of DNA.

Episiotomy – a surgical incision through the perineum made to enlarge the vagina and assist childbirth.

Equity – study of fairness.

Essential fatty acids – certain fats that humans are unable to make and therefore must be obtained from dietary sources (linoleic acid and alpha-linolenic acid).

Evolution – a process of change over time, particularly over generations, often referring to genetic change.

Executive function – brain processes responsible for cognitive flexibility, selective attention and capacity to inhibit irrelevant information.

External cephalic version (ECV) – a process by which a breech baby can be turned from buttocks or feet first to head first.

Extreme premature – an infant born before 28 weeks of gestation.

Extremely low birth weight – a low birth weight baby weighing less than 1000 grams (1 pound 12 ounces).

F

Fertility – the ability to conceive and have children, the ability to become pregnant through normal sexual activity.

Fetal distress – the presence of signs in a pregnant woman, before or during childbirth, that the fetus is not well or is becoming excessively fatigued.

Forceps – a handheld, hinged instrument used to assist the delivery of a baby during childbirth.

Full term – an infant born between 37 to 42 weeks of gestation.

Functional limitation – a loss of being able to do one or more normal activities for a person's age. For example not being able to see the pictures clearly on the TV is a functional limitation.



Gene – a segment of molecules that make up DNA that become part of a larger set of molecules called a chromosome. A gene is responsible for physical and inheritable characteristics that make up us individuals.

Genetic – inherited characteristics usually considered to reside in DNA.

Gestational age – the number of weeks that a pregnancy lasts. A premature baby's gestational age is 36 weeks or less.

Glomerular filtration rate (GFR) – a renal function test.

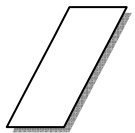


High order multiple pregnancy – a multiple pregnancy involving three or more babies (triplets, quadruplets, quintuplets, etc.).

Hypertension – chronic medical condition in which blood pressure is elevated.

Hypothalamic-pituitary-adrenal (HPA) axis – a neurohormonal system that controls reactions to stress. It is a set of interrelated parts of the body extending from the brain to the whole body that regulates stress reactivity and is vital for every day life. This includes a complex set of interactions between the hypothalamus (a part of the brain), the pituitary gland (also part of the brain) and the adrenal or suprarenal glands (at the top of each kidney.) The HPA axis helps regulate things such as your temperature, digestion, immune system, mood, sexuality and energy usage. It is also a major part of the system that controls your reaction to stress, trauma and injury. One of the fascinating parts of the HPA system is that it controls its own activity, termed autoregulation.

Hysterectomy – the surgical removal of the uterus.



Impairment – a loss of one of the body or brain's functions (vision, hearing, motor ability, intelligence).

Incontinence – the inability of any of the physical organs to restrain discharges of their contents.

Urinary incontinence – the involuntary leakage of urine.

Fecal incontinence – the loss of regular control of the bowels.

Infertility – inability of a person to conceive after a year of regular intercourse without contraception.

Intrauterine growth retardation (IUGR) – poor fetal growth.

Intraventricular hemorrhage (IVH) – bleeding into the fluid-filled cavities in the brain.

In vitro fertilization (IVF) – a fertility treatment in which eggs are removed from the woman's body and fertilized with sperm in the lab. The resulting embryos are then returned to her uterus in the hopes of fostering a pregnancy.



Labor – the culmination of a human pregnancy or gestation period with the birth of one or more newborn infants from a woman's uterus.

First-stage of labor – during this stage shortening and dilation (widening) of the cervix occurs, in preparation for second-stage.

Second-stage of labor – descent through the birth canal (vagina) and birth of the infant.

Third-stage of labor – the uterus expels the placenta (afterbirth).

Late premature – an infant born between 34 and 37 weeks of gestation.

Learning problem – performance in reading, math or written expression that is significantly below the child's age peers and intelligence.

Low birth weight – an average baby weighs 3,500 grams (7 pounds 12 ounces). A low birth weight baby weighs less than 2500 grams (5 pounds 8 ounces pounds).



Malpresentation – the abnormal position of a baby's body or head during childbirth.

Maternal mortality – the death of a woman during or shortly after a pregnancy.

Maternal morbidity – any departure, subjective or objective, from a state of physiological or psychological well-being, during or shortly after pregnancy.

Mechanical ventilation – help with breathing by a machine using a tube into the lungs.

Meiosis – the process of cell division in sexually reproducing organisms that reduces the number of chromosomes in reproductive cells from diploid to haploid, leading to the production of gametes (egg or sperm).

Menarche – the time in a girl's life that menstruation first begins.

Menopause – the point at which menstruation ceases, and marks the end of a woman's fertility.

Mental retardation – a condition diagnosed in early infancy that includes below average general intellectual function and a lack of skills for daily living.

Methylation – the addition of a methyl group (CH₃) to a substrate.

Microchimerism – an individual who has a small number of cells coming from another individual.

Miscarriage – the spontaneous loss of a pregnancy before 24 weeks of gestation.

Morbidity – refers to a diseased state, disability, or poor health due to any cause.

Mortality – the condition of being mortal, or susceptible to death.

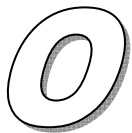


Necrotizing enterocolitis – a medical condition primarily seen in premature infant characterized by injury to the inner surface of the intestine.

Neonatal death – the death of a fetus or an infant who is within hours, days, or up to a few weeks from birth.

Neonatal intensive care (NICU) – the place in the hospital which cares for the sickest and smallest newborn babies. The NICU has the technology and equipment to care for these babies. Level 3 NICUs care for the sickest babies. There are three in the province of BC. Level 2 NICUs provide care for sick babies until they can be moved to a level 3 NICU and care for less sick babies.

Neurotransmitter – chemicals that allow the movement of information from one neuron across the gap between neurons. The release of neurotransmitters from one area of a neuron and the recognition of these chemicals by a receptor site on an adjacent neuron causes an electrical reaction that facilitates the release of the neurotransmitter and its movement across the gap. Examples of neurotransmitters include: acetylcholine, dopamine, GABA (gamma-aminobutyric acid), glutamate, norepinephrine, serotonin.



Off label drug use – Health Canada regulates all drugs sold in Canada. Before they are approved, drugs manufactured and sold in this country must go through a regulatory process to ensure their quality, safety and effectiveness. A drug is considered off-lab use when a doctor prescribes a drug for a use for which that drug has not yet been approved by Health Canada.

Omega 3 fatty acids – a family of unsaturated fatty acids including alpha-linolenic acid (ALA), eicosapentanoic acid (EPA) and docosahexaenoic acid (DNA).

Omega 6 fatty acids – a family of unsaturated fatty acids including linoleic acid (LA) and arachidonic acid (AA).

Opportunity cost – lost benefit associated with the next best use of resources.

Ovulation – the release of the ripe egg from the ovary. The egg is released when the cavity surrounding it (the follicle) breaks open in response to a hormonal signal.

P **Parturition** – synonym for labor or birth.

Pelvic floor – the muscle fibers and associated connective tissue which span the area underneath the pelvis and support the bladder, bowel and uterus.

Perinatal – pertaining to the period immediately before and after birth, specifically from 22 weeks of gestation to 7 days after birth.

Perineum – the region between the vaginal opening (in females) and the anus.

Periventricular leukomalacia (PVL) – damage to the brain substance in the white matter of the immature brain.

Placenta accreta – a severe obstetric complication involving an abnormally deep attachment of the placenta, through the endometrium and into the myometrium (the middle layer of the uterine wall).

Polymorphisms (SNPS) – are very specific variations in DNA sequences that occur when a single molecule in the DNA sequence – the nucleotide (A,T,C,or G) varies. For example a SNP might change the DNA sequence AAGGCTAA to ATGGCTAA. For a variation to be considered a SNP, it must occur in at least 1% of the population.

Premature – an infant born before 37 weeks of gestation.

Prematurity – a normal pregnancy lasts for 40 weeks (9 months) counting from the mom's last menstrual period. When the baby is born at 36 weeks or less, he or she is premature. An extremely premature baby is born at 25 weeks or less.

Presentation – position of the fetus in the uterus relative to the birth canal.

Prevalence of a disease – defined as the total number of cases of the disease in the population at a given time.

Q **Quality of life** – general well being of a person.

R **Renin-angiotensin system** – hormone system that regulates blood pressure and water (fluid) balance.

Resource scarcity – available resources cannot satisfy all wants and needs.

Retinopathy of prematurity – a disorder in which the small blood vessels in the back of the eye (retina) grow abnormally.



Schizophrenia – severe, lifelong brain disorder characterized by unusual thoughts or perceptions, disorders of movements, difficulty speaking, and problems with attention.

Selective serotonin reuptake inhibitor (SSRI) – a class of psychotropic drugs commonly used to treat depression and anxiety.

Serotonin (5HT) – a neurotransmitter found primarily in the gastrointestinal tract and central nervous system (CNS) of humans and animals. Approximately 80 percent of the human body's total serotonin is located in specific cells (enterochromaffin cells) present in the gut, where it is used to regulate intestinal movements. The remainder is synthesized in serotonergic neurons in the CNS where it has various functions, including the regulation of mood, appetite, sleep, muscle contraction, and some cognitive functions including memory and learning. Modulation of serotonin at synapses is thought to be a major action of several classes of pharmacological antidepressants.

SLC6A4 – the gene that produces a protein that transports serotonin back up into neurons.

Stillbirth – when a fetus, which has died in the uterus during labor or delivery, exits a woman's body.

Stem cells – cells that have the potential to produce daughter cells almost indefinitely.

Super-ovulation – use of ovarian stimulant drugs to increase the number of eggs released during ovulation.

Sympathetic overactivity – overactivity in the sympathetic nervous system (its general action is to mobilize the body's resources under stress).

Sympathoadrenal overactivity – same as sympathetic overactivity.



Total parenteral nutrition (TPN) – nutrition provided by intravenous fluids alone.

Transfusion – the process of transferring blood from one person into the circulatory system of another.

Trisomy – the presence of three copies of a chromosome rather than the normal two.



Uterine rupture – a potentially catastrophic event that occurs in late pregnancy or childbirth in which the integrity of the myometrium (muscular wall) of the uterus is breached.

Uterus – a major female hormone-responsive reproductive sex organ where the fetus develops during pregnancy.



Vacuum (ventouse) – a vacuum device used to assist the delivery of a baby when labour has not progressed adequately.

Vagina – a fibromuscular tubular tract leading from the uterus to the exterior of the body in females.

Vaginal birth after cesarean (VBAC) – the practice of delivering a baby vaginally after a previous baby has been delivered through caesarean section.

Very low birth weight – a low birth weight baby weighing less than 1500 grams (3 pounds 5 ounces).

Some definitions have been selected from <http://en.wikipedia.org>