SLEEP NEEDS AND DISORDERS

Sleep

How sleep-deprived are we? To know the amount of sleep we are *losing*, we can use the following formula:

$$\text{Hours lost} = [8 - (\text{hours of sleep})] \times 5$$

The assumption is that you fall asleep right away and that your sleep is uninterrupted, but this is not always the case. The above calculation is only a rough estimate. Your actual sleep deprivation may be even worse than you've calculated.

Sleep can be disturbed by:
- Irregular bed times
- Stress
- Diet
- Activities before bedtime
- Drugs

Lack of sleep interferes with efficient daily functioning. Research has shown that beta-amyloid (toxic protein in the brain of Alzheimer patients) is removed from the brain during sleep. Sleep is necessary for survival and good health. Why we need sleep is still not fully known. Adults vary in their need for sleep, but the typical range is *6 to 8 hours* every day. Older adults may not sleep as well as younger persons.

How rested one feels after a period of sleep depends on:
- Level of excitement
- Emotions
- Age
- Diet
- Drugs

There is a change in daily melatonin levels. The change is as follows:
- Pineal gland produces melatonin in the evening.
- Melatonin levels peak in the middle of the night.
- Melatonin levels decline to low daytime amounts.

Aging and sleep:

With less physical activity in older persons, falling asleep may be more difficult. With aging, the body produces less growth hormones. These hormones promote deep sleep. Less exposure of the eyes to sunlight also disturbs production of melatonin, necessary for regulation of sleep-wake cycles.

Older persons fall asleep earlier, wake up earlier and tend to wake up more often. They may have sleep difficulties induced by medical problems (i.e. arthritis, heart/lung disorders). Daytime napping to compensate for night-time wakefulness can make sleeping adequately at night more problematic.

Types of sleep:

In a typical night of sleep, people cycle through the 3 stages of non-REM punctuated by an interval of REM sleep. Each cycle lasts about *90 minutes*, with 5-6 cycles every night. At the end of each cycle, there may be brief periods of awakening, although one can be unaware of being awake.

There are 2 stages:
- Non-REM – Accounts for 75-85% of time spent in sleep.
  - Stage 1 – Lightest sleep.
  - Stage 2 – Moderate sleep.
  - Stage 3 – Deepest sleep. Difficult to arouse, blood pressure, heart rate and breathing are at their lowest.
- REM (Rapid eye movement) – Electrical activity in the brain is very high. The eyes move rapidly behind the eyelids. Respiration rate is increased and the muscles are paralyzed, although there may be involuntary twitching. Most *vivid dreaming* occurs during this stage.

Sleep disorders:

Sleep disorders can include:
- Inability to fall or stay asleep
- Difficulty staying awake
- Sleepwalking
- Unusual behaviours (i.e. restless legs, nightmares)

Poor sleep leads to:
- Difficulty with memory, coordination and emotions
- Compromised ability to perform in school or at work
- Increased risk of sleepiness at the wheel, leading to an accident
- Increased risk of developing a heart disorder

A sleep log plus testing in a sleep lab is necessary to provide an accurate diagnosis.

Sleep deficit/sleep deprivation

Evidence is pointing to the idea that sleep is a predictor of how long one will live. Chronic sleep deprivation increases the risk for developing *heart disease*, *obesity* and *diabetes*. The relation may come from the diminished time that the body has to repair itself. The amount of sleep people get has been decreasing over the last 100 years since the development of the light bulb. The recommended amount of sleep for adults is *8 hours/night*.

Sleep deficit:

The theory is that sleep time is necessary for the body to repair damage of daily living. There are many negative effects of sleep deficit:

» Cardiovascular - The Nurses' Health Study has shown that women who slept less than 6h/night had an 18% higher risk of heart attack and those who slept 5h/night had a 39% increased risk. Remember, during REM sleep, blood pressure and heart rate increase. Stress hormones like *adrenaline* and *cortisol* are released just before waking. If sleep is reduced, stress on the heart may be increased.
  - Sleep apnea is a condition in which the airway is obstructed during sleep. Breathing can stop many times through the night. To counteract this, the body's reaction is to hyper ventilate. During hyperventilation, blood pressure and heart rate increase markedly.
» Diabetes – Post-breakfast blood sugar levels showed dramatic rise in one study. Secretion of insulin (this reduces blood sugar) was lowered. In another study, women who were sleep-deprived were more likely to develop diabetes than those who slept 8 hours per night.
» Hormonal imbalances – Levels of thyroid hormones are abnormal in persons who are sleep deprived.
» Immune defense – It will decrease if one accumulates a sleep deficit, even after only one night of sleep deprivation. One night of recovery sleep allowed some return of immune system to normal.
» Weight gain – Recent research is showing that being deprived of sleep increases the appetite. The mediator may be *leptin* (signals satiety after eating), which may be reduced in those who are sleep-deprived. The result is that there is an increase in appetite. In addition, caloric intake for those who stay awake longer than usual tends to increase over and above the amount required to cover the extra activity needs of the body.
» Interrupts release of growth hormones – This hormone is needed to encourage healing and repair, even in adults, and controlling percentages of fat and muscle in the body. Growth hormone is secreted during sleep and the amount secreted declines with age.

INFECTIOUS DISEASES

Agents of infection

Microbes are microscopic life forms that can be beneficial or harmful.

The infection triangle consists of:

» Pathogens – Disease-causing organisms. They are microscopic and need a *host* to survive.
» Host – Infected person/animal.
» Vector – Biological or physical vehicle that carries the pathogen to the host.

Viruses:

Viruses are the tiniest pathogens whose form consists of *DNA* or *RNA* enveloped in a coat of protein. To infect cells, they release their DNA or RNA (whichever they have). They require a host to replicate and form copies of themselves to infect other cells.

Viruses sometimes cause the infected cell to *die*. In other cases, the infected cell lives but its functions are *altered*. Viruses can infect a variety of hosts and can be transmitted through:

» Droplets from coughs
» Food
» Water
» Insect bites

Since viruses live within the host's cells, it is difficult to destroy the virus without harming the host cell. Antiviral drugs disrupts the viral duplication process but may not completely eradicate the infection.

Bacteria:

Bacteria are *one-celled organisms*. They have the capacity to replicate on surfaces (no host required). Most bacteria are not pathogenic. Some play roles in digestion or in food production. They have 3 shapes:

» Spiral – Spiralla
» Rod-shaped – Bacilli, bacillus
» Round – Cocci

The harmful effects of bacteria come from *enzymes* or *toxins* they produce. We produce antibodies to bacterial infection since bacteria are recognized as foreign cells. Antibiotics kill bacteria without harming the host cell, but there can be side-effects. Overuse or poor use of antibiotics can lead to bacterial resistance.

Fungi:

Fungi are *single-celled* or *multi-celled* organisms that reproduce by *spores* or by *growing fibres* that can spread. Fungal infections often occur on hair-covered parts of the body. They are useful in making:

» Antibiotics
» Bread
» Beer

Protozoa:

Protozoa *destroy* cells or *alter* functions due to their toxins. They are more common in developing countries due to contaminated water. *Malaria* is caused by protozoans but is spread by *insects* (vector).

Helminthes:

Helminthes are parasitic worms that *attack* and *compete* with the host for nutrition. They are contracted from uncooked meats or fish.

Infection

We can catch infections through vectors:

» Animals or insects – Some diseases depend on one or both.
» People – Air, contact, sexual contact, improperly washed utensils.
» Food – Spread by ingestion or improperly prepared/stored food.
» Water – Poor water purification methods.

Protection from infection:

Immunity is your body's method for protecting itself from diseases. The immune system is called into play whenever the body feels there are foreign cells present. The immune system includes the following to remove impurities:

» Lymphatic system
» Spleen
» Thymus gland
» Lymph vessels

The 3 lines of defense are:

» First line of defense – Barriers.
  ▪ Skin – First barrier to most infectious agents.
  ▪ Mucous, tears, saliva and skin oils – Contain bactericides.
  ▪ Cilia lining respiratory tract – Screens for air-borne pathogens.
» Second line of defense – Non-specific immunity. Various types of *WBC* and *phagocytic cells* patrol the lymphatic system, blood system and many other areas to find and destroy invaders.
» Third line of defense – Specific immunity.
  ▪ Humoral immunity – Protection is conferred by *antibodies*. Antibodies are produced after exposure to an *antigen* (substance that causes antibody response). Antibody production is elicited though *vaccination*, injection of synthetic or weakened antigens or antibodies from other persons.
  ▪ Cell mediated immunity – T cells protect the body from parasites, fungi, destroy cancer cells and foreign tissue. *T cells* and *macrophages* detect antigen. *B cells* produce antibodies to the antigen. *Lymph nodes* store some of these protective cells and are the site of destruction of antigens.

Immune response to infection:

In the event of an infection, blood supply to the infected area increases, causing swelling or inflammation. Antibacterial and antitoxic proteins also accumulate in the area. An abscess can form around the infection from fluid, cells and dead white blood cells. If the body cannot completely fight off the infection, systemic infection (total body infection) occurs.

Stress causes the release of *cortisol*, the hormone that enables us to meet and respond to a crisis. The stress response affects immunity negatively.

Prevention:

The most at risk for infectious diseases are:

» Children
» Elderly
» Chronically ill
» Smokers and those with respiratory problems
» Health-care workers, nursing home residents, hospital patients and day-care workers
» Workers in poorly ventilated buildings

Hand-washing prevents the spread of many (not all) communicable diseases. Alcohol-based gels are useful if they contain at least *60*% alcohol (antibiotic gels and soaps are *not* necessary). Following immunization schedules for communicable diseases is strongly recommended, both for children and adults.

Complications

The common cold:

Treating the common cold involves

» Medications – Aspirin, acetaminophen and antihistamines are *not recommended*. Ibuprofen is recommended for achiness. Antibiotics are *not effective* against a cold because the cold is caused by a *virus* and not bacteria.
» Other remedies – There are many.
  ▪ Hot fluids – Ease congestion
  ▪ Single formula cough suppressant – Dextromethrophan better than multi-symptom formulas
  ▪ Expectorants – Liquefy secretions in the chest
  ▪ General recommendations – Rest, plenty of fluids (hot or warm).

Influenza:

It has similar symptoms to the cold but lasts longer and also includes:

» Fever
» Bronchitis

Influenza is caused by a virus spread by *coughs, sneezes, laughs* and *normal conversation*. Vaccines do not protect against al variants of the disease. Influenza viruses can combine genes from different influenza types and are constantly evolving.

Flu shots are recommended for those over 6 months, the elderly and chronically ill. Antiviral drugs have been effective in shortening the duration of illness.

Emerging and re-emerging infectious diseases:

A pandemic is a global outbreak of an infectious disease. Diseases that infected animals adapted and now infect humans. Increased global travel has fueled ease of spread of emerging diseases (SARS, MERS).

Hepatitis:

5 viruses are known to cause hepatitis. The symptoms include:

- Headache
- Fever
- Fatigue
- Nausea
- Vomiting
- Yellowing of the whites of the eyes or complexion
- Enlarged and tender liver

Treatments consists of:

- Rest
- High protein diet
- Avoidance of drugs and alcohol

10% of hepatitis B and up to 66% of hepatitis C patients become chronic carriers of the virus. The types of hepatitis are:

- Hepatitis A – Transmitted by fecal contamination of food or water. This is a less serious form. At risk are children, staff at daycare centers, people living in institutions and sanitation workers.
- Hepatitis B – Transmitted by unprotected sex and having multiple partners, transfusion of contaminated blood, sharing needles and tattoo or body piercings. Vaccination recommended (grade 4 kids).
- Hepatitis C – Transmitted by sharing needles with an infected person, improperly cleaned tattoo and body piercing needs. Treatment available (what the treatment is isn't mentioned).

Methicillin-resistant staphylococcus aureus (MRSA):

MRSA is a strain of staphylococcus, once treated with penicillin, which is now quite resistant to currently available antibiotics. Many healthy individuals carry staphylococcus on their skin but are not affected by it. The bacterium must enter through a break in the skin such as a cut or a scrape or during surgery.

The bacterium can spread through touch, especially in health care settings via improperly sterilized equipment, lack of due care to wash hands properly. Those most at risk are:

- Those with weakened immune systems
- Any person with wounds or cuts or unhealed surgery
- Elderly persons
- Premature or newborn babies
- Athletes competing in contact sports

Zika virus:

Zika virus is transmitted through the bite of a mosquito, mother to fetus, sexual activity, possibly blood transfusions from infected person. Some will have no symptoms but general symptoms include:

- Fever
- Joint pain
- Red eyes (conjunctivitis)
- Severe brain malformations in fetuses (missing brain structures, excess brain fluid), *microcephaly*

Since there is no vaccine for Zika, at present, the best option is to decrease the risk of mosquito bites by:

- Wearing long-sleeved clothing
- Using insect repellent
- Control mosquitoes inside and outside the house
  - No standing water
  - Use screening to prevent them from entering the house

True or false questions

Washing my hands helps to reduce antibiotic resistance

True. Hand-washing is the most important thing we can do to prevent the spread of infection. Antibiotic resistance bacteria can spread from person to person just as any other type of bacteria would. This includes through direct contact and by touching surfaces where bacteria are present.

You don't need to finish antibiotics if you are feeling better

False. Taking an antibiotic incorrectly increases the risk of the bacteria in your body developing antibiotic resistance. If you do not complete the full course of antibiotics, the infection may also not be completely killed. You should always take antibiotics as instructed by the nurse or doctor and ensure you complete the course. Not taking the correct dose (1 or 2 capsules instead of 3) means you get less antibiotics in the area of infection. These lower concentrations can encourage the multiplication of resistant strains.

Antibiotics can kill viruses

False. Antibiotics can *only* be used to treat bacterial infections due to the different structures of bacteria and viruses. Antibiotics work by targeting specific parts of the bacteria (i.e. cell walls, ribosome).

Leftover antibiotics can be saved for use at a later date

False. You should not have leftover antibiotics if you complete the course. Leftover antibiotics are safely disposed of in a pharmacy.

Taking antibiotics weakens your immune system

False. Most antibiotics do not negatively affect your immune system so they do not reduce your ability to fight off future infections. They target bacteria by killing them or slowing their growth. The body does not become resistant to antibiotics, it is the bacteria that does through genetic mutations.

TIME MANAGEMENT

Introduction

Successfully managing one's time means having to set priorities. The key is to manage all the different tasks that ask to be prioritized.

Health, family relationships, social ties, professional needs, studying, spiritual needs all demand our attention. One needs to decide on the *quantity* and *quality* of time to devote to each area to find the proper life balance. Neglect of any area decreases chances for overall success.

Steps:

- Make a plan or list – Plan out the day and consider making a list of tasks that need to be done as well as for those you want to do. Realize that not all items on the list may be completed.
- Review your list – See if items on the list reflect the best use of your time.
  - Items that reflect good use of time – Set as priorities.
  - Items that do not reflect good use of time – Set aside, deprioritize.
- Prioritize your list – Ensure that crucial items on the list get accomplished. Work on *quality*, not quantity.
- Interruptions – Take note of the time spent on needless interruptions. Many of these come from electronic sources (i.e. email, phone, video games, etc.). Try to figure out the difference between positive interruptions and those of lesser importance.

Procrastination (my favourite)

Procrastination is putting off doing a task to avoid something negative, such as anxiety and boredom. It is not the same as *laziness*. In reality, more stress come with the procrastination.

Below are some of the other reasons why we procrastinate:

- Fear of failure – Being fearful gives one a ready-made excuse for the situation if things don't work out well.
- Fear of success – Some people fear doing well. By procrastinating, this person will not have to show his/her potential and will not have to live up to others' expectations.

Procrastination styles (ohohohoh ok here we go):

- Busy bee – This type of procrastinator takes on many different tasks in a bid to feel productive, while putting off the necessary task that may feel too big or too overwhelming. Overcoming this type of behaviour means breaking tasks down into small, manageable pieces.
- Multi-tasker – This involves trying to accomplish many tasks at the same time, but not concentrating on the most important task. Suggestions to overcome this is to turn the distractions into rewards to be done after accomplishing a set amount of necessary work.
- Avoider – Anxiety may be at play here and the anxiety overcomes the ability to start and accomplish the task effectively. Meditating may help.
- Thrill seeker – These workers feel that they work better under pressure (hello, this is me), as the feeling of being under pressure feels like a positive. The end result may be a crash that follows the adrenaline-fuelled pressure. The suggestion to use this pressure in a more productive way is to break the tasks into smaller pieces but with smaller/tighter deadlines.

Covey's concept of time

In today's society, we tend to do things based on whether or not we perceive them as urgent. Stephen Covey says that 2 things drive our use of time, importance and urgency.

We should prioritize activities, spending our time based on their *importance* to us, rather than how *urgent* they seem.

	Urgent	Non-urgent
Important	*Quadrant of urgency* - Urgency - Importance - Deadline-driven projects	*Quadrant of quality* - Preparation - Relationship building - Planning
Non-important	*Quadrant of deception* - Interruptions - Phone calls/texts - Email, social media - TV	*Quadrant of waste* - Escape activities - Video games - Shopping - Sleeping

If what you are doing *now* positively affect your life in 6 months' time, it is in quadrant 1 or 2. If not, it is in quadrant 3 or 4. How do you work out how you spend your week?

- Evaluate how you use your time using a *finding time grid*.
- Make an actual picture of how you use your week.
- Assess how well you are spending your time.

To know if you have a good schedule, ask the following questions:

- Is it realistic?
- Will you stick to it?
- How many hours for a part-time job do you have?
  - 20 hours is too many.
- How many hours for studying?
  - Classes crammed into just a few days make it harder to commit to studying in "days off".

Assess honestly how much time you are giving to each aspect:
» Is there balance?
» Are you allowing enough time for studying? (2h per class hour)
» Are you working too much?
» Are you giving too much time to your social groups?
» Do you always feel rushed?
» Do you procrastinate?

Procrastination

Procrastination means putting off until tomorrow something you should do today (or right now) *knowing* that to do so will probably lead to problems and *cause stress*. In other words, we procrastinate even when we know it is bad for us.

How do people procrastinate? Research suggests:
» 90% of all people procrastinate.
» 30% consider procrastination a serious problem.
» People aged 20-30 procrastinate most.

People who procrastinate a lot often have these characteristics:
» Stressed out (we don't know how we will get things done).
» Not confident
» Easily distracted
» Impulsive
» Easily bored
» Not very motivated
» Perfectionist

Procrastinators are often perfectionistic procrastinators:
» They spend too long *trying to perfect* the results of a task.
» They take too long to start something because they are not sure how to do it and *don't want to ask for help*.
» Avoid handing something in at all if you are *not satisfied* with it.

6 Ways we procrastinate:
» We act based on how we feel – Solution: *Reality check*. Recognize that doing something important cannot depend on whether you feel like doing it. Stop believing the myth that you'll do it later. We often procrastinate because we think that we'll do it *better* later or that we'll *want* to do it later, but that's not true. Do it now instead.
» We give into distractions – Solution: *Prioritize*. Make a list of important things to do. Start with the most important one. Don't begin any other until you finish this. Know your distractors and avoid them.
» We feel the task is too overwhelming – Solution: *Break it down*. Make a list of small steps do to. Feel satisfied when you complete a step. Reward yourself.
» We lack confidence – Solution: *Reshape your internal voice*. Reduce pressure by changing what you say to yourself.
» We lack knowledge or skill – Solution: *Fix what is holding you back*. Work out what you need to know in order to do it. Make a plan to get that knowledge. Fixing what is holding you back will help you get going on the task.
» We can't concentrate – Solution: *Work out what the interruptions are and find the right conditions to work*. Think about where and how you work best, create that situation when you can and get other people involved if you need to.

Ways to beat procrastination:
» Know what distracts you – Plan for avoiding distractions.
» Get started – Begin with something do-able.
» Break it down – Gain confidence as you make progress.
» Find help – If you are stuck or not sure, find answers.

EATING DISORDERS

Body image

Body image refers to how one sees oneself. One's body image can be affected by society's idea of the "ideal" body.

A negative body image can lead to dissatisfaction with the body and low self-esteem. It can lead to:
» Poor eating habits
» Dieting
» Depression
» Eating disorders
» Other negative behaviours

Present-day society tends to value thinness as the ideal and this "ideal" hampers the development of positive body image of both sexes, especially for women.

Eating disorders

Eating disorders are characterized by *unusual eating behaviours.* Common eating disorders are:
» Anorexia
» Bulimia
» Binge-eating disorder

About 5% of adults (Western society) are estimated to have an eating disorder. It is thought that there are some inherited traits that increase the risk of developing eating disorders. 90% of those with anorexia or bulimia are women. 50% of adults with binge-eating disorder are men.

General personality characteristics are an overachieving adolescent who has low self-esteem. Most cases of eating disorders start in *adolescence* and are more common in *women*. Athletes in sports for which a specific body line is essential are particularly prone to eating disorders.

Female athletic triad is a specific combination of 3 signs seen in female athletes:
» Disturbed eating
» Osteoporosis
» Loss of monthly periods (amenorrhea)

Anorexia nervosa:
Anorexia nervosa is characterized by self-starvation and weight loss. The anorexic has an appetite but refuses to eat, even while being very obsessed with food intake. There is a stubborn refusal to accept that there has been dramatic weight loss. Mortality rate with anorexics is 15-20%. With weight loss, there is:
» Loss of body fat
» Wasting of muscles
» Flaking skin
» Loss of hair
» Loss of bone density
» Greater risk of infection
» Lowering of testosterone levels (in men)
» [Long term effect] Electrolyte imbalances
» [Long term effect] Abnormal heart rhythm
» [Long term effect] Death

Behaviours of an anorexic include:
» Not eating in the presence of others
» Inducing vomiting after eating
» Using laxatives and/or diuretics
» Excessive exercise
» Being obsessed with planning restricted food intake

Common personality traits of anorexics are:
» Desire to maintain control
» Show competence
» Establish one's identity

Treatment of anorexia nervosa includes:
» Having the patient gain weight to a healthy level
» Having them develop healthy eating behaviours
» Family therapy

Bulimia nervosa:
Bulimics restrict food intake and then binge-purge:
» Binge phase – Eat massive amounts of high-calorie foods.
» Purge phase – Vomit using diuretics (water pills) to lose fluid weight. Laxatives can also speed the food through the colon of the digestive tract. Digestion and absorption have already occurred before the food enters the colon, so laxative use is not actually effective for what the bulimic wants.

Individuals suffering from bulimia are able to cover up the activity. They can be underweight, overweight or near to normal weight. The aim is to control the behaviour, but eventually, the person loses control and develops *guilt* and *depression*. Health concerns are:
» Electrolyte imbalance
» Dental cavities
» Esophageal tears
» Heart irregularities
» Dehydration

Bulimia is thought to be a way for individuals to try to deal with anxiety, loneliness and low self-esteem. Treatment and recovery involves:
» Behaviour change – Learning to deal with unpleasant feelings
» Psychological counselling
» Efforts to boost self-esteem

Binge-eating disorder:
With binge-eating, the person ingests large amounts of food over a short period of time, with no connection to hunger or need for the food. There is no purging with this type of eating disorder. After the binge, the person is left with feelings of guilt, depression and disgust with himself/herself.

Binge-eaters are generally overweight. Some are extremely overweight. The person often has a history of depression and impulsive behaviour. Malnutrition can be a problem because, despite consuming many more calories than needed, the food eaten does not provide all the nutrients required.

Treating binge-eating disorder:
» Counselling – Necessary to effect a cure.
» Changing eating behaviours and instill healthy eating habits.

12 steps of overeaters' anonymous program (describe at least 3)
» We admitted we were powerless over food, that our lives had become unmanageable.
» Came to believe that a Power greater than ourselves could restore us to sanity.

- Made a decision to turn our will and our lives over to the care of God *as we understood Him*.
- Made a searching and fearless moral inventory of ourselves.
- Admitted to God, to ourselves, and to another human being the exact nature of our wrongs.
- Were entirely ready to have God remove all these defects of character.
- Humbly asked Him to remove our shortcomings.
- Made a list of all persons we had harmed and became willing to make amends to them all.
- Made direct aments to such people wherever possible, except when to do so would injure them or others.
- Continued to take personal inventory and when we were wrong, promptly admitted it.
- Sought through prayer and meditation to improve our conscious contact with God *as we understood Him*, praying only for knowledge of His will for us and the power to carry that out.
- Having had a spiritual awakening as the result of these Steps, we tried to carry this message to compulsive overeaters and to practice these principles in all our affairs.

HEALTHY SEXUALITY

Sexual health

Maintaining sexual health is part of maintaining and enhancing overall health. Sexuality is a complex undertaking and there is no *one* definition of it. Included in the definition of sexuality would be:

- Sex
- Identity
- Gender roles
- Sexual orientation
- Pleasure intimacy
- Reproduction

Sexuality can be expressed in:

- Thoughts/fantasies
- Desires
- Beliefs
- Attitudes
- Behaviours
- Practices
- Roles
- Relationships

Influences:

- Biological
- Psychological
- Social
- Economic
- Cultural
- Legal
- Historical
- Religious

Not all dimensions of an individual's sexuality need to be part of every person's experiences. There are benefits to sexual health:

- Positive and satisfying sexual interactions
- Healthy levels of self-esteem
- Avoidance of STIs and reduced risk of pregnancy
- Better mental health, free of shame and guilt
- Enhanced quality of life

Sexually transmitted infections (STIs)

The highest rates of STIs occur between 16 and 24 year olds. They are the major cause of preventable sterility and can lead to ectopic pregnancies and a life-threatening conditions. Untreated STIs increase the risk for miscarriage, premature delivery, post-natal uterine infections and the infection of the newborn.

The microbes that lead to STI infections live best on *warm* and *moist* areas of the reproductive tract. It is possible to have more than 1 STI at the same time. Treatment is specific for each STI. Curing one STI does not necessarily cure the other STI and treatment does not act as a protection from another STI.

Many STI do *not* produce any or *only* mild symptoms or signs. Sexual activity while silently infected leads to infecting one's sexual partners. Infection with one STI increases the risk of becoming infected with another STI. Honest and open communication about prior sexual history is also important.

Routes of transmission for STIs are:

- Sexual contact (with bodily fluids)
- Warm and moist areas of the body (mucous membranes)

Complications of STIs:

- Pelvic inflammatory disease – A result of women having repeat STIs or untreated STIs. This results in scarring of fallopian tubes and can also damage ovaries and uterus.
- Epididymitis – Symptoms are blood in semen, urethral discharge, swelling of the groin, pain during urination and/or ejaculation.
- Chlamydia – Most common sexually transmitted bacterium is chlamydia trachomatis. Having multiple sexual partners is a risk factor. Symptoms may be absent in both men and women. Infection can be transmitted to newborn during delivery, causing eye infections (conjunctivitis; blindness if left untreated). This can be treated by *antibiotics*.
  - *Men* – Infection can lead to inflammation near the testicles and injury to the prostate gland.
  - *Women* – Untreated infections lead to PID.

» Gonorrhea – Second most common STI and frequently occurs with chlamydia. Sexual contact is the primary means. This can lead to PID and sterility in women (and men). Treated with *antibiotics*.
  - *Symptoms* – Sometimes, men and women show no symptoms. [Men] Burning on urination and thick pus oozing from penis accompanied by pain. [Women] Vaginal discharge and burning on urination. Bacteria can live in vagina or fallopian tubes or on cervix for years and sexual partners can continue to be infected.
  - *Results* – PID is a major risk. Infant can be infected. Can spread to prostate gland, testicle, bladder and kidneys. Sterility is possible (in men because the vas deferens is blocked). Can develop into blood-borne infection, which can cause arthritis, attack heart muscle, as well as cause meningitis. Drug-resistant strains are common.

» Syphilis – Caused by bacterium. Sexual contact is the primary means (break in skin or mucous membranes). Can be transferred from mother to fetus. During pregnancy, women with untreated syphilis can experience premature birth and miscarriage. The baby can be born with congenital syphilis, which can include blindness, deafness and developmental delays. This increases the risk of HIV and vice-versa.
  - *Primary syphilis* – Open lump or crater (chancre) appearing at point of entry of bacterium, but the chancre will disappear within weeks. Chancre is teeming with bacteria and any contact is likely to result in infection.
  - *Secondary syphilis* – 1 to 12 months after infection if left untreated. May be symptomless or it can include skin rash, white patches in mouth, swollen glands, moist sores around mouth and genitals. These can disappear and may seem non-specific.
  - *Latent syphilis* – If continues to be left untreated, develops during which the bacteria are invading various organs. There can be outbreaks which decrease in intensity. Fetal transmission occurs at this stage.
  - *Tertiary syphilis* – 10 to 20 years after latent stage. Heart damage, progressive brain involvement may lead to paralysis, blindness and dementia.
  - *Prevention and treatment* – Blood test for diagnosis, early treatment with antibiotics can lead to a complete cure, abstinence is the most effective preventative measure and use of condoms can decrease the risk of contraction.

» Herpes simplex virus – Name given to a variety of viruses. These cause *blistering* on the skin or mucous membranes. Remain dormant in nerve cells for life. Not completely cleared from the system once infected. Outbreaks can return but with diminishing frequency and severity over time. Intense long-term stress is likely to cause a flare-up of the infection and these tend to occur during menstruation or even after sudden changes in body temperature. Newborns can be infected during the delivery, caesarian is recommended. *Antivirals* decrease the severity of the outbreaks.
  - *HSV 1* – Most common HSV. Causes cold sores and blisters around the mouth but can be responsible for sores around genitals.
  - *HSV 2* – Genital HSV. Causes blisters on the penis, inside the vagina, on the cervix, buttocks or pubic area. Lesions can occur in the mouth. Can be spread even between flare-ups of the disease when there are no signs of the infection.

» Human papilloma virus (HPV) – Genital warts. This is the *most common viral STI*. It is the name of a group of 100 or so viruses, some of which are sexually transmitted. This infection increases the chance of developing cervical cancer by causing changes in cervical cells. Genitals should be examined regularly. Men with genital warts should have the warts removed as the warts increase the risk of penile cancer. HPV is also a risk to the fetus, must deliver by caesarian. Diagnosis through a pap smear. Sexual partners can be unknowingly infected due to lack of symptoms. A vaccine is available that provides protection from 4 strains that are associated with 70% of the cases of cervical cancer and 90% of genital warts. Transmission is through sexual contact. Warts appear 3 weeks to 18 months after contact with an infected individual. There is a strong association between HPV infection and cancer of the cervix, vagina, vulva, urethra, penis and anus. Treatment of warts is by freezing (cryosurgery), use of heat (cauterization), chemical removal or surgical removal.

» Public lice – Insects found in pubic hair but can migrate to other hairy parts. Bites causes itching and irritation. Specific shampoos and/or creams kill live and their eggs. Bedding should be washed frequently.

Spread of HIV and AIDS

HIV infections is a result of several factors such as:

» Frequent sexual activity with multiple anonymous partners.
» High-risk sexual practices (i.e. anal).

Human immunodeficiency virus (HIV) is the virus linked to acquired-human deficiency syndrome (AIDS). HIV lives in blood, semen, vaginal fluids and breast milk. It can be spread by these fluids in a single episode of exposure.

Anal intercourse is an extremely high-risk behaviour associated with transmission of HIV. Other high-risk behaviours include:

» Having multiple sex partners
» Sex without condoms or without virus-killing spermicides
» Sharing needles for drug use
» Having another STI

To reduce mother-child transmission, caesarian is encouraged for HIV positive mothers. HIV has the ability to cause abnormalities in the immune system. Once the virus enters the bloodstream, generalized symptoms appear. The symptoms are flu-like:

» Swollen lymph nodes
» Fever and chills
» Diarrhea
» Weight loss
» Coughing and shortness of breath
» Persistent tiredness

The use of *antiretroviral cocktails* has reduced the toll of HIV in some areas of the world. The infection, with this treatment, has become similar to a chronic infection. Prevention includes abstinence or use of condoms during sexual activity.

Guest speaker notes

Some people choose to abstain from sex and are going through a dry spell. They are asexual or are abstaining while treating a sexually transmitted infection.

What makes sexuality healthy?

Understanding what makes sexuality *healthy* will help you make decisions that are useful to you. Learn about diverse people and cultures and different beliefs/values about sexuality. Develop insight into *your* beliefs/attitudes toward issues related to healthy sexuality:

» Marriage and open relationships
» Women taking charge in the bedroom
» Oral, anal, online sex (is it really "sex"?)
» Media stories about unwanted sexual touching at work, at university (hazing).

You want to understand what influences your opinions and how your values link to your sexuality. Form skills supporting healthy sexuality:

» Sexual decision-making
» Sexual self-care – Breast awareness, contraception, testicular awareness, normal menstrual cycle. Know what's *normal* for you and when to connect with a health professional.
» Find a health professional (health services) who can support your sexual health.

Some negative emotions about sexuality (i.e. anxiety, guilt) experienced occasionally are normal and common. When they become *overwhelming*, they can inhibit sexual response, impair relationships and have other negative consequences. There are effective treatments (i.e. talk therapy).

Sexual enhancement include:

» Developing a positive self-image and self-worth.
» Developing healthy, gratifying and satisfying relationships.
» Prevention of sexual health problems (i.e. unintended pregnancy, overwhelming negative emotions, STI, sexual abuse, sexual dysfunction, etc.).
» Communication and negotiation skills and consent.

Porn is easily accessible. Unfortunately, it is the default sex educator for many people and some experience distress related to their porn use.

STIs are often transmitted through sexual contact and are mainly caused by a virus, bacteria or parasite. At least 70% of Canadians will experience an STI in their lifetime. One in two sexually active persons will contract an STI by age 25:

» STIs can cause problems – Pain, cancer, infertility and death.
» Having an STI increases our chance of getting another STI.
» Being diagnosed with an STI causes suffering and distress.

It is important to learn how to live with an STI. You may get an STI that you want to avoid spreading while being treated. You may get one that is not curable but manageable. You may start a relationship with a person who has an STI. The general signs of sexually transmitted infections are:

» Abnormal discharge from the urethra, vagina or anus.
» Lumps, growths or blisters in the genital or anal area.
» Burning when peeing.
» Some are *asymptomatic*.

Examples of safer sex practices are the following:

» Abstinence
» Enjoy solo activities
» Use a barrier
» Negotiate sexual activity
» Disinfect shared toys
» Avoid contact with sores
» Limit sexual partners
» Share sexual history
» Avoid sex under influence
» Get tested often
» Get vaccinated
» Treat an STI
» Get informed
» Adopt positive attitudes

FOOD SAFETY

Introduction

A foodborne illness is any illness that is related to food consumption. Generally, foodborne illness is in a majority of cases due to pathogens in the food and the toxins they can produce.

Other sources of foodborne illness can be:

» Drugs used in animals
» Pesticides
» Fertilizers
» Industrial wastes

The chief cause of foodborne illness is:

» Pathogens
» Bacteria
» Moulds
» Parasites
» Toxins
» Viruses

Common symptoms are:

» Abdominal pain
» Nausea
» Diarrhea
» Vomiting

Those with weak immune systems are particularly vulnerable

These can be fatal, damage kidneys, cause arthritis or lead to miscarriage in pregnant women

Contamination

Contamination can occur during growth and food production. Other contamination may occur during processing, storage or at home. The dose to cause harm is dependent on many factors:

» How much of the contaminant was ingested
» Body size, body weight, life stage
» One's nutritional status

Direct infection with the pathogens cause illness as the pathogen multiplies in the gastro-intestinal tract. Some examples are:

» E. coli (most strains)
» Salmonella
» Listeria

Toxins produced by the pathogen causes illness, this is known as foodborne intoxication. Not many bacteria need to be ingested and some toxins are difficult to destroy by heat (i.e. staphylococcus aureus and clostridium botulinum).

Bacterial infections:

» Salmonella – Found in animal and human feces. Foods contaminated with these can transmit the infection. It can also be transmitted by contaminated meat, dairy products, seafood and fresh vegetables. Poultry and eggs are the most common source. Spraying chicks with beneficial bacteria can "crowd out" the harmful salmonella bacteria. The food must be properly cooked and stored. Thus, salmonella can be destroyed by heat. Refrigeration slows down its growth.
» Escherichia coli (E. coli) – Found in the GI tract of humans and other animals. It can get into the food supply through contamination with fecal matter or fecal-contaminated water. Most strains are harmless, although this bacteria is a frequent cause of traveller's diarrhea. Strain *0157:H1* produces a toxin that leads to abdominal pain, bloody diarrhea, kidney problems and death in serious cases. It can multiply slowly at refrigerator temperatures. Bacteria and toxins are destroyed by cooking food to at least 160°F or 71°C. Ground meats are a problem as the bacteria are introduced throughout the meat, compared to a solid cut of meat (i.e. steak) where the bacteria or toxin are more likely to be on the surface and will be willed by the heat of cooking. Risk is higher in daycare centres if caregivers do not wash their hands thoroughly after diaper changes. Outbreaks of infections have occurred with the consumption of unpasteurized juices or milks, also with inadequately cooked hamburger patties.
» Listeria monocytogenes – Infection causes flu-like symptoms, although infection in some persons (i.e. the young, elderly and chronically ill) can lead to death. Its growth is *not* slowed by refrigeration and it can *survive* higher temperatures than many other bacteria. It will be destroyed by pasteurization of dairy products. It is often found in processed deli-type meats, hot dogs, luncheon meats, fish and some cheeses.

Intoxication:

» Staphylococcus aureus – Many persons are carriers of this bacteria, often found in the nasal passages and throat. Bacteria is transferred to food while preparing and unsafe food handling is present. Common sources of infection are salads, bakery products, cooked ham and dairy products. The toxin causes the illness.
» Clostridium botulinum – Clostridium are anaerobic bacteria (live in conditions where there is little or no oxygen. They can go into dormancy and form tough, heat-resistant spores under unfavourable growing conditions. Once the conditions are more favourable, the spores break from dormancy and the bacterium begins to grow and produce its toxin. It is often found in improperly canned (home-canned) foods. The toxin is a *nerve toxin*, which causes weakness, double vision, breathing difficulties, paralysis and death. Botulism spores can be found in honey.

Viral infections:

Common foodborne viral infections are *hepatitis A* and *norovirus*. The viruses themselves do not grow or reproduce on the foods. The mode of infection is often from food or water contaminated by animal or human feces. The *norovirus* may be the most common cause of gastroenteritis infections resulting in vomiting and diarrhea.

» Norwalk virus – Shellfish are common foods that transmit it if the water they grow in is contaminated with human or animal feces. The virus is transmitted through raw or inadequately cooked shellfish or

inadequate washing of salad ingredients. This is destroyed by cooking.

» Hepatitis A – Transmitted through food or water contaminated with feces of a carrier and by improper handling of food by an infected person. The liver gets infected, resulting in jaundice, fever, nausea and abdominal pain. Treatment is not necessary but recover can take months. Vaccine for hepatitis A is available.

Other:

» Moulds – Uncommon cause of foodborne illness. Mouldy foods are likely to be thrown out. Some moulds could produce dangerous toxins in grains and corns. Moulds that grow on improperly stored peanuts, corn and rice are carcinogenic (aflatoxin). Ergot (mouldy rye grain) can cause hallucinations.

» Parasites – Protozoans (single-celled animals) and helminthes (worms). Transmitted through improperly treated water and destroyed by cooking. Fish often carry worm larvae, which, after being consumed, invade the stomach and intestines of humans. Consumed fish should be very fresh or well cooked. If consuming raw fish, it should be either very fresh or frozen for 72 hours before consumption.

Reducing the risk of foodborne illness

» Safe food storage – Cold foods should be kept cold (38-40°F or 4°C). The freezer should be 0°F or -18°C. Hot foods should be kept at 140°F or 60°C or above.

» Separate raw and cooked foods – Wash preparation surfaces before each step in preparation. Separate preparation of raw/cooked foods.

» Cook foods thoroughly – Especially ground meats. Eggs should *not* be eaten raw. Cook foods to the proper temperature. Colour is not always a reliable indicator of safe cooking temperature.

» Store cooked foods properly – Large portions of food should be divided into smaller quantities so they will cool more quickly. Refrigerate foods promptly and reheat leftovers thoroughly.

Most foodborne illness occurs in the home. In restaurants and in institutions, avoid cross-contamination amongst customers by using equipment, not hands, to handle food. Food left at room temperature is exposed to the prime temperatures for microbial growth. Extra care should be taken to keep foods cold or sufficiently hot.

YOUR INNER LIFE

Introduction

As we have seen already, the trend to obesity is quite pronounced. Despite the introduction of various diets, better food labelling, better access to health information, etc. the trend does not show much sign of changing. Why is it that we haven't yet found the definitive answer?

Intestinal bacteria:

New evidence is showing that gut bacteria may play a role in the development of obesity and diabetes. The gut bacteria may influence how we store fat, maintain blood glucose levels and react to hormones related to feeling full. An unhealthy mix of gut bacteria may start their influence immediately after birth.

Research is trying to elucidate what mixture is healthy and what affects the mix of these bacteria. Having the knowledge of what is health or unhealthy may help to prevent or treat obesity.

Although there are estimated to be more than 500 species living at any one time in an adult intestine, the major belong to:

» Firmicutes – Streptococcus, Clostridium and Staphylococcus

» Bacteriodetes – Flavobacterium

More than 1000 different known bacterial species can be found in human gut microbiota, but only 150 to 170 predominate in any given subject. Bacterial cells (in or on the body) outnumber the cells in the human body (10:1), although the real number is not known. Large populations of bacteria occur in the *mouth*, with even more bacteria in the *large intestine*.

During the normal birth process, the baby picks up the bacteria from the mother's *birth canal*, with more strains of bacteria being picked up subsequently from the *environment*. The mixture of bacterial strains is greatly variable from person to person across various population groups.

Recent studies are showing:

» Leaner persons – *Greater variety* of bacterial species

» Overweight persons – *Less diverse* bacterial types in their gut

Rat studies have been done using bacterial flora from human twins, one twin being lean and the other obese. Rats raised in a sterile environment inoculated with bacteria from the heavier twin tended to have a greater amount of body fat compared to rats receiving bacteria from the leaner twin.

Another study has shown that after inoculation from either the lean or obese twin, if rats were allowed to share cages, both groups remained lean and had a greater variety of bacteria. Also in mice, directly introducing bacteria from lean persons to the previously obesity-

inoculated mouse group resulted in the obese-inoculated mice reverting to a healthier weight.

Blood levels of mice with unhealthy mix of bacteria show higher levels of branched-chain AA and other compounds which are also elevated in obese persons and those suffering from type 2 diabetes.

Helicobacter pylori (H. pylori) is a bacterium found in the stomach of humans and is implicated in the formation of ulcers. This bacterium may regulate the stomach hormone ghrelin which stimulates hunger. This bacteria is less common in the digestive tract of humans in North America due to the emphasis on hygiene and greater use of antibiotics.

The North American diet of more processed foods leads to less diverse gut flora. Mice studies showed that this type of diet (low fibre, low fruits and veggies, higher in fat) induced obesity even if the mice were raised with mice with lean-type bacterial types.

Persons fed infant formula and those born by caesarean section show a higher tendency for obesity later in life compared to those born vaginally. Breast-fed infants will also acquire bacteria that help in the digestion of milk, encourage a healthy population of bacterial species and discourage growth of unhealthy bacteria.

Formula-fed infants have different bacterial populations compared to breast-fed infants. It is thought the infant's still immature immune system in bottle-fed infants is not able to correctly handle the unhealthy bacteria. The consequence is greater exposure to allergens leading to higher risk of asthma, allergies, eczema, celiac disease and obesity.

Studies in mice show a greater percentage of body fat in mice given low-dose antibiotics. It is thought that the antibiotics kill off the healthy bacterial types that help maintain a healthy weight. Human studies in the US show that states that have greater antibiotic use show increased prevalence of obesity.

Studies are being conducted on infants born by caesarian section being inoculated with bacteria from the mother's birth canal. The children's growth will be monitored to check if there will be any effect on growth and weight. Other studies are trying to determine whether fecal transplantation from healthy weight persons to overweight/obese persons will lead to weight loss. It is still to be determined, however, which bacterial species are specifically related to leanness.