**Herpes and Hep and Flu, Oh My!**

*Public Health Issues for Massage Therapists*

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Specific Immunity Review
A cootie gains access; it is picked up by a nonspecific WBC

The WBC (a monocyte or macrophage) carries it to a nearby lymph node

The WBC stimulates the associated T cell, which clones into

- Helper Ts
- Killer Ts
- Suppressor Ts
- Memory Ts

Helper T cells wake up associated B cells

B cells clone into

- Plasma cells
- Memory cells

Plasma cells make antibodies, make antibodies, make antibodies, make antibodies

Helper Ts, Killer Ts, antibodies, and other agents circulate through the body killing pathogens and infected cells (and their neighbors, just in case)

It is this action that causes most symptoms associated with a systemic infection:
fever, malaise, exhaustion— at a cellular level you really are quite busy!

After the infection is over Memory Ts and Bs and antibodies continue to circulate

“Immunity” means you fight it off quicker than before
Herpes Simplex

Definition
- HSV-1: viral infection around the mouth
- HSV-2: viral infection around the genitals
- Distinction is no longer considered important

Etiology
- Oral, respiratory, mucus secretions, direct contact
- 1st outbreak = primary (picked up in childhood)
- Subsequent outbreaks = recurrent
- HSV is never fully expelled (“creeping thing”)
  - Hides in DRG or trigeminal nerve
  - Waits for trigger (drop in antibodies)
    - Cold, menstruation, stress...
    - “Cold sore”, “fever blister”
  - Reactivates at same area

Complications:
- Risk for secondary bacterial infection
- Increased risk for HIV spread
- Vaginally delivered babies at risk if genital herpes is present

Communicability
- Skin-to-skin is easiest but...
  - Virus is sturdy outside a host
  - Can stay on surfaces for hours or days
- Autoinoculation is possible but not frequent
- In high concentration in blisters
- May be present on skin during prodrome
- You probably already have antibodies— you are protected

Oral Herpes
- “Herpes labialis”
  - Outbreaks with immune suppression, stress
  - Usually on lips, around mouth
  - Can be lifelong problem

Genital Herpes
- Outbreaks with immune suppression, stress
  - May be accompanied by fever, inflamed lymph nodes, etc.
Decreasing frequency over time
Can be on genitals, but also on
  - Thighs, buttocks, low back (places we touch)

**Herpes Whitlow**
- Outbreak of lesions on hands, nail beds
- Used to be common among dental hygienists
- Still happens when toddlers suck their thumbs
  - Example of autoinoculation
- Occupational hazard for massage therapists?

**Herpes Gladiatorum**
- On trunk, extremities
- Associated with wrestlers, other athletes with skin-to-skin contact
- Blister may rupture, look like ulcerations

**Herpetic Sycosis**
- Multiple lesions over the beard area
  - Shaving with an active lesion—autoinoculation
**Signs and Symptoms**
- **Prodrome stage:** tingling, itching, pain
- **Blisters on a red base**
  - Virus-rich fluid in blisters
- **Scab over after 7-10 days**

**Treatment**
- **Nothing eradicates the virus**
  - Emphasis on prevention
  - Reducing frequency
  - Staying healthy

**Medications**
- **Antiviral medication to shorten outbreak**
- **Topical cream for pain with oral herpes**
- **Prophylactic medication to reduce frequency of genital herpes**

**Massage Therapy Implications**
- **Risks:** active lesions contraindicate local massage; best to reschedule if possible
- **Benefits:** no specific benefits; can improve quality of life and stress management
- **Options:** don’t work directly on the hands of a person with an active lesion
**HIV/AIDS**

**Definition**
- HIV = human immunodeficiency virus
- AIDS = acquired immune deficiency syndrome

**Demographics**
- Worldwide:
  - 35 million are HIV+
  - 2.1 new infections/year, 240,000 among children
  - 1.5 deaths/year
- US:
  - 1.3 million are HIV+
    - Up to 14% don’t know
  - 50,000 new infections/year
  - 35,000 people progress from HIV+ to AIDS /year
  - 14,000 deaths/year
  - 80% of US cases are among men

**Etiology**
- HIV enters the body by way of shared fluids
  - Blood
  - Semen
  - Breast milk
  - Vaginal secretions
- It attaches to cells in mucosal epithelium
  - STDs dramatically increase the risk of infection
- Then it invades a target cell through a receptor called CD4
  - Many cells are CD4+
  - HIV usually starts with monocytes and macrophages
  - These transport it to lymph nodes and other tissues with lots of CD4+ cells
    - Especially helper T cells
- HIV is composed of RNA
  - Inside a target cell it needs to convert to DNA to replicate
  - This requires an enzyme called transcriptase
  - It replicates until the target cell ruptures, releasing new virus to infect more cells
  - HIV can pool and replicate inside immune system cells without creating an immune system response
    - This is why blood tests may not be accurate for up to 6 months after infection
- HIV can move from one CD4+ cell to another, destroying tissue along the way
  - In lymph nodes
Progression: Phase 1
- New infection
  - Virus pools in WBCs
  - No immune response, no symptoms
  - Highly communicable
  - Usually lasts 3 weeks to 6 months

Progression: Phase 2
- Acute primary phase
  - Immune system response begins
  - Antibodies for HIV are detectable in the blood
  - May have symptoms that look like flu or mononucleosis for about 2 weeks

Progression: Phase 3
- Asymptomatic phase
  - No symptoms or opportunistic diseases
  - The infection is progressing, and the immune system is keeping up
  - Medical intervention works to prolong this phase by inhibiting viral replication
  - Can last 1-20 years or more

Progression: Phase 4
- AIDS
  - T cell counts drop to <200/ cubic mL (normal is 800-1000)
  - Opportunistic diseases develop

HIV Resistance
- Some people are long-term non-progressors
- 3 main variables for HIV resistance
  - Host resistance: some people may have fewer CD4 receptor sites
  - Immune system response: some people have a faster, more aggressive immune system response to the virus
  - Virulence of the virus: some strains of HIV are weak so hosts are better able to manage infection

Communicability
- HIV is spread through...
  - Sexual activity
  - Shared needles or contaminated equipment that breaks the skin
    - (i.e., tattoo, piercing equipment)
  - Childbirth, breast feeding
• HIV is NOT spread through...
  • Exposure to tears, sweat, saliva
  • Surfaces that don’t break the skin (i.e., toilet seats, massage face cradles)
  • Insect vectors
  • Airborne particles

Complications
• Complications of AIDS occur when HIV has disabled normal immune system function
• Pathogens that don’t threaten others can become deadly because the immune system response is crippled
  • Pneumocystis carinii pneumonia
  • Cytomegalovirus
  • Kaposi sarcoma
  • Non-Hodgkin lymphoma
  • Toxoplasmosis
  • Herpes simplex
  • Meningitis
  • Herpes zoster… etc.

Signs and Symptoms
• Described in the discussion of phases

Prevention
• Avoid high-risk behaviors
• Be well educated about high-risk behaviors
• Pre-exposure prophylaxis
  • Antiretroviral drugs reduces the risk of transmission
  • May be appropriate for those living with an HIV+ partner
  • Not risk-free

Treatment
• HAART
  • Highly active antiretroviral therapy
  • Slows viral activity, can’t expel the virus
• Not always clear when to begin treatment
  • Drugs are toxic, carry major side effects
    • Low blood cell count
    • Peripheral neuropathy
    • Pancreatitis
    • Insulin resistance, etc.
Medications
- Antiretroviral drugs

Massage Therapy Implications
- **Risks**: The person most at risk is the client: be sure to be healthy when working with someone who is immune-compromised. People who are HIV+ could have a communicable disease as a complication. Also, people who are HIV+ may have side effects to medication that are issues for massage therapy, like kidney problems or peripheral neuropathy.

- **Benefits**: Massage therapy can be a wonderful therapy to add to the life of someone who is HIV+ or in end-stage AIDS, as long as it is adjusted to the resilience of the client.

- **Research**: Massage therapy has been seen to help with immune system activity, depression and other symptoms related to HIV/AIDS.
Hepatitis

Definition
• Inflamed liver
• Can be from some other sources but this discussion focuses on viral hepatitis
  • Hepatitis A, B, C cause about 90% of all infections in US
  • Viruses A-G have been identified
• Liver inflammation without viral infection is usually nonalcoholic steatohepatitis (NASH)

Demographics
• Up to 30% of all adults have been exposed to hepatitis A
  • Many have no memory of an infection
• Up to 1.4 million have hepatitis B
  • Many don’t know
• Up to 3.2 million have hepatitis C
  • High risk of long-term liver disease
  • Most common blood-borne infection in US
• (NASH affect 2-5% in US)

Etiology
• Hepatitis A, B, C = viral infections of the liver
• They are unrelated; exposure to one confers no protection from others
• Viral attack on liver stimulates inflammatory response
  • Blood tests show liver enzymes, antibodies

Etiology: 4 Phases
  – Phase 1
    • New infection, viral replication, liver compensation
    • Blood tests are positive
  – Phase 2
    • Prodrome: symptoms develop
      – Food aversion, nausea, vomiting, malaise
  – Phase 3
    • Icteric stage: jaundice, pale stools, dark urine, hepatomegaly
  – Phase 4
    • Convalescence: liver heals, symptoms resolve, health is restored
Hepatitis A (HAV)
- Spread most efficiently through oral-fecal contamination
  - Intimate fluids can also work, but less efficiently
- Short, acute infection, no long-lasting damage
- Incubates 2-6 weeks, present 2-3 weeks, several months of convalescence
- One exposure = lifelong immunity

Hepatitis B (HBV)
- Spread through intimate fluids
  - Stable outside a host, can be spread through contaminated surfaces, i.e., needles, toothbrushes that touch
- Long-term infections, subtle symptoms related to inflammation of liver
- Incubates 2-6 months, resolves within 15 months
  - Infants, children, and about 5% of adults become long-term carriers
  - At risk for liver cancer, cirrhosis, etc.

Hepatitis C (HCV)
- Probably spread most efficiently through intimate fluids
- 75% develop chronic disease
  - Of them, 1-5% are likely to die from complications related to HCV
- Damage accrues very slowly, over decades
  - Communicable during this time

Other Forms of Hepatitis
- Hepatitis D: only seen alongside HBV
- Hepatitis E-G: uncommon in US
- Other viruses may cause liver inflammation:
  - Epstein-Barr, cytomegalovirus
- Nonviral hepatitis
  - From alcohol, drug use, fatty liver disease
  - From autoimmune disease

Signs and Symptoms
- Varies by person and type of virus
- In general:
  - Malaise
  - Weakness
  - Fever
  - Nausea
  - Food aversion
  - Jaundice
• HAV presents clearest, most severe symptoms
• HBV, HCV present subtler, long-term symptoms (but cause more damage)

Treatment
• HAV: immunoglobulin injection (equine antibodies)
• HBV, HCV: antiviral agents, rest, supportive therapies
  • Antiviral medications can cause serious side effects
• If enough function is lost, liver transplant

Medications
• HAV: immunoglobulin injection
• HBV, HCV: combinations of antiviral agents

Massage Therapy Implications
• Risks: Hepatitis has several possible complications that may contraindicate massage therapy. Anything that exerts adaptive stress may present too much challenge for a client who is struggling with a hepatitis infection.
• Benefits: Massage therapy that is within the bounds of a person’s ability to adapt may be supportive and helpful, especially in dealing with some of the medication side effects. A person who has fully recovered with no long-term impacts on health is a good candidate for massage therapy.
Influenza
Definition
• Viral infection of the respiratory tract
• Often irritating but not dangerous, but can be life-threatening for vulnerable patients

Demographics
• Estimated that 5%-20% of US population get flu each year
• 200,000 hospitalizations
• 23,000-36,000 deaths/year
  • Can go as high as 50,000 in bad years

Etiology
• Gain access to mouth, eyes, nose
  • Can be airborne or by touch
• Travel to mucous-producing cells in the respiratory tract
• Immune system response creates most symptoms
• Communicable from exposure through infection and recovery
• Type A flu viruses easily mutate
• Can move from animals to humans
• Labeled by proteins on outer coat:
  • Hemagglutinin
  • Neuraminidase
  • Examples: H2N2, H3N1 = common human variants

Complications
• Pneumonia, acute bronchitis
  • Can be fatal
• Especially for high risk populations
  • Children 2-5 years old
  • Those over 65 years old
  • Smokers
  • Those with diabetes or immune suppression, chronic lung or heart problems

Seasonal Flu
• Most common form
• Can involve several different type A viruses
• Fall through spring

H5N1 Flu
• AKA : Avian flu
• Passes from wild water birds to domestic poultry
• Rarely passes from poultry to humans
  • Requires prolonged close contact with live, sick bird
• VERY rarely passes from human to human
  • Only a few cases on record, but dangerous when it does
• Extremely virulent with about 30% mortality rate

**H1N1 Flu**
• AKA: Swine flu
• Fast-moving pandemic in 2009
• Targets younger adults, can be fatal

**Signs and Symptoms**
• Subtle to fatal
  • Looks like a bad cold:
    • Respiratory irritation with headache and body aches
    • Long-lasting high fever (may go over 102°)
    • Possible vomiting, but not because of viral attack on GI tract
    — *(No “stomach flu”)*
• Persistent, extreme symptoms suggest pneumonia

**Treatment**
• Rest, liquids, humid air
• OTC drugs may help with symptoms but don’t shorten the infection
• Neti pots, rinsing devices (if they are clean)
• Neuraminidase inhibitors can shorten duration
• Flu vaccines are compiled the previous year to protect against predicted predominant viruses

**Medications**
• NSAIDs
• Antiviral medications
• Neuraminidase inhibitors

**Massage Therapy Implications**
• **Risks:** Delay rigorous massage therapy until the infection has peaked. Afterwards, be aware that sinuses may be painful, and make appropriate accommodations. Working with a client who is just getting over a cold or flu may exacerbate symptoms for a day, and then speed healing (this is purely anecdotal)—it is important to warn of this possibility.

• **Benefits:** Gentle work during an infection may be soothing, and sleep-promoting, if precautions protect the therapist from catching the cold. Afterwards, massage therapy may help with sinus pain and general recovery.
Staphylococcus Infections of the Skin

Definition
• Skin infections with *Staphylococcus aureus*
• Different names depending on location, subtypes of bacteria

Etiology
• Staph uses 2 mechanisms to cause damage:
  – Active invasion of health cells
  – Release of corrosive wastes that kill cells
• Most people have resident staph in nasal passages or skin
  – Can be transferred person-person, also from one place to another
• If bacteria get into bloodstream...
  – Pneumonia, bone/joint infections, toxic shock syndrome, etc
  – Special risk for immune-compromised people
• Infections can begin at hair shafts or anywhere the skin is compromised
• Symptoms from aggressive immune system response

Boils
• Local infections
• Usually single, may be in clusters
  – Carbuncles
• Similar to acne, but MUCH more aggressive

MRSA
• Infections with methicillin-resistant staph A
  – In hospitals since 1950s
    • Pneumonia, kidney infection, surgical wounds
  – Now widespread in the community
    • Skin infections from
      • Athletic facilities; high-density, low hygiene areas
• Several subtypes
• Resistant to the penicillin group of antibiotics
• Lesions may be lanced or surgically removed to avoid treating with medication
• Risk for massage therapists
Folliculitis

- Multiple boils close together at hair shafts
- Diamond-shaped pattern
  - “Hot tub folliculitis”, “wet suit folliculitis” where contaminated water is held against the skin
- Sty is a type of folliculitis at eyelashes

Pilonidal Cysts

- Large encysted infections at the base of the sacrum
- Frequently recur
- May have to be surgically removed

Hidradenitus Suppurativa

- Deep infections at axilla and groin
- Rich environment for infection, body encysts them, grows sinuses to skin for drainage
- Can cause keloids

Signs and Symptoms

- Hard, painful, red or pink bump
- Increases in size and painfulness
- Abscess fills with pus
- May rupture and resolve; may be lanced or removed; may leave scars

Treatment

- Manage obesity, diabetes (2 main risk factors)
- Warm compresses, loose clothing
- Topical antibiotic ointment
- Lance or excise
- Oral antibiotics (for recurring problem)

Medications

- Topical antibacterial ointment
- Oral or IV antibiotics if necessary

Massage Therapy Implications

- **Risks**: local contraindication at least; reschedule if signs of systemic infection are present
- **Benefits**: massage is fine for someone who has recovered
- **Options**: someone with a well-controlled infection that is covered may receive massage, but not on or near the lesion
**Tuberculosis**

**Definition**
- “Condition of having tubercles (bumps)”
- Pus-and bacteria-filled bumps
  - Usually in lungs
  - Can be elsewhere

**Demographics**
- World-wide:
  - 9 million develop active TB /year
  - 1.5 million deaths/year
- US:
  - About 15 million have been exposed
  - 10,000 cases of active TB
  - Mostly among
    - Recent immigrants
    - Native Americans
    - People of color
    - People in prisons
    - Homeless
  - 500 deaths/year

**Etiology**
- Airborne bacterial infection
  - *Mycobacterium tuberculosis*
- Waxy coat allows it to...
  - Survive outside a host
  - Resist phagocytosis
- When a person with active disease coughs, bacteria are expelled and float in the air, waiting for a new host

**2 Phases**
- Primary phase— TB exposure
  - A person inhales some floating bacteria into the lungs
  - Bacteria withstand normal phagocytosis, form colonies
  - The body encases them in fibrous cysts (tubercles)
  - Usually in the lungs, may happen at kidneys, spine, CNS
  - This is **latent infection**
  - After 10 weeks skin tests will be positive
  - Bacteria may stay encased for a lifetime— this is the case for 90% of all who are exposed
• Phase 2—Active disease
  • 5%-10% of those exposed to TB develop active disease
  • Usually within a year, may be decades later
  • Bacteria escape, spread further into lungs and elsewhere
  • Body tries to build bigger capsules
    • Scarring, pleurisy
  • Inside the capsules the bacteria are destroying tissue
    • Filled with dead bacteria, pus, blood
  • New capsules erode into lung tissue, impede function
    • Cavitations
    • Cough, bloody sputum
    • Highly infectious

• Major risk factor: exposure to someone with active disease
• Co-infection with HIV
  • Makes transition to active disease more likely
  • Can interfere with accurate skin test (immune system suppression)

**Drug-Susceptible Tuberculosis**
• Most common type, main focus of this discussion
• Sensitive to 1st-line antibiotics
• Prognosis, if fully treated, is good

**Multidrug Resistant Tuberculosis (MDR-TB)**
• Mutation occurs when someone doesn’t complete their treatment
• Someone who has MDR-TB can spread it
• Bacteria are resistant to all 1st line antibiotics; requires longer, more risky treatment with drugs that have more side effects

**Extensively Drug Resistant Tuberculosis (XDR-TB)**
• Resistant to almost all modern antibiotics
  • Treated with older, less effective drugs
• Most common in parts of Asia, Russia, and in HIV+ populations in South Africa

**Signs and Symptoms**
• Primary phase may not be noticed
  • Might look like flu
• Active disease
  • Fever, sweating, weight loss, exhaustion
  • Chest pain, shortness of breath
  • Stubborn cough with pus-filled or bloody phlegm
Treatment
• Fresh air, rest, good nutrition

• Antibiotics
  • Much simpler to treat drug-susceptible TB than other types
  • Requires up to 9 months of treatment
  • Side effects:
    • Sensitivity to sunlight
    • Discolored tears, sweat, saliva
    • Neuropathy
    • Joint pain
    • Dizziness, tinnitus, etc.

Medications
• Antibiotics

Massage Therapy Implications
• **Risks:** TB is contagious through casual contact, although it usually takes prolonged exposure. Active, untreated TB contraindicates massage therapy (or any public exposure). Be aware that clients who are taking medication for TB may have uncomfortable side effects that require some accommodations.

• **Benefits:** A client who is treating TB and who has been declared non-communicable is a good candidate for any massage therapy that respects whatever challenges his or her treatment may present.

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A complete bibliography is available on request.

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Thank you!