Outline

• What are PSEs?
• Infections associated with specific services
• Questions/Discussion
What are Personal Service Establishments?
PSEs

- Offer wide array of services including
  - aesthetics: manicures, pedicures, waxing
  - tattooing
  - piercing
  - body modification
Body Modification

• Includes more extreme procedures
  – stretching
  – dermal implants
  – branding
  – scarring
  – suspensions
Public health challenges

- Burden of disease is not known
- Incidence of “extreme” procedures is not known
- Limited scientific literature on health risks exists
- The public may be unaware of health concerns
- Specific training is not required of operators
- Operators themselves may not be aware of all the risks
- EHOs may inspect PSEs ~ once a year
- New services are coming out all the time
Infection risks

• Both invasive and non-invasive services exist
• Infection risks (bacterial, fungal, viral) exist for any procedure that potentially breaks the skin
• Infections:
  – can be spread to and between clients
  – risks increase with use of improperly cleaned, disinfected or sterilized tools
  – risks also increase with invasive procedures, use of multiple-use tools and critical tools
A closer look at infections associated with PSE services
Literature review

• Originally requested by BC Ministry of Health
• We conducted a search for scientific studies looking at PSE services and infections
• Other health concerns – injuries, allergic reactions – were not included in the review
## Studies on PSE infection risks

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<th>Services</th>
<th>Number of studies</th>
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<tr>
<td><strong>Aesthetics</strong></td>
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<tr>
<td>Manicures</td>
<td>4</td>
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<tr>
<td>Pedicures</td>
<td>7</td>
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<tr>
<td>Facials, microdermabrasion</td>
<td>0</td>
</tr>
<tr>
<td>Waxing</td>
<td>5</td>
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<tr>
<td><strong>Hair services</strong></td>
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<td><strong>Piercing</strong></td>
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<td>General</td>
<td>27</td>
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<tr>
<td>Permanent make-up</td>
<td>3</td>
</tr>
<tr>
<td><strong>Other body modification (scarring, branding, etc)</strong></td>
<td>0</td>
</tr>
</tbody>
</table>
## Types of Studies

<table>
<thead>
<tr>
<th>Study type</th>
<th>Description</th>
<th>Information provided</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case-controls</strong></td>
<td>compare cases (those with infections) against controls (no infection) to identify infection risks</td>
<td>possible routes of infection transmission and risk factors of infection; may include environmental sampling</td>
</tr>
<tr>
<td><strong>Outbreak investigations</strong></td>
<td>Follow up with infection cases and establishment implicated in outbreak</td>
<td>possible routes of infection; environmental sampling</td>
</tr>
<tr>
<td><strong>Cross-sectional surveys</strong></td>
<td>environmental sampling of multiple facilities</td>
<td>presence of pathogens at specific sites</td>
</tr>
<tr>
<td><strong>Case reports</strong></td>
<td>reports of individual cases of infection, medical treatment - or - environmental sampling of one facility</td>
<td>may discuss possible route of infection but rarely involve site investigation of establishments</td>
</tr>
<tr>
<td><strong>Reviews</strong></td>
<td>summarize findings from other studies</td>
<td>synthesis of the current information</td>
</tr>
</tbody>
</table>
Aesthetics - Manicures

• Treatment involving the hands and nails
• Tools: cuticle cutters, nail files, nail clippers
• Very little information on infection risks
• No reported outbreaks; only 1 case report\(^1\)
• Generally, manicure-related infections occur due to damage to skin and/or nail bed
Manicures – infection control

• Survey of North York, Ontario nail salons\(^2\)
  – 70 randomly-selected service providers
  – reported inconsistent glove use
  – many single use tools were re-used, including razor blades on callus removers
  – disinfection techniques were inconsistent
  – unapproved sterilization techniques were used, including UV light, glass bead sterilizers and ultrasonic cleaners
Pedicures

• Treatment of the feet and nails
• Consist of: soaking feet in a footbath; exfoliation and removal of calluses; treatment of toenails using cuticle removers and nail polish
• Commonly used tools include: nail & cuticle clippers, nail files, callus removers
General findings from studies

• Case reports consistently described mycobacterium infections of the lower legs

• Outbreak of infection led to further study

Photo credit: Pacificenterprise, istock photos, 2011
Pedicures - outbreak

• Case-control study: 46 cases, 54 controls
• All 46 cases had *Mycobacterium fortuitum* infections on lower legs
• Shaving of legs prior to pedicure (morning of or night before) was an important risk factor
  – no other risk factors were identified
• Swab samples were taken from all 11 footbaths; all were positive for *M. fortuitum*
  – no other environmental samples positive for bacteria
General findings

• Environmental sampling has implicated re-circulating footbaths as the source of infection\textsuperscript{4,5}

• Site investigations show that footbaths are poorly cleaned and inadequately disinfected
  – Intake screens in particular harbour organic debris and visible biofilm

• Authors recommend that footbaths be flushed and disinfected after each use and that screens be dismantled, cleaned and disinfected daily
Photo credit: Christian Lapensee, Ottawa Public Health & Gary Nelson, Agloma Public Health
Waxing

• Waxing temporarily removes body hair
• Double dipping (wax, moisturizer) and damage to the skin’s surface can lead to infection risks

Photo credit: leezsnow, istock photos, 2010

Photo credit: AntonPZoghi, istock photos, 2010
Waxing - studies

- We identified:
  - 4 case reports
    - 3 bacterial
    - 1 viral: herpes simplex
  - 2 bacterial infection outbreak reports
Outbreak

• Service provider had reoccurring Methicillin-resistant *Staphylococcus aureus* (MRSA) infections over one-year period
  - 2 customers hospitalized with MRSA infections; 8 individuals indirectly in contact with service provider or customers identified with infection

• Waxing was believed to be source of transmission

• Public health staff observed that during waxing:
  - diluted post-waxing disinfectant applied to clients’ legs
  - service provider did not wash hands between sessions; did not consistently wear gloves

• Environmental samples were all negative
Waxing – susceptible groups

- Skin damage can occur among individuals taking certain acne medications
  - Large areas of skin removed during waxing sessions of two individuals\textsuperscript{7}
  - May be important to inform individuals taking certain medications about increased susceptibility

- Diabetes may also be an important risk factor for waxing-related infections\textsuperscript{8}
Hair services

- Variety of tools used: razors, scissors, combs, clippers, and hairpins
- Few studies have reported infections – fewer for PSEs specifically
- 2 case reports describe bacterial infections in hospitals\textsuperscript{9,10}
  - patients receiving shaves or haircuts
  - inadequate disinfection of hairdressing equipment implicated
Barbering as a risk factor for hepatitis

• Case-control study using Italian surveillance data of hepatitis B and C (cases) and hepatitis A (controls)^11

• Several PSE services investigated as risk factors

• Those receiving services from barbershop or tattoo parlour had significantly higher risks of having hepatitis B and C infections
Piercings

• Create an opening or hole in which jewelry is placed.
• Can have a clear entry and exit point in which a piece of jewelry is inserted (e.g. earlobe, nasal, and navel piercings)
• Can also be an opening in which jewelry is embedded into the skin (e.g. dermal implants)
Piercings - studies

• Bacterial infections most commonly reported
  – Infections commonly attributed to *Pseudomas*, *Streptococcus* and *mycobacterium*
• Only one viral (HIV) infection reported
  – piercing was one of many risks factors for infection
• Localized infections at site of piercings are common: ear lobes, cartilage, navel, eyebrow, etc
• Only one outbreak investigation was identified
Outbreak

- 118 individuals received piercings from one location over 45 day period\textsuperscript{12}
  - 186 piercings conducted (new holes)
  - 7 (4\%) had laboratory confirmed \textit{Pseudomonas aeruginosa}; all were cartilage piercings
  - Piercing gun used for earlobe and cartilage piercings
  - Disinfectant spray bottle used to spray pre-sterilized jewelry likely contributed to infections
Piercings – susceptible groups

• Infective endocarditis is also an important risk
  – Systemic infection of the outer lining of the heart
  – Individuals with pre-existing heart conditions are at greatest risk but may be unaware of their risks$^{13,14}$
  – Infections have been reported among individuals with no known heart conditions$^{15,16}$
Tattooing

- Pigment is added to the dermis layer of the skin
- Done with an electric tattooing machine and single-use needles
- Like piercing, there is a high potential for transmission of blood-borne pathogens
Tattooing - studies

- Case reports describing bacterial and viral infections
- Case control studies looking at risk factors
- Review and meta-analyses that combine data from multiple studies
Findings

• Bacterial infections are common – linked to MRSA, mycobacteria

• Viral infections have been reported
  – include hepatitis B and C, human papillomavirus (HPV), molluscum contagiosum virus (MCV)
  – of these, hepatitis B and C risks are most well characterized
Hepatitis B and C

• Hepatitis B:
  – Studies show that those with tattoos most likely to have HBV infections\textsuperscript{17,18}

• Hepatitis C:
  – those with tattoos have increased risk of acquiring HCV\textsuperscript{19}
  – risk of HCV increases with number and surface area of tattoos\textsuperscript{20}
Tattooing - other viral risks

- Other viral infections are not as commonly reported
  - HPV\textsuperscript{21}
  - MCV\textsuperscript{22}
  - HIV\textsuperscript{23}
High Risk Groups

• Individuals
  – Pre-existing heart conditions
  – Diabetes?

• Risk factors
  – Shaving legs before procedure
  – Taking certain medications
  – Size and number of tattoos
Gaps and Limitations

• Risks for various services unknown
• Routes of transmission and risk factors not well characterized
• Scientific literature is incomplete
  – Not all clients seek medical advice
  – Not all infections reported
Key points

• PSEs provide a range of services

• Scientific literature provides valuable information but it is limited
  – consists mainly of case reports

• Infection risks exist for most services;
  – vary depending on procedures, tools, infection control procedures, and health status of operator and clients

• Bacterial infections are most commonly reported
Key Points 2

• Invasive procedures, particularly for tattooing, are risk factors for hepatitis B and C
• Other viral risks, including HPV and HIV are not well characterized
• Proper infection control through cleaning, disinfection, and sterilization is essential to minimizing infection risks
NCCEH Resources

• Infection risks review
• Disinfection, sterilization document
• Summary table of regulations and guidelines
• Fact sheets on waxing and tattooing
• Workshop report
• Additional resources
Thank You

Questions?
Comments?

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