

# Personal Service Facilities: Looking at Infections Risks

Prabjit Barn  
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BC Centre for Disease Control  
An Agency of the Provincial Health Services Authority

# Outline

- What are PSFs?
- Infection risks
- Questions/Discussion

# What are Personal Service Facilities?



# PSFs

- Offer wide array of services including
  - aesthetics: manicures, pedicures
  - 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
- PHIs may inspect PSFs ~ once a year
- New services are coming out all the time

# Health concerns

- There is a risk of bacterial, fungal, viral infections for any procedures that potentially break the skin
  - can be spread between clients, from client to operator, operator to client
  - risk increases with use of improperly cleaned, disinfected or sterilized tools
  - greater risk with invasive procedures, use of multiple-use tools and critical tools

# A closer look at infection risks



# Infection risks

- Both invasive and non-invasive procedures exist
- Invasive procedures such as piercing and tattooing are linked to greater risks but even non-invasive procedures such as pedicures, manicures, and waxing are linked with infections risks

# Literature review

- Originally requested by BC Ministry of Health
- Searched for scientific studies looking at PSFs services and infections
- Focused on infection risks versus other health concerns – injuries, allergic reactions

# Studies on PSE infection risks

Services	Number of studies
<i>Aesthetics</i>	
Manicures	4
Pedicures	7
Facials, microdermabrasion	0
Waxing	5
<i>Hair services</i>	3
<i>Piercing</i>	29
<i>Tattooing</i>	
General	27
Permanent make-up	2
<i>Other body modification (scarring, branding, etc)</i>	0

# Types of Studies

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

# 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<sup>1</sup>
- Generally, manicure-related infections occur due to damage to skin and/or nail bed



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# Manicures – infection control

- Cross-sectional survey in North York, Ontario nail salons<sup>2</sup>
  - 70 randomly selected service providers
  - reported inconsistent glove use
  - many tools single use tools re-used, including razor blades on callus removers
  - disinfection techniques inconsistent
  - unapproved sterilization techniques 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



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# Pedicures - outbreak

- Case-control study<sup>3</sup>
  - 46 cases; 54 controls; customers visiting facility within 6-month period
- All 46 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 identified
- Swab samples taken from all 11 footbaths; all 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
- Site investigations showed that footbaths were poorly cleaned and inadequately disinfected
- Often had visible debris in screens between basins and re-circulating units
- Authors recommended that footbaths be flushed and disinfected after each use
- Screens should 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



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# Waxing - studies

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

# Outbreak

- Servicer provider had reoccurring Methicillin-resistant *Staphylococcus aureus* (MRSA) infections over one-year period<sup>5</sup>
  - 2 customers hospitalized with MRSA infections; 8 individuals indirectly in contact with service provider or customers identified with infection
- Waxing 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 also occur if individuals are taking acne medication
  - Large areas of skin removed during waxing sessions of two individuals<sup>6</sup>
  - May be important to inform individuals taking certain medications about increased susceptibility
- Diabetes may also be an important risk factor for waxing-related infections<sup>7</sup>

# Hair services

- Variety of tools used: razors, scissors, combs, clippers, and hairpins
- Few studies have reported infections – fewer for PSFs specifically
- 2 case reports describe bacterial infections in hospitals<sup>8,9</sup>
  - patients receiving shaves or haircuts
  - inadequate disinfection of hairdressing equipment implicated

# Barbering as a risk factor for hepatitis B and C

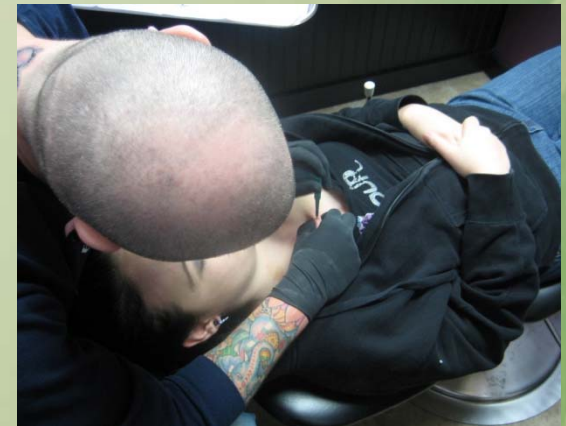
- Case-control study using Italian surveillance data of hepatitis B and C (cases) and hepatitis A (controls)<sup>10</sup>
- Several PSF services investigated as risk factors
- Those receiving services from barbershop or tattoo parlour found to more likely have hepatitis B and C infections

# 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)



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# Piercings - studies

- Bacterial infections most commonly reported
  - Infections commonly attributed to *Pseudomonas*, *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<sup>11</sup>
  - 186 piercings conducted (new holes)
  - 7 (4%) had laboratory confirmed *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<sup>12,13</sup>
  - Infections have been reported among individuals with no known heart conditions<sup>14,15</sup>

# 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<sup>16,10</sup>
- Hepatitis C:
  - those with tattoos have increased risk of acquiring HCV<sup>17</sup>
  - risk of HCV increases with number and surface area of tattoos<sup>18</sup>

# Tattooing - other viral risks

- Other viral infections are not as commonly reported
  - HPV<sup>19</sup>
  - MCV<sup>20</sup>
  - HIV<sup>21</sup>

# High Risk Groups

- Individuals
  - Pre-existing heart conditions
  - Diabetes
- Risk factors
  - Shaving legs before procedure
  - Taking certain medications
  - Size and number of tattoos

# Gaps in knowledge

- Risks for various services
- Routes of transmission
- Risk factors

# Key points

- PSFs provide a range of services
- Scientific literature provides valuable information on infections risks but it is limited
  - consists mainly of case studies
  - need more case-control studies to understand risk factors
- 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 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
- PHIs perform a valuable role in minimizing health risks through enforcement and education

# 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?

[www.ncceh.ca](http://www.ncceh.ca) | [www.ccnse.ca](http://www.ccnse.ca)

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