Personal Service Establishments: Looking at Infections Risks

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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

Services	Number of studies
Aesthetics	
Manicures	**4**
Pedicures	**7**
Facials, microdermabrasion	**0**
Waxing	**5**
Hair services	**3**
Piercing	**29**
Tattooing	
General	**27**
Permanent make-up	**3**
Other body modification (scarring, branding, etc)	**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 establishment implicated in outbreak	possible routes of infection; environmental sampling
Cross-sectional surveys	environmental sampling of multiple facilities	presence of pathogens at specific sites
Case reports	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 establishments
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

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- 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

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- Outbreak of infection led to further study

Pedicures - outbreak

- Case-control study: 46 cases, 54 controls[3]
- 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[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

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Waxing - studies

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

Outbreak

- Service provider had reoccuring Methicillin-resistant *Staphylococcus aureus* (MRSA) infections over one-year period[6]
  - 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[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[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[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)

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Piercings - studies

- Bacterial infections most commonly reported
  - Infections commonly attributed to *Pseudomas*, *Streptoccocus* 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[12]
  - 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[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[17,18]
- Hepatitis C:
  - those with tattoos have increased risk of acquiring HCV[19]
  - risk of HCV increases with number and surface area of tattoos[20]

Tattooing - other viral risks

- Other viral infections are not as commonly reported
  - HPV[21]
  - MCV[22]
  - HIV[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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