

Catching the Bug:

Infection Prevention in the Doctor's Office

By Dr Kamaljit Singh Sandhu and Dr Surinder Kaur Pada

This is part of a series on workplace safety and health for healthcare institutions.

A 30-year-old healthy male visits a crowded family practice clinic, after he developed a fever of 38.5 degrees Celsius, lethargy and a sore throat. On the day of the clinic visit, he noted an itchy vesicular rash that started on his face and scalp and slowly progressed to involve his trunk and extremities. After registering with the clinic receptionist who is six months pregnant, he settles down in the waiting area, next to a 17-year-old teenager and an irritable five-year-old child. After 45 minutes, he is seen by the GP and diagnosed with chickenpox (varicella zoster infection). He is told to stay home from work and take paracetamol for fever. What should the GP now advise his pregnant clinic receptionist, and what precautions should have been taken when the patient first arrived in the clinic?

Introduction

The past decade has seen a significant shift in healthcare delivery from the inpatient, hospital setting to the ambulatory setting which includes doctors' offices, outpatient surgical centres, dialysis centres and wound care clinics. In addition, a greater variety and complexity of procedures are now performed in doctors' offices including minor surgeries, diagnostic ultrasound procedures, vaccinations and chemotherapy. Compared to the hospital setting, outpatient clinics have generally lacked the infrastructure and staffing resources to support infection control and prevention (ICP) practices. Several published reports also highlighted the risk of bacteria, mycobacteria, viruses and parasitic infections in the outpatient setting.^{1,2,3} Therefore, it is important that all patient care is provided under conditions that minimise or eliminate risks of infection transmission.

The SARS coronavirus epidemic which hit Singapore in 2003 was probably the first significant reminder of the risk for transmission of a potentially lethal infection to patients and family members in doctors' waiting rooms. It also highlighted another public health concern – the importance of infection control in doctors' offices. With the continued emergence of novel infections such as the MERS coronavirus and Ebola, it is even more important for community doctors to be aware of the need for an active ICP programme. The scope of any such programme will depend on the type of clinic practice, and needs to be balanced with the reality

of busy clinic practices with limited and often high rates of staff turnover that can result in poor infection control practices. For example, Herwaldt et al found that despite their exposure to blood and bodily fluids, clinic personnel often do not comply with precautions designed to protect them from blood-borne pathogens.⁴ Finally, unlike in many developed countries, there are no formal guidelines (eg, The Joint Commission in America) for infection prevention in outpatient clinics in Singapore (although one private ambulatory clinic practice, Infectious Disease Specialists, was recently the first in the country to be accredited by Joint Commission International).

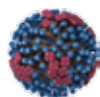
Elements of an outpatient ICP programme

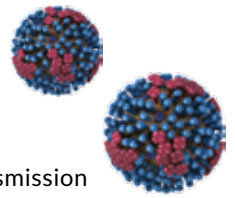
Infection prevention must be made a priority in any healthcare setting including outpatient and ambulatory clinics. The goal of an ICP programme is to protect both patients and staff members from injury and the spread of infection.

Risk assessment

Clinic practices differ greatly in size and function, and so it is not possible to provide a one-size-fits-all approach to infection prevention. Practices need to perform a risk assessment in their own context and decide on appropriate ICP practices and educate staff regarding their responsibilities in managing these risks. For example, a GP clinic should post signs to identify patients presenting with fever, cough and/or rash, and isolate these patients from the general waiting area. In contrast, an oncology clinic with immunocompromised patients, and where catheters are accessed and chemotherapy is administered, should ensure that its staff is educated regarding blood-borne pathogens, and that staff vaccinations, including hepatitis B, are up-to-date.

However, there is clearly a great overlap in practices. For example, GPs often draw blood from patients and are exposed to the risk of sharps injuries and blood-borne pathogens. Meanwhile, an oncology patient who presents with fever and cough due to unsuspected influenza, represents a significant risk to other patients and staff. Table 1 provides a useful checklist of ICP practices for the outpatient clinic (refer to page 17).





Standard precautions

During patient care, standard precautions should be used by all staff who may have contact with: 1) blood; 2) body fluids, secretions and excretions excluding sweat (eg, urine and faeces); 3) non-intact skin; and 4) mucus membranes (regardless of perceived or known infection status of the patient). These precautions are designed to protect doctors and their staff from infection and prevent infection transmission.

Standard precautions include:

- Hand hygiene
- Use of personal protective equipment (PPE), eg, mask, goggles, face shields, gloves and gowns, depending on the anticipated exposure
- Respiratory hygiene and cough etiquette
- Standard aseptic technique
- Safe management of sharps and other clinical waste
- Environmental cleaning and spills management

Contact precautions

These precautions are used in addition to standard precautions when there is a risk of direct or indirect transmission of pathogenic organisms, during contact with patients or objects contaminated with secretions. Examples of such pathogens include vancomycin-resistant enterococci, methicillin-resistant *Staphylococcus aureus*, salmonella, enterovirus (hand, foot and mouth disease), *Clostridium difficile* and varicella zoster (shingles). To prevent contact transmission, the following are recommended:

- Wear gloves for all contact with patients
- Clean hands before and immediately after attending to patients
- Ensure all equipment in contact with a patient is cleaned before use on the next patient

Droplet precautions

Large droplets produced by an infected patient coughing or sneezing may make contact with people within a metre's radius. Examples of such organisms include respiratory viruses such as influenza, SARS and pertussis. To prevent droplet transmission of organisms, advise patients on respiratory etiquette, and provide them with tissues and surgical mask at check-in. Also, ensure that staff vaccinations (eg, pertussis and influenza) are up-to-date.

Airborne precautions

Small particles produced by an infected patient coughing or sneezing, which can remain suspended in the air and travel long distances, may infect susceptible people. Examples of such infections include tuberculosis,

measles and chickenpox. To prevent airborne transmission and minimise exposure to other patients, segregate such patients into a separate area such as a spare room, and ask them to wear surgical masks. Additionally, staff can use fitted N95 high-efficiency filtration masks.

Hand hygiene

The hands of healthcare workers are a common source of transmission of pathogens. Improved hand hygiene is the single most important method to reduce the risk of infection and interrupt the transmission of pathogens.⁵ Hand hygiene must be performed before and after every episode of patient contact. All clinics should provide easily accessible hand hygiene products such as alcohol-based hand rubs at the reception desk and in the waiting room. Alcohol-based hand rubs (liquid or gel) are preferred as they are more easily accessible, more effective than plain or antiseptic soap and water against many pathogenic organisms, and can significantly improve compliance in clinic settings.⁶ For routine hand hygiene practices, use alcohol-based rubs that contain between 60% and 80% volume/volume ethanol or equivalent.

Aseptic techniques

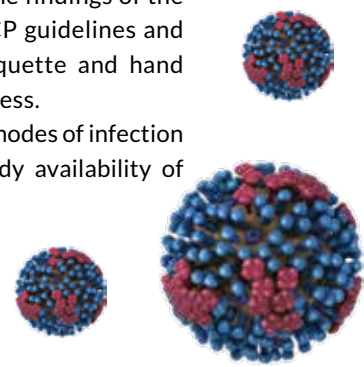
Standard aseptic techniques should be applied to minimise the risk of introducing and transmitting infection during clinical procedures (eg, treatment of wounds such as lacerations, minor surgical procedures and venipuncture). These techniques include:

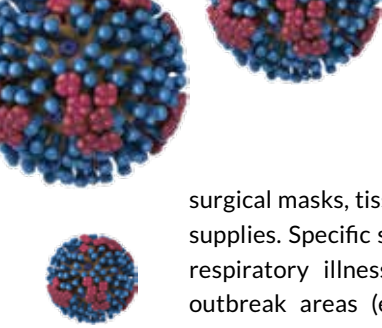
- Using standard precautions, including hand hygiene and PPE (eg, sterile single-use gloves)
- Using sterile solutions to clean wounds or lacerations
- Using skin disinfectants with chlorhexidine alcohol to prepare operative sites
- Using drapes to form a "clean field"
- Using sterile disposable instruments and equipment

Protecting staff and patients

The waiting rooms in GP clinics are often crowded with infants, children and adults with cough, rhinorrhoea and fever. This represents the perfect setting for pathogen transmission. In a study by Simmering et al that analysed outpatient care from more than 84,000 families from 1996 to 2008, the investigators found that well-child visits that occurred during influenza season were significantly associated with subsequent development of influenza-like illness ($P < 0.0001$), not only among the children, but among their family members too.⁷ The findings of the study demonstrate the importance of ICP guidelines and the need to emphasise respiratory etiquette and hand hygiene for patients with respiratory illness.

Clinic staff should be educated about modes of infection transmission and should ensure the ready availability of





surgical masks, tissues, trash receptacles and hand hygiene supplies. Specific syndromes such as febrile rash or febrile respiratory illness and patients who have travelled to outbreak areas (eg, Ebola in Guinea, Sierra Leone and Liberia; or MERS coronavirus in Saudi Arabia) deserve appropriate triage. Clinics should develop and implement an ICP programme with systems for detection, isolation and transfer of such potential patients. In addition, a written or electronic copy of the clinic ICP programme should be readily available and signed off by all staff.

Staff immunisations

Doctors and clinic staff should be advised to receive appropriate immunisations to protect themselves from vaccine-preventable infectious diseases (eg, hepatitis B and influenza). A vaccination policy should be implemented. This should include the provision of information about relevant vaccine preventable illnesses, and up-to-date staff vaccination records, particularly for staff not born in Singapore and those who are pregnant or for whom the possibility of pregnancy exists. Additional helpful resources for setting up a clinic ICP programme are provided after the references.

Exposure to an infectious agent during pregnancy is naturally a cause for great anxiety. A live attenuated varicella vaccine is available for children and susceptible, non-pregnant adults (efficacy of 98% to 100% after two doses). A self-reported history of chickenpox in a pregnant woman is a strong predictor of immunity.⁸ In addition, many women without a history of chickenpox have antibody evidence of past infection. The degree of exposure risk should be reviewed with the exposed staff as it is greatest among household contacts and close contact with an index case for at least five minutes. In addition, the greatest risk of congenital varicella infection occurs in the first 20 weeks of pregnancy. Ideally, a varicella antibody test should be performed if the staff member lacks a history of varicella and prior to consideration of immunoprophylaxis with varicella zoster immunoglobulin (VariZIG or IVIG) – there is no data on the efficacy of acyclovir in reducing the risk of varicella after exposure during pregnancy. Alternatively, a watchful wait approach may be taken with the initiation of acyclovir therapy immediately at the onset of varicella rash.

Finally, the two patients seated on each side of the index case should also receive counselling about varicella infection, including information on the incubation period and symptoms. A proactive ICP programme and staff vaccine policy would have allowed for the rapid identification and isolation of the index patient and documentation of appropriate proof of staff immunity. ■

References

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2. Thompson ND, Perz JF, Moorman AC, et al. Nonhospital health care-associated hepatitis B and C virus transmission: United States, 1998 - 2008. *Ann Intern Med* 2009; 150(1):33-9.
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Additional resources

1. US Centers for Disease Control and Prevention. Guide to infection prevention for outpatient settings: minimum expectations for safe care. Available at: <http://www.cdc.gov/HAI/settings/outpatient/outpatient-care-guidelines.html>. Accessed 28 January 2015.
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Table 1: Ambulatory clinic checklist

LOCATION	YES	NO	COMMENTS
A. Waiting room			
1. Clean and organised			
2. Signs indicating fever, cough and rash			
3. Staff aware of actions to take when patients are potentially infectious			
4. Surgical masks are available for patients with respiratory tract infections			
5. Toys are cleaned per clinic protocol			
B. Exam rooms			
1. Clean and organised			
2. Wash sink or hand sanitiser available			
3. Appropriate waste containers, including biohazard waste containers, available			
4. Disposable examination gloves available			
5. Sharp containers:			
a. Easily accessed/not blocked			
b. Not greater than 3/4 overfilled			
c. Sharps injury/exposure policy is available			
6. PPE, including fit-tested N95 masks, available			
7. Patient supplies (eg, tongue depressors, gauzes, etc) individually wrapped			
8. Examination/treatment couches have wipeable surfaces			
9. Disposable paper is used to protect the examination couches and changed between patients			
10. Outpatient surgery: environmental surfaces are cleaned appropriately between patients			
C. Storage			
1. No storage within 18 inches of ceiling or floor			
2. No storage of clean items next to dirty ones			
D. Medication/supplies			
1. Separate refrigerators for medication, food and specimens			
2. Daily temperature logs completed			
3. No expired medications or patient supplies			
4. Current mechanism to check monthly for expired medications/patient supplies			
5. Patient medications/care supplies with intact integrity			
6. Single dose vials discarded after each use			
7. Only single use/disposable equipment used, eg, suture sets, speculums, etc			
E. Cleaning/disinfection			
1. Distinct separation of clean and dirty areas			
2. Guidelines for cleaning are available			
3. Appropriate products are available for the cleaning staff (ie, detergent/glutaraldehyde)			
4. Cleaning equipment (mops, buckets and cloths) is designated for use, and stored clean, dry and inverted			
5. Guidelines on decontamination of environment and equipment are available			
F. Miscellaneous			
1. Signs on good hand hygiene techniques			
2. No food or drink present in patient care area			
3. Tuberculosis/Ebola/MERS/blood-borne pathogen exposure plan			
4. Staff able to verbalise what to do if exposed to tuberculosis, chickenpox, etc			

Adapted from: Zimmerman M, Pur S, Schmitt B, et al. Value of an infection control practitioner in improving infection control practices at ambulatory sites. *Infect Control Hosp Epidemiol* 2004; 25(4):348-350.