Control of Communicable Disease in Child Care Facilities

Stephanie Agyepong, B.Sc, B.E.H, C.P.H.I(C)
Communicable Disease

• an illness in humans that is caused by an organism or micro-organism or its toxins and is transmitted directly or indirectly from an infected person or animal or the environment

Direct vs. Indirect transmission

• Direct
  – From a person/object to another with no intermediate
  – person-to-person
• Indirect
  – Using contaminated objects
  – Contaminated toys, Poor hygiene
Why are Children at risk of Communicable Disease

• Children consume more and drink, eat and breathe more rapidly
• Unique Behaviours
  • Explore objects with their mouths
  • Crawl around their environment
  • Play together
• Immature immune systems

Children in child care are at greater risk of communicable diseases
• High occupancy
  – Increased transmission of disease
• Difficult to maintain hygiene

Spread to family members and others in the community
Outline

• **Gastroenteritis Outbreak in a Community Daycare**
  • Stopping the Spread of Infection
    • Common Communicable Disease
    • Handwashing
    • Alcohol Based Sanitizers
    • Personal effects
    • Disinfectants
    • Diapering Area
    • Water Play Tables
    • Exclusion Policy

• **Role of Environmental Health Services**
Gastroenteritis Outbreak in a Community Daycare

A Community Daycare

- Staff noticed several children with symptoms of nausea, vomiting and diarrhea during the course of a couple weeks
- **Gastroenteritis (GI)**
  - experiencing 2 or more diarrhea or vomiting (or both) episodes within 24 hours
- Unable to determine the cause, the daycare manager contacted the community health nurse and the environmental health officer
- EHs correspondence with the daycare manager identified an outbreak was imminent
Gastroenteritis Outbreak in a Community Daycare

• After consultation with the Regional Environmental Health Manager and Medical Officer of Health, a team was assembled to prepare for an outbreak investigation. This included:
  • Environmental Health Officers
  • Community Health Nurse and,
  • Communicable Disease Nurse Specialist

• Environmental Health Officers and the Community Health Nurse conducted the investigation which involved:
  • Interviewing of the staff of the daycare
  • Interviewing parents of ill children
    – Enteric Investigation form competed
  • Environmental Health Inspection of the facility was conducted
  • Collection of stool samples for diagnosis
Diagnosis

- Many enterics present with the same gastrointestinal symptoms
- Identification of enteric requires Lab confirmation
  - the collection of stool or vomitis samples
  - 19 kits were distributed to staff and parents of children determined to be cases
  - 7 samples were submitted to the Provincial Laboratory for analysis
Who was identified as a case?

- A case was defined as:
  - Any person attending the daycare who had experienced vomiting and/or watery diarrhea (2 or more loose stools within a 24 hour period) with an onset date of September 5th or later or
  - Any person who had an association with an individual from the facility experiencing the above symptoms and had an onset date of September 5th or later.
- There were 19 suspected cases
Symptoms in Children

Symptom(s) by Number of Children (Cases)  n=12

- Nausea: 0 cases
- Vomiting: 2 cases
- Diarrhea: 12 cases
Symptoms in Adults

Symptom(s) by Number of Adult Cases (n=7)

- Nausea: 5 cases
- Vomiting: 4 cases
- Diarrhea: 7 cases

Number of Adult Cases
Age Distribution of Cases

- 0 year olds: 5%
- 1 year olds: 26%
- 2 year olds: 11%
- 3 year olds: 5%
- 4 year-5 year olds: 16%
- 18+ year olds: 37%

Ages of Cases
Where were the cases?

- The majority of cases were in Nursery (0-12 mo) (6 cases)
  - Diapered children
- 2 of the staff cases were floaters
  - Provided care in all rooms including the nursery
  - Possible source of transmission
When were the Cases?

Number of Cases

Date of Onset of Illness (September 2007)
Investigation Findings

• Stool samples did not identify one conclusive agent.
  • 19 kits distributed, 7 submitted to prov lab
  • 4 were negative for parasites, bacteria or viruses.
  • Norovirus, Giardia lamblia and Entamoeba coli were identified in the three remaining samples.

• Environmental Health Inspections revealed no concerns with the water or food quality. However improper diapering procedures were noted including the inadequate disinfection of the diapering surface and improper hand washing.
Control Measures

• The daycare was ordered closed by the MOH due to findings of facility inspection and ongoing disease transmission.

• During the closure, disinfection of all environmental surfaces, toys, and other furniture's was conducted.

• The daycare was reopened with the caveat that any symptomatic individual meeting case definition was to be excluded and only return after 2 negative stool samples 24 hrs apart were obtained.

• Educational presentations were given to the daycare staff, parents and community emphasizing general sanitation, methods of proper personal hygiene, hand-washing, disinfection and diapering procedures to reduce transmission and importance of exclusion.
Control Measures

- Environmental Health Inspections were conducted throughout the outbreak to verify that all recommendations have been carried out.

- The daycare was ordered closed a second time for five days after the staff failed to comply with the exclusion order.

- The facility was reopened after all environmental control measures were achieved and laboratory confirmation was received indicating the staff were no longer infected. No further cases of related illness were reported.

- Outbreak was deemed closed and final summary reports were prepared for the community and Alberta Health And Wellness.
What did we learn?

• Time is essential for controlling the spread of further disease.
  • Delayed reporting of the outbreak from the daycare to Health Centre and therefore FNIH (1\textsuperscript{st} case Sept 5\textsuperscript{th} notification Sept 19\textsuperscript{th})
    – Prevented early implementation of control measures
    – Allowed for further spread in the daycare when exclusion policies were not immediately followed
    – Made it difficult to collect viable specimen samples as ill individuals were no longer symptomatic
What did we learn?

• Need for ongoing and continued education with the community and daycare providers
  • About proper sanitation procedures
  • Importance of exclusion of staff and children when ill
  • Importance of need for timely reporting of illness
Outline

- Gastroenteritis Outbreak in a Community Daycare
- **Stopping the Spread of Infection**
  - Common Communicable Disease
  - Handwashing
  - Alcohol Based Sanitizers
  - Personal effects
  - Disinfectants
  - Diapering Area
  - Water Play Tables
  - Exclusion Policy
- Role of Environmental Health Services
Spread of Common Communicable Diseases

- **Airborne**: Respiratory (cold, conjunctivitis, chicken pox, measles, RSV)
- **Fecal Oral**: Gastrointestinal (Shigella, E.coli, Crypto, Giardia, Pineworms)
- **Direct Contact**: Skin and scalp (Head lice, Scabies, Cold sores

****Schedule 1) of the CDC Reg outlines the all notifiable diseases that must be reported to public health professional****
Preventing Infection

- As indicated there are several risk factors that make children more susceptible to infection.
- Staff should encourage and practice good hygiene and sanitation
  - Handwashing
  - Alcohol based sanitizers
  - Cleaning and Disinfection
  - Personal Effects
  - Diapering Procedures
  - Exclusion Policies
Stopping the Spread of Infection

Handwashing
• Helps prevent the spread of pathogens
• Removes transient microbes which we pick up from the environment, people, animals and food
• Should take place at a dedicated handsink
• A supply of soap and paper towels must be provided at all times
Stopping the Spread of Infection

**When to wash your hands**

- At the start and beginning of every day
- Before wearing gloves
- After changing a diaper - wash the diaper-wearer's hands, too
- After using the washroom (urination AND defecation)
- Before preparing food
- Before eating
- After cleaning tables
- Before and after touching a sick or injured person
Stopping the Spread of Infection

Kids Need Clean Hands Too!
Promote hand hygiene:
  • Frequent helping them wash their hands

Children are required to wash their hands several times a day not just before meals
  • Child size fixtures (sinks, toilets)

Place hand-washing reminders (posters) at children's eye level to remind them
  • Use fun games/songs (ABCs, "Row, Row, Row Your Boat“) help teach the length of time hands should be washed (30 seconds)
  • Charts with stars or incentives for handwashing
Stopping the Spread of Infection

Alcohol-Based Hand Sanitizers

- Contain 60 – 95% alcohol solutions
  - Effective when used supplementary to proper handwashing

- Advantages
  - Effective to kill bacteria and most viruses
  - Do not contribute to antimicrobial resistance because all alcohol evaporates
Stopping the Spread of Infection

Disadvantages

• Cannot remove dirt and grease which affects effectiveness of the sanitizer
• Not recommended for heavily/visibly soiled hands
• They are flammable and must be stored away from high temperature and flames
  – Fire department
• Prolonged use can dry hands
Stopping the Spread of Infection

Disinfection
Cleaning and disinfection of the facility, equipment and toys is required
  • Cleaning schedules
    – Daily, weekly, monthly
    – Responsible individual

“High touch” surfaces such as door knobs, diapering areas, counters and food preparation tables should be cleaned and disinfected daily
  • Between uses, every 2 hours during continuous use

Toys are also a source of germs and must be cleaned and disinfected when soiled or
  • Stuffed toys – laundered weekly
  • Toys used by diapered children – daily
  • All others at least once/week
Cleaning and Disinfection Guide

One page guide that can be used by institutions to ensure proper cleaning and disinfection for environmental surfaces and objects within the facility.

- Surface to be disinfected
- Procedure
- Frequency
- Disinfectant type

<table>
<thead>
<tr>
<th>Surface/Object</th>
<th>Procedure</th>
<th>Frequency</th>
<th>Disinfectant Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfaces</td>
<td>- If soiled, first remove debris with a detergent solution and rinse with warm clean water. Then, disinfect with a low level disinfectant as per manufacturer’s instructions. Allow to air dry.</td>
<td>Between patient and when visibly soiled</td>
<td>Low level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Daily and/or when visibly soiled</td>
<td>Low level</td>
</tr>
<tr>
<td>Toilet</td>
<td>Clean and disinfect with a low level disinfectant.</td>
<td>Daily and/or when visibly soiled</td>
<td>Low level</td>
</tr>
<tr>
<td>Sinks and Taps</td>
<td>Clean with detergent, or launder.</td>
<td>Monthly or when soiled</td>
<td>No disinfection required</td>
</tr>
<tr>
<td>Water fountain</td>
<td>Clean with detergent.</td>
<td>Daily and/or when visibly soiled</td>
<td>No disinfection required</td>
</tr>
<tr>
<td>Windows</td>
<td>Vacuum and shampoo as necessary.</td>
<td>Daily and/or when visibly soiled</td>
<td>No disinfection required</td>
</tr>
<tr>
<td>Carpet</td>
<td>Wash with detergent and rinse.</td>
<td>Daily and/or when visibly soiled</td>
<td>Low level</td>
</tr>
<tr>
<td>Laundry</td>
<td>Sorting, washing and disinfecting as per procedures outlined in Health Canada’s Infection Control Guidelines: Handwashing, Cleaning, Disinfection and Sterilization in Health Care.</td>
<td>After each use.</td>
<td></td>
</tr>
</tbody>
</table>

When blood / body fluids spills occur on any of the above surfaces or objects, refer to your Nursing Procedures for specific cleaning and disinfection instructions.

Please consult with your Nurse in Charge or Environmental Health Officer.

During an outbreak, thorough environmental cleaning and disinfection with a disinfectant that has demonstrated effectiveness against the specific organism is required. Increasing the disinfectant level may also be required.

**FOR H1N1: THE INFORMATION ON THE LABEL OF THE PRODUCT SHOULD INDICATE THAT IT IS EFFECTIVE AGAINST “INFLUENA A VIRUSES”, MAKE SURE TO FOLLOW THE DIRECTIONS EXACTLY AS WRITTEN ON THE LABEL.**

Disinfectant Classifications

<table>
<thead>
<tr>
<th>Low Level</th>
<th>Intermediate Level</th>
<th>High Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low level disinfectants are effective at killing vegetative bacteria and enveloped viruses (e.g.) Staphylococcus aureus, bacteria, influenza virus, HIV. They are used on non-critical items such as work surfaces, countertops, and other environmental surfaces. They are often found in common household cleaning products, with one of the following active ingredients:</td>
<td>Intermediate level disinfectants are effective for killing vegetative bacteria, enveloped viruses, and fungi (e.g.) Staphylococcus aureus, bacteria, influenza virus, and Aspergillus species of fungi. They are typically used on work surfaces. Examples include:</td>
<td>High level disinfectants are effective at killing vegetative bacteria, enveloped and non-enveloped viruses, fungi and mycobacteria, (e.g.) Staphylococcus aureus, influenza virus, Norovirus, Aspergillus fungi. Mycobacterium tuberculosis. They are not effective at killing spores. They are used for semicritical and critical items, such as surgical tools/equipment, and are not used for general cleaning purposes. Examples include:</td>
</tr>
<tr>
<td>Lysof</td>
<td>5.25% household bleach at 5000 ppm = 1 part bleach to 9 parts water or = 1000 ppm bleach per litre of water</td>
<td>70% isopropyl alcohol</td>
</tr>
<tr>
<td>Phenolics *not to be used in nurseries or on toys (e.g.) Phenox</td>
<td>5.25% chlorine bleach at 100 ppm</td>
<td>70% isopropyl alcohol</td>
</tr>
<tr>
<td>Alcohols</td>
<td>1/2 tsp bleach per litre of water</td>
<td>1/2 tsp bleach per litre of water</td>
</tr>
<tr>
<td>Quaternary Amphcimons (e.g.)</td>
<td>Chlorox liquid bleach</td>
<td>CaviWipes</td>
</tr>
</tbody>
</table>

** Please follow manufacturer’s instructions for disinfectant preparation

For further information about the handling and use of disinfectants please contact your Environmental Health Officer (EHO) (780) 495-2712
Stopping the Spread of Infection

Disinfectant Types
Three approved disinfectants recommended by Public Health
- Chlorine
- Hydrogen peroxide
- Quaternary Ammonium Compounds (Quats)

Concentration required to kill pathogens (germs) are known
Must be verified using test strips

***All disinfectant and chemical containers are correctly labelled***
Chlorine

- Chlorine is an effective, efficient and easy-to-use
- Economical, accessible

Prepare 100 ppm solution by
- Add 1 oz. household bleach to 1 gallon (4 liters) of water
- If 200 ppm desired use 2 oz. Bleach (CIP)
- Can be applied using a bucket solution or spray bottle

Wipe Twice Process:
- Step 1: wipe/clean with hot water and soap, rinse
- Step 2: wipe/spray with chemical disinfectant allow to air dry

Recommend replacing solution regularly as chlorine effectiveness diminishes in the presence of oxygen
Personal Effects

Personal effects, such as toothbrushes, combs, facecloths, soothers and bottles can be a source of germs.

- Each child should have their own clearly marked with the child’s name and protected from contamination

- Mat and cot storage
  - Individually labelled
  - Stored to prevent contact between bedding
  - Physical barrier
Diapering Area

• Handwashing sink, including liquid soap and papertowels located within 8ft of diapering area
• Diapering table (moisture resistant surface, safety belt)
• Disposable changing sheets
• Cleaning supplies (approved disinfectant)
• Always wash the hands of the child as well as your own

Note: Diapering areas must be cleaned and disinfected after each use
Water Play Tables

- Can transmit germs such as the cold virus, norovirus
- Users hands must be washed before and after use
- Table kept clean, free from debris, and in good condition at all times
- Water must refilled twice per day
- Toys emptied, cleaned and disinfected at the end of each day.
Sick Child Exclusion

When a child in your facility has symptoms of illness that can spread to others, they are sent home to prevent exposure.

Possible symptoms of illness indicating need for exclusion:
- Unusual behaviour (persistent crying, irritable)
- Fever
- Difficulty breathing
- 2 or more vomiting episodes with 24 hours
- Diarrhea
- Stools with blood or mucus
- Pink eye
- Head lice/scabies (end or day until first treatment)

NOT A COMPREHENSIVE LIST
Sick Child Exclusion Policy

Policy should include:

- Symptoms of disease that will result in isolation of a child
- Circumstances for which parent will be contacted to pick up their child early
- Description of when children or staff should stay home
- When public health professionals will be notified
- The requirement for up to date contact numbers
An institutional staff’s health and hygiene is vital in prevention of communicable disease transmission within the facility.
Sick Staff Exclusion Policy

• Institutional facility staff experiencing symptoms of disease must not work in an institutional setting; seek medical attention
• Managers/supervisors aware of sick personnel are responsible for ensuring the appropriate action is taken

MOH (Dr. Yacoub) MAY ISSUE AN EXCLUSION ORDER IF ILL CHILDREN OR STAFF REMAIN IN FACILITY
Returning to the Institution

When and for how long a child needs to be excluded depends on the disease.

**Enteric Illness**
- only return after 2 negative stool samples 24 hrs apart are obtained

**Other Communicable Disease**
- only return following a physicians orders (doctors note) or daycare policies
Outline

• Gastroenteritis Outbreak in a Community Daycare
• Stopping the Spread of Infection
  • Common Communicable Disease
  • Handwashing
  • Alcohol Based Sanitizers
  • Personal effects
  • Disinfectants
  • Diapering Area
  • Water Play Tables
  • Exclusion Policy
• Role of Environmental Health Services
Role of Environmental Health Services

Inspection:

• Conduct routine and demand inspections of public facilities such as schools, daycares, health centers, food establishments, water and wastewater facilities and landfills to identify potential hazards

• Identification of hazards is key to early mitigation and prevention of possible disease spread
EHS and Outbreak Management

- EHS becomes involved when more than 1 case is reported
- When water or food suspected as the cause
- Work with members of public health team to manage outbreak
- Assist with sample collection of sick children
- Provide education, recommendations and corrective actions to prevent future outbreaks
- Letters to parents signed by MOH
  - Outbreak symptoms
  - Exclusion policy
  - Methods to prevent spread of the illness
Public Health Team Players

• Alberta Health and Wellness
  • Public Health Act, CD Regulations
  • Development of guidelines/protocols
    – Appropriate reporting forms
• Surveillance
• Reporting to Health Canada
Public Health Team Players

- FNIH MOH:
  - Functions under authority of Public Health Act, Communicable Disease Regulations:
    - Initiate outbreak management response
    - Ensure appropriate partners are notified/involved
    - Monitor effectiveness of interventions and progress of outbreak
    - Ensures appropriate timely communication
Public Health Team Players

- **Community Based Staff:**
  - Under direction of MOH:
    - Health Director:
      - Liaise with Chief and Council
      - Ensures staff are available to implement specific outbreak management activities
    - Nurses/EHOs/CHRs:
      - Complete required activities based on outbreak parameters
Children are our future, so it is important to provide an environment that is safe, sanitary and free of disease.

Ultimately, we know the methods and practices for preventing infection.

Diligent use of these and many other practices at child care facilities and in the home will help reduce the transmission of disease within our community.