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Outbreak Management of Healthcare Associated Infections

prevention and control on infectious disease outbreak

1.
Basic Concepts

Key Terms

1. HAIs Outbreak: An increase in the number of hospital - acquired or any other healthcare facility - acquired cases of a disease among patients or staff over and above the expected number of cases. However, in Saudi Arabia, if there are more than 2 cases of HAIs with the same organism, linked to the same exposure, at any given time or location within 3 days, it will be considered an outbreak. (in some situations, 1 case is considered as an outbreak e.g. Candida Auris). Outbreaks in healthcare facilities are often multifactorial including breaches in infection control or clinical practices, contaminated devices, infected or colonized patients and /or healthcare workers.

Key Terms

2. Pseudo-outbreak: "Generally applied to situations in which there's a rise in test results (e.g. positive microbiology cultures) without an actual clinical disease."

3. Colonized: Cases are classified as "colonized" if MDROs found in or at body site, without clinical signs and symptoms of illness or infection.

4. Infected: Cases are classified as "infected" if MDROs found in or at body site with clinical signs & symptoms of infection (e.g., fever, lesions, wound drainage) that requires medical evaluation.

Key Terms

5. Incidence: The number of new cases of a given disease in a given time period.

6. Prevalence: The number of existent cases of a given disease at a given time.

Key Terms

7. Attack rate: Is a form of incidence that measures the proportion of persons in a defined population who had an acute health event during a limited time period (e.g., during an outbreak).

Attack Rate = Number of new cases of disease during specified time interval/ Population at start of time interval x 100

Key Terms

8. Case Fatality Rate:" The proportion of persons with a particular condition who die from that condition. It is a measure of the severity of the condition.".

Case fatality rate = Number of cause- specific deaths among the incident/ total number of incident cases x 100

Key Terms

9. Mortality Rate: "It is a measure of the frequency of occurrence of death among a defined population during a specified time interval".

Mortality rate= Number of deaths assigned to a specific cause during a given time interval/ Mid - interval population X 100

Key Terms

10. Endemic Rate: "The usual incidence of a given disease within a geographical area during a specified time period".

11. Epidemic: "An excess over the expected incidence of disease within a given geographical area during a specified time period. If the expected number of cases of a disease in a county is 8 per year, and 16 occur in 1 year, this indicates an epidemic. It should be noted that an epidemic is not defined on the absolute number of cases but on the number of cases in comparison to what is expected".

Key Terms

12. Pandemic: "An epidemic spread over a wide geographical area, across countries or continents".

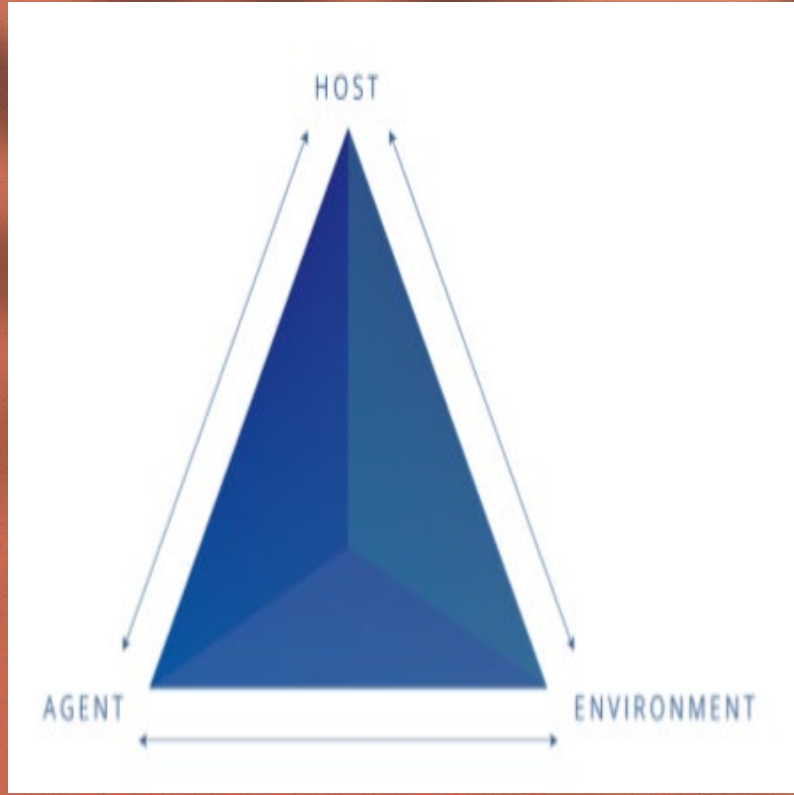
General Definitions

1. **Outbreak:** The occurrence of a disease in a population above the normally expected rates at any given time or location.

General Definitions

2. Epidemiological triad:

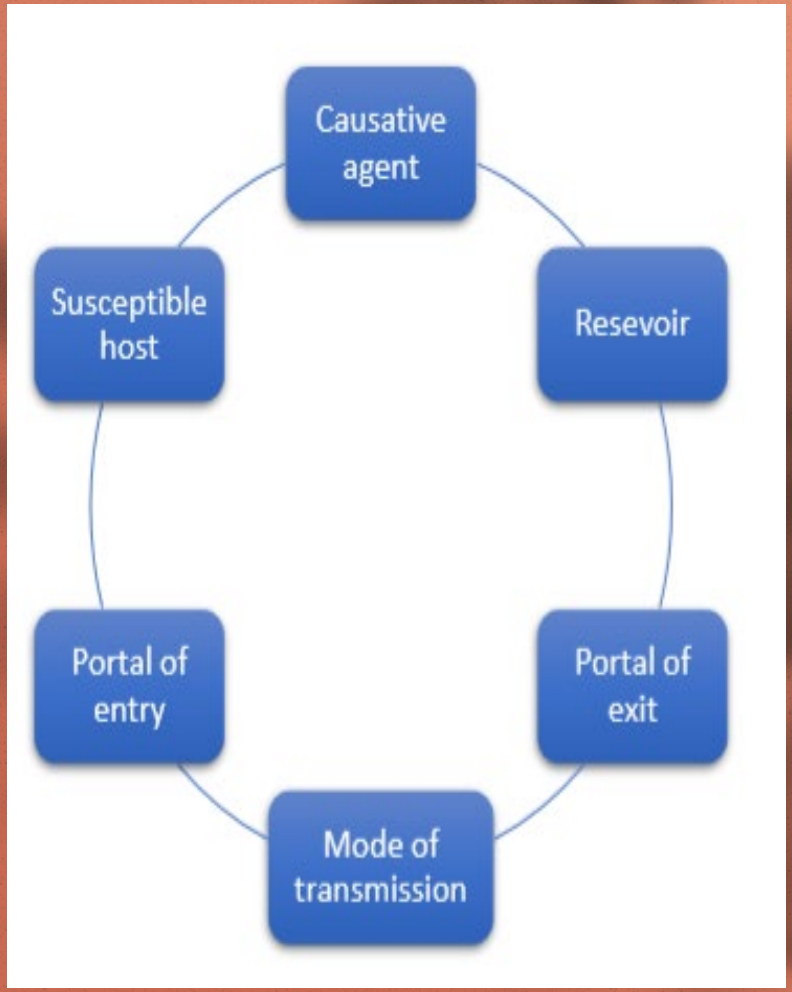
A model for depicting disease causation and it consists of an external agent, a susceptible host, and an environment that brings the host and agent together.



General Definitions

3. Chain of infection:

The chain of infection displays the series of events in the infection process.



General Definitions

4. Endogenous sources: Body sites such as the skin, nose, mouth, GI tract or vagina that are normally inhabited by microorganisms.

5. Exogenous sources: External sources such as patient care personnel, visitors, patient care equipment, medical devices or the health - care facility's environment.

General Definitions

6. Multi-drug Resistant Organisms (MDRO):

Microorganisms, predominantly bacteria that are resistant to one or more classes of antimicrobial agents. Although the names of certain MDROs describe resistance to only one agent (e.g., MRSA, VRE), these pathogens are frequently resistant to most available antimicrobial agents.

General Definitions

7. Extensively Drug Resistant Organisms (XDRO):

Microorganisms, predominantly bacteria, that are resistant to all major classes of antimicrobials but sensitive to 1 or 2 antimicrobials e.g. (Colistin or Tigecycline).

General Definitions

8. Pan-Drug Resistant Organisms (PDRO):

Microorganisms, predominantly bacteria, that are resistant to all major classes of antimicrobials.

Common Healthcare Associated Infections (HAIS's)

Common Healthcare Associated Infections (HAIS's) Outbreaks Micro - Organisms

HAIs caused by Multidrug - resistant Organisms (MDRO) place patients at greater risk of potentially untreatable infections with increased mortality, morbidity and longer hospital stay.

In Saudi Arabia, the number of some MDROs' outbreaks in MOH hospitals have been noticed to be increasing in the last 2 years based on the last outbreak annual reports (2018- 2019).

Common Healthcare Associated Infections (HAIS's) Outbreaks Micro - Organisms

	Type of Organism BACTERIAL	Outbreak Definition
1	**Multi-drug Resistant Organism (MDRO)**	An increase in the number of facility-acquired MDRO cases above and beyond the endemic (baseline) level in a certain facility/unit during a specific time period, and may include an increase in cases of: Methicillin-Resistant Staphylococcus Aureus (MRSA),Vancomycin-Resistant Enterococcus (VRE),Carbapenem Resistant Klebsiella Pneumoniae or other Carbapenem-Resistant Enterobacteriaceae (CRE), Multi-Drug Resistant Acinetobacter or Pseudomonas, or any other multi-drug resistant organisms. **2 cases are considered an outbreak**
2	**Clostridium Difficile Infection (CDI)**	**1 case is considered an alert** **2 cases are considered an outbreak**
3	**Legionella**	**If the patient has been in the healthcare facility for the entire incubation period (10 days).**
4	**Foodborne Disease Outbreak**	**2 or more persons who experience a similar illness after ingestion of a common food.** Please note two exceptions: **1 case of botulism or chemical poisoning is considered an outbreak.**
5	**Waterborne Disease Outbreak**	**2 or more persons who experience a similar illness after consumption or use of a common water source.**

Common Healthcare Associated Infections (HAIS's) Outbreaks Micro - Organisms

Type of Organism		Outbreak Definition
VIRAL		
1	Influenza or influenza-like illness (ILI)	3 or more cases of influenza-like illness in a defined setting within a 3-day period (e.g., hospital unit, long term care facility, etc.), or 1 or more laboratory-confirmed cases of influenza within a 3-day period in a long-term care facility or an increased absenteeism in association with ILI and/or laboratory confirmed influenza in healthcare workers
2	Chickenpox	1 case is an alert. 2 cases are considered an outbreak
3	Measles	1 case in Healthcare facility is an alert. 2 cases are considered an outbreak
4	Acute hepatitis B or C	1 case of a patient who had an invasive procedure during the incubation period and no other risk factors for hepatitis is an alert. 2 cases are an outbreak
5	Acute Hepatitis A	2 cases are considered an outbreak

Common Healthcare Associated Infections (HAIS's) Outbreaks Micro - Organisms

Type of Organism		Outbreak Definition
FUNGAL		
1	Candida species	2 case is considered an outbreak
2	Aspergillus species	1 case is considered an outbreak
3	Candida Auris	1case is considered an outbreak
4	Burkholderia Cepacia	2 cases are considered outbreak

2. Epidemiology of the Common Organisms

Bacteria	Acinetobacter Baumannii	Clostridium Difficile	Legionella Pneumophila	M. Tuberculosis
Habitat	Moist skin, GI tract	GI tract	Water	Respiratory tract
Survival on dry surfaces	3 days – 5 months	Spores – 5 months	-	1 day – 4 months
Spread in HC	Contact	Fecal-oral; contact	Aerosols	Airborne
HAIs	UTI, sepsis, meningitis, pneumonia	CDI	Legionnaire's disease	Tuberculosis
Specimens	Urine, blood, CSF, sputum, aspirates	Stool	Sputum, blood for serology	Sputum
Prevention	Clean environment, instruments, hands	Clean environment, hands, use of antibiotics	Hyper chlorination of water or heating to at least 55°C	Isolation

2.Epidemiology of the Common Organisms

Bacteria	Neisseria Meningitides	Clostridium Tetani	Enterococcus Species	Coagulase Negative Staphylococci (CNS)
Habitat	NP	Environment	GI tract, GU tract	Skin, mucous membranes
Survival on dry surfaces	-	-	5 days – 4 months	-
Spread in HC	Droplets	Entering umbilical cord	Contact, endogenous	Contact
HAIs	Meningitis	Tetanus	UTI, sepsis	Various
Specimens	CSF	-	Urine, blood	Various
Prevention	Isolation, vaccination	Sterilization of instruments	Clean environment, hands, use of Cephalosporins	Clean environment, instruments, hands

2.Epidemiology of the Common Organisms

Bacteria	Enterobacter Species	Escherichia Coli	Vibrio Cholerae	Klebsiella Pneumoniae	S. Pyogenes (Group A Streptococcus)
Habitat	Environment, GI tract	GI, GU tract	GI tract	Environment, GI tract	Oropharyngeal mucosa
Survival on dry surfaces	5-49 days	1.5 hours – 16 months	1 – 7 days	2 hours – more than 30 months	3 days-6.5 months
Spread in HC	Contact, food	Fecal-oral, contact, endogenous	Fecal-oral	Contact, endogenous	Droplet, contact, endogenous
HAIs	UTI, sepsis, wound infection	UTI, sepsis, neonatal meningitis	Cholera	UTI, sepsis, pneumonia	Pharyngitis, surgical wound infection
Specimens	Various	Various	Stool	Various	Oropharyngeal swab, wound exudate
Prevention	Clean environment, equipment, hands	Clean hands, use of Cephalosporins	Safe water and food	Clean hands, use of Cephalosporins	Clean hands, masks in operating room

2.Epidemiology of the Common Organisms

Bacteria	Proteus Species	Pseudomonas Aeruginosa	Salmonella Species	Salmonella Typhi	Burkholderia Cepacia
Habitat	GI tract	GI tract, humid areas	GI tract	GI tract	Water, humid areas, moist environment, contaminated fluid (*saline –povidine iodine)
Survival on dry surfaces	1-2 days	6 hours to 16 months	1 day	10 months – 4.2 years	<24 h to <7 DAYS
Spread in HC	Contact, endogenous	Contact	Fecal-oral	Fecal-oral	Contact
HAIs	UTI, sepsis	Various	Diarrhea, sepsis	Typhoid fever	Various
Specimens	Urine, blood	Various	Stool, blood	Stool, blood	Blood, sputum, pleural effusion
Prevention	Clean environment, equipment, hands	Clean, dry environment, disinfected/sterilized equipment; clean hands, use of antibiotics	Safe food, water, clean hands	Safe food, water, clean hands	Environment, mucosa

2.Epidemiology of the Common Organisms

Bacteria	Salmonella Typhimurium	Serratia Marcescens	Shigella Species	S. Aureus
Habitat	GI tract	GI tract, humid areas	GI tract	Skin, mucous membranes
Survival on dry surfaces	10 months – 4.2 years	3 days – 2 months	2 days – 5 months	7 days - 7 months
Spread in HC	Fecal-oral	Contact, IV fluids	Fecal-oral	Contact, droplets, equipment, endogenous
HAIs	Diarrhea, sepsis	Sepsis, wound infection	Diarrhea	Various
Specimens	Stool, blood	Blood, wound exudate	Stool	Various
Prevention	Safe food, water, clean hands	Clean environment, equipment, hands	Safe food, water, clean hands	Clean hands, environment; use of antibiotics

2.Epidemiology of the Common Organisms

Fungi	Aspergillus Species (Mold)	Candida Albicans (Yeast)	Candida Glabrata (Yeast)	Candida Parapsilosis (Yeast)	Candida Auris
Habitat	Environment (air)	Environment, mucosa	Environment, mucosa	Environment , mucosa	Environment, mucosa
Survival on dry surfaces	Conidia and spores are resistant	1-120 days	120-150 days	14 days	both moist and dry, for at least 14 days
Spread in HC	Inhalation, (contact)	Contact, endogenous	Contact, endogenous	Contact, endogenous	Contact, endogenous
HAIs	Various	Various	Various	Various	bloodstream infections Respiratory infections wound infections, and ear infections
Specimens	Various	Various	Various	Various	Various
Prevention	Safe water, air, reverse/protective isolation	Clean hands, equipment	Clean hands, equipment	-	Clean environment, instruments, hands

2.Epidemiology of the Common Organisms

Virus	Human Virus	Coronavirus, including SARS	Influenza Virus	Respiratory Syncytial Virus	Varicella-Zoster Virus
Habitat	Humans	Humans	Humans	Humans	Humans
Survival on dry surfaces	>7 days	3 hours SARS virus: 72-96 hours	1-2 days	Up to 6 hours	-
Spread in HC	Blood, body fluids, tissue, organs for transplant	Droplet	Droplets, contact	Droplets, contact	Droplets, close contact
HAIs	Acquired immune deficiency syndrome	Respiratory infections	Influenza	Acute respiratory infections	Varicella
Specimens	Serum sample	Serum sample	Serum sample	NP exudate	Serum sample
Prevention	Safe blood products and tissues/organs for transplant	Isolation, clean hands, environment	Isolation, vaccination	Isolation, clean hands, environment	Isolation, vaccination

2.Epidemiology of the Common Organisms

Virus	Rotavirus	Rubella Virus (Mumps)	Rubi Virus (Rubella)	Morbillivirus (Measles)
Habitat	Humans	Humans	Humans	Humans
Survival on dry surfaces	6-60 days	-	-	-
Spread in HC	Fecal-oral, contact	Droplets	Droplets	Droplets
HAIs	Diarrhea	Mumps (parotitis)	Rubella (German measles)	Measles
Specimens	Stool	Serum sample	Serum sample	Serum sample
Prevention	Clean hands, environment	Isolation, vaccination	Isolation, vaccination	Isolation, vaccination

Multi Drug Resistant Organisms (MDRO's)

Type	Definition Source	Definition
Methicillin-resistant Staphylococcus Aureus	CDC, NHSN	Includes S. aureus cultured from any specimen that tests oxacillin-resistant, cefoxitin-resistant, or methicillin-resistant by standard susceptibility testing methods, or by a laboratory test that is FDA-approved for MRSA detection from isolated colonies; these methods may also include a positive result by any FDA-approved test for MRSA detection from specific sources.
Vancomycin-Resistant *Enterococcus* spp.	CDC, NHSN	Any Enterococcus spp. (regardless of whether identified to the species level), that is resistant to vancomycin, by standard susceptibility testing methods or by results from any FDA-approved test for VRE detection from specific specimen sources.
Carbapenem Resistant Enterobacteriaceae (CRE)	Oregon	Any Enterobacteriaceae spp. testing resistant to any carbapenem including doripenem, ertapenem, imipenem or meropenem using the current CLSI breakpoints; or by a positive result for any method FDA approved for carbapenemase detection.
MDR-Acinetobacter	CDC, NHSN	Non-susceptibility (i.e., resistant or intermediate) to at least one agent in at least 3 antimicrobial classes of the following 6 classes: • Ampicillin/sulbactam • Cephalosporins (cefepime, ceftazidime) • β-lactam/β-lactam β-lactamase inhibitor combination (piperacillin, piperacillin/tazobactam) • Carbapenems (imipenem, meropenem, doripenem) • Fluoroquinolones (ciprofloxacin or levofloxacin) • Aminoglycosides (gentamicin, tobramycin, or amikacin)

Multi Drug Resistant Organisms (MDRO's)

MDR-Pseudomonas	CDC, NHSN	Non-susceptibility (i.e., resistant or intermediate) to at least one agent in at least 3 antimicrobial classes of the following 5 classes: • Cephalosporins (cefepime, ceftazidime) • β-lactam/β-lactam β-lactamase inhibitor combination (piperacillin, piperacillin/tazobactam) • Carbapenems (imipenem, meropenem, doripenem) • Fluoroquinolones (ciprofloxacin or levofloxacin) • Aminoglycosides (gentamicin, tobramycin, or amikacin)
Extended-spectrum beta-lactamase Gram negatives	CDC, NHSN	• Enterobacteriaceae spp. non-susceptible (i.e., resistant or intermediate) to ceftazidime, cefepime, ceftriaxone, or cefotaxime. • Pseudomonas aeruginosa non-susceptible (i.e., resistant or intermediate) to ceftazidime or cefepime.
Clostridium difficile	CDC, NHSN	A positive laboratory test result for *C. difficile* toxin A or B, (includes molecular assays [PCR] or toxin assays) OR A toxin-producing C. difficile organism detected by culture or another laboratory means performed on a stool sample.
Drug-resistant Streptococcus pneumoniae	CDC, Emerging Infections Program	S. pneumoniae isolated from a sterile site and non- susceptible to "at least one antimicrobial agent currently approved for use in treating pneumococcal infection."

2.
Practical Part

Outbreak Detection and Notification

Different sources could be utilized to identify the existence of an outbreak:

a) Active surveillance (Daily check of laboratory results of all inpatients by the Hospital's IPC assigned person).
b) A notification of a suspected outbreak by the assigned IPC person who reports to the head of IPC department.
c) Laboratory notification's reports sent to the in-charge nurse and to the head of IPC department of an abnormal organism that is suspected to cause an outbreak.
d) Informal reports that are given by the hospital clinicians.
e) The regional epidemiology unit notification report.

*Note: If the Nursing, Medical or Other Staff suspect the occurrence of an outbreak, whether or not it is recognized or declared, they should immediately notify the hospital's IPC department. Laboratory confirmation of that suspected outbreak, is not a cause to delay the prevention and control measures by any means.

Notification Process

Once an outbreak is confirmed, the hospital outbreak coordinator is required to fill an online outbreak notification form within the first (2-6) hours of an outbreak onset. (Appendix2)

The filled outbreak notification form regarding the occurrence of a confirmed outbreak will be received by regional directorate coordinator and GDIPC simultaneously.

Hospital infection preventionists should start the control measures immediately according to the hospital outbreak management action plan (OMAP). (Appendix6)

Outbreak Investigation

Outbreak Investigation Steps

Generally, an outbreak investigation is divided into 10 main steps:

1. Prepare to investigate.
2. Verify the diagnosis and confirm outbreak.
3. Case definition.
4. Case finding.
5. Perform Descriptive Epidemiology.
6. Hypothesis generation - the how and the why.
7. Evaluate hypothesis through statistics.
8. Additional Environmental Studies.
9. Implement control/prevention measure.
10. Communicate findings.

Outbreak Investigation Steps

Communicate findings: The investigation's processes, outcomes and findings should be communicated clearly and in a detailed report, and sent directly to the Hospital Director, Regional Directorate, GDIPC and all Outbreak Control Team members

The final report should be detailed and highlight the following:
a)The results of outbreak investigation.
b) The control measures that were taken.
c) Actions taken to prevent recurrence.
d) Future recommendations.

Roles and Responsibilities

A. Healthcare Facilities Level

Nursing Staff roles

1. Immediately notify the infection prevention and control department's personnel.
2. Direct HCWs towards their responsibilities for patients and outbreaks.
3. Implement IPC policies and practices immediately.
4. Implement the hospital outbreak management action plan provided by GDIPC.
5. Prepare a primary list of patients, staff, and their contacts.
6. Proper collection, labelling and follow up of laboratory samples.
7. Assist in the collection of environmental samples.
8. Provide information and help the hospital's OMT in the investigation.

A. Healthcare Facilities Level

Treating Consultants/Physicians on charge roles

1. Suspect and early detect outbreaks.
2. Ensure that colonized/infected patients have received an appropriate medical care according to MOH regulations.
3. Isolate/de-isolate the patients (in coordination with IPC) depending on the type of the outbreak.
4. Identify the contacts (HCW and patients) and properly deal with them.
5. Communicate treatment information and infection control precautions to patients/relatives.

A. Healthcare Facilities Level

Infection Control Department Personnel roles

1. Confirm whether there is an outbreak or not by reviewing the preliminary information on the number of potential cases, available laboratory results, severity of the problem, and demographic data of person(s), place and time (line list).
2. Immediately notify the hospital administration, RHD's coordinator and GDIPC's outbreak management department through the official notification form within 2-6 hours.
3. Immediately notify the hospital OMT.
4. Immediately begin acting upon the outbreak management action plan.
5. Share, help and supervise HCWs in the defined unit for well implementing the plan of outbreak's infection control measures.

A. Healthcare Facilities Level

Infection Control Department Personnel roles

6. Discuss the outbreak information with the relevant treating physicians, id consultants, laboratory specialist, environmental officers.

7. Compare surveillance data and laboratory records, discharge data, mortality statistics and other pertinent records.

8. Activate hospital OMT depending on the type and situation of the outbreak.

9. Escalate the incident of the outbreak to the hospital infection prevention control committee in its upcoming meeting.

A. Healthcare Facilities Level

Infection Control Department Personnel roles

10. Assist the regional coordinator in the investigation processes by primarily preparing at least line listing and contact list of HCWs and patients.

11. Visit regularly and on demand the unit to review the patient's clinical findings, laboratory results and relevant outbreak data.

12. Conduct daily rounds to follow up the cases, notify new cases and report the deceased.

A. Healthcare Facilities Level

Hospital Laboratory roles

1. Immediate notification of patients' abnormal and critical results to the IPC personnel and treating physicians.

2. Provide microbiology services (swab, diagnostic and confirmatory tests etc., for patients and HCWs) during the investigation of outbreaks.

3. Assist in the environmental sample collection and analysis.

4. Appoint a member to participate in the activities of OMT.

5. Store and refer specimens to the relevant regional reference laboratories.

A. Healthcare Facilities Level

Environmental Health Officer roles

1. Plan (methods of collection, sites, and materials etc...) and arrange for environmental sampling.
2. Collect specimens of suspected food from kitchens and outbreak defined places.
3. Assess the statue and condition of water (distribution systems, sinks and faucets).
4. Asses the condition of heating, ventilation and air conditioning (HVAC System) and look for a possibility of taking an air sampling.

Epidemiology of the Common Organisms

Hospital OMT roles

1. Confirm the existence of an outbreak.
2. Establish case definition.
3. Report the outbreak within 2-6 hours, and provide interim and status reports when deemed necessary.
4. Determine the extent of the outbreak through active-case finding.
5. Investigate the source and cause of the outbreak.
6. Make sure laboratory tests are undertaken appropriately and promptly.

Epidemiology of the Common Organisms

Hospital OMT roles

7.Generate a hypothesis on the occurrence of the outbreak whenever possible.

8.Define and implement control measures.

9.Implement a screening policy during the outbreak for patients and staff.

10.Asses the requirement for additional supplies and staff in case of a large outbreak.

11.Coordinate with the hospital managers for assisting the OMT.

Epidemiology of the Common Organisms

Hospital OMT roles

12. Keep the HCWs in the hospital aware of the outbreak, regularly update them on its situation, and provide training and clear recommendations.

13. Declare the end of the outbreak after the regional OMT and GDIPC's consultation and approval.

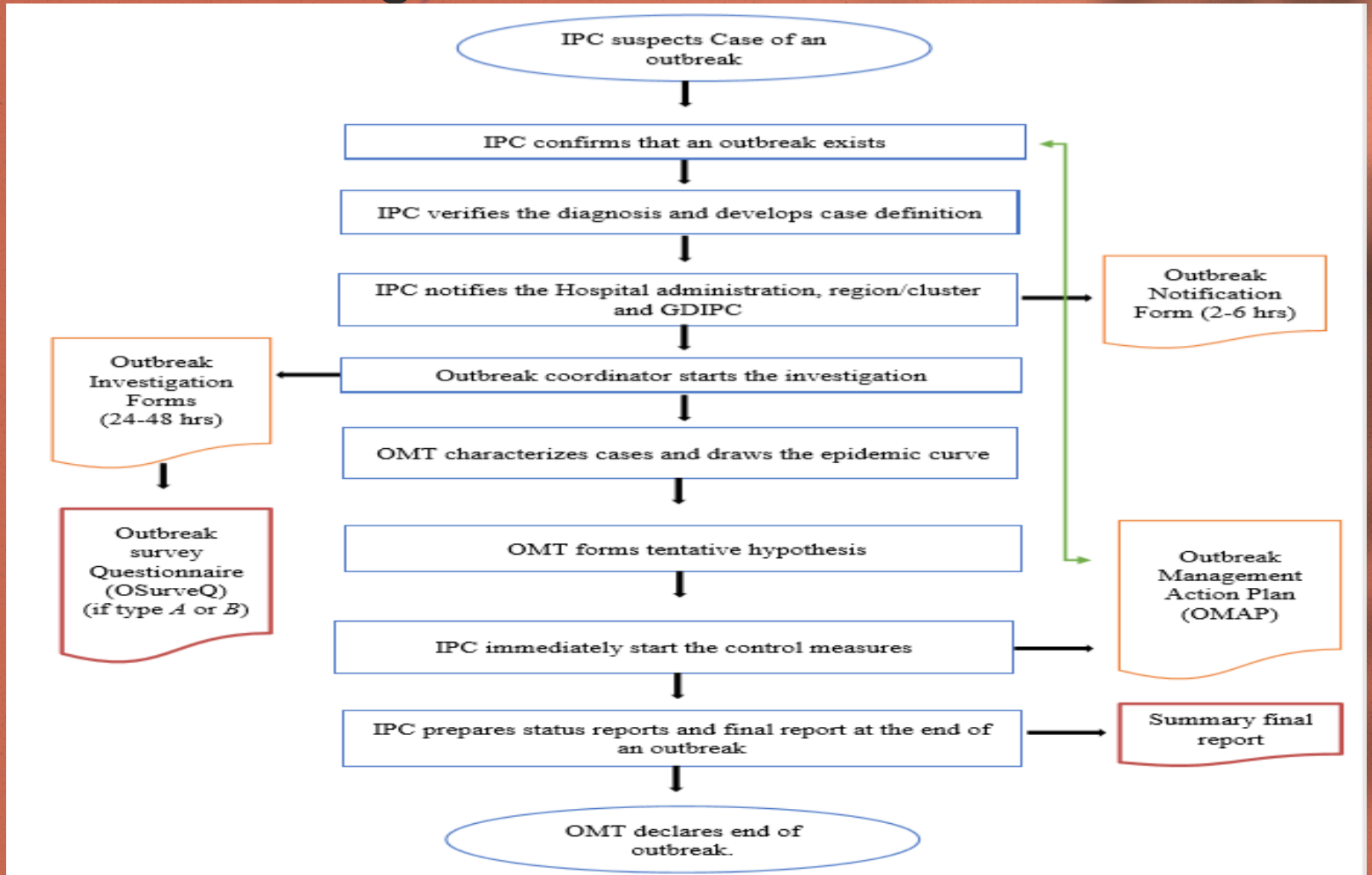
14. Make sure prompt, consistent, accurate and adequate information is available.

15. Maintain the confidentiality of the outbreak data.

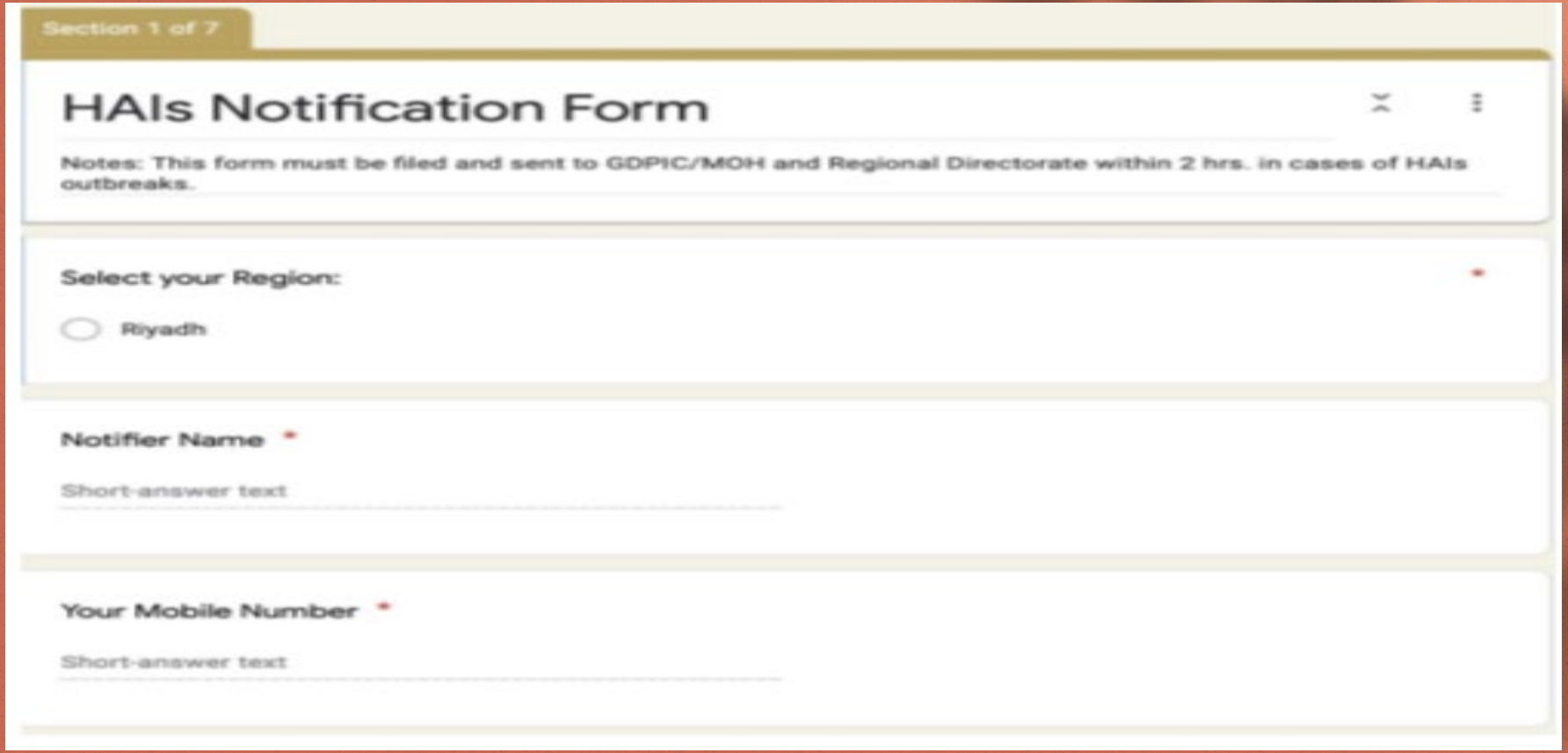
There are four main members that are preferred to be present in the field team to investigate a HAIO:

1. Epidemiologist.
2. Laboratory Specialist.
3. Environmental Investigator.
4. Infection Control Specialist.

Outbreak Management Process



Notification form (There is a link for each region that grants them an access to their notification form and below is Riyadh's notification form)



Investigation form – Line list

General Data			Demographic Data							Epidemological Dat	
Region	Hospital	Outbreak Code	Medical record Number	Patient Name	Age	Gender	Date Of Admission to The Hospital	Date of Unit Admission	Unit	Diagnosis	Risk Factors

Contact List of Patients

General Directorate of Infection Prevention and Control

Outbreak Department

CONTACT TRACING FORM FOR PATIENTS

Hospital	Outbreak code	Index Patient	Case number (#)	Name (PT)	File number	Relationship	Contact No.	Date of Exposure	Comments

Contact list for HCWs

General Directorate of
Infection Prevention and Control

Outbreak Department

CONTACT TRACING FORM FOR EXPOSED HEALTHCARE WORKERS

Hospital	Outbreak code	Index Patients	Name (HCW)	File number	ID number	Category	Department	Contact No.	Date of Exposure	Comments

Hospital Outbreak Management Action Plan (OMAP)

(6) Hospital Outbreak Management Action Plan (OMAP)

Status of the Outbreak Management action

Done	
Ongoing	
Not done	
N/A	

Region :_____

Hospital : _____

Action	Recommendation	Responsibility	Time Frame	Status			
				Done	Ongoing	Not Done	N/A
1. NOTIFY GDIPC / Outbreak Management Department and the Regional Coordinator	-Use the designated Google Form for the Outbreak Notification	Hospital IPC Head/ Hospital Outbreak Coordinator	**IMMEDIATE**				
2. IMPLEMENT IPC Measures IMMEDIATELY	- Review MOH Guideline and IPC Policies	Infection Preventionists and the Unit Nurses	**IMMEDIATE**				
3. ACTIVATE the Outbreak Management Team (OMT)	-Review the Outbreak Management Team roles - Documentation of Minutes Meeting - OMT regular meetings until the end of the outbreak	IPC Head	**IMMEDIATE**				
4. INFORM the Infection Control Committee	-Inform during the coming ICC meeting and ask for an urgent meeting if necessary	IPC Head	-On the specified regular meeting -On need and demand				

Hospital Outbreak Management Action Plan (OMAP)

5. DETERMINE the criteria of MDROs	-Review the lab results -Review MOH/CDC guideline -Consult the ID doctor	Infection Preventionists / ID Consultant		
6. SCREEN the Newly – Admitted Patients in the Critical Areas	- Contacts Screening - MRSA - CRE / Gram Negative Bacteria - Other organisms when Indicated	Infection Preventionists / Unit Head Nurse		
7.REVIEW the Previous Culture Positive Results	- Monthly Microbiological Results -Culture log book documents	Hospital Infection Preventionists/ Regional Outbreak Coordinator		
8. ISOLATE the Patients	-Contact isolation in separate rooms or Cohort Isolation - Place a precaution sign at the entrance of the infected patient's rooms with approved MOH color coding	Unit Head Nurse and Infection Preventionists	**IMMEDIATE**	
9. DECLONIZE the Patients	-According to the type of microorganisms -Review MOH/CDC guideline -Review the materials required (Chlorohexidine, Disposable Oral Hygiene Kit, Insertion Line Kits)	Nursing Staff / IPC Staff		
10. PROMOTE Patients Hygiene	-Daily or According to the known IPC Policies	Nursing Staff / Infection Preventionists	Daily or according to the IPC Policies	

Hospital Outbreak Management Action Plan (OMAP)

11. STICK to Aseptic Technique Practices and Procedures	-Review the IPC policies of lines insertion and blood cultures extraction / catheters insertion / ventilators -Audit the Respiratory Therapist's regarding IPC practices.	Infection Preventionists / Treating Physician / Nursing Staff		
12. NOTIFY the Receiving Department	-Fill the Transfer form -Check the cases' files to know if they were previously transferred from another department or hospital -Cases' status (infected, colonized) -Required precaution type (contact precaution) in addition to standard precaution	Infection Preventionists and Head Nurse	Whenever transferring the patient	
13. LIMIT the Overcrowding of ICU	-Limit the admission when needed -Long-stay patients may be transferred to long term care hospital	Infection Preventionists / Unit Head / Outbreak Regional Coordinator		
14. TRACE Contacts of the Patients	-Prepare the Contact Lists (Patients /Healthcare workers)	Infection Preventionists		
15. CALCULATE Nurse: Patient Ratio	-1: 1 or 1:2 nursing staff: patient ratio in critical area	Head Nurse / Medical Director/ Infection Preventionists		
16. ASSIGN Infection Control Personnel per Shifts	-Audit and follow up the infection control implementations in the unit during every shift until the outbreak closed	Infection Preventionists / Medical Director		

Hospital Outbreak Management Action Plan (OMAP)

17. AVAIL Infection Prevention and Control Supplies (PPEs)	-Check proper quantities and quality - All sizes of (gloves -gowns – mask) should be provided -Follow up the practice of donning and doffing of PPES	Head Nurse / Infection Preventionists /Medical Supplies Department Head		
18. PROVIDE Environmental Disinfectants Products (quantities and quality)	-Approved MOH disinfectants -Apply Proper contact time for disinfectant -Activate the roles and responsibilities of the environmental cleaning	Infection Preventionists/ Unit Head Nurse / Housekeeping supervisor		
19. PERFORM routine and terminal cleaning when Indicated	-According to the IPC's cleaning and disinfection policies -Inform the housekeeping supervisor to terminally clean the unit -Use check list for routine and terminal cleaning	Infection Preventionists/ Unit Head Nurse /Housekeeping Supervisor /ER Supervisor	-According to the Cleaning Schedule of the Room. -After the Discharge of the patients.	
20. COLLECT environmental samples for cultures during the outbreak	-Proper samples collection -Report (Number of samples / Positive results /Sites of collection…etc.)	Link Nurse / Microbiology Lab Personnel		
21. REVISE the waste management	-Review updated policies and implement waste management policy -Continuously train the housekeepers staff	Head of Support Services Department/Infection Preventionists		
22. DISCARD disposable items	-Review Quantities and quality of disposable items (oral hygiene care and central line kit) and skin disinfectants available in the unit (suction tubes, Ambu bag, Swabs …etc.)	Infection Preventionists/Unit Head Nurse/ Storage Department Head		

Head of the Infection Prevention and Control Department:

Head of the Infection Prevention and Control Department:

_____

Mobile No: _____

E-mail :_____

Signature : _____

Outbreak Coordinator:

_____

Mobile No: _____

E-mail :_____

Signature :_____

Date :_____

(7)Environmental Sampling: Swab Checklist Guide (It is not routinely recommended, only indicated in the situations of an outbreak, construction/renovation and for research purposes)

High touch surfaces	Item	Yes	No
Patient Room	Bed controls		
	Bed rails		
	Bedside table		
	Over bed table		
	Beds Patient Couches /Mattresses		
	Babies incubators		
	Babies humidifier		
	Chair		
	Chair arms/seat		
	Call light		
	Cabinet knobs		
	Handheld Television controls		
	Telephone		
	Light switches		
	Doorknobs		
	Sink		
	Bedside oxygen and suction connectors, earpieces for radios (single use ear pieces preferable)		
	Bedside Alcohol Hand Gel/ Soap Containers/Dispensers /Brackets		

(7)Environmental Sampling: Swab Checklist Guide (It is not routinely recommended, only indicated in the situations of an outbreak, construction/renovation and for research purposes)

High touch surfaces	Item	Yes	No
Equipment's and Machine	Cardiac monitors		
	IV pump control		
	Ventilator controls		
	Blood pressure cuff		
	Phototherapy machine		
	X- RAY machine		
	Ultrasound machine		
	Stethoscopes		
	ABG machine		
	Thermometer		
	Glucometer		
	Ambu bags		
	Laryngoscope		
	Pulse oximeters		
	Treating trolleys		
	Dressing trolleys		
	Medication trolley		
	Chart trolley		
	Resuscitation Trolley		
	Patient file		
	Computer keyboards		
	Commodes		
	weighing scales		
	Baby bottles, teats		
	TPN (Total parental nutrition formula)		

Screening Guide (According to the type of organisms)

	Screening site	Indication screening for patient	Indication screening for HCWs and Environment
CREs	a. Peri-anal swabs or rectal b. skin sites, wounds or urine (if urinary catheter is present)	Screen all patient who are: a) Known to be previously CRE positive for last 6 months or more. b) Roommates exposed to CRE-positive patient who shared the room for more than 48 hours. c) Consider point prevalence screening of a particular unit if more than one CRE patient is identified.	
MRSA	a) Anterior nares. b) Non-intact skin areas e.g. tracheostomy, pressure sore or surgical wound. c) Neonatal and pediatric patient awaiting liver or cardiac surgery should also both groin and axilla.	Screen all patient who are: a) Admitted to the intensive care units (ICU). b) Transferred from another hospital or have been treated in another hospital /clinic within the past six months. c) Undergoing liver or cardiac, orthopedic (including spine) surgery (pre-operatively). d) Hemodialysis patient admitted for their first dialysis treatment and for placement of any type of vascular access (e.g. AV-fistula, permanent catheter, graft or port access device). e) Known to be previously MRSA positive. f) Roommates of positive patient not on isolation precautions.	1. Do not screen HCWs or the environment because it is not normally indicated and incurs unnecessary costs
VRE	a) Peri –anal area b) Wound and catheter exit sites	All who are: a) Known to be previously VRE positive within the past 6 months or more. b) Roommates exposed to VRE-positive patient for more than 48 hours.	1) Do not screen HCWs or the environment because it is not typically indicated and incurs unnecessary costs. 2) Consult the infection preventionists before such measures are taken.

Logbook/ Report Form for critical values of the Positive Culture - Hospital

Region:	
Hospital Name:	

Date of Notification						
Patient Name						
File Number						
Unit						
Type of Sample						
Date of Sample Extraction						
Type of Microorganisms						
Status of Resistance						
Notification Receiver (IPC Practitioner) from The Lab						
Comment						

Logbook/ Report Form for critical values of the Positive Culture - REGION

Region:	

Date of Notification						
Patient Name						
File Number						
Unit						
Type of Sample						
Date of Sample Extraction						
Type of Microorganisms						
Status of Resistance						
Notification Receiver (IPC Practitioner) from The Lab						
Comment						

Transfer form

(10)Transfer Form

Is the patient currently on antibiotics? □ NO □ YES DX: _____

Is the patient currently in isolation? □ NO □ YES

Type of Isolation (check all that apply) □ Contact □ Droplet □ Airborne □ other:

Does the patient currently have an infection, colonization OR a history of a multidrug-resistant organism (MDRO)?	Colonization or history *Check if YES*	Active infection on Treatment *Check if YES*	Unknown
Methicillin-resistant Staphylococcus aureus (MRSA)			
Vancomycin-resistant Enterococcus (VRE)			
Clostridium difficile			
Acinetobacter, multidrug-resistant			
E coli, Klebsiella, Proteus etc. w/Extended Spectrum B-Lactamase (ESBL)			
Carbapenemase-resistant Enterobacteriaceae (CRE)			
Other:			

Does the patient/resident currently have any of the following?

□Cough or requires suctioning
□Diarrhea
□Vomiting
□Incontinent of urine or stool
□Open wounds or wounds requiring dressing change
□Drainage (source)_____

□Central line/PICC
□Hemodialysis catheter
□Urinary catheter
□Suprapubic catheter
□Percutaneous gastrostomy tube
□Tracheostomy

Printed Name of Person completing the form	Signature	Date	If information communicated prior to transfer: Name and phone of individual at receiving facility


感謝你
Danke
Gracias
Grazie
Merci
Thanks!
THANK YOU!