



My reservoir is like the distance between Aden and Amman in al-Balqa

**Al-Balqa Applied University**



***Faculty of Medicine***

**Epidemiology and Biostatistics**

**الوبائيات والإحصاء الحيوي (31505204)**

***Lecture 20***

**Communicable diseases Epidemiology**

**Transmission of infectious diseases**

***Standard Precautions***

By

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# Standard Precautions

- **Standard Precautions** are a **group of infection prevention practices** intended to be applied to the care of **ALL patients in all healthcare settings**, regardless of the **suspected or confirmed presence of an infectious agent**.
- **Implementation of Standard Precautions constitutes the primary strategy for the prevention of healthcare-associated transmission of infectious agents** among **patients and healthcare personnel**.
- Standard Precautions are based on the **principle that all blood, body fluids, secretions, excretions except sweat, nonintact skin, and mucous membranes may contain transmissible infectious agents**.

# Rules of Standard Precautions

- Used for AAL patients.
- Wash hand after accidental contact with bodily fluids.
- Wash hands before/ after glove use.
- Wear Personal Protective Equipment (PPEs) as needed.
- Handle soiled linens away from skin /clothing.
- Disinfect equipment according to facility policy.
- Dispose of sharp objects in needle box.
- Treat all soiled linen as potentially infectious.

# Standard Precautions (1)

- ❑ Group of infection prevention practices that apply to **ALL patients**.
  
- ❑ Based on principle that the following can contain transmissible infectious agents:
  - **Blood and body fluids**
  - **Secretions**
  - **Excretions (except sweat)**
  - **Non-intact skin**
  - **Mucous membranes**

# Standard Precautions (2)

- Applied **during patient care** based on nature of healthcare worker-patient interaction.
- Dependent on anticipated blood, body fluid, or pathogen exposure.
- **Standard precautions are intended to protect both the healthcare worker and the patient.**
- This means that for some interactions , such as performing **venipuncture**, only **gloves** may be needed; during other interactions, such as **intubation**) use of **gloves, gown, and face shield or mask and goggles** is necessary.

# Standard Precautions (3)

- ❑ **Education and training are critical and include the following elements:**
  - **Hand hygiene**
  - **Respiratory hygiene/cough etiquette**
  - **Personal protective equipment (PPE)**
  - **Safe injection practices**

# Key Elements of Standard Precautions

1. Hand hygiene
2. Gloves
3. Mask, goggles, face masks
4. Gown
5. Prevention of needle stick & injuries from sharp instruments
6. Respiratory hygiene & cough etiquette
7. Environmental cleaning
8. Linens
9. Waste disposal
10. Patient care equipment

PPE

WHO, 2007

## STANDARD PRECAUTIONS

A simple, consistent and effective approach to infection control



Minimise contact with blood and body substances by utilising safe work practices and protective barriers.

STANDARD PRECAUTIONS APPLY TO ALL PATIENTS



## Elements of Standard Precaution

1. Hand Hygiene
2. Gown
3. Mask
4. Face Protection
5. Gloves
6. Safe injection practices
7. Patient Care Equipment/ Devices
8. Environmental Control
9. Textile and laundry
10. Worker Safety
11. Patient Placement and Transport
12. Respiratory Hygiene / Cough Etiquette
13. Infection Control Practices for Lumbar Puncture

# Transmission-Based Precautions

- Used when route of **transmission is not completely interrupted** using **standard precautions alone**.
- Always used in **addition** to standard precautions.
- **Categories of precautions**
  - **Contact**
  - **Droplet**
  - **Airborne**



# Contact Precaution Basics

- Intended to prevent spread of infectious agents transmitted by **direct or indirect contact**.
- Applied when **excessive wound drainage, fecal incontinence**, or other body discharges increase the potential for environmental contamination

# Contact Precautions

- **Single-patient rooms are preferred.**
- **For multi-patient rooms,  $\geq 3$  feet separation is recommended between beds.**
- **Healthcare personnel should wear gown and gloves for ALL patient interactions.**
- *PPE donned upon entry and discarded before exiting room.*

# Droplet Precaution Basics

- Intended to prevent spread of infectious agents transmitted **by respiratory secretions or mucous membrane contact.**
- Droplets **do not travel far and do not require special ventilation systems.**
  - Single-patient rooms are preferred.
  - For multi-patient rooms,  $\geq 3$  feet separation between beds and drawing the curtain is recommended.
  - Healthcare personnel should wear **mask upon entering room.**
  - **Patients should wear mask (if tolerated) when transferred out of room.**
    - Follow respiratory hygiene/cough etiquette

# Airborne Precaution Basics

- Prevent transmission of infectious agents that **remain infectious in air over long distances.**
- **An airborne infection isolation room (AIIR) for placement of patient**
  - **Single-patient room**
  - **Special ventilation system**
- Healthcare personnel should **don a fit-tested N95 mask before entry.**



# Airborne Precautions

- **Until AIIR can be instituted, the following should reduce likelihood of airborne transmission:**
  - **Mask patient.**
  - **Place patient in private room.**
  - **Provide N95 or higher level respirator for staff.**

# Group Exercise (1)

- Each group has been assigned a disease.
- Please complete the table affiliated with your disease
  - **Type of precautions**
  - **Type of PPE**
  - **Room placement**
  - **Discontinuation of precautions**

# Influenza

<b>Precautions</b>	
<b>Personal protective equipment</b>	
<b>Room placement</b>	
<b>Discontinuation of precautions</b>	

# Influenza

<b>Precautions</b>	<b>droplet</b>
<b>Personal protective equipment</b>	<b>don mask upon entering room ... patient to wear mask (if tolerated) when out of room</b>
<b>Room placement</b>	<b>Private or cohort with spatial separation of <math>\geq 3</math> feet.</b>
<b>Discontinuation of precautions</b>	<b>5 days; duration of illness for immunocompromised patients</b>



# *Streptococcus pneumoniae*

(single patient)

<b>Precautions</b>	
<b>Personal protective equipment</b>	
<b>Room placement</b>	
<b>Discontinuation of precautions</b>	

# *Streptococcus pneumoniae*

**(single patient)**

<b>Precautions</b>	<b>standard</b>
<b>Personal protective equipment</b>	<b>Only for anticipated contact with secretions or excretions or blood or body fluids ...</b>
<b>Room placement</b>	<b>Private room and cohorting are not necessary</b>
<b>Discontinuation of precautions</b>	<b>Standard precautions are NEVER discontinued</b>

# *Streptococcus pneumoniae*

(outbreak)

<b>Precautions</b>	
<b>Personal protective equipment</b>	
<b>Room placement</b>	
<b>Discontinuation of precautions</b>	

# *Streptococcus pneumoniae*

**(outbreak)**

<b>Precautions</b>	<b>droplet</b>
<b>Personal protective equipment</b>	<b>don mask upon entering room ... patient to wear mask (if tolerated) when out of room</b>
<b>Room placement</b>	<b>Private or cohort</b>
<b>Discontinuation of precautions</b>	<b>(while there is transmission in the facility)</b>

# Norovirus

<b>Precautions</b>	
<b>Personal protective equipment</b>	
<b>Room placement</b>	
<b>Discontinuation of precautions</b>	

# Norovirus

<b>Precautions</b>	<b>Standard precautions; Contact precautions for institutional outbreaks</b>
<b>Personal protective equipment</b>	<b>Contact precautions: gowns, gloves (masks)</b>
<b>Room placement</b>	“cohort to separate airspaces and toilet facilities may help interrupt transmission during outbreaks”
<b>Discontinuation of precautions</b>	

# ***Clostridium difficile* (C. diff)**

<b>Precautions</b>	
<b>Personal protective equipment</b>	
<b>Room placement</b>	
<b>Discontinuation of precautions</b>	

# *Clostridium difficile* (C. diff)

<b>Precautions</b>	<b>contact</b>
<b>Personal protective equipment</b>	<b>wear gown and gloves for ALL patient interactions; don PPE upon entry and discard before exiting room</b>
<b>Room placement</b>	<b>Private or cohort</b>
<b>Discontinuation of precautions</b>	<b>Duration of illness</b>



# Pulmonary Tuberculosis

<b>Precautions</b>	
<b>Personal protective equipment</b>	
<b>Room placement</b>	
<b>Discontinuation of precautions</b>	

# Pulmonary Tuberculosis

<b>Precautions</b>	<b>Airborne</b>
<b>Personal protective equipment</b>	<b>Fit-tested N95 mask</b>
<b>Room placement</b>	<b>Negative pressure room</b>
<b>Discontinuation of precautions</b>	<b>When patient is on effective therapy, is clinically improving and has 3 consecutive negative smears for TB</b>

# Scabies

<b>Precautions</b>	
<b>Personal protective equipment</b>	
<b>Room placement</b>	
<b>Discontinuation of precautions</b>	

# Scabies

<b>Precautions</b>	<b>Contact precautions</b>
<b>Personal protective equipment</b>	<b>Gloves and gown.</b>
<b>Room placement</b>	<b>Private or cohort</b>
<b>Discontinuation of precautions</b>	<b>24 hours after completion of effective therapy</b>

# Brucellosis

## Brucellosis in Humans

Brucellosis is the name given to a bacterial infection which basically is contracted from animals usually due to consumption of unpasteurized dairy products.



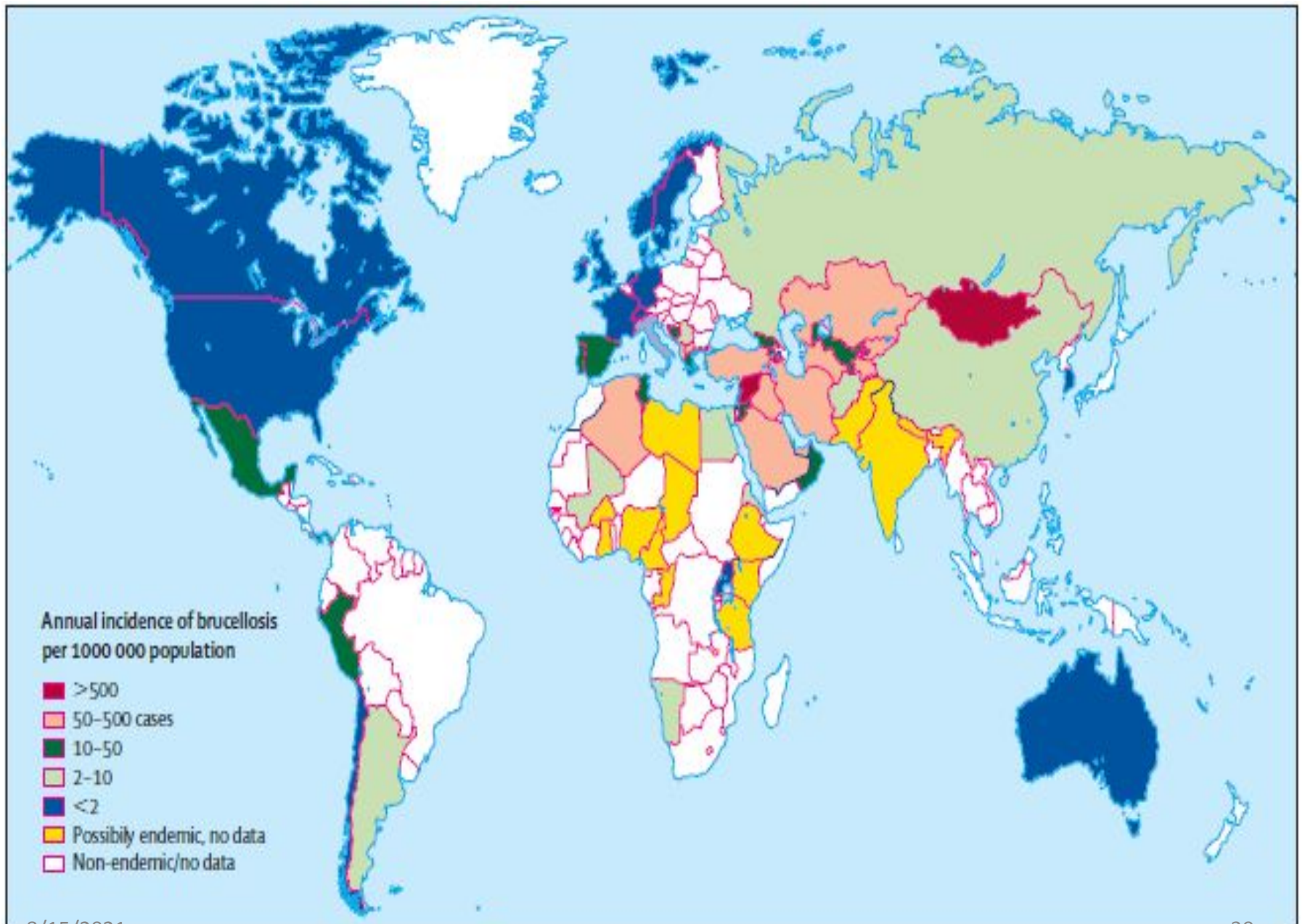
Bacteria

Some of the Symptoms of Brucellosis are

- Fevers
- Chills
- Weakness
- Lethargy
- Muscle and joint aches and pains
- Headaches.



ePainAssist.com



# The Many Names of Brucellosis

## □ Human Disease

- **Malta Fever**
- **Undulant Fever**
- **Mediterranean Fever**
- **Rock Fever of Gibraltar**
- **Gastric Fever**

## □ Animal Disease

- Bang's Disease
- Enzootic Abortion
- Epizootic Abortion
- Slinking of Calves
- Ram Epididymitis
- Contagious Abortion

# Populations at Risk

## 1. Occupational disease

- Cattle ranchers/dairy farmers
- Veterinarians
- Abattoir workers
- Meat inspectors
- Lab workers

## 2. Hunters

## 3. Travelers

## 4. Consumers

- Unpasteurized dairy products





# Transmission in Humans

## ☐ Ingestion

- Raw milk, unpasteurized dairy products.
- Rarely through undercooked meat.

## ☐ Mucous membrane or abraded skin contact with infected tissues.

## ☐ Animal abortion products

- ☐ Vaginal discharge, aborted fetuses, placentas

# Transmission in Humans

## □ Aerosol

- Laboratory, abattoirs
- Pens, stables, slaughter houses

## □ Inoculation with vaccines

- *B. abortus* strain 19, RB-51
- *B. melitensis* Rev-1
- Conjunctival splashes, injection

## □ Person-to-person transmission rare.

# Transmission in Animals

- **Ingestion** of infected tissues or body fluids.
- **Contact** with infected tissues or body fluids.
- **Mucous membranes**, injections
- **Venereal**
- **Fomites**

# Disease in Humans

- **Incubation period**
  - **Variable; 5 days to three months**
- **Multisystemic**
  - **Cyclical fever**
- **Flu-like illness**
  - **Chronic illness possible**

# Prevention and Control

- **Education about risk of transmission**
  - **Farmers, veterinarians, abattoir workers, butchers, consumers, hunters.**
- **Wear proper attire if dealing with infected animals/tissues.**
  - **Gloves, masks, goggles**
- **Avoid consumption of raw dairy products.**

# Prevention and Control

- **Eradicate reservoir**

- Identify, segregate, and/or cull infected animals

- **Venereal transmission**

- Separate females at birthing to reduce transmission on the farm or in kennel

