

وَقُلْ رَبِّ زِدْنِي عِلْمًا



PERIPHERAL NERVOUS SYSTEM

SUBJECT : Community Medicine

LEC NO. : 2

DONE BY : Sanad Subuh



Epidemiology of

Common Nervous System infections



Dr. Omnia Elmahdy

Rabies

- Rabies is estimated to cause **59000 human deaths annually** in over 150 countries, with **95%** of cases occurring in **Africa and Asia**. **40%** of cases are children **under 15 years** of age. بعض الدول التي يكون في ال rabies بمعدل كبير : اثيوبيا و الهند و غينيا
- ✳ **New Zealand and Australia have never had rabies (rabies-free countries).**
- Rabid dogs are **commonly found** in Jordan. The number of dog bite cases in **2022 reached 5,138.**

• Reservoir:

✳ **Dogs: Mainly**, cats, fox, raccoons
wolf, Cows, horses,..

Rodents, bats..

Dogs are the main source of human rabies deaths, contributing up to **99%** of all rabies transmissions to humans.

RABIES

Zero deaths by 2030

99%
human cases
result from
dog bites

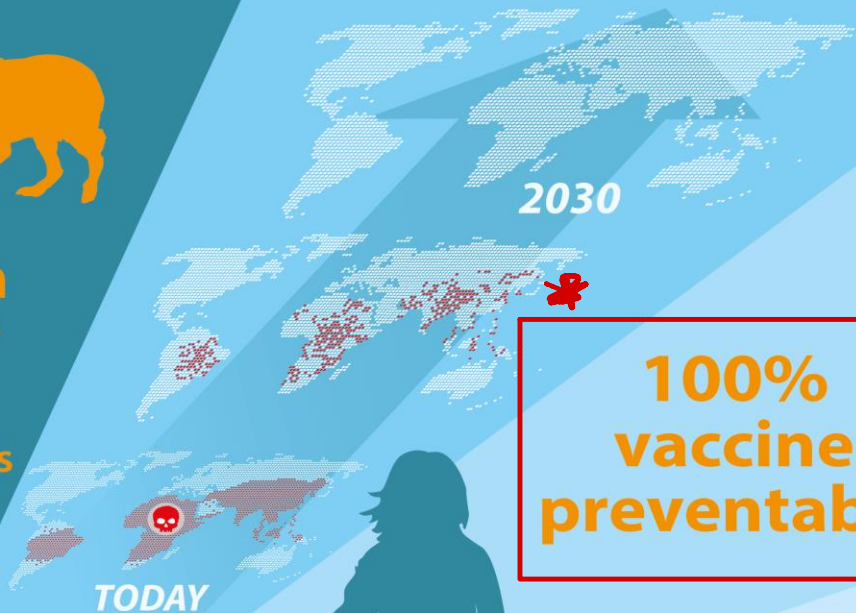


One death

every 9 minutes
worldwide



4 out of 10 deaths
are in children



**100%
vaccine
preventable**



**no bite
no rabies**



#rabies
28 September
World Rabies Day
www.who.int/rabies/en

- Exit: Saliva of rabid animal.

- Mode of transmission:

1- Bite of rabid animals (mainly).

2- Lick of animals (abrasions in skin).

هسا في نقطة لازم ننتبه عليها في الحال ال **lick of animals** إذا ما كان في جرح بالمنطقة ما رح ينتقل المرض عشان هيك لازم يكون في **abrasion in the skin** عشان ينتقل المرض

Incubation period: **from 10 days**

to 12 months (typically between 20 and 90 days)

Rabies symptoms in humans

Initial symptoms

The first symptoms of rabies may be very similar to those of the flu, including general weakness or discomfort, fever, or headache. These symptoms may last for days.



Headache



Fever



Fatigue



Tingling at site of exposure

Rabies-specific symptoms

As the disease progresses, the person may experience delirium, abnormal behavior, hallucinations, hydrophobia (fear of water), and insomnia.



Hallucinations



Excessive salivation



Light sensitivity



Hydrophobia



Insomnia



Aggression



Prevention

I. For animals:

- **Control** of stray dogs and cats.
- Active **immunization** of **dogs and cats** using **vaccine yearly and given license**.
- **Quarantine** measures for **imported dogs and cats**.

Prevention

II. For human:

ال pre exposure يعني الشخص ما أتعرض ل animal bite أصلا بس ممكن يتعرض للعض لأنه بتعامل مع الحيوانات

1- Pre-exposure immunization

-for: Veterinarians, zoo- workers, lab- workers, night- guards, and travelers to rabies-affected areas according to the level of risk in that area.

Human diploid cell vaccine (HDCV) 1ml, IM in the deltoid region, 3 doses



2-Post-exposure management & immunization

A. Wound care: Should be immediate, essential even if the person presents long after exposure

- Free flushing with soap and water at once for 15 minutes

* -Delay suturing of wounds. If suturing is necessary, ensure that RIG has been applied locally

RIG: Rabies immunoglobulin

-Use chemical disinfectant.

B. Tetanus seroprophylaxis

or **booster dose of toxoid.**

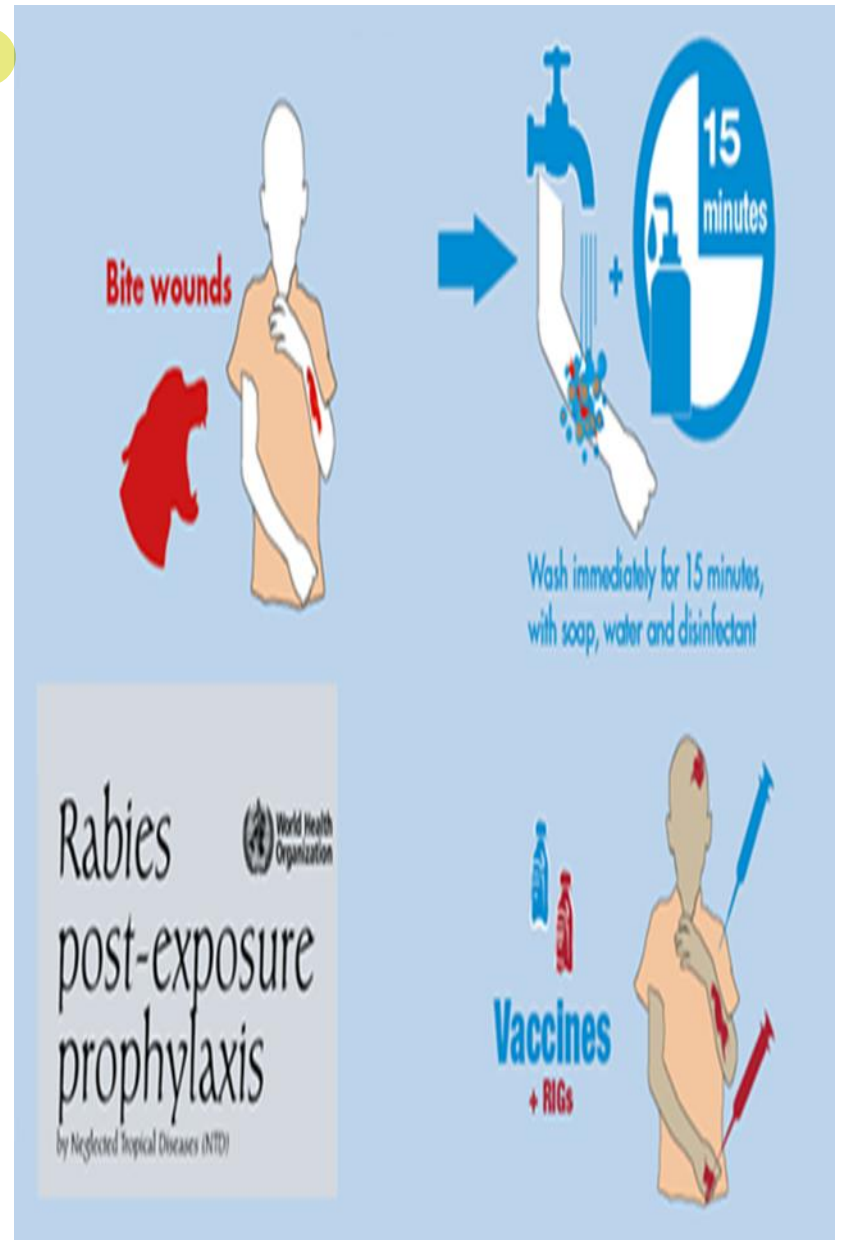
C. Chemoprophylaxis: by

penicillin.

D. Specific protection by

immunization (vaccination

& seroprophylaxis).



Categories of exposure

Category of exposure	Description	Post-exposure prophylaxis
Category I	Touching or feeding animals, licks on intact skin, contact of intact skin with secretions or excretions of rabid animal or person	Not regarded as exposures, therefore no PEP required
Category II	Nibbling of uncovered skin, minor scratches or abrasions without bleeding	Vaccine should be injected as soon as possible
Category III	Single or multiple transdermal bites or scratches, licks on broken skin, contamination of mucous membrane with saliva from licks and exposure to bats.	Vaccine and rabies immunoglobulin should be administered at distant sites as soon as possible.

ال category 2 بياخذ ال vaccine فقط
 ال category 3 بياخذ ال vaccine و ال RIG

A-Without pre-exposure immunization (not immunized before):

- Vaccination (and seroprophylaxis if needed)

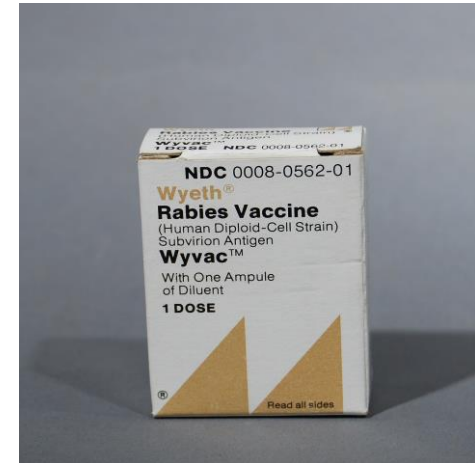
Human diploid cell vaccine (HDCV):

- If the person is not vaccinated in the past, needs 4-5 doses of rabies vaccine

(given on days 0, 3, 7, 14, and 28), depending on severity of the wound.

للامتحان المطلوب منا نعرف انه عندي ٤ جرعات الي هم (0,3,7,14)

*No neurological or allergic complications.



Seroprophylaxis

- Given **with vaccination, after severe exposure.**
- Without previous vaccination.
- **1/2 dose around the bite** by **infiltration in wound** and the **other 1/2 IM.**
- If RIG is unavailable on first visit, its administration can be delayed by **a maximum of 7 days** from the date of **first vaccine dose**

B-With previous immunization (immunized before):

- The exposed when re-exposed is given vaccination and No seroprophylaxis. ✖

HDCV: 2 doses. (0-3)

- A recent **intradermal (ID) regimen** requires a **reduced volume** of **vaccine** to be utilized than any of the intramuscular regimens, therefore, **reducing vaccine cost by 60-80%**
- This method is appropriate where vaccine or/and money are in short supply, particularly in rural areas with high-flow clinics
- The volume per intradermal (ID) site is 0.1 mL
- Needs careful instructions.

Leprosy

Leprosy is a **chronic** infectious **skin** disease may lead to **disability** and **disfigurement** of the face. It is **endemic** in many regions of the world. **India, Myanmar and Nepal** contained 70% of cases.



It **mainly** affects the **skin**, the **peripheral nerves**, **mucosal surfaces** of the **upper respiratory tract** and the **eyes**.

Causative agent: **Mycobacterium leprae**, acid fast bacilli.

Between 2007 and 2021, Jordan leprosy cases remained stable at around 0.

• Reservoir:

Man: **open case** with **ulcerated lesions of skin** and **mucous membrane**.

• Mode of transmission:

***** Prolonged **contact** with open case

I.P: Several years.

* 1- Lepromatous Leprosy: *

- **Skin lesions.**
- **Sensory loss.**
- * **Destruction of the nasal septum**
with **collapse of the nose leading to**
disfigurement + Leonine facies, *
- * **Loss of eyebrows and lashes,** **eye**
damage (dryness, **reduced**
blinking)..



* 2- Tuberculoid Leprosy: *

- **Peripheral nerve affection**

causes anesthesia

- **Muscle weakness &**

paralysis.

- * **Trophic changes of skin**

(hypo pigmented)



Control of cases:

1- Case- finding.

*2- Notification

ال notification هي ابلاغ الجهات الصحية

يعني بعض الأمراض لما تظهر لازم ابلاغ الجهات الصحية ومن ضمن هاي الأمراض مرض ال leprosy

*3- Isolation: **compulsory-**
segregation.

4- Disinfection.


*5- Treatment: by Multiple
Drug Therapy (**MDT**)

6- Release: after
becoming bacteriologically
free.

Control of contacts:

1- **Periodic examination for case-finding.**

2- **Health education.**

 **Special prevention by chemoprophylaxis and BCG immunization**

Tetanus (Lock-Jaw)

- Tetanus is a form of **wound infection** characterized by acute intoxication that involves the nervous system.



Causative agent: Clostridium tetani”

• Reservoir:

- **Animals** (**herbivorous animals, horses**). (The **organism lives in the intestine is excreted with faeces and sporulates outside the body**).
- **Man** (but No man to man spread).

Prevalence of tetanus

- In **2019**, the **Global Burden of Disease** study estimated over **73,000** total tetanus cases including over **27,000 neonatal tetanus** infections.
- According to the latest WHO data published in **2020**, tetanus deaths in Jordan reached **11 or 0.04% of total deaths.**

Incubation period: 4-21 days

① lock jaw or trismus. ② Risus sardonicus. ③ Arched back.

↳ 3 important symptoms

• Mode of transmission:

Infection of wound, by spores occurs in different

methods:

1. **Injury in polluted place.**
2. **Neonatal infection: (tetanus neonatorum).**
3. **Surgical tetanus (post- operative)**
4. **Puerperal infection: Infection of uterus by non- sterile instruments.**
5. **Otogenic infection: Introduction of foreign body (F.B.) in the air into ear.**

Prevention

I. General prevention:

1-Sanitation of the environment

2-Health education.

II. Specific prevention:

1. Active immunization

2. Seroprophylaxis

3. Chemoprophylaxis



↳ Arched back

Tetanus Toxoid

Pre-exposure application of Tetanus toxoid:

1. For **infants** in routine immunization program.
2. School children.
3. **At risk groups** like military forces, pregnant females, guards, Policemen.

Adults dose schedule: **2 doses, 8 weeks interval + 3rd dose after 1y**
(three doses) *

and then **booster is needed every 10 years .**

After injury:

الجدول مهم جدا
post exposure

Immunization status	* Clean minor wound (< 6 hours)	* Other wounds
Not immunized before or less than 3 doses or unknown status	Give 3 doses of vaccine	* 1 dose of the vaccine then completes as in clean wound *TIG., IM (TT + TIG)
3 doses	Nothing	* booster dose can be given if the risk of infection is high (TT only)

Control of tetanus

1- Case:

- **Surgical care of wound** (cleaning, disinfectant & removal of FB)
- **Specific therapy**
 1. **Serotherapy** with ATS or TIG (better) ال ATS هو anti tetanus serum ال TIG هو ال tetanus immunoglobulin
 2. **Chemotherapy** (rarely used) **Penicillin or tetracycline**
 3. **Muscle relaxant**

* 2- Contacts:

Nothing because no man to man transmission.

Guillain–Barré syndrome

- Guillain-Barré syndrome (GBS) is a rare **autoimmune** condition (**temporary inflammation and demyelination of peripheral nerve myelin sheaths**).
- People of **all ages can be affected**, but it **is more common** in **adults and in males**.
- **Most people recover fully** from **even the most severe cases of Guillain-Barré syndrome**, however, it can be **life-threatening in the acute phase**.

- **Severe** cases of Guillain-Barré syndrome are **rare but can result in near-total paralysis** and **problems breathing**. People with Guillain-Barré syndrome **should be treated and monitored as quickly as possible; some may need intensive care**.
- The cause of it is **not fully understood**, but **most cases (70%) follow an infection** with a **virus or bacteria**. Infection with the bacteria **Campylobacter jejuni**, which **causes gastroenteritis**, is one of the **most common risk factors for GBS**. People can also develop GBS after having the **flu** or other viral infections including **cytomegalovirus, Epstein-Barr virus, corona virus**, and the **Zika virus**.

- The **global incidence** of Guillain-Barré syndrome is **1-2 cases per 100000** person-years.
- **Ascending paralysis**, weakness **beginning in the feet and hands and migrating towards the trunk**, is the most typical symptom, and some subtypes cause change in sensation or pain as well as dysfunction of the autonomic nervous system.
- Patients usually **recover** spontaneously over a few weeks or months as affected nerves are **re-myelinated**.
- In most cases, **Guillain-Barré syndrome isn't preventable**. But one way you can try to lower your risk of GBS is to stay as healthy as possible.

Herpes Zoster (shingles)

- People get shingles when the varicella-zoster virus, which causes chickenpox, reactivates in their bodies after they have already had chickenpox.
- It is a painful but self-limited dermatomal rash. Most people who develop shingles only have it one time during their life. However, you can have shingles more than once.
- ✿ You cannot get shingles from someone who has shingles, however, ✿ you can get chickenpox from someone who has shingles if you never had chickenpox or never got chickenpox vaccine. You could then develop shingles later in life.

🦋 People who never had chickenpox or didn't get chickenpox vaccine can get infected with VZV from someone who has shingles. These people can get the virus through:

سلايد مهم جدا

1. **Direct contact with the fluid** from shingles rash blisters.
2. **Breathing in virus particles** that come from the blisters.

🦋 **At risk group:**

1. With a **weakened immune system** (such as people with cancer, HIV, organ transplant recipients or those receiving chemotherapy).
2. **Over the age of 50.**
3. Who have been **ill.**
4. Who are under **stress.**



* **Without vaccination**, individuals who live to **85 years** old have an **approximately 50% lifetime risk** of developing HZ. Hence, HZ prevention is an important global health priority.

- **Scarring** can occur if deeper epidermal and dermal layers have been compromised by **excoriation or secondary infection**.
- Almost all **adults experience pain**, typically **severe**.

* **Treatment** includes **antiviral medications** such as **acyclovir**, **famciclovir**, and **valacyclovir** given **within 72 hours** of **symptom onset**, with other **conservative** measures (NSAIDs, **lotions**)

- **Prevention:**

The routine use of the **varicella vaccine** has led to a remarkable reduction in the incidence of primary varicella infection.

- CDC recommends two doses of recombinant zoster vaccine (**Shingrix**) to prevent shingles and related complications in adults **50 years and older**, (and adults 19 years and older who have weakened immune systems because of disease or therapy).

- **Varivax** (live- attenuated varicella vaccine) for **children.**

Shingrix is given even if in the past you:

- Had shingles
- Received Zostavax
- Received varicella (chickenpox) vaccine

** not used anymore*