



DEPARTMENT OF MICROBIOLOGY INFECTIOUS DISEASE BULLETIN

VOLUME 1 ISSUE 9

SEPTEMBER 2022

World Sepsis Day was initiated by the Global Sepsis Alliance in 2012. Every year on September 13th, events in all parts of the world raise awareness for sepsis worldwide. Sepsis accounts for at least 11 million deaths worldwide annually. Yet, depending on country and education, sepsis is known only to 7 – 50% of the people. Likewise, it is poorly known that sepsis can be prevented by vaccination and clean care and that early recognition and treatment reduce sepsis mortality by 50%. This lack of knowledge makes sepsis the number one preventable cause of death worldwide

WORLD SEPSIS DAY

13 SEPTEMBER 2022

SEPSIS – A GLOBAL HEALTH CRISIS

 **47 000 000 - 50 000 000**
Cases per Year

 At Least **11 000 000** Die
- 1 Death Every **2.8** Seconds

 **1** in Every **5** Deaths
Worldwide Is Associated
With Sepsis

 Survivors May Face
Lifelong Consequences

WORLD SEPSIS DAY - SEPTEMBER 13TH

SEPSIS – A GLOBAL HEALTH CRISIS

SPECIAL

REPORT

- Sepsis is a global health crisis.
- It affects between 47 and 50 million people every year, at least 11 million die – one death every 2.8 seconds.
- 20% of all deaths worldwide are associated with sepsis.
- Depending on country, mortality varies between 15 and more than 50%. Many surviving patients suffer from the consequences of sepsis for the rest of their lives.



When it comes to sepsis, remember **IT'S ABOUT TIME™**. Watch for:

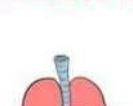
-  **TEMPERATURE**
higher or lower than normal
-  **INFECTION**
may have signs and symptoms of infection
-  **MENTAL DECLINE**
confused, sleepy, difficult to rouse
-  **EXTREMELY ILL**
Severe pain, discomfort, shortness of breath

RED FLAGS... THINK SEPSIS!

NHS Foundation Trust

Suspected or proven infection AND has 1 of the following:

 **<36°C**
>38.5°C
Core temperature

 **RR↑**
Increased
respiratory
rate

 **HR↑**
Inappropriate tachycardia
see PEWS chart

 Have a lower threshold of suspicion for:
Patients younger than 3 months,
chronic disease, recent surgery,
immunocompromised

 **Altered mental state**
Inc., sleepiness, irritability, lethargy,
floppiness

 **prolonged capillary refill**
(reduced skin perfusion)

Suspect sepsis. Say sepsis. Save someone's life today

THE SEPSIS 6





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- Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection . If not recognized early and managed promptly, it can lead to septic shock, multiple organ failure and death.
- Sepsis is the final common pathway to death from most infectious diseases worldwide, including COVID-19
- The standard definition of sepsis is based on the Sequential Organ Failure Assessment (SOFA) score.
- SOFA variables: ϕ PaO₂/FiO₂ ratio ϕ Serum creatinine or urine output ϕ Bilirubin ϕ Mean arterial pressure (MAP) ϕ Platelet count ϕ Glasgow Coma Scale (GCS) score ϕ Administration of vasopressors and dose rate
- SOFA Score \geq 2 in setting of infection strongly supports the diagnosis of sepsis.
- Treat Sepsis as an Emergency – Within 1 Hour
- Sepsis Six:
 - Give oxygen to keep your blood oxygen levels normal
 - Take blood cultures
 - Give IV antibiotics
 - Start IV fluid resuscitation
 - Check lactate
 - Monitor hourly urine output accurately



- A central line-associated bloodstream infection (CLABSI) is defined as a laboratory confirmed bloodstream infection not related to an infection at another site that develops within 48 hours of central line placement.
- Of all the healthcare-associated infections, CLABSIs are associated with high-cost burden and prolong hospitalization
- Gram-positive organisms (coagulase negative staphylococci, enterococci, and Staphylococcus aureus) and followed by gram negative organisms (Klebsiella, Enterobacter, Pseudomonas, E. coli, Acinetobacter, Candida species and others) are the most common etiological agents of CLABSI
- Central line-associated bloodstream infection (CLABSI) is a highly prevalent problem in the intensive care unit. As per CDC HAI 2020 annual report - overall, there was about 24% increase in CLABSI between 2019 and 2020 with largest increase in ICU (50%)
- Evidence-based guidelines show that by adhering to CLABSI bundle care protocols, one can reduce the rate of CLABSI. One of the major reasons for central line removal is an infection or its suspicion.
- However, to ensure compliance, audits of doctors who insert the central lines and nurses who monitor the lines for infections is vital. Most cases are preventable with proper aseptic techniques, surveillance, and management strategies.



Dr. Abhilasha D Motghare (MBBS ,DA DNB Anaesthesiology FIPA)



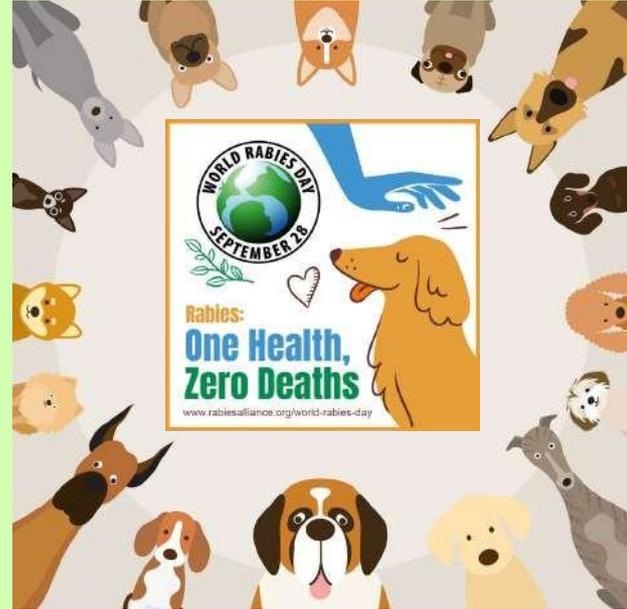


WORLD RABIES DAY

It is celebrated annually to raise awareness about rabies prevention and to highlight progress in defeating this horrifying disease.

28 September also marks the anniversary of Louis Pasteur's death, the French chemist and microbiologist, who developed the first rabies vaccine.

Today, safe and efficacious animal and human vaccines are among the important tools that exist to eliminate human deaths from rabies while awareness is the key driver for success of communities to engage in effective rabies prevention.



- Rabies is a vaccine-preventable viral disease which occurs in more than 150 countries and territories.
- Dogs are the main source of human rabies deaths, contributing up to 99% of all rabies transmissions to humans.
- Interrupting transmission is feasible through vaccination of dogs and prevention of dog bites.
- Infection causes tens of thousands of deaths every year, mainly in Asia and Africa.
- Globally rabies causes an estimated cost of US\$ 8.6 billion per year
- 40% of people bitten by suspect rabid animals are children under 15 years of age.
- Immediate, thorough wound washing with soap and water after contact with a suspect rabid animal is crucial and can save lives.
- Engagement of multiple sectors and One Health collaboration including community education, awareness programmes and vaccination campaigns are critical.
- WHO leads the collective "United Against Rabies" to drive progress towards "Zero human deaths from dog-mediated rabies by 2030".





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RABIES VACCINE, HUMAN (CELL CULTURE) IP
Purified Vero Cell Rabies Vaccine
Abhayrab
1 dose for human use



Abhay Rab – Freeze dried, containing purified inactivated Rabies Virus [L.Pasteur 2061 / Vero strain propagated in Vero Cells] 0.015% w/v Thiomersal is preservative.

Recommendation of Vaccination

- For category I exposures, no prophylaxis is required;
- For category II, immediate vaccination is recommended;
- For category III, immediate vaccination and administration of rabies immunoglobulin are recommended.

RABIES: THE FACTS

VIRUS TRANSMISSION

Saliva of infected animals **99%** of human cases are caused by **dog bites**

The virus attacks the brain
Rabies is **fatal** once symptoms appear

FATALITIES

Rabies affects **poor rural communities** mostly in Asia and Africa



About **One death every 9 mins**

40% of the victims are children younger than 15

TREATMENT

Thorough washing of the wound with soap, and, vaccine injections can avoid symptoms and **save lives**.
Seek immediate medical care if bitten.

HOW TO PREVENT RABIES TRANSMISSION FROM DOGS?

Learn **dog body language**
Raise public **awareness**
NO DOG BITE = NO RABIES

VACCINATING DOGS SAVES HUMAN LIVES

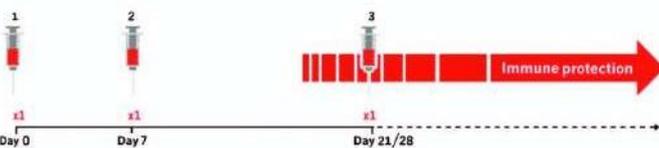
Rabies is **100% preventable**
Vaccinating **70%** of dogs **breaks rabies transmission cycle** in an area at risk
Every dog owner is concerned

28 September • World Rabies Day • #rabies



Pre-exposure prophylaxis

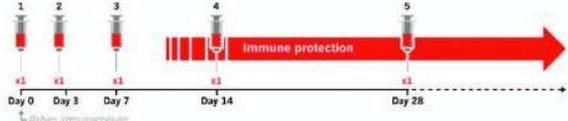
Vaccination dose



Post-exposure prophylaxis administered intramuscularly

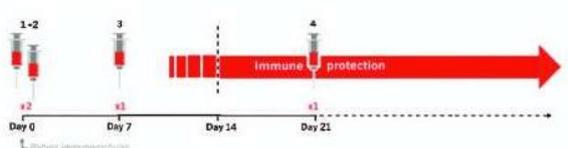
Essen schedule (5-dose)

Vaccination dose



Zagreb schedule (4-dose, 2-site)

Vaccination dose



Two vaccination regimens are approved in India.

The five dose Essen regimen (0.5 mL or 1 mL IM) given on days 0, 3, 7, 14 and 28;
Updated Thai Red Cross regimen (0.1 mL ID, in two sites) given on days 0, 3, 7 and 28.
The vaccine by IM route shall never be given in the gluteal area





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KNOW YOUR DRUG

Ceftazidime/avibactam (Avycaz)

Antibacterial drug with fixed-dose combination medication

composed of ceftazidime, a cephalosporin antibiotic, and avibactam, a β -lactamase inhibitor.



- The recommended dosage of AVYCAZ is 2.5 grams (ceftazidime 2 grams and avibactam 0.5 grams) administered every 8 hours by intravenous (IV) infusion over 2 hours in patients 18 years of age and older with CrCl greater than 50 mL/min

FDA approved indications:

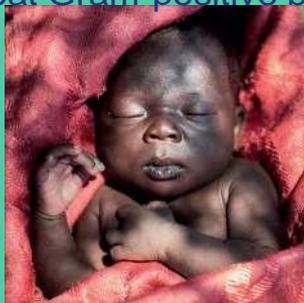
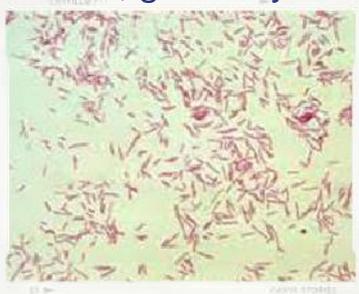
- Complicated intra-abdominal infections. In these cases it is often used in combination with metronidazole, which provides coverage for anaerobic pathogens.
- Complicated urinary tract infections, including acute pyelonephritis, in adults.
- Hospital-acquired bacterial pneumonia and ventilator-associated bacterial pneumonia.

Adverse effects:

- Worsening kidney function and gastrointestinal adverse effects, headache, dizziness, vomiting, nausea, abdominal pain, diarrhea, constipation, and anxiety, Hypersensitivity Reactions, Clostridium difficile-Associated Diarrhea, Central Nervous System Reactions

KNOW YOUR BUG:

- Elizabethkingia meningoseptica organism named after the American scientist “Elizabeth O King” who was studying unclassified bacteria associated with pediatric meningitis at the CDC Atlanta. It (previously Chryseobacterium meningosepticum) is a ubiquitous Gram-negative bacillus, widely distributed in nature, particularly in soil and water.
- Although infections caused by this bacterium are common among immunocompromised hosts, only few case reports are available even among the immunocompetent hosts.
- Moreover, available clinical data from India are limited. It is associated with neonatal meningitis with higher mortality rate (~57%).
- It is commonly associated with nosocomial pneumonia and sepsis both in immunocompromised neonates and adults. It is also considered among the hospital emergent infections related to contaminated medical equipment, especially in neonatal wards. The bacteria is commonly found in saline solutions used for the reconstitution of antibiotics as well as in the water sinks and tanks in healthcare settings.
- E. meningoseptica has a unique antibiotic susceptibility pattern. It is resistant to many antibiotics commonly used to treat infections caused by Gram-negative bacteria such as aminoglycosides, beta-lactam antibiotics, tetracycline, and chloramphenicol.
- However, they are highly susceptible to clindamycin, erythromycin, cotrimoxazole, and quinolones, generally used to treat Gram-positive bacterial infections.





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BREAKING NEWS



1) Tomato Flu outbreak in India

[https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(22\)00300-9/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(22)00300-9/fulltext)



2) A Strain of Multidrug-Resistant Salmonella Newport in Mexico

<https://wwwnc.cdc.gov/travel/notices/watch/salmonella-newport-mexico>

3) Researchers discover potential treatment for Chagas disease

<https://www.sciencedaily.com/releases/2022/09/220908112448.htm>



4) Swimmer's Itch: What Causes This Neglected Snail-Borne Disease?

<https://www.sciencedaily.com/releases/2022/09/220914102234.htm>

5) Researchers Discover One of the Largest Known Bacteria-to-Animal Gene Transfer Inside a Fruit Fly
<https://www.medschool.umaryland.edu/news/2022/Researchers-Discover-One-of-the-Largest-Known-Bacteria-to-Animal-Gene-Transfer-Inside-a-Fruit-Fly.html>





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What's New in the Laboratory



Today's global healthcare challenges like Multi-Drug Resistant Organisms (MDRO) mean that microbiology labs need to be flexible and responsive to provide the right information at the right time.

VITEK® 2 COMPACT instrument offers the capacity to help improve therapeutic success and patient outcomes through reliable microbial identification (ID) and antibiotic susceptibility testing (AST).

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, RAJKOT (GUJARAT)

Upcoming Events



WORLD ARTHRITIS DAY: 12th OCTOBER

GLOBAL HAND HYGIENE DAY: 15th OCTOBER

INFECTION PREVENTION WEEK: 16-22th OCTOBER

WORLD POLIO DAY: 24th OCTOBER