

The background features a repeating pattern of small green circles. Overlaid on this are several large, semi-transparent circles in various shades of green and light blue. Two horizontal lines, one dark green and one light green, cross the page. In the upper right, there are two abstract, glowing, fractal-like shapes in shades of yellow and green.

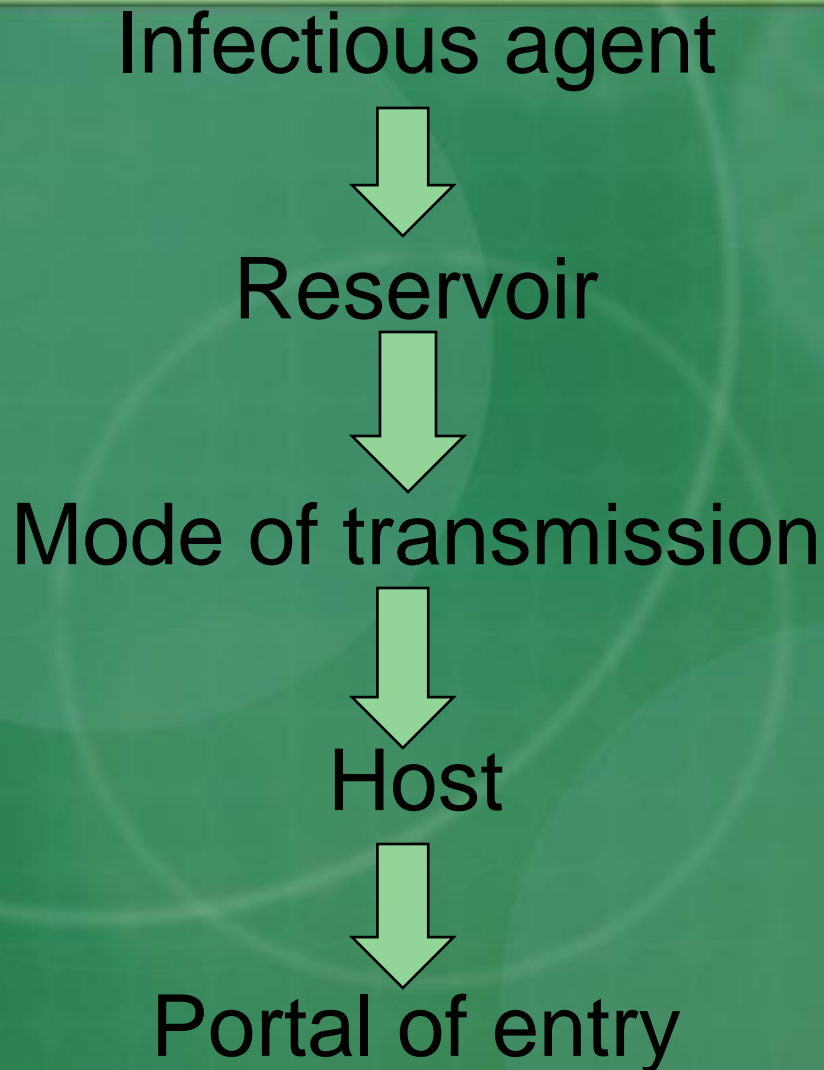
REGION 8 EMS

AUGUST 2010

OBJECTIVES

- Identify various infectious agents, and describe how they are transmitted, and how to prevent further transmission
- Discuss antibiotic-resistant agents; how they occur, and prevention strategies
- Review Peds Shock and Adult Syncope SOPs

HOW ARE GERMS SPREAD?



TYPES OF INFECTIOUS AGENTS



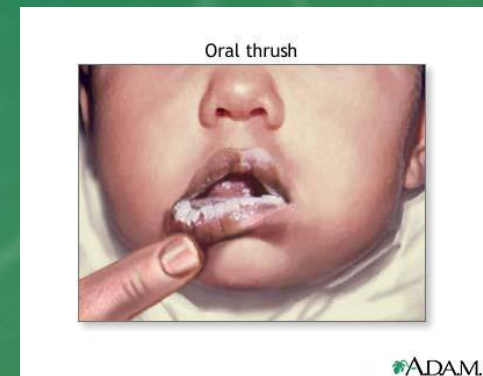
BACTERIA:

Staphylococcus aureus/MRSA; Tuberculosis; C. diff; VRE; Gonorrhea



VIRUSES :

Hepatitis B, HIV, Rhinovirus,
Herpes Simplex, Influenza



FUNGI:

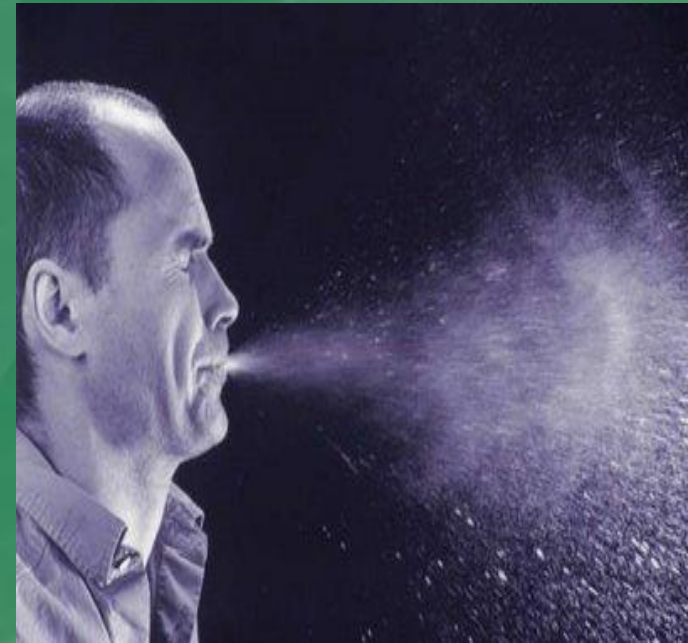
Candida albicans (thrush/diaper rash),
Tinea (athlete's foot, ringworm)

RESERVOIRS



HOW DO GERMS TRAVEL?

- **Contact transmission** – Just as the name implies; germ transmission is by touching/making contact with the infectious agent.
- **Airborne transmission** – Some microorganisms remain suspended in the air for some time; (think TB) and are inhaled by the host.
- **Droplet transmission** – Think coughing and sneezing. Wet, heavy particles loaded with microorganisms. These particles fall to the ground, or land on surfaces quickly, because they are too heavy to remain suspended in the air for very long. In some cases, these microorganisms can live outside of the body on these surfaces; which increases the chance for transmission via direct contact.



GERM TRANSMISSION

- http://www.youtube.com/watch?v=xZBxvk-4QIk&feature=player_embedded

HOW LONG DO GERMS LIVE?

BACTERIA

- C. diff.....5 months
- E. coli.....16 months
- Mycobacterium tuberculosis (TB).....4 months
- Pseudomonas.....5 weeks
- Salmonella typhimurium.....up to 4 YEARS!
(the peanut recall of 2009)
- Staph aureus (including MRSA).....7 months
- VRE.....4 months

FUNGI

- Candida albicans.....4 months

VIRUSES

- HIV.....1 week+
- Hepatitis B.....1 week +
- influenza virus.....3 days
- rotavirus.....2 months

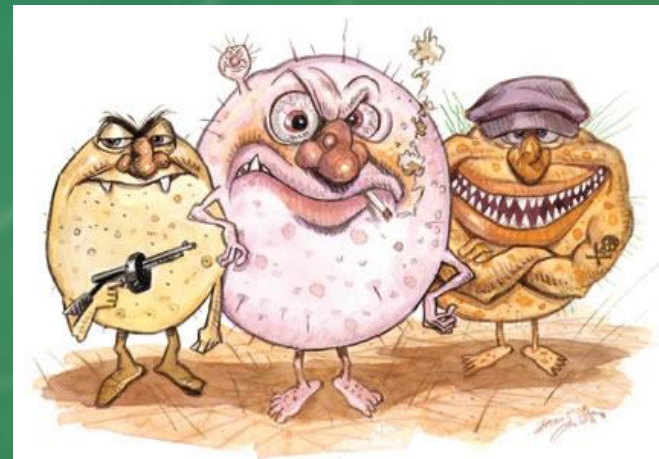
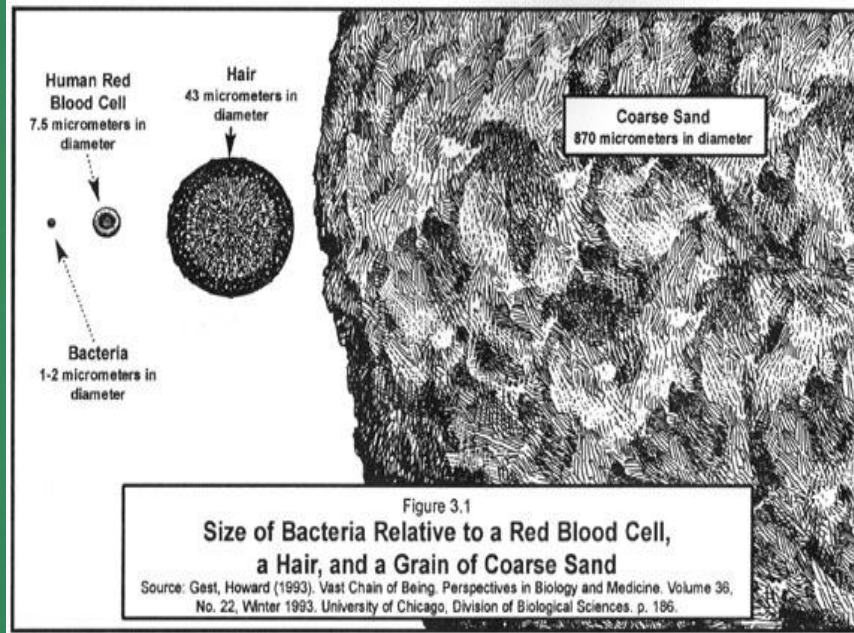


Illustration: Don Smith

SIZE DOES MATTER !!



Germs travel in groups...
pairs, clusters, chains...they are so
small, that 500~1000 bacteria can fit on
the tip of a pin!

**Now that you know how long
some germs can live on surfaces
outside of the human body, is it
any wonder why hand washing
and equipment disinfection is
necessary?!?**

Hand washing is the single best means of preventing the spread of infection



■ Areas most frequently missed during hand washing

■ Less frequently missed

■ Not missed

(Adapted from Taylor L (1978), An evaluation of hand washing techniques - I, Nursing Times, 12 January, pp 54-55)

But, Mom...they're not dirty!



Gross! Reality Check:

How many of us wash our hands, and then use our clean hands to turn off the faucet, or open the bathroom door?

Ring the alarm! Recontamination!

What's on that faucet *and* the doorknob?

URINE and FECAL MATTER!

After washing your hands, use a paper towel to shut off the faucet and to open the bathroom door.



PPE

- Gloves
- Gowns
- Masks/Face Shields



"The patient in the next bed is highly infectious. Thank God for these curtains."



GLOVES

- Useful when in anticipation of and/or direct contact with:
 - Body fluids
 - Patients who are infected/colonized with agents transmitted via direct contact route
 - Potentially contaminated patient care equipment and environmental surfaces
- Donned BEFORE entry into scene/patient's room
- Hand hygiene required following glove removal



ISOLATION GOWNS

- Used to protect your arms and body from contamination with blood/body fluids and other potentially infectious materials
- Always worn in combination with gloves
- Put on **before entering** patient area/room
- Removed **before exiting** patient area/room



MASKS

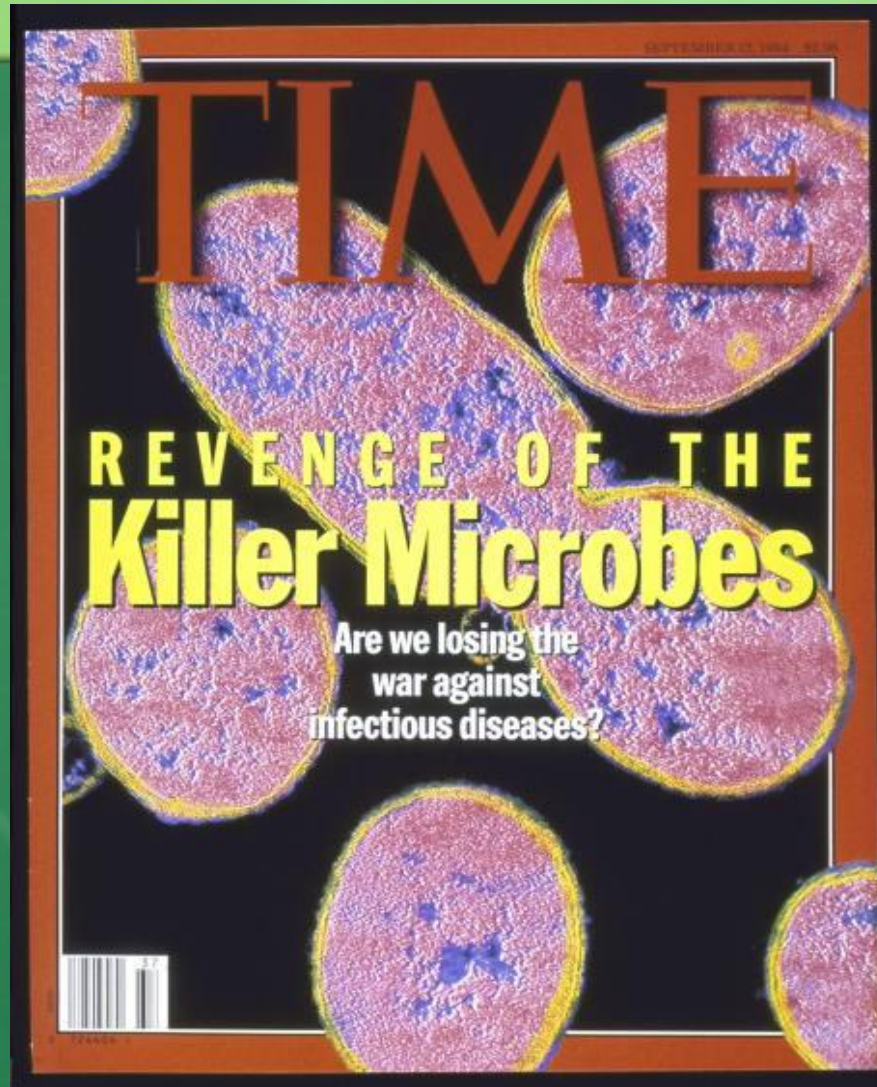
- 3 Primary Uses in Healthcare
- Worn by you:
 - Protects you against contact with infectious material from patients (i.e. respiratory secretions, blood, fluids...)
 - Protects your patient during sterile procedures
- Worn by (coughing) patients:
 - Prevents the potential spread of respiratory infections/secretions to you and others

TRANSPORT OF PATIENTS

- Use appropriate barriers on patient
 - Masks
 - Dressings/Cover areas when infectious skin lesions or drainage are present
- Notify ED staff of impending arrival of patient, and appropriate precautions to prevent transmission

C. diff

MRSA

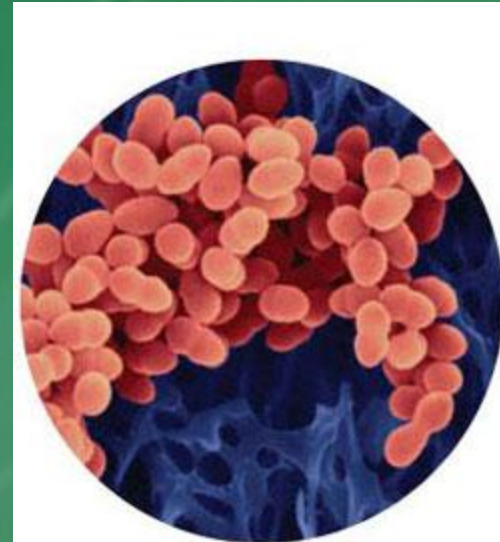


VRE

MRSA

METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS

- Staphylococcus aureus is a bacteria
 - Normally found on the skin and in the nose
 - Can cause infections if it enters a cut or wound
 - People with weakened immune systems (immunocompromised) at highest risk for serious infections
- MRSA is staph bacteria which is resistant to many antibiotics
 - Found in the hospital or community setting
 - Colonized or active infection
- Transmission:
 - Close skin-to-skin contact
 - Openings in the skin such as cuts or abrasions
 - Contaminated items and surfaces such as clothes and athletic equipment
 - Crowded living conditions
 - Poor hygiene (although even very clean people can get staph infections)
- Treatment
 - Supportive care
 - Prevention of transmission



Staphylococcus aureus (MRSA)

SIGNS OF WOUND INFECTION

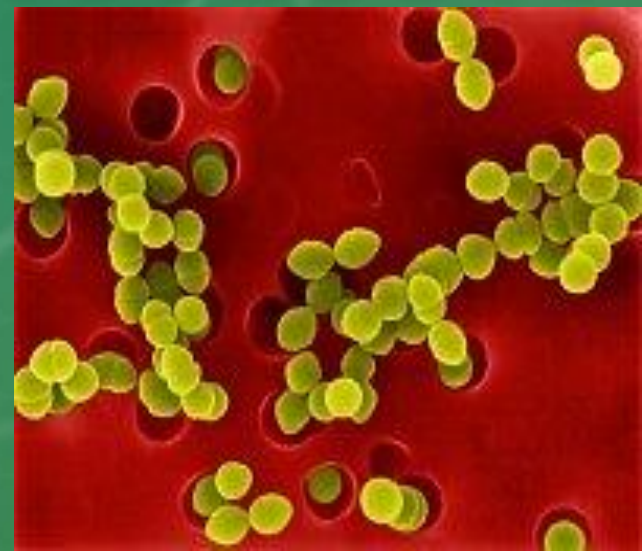
- Redness
- Drainage/Pus
- Swelling
- Pain
- Fever



VRE

VANCOMYCIN-RESISTANT ENTEROCOCCI

- Enterococci are bacteria normally found in the intestine, female genital tract and the environment
- Colonized or active infection
- VRE is enterococci which is resistant to vancomycin
 - Most occur in the hospital setting
- Transmission via direct contact
- EMS Treatment
 - Supportive care
 - Prevention



SCENARIO: YOU ARE CALLED FOR THE 76 Y.O. MALE WITH ABDOMINAL PAIN.

How many times have you been on this call?

Symptoms:

- Watery diarrhea for 2 days
- Abdominal cramping & nausea
- Fever
- NKDA
- ASA, metoprolol, ciprofloxacin
- Htn, UTI

What could be the cause?

C. DIFF

- Symptoms
 - Watery diarrhea 2-3 times/day for 2-3 days
 - Abdominal cramping
- Treatment
 - Antibiotics: Flagyl or Vancomycin
 - Supportive care (IVF's, etc.)
 - Prevention of transmission

C. DIFF

Prevention of transmission is essential!

- Gloves/gowns
- Hand Washing...not antiseptic gel
- Thorough cleaning of equipment

Recent studies show that number of cases of C. diff is surpassing those of MRSA!

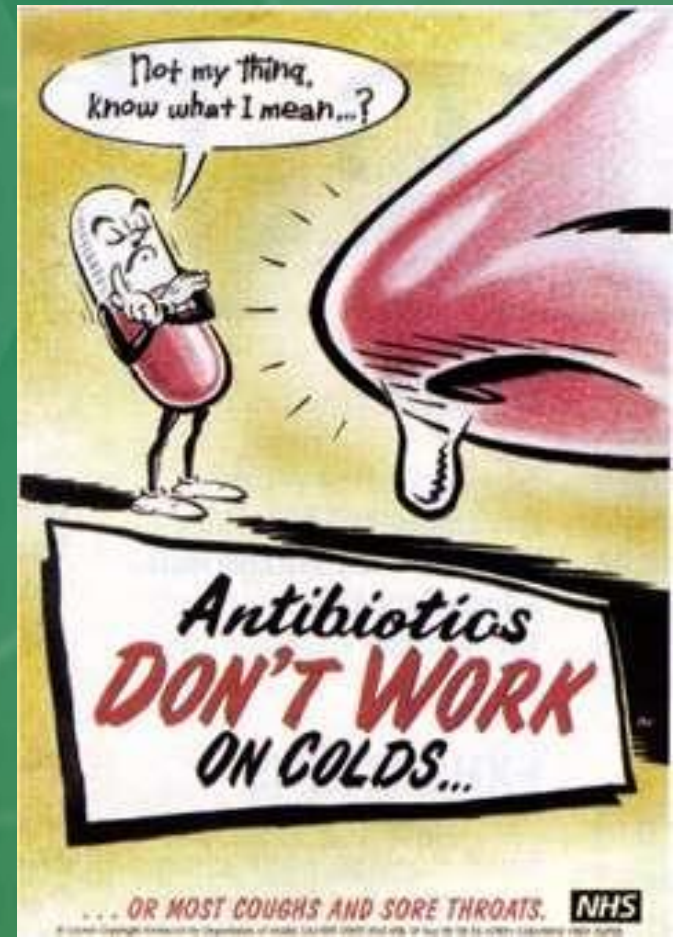
WHAT CAUSES ANTIBIOTIC RESISTANCE?

Most are caused by humans

Unnecessary antibiotic use

Improper antibiotic usage

Antibiotics in food and water



**DOES ALL THIS TALK ABOUT
GERMS MAKE YOU WANT TO
WALK AROUND LIKE THIS?**



SOP OF THE MONTH

- Pediatric Shock (with sepsis highlighted)
- Adult Syncope

PEDIATRIC SHOCK

BLS / ALS

1. **Pediatric Initial Medical Care**
2. Supine or shock position
3. Control bleeding as appropriate

ALS

1. Secure Airway as appropriate

Obstructive Shock (Tension Pneumothorax)

1. **NEEDLE CHEST DECOMPRESSION** per System procedure

Distributive Shock (Suspected Sepsis)

5. Establish **VASCULAR ACCESS IV / IO**
6. Administer **FLUID BOLUS 20 mL/kg**
7. If suspected allergic reaction, refer to Allergic Reaction / Anaphylaxis SOP
8. If no response to initial fluid bolus, **repeat fluid boluses 20 mL/kg**. May repeat x 2 to a maximum of 60 mL/kg.

Cardiogenic Shock (Congenital Heart Disease / Cardiac Surgery / Post-Cardiac Arrest)

5. Establish **VASCULAR ACCESS IV / IO**
6. Treat any cardiac rhythm disturbance per appropriate SOP
7. Consider **FLUID BOLUS 20 mL/kg**
 - Caution – fluids may need to be restricted in Cardiogenic Shock

Hypovolemic Shock (Suspected Dehydration / Volume Loss / Hemorrhagic Shock)

5. Establish **VASCULAR ACCESS IV / IO**
6. Administer **FLUID BOLUS 20 mL/kg**
1. If no response to initial fluid bolus, **repeat fluid boluses 20 mL/kg**. May repeat x 2 to a maximum of 60 mL/kg.

ADULT SYNCOPE / NEAR SYNCOPE
Non-traumatic loss of consciousness

BLS/ALS

1. **Initial Medical Care**
2. Obtain and record blood glucose level (BLS - if available.) If < 60, treat per Diabetic / Glucose Emergencies SOP

BLS

1. Expeditious transport. Contact Medical Control enroute

ALS:

STABLE: alert, normotensive

- Special considerations:
 - Monitor ECG continually enroute
 - Consider 12-lead ECG
 - Document changes in GCS
3. Anticipate underlying etiologies and treat according to appropriate SOP:
 - Metabolic Diabetes or Poisoning/Overdose SOP
 - Cardiac Appropriate Dysrhythmia or Cardiogenic Shock SOP
 - Hypovolemic Fluid Resuscitation
 - CNS Disorder See appropriate Medical or Trauma SOP
 - Vasovagal Initial Medical Care

UNSTABLE: altered mental status and/or signs of hypoperfusion

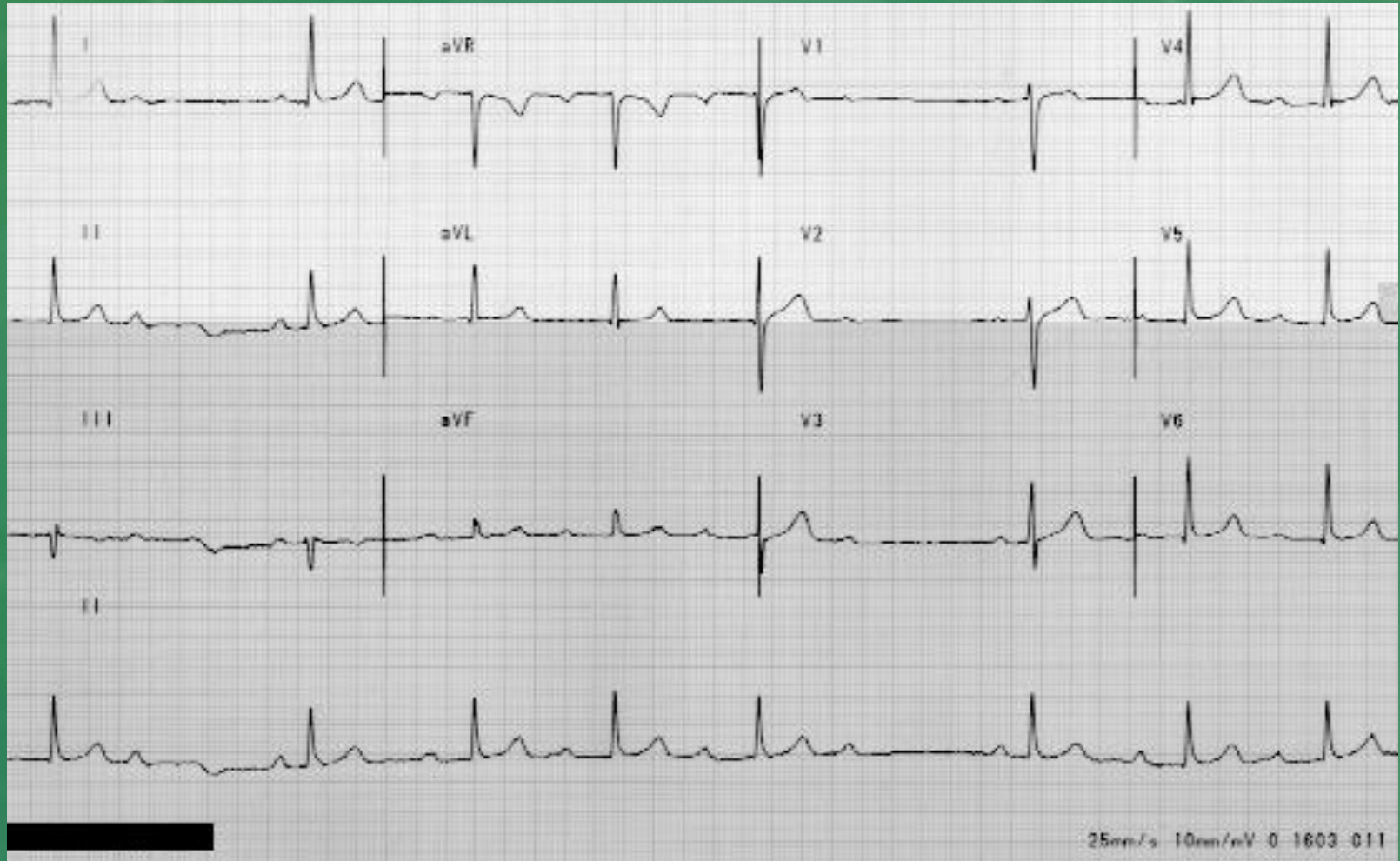
If lungs clear and hypoperfusing:

4. **IV FLUID CHALLENGES in 200 mL increments**

If indicated by decreasing sensorium and pinpoint pupils, depressed respirations, and possible history of narcotic / synthetic narcotic ingestion:

4. **NARCAN 2 mg IV/IN. May repeat NARCAN q 5 minutes PRN if transient response observed**

EKG OF THE MONTH



QUESTIONS?

BASIC INSTRUCTIONS

How to Slow the Spread of Germs

by Scott MEYER

Diseases lurk all around us. We all have a duty to slow the spread of germs, but many of us don't know how.



One way to slow germs' progress is to use anti-microbial hand sanitizer to kill any germs clinging to your skin.



Experts suggest you cough into the crook of your arm. This keeps your hands germ free, and makes you look insane, causing healthy people to avoid contact with you.



I recommend that you sneeze into a megaphone. This allows you to channel the germs away from people you don't want to infect, and focus them like a laser on those you do.

