The patient's sick…blame Respiratory! Wait…whaaat?

An RT's brief guide to infection prevention.

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Disclosures

- No one is sponsoring this talk, really.
- I, Cassie Molina DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

Disclosures

- Cassie J Molina, BS RRT CIC

Within the past 12 months, the presenter or their spouse/partner have had a financial interest/arrangement or affiliation with the organization listed below.

- Clorox Product evaluator

Objectives

- Understand some historical data regarding infection prevention
- Basic knowledge of multi drug resistant bacteria
- Reduce complacency (I HOPE!)
- Teach you some helpful tips and tricks to prevent infections in your patients
- Maybe you'll be inspired to CLEAN SOMETHING!!!

Little background

- Mom of a NICU Grad who had a hospital acquired fungal septicemia & nearly **DIED**
- Went into Respiratory because of RTs
- UCF grad…GO KNIGHTS!!
- Critical Care RT
- Went into IC after several years in PICU
- NEVER understood infection prevention until I began to work in the IC field!!
- How many RRTs are in the IC field? Very few!

History of Infection Prevention

- Florence Nightingale – Respiratory secretions were dangerous….
- Delivery room MDs in 1800's – everyone thought they were NUTS

Am I at fault for spreading infections?

- Yes. I'm sure I have.
- Not a proud realization…
- NO ONE came to our staff meetings to discuss infection prevention or hand hygiene!
- 1990s: Didn't understand drug resistant bacteria, mechanisms of transmission
- Every vent patient had Pseudomonas or yeast
- It was the acceptable norm – **doesn't make it right!!**

Gross factoids…

- The number of germs on your fingertips **doubles after using the toilet**, especially on the hand that wipes.
- 80% of all infections are transmitted via contact, the NUMBER ONE contact is TOUCH.

- A recent APIC Journal article suggests increased study is needed for “toilet spray”, bacteria and viruses have been found in toilet spray after several flushes. This suggests that viruses such as norovirus may linger in toilet water longer than we would like….

A tiny amount of knowledge:

- Smart germs (AKA multidrug resistant bacteria or organisms OR MDRO)
- Antimicrobial agents
- Transmission
- Hand Hygiene
- Dirty equipment

How those germs get so smart

They go to Florida Southwestern State College!

Really…

- Multidrug resistant bacteria become resistant many ways:
  - Produce enzymes that deactivate antimicrobial agents (ESBL, KPC)
  - Change their RNA structure
  - Change their cell wall structure
  - Reproduce like maniacs!

Antimicrobial agents

- Are supposed to essentially invade the bacteria's cell wall structure and either destroy or weaken it
- Cause the cell to become sterile or blow up
- Doesn't work with ESBL organisms

Then why is the patient's infection MY FAULT???

- Hand hygiene, on average, is only around 47%
- People do stupid things like:
  - Use tap water to clean wounds, suction ETTs, trachs
  - Ignore warnings such as patient symptoms, histories, or + cultures
  - Fail to clean equipment between patients
  - Refuse to wear PPE… "It's too hot"…

Transmission

- Also includes:
- Respiratory Droplets
- Stool (fecal-oral)
- Contact w/blood and body fluids
- Indirect contact (touch a surface)
- Needlesticks
- Contaminated food & water
- Contaminated objects (your pulse ox??)
- Insects/Animals (not common within the hospital?)

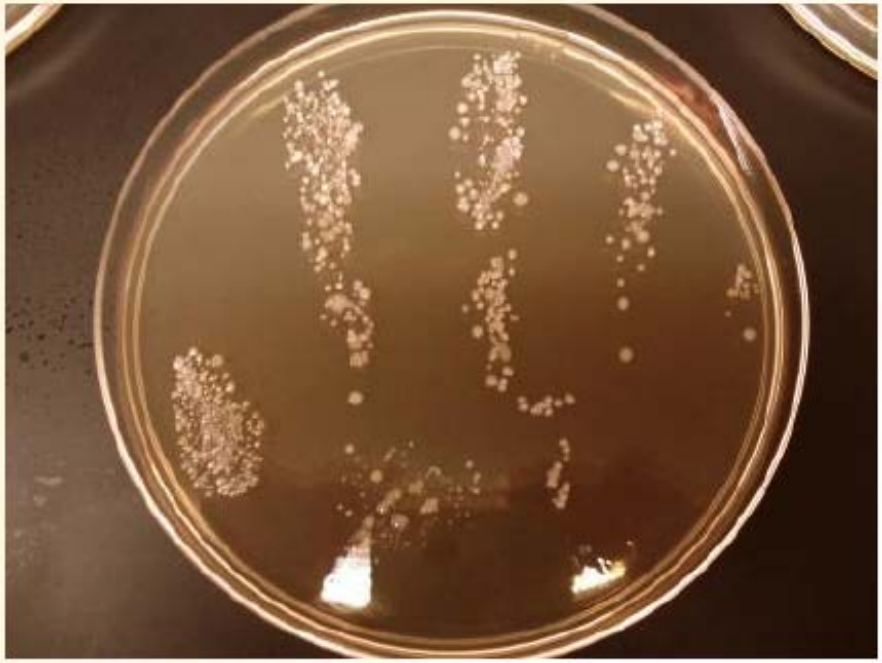
But I was just talking*

* Photo courtesy of Francis P. Mitrano, MS, RPh, Director of Pharmacy, Beth Israel Deaconess Medical Center, Boston, MA, November, 2005.

Hand hygiene

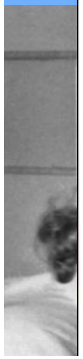
- 70% of infections can be prevented by hand hygiene…
- What is hand hygiene??
  - Soap and water
  - Alcohol gel (at least 62%)
  - You need at least 70% to sort of affect norovirus FYI

Hand hygiene[1] is paramount to safety, as this agar imprint of an unwashed hand shows[2]



1 http://www.cdc.gov/handhygiene/
2 E Larson. *Am J Nurs, AJN*. July 1989: 935


HANDS HANDS HANDS
SCRUB & WASH THEM..
KEEP THEM OUT OF FOOD
FINGERS IN FOOD
NOT WANTED



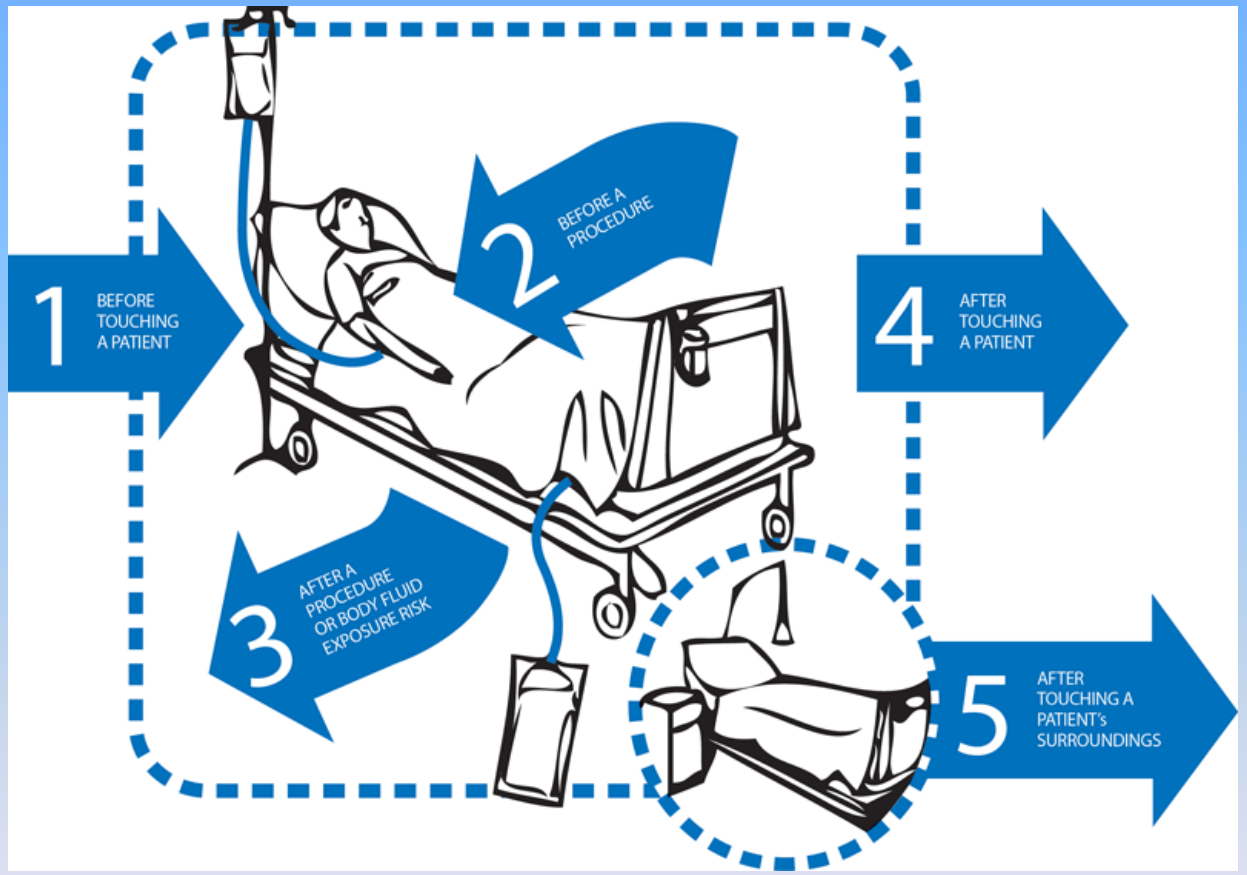

Wellbee
says:
be well
be clean
/ASH YOUR HANDS
Wash hands
ith soap and
ater.
2. Clean finger-
nails with
toothpick.
3. Rinse under
warm running
water.
4. Wipe hands
on your own
clean towel.


CLEAN HANDS
GUARDIANS OF HEALTH
ALWAYS
WASH HANDS THOROUGHLY — CLEAN FINGER NAILS
1. BEFORE BEGINNING TO PREPARE OR SERVE FOOD
2. ALWAYS AFTER USING THE TOILET
3. WHENEVER HANDS BECOME SOILED
GET THE CLEAN HANDS HABIT

How to wash your hands…

- Turn the water on. (Prepare paper towel in advance if there is not an automatic dispenser.)
- Wet your hands.
- Apply a pump or two of soap.
- Lather your hands, use friction to scrub all surfaces, fingers, thumbs, wrists.
- Do this for at least 15-20 seconds.
- Rinse your hands.
- Dry your hands with a paper towel.
- Use the paper towel to turn off the water and exit the restroom.
- Discard the used paper towel.

When to wash:

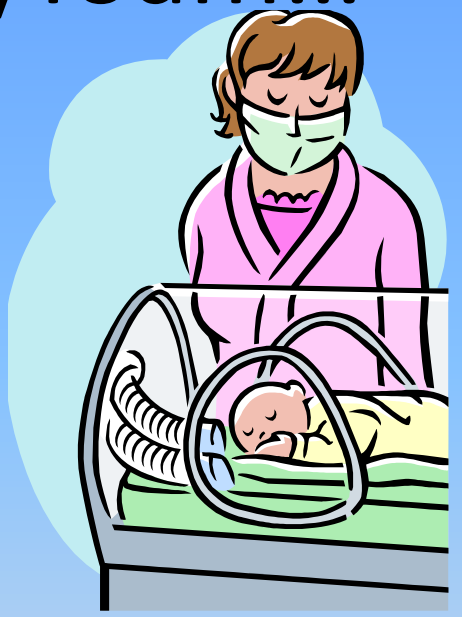


Source: World Health Organization www.who.int

Other times to wash:

- Before and after you eat or prepare food.
- Before and after personal hygiene activities.
- If your hands are wet, sticky, have something gross on them.
- Before and after you smoke (if you do).
- After any first aid activity.
- After working with a patient who has something that won't die with alcohol foam. SUCH AS: C. diff, some types of viruses that cause pink eye, and in less than 70% concentrates, Norovirus.
- Before and after all patient care activities.
- Of course: after touching animals or their waste.
- After feeding a pet.
- After touching garbage.

How to use alcohol gel/foam…



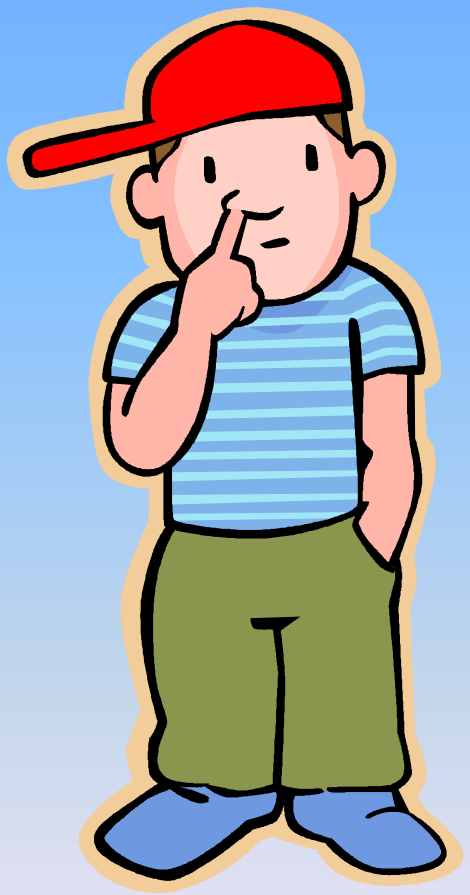
- Squish it on your hands
- Rub
- Let it dry
- Done!
- We would have done ANYTHING for this product in the 1990s!!!

How to kill C. diff

- Interestingly you really can't.
- Sorry.
- Alcohol gels/foams will not kill it, you have to drown them….
- You must emulsify the soap to remove the spores…ever try to make mayonnaise?

CLEAN YOUR EQUIPMENT!!

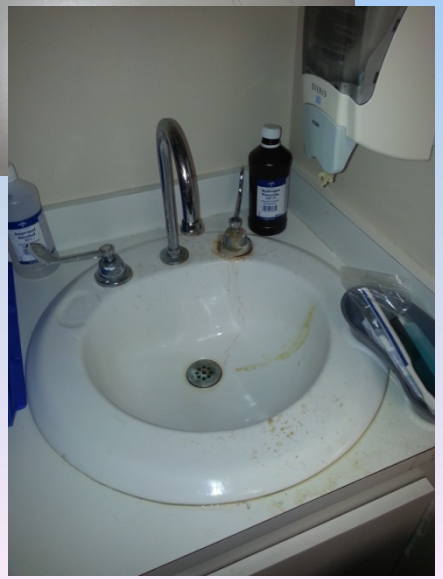
- Seriously, look at your equipment
- What's in your pocket, the only tool the RT loves to hate…the pulse ox….
- And where does this thing go?
- Know how to clean your equipment – what is the kill time of the disinfectant you're using?



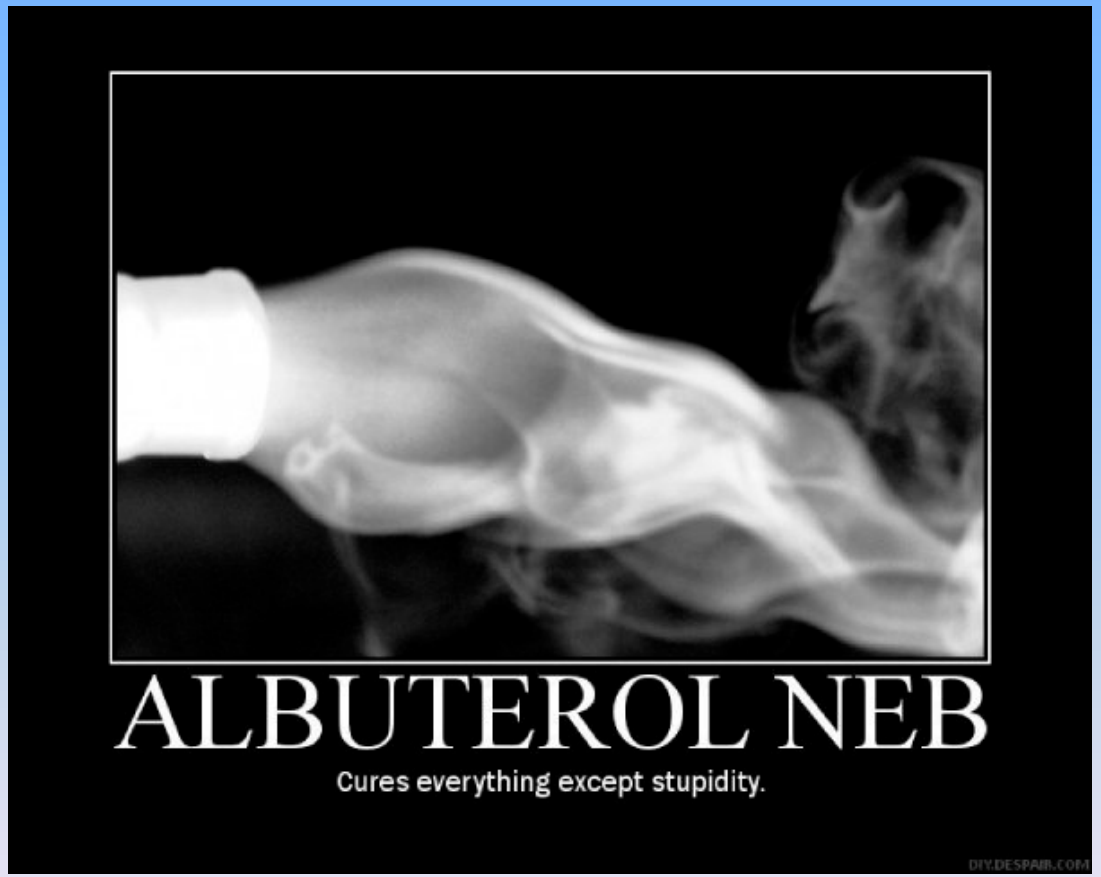
And you're telling me RT equipment is dirty??

- Yup.
- You're lucky I lost the dirty vent pictures.

Reservoirs



Why do RTs catch the blame??



- Not only is our hand hygiene poor but…
- Our equipment is dirty…
- And Albuterol cures EVERYTHING so we see nearly EVERY patient in the hospital!!!

Also, studies say we have nasty practices…

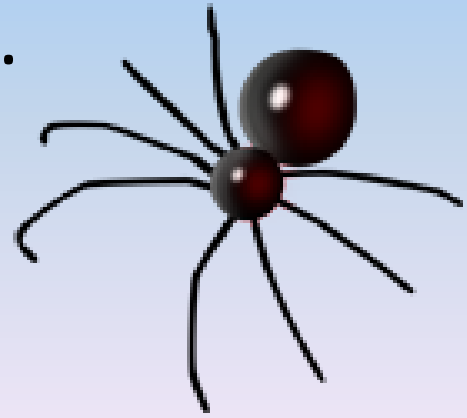
- Contaminated humidification equipment (reservoir nebulizers)
- Tap water used for trach care
- Peak Flow Meter
- Manometer used to calibrate equipment

But we all have ___, right??

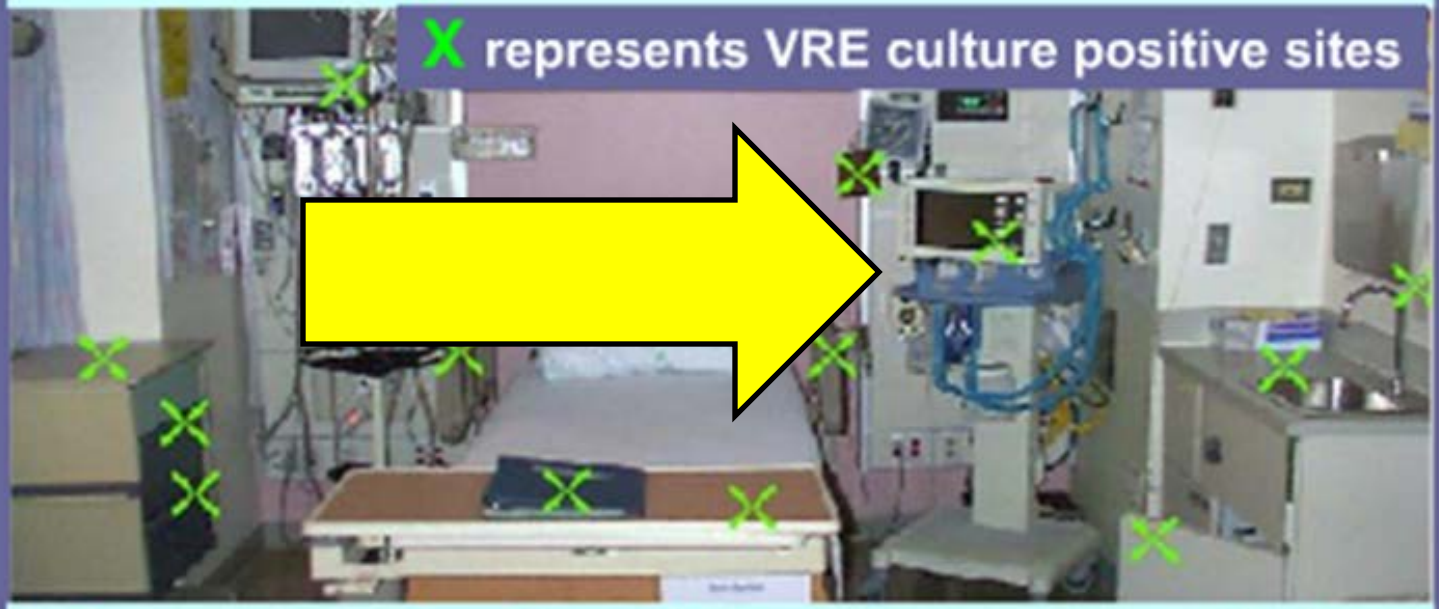
- Nope. So stop being so lax!!
- We don't all have MRSA. We are not all colonized with C. diff.
- MRSA isn't gone because the infected foot is gone.
- MRSA's not "just in the nares".
- Colonization is NOT infection but the spread is the same!
- 20-30% of population colonized with Staph aureus, <2% colonized with MRSA. (CDC)

MRSA

- 1st found in 1960s in healthcare.
- CA MRSA since 1990s.
- HAI MRSA declining in healthcare (was >50% of all S. aureus infections in ICUs in 1990s).
- BSI rates dropped by 50%.
- CA MRSA typically skin infections.
- Google “It’s not a spider bite, it’s Community acquired MRSA”



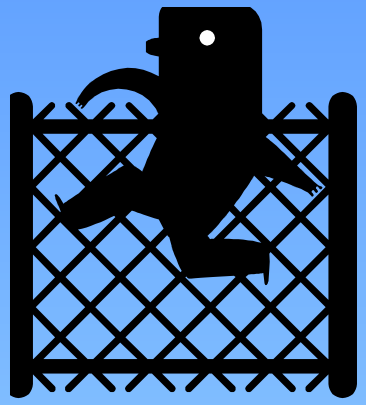
The Inanimate Environment Can Facilitate Transmission



~ Contaminated surfaces increase cross-transmission ~

Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE (+) Patient Environment. Hayden M, ICAAC, 2001, Chicago, IL.

ESKAPE: A new threat



- *Enterococcus faecium*
- *Staphylococcus aureus*
- *Klebsiella pneumoniae* (ESBL capable)
- *Acinetobacter baumannii* (HIGH rate of resistance)
- *Pseudomonas aeruginosa* (ESBL capable)
- *Enterobacter* (ESBL capable)

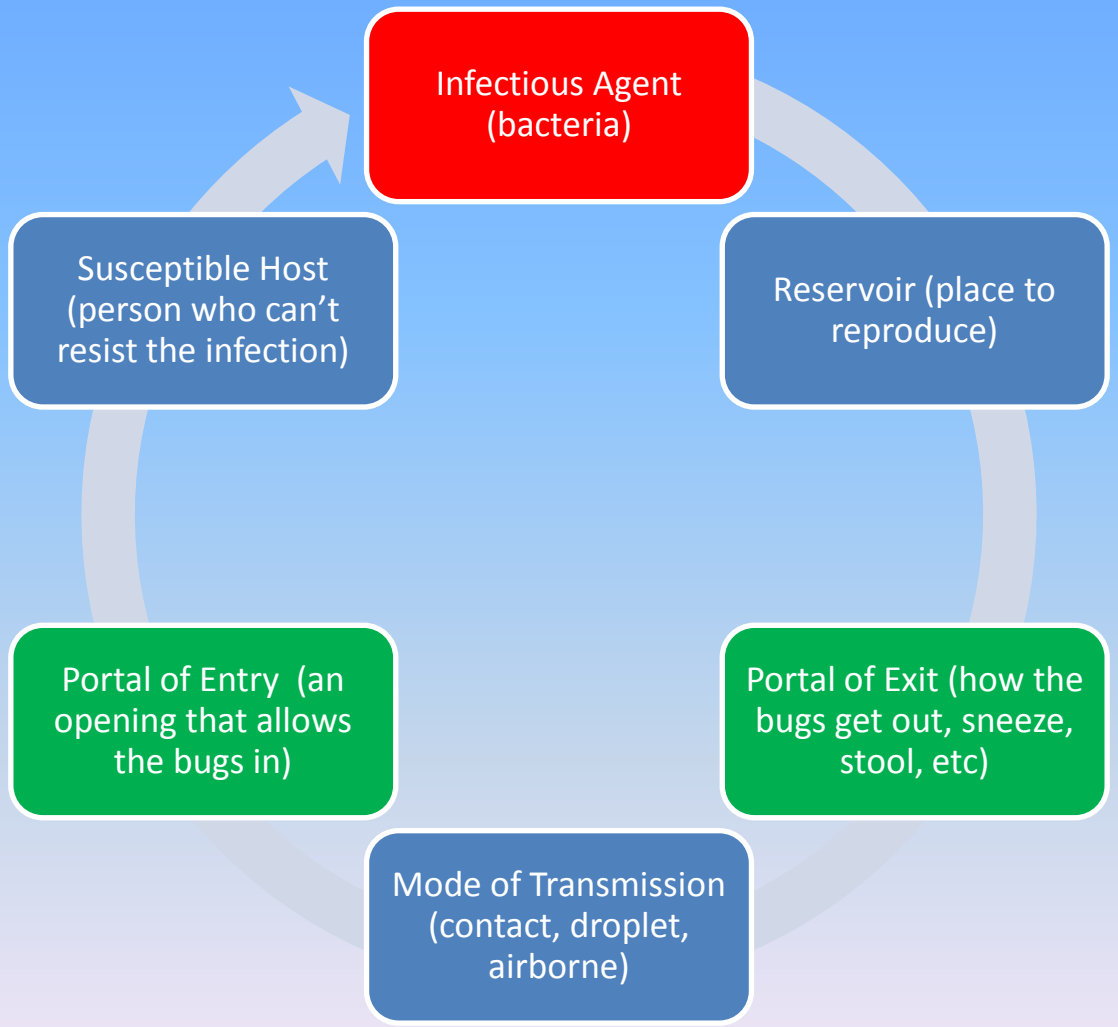
HIGH rate of antimicrobial resistance with ESKAPE pathogens….HUGE problem for patients & physicians.

40% of all infections in ICU are ESKAPE pathogens!

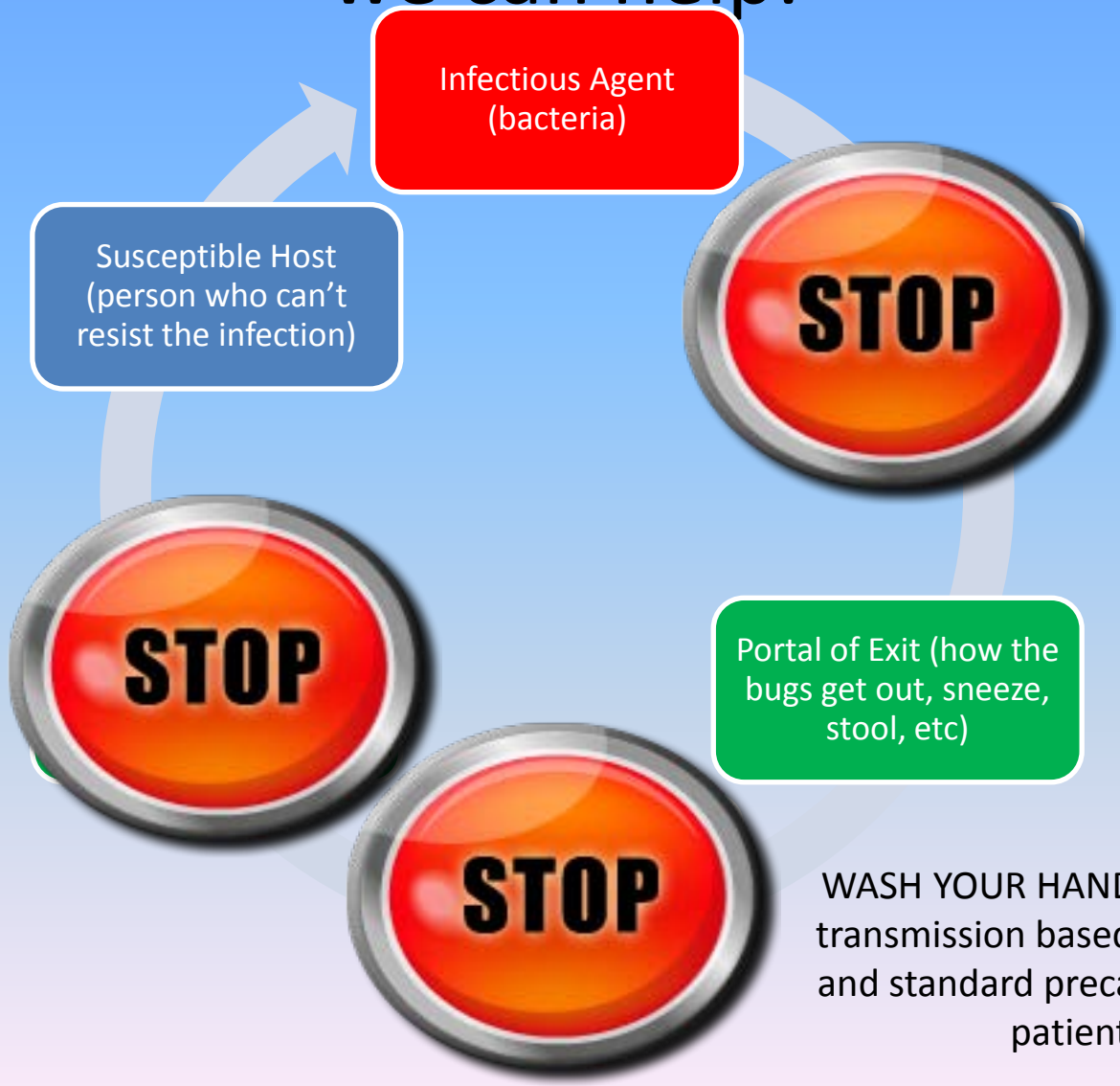
Length of Survival on Surfaces

- Acinetobacter: 3 days – 5 MONTHS
- C. diff: 5 MONTHS
- VRE: 5 days – 4 MONTHS
- Klebsiella (common UTI culprit): 2 hours - >30 MONTHS
- MRSA & S. aureus: 7 days – 7 MONTHS

Transmission cycle



STOP the transmission cycle – the things we can help:



Disinfection of surfaces stops bacteria from spreading.

Get those lines , tubes and foleys out! Fewer highways = less traffic!

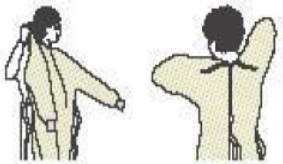
WASH YOUR HANDS! Proper use of transmission based guidelines (PPE) and standard precautions minimizes patient risks.

PPE per CDC

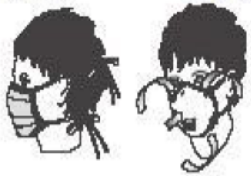
Protective Equipment (PPE)

DONNING PPE

GOWN
- Fully cover torso from neck to knees, arms to end of wrist, and wrap around the back
- Fasten in back at neck and waist

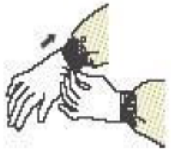


MASK OR RESPIRATOR
- Secure ties or elastic band at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



GOGGLES/FACE SHIELD
- Put on face and adjust to fit

GLOVES
- Use non-sterile for isolation
- Select according to hand size
- Extend to cover wrist of isolation gown



SAFE WORK PRACTICES
- Keep hands away from face
- Work from clean to dirty
- Limit surfaces touched
- Change when torn or heavily contaminated
- Perform hand hygiene

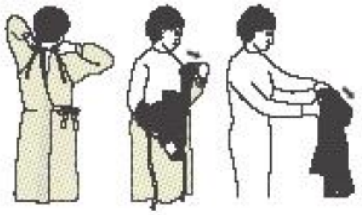
REMOVING PPE

Remove PPE at doorway before leaving patient room or in anteroom

GLOVES
- Outside of gloves are contaminated!
- Grasp outside of glove with opposite gloved hand; peel off
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist

GOGGLES/FACE SHIELD
- Outside of goggles or face shield are contaminated!
- To remove, handle by "clean" head band or ear pieces
- Place in designated receptacle for reprocessing or in waste container

GOWN
- Gown front and sleeves are contaminated!
- Unfasten neck, then waist ties
- Remove gown using a peeling motion; pull gown from each shoulder toward the same hand
- Gown will turn inside out
- Hold removed gown away from body, roll into a bundle and discard into waste or linen receptacle

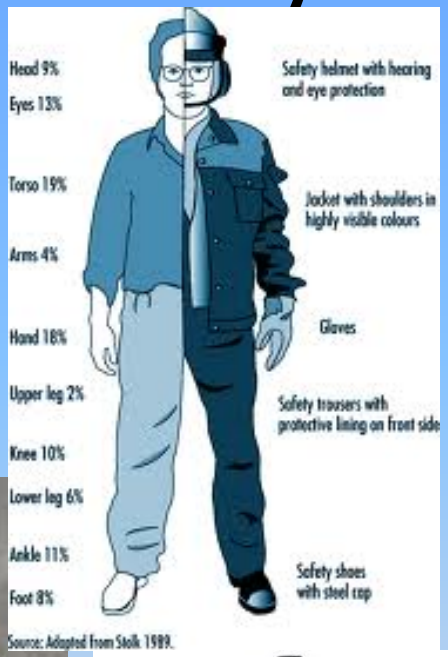


MASK OR RESPIRATOR
- Front of mask/respirator is contaminated – DO NOT TOUCH!
- Grasp ONLY bottom then top ties/elastics and remove
- Discard in waste container

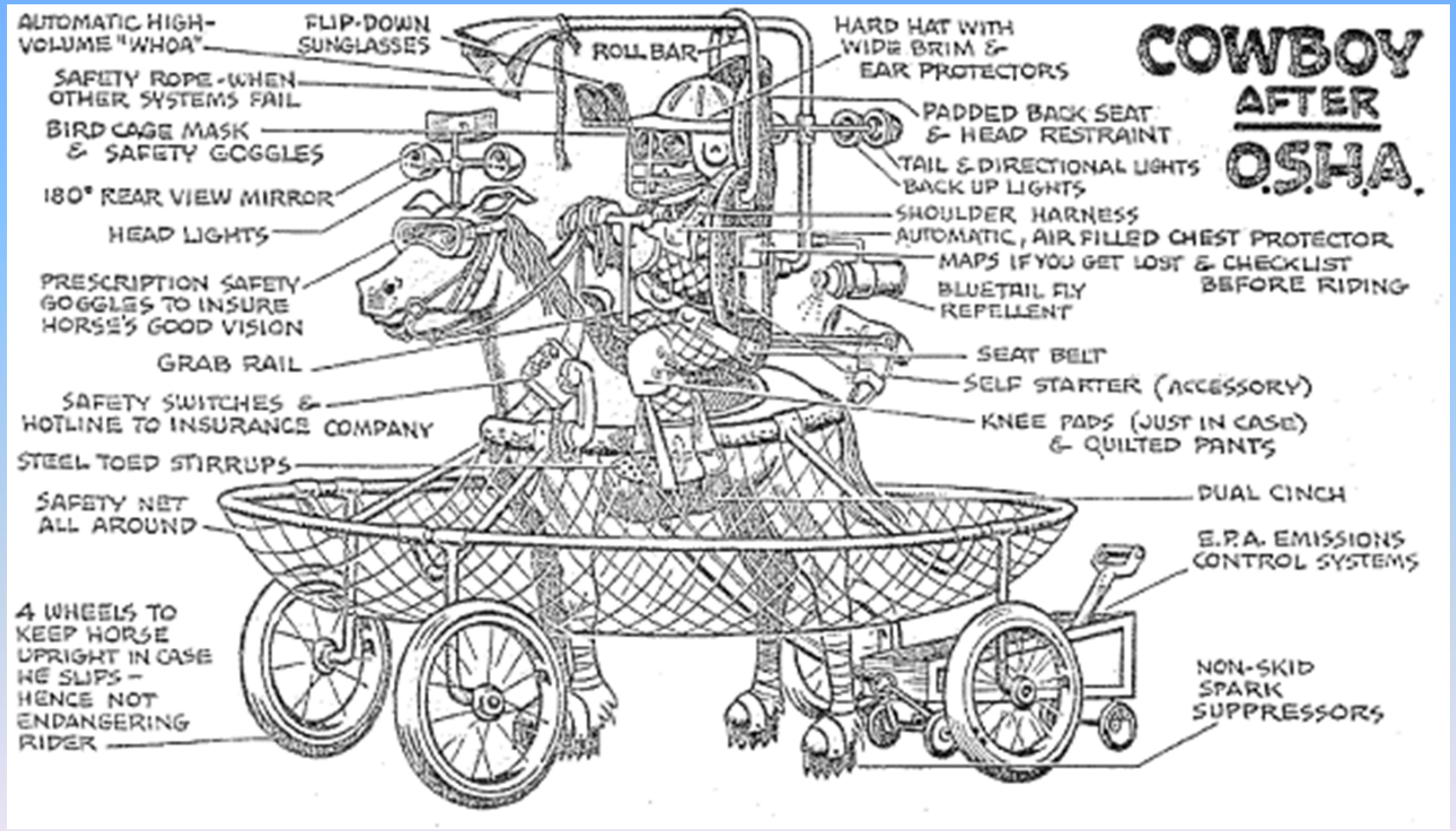
HAND HYGIENE

Perform hand hygiene immediately after removing all PPE!

How PPE really feels….



If OSHA dictated PPE to Cowboys…



Hard facts

- 90,000 people are in the ICU in the US on any given day.
- ICUs put 5,000,000 lines into patients each year and after 10 days 4% are infected.
- Line infections occur in 85,000 people per year and are fatal between 5 and 38% of the time. (That's 4,250 to 32,300 people!!)
- Approximately 50% of antibiotic use in hospitals is unnecessary or inappropriate.

Who will you infect? Or will you be infected? Will someone you love?

So…I challenge YOU!

- What are you going to do with your new knowledge?
- How are YOU going to prevent infections in your patients?
- Can you go back to your departments and teach at least 5 other people how to do things right??
- Challenge them to teach 5 others…Prove everyone wrong…

RTs are AMAZING!!!

And are **NOT the source of all disease**!!

- http://download.journals.elsevierhealth.com/pdfs/journals/0196-6553/PII0196655383900068.pdf
- http://download.journals.elsevierhealth.com/pdfs/journals/0196-6553/PIIS0196655311001064.pdf
- http://download.journals.elsevierhealth.com/pdfs/journals/0196-6553/PII0196655394900205.pdf
- http://www.niaid.nih.gov/topics/antimicrobialresistance/examples/mrsa/pages/history.aspx
- Van Delden C, Iglewski BH. Cell-to-Cell Signaling and *Pseudomonas aeruginosa* Infections. Emerg Infect Dis. 1998, Dec [March 22, 2013]. Available from http://wwwnc.cdc.gov/eid/article/4/4/98-0405.htm
- Munoz-Price LS. Long-term acute care hospitals. Clinical Infectious Diseases 2009;49:438-43.
- CDC Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE). 2012 CRE Toolkit.
- http://www.cdc.gov/HAI/organisms/cre/
- Public Health Image Library http://phil.cdc.gov/phil/quicksearch.asp
- Interventional evaluation of environmental contamination by vancomycin-resistant enterococci: failure of personnel, product, or procedure? http://dx.doi.org/10.1016/j.jhin.2008.10.030


ATTENTION:
EMPLOYEES MUST WASH PAWS, CLAWS AND/OR TENTACLES BEFORE RETURNING TO WORK
DO NOT EAT THE SOAP
Let's Work Together!
M.I. Management