

Imperatives for Infection Prevention and Control: An Overview

July 18, 2018

Georgia Sands

Infection Preventionist



Disclosures

- Nothing to disclose



Objectives

- Line-Associated Infections
- Surgical Site Infections
- High-Level Disinfection/Sterilization
- Quality Measures of HLD/S
- Multi-drug Resistant Organisms
- Standard versus Transmission-Based Precautions
- Environmental Controls
- References



Line-Associated Infections



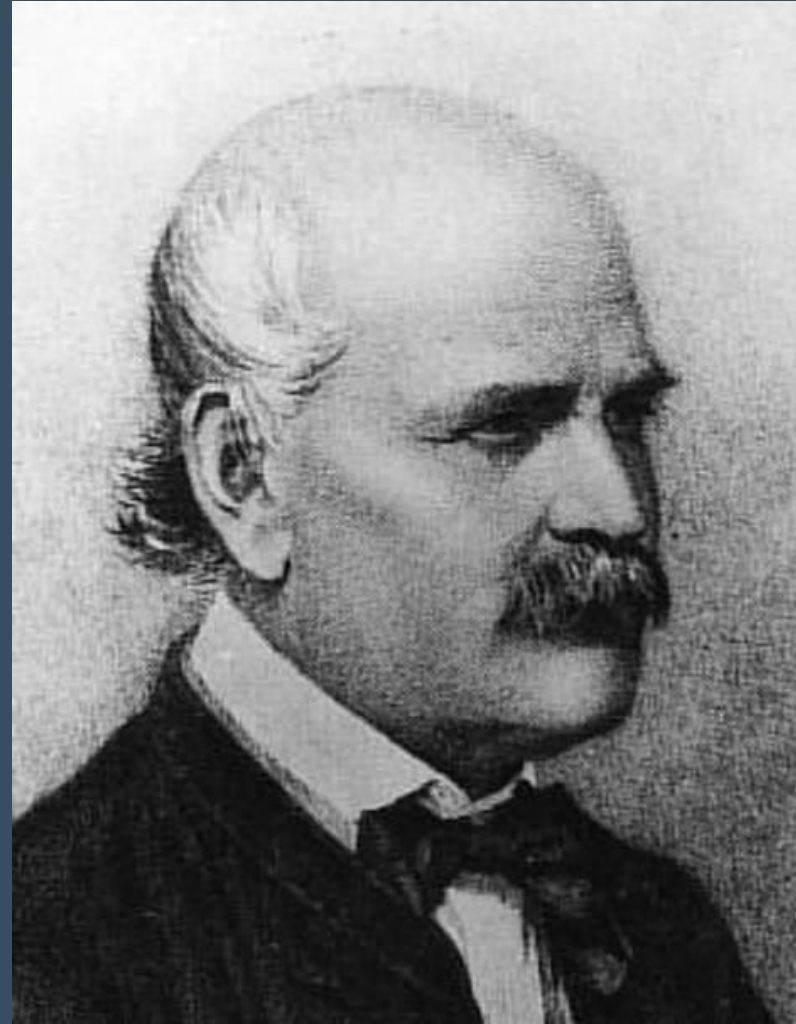
Hand Hygiene

- Hand Hygiene and Your Normal Flora
- Products
- Factors influencing hand hygiene compliance
 - Irritation from products
 - Busy
 - Forgot
 - Product not available



Ignaz Semmelweis

- The “Savior of Mothers”
- Identified hand hygiene practices as way to prevent post-partum death



Line-Associated Infection Definitions

- Central line-associated blood stream infections (CLABSIs)
- Catheter-associated urinary tract infections (CAUTIs)
- Ventilator-associated events (VAEs)
- Pneumonia (PNU)



CLABSIs

- Any line that terminates in a major vessel (e.g. superior vena cava).
- Internal jugular access are more prone to infection when compared to subclavian lines.
- **Avoid femoral lines!**
- Maintain aseptic technique when changing dressings.
- Scrub hubs for 15 seconds.
- Can the line be removed?
- Following Catheter Bundles.

CAUTIs

- Does the urinary catheter need to be in place?
- Why?
- What other measures can we take to avoid urinary catheters?
- Bladder scan, condom catheters, female catheters.

VAEs

- Ventilator
- Changes in FiO_2 and PEEP
 - PEEP increase $>3\text{cmH}_2\text{O}$
 - FiO_2 increase $>20\%$
- Antimicrobial days
- Respiratory sputum (Lung butter) production

VAP

- Ventilator-associated pneumonia (VAP)
- Pneumonia criteria
 - Clinical presentation
 - Laboratory findings
 - Radiographic evidence



Surgical Site Infections (SSI)



SSI Classifications

- Superficial
- Deep
- Organ Space



SSI Types

- COLO
- HYST
- HPRO
- KPRO



High-Level Disinfection/Sterilization (HLD/S)

- Source of the guidelines:
 - AAMI Standards 58, 79, 91
 - Dr. Rutala



Quality Measures of HLD/S

- Adenosine triphosphate (ATP) swabbing
- Lumenal checks (e.g. Channel Check[®], Resi-Test)



Quality Measures

- Healthmark ChannelCheck™
- 3M ATP Swab



Multi-drug Resistant Organisms (MDROs)



Defining MDROs

- Organisms, usually bacteria, which are resistant to ≥ 1 antimicrobial drugs.



MDROs

- MRSA
- VRE
- ESBL
- CRE
- *Candida auris*
- MDRO TB



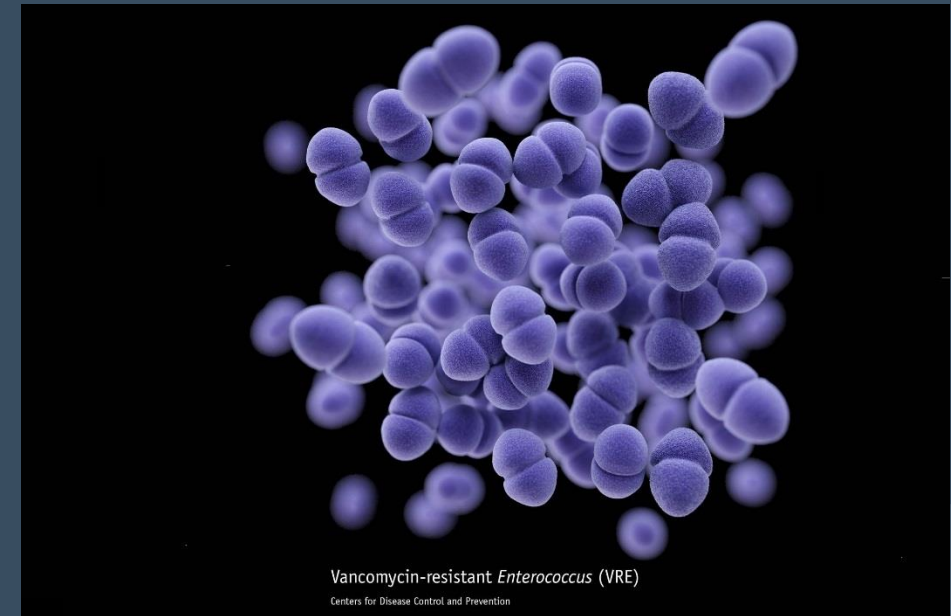
MRSA

Methicillin-resistant *Staphylococcus aureus*



VRE

Vancomycin-resistant Enterococcus



ESBL

Extended-Spectrum Beta Lactamase-Producing Enterobacteriaceae



CRE

Carbapenem-Resistant Enterobacteriaceae



Candida auris

Fungal



MDRO TB

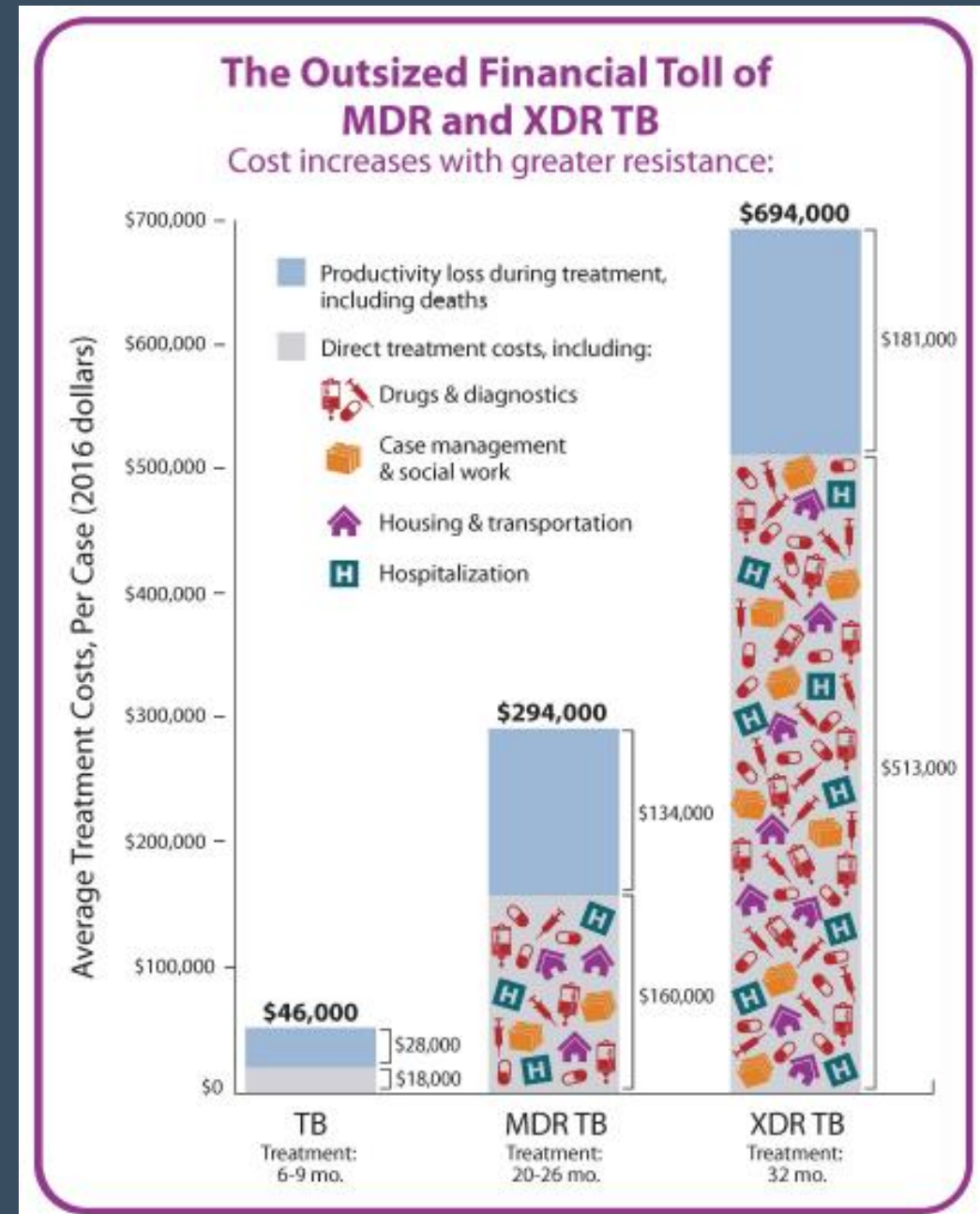
Multi-drug resistant Mycobacterium
Tuberculosis



Extremely Drug Resistant (XDR) Tuberculosis

- Treatment = \$513,000
- Loss of productivity and deaths = \$181,000

<https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/costly-burden-dr-tb-508.pdf>



Emerging Pathogens

- Arbovirus
 - Zika in the Caribbean, South, Central and North America
- Ebola in Democratic Republic of the Congo
- Plague in Madagascar



Standard versus Transmission-Based Precautions



Contact Precautions

- *Clostridium difficile*
- Norovirus
- CRE
- Body lice (e.g. pediculosis capitis/pubis/corporis)



Droplet Precautions

- Meningitis
- *Influenza*
- Mumps
- Pertussis (Whooping Cough)
- *Mycoplasma pneumoniae*



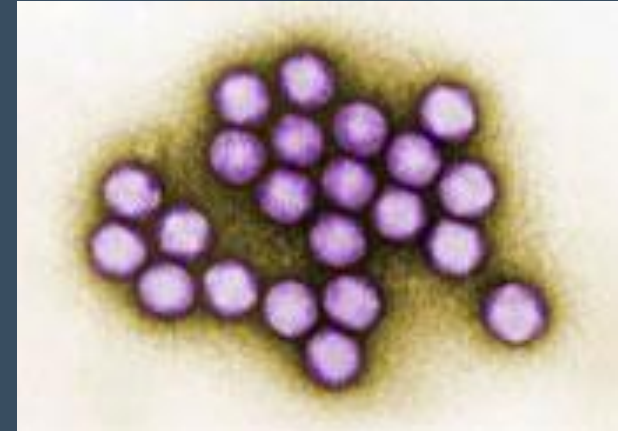
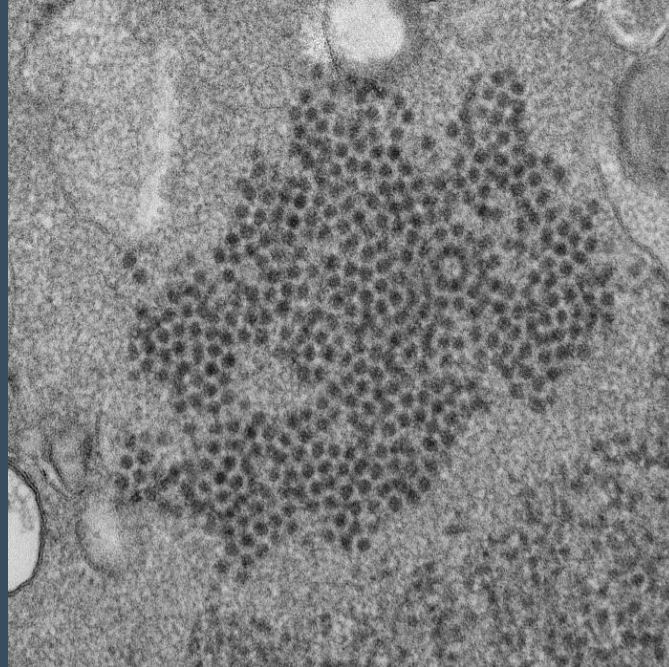
Airborne Precautions

- Measles
- Tuberculosis



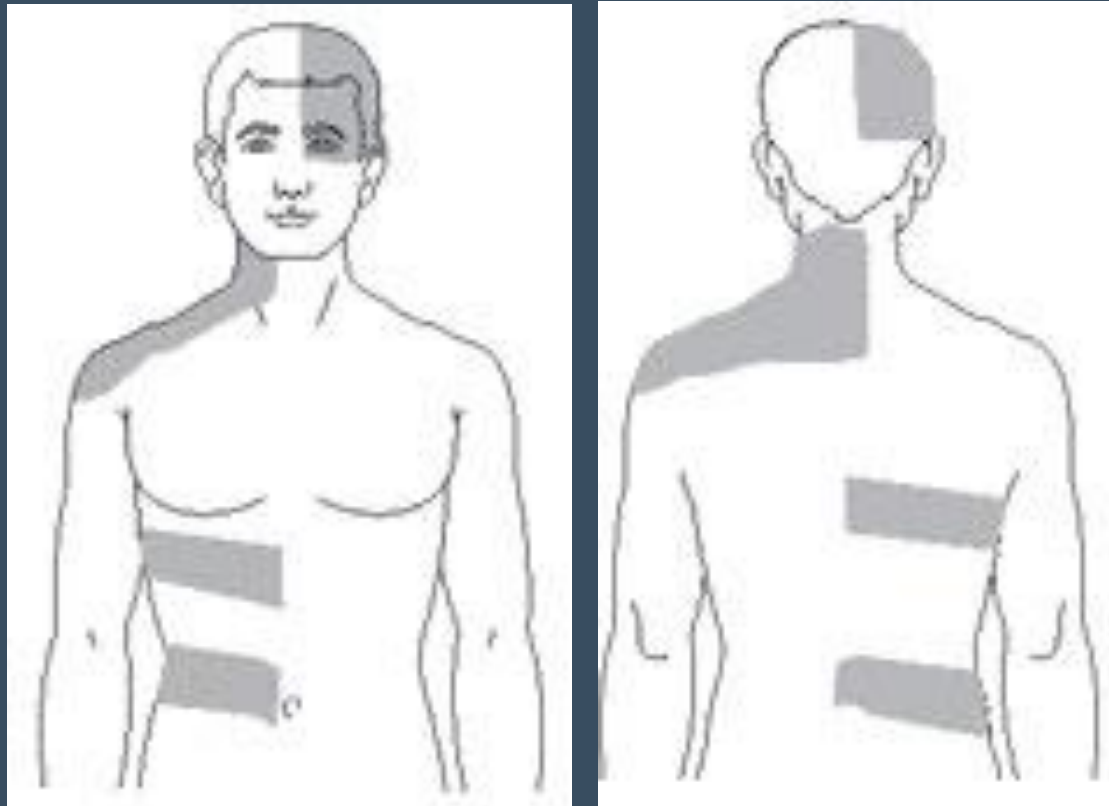
Droplet & Contact Precautions

- Adenovirus
- Enterovirus



Airborne & Contact Precautions

- Disseminated herpes zoster (Shingles)



Environmental Controls



Environmental Controls

- The Right Products
- The Right Contact Time
- The Right Air Exchanges
- The Right Air Pressurization
- The Right Infection Control Risk Assessment (ICRA) for Construction



What is Corrugated Cardboard?





What Bugs Like Cardboard?



- Silverfish
- Cockroaches
- Palmetto bugs
- Spores, molds and fungus





How Can We Prevent Bugs?



1. Hand Hygiene.
2. Remove products from outside shipping boxes before bring those boxes into the sensitive areas (e.g. kitchen, operating room, sterile processing, patient care areas, etc.).
3. Ensure your environment is clean and free of debris.
4. Remove products that are contaminated and/or damaged immediately.

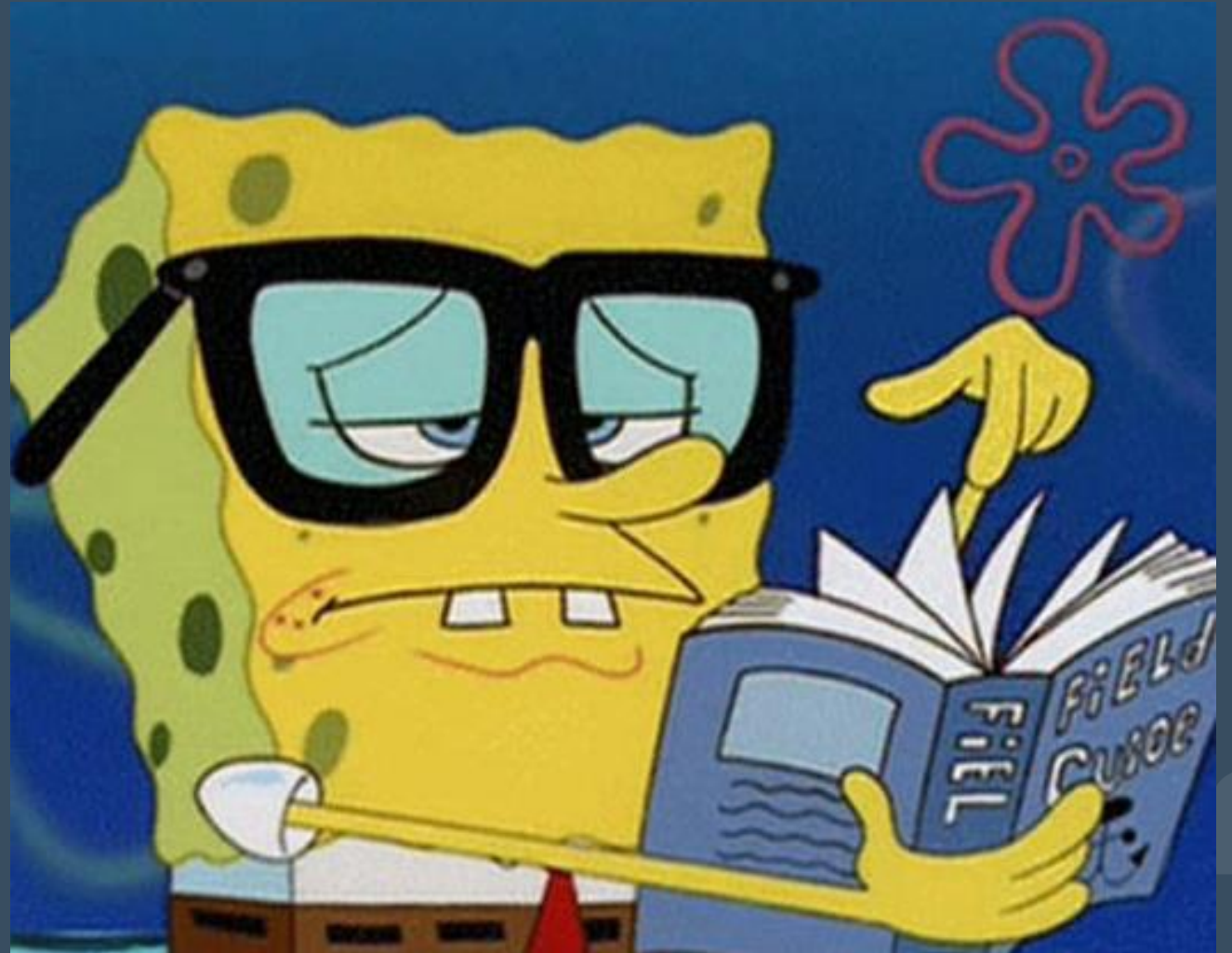


Key Takeaways

- Hand hygiene is the most effective way of preventing hospital-acquired infections.
- Education, communicate, and replicate.
- Environmental conditions are extremely important.



Questions?



Thank you for your time.



References

- Centers for Disease Control and Prevention. Guidelines for Hand Hygiene in Health-Care Settings. MMWR, 2002; 51 (No. RR-16): 1-56.
- Siegel, J. D., 2017. Management of Multidrug-Resistant Organisms in Healthcare Settings.
- Siegel, J. D., Rhinehart, E., Jackson, M., Chiarello, L, HICPAC. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings; 2017.
- Rutala, W. A., Weber, D. J., and HICPAC, 2008. Guideline for Disinfection and Sterilization in Healthcare Facilities.
- Sehulster LM, Chinn RYW, Arduino MJ, Carpenter J, Donlan R, Ashford D, Besser R, Fields B, McNeil MM, Whitney C, Wong S, Juranek D, Cleveland J. Guidelines for environmental infection control in health-care facilities. Recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Chicago IL; American Society for Healthcare Engineering/American Hospital Association; 2004.
- Centers for Disease Control and Prevention. Guidelines for environmental infection control in health-care facilities: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). MMWR 2003; 52 (No. RR-10): 1–48.
- Association for the Advancement of Medical Instrumentation. ST 79: Comprehensive Guide to Steam Sterilization and Sterility Assurance in Health Care Facilities. 2013.
- Association for the Advancement of Medical Instrumentation. ST 91: Flexible and Semi-Rigid Endoscope Processing in Health Care Facilities. 2015.
- Association for the Advancement of Medical Instrumentation. ST 58: Chemical Sterilization and High-Level Disinfection in Health Care Facilities. 2013.



Every life deserves world class care.