

Research @210

Highlights of Research in SATX



UT Health

San Antonio

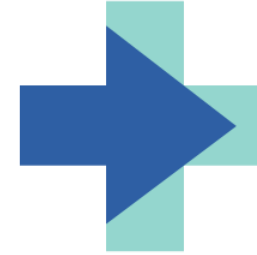
Emergency Medicine

Robert A. De Lorenzo, MD, MSCI, MSM, FACEP

Patrick C. Ng, MD, MS



Disclosures



emergenceMed





SATX

*Emerging
Hub for
Emergency
Medicine
Research*



A group of people, including women and children, are walking outdoors. One woman in a pink shirt is raising her hand. The background is a brick wall.

Tour of EM Research in SATX

Disclaimer: Only a sampling of the many great projects in the Alamo area. Apologies in advance if good projects are omitted.



University
Health System



UT Health
San Antonio



Placement of Antibiotic Powder
in Wounds During the Emergency
Room (POWDER) Study

MW
R



Background

Spine surgery studies evaluating the efficacy of vancomycin powder in preventing post-operative infections report benefit both in infection reduction and cost savings.

Time to antibiotic treatment has a significant effect on infection risk

Wounds sustained from high-powered combat weapons and explosives in the austere environment are at risk of contamination from soil, weapon fragments, shrapnel, and debris

Objectives

Primary Objective:

- To assess the efficacy of vancomycin powder applied to long bone open fractures compared to the usual care in the acute setting, prior to surgery, to reduce long-term infection risk

Secondary Objectives:

- To assess the safety of this intervention within this population
- To develop a risk-prediction model for long-term morbidity in subjects enrolled into the control arm or observation arm

Drug Application



Open fracture wound presenting to the ER



+ 2 gram Vancomycin powder



Uniform distribution of Vancomycin powder throughout the wound site, covering any exposed bone edges and soft tissue

Endpoints

Primary Endpoint:

- Deep-space infection at the prophylaxis site within 1 year of injury

Secondary Endpoints:

- Post-operative medical intervention rate for open fracture infection over a 1-year follow-up
- Local and/or systemic complications over a 1-year follow-up
- Development of a risk-prediction model for open fracture wound complications

ASPIRED: Alleivating Suicidality by Combining Psychotherapy and IM Ketamine for Rapid Treatment in the Emergency Department - A Randomized Clinical Trial



Robert De Lorenzo, Romeo Fairley, Alex Arena, Stacey Young-Mcoughan, Alan Peterson

Ketamine

- Emergency Departments are often the first-line access point for psychiatric crises including suicidal thoughts and behaviors.
- Ketamine
 - Esketamine is FDA-approved in the treatment of depression.
 - Ketamine has been used off-label in the treatment of suicidality.



CRP

- Crisis Response Planning (CRP) is a cognitive behavioral therapy-based, brief (~30 minute) intervention with evidence supporting reduced risk of suicide (Bryan et al., 2017; Stanley et al., 2018; Rozek et al 2019)

Sample Crisis Response Plans

Warning Signs: pacing
feeling irritable
thinking "it'll never get better"

- go for a walk 10 mins
- watch Friends episodes
- play with my dog
- think about my kids
 - vacation to beach in Florida
 - Christmas Day 2012
- call/text my Mom or Jennifer
- call Dr. Brown: 555-555-5555
 - leave msg w/ name, time, phone #
- 1-800-273-TALK
- go to hospital
- call 911

① crying ③ wanting to hit things
② getting angry ④ argument w/ wife

~~① play videogames~~ ② photography
② woodwork in garage ③ writing
③ go for walk ④ games on phone
④ breathing 10 mins ⑤ listen to ^{uplifting} music

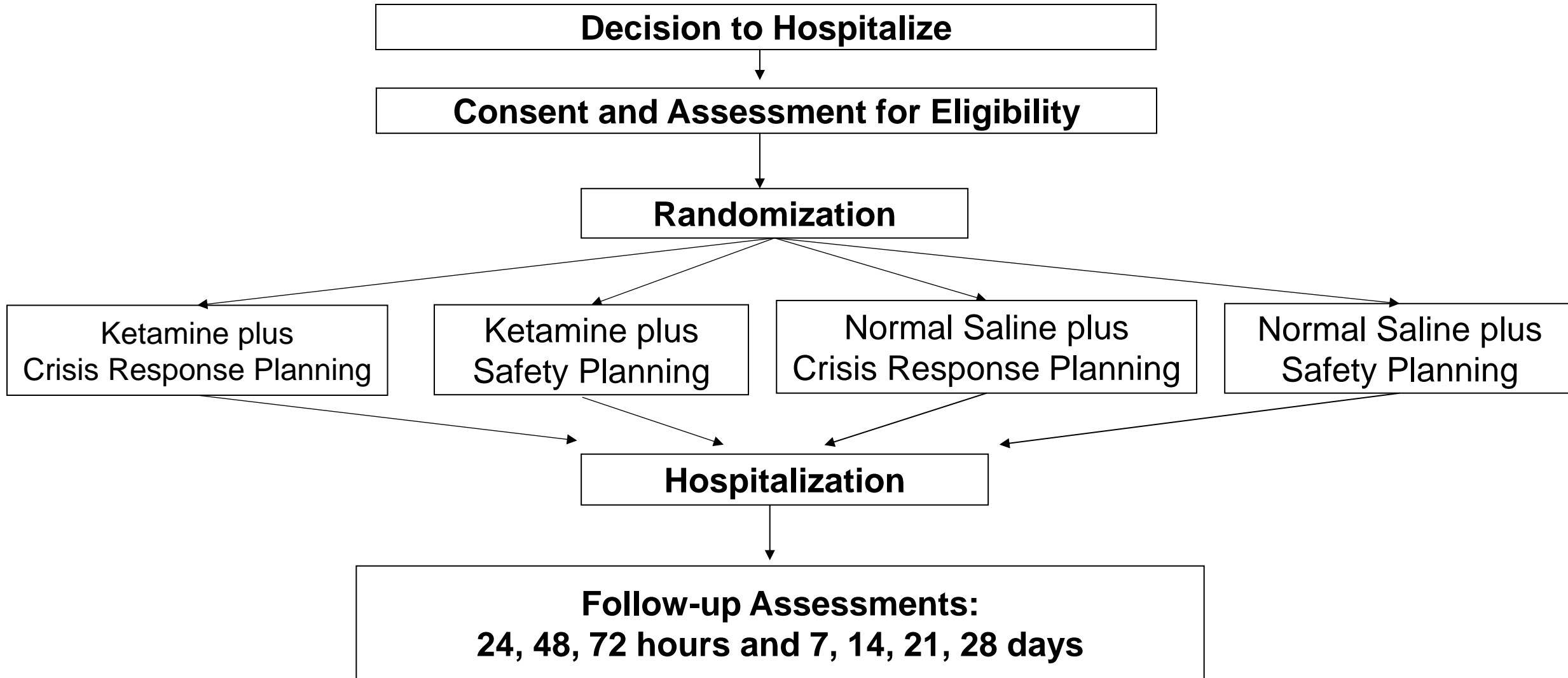
⑤ talk to Bill
⑥ Dr. Smith: 555-555-5555 (voicemail)
⑦ Hotline: 1-800-273-2755
⑧ Hospital or 911

Reasons to live:
Mom photography
wife motorcycle rides
kids (Matt, Katie)

Purpose of the Study

- Evidence supports the long-term effectiveness of Crisis Response Planning (CRP) to acutely suicidal patients, but its immediate and short-term effects remain largely unexamined.
- Evidence supports the immediate effectiveness of ketamine to acutely suicidal patients, but its feasibility, safety, and effectiveness when administered in ED settings remain unknown.
- Are there possible synergistic effects of the CRP and ketamine, both in the short- and long-term?

Flow Diagram



ASPIRED

- Status: Funded, pending IRB approval
- Pilot Study is active and accruing subjects



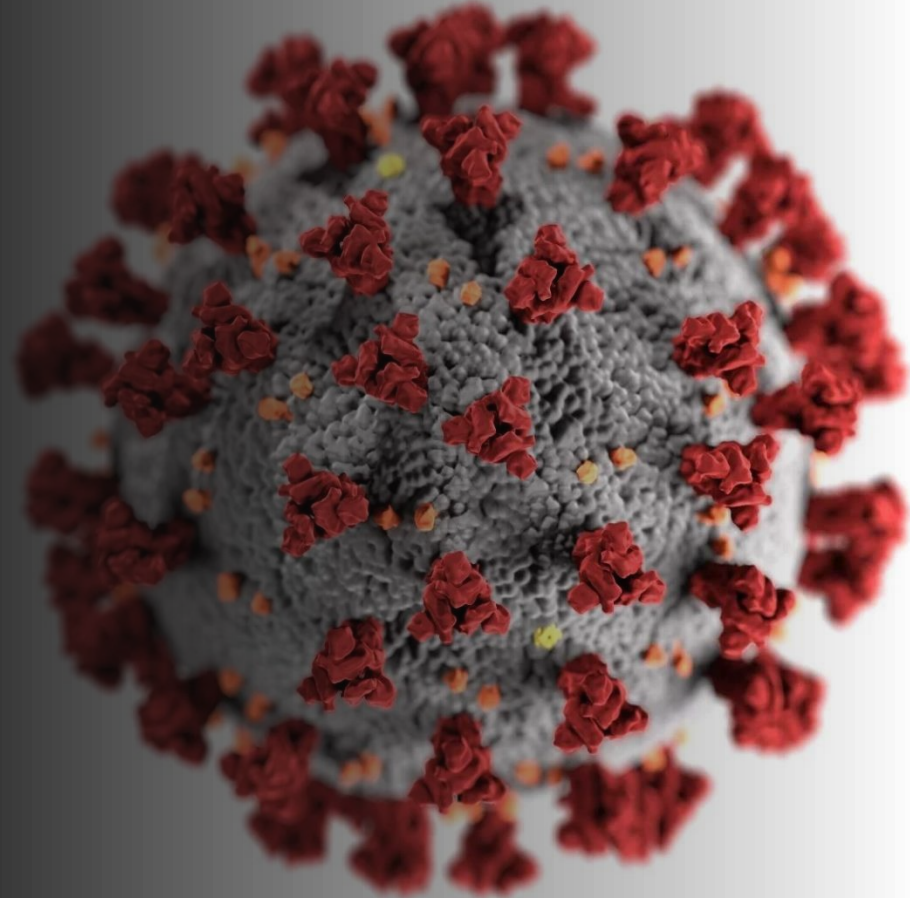
More Clinical Trials

COVID-19 Studies

- **Abbott COVID-19 Swab**
 - Riviello
- **Quadrant - Maximizing Sensitivity of Pooled Saliva Testing for COVID-19” Study**
 - Varney

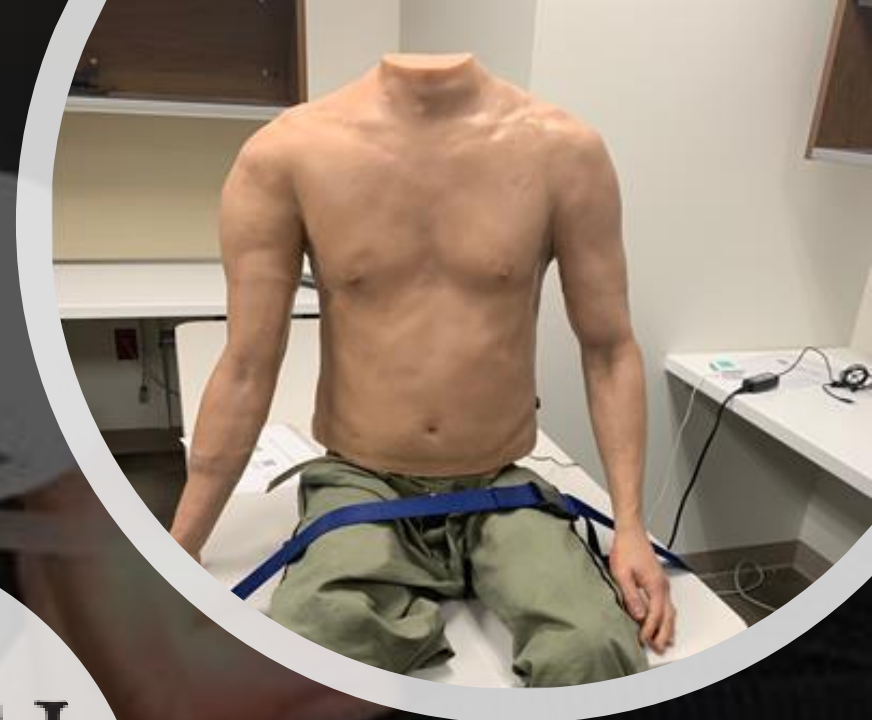
Collaborative Trials

- **Auxora in Patients with Acute Pancreatitis and Accompanying SIRS**
 - GI
- **PETRACT PE emboloectomy**
 - Arbo, Cardiology, IR, Pulmonology
- **TeaPot - TXA Bleeding Tonsillectomy**
 - Meyer, Schwarz



Medical Device Studies

- **Assessment of Fielded Airway Devices**
 - Schauer
 - UT EM and USAISR/59th
- **Combat Airway Intubation Assistance Device**
 - Hood & Treadway
 - ISR/UTSA/UT-EM/Trinity
 - \$248k/1yr
- **JAARS Shoulder Dislocation**
 - Moore
- **SAMH Morphing Moulage**
 - Moore



Ultrasound Research

- **Skills Determination, Decay and Delay Study (SD3) - EFAST**
 - Sisson
 - UPitt/MTEC MPAI
- **Does non-invasive positive pressure ventilation affect the Caval Index, a commonly used measure of clinical volume status?**
 - Solia
- **Efficacy of point-of-care gallbladder ultrasounds in this ED**
 - Gardner, Arena
- **REASON – Realtime Emergency Assessment with Sonography: Outcome research Network**
 - Solis, et al
- **US for compartment syndrome pressures**
 - Sisson, et al
 - Comprium
- **ELEVATE**
 - Chavez
 - Cardiac output at altitude

Emergency Mental Health Triage System

PsySTART® is an emergency mental health triage incident management platform.

PsySTART® Disclaimer:

Warning: You are accessing a secure information system, which includes this computer, this computer network, and all devices and/or storage media attached to this network or to a computer on this network. This information system is provided solely for official PsySTART-authorized use only. Federal and State Law prohibit unauthorized use of this portal and unauthorized or improper use of this system may result in disciplinary action, civil and/or criminal penalties and all violations will be reported to the State. By using this information system, you understand and consent to the following: You have no reasonable expectation of privacy regarding any communications transmitted through or data stored on this information system. Registration, log on sessions and all activities are monitored. Any protected health information accessed via this site is subject to existing HIPAA policies. Any communications transmitted through or data stored on this information system may be disclosed or used for any authorized purpose.



EMS & Disaster Research

- **AntiSEPTIC (Alamo area SEPs Treatment Improvement Collaborative)**
 - SAFD, Everitt & Cooley
- **PsySTART**
 - Fairley, CDC
- **Bystander Cardiopulmonary Resuscitation Rates as Related to COVID-19**
 - Cooley, et al
- **EMS Leadership Presence Positively Influences EMS Provider's Decision to Receive the COVID-19 Vaccine**
 - Everitt, Sparkman
- **Drone Delivery of AEDs**
 - Bierle

Translational Research



- New lab spearheaded by Dr. Ng
- Building and expanding capacity
 - Bench & engineering
 - Cadaver
 - Small & Large Animal
- REBOA Translational Study
 - Maddry & Paredes
 - BAMC/59th MDW
- Microcatheter for surgical site infections
 - J&J

Military Research

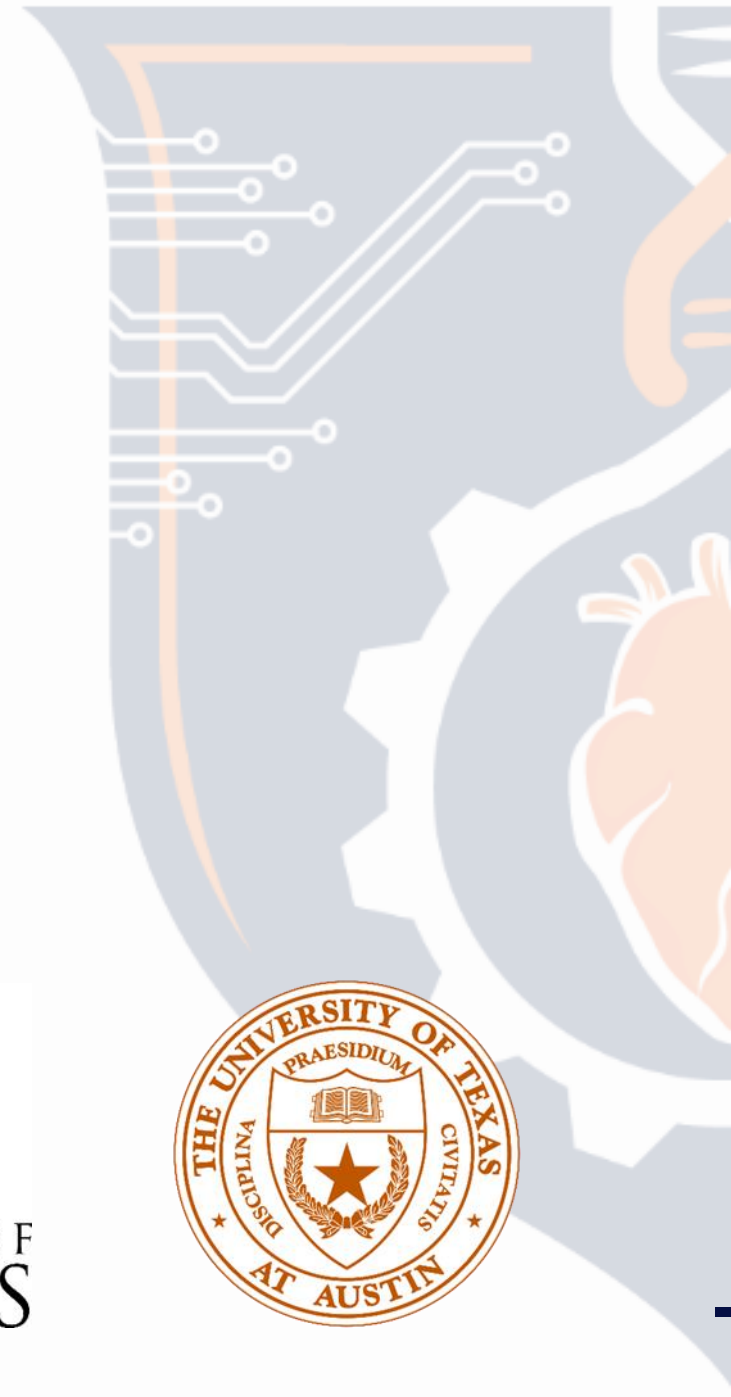
- Engineered dried whole blood
- Wearable critical care
- Full multi-organ support
- Burn & pain research
- LBNP Shock Model
 - Convertino
 - ISR



THERMIC

Thermoregulatory Health Emergencies and Rapid Management Interdisciplinary Collaboration

Maria Jose Londono Jaramillo; Everitt, Bryan; Boyle, Lee ; Bierle, Ryan; Moore, Steven; Anjelyka Fasci; Lyle Hood; Jones, William; Young, Douglas; Evans, Connor; Brendon McDermott; Gualtieri, Nicholas; Reynaldo Garza; Ng, Patrick; Sparkman, Mark; Angeles Gomez; Rosie P; Steven Schauer



Exertional Heat Stroke (EHS):

- Characterized by severe hyperthermia
- Core temperatures exceeding 40°C

→ Leads to organ failure - Central Nervous System (CNS) dysfunction

→ Can lead to death

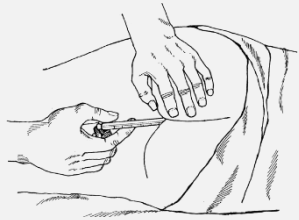
Rapid intervention is crucial, especially in remote or military environments where traditional cooling methods are impractical

TEMPERATURE MEASUREMENT

Measure of core body temperature

Peripheral readings often fail to capture accurate core body temperature

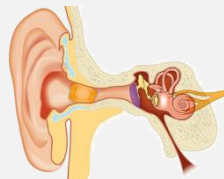
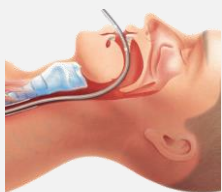
Gold Standard: Rectal



Concerns:
Privacy, hygiene,
and patient acceptance

Challenges

Urgent need: reliable and practical measurement sites that accurately reflect core body temperature



TREATMENT / COOLING SYSTEM

Essential to prevent severe outcomes like brain damage and death

**Gold Standard:
Cold Water Immersion**

Requires: Tub/bag, 30-40 gallons of water and 10 pounds of ice

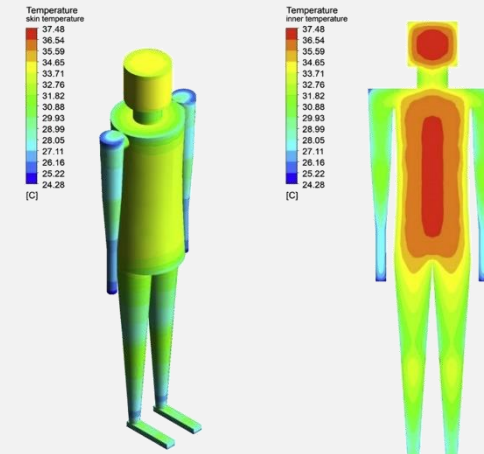


Challenges

Urgent need: Novel, resource-independent, portable cooling solution for prehospital care

SIMULATIONS AND COMPUTATIONAL MODELS

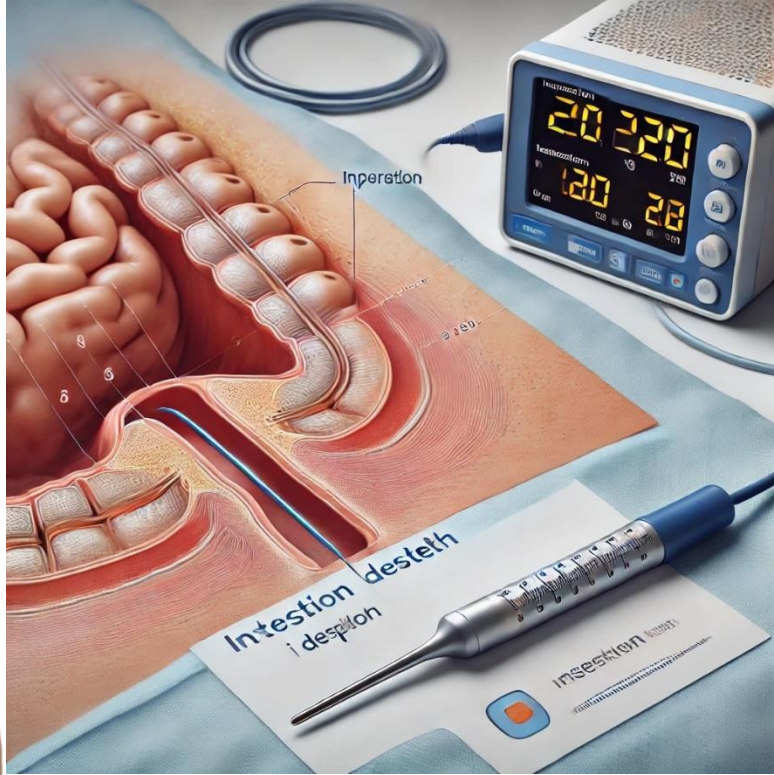
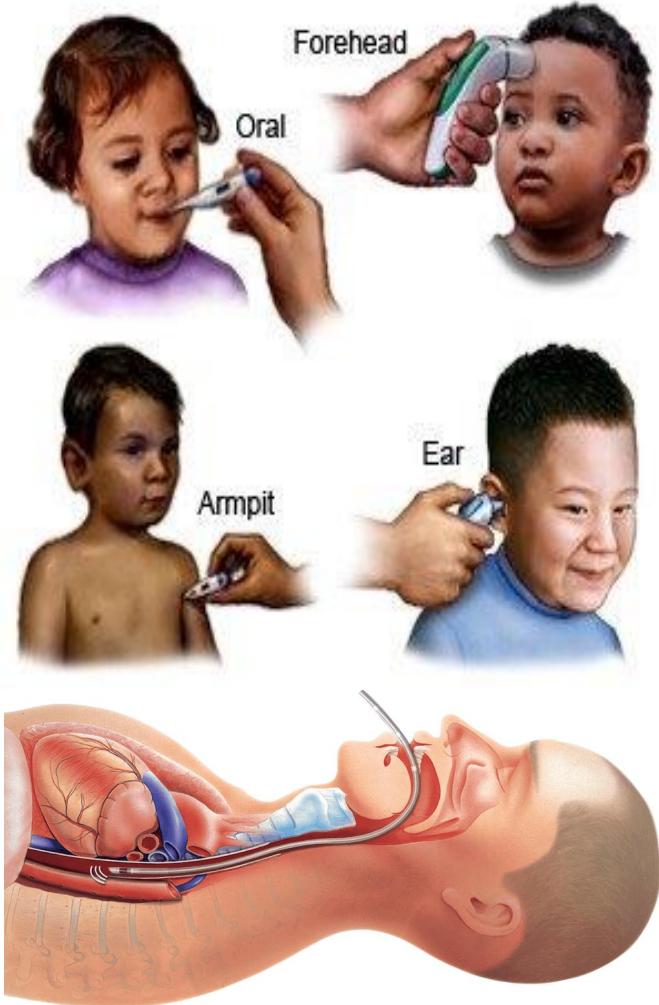
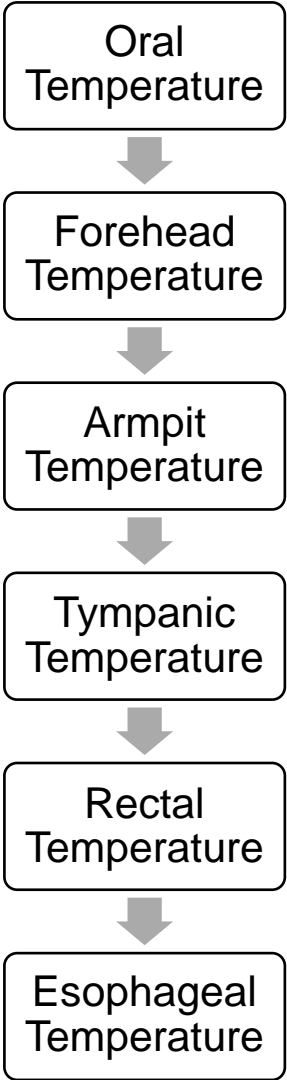
There exists a limited understanding of the body's **thermoregulatory response during different cooling modalities**



Challenges

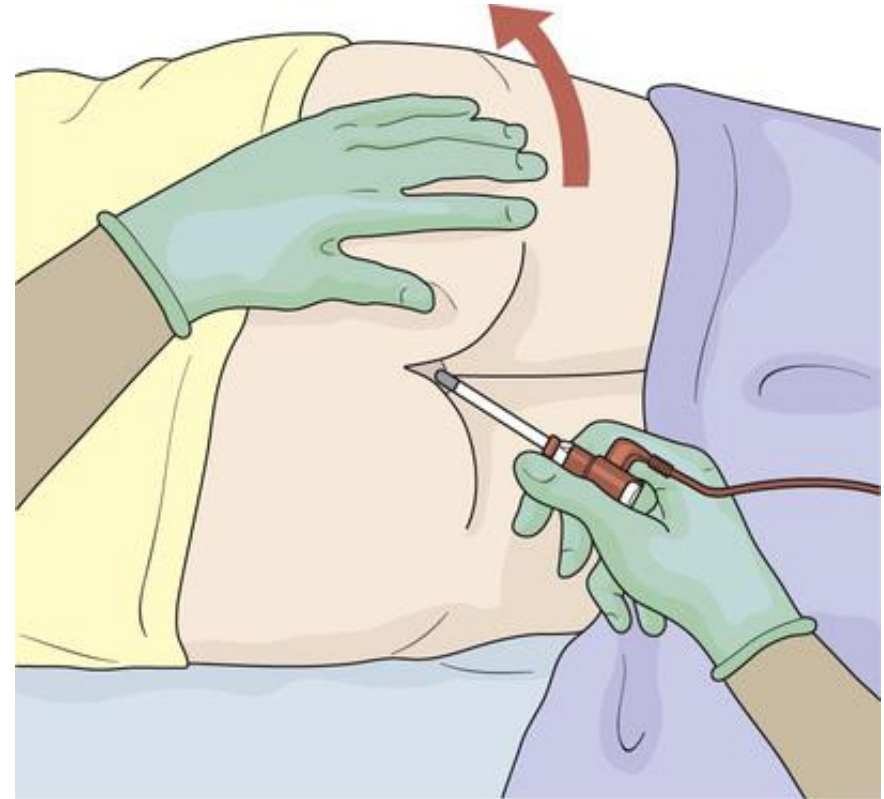
Urgent need: Accurate and realistic computational model of response to different treatment modalities

Body Core Temperature Instruments



Alternatives to Rectal Measurement

- Rectal Temperature is the golden standard for core body temperature but has limitations:
 - Invasive & uncomfortable
 - Risk of contamination & infection

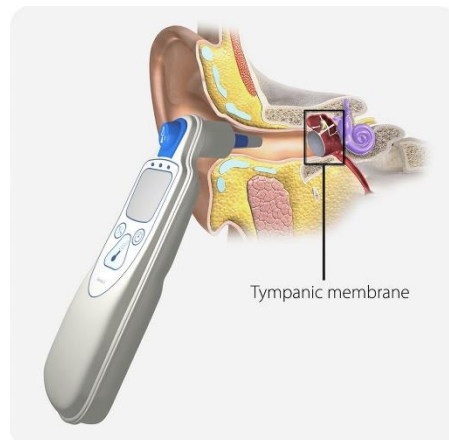


Tympanic

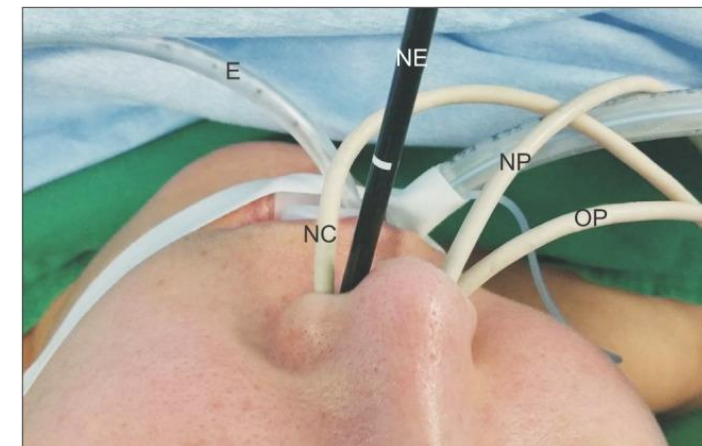
vs

Nasopharyngeal

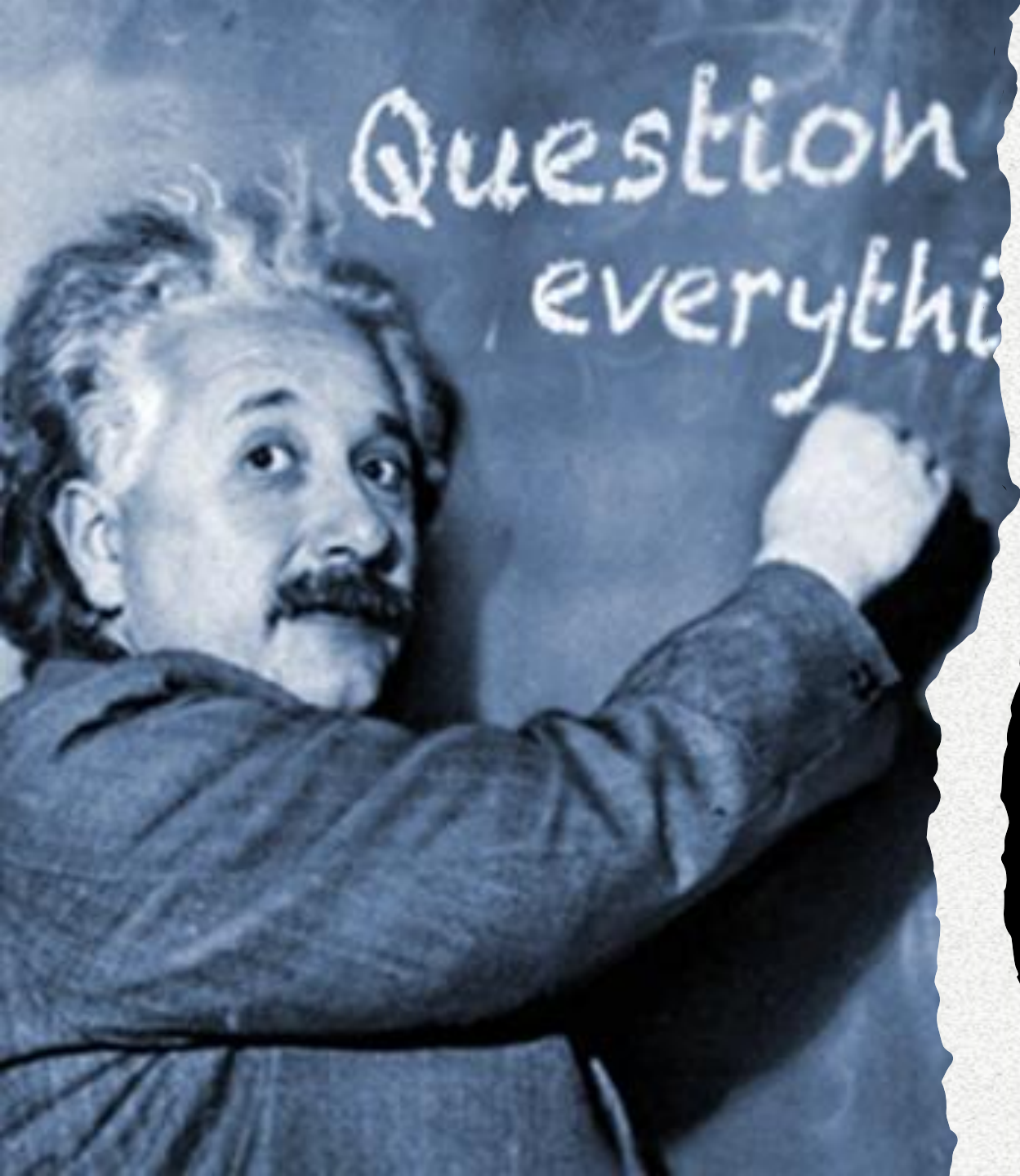
- Pros
 - Non-invasive, quick and easy to use
 - Can be used in various settings
- Cons
 - Affected by earwax presence
 - Improper probe placement can lead to false readings



- Pros
 - More stable and less influenced
 - Better indicator of brain temperature
- Cons
 - Requires careful sensor placement
 - Can be uncomfortable



THE END OF THE TOUR



Question
everything

Questions?