Tactical Operation Medical Manikin

TOMManikin

Photo courtesy of SCANG

NORTH AMERICAN RESCUE®
Simulation

Reducing Battlefield Mortality Through Innovative Learning

Photos courtesy of South Carolina Army National Guard

North American Rescue Simulation Executive Summary

1. The NARS executive team has more than 80 years of combined military medical experience.
2. We lead the simulation industry with innovative products that compliment field medical experiential learning.
3. Knowledge gained outside the wire = product development designed by warfighters, for warfighters.
4. We believe reducing mortality begins in the classroom coupled with realistic, believable field training.
5. “Fight as you train” is measured by lives saved.
6. To date, NARS has sold more than 1,000 TOMManikins (75%+ to DoD agencies)

North American Rescue Simulations

Headquarters LaGrange, Kentucky

CORE COMPETENCIES

- Innovative Product Design and Manufacturing
- Specializing in Combat Medical and SOF Rescue Mission Recreation
- Nimble manufacturing to accommodate customer requirements
- Buy America, Fair Trade/Berry Amendment Compliance
- Sustained Relationship Management

Noteworthy Customers

Bridging the Clinical Gap

“The fate of the wounded rests in hands of those who apply the first dressing.”

-Colonel Nicholas Senn, 1898

TOMManikin

Setting the standard for realism, durability, and ruggedization since 2008.

Engineered for Field Training!

All TOMManikins are IP68-rated = TOMM is protected from total dust ingress and long-term immersion up to a specified pressure.

TOMM has an operating temperature range of 14°F – 158°F and can be stored in temperatures of -40°F – 185°F.

New GEN 5 Control Boxes – In Production 2020

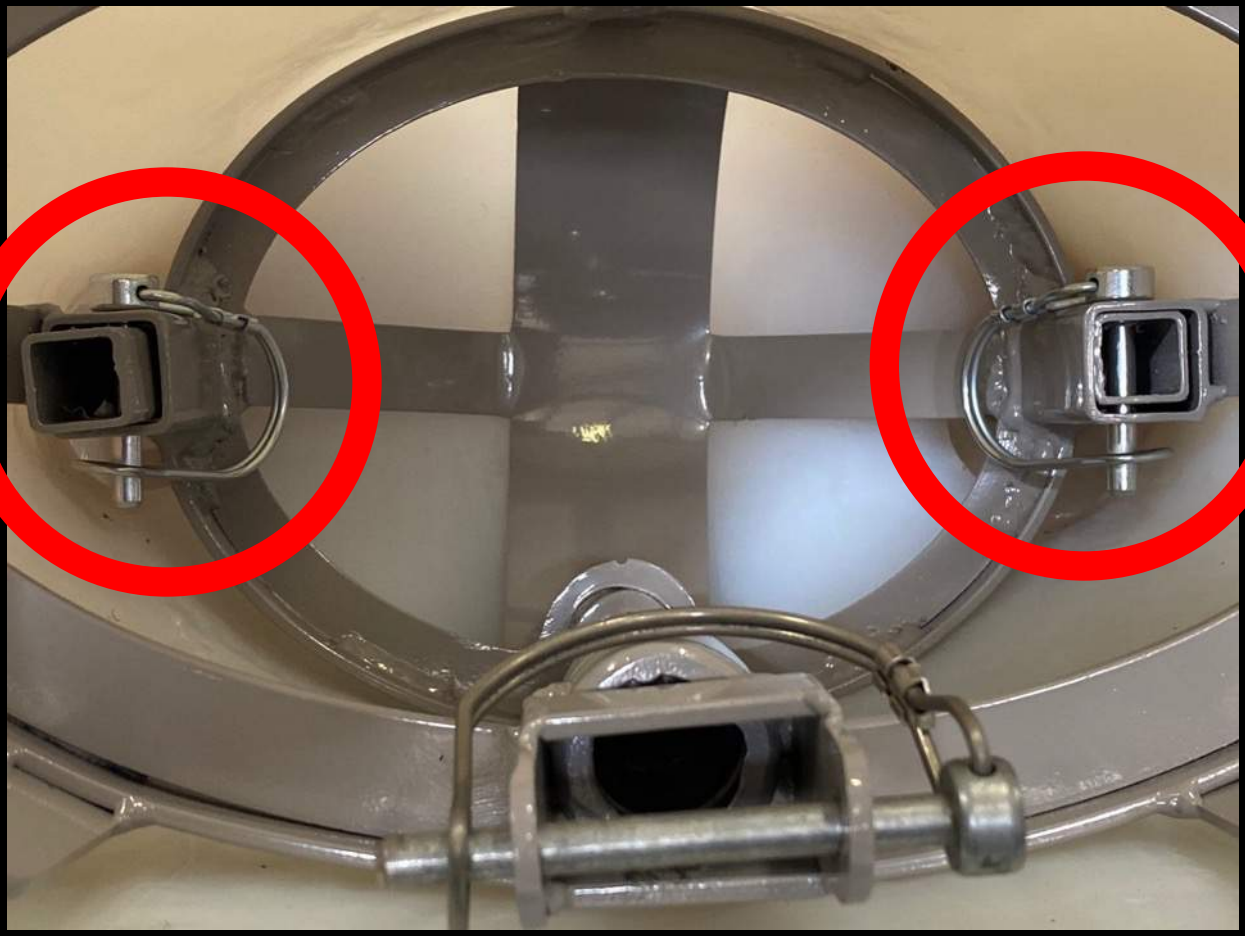
Features:

- Tray-mounted side-by-side electronics and onboard air compressor boxes
- Simplified cable management system
- Braided steel cable jacketing

Solid metal bones and joints

Unparalleled durability in the most austere environments!

GEN4+ Quick Exchange Leg Joints



- *Compatible with all Generation TOMM legs*
- *Reduces time necessary to exchange legs*

180 pounds of dead weight dragged by arms

TOMManikin Skin

- TOMM's skin is a proprietary silicone that features Softech*TM* and Rocktech*TM* construction technology.

- Skin is stable, inert, non-environmentally reactive, and non-leaching (will not break down, or become brittle, when exposed to extreme temperatures or prolonged UV exposure).

- Manufactured using a hand-laid production technique where skin tone is imbedded throughout the material.

- *Available in light, medium and dark skins tones at no additional charge*

Setting the simulation industry standard for ruggedization and field durability

Photo courtesy of Stop The Bleeding Foundation, Jonesboro, Arkansas

Available TOMManikin injuries

Faces *(all interchangeable)*

- Burn
- Healthy
- Open jaw fracture

Arms *(all interchangeable)*

- Healthy (with radial pulse, antecubital IV access, humeral IO)
- Burn
- Shrapnel
- Partial & complete amputations
- Closed fracture with palpable crepitus

Chest

- Uninjured – male or female anatomy
- GSW (with sucking chest wounds and exit wound), male or female anatomy
- Abdominal evisceration (packable)

Pelvis *(all interchangeable)*

- Uninjured, genderless
- Uninjured, male or female anatomy
- GSW with packable femoral entry and gluteal exit, male or female anatomy

Legs *(all interchangeable)*

- Uninjured
- GSW (through and through; can be used as an impaled object *(see construction site slide).*
- Partial and complete amputations
- Tibial I/O

Note: faces, limbs, and pelvis are all interchangeable between TOMManikin platforms. This feature is a training force multiplier!

Hyper-realistic injuries

GSW & amputation legs

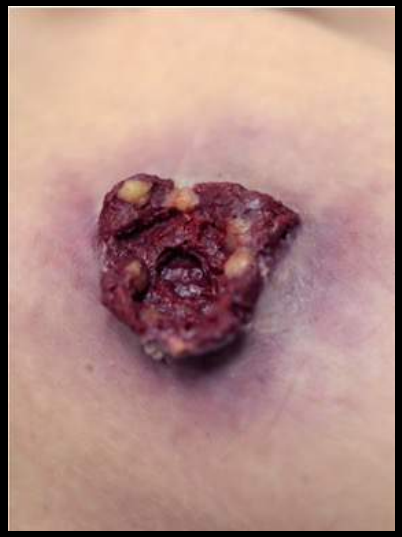
Packable abdominal evisceration

Inguinal GSW entry wound with scrotal avulsion

Gunshot Wounds
Standard configuration on GSW TOMM 93-0040

Chest GSW entry

Chest GSW exit



Leg GSW entry

Leg GSW exit

Pelvic GSW entry

Pelvic GSW exit

Blast Injuries
Standard configuration on Blast TOMM 93-0036

Open Jaw Fracture Face

Shrapnel arm

Packable Bowel Evisceration

Complete leg amputation

Partial and Complete Amputation Arms

Complete Arm Amputation – Left Arm

Complete Arm Amputation – Right Arm

Partial Arm Amputation – Left Arm

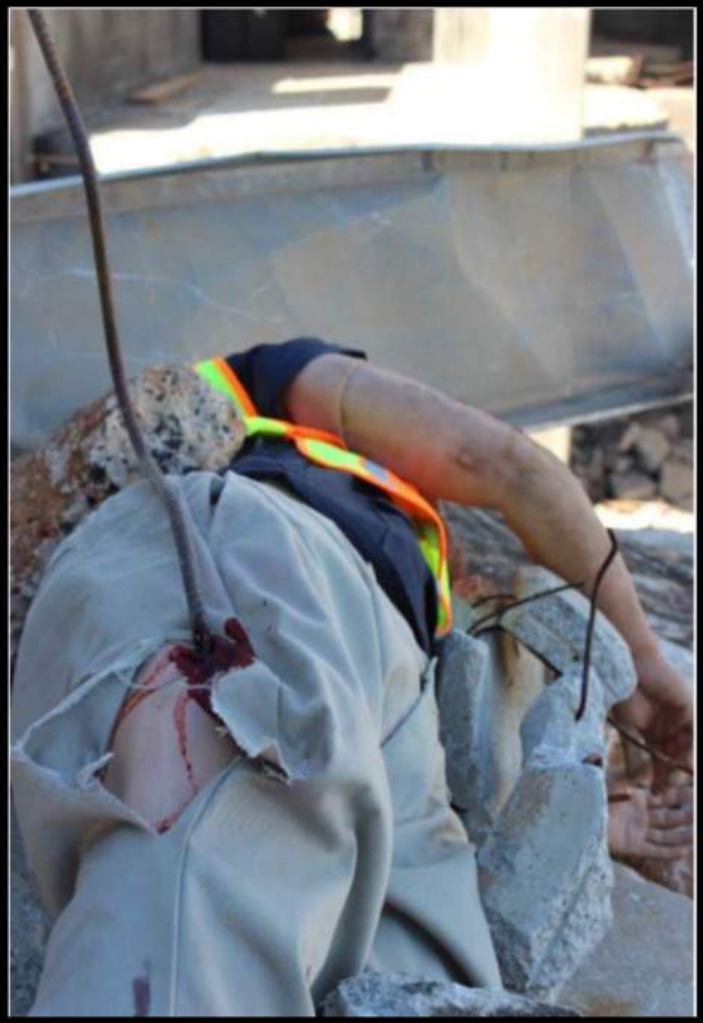
Partial Arm Amputation – Right Arm

Closed Fracture & Burn Arms

Closed fracture arm with palpable crepitus

Burn Arm - Right

Burn Arm - Left



GSW leg used for impaled object

Soft tissue injury arm

Photos courtesy of Guardian Centers of Georgia

Realistic clinical interventions

TQ responsive full amputation leg pictured


MEDIC
MEDIC
EMS

TOMManikin can be crushed under 3 tons of pressure


Create realistic confined space and
entrapment scenarios.

TOMM enables dramatic scenarios that extend beyond conventional exercises.

Pushing extrication scenario limits

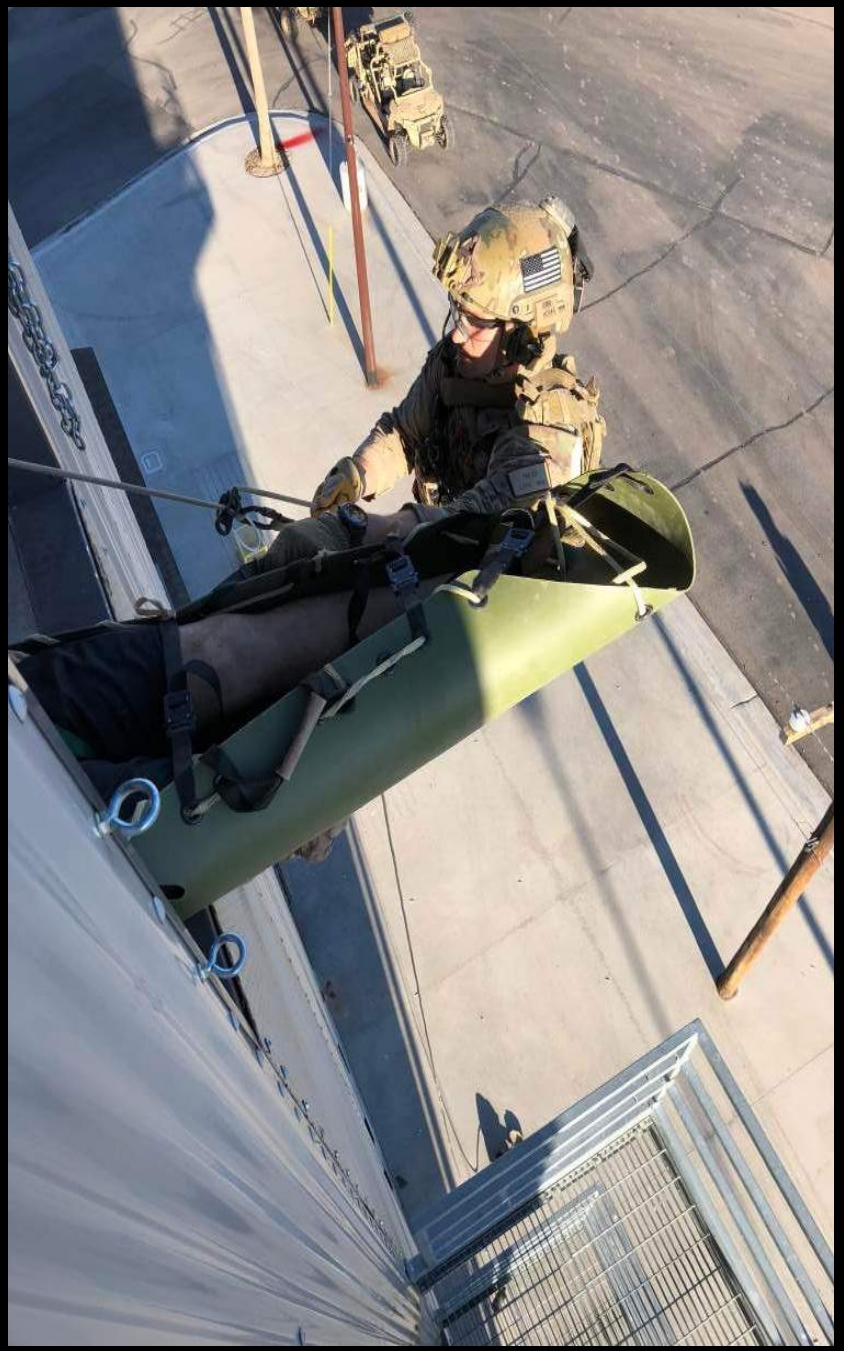
Crushed under two cars

Photo courtesy of 5th CRFP, IL

TOMM's capabilities enable skill mastery that can be applied in realistic environments where responders work as teams to manage complicated rescues.

Photo courtesy of 5th CRFP, IL

Making training memorable!



Popular TOMManikin Configurations

- GSW TOMM
- Blast TOMM
- Basic TOMM
- Burn TOMM
- Confined Space TOMM
- Water TOMM
- CBRNE TOMM
- TAMI – Female version
- *Custom configurations available*

GSW TOMM

Photo courtesy of BMK Ventures

Confined Space TOMM

Photo courtesy of Guardian Center of Georgia

Blast TOMM

Photo courtesy of Southern IL EMS

Photo courtesy of FDNY

Water TOMM

Fully submersible in fresh or salt water

Photo courtesy of Sarasota County Sheriff Dive Team

Photo courtesy of Sarasota County Sheriff Dive Team

Photo courtesy of New Orleans PD & FD

CBRNE TOMM

Photo courtesy of USMC CBIRF

TAMI

Female version of GSW TOMManikin, with anatomically correct female features and voice.

Injury locations based on US Army study suggesting females who suffer penetrating injuries to chest, abdomen, pelvis have a higher mortality rates than male colleagues.

- Injuries located under breast, pubic area, and leg.
- Parallels TOMManikin's capabilities.
  - Industry-leading ruggedization
  - Interchangeable limbs
  - Medical intervention support

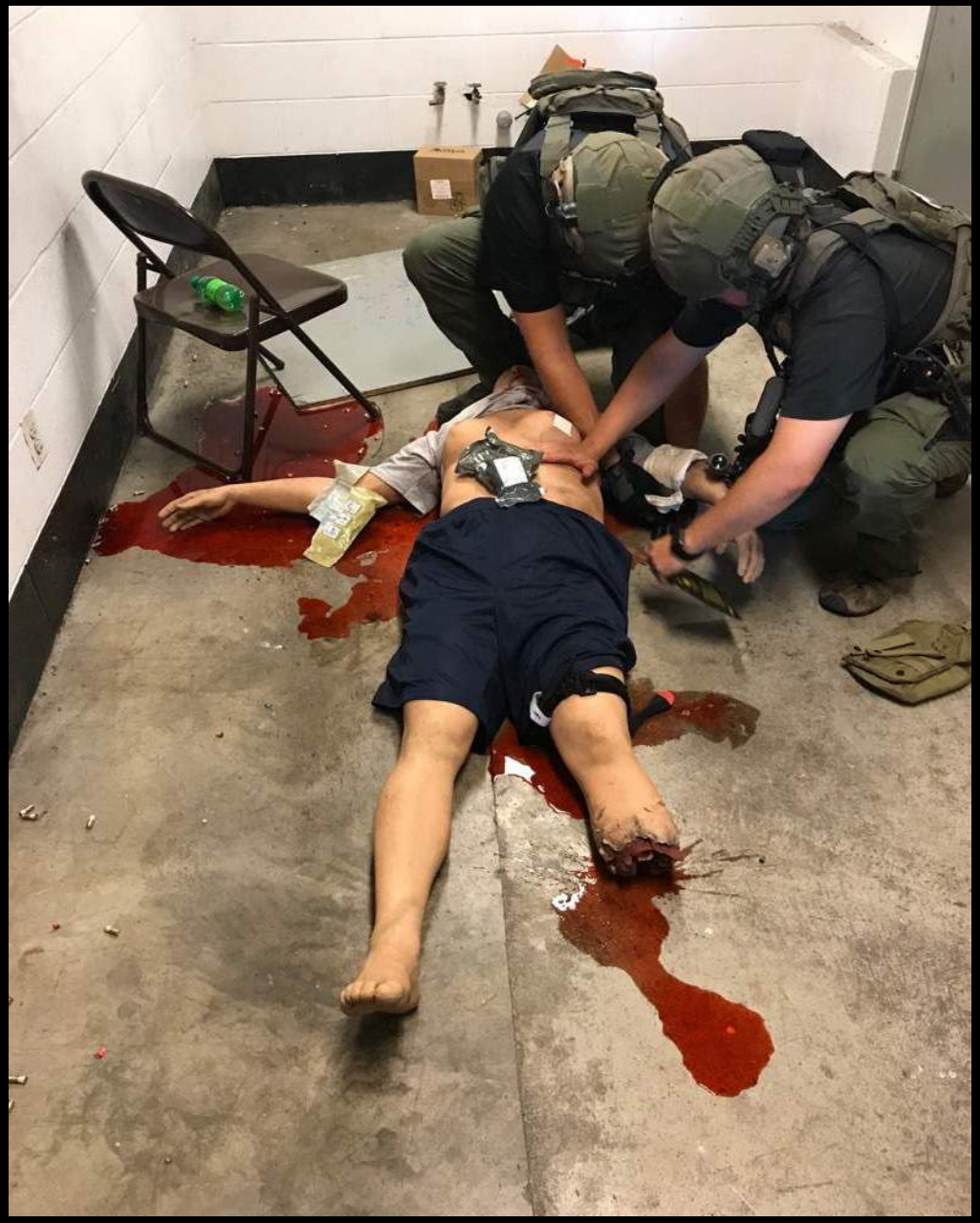


Photo courtesy of Louisville SWAT

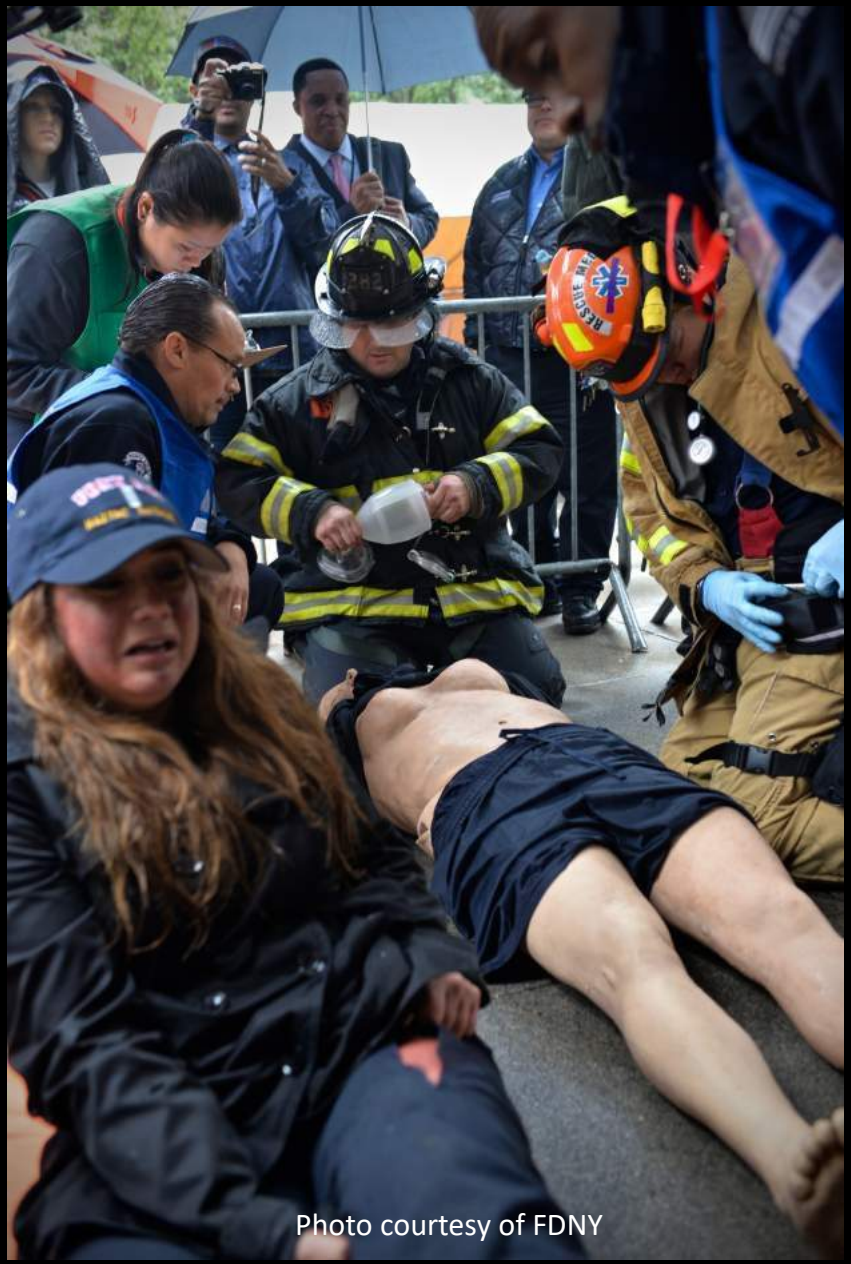
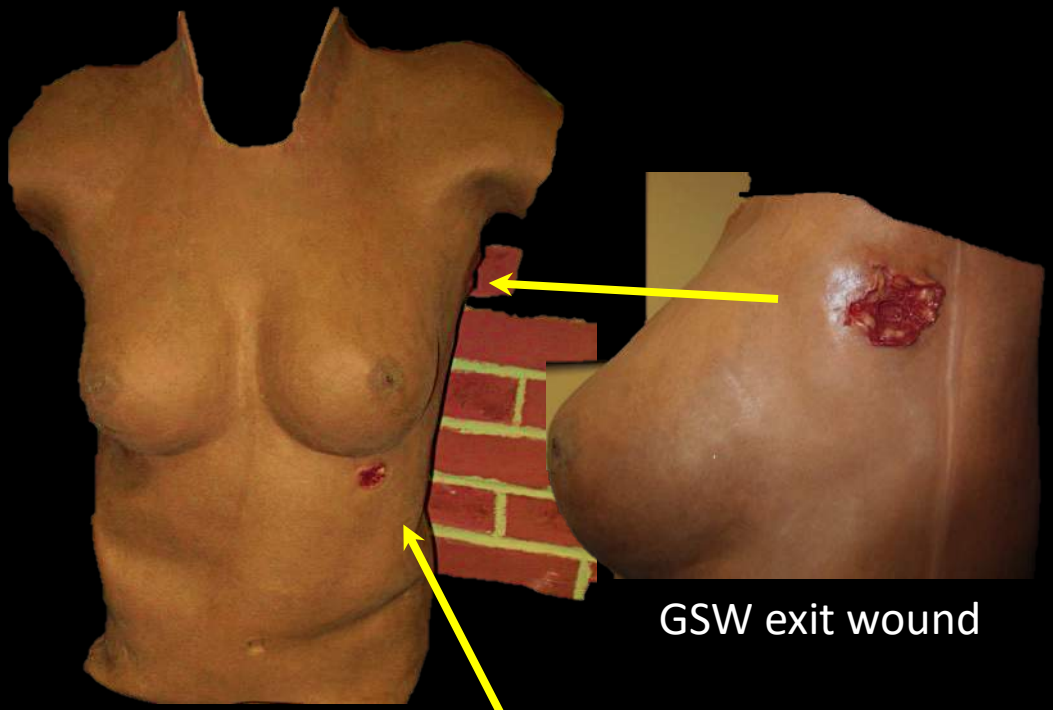


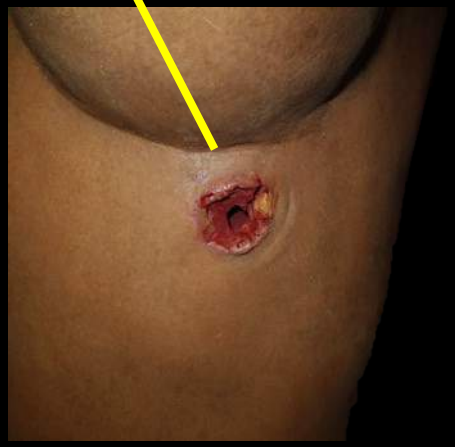
Photo courtesy of FDNY

Examples of dark skin tone TAMI



GSW exit wound

Packable pelvic
GSW entry wound



GSW entry wound

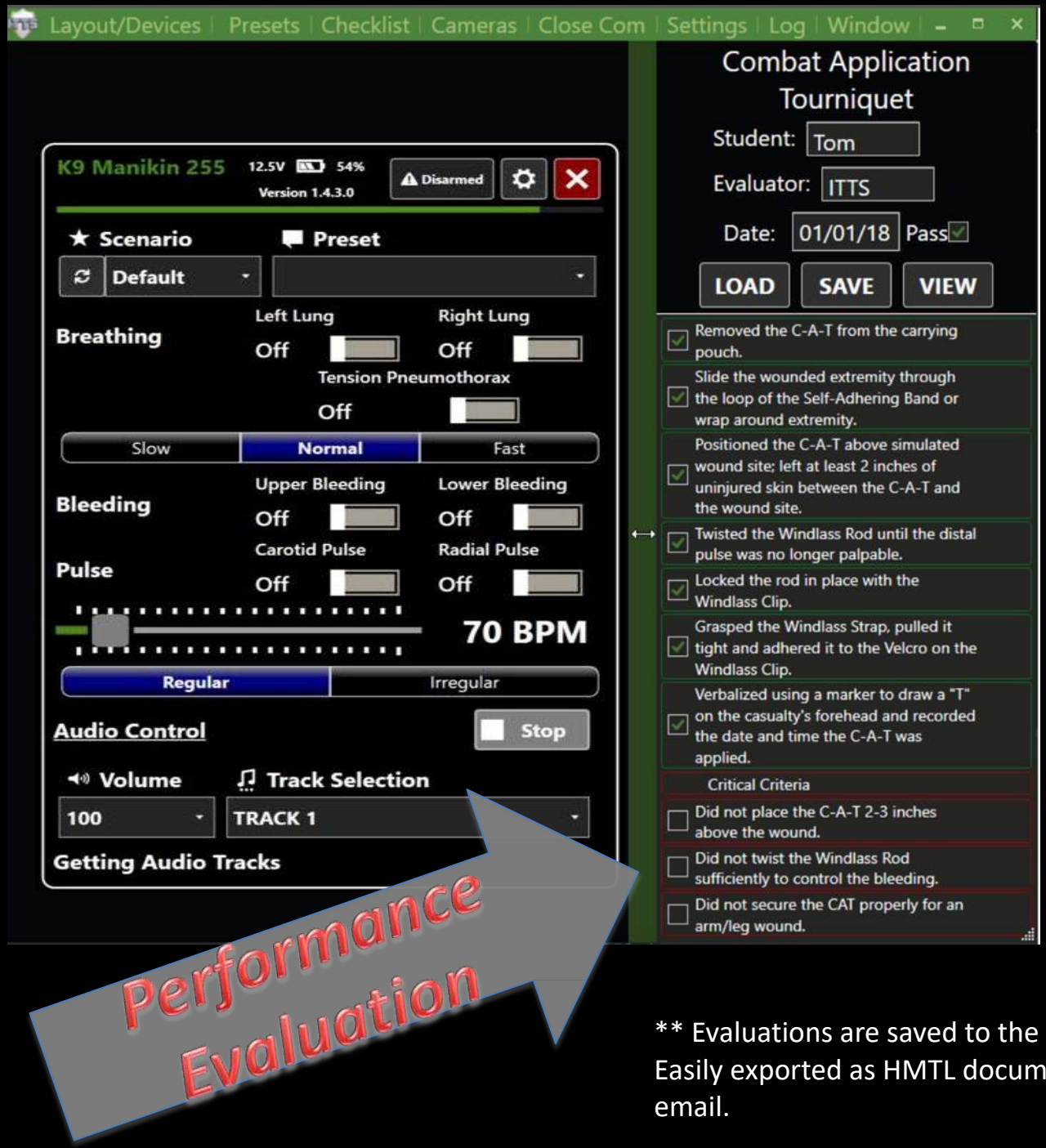
GSW exit wound
(Left gluteus)

Simulator Communications

- Features proprietary communication link that requires NO Wi-Fi, Bluetooth, or LAN connections.
- Simultaneous long-range communications with numerous NARS devices.
- NO interference risk with telemetry, avionics, or weapon systems.

MILSPEC Rated

Operating: -20°C to 60°C (-4°F to 140°F) MIL-STD-810G, Method 501.5 Procedure II
Storage: -40°C to 70°C (-40°F to 158°F) MIL-STD-810G, Method 501.5/502.5 Procedure I
Drop / Shock: 26 drops from 1.2 m (4 ft) MIL-STD-810G, Method 516.6 Procedure IV
Vibration: MIL-STD-810G, Method 514.6 Procedures I, II
Sand / Dust: IP65, IEC 60529
Water: IP65, IEC 60529
Humidity: 0 ~ 95% (non-condensing) MIL-STD-810G, Method 507.5
Altitude: 4572 m (15.000 ft) MIL-STD-810G, Method 500.5 Procedure I



Performance Evaluation

** Evaluations are saved to the instructor tablet. Easily exported as HMTL document via USB or email.

Sample exported student evaluation

Combat Application Tourniquet

Student: **Mike** (●) Pass ( ) Fail
(●) Initial Evaluation ( ) Re-Evaluation
Evaluator: Tom Date: 02/07/19 9:37:42

(●) Pass	( ) Fail	Removed the C-A-T from the carrying pouch.
(●) Pass	( ) Fail	Slide the wounded extremity through the loop of the Self-Adhering Band or wrap around extremity.
(●) Pass	( ) Fail	Positioned the C-A-T above simulated wound site; left at least 2 inches of uninjured skin between the C-A-T and the wound site.
(●) Pass	( ) Fail	Twisted the Windlass Rod until the distal pulse was no longer palpable.
(●) Pass	( ) Fail	Locked the rod in place with the Windlass Clip.
(●) Pass	( ) Fail	Grasped the Windlass Strap, pulled it tight and adhered it to the Velcro on the Windlass Clip.
(●) Pass	( ) Fail	Verbalized using a marker to draw a "T" on the casualty's forehead and recorded the date and time the C-A-T was applied.
Critical Criteria		
(●) Pass	( ) Fail	Did not place the C-A-T 2-3 inches above the wound.
(●) Pass	( ) Fail	Did not twist the Windlass Rod sufficiently to control the bleeding.
(●) Pass	( ) Fail	Did not secure the CAT properly for an arm/leg wound.

*** Custom student evaluations added at no additional charge*

Now with Scenario and Preset Builder software included!

What's included when you purchase a TOMManikin

- Accessory Kit
  - 2 NiMH rechargeable batteries (5-amp & 10-amp) with independent chargers
  - T-handle wrench
  - Replacement connectors
  - 5-pack of surgical airway neck skins (35 op sites)
  - 8 oz. concentrated sim blood
  - NARS mil spec-rated tablet

- 2 3-wheeled transport and storage bags designed for TOMM

- NAR IFAK

- Velcro uniform (blouse and trousers
  - Digital pattern
  - Sand color scheme
  - Blouse features Velcro sleeves and lateral seams
  - Trousers feature Velcro inseam and lateral seams
    - Button fly

Simulation Enhancements

*** All NARS devices are capable of simultaneous control via a single NARS instructor tablet*

TOMMANIKIN MOULAGE KIT

Fully compatible with TOMManikin or worn by human role player.

Includes: bleed system, 8.8 oz simulated blood concentrate, extra tubing, connectors, hard case, and the following wounds: Thigh Laceration, GSW Through Hand, GSW Leg, Neck Wound, Broken Jaw w/ Laceration, Open Scalp Wound, Blast Face with hard bone (mask)

Open scalp wound

Laceration to scalp with exposed bone.

Thigh wound

A wearable wound simulation that represents a deep laceration exposing fat and muscle tissue

Neck injury exposing fat and muscle. Supplied with bleeding system. Wrap-around device with hook and loop fasteners

Blast face with hard bone

Full face mask with third degree burns, swelling, with bleeding system. Wrap-around with hook and loop fastener

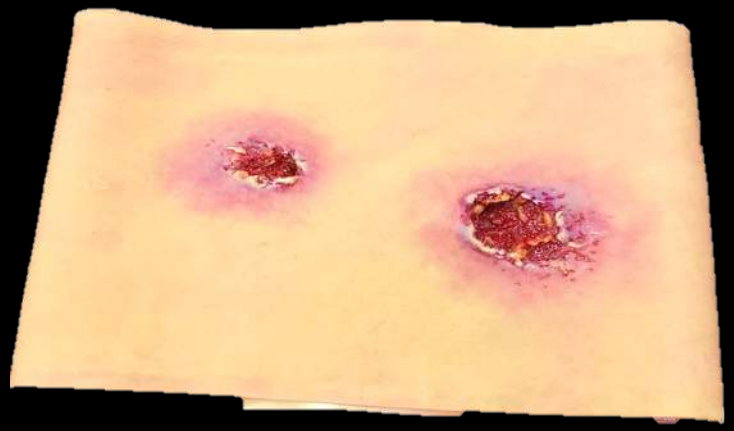
Broken jaw with laceration

Half-mask allows for unobstructed breathing through nose. Wound shows bone, muscle and fat tissues. Supplied with bleeding system. Wrap-around with hook and loop fastener

GSW to hand (Rt)

A through-and-through gunshot to the right palm exposing fat, muscle, bone and tendons. It bleeds from both the entry and exit wounds. It wraps around an actor or manikin. Attaches with hook and loop fastening.

GSW to leg



A through and through gunshot wound exposing fat and muscle tissues. Bleeds from entry and exit. Wrap around device with hook and loop fastener

Manual bleeding system and non-staining simulated blood liquid concentrate

This 2-Liter simulated blood supply reservoir with manual pump is designed to attach to any NARS bleeding wearable wound simulation, Wound in a Box™, part task trainer, or worn by human role player.

8 oz. concentrated simulation blood.
Non-staining

Wearable Wounds

- *100% silicone construction*
- *Hook & loop wrap around closure*
- *Application/removal in minutes*
- *Designed for use on TOMManikin and human role players*

Examples of Wearable Wounds

Packable evisceration

Large thigh laceration

GSW through hand

Burn arm

Sticky Wearable Wounds

100% silicone construction
can be reused multiple times

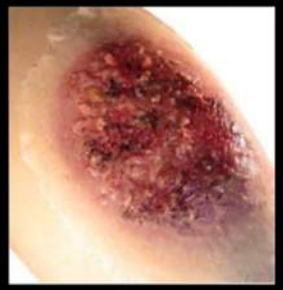
Designed for use on TOMManikin and human role players

Examples of Sticky Wounds

Laceration

Electrical Burn

GSW entry wound



Thermal Burn

Chemical Burn

Patient Monitoring suite (PMS)

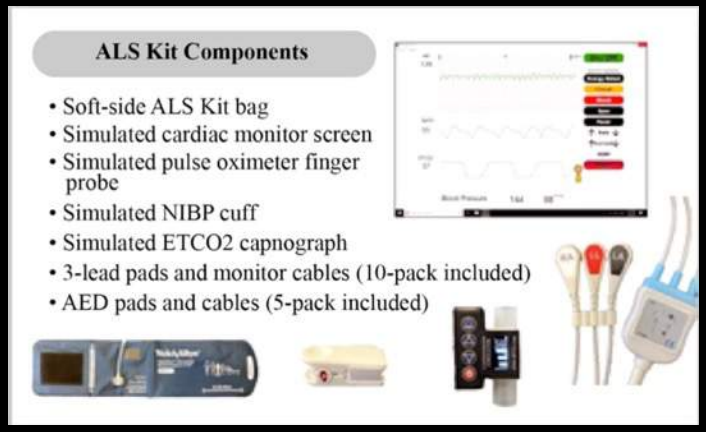
The NARS Capnograph Simulator is designed to be used as a mainstream carbon dioxide monitor that can be connected in-line with a mask or tube. Simulator displays include carbon dioxide partial pressure, respiratory rate and CO2 waveform.

The NARS Pulse Oximeter Simulator utilizes the widely used finger-style probe for monitoring blood oxygen saturation. Simulator display includes Heart Rate, SpO2 and SpO2 waveforms.

The NARS NIBP Monitor Simulator is designed to replicate a portable NIBP monitor. This simulator allows medical responders to gather vital signs without instructor intervention. Onboard controls allow various modes of operation. Display includes systolic & diastolic pressures (mmHg) and heart rate.

The Advanced Life Support (ALS) Kit devices are controlled by the Instructor Tablet via Bluetooth.

- These devices are used to simulate various vital signs for advanced life support monitoring and simulation.
- A set of simulators for use in all phases of patient care for any human (role-player), or any patient simulator, includes simulated cardiac monitor screen, NARS Patient Monitoring Suite (Pulse oximeter, NIBP cuff, ETCO2 capnograph), durable ALS bag with 3-lead monitor cables and AED pad cables and simulated cardiac monitor screen tablet.
- The ALS Kit supports on-the-fly, dynamic cardiac rhythms, B/P, ETCO2, SpO2, all controlled from the instructor tablet.
- Waveforms include ECG Lead II, ETCO2 & SpO2



Introducing rapid immersion augmented reality training

Helmet not included

The Virtual Patient Interactive Trainer (VPIT) is an augmented reality training system paired with the instructor tablet that enhances the visual presentation of patient conditions.

The VPIT is remotely controlled by the instructor tablet using Advanced Remote software. It highlights patient visual cues that are hard to replicate in traditional training (e.g., altered mental status, respiratory distress, the progression of shock, and tissue swelling).

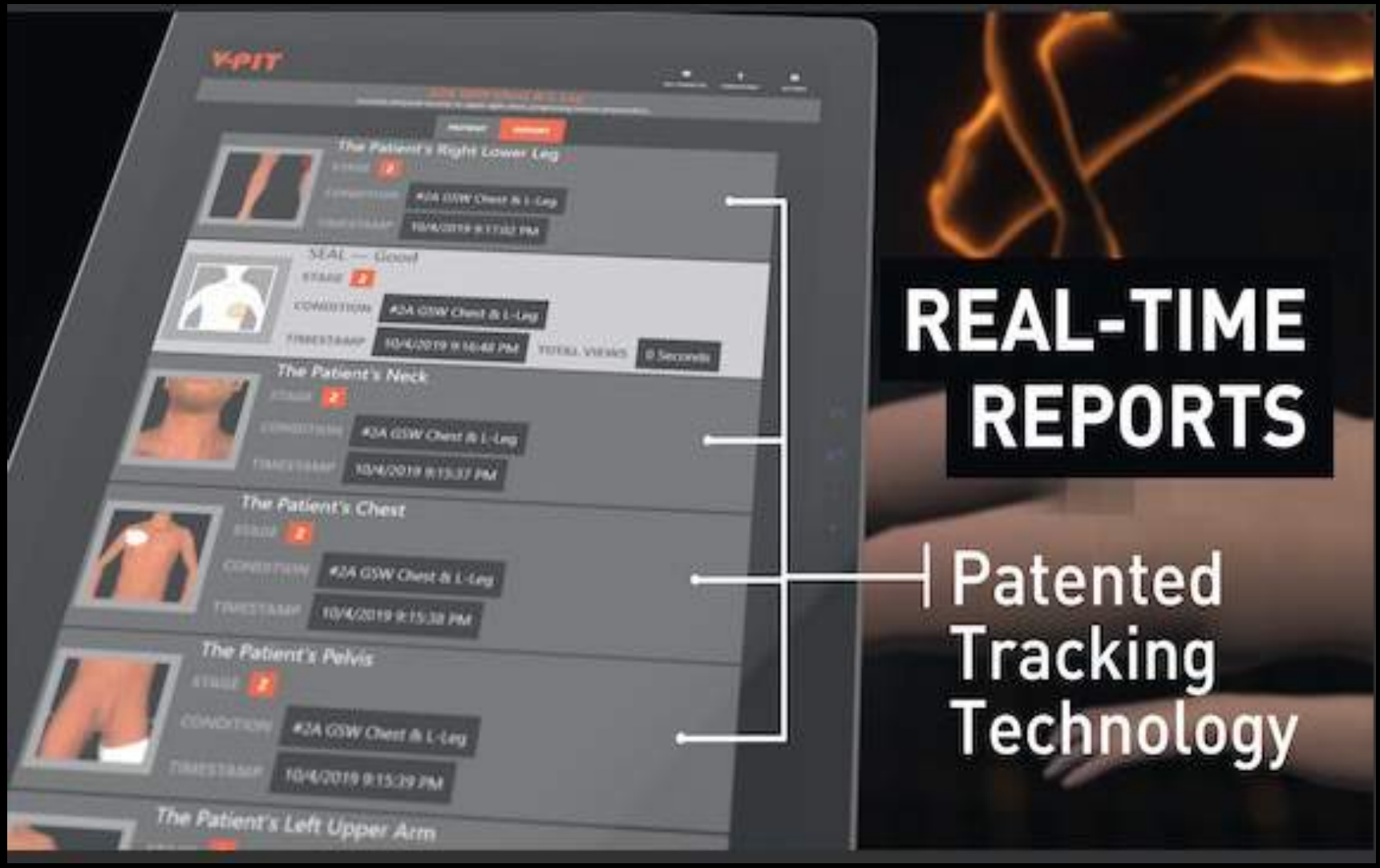
VPIT's rapid delivery of training session scenarios and real-time data capture makes TCCC training more efficient. Rapid immersion helps students develop fast recognition skills and mentally rehearse the activities/interventions that will be needed in a real-world environment.

Gaze tracking technology captures students' focus points, particularly useful in debriefings.

V-PIT™

VIRTUAL PATIENT
IMMERSIVE TRAINER


V-PIT
60+
INJURY
COMBINATIONS

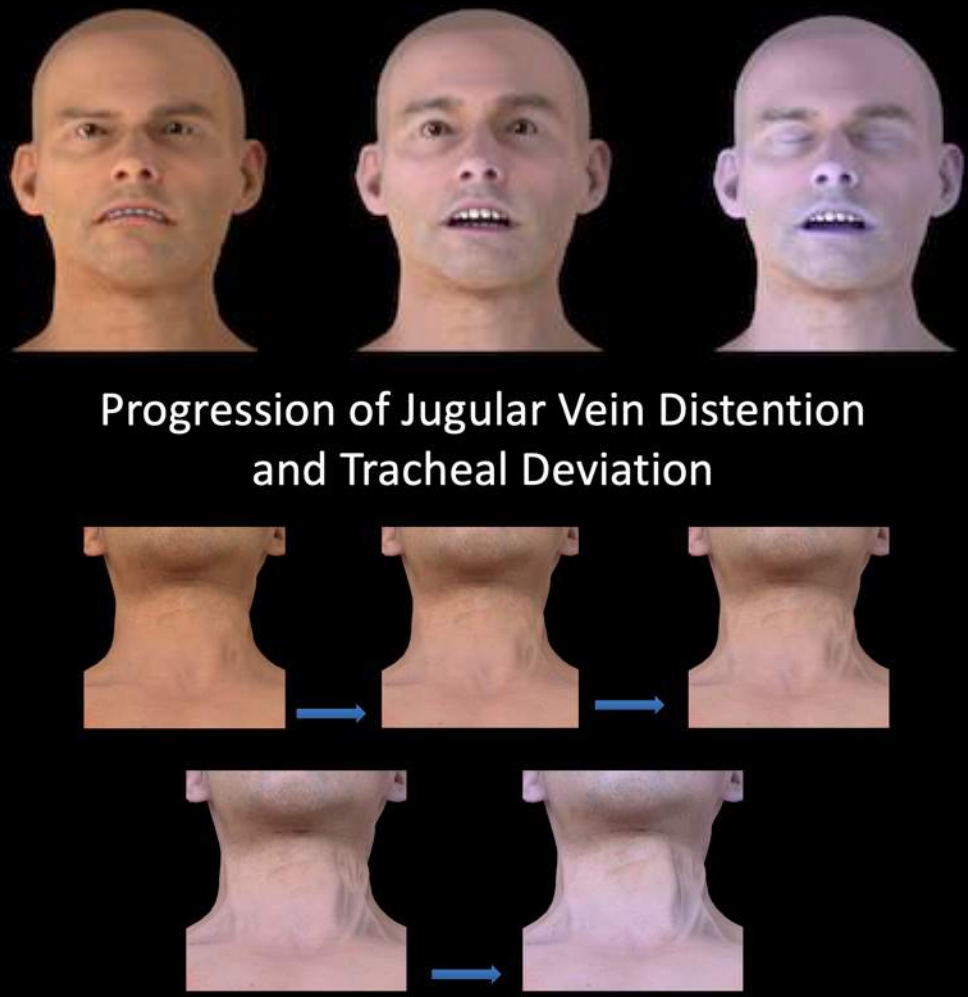

V-PIT
The Patient's Right Lower Leg
#2A GSW Chest & L-Leg
SEAL — Good
STAGE 2
CONDITION
#2A GSW Chest & L-Leg
TIMESTAMP
10/4/2019 9:16:48 PM
TOTAL VIEWS
0 Seconds
The Patient's Neck
#2A GSW Chest & L-Leg
10/4/2019 9:15:37 PM
The Patient's Chest
#2A GSW Chest & L-Leg
10/4/2019 9:15:38 PM
The Patient's Pelvis
#2A GSW Chest & L-Leg
10/4/2019 9:15:39 PM
The Patient's Left Upper Arm
REAL-TIME REPORTS
Patented Tracking Technology

VPIT and TOMManikin

•The trainee wears the headset throughout the training session

• When interventions need to be applied, the virtual patient can be removed from the trainee's view to ensure safe and effective practice

Samples of student-worn VPIT views



V-PIT™ PACKAGE

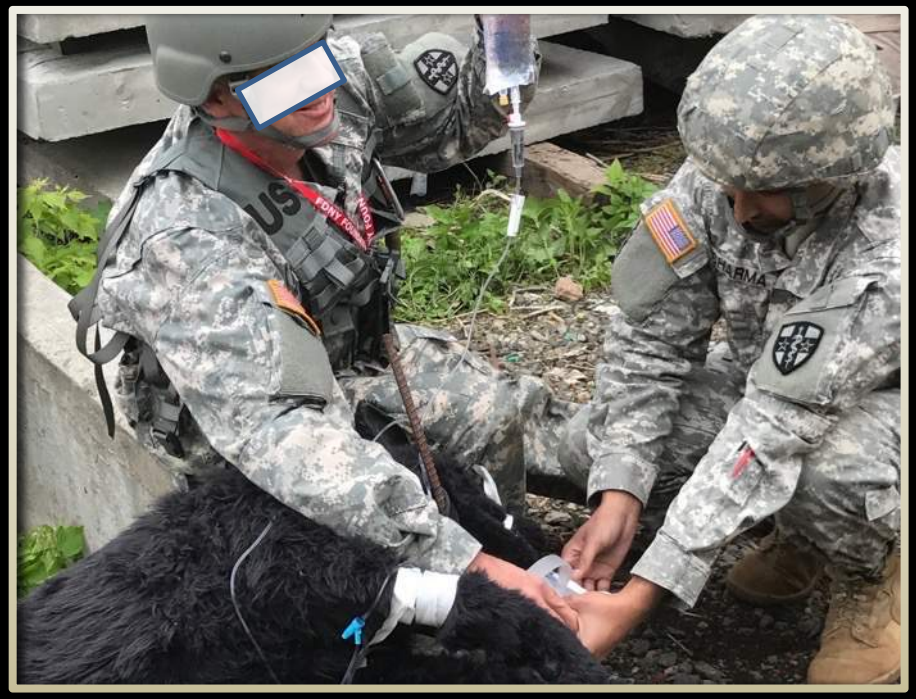
VIRTUAL PATIENT
IMMERSIVE TRAINER

Microsoft Hololens 2

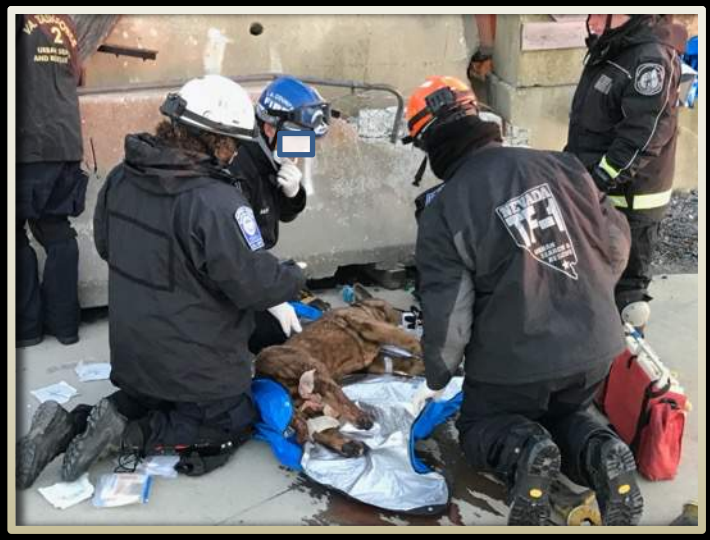
Curricula Support
based on 2019 TCCC Guidelines

Microsoft Surface
with V-PIT Preloaded
& Pretested

NORTH AMERICAN RESCUE®
Simulation

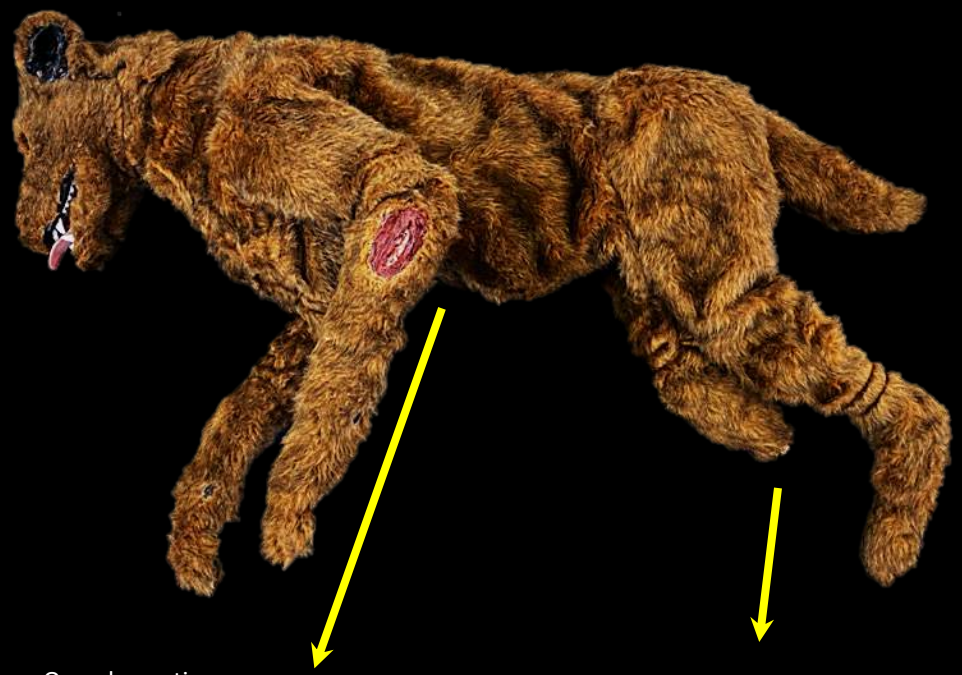


Meeting the needs of working dog field medicine



K9 Trauma simulator

- Expanded joint range of motion
- CPR chest
- 5 interchangeable limbs with various injuries
- Improved airway
- Barks, bleeds & breathes
- 1L onboard blood capacity
- Wireless operation via NARS tablet



Advanced airway management

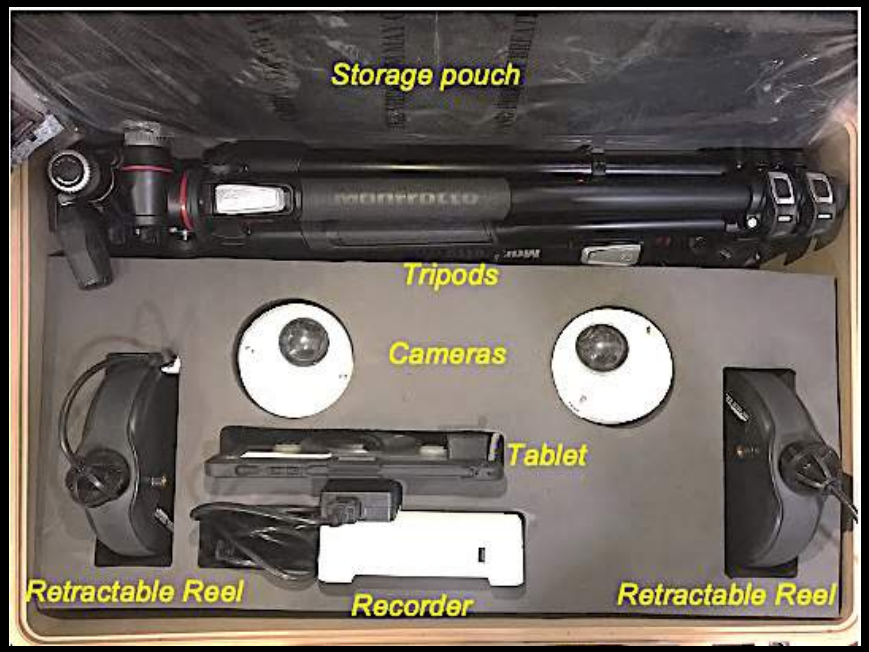
Open laceration

Complete amputation

NARS simulation accessories

Compressed air blast sim

- *Safe for indoor/outdoor use*
- *Housed in all-weather case*
- *Onboard compressor*
- *Multiple 'blasts' from single charge*
- *Onboard rechargeable battery*
  - *Battery is commercially available*
- *Remotely controlled by NARS tablet*
- *Test student's situational awareness with an unmarked/unattended case*
- *Can be safely x-rayed by EOD members*



Mobile Feedback System

- *Dual HD cameras*
- *2 Professional tripods w/ camera mounts*
- *4TB data recorder*
- *2 25' retractable cord reels*
- *Wheeled Pelican case*
- *Includes student-wearable stress monitor*

Mobile Feedback System Camera – The NARS video management system—coupled with TOMManikin's physiologic trending capture and student performance scoring—equips training personnel with comprehensive student performance metrics useful in After Action Reviews and program assessment. This comprehensive system enables multi-angle video capture, control room evaluator annotations, trending physiologic data, and time stamp record of interventions provided

CASEVAC Simulators

CV-22

H-60

Options include ICS Kit with headsets, cameras with video capture, litter stanchions, FRIES bar, blackout drapes.

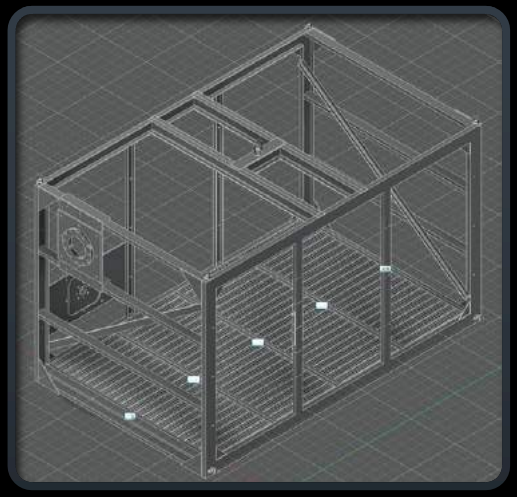
MH6 Little Bird

MH-6 Little Bird - Water

Water TOMM pictured inside Little Bird

NARS Salvage Vehicles

US Navy Mobile Diving and Salvage Unit ONE



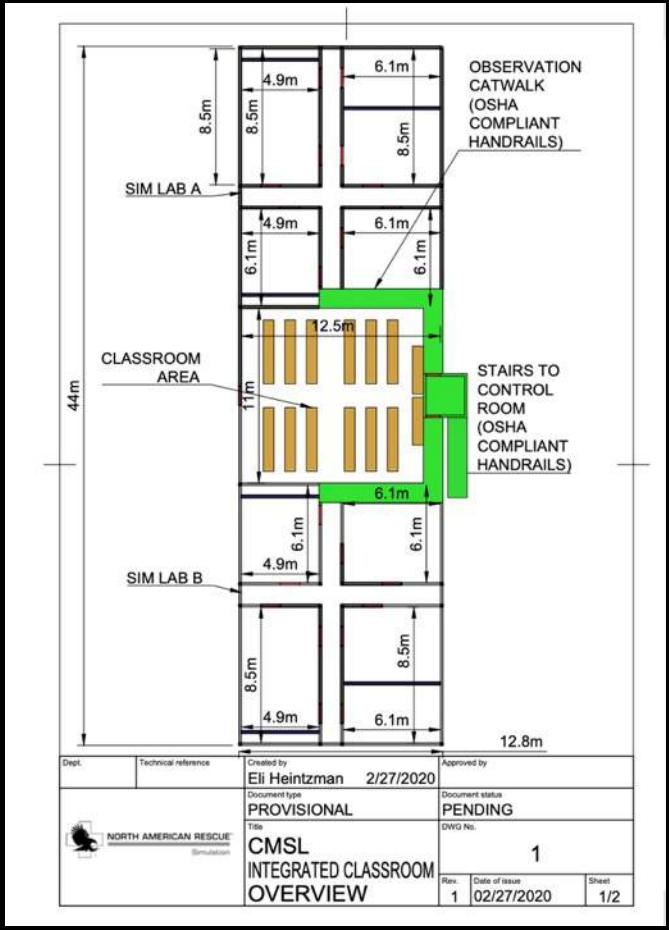
Preparing for shipment

Custom Navy Diver Salvage Training Box

Simulation training centers

Engineering custom turnkey training solutions that feature

- Structures
- Trauma simulators
- Patient vital sign simulators
- Vehicle simulators
- Dynamic multi-angle video capture
- Special environmental effects
- Live student stress monitoring



Simulation training centers

Engineering custom scalable experiential learning environments from concept design through installation and onsite training.

Simultaneous integration of multiple NARS products and devices, create environmentally realistic scenario settings. From care in the streets/POI care, mass-casualty triage, prolonged field care and complex medical/surgical case management, our solutions provide the capability to train personnel in a safe, reproducible, environment.

Simulation center elements

- Portable, reusable, training systems that enhance the realism of combat medical training without heavy demand on personnel.
- Enhances stress inoculation capabilities while training personnel proper methods of administering medical aid to occupants from the interior of any structure or within the parameters of a training exercise.
- NARS proprietary software enables simultaneous control of all devices from a single tablet.

Smoke Generator

Our smoke machines produce some of the highest output in the business with controlled and settable bursts of smoke for setting different levels of applicable vision restrictions.

Fire suppression system safe even with heavy dense fog.

Control is fully integrated into the NARS control system and can be set to on, off, or settable intervals.

Can be integrated into NARS scenario software

Sensory Control Unit System components

Wind simulator

- Wireless AC control
- 3-speed output (2600-4000 CFM)
- 1HP
- Power: 10-10.8 amp
- Voltage: 115-120
- Weight: 38.5 lbs
- Power cord length: 25’

Sound System

Sim center is equipped with multiple powered speakers to generate unique background and environment sounds.

System is fully integrated into the NARS control system software and the operator need only push a button to change the environment from quiet wilderness to explosive crash site for any of the rooms at any time.

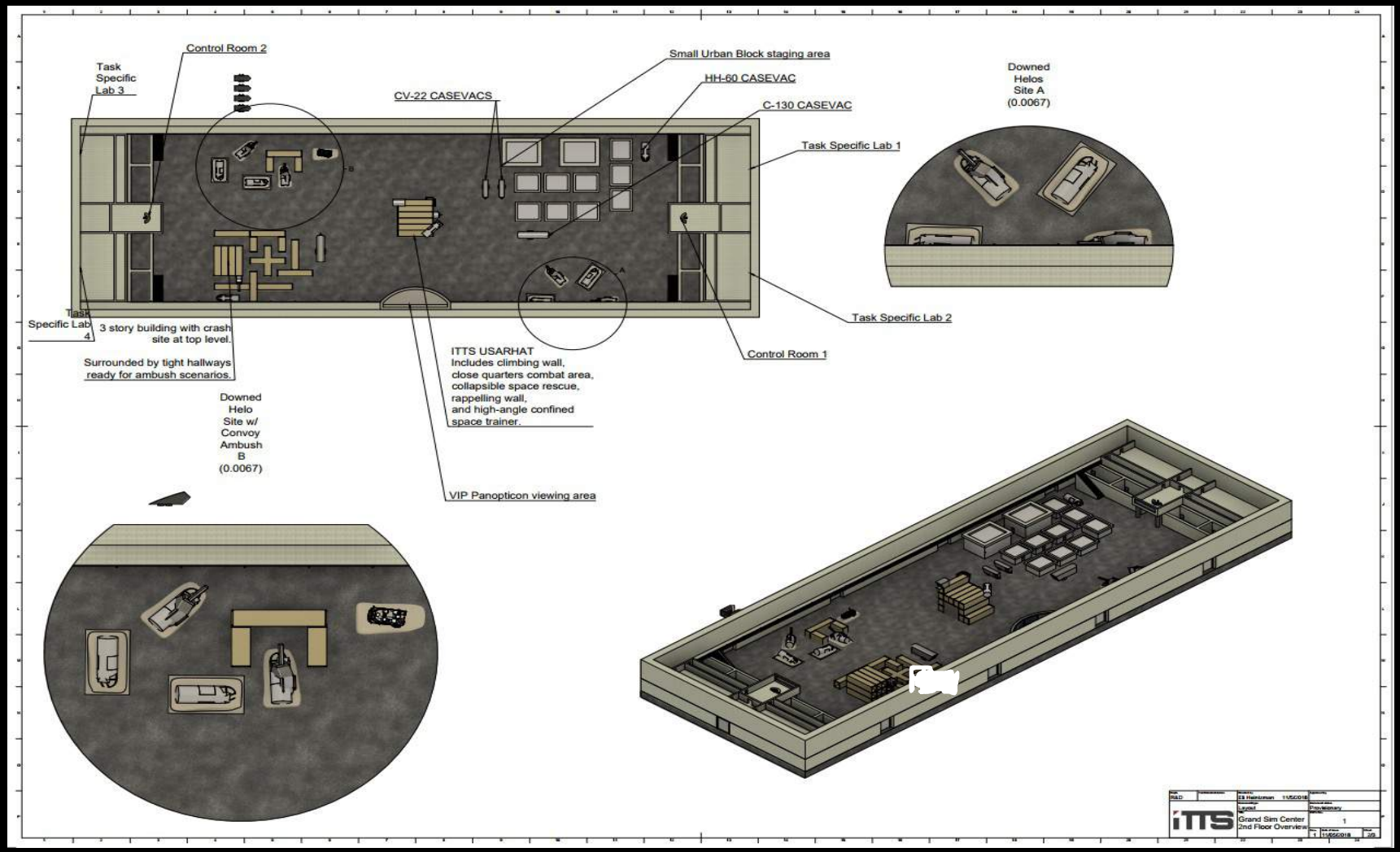
LED lights

Brilliant strobe lights with configurable strobe patterns, and levels of intensity, help generate the in-field immersion of each scenario.

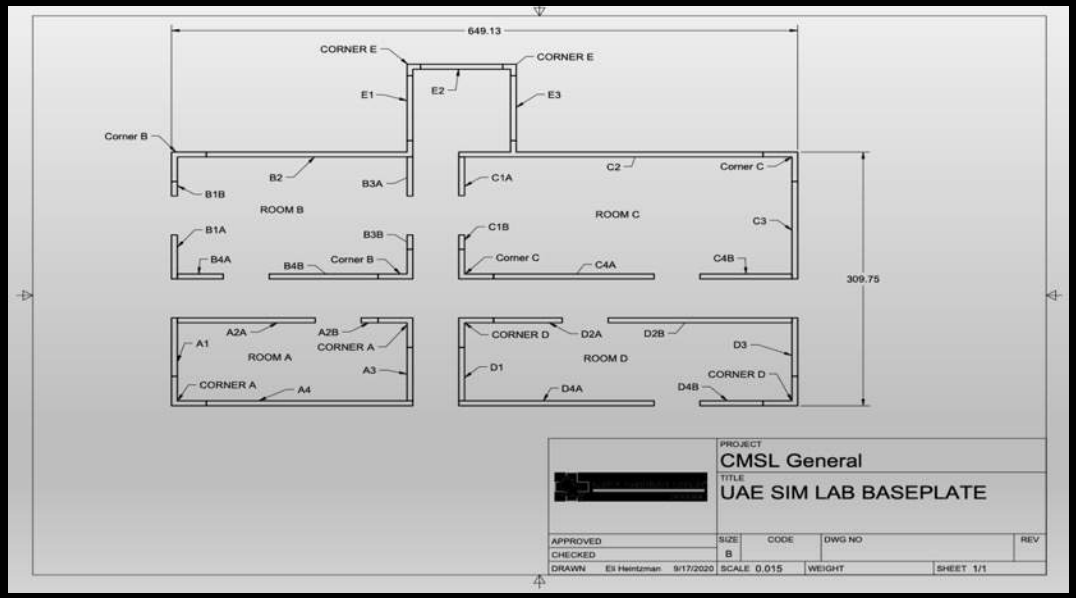
Grand Simulation Center Saudi Arabia

Conceptual project that includes multiple crash sites, urban and rural settings and CASEVAC capabilities.

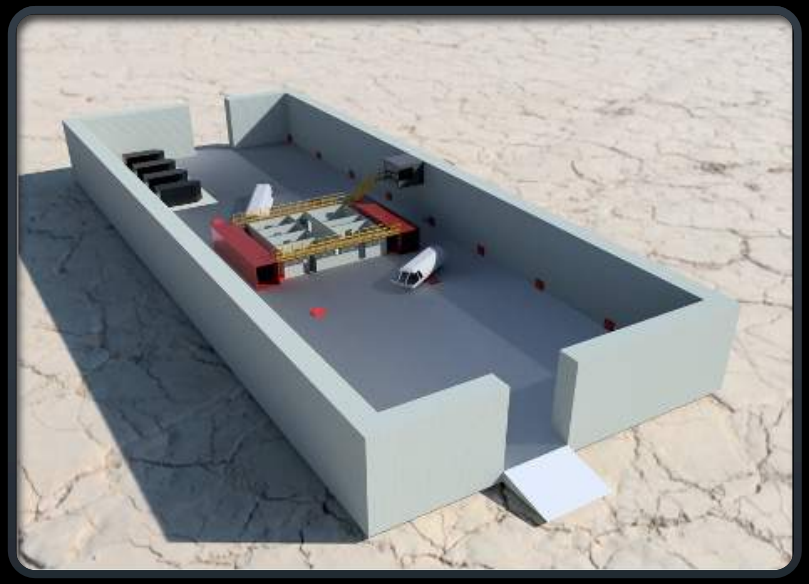
Includes master control suite with VIP observation area and 4 classrooms.



UAE Simulation Center



Final drawing
(baseplate layer shown)



Initial conceptual drawing

UAE Simulation Center during assembly

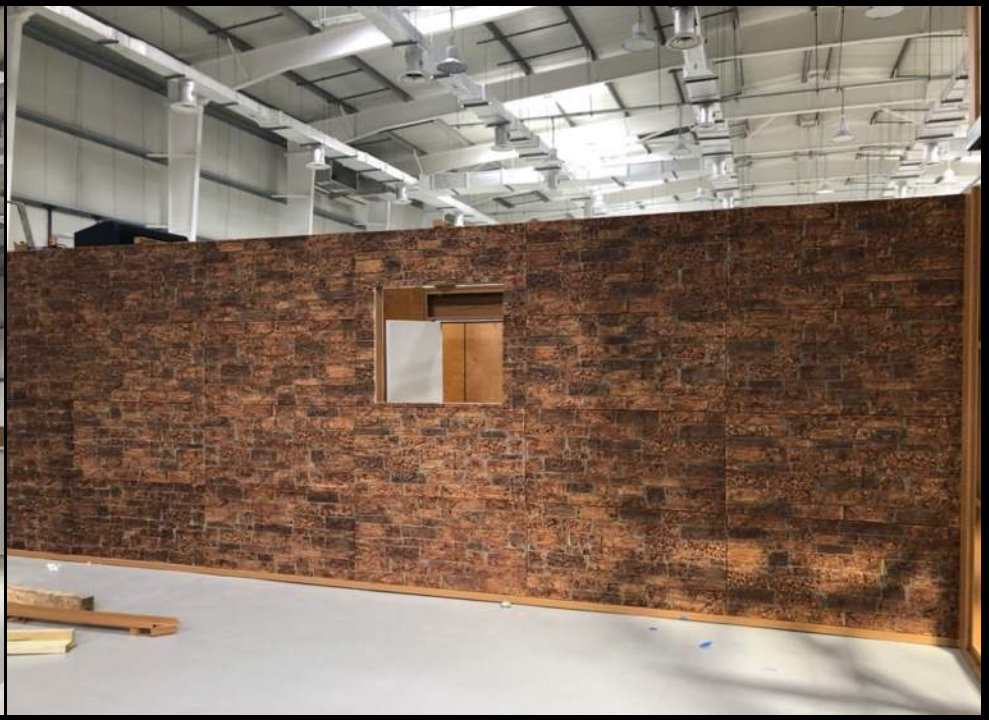
Loudspeaker mounted

Individual room view from observation deck

Ground-level view with overhead camera mounted

Faux brick wall installation

Center hallway entrance



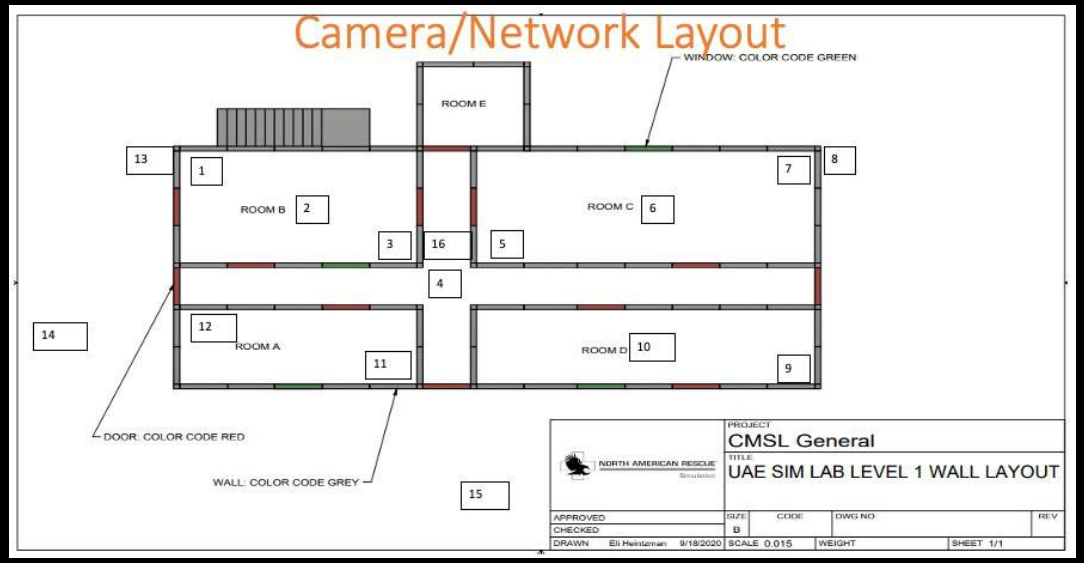
Simulation Control Room

(In assembly) View from catwalk

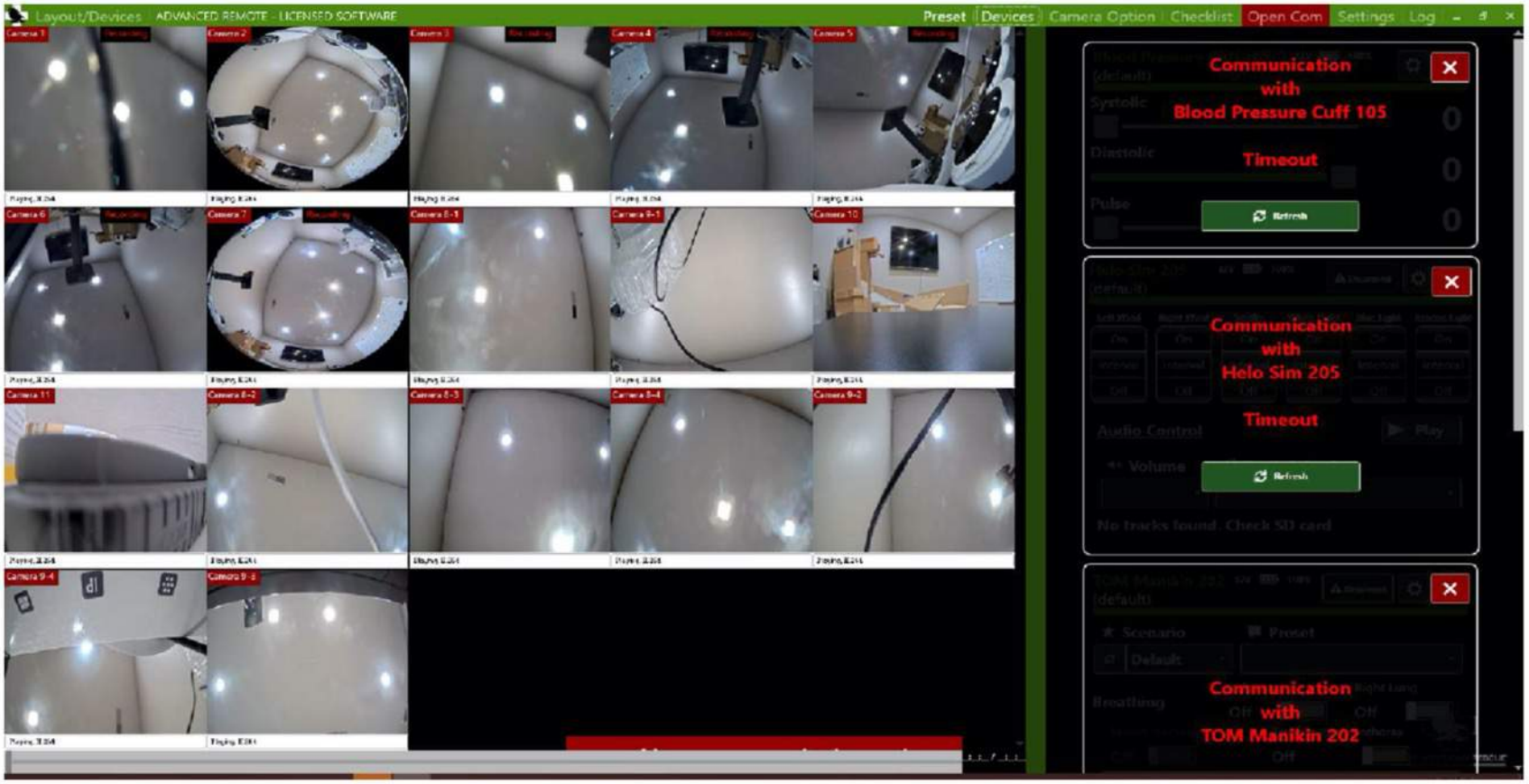
Multiple servers to capture video and student performance evaluations

Multiple video screens enable simultaneous control of sim center components and live multi-camera views of sim center areas of operation.

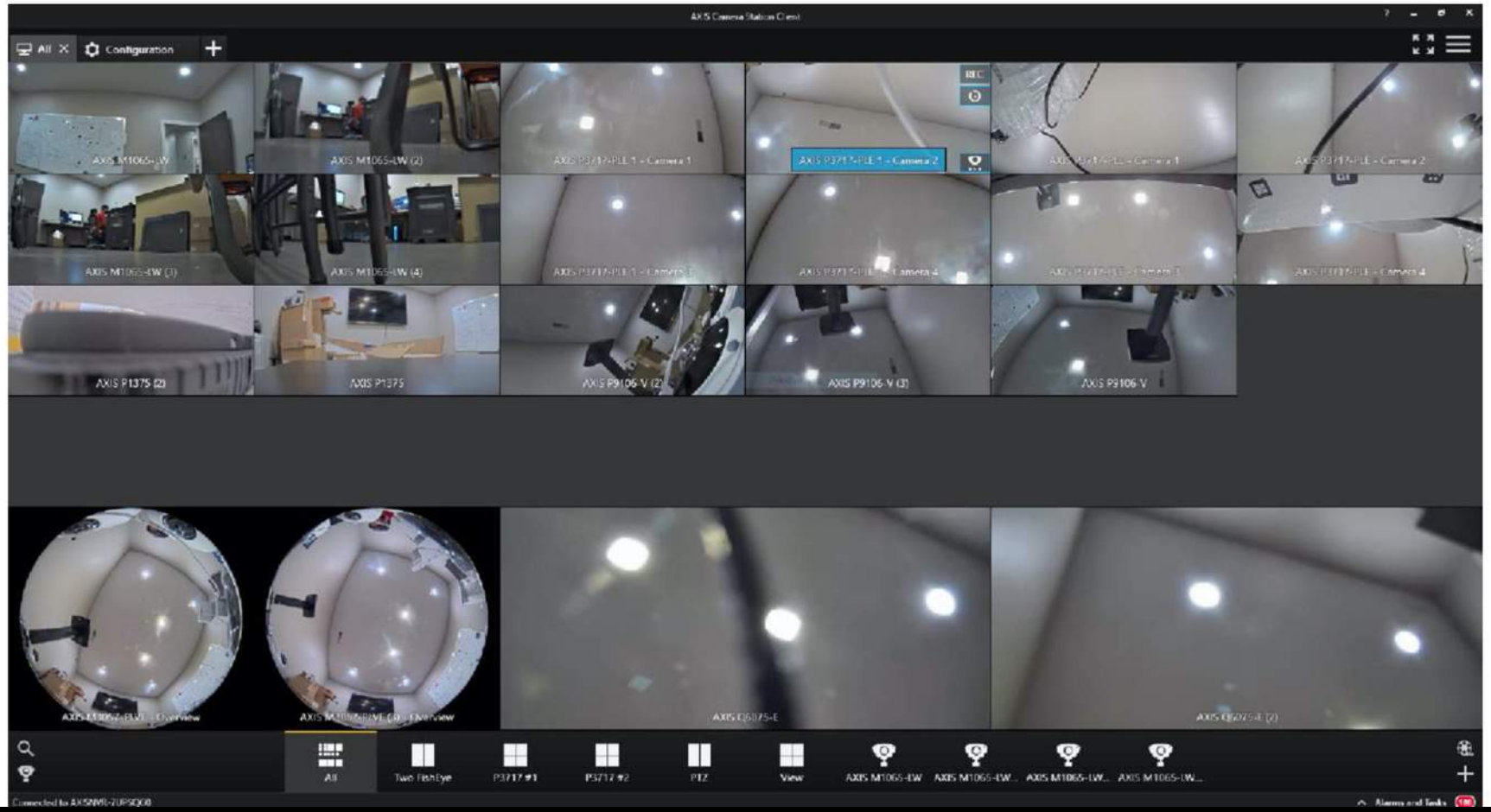
Multiple cameras to capture scenario performance



Sim Room Camera Interface 1 – Alienware Dual Monitor



Sim Room Camera View 2 – Dell 55” Monitor



Customer Support

NARS offers flexible customer support options:

- Onsite visits / New Equipment Training *(required)*
- Telephone and video conferencing support
- Online training videos, resource page, and warranty registration.
- Flexible extended warranty options available

NARS Equipment Sustainment Levels

Modular design enables rapid repair/replacement in the field by end-users.

Technical support via:

1. Telephone/Video consultation *(Skype/Zoom/Facetime/etc.)*
2. Replacement part exchange
3. Onsite Technician visit

Future Upgrade Capabilities

TOMManikin's features and capabilities continue to be refined and improved. Historically, NARS has maintained upgradable continuity from our earliest TOMMs through current production.

Innovative experience
where it matters most

NORTH AMERICAN RESCUE®

Simulation