University of Maryland Baltimore · Uniformed Services University of the Health Sciences · University of Pittsburgh · Mayo Clinic · UT Health San Antonio

Military - Civilian Partnership to Advance Standards of Performance for Simulated Combat Trauma Medical Skills: Prospective Cohort Study

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on behalf of the CMSS Consortium

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What does proficiency actually look like, and how would we know?

The Readiness Gap

Combat casualty care is central to military medical readiness, yet a critical gap exists between training investments and operational performance.

~10%

Meet Readiness Threshold

Only ~10% of military surgeons meet the KSA threshold for deployment readiness; this reflects 2019 data.

3–6 mo

Skill Decay Window

Procedural skills degrade within months without structured refresher training.

Critical

Training - Operations Mismatch

Military medical personnel often train with less complex cases than wartime trauma.

1. Dalton MK, et al. "Analysis of Surgical Volume in Military Medical Treatment Facilities and Clinical Combat Readiness of US Military Surgeons." JAMA Surg. 2021;156(12):1168 –1175. doi:10.1001/jamasurg.2021.5331

2. Linde AS, Caridha J, Kunkler KJ. "Skills Decay in Military Medical Training: A Meta - synthesis of Research Outcomes." Mil Med. 2018;183(1 - 2):e40 –e45. doi:10.1093/milmed/usx053

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The CMSSC: Military -Civilian Consortium

Principal Investigator: Paul Phrampus

The **Combat Medical Skills Sustainment Consortium (CMSSC)** was established by the Defense Health Agency (DHA) in 2021 to develop empirically derived proficiency standards for 20 trauma and resuscitation skills identified as essential for combat readiness .

CMSS Consortium contributors:

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No Relevant Disclosures

Gamma, Grok and Claude AI Used to Create Slide Graphics

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Study Design & Participants

Prospective Cohort Study

Five military-civilian academic medical centers; 20 Defense Medical Modeling and Simulation Office prioritized trauma skills. IRB approved at all sites (OHRO #E03688).

Enrollment Period

October 2022 – March 2025. ~40 participants per skill.

Total Assessments

1,495 enrolled · **1,457** usable · **38** excluded

Experience Stratification

Novice, intermediate, and expert groups based on self-reported procedures and training level.

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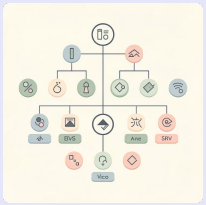
Combat Medical Skill Mastery

Upstream — Identification

Defining and Detecting Mastery

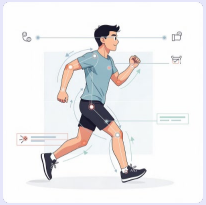


Skill Definition

Taxonomy and task deconstruction

Competency Thresholds

Validated proficiency benchmarks



Expertise Markers

Kinematics, Gaze, Stress

Adaptive Decisions/Errors Correction

Downstream — Maintenance

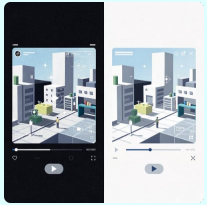
sustaining mastery over time

Decay Detection

Performance monitoring, triggers

Training Framework

Maintenance, booster, refresher



Modality Matching

Simulation, VR, video, mental practice

Simulation Design Modifying Foundational Factors (cross -cutting)

Person Factors	Task Characteristics	Training Method	Clinical Context
experience, motivation, ability	complexity, criticality, frequency	cognitive vs behavioral	exposure, austerity, stakes

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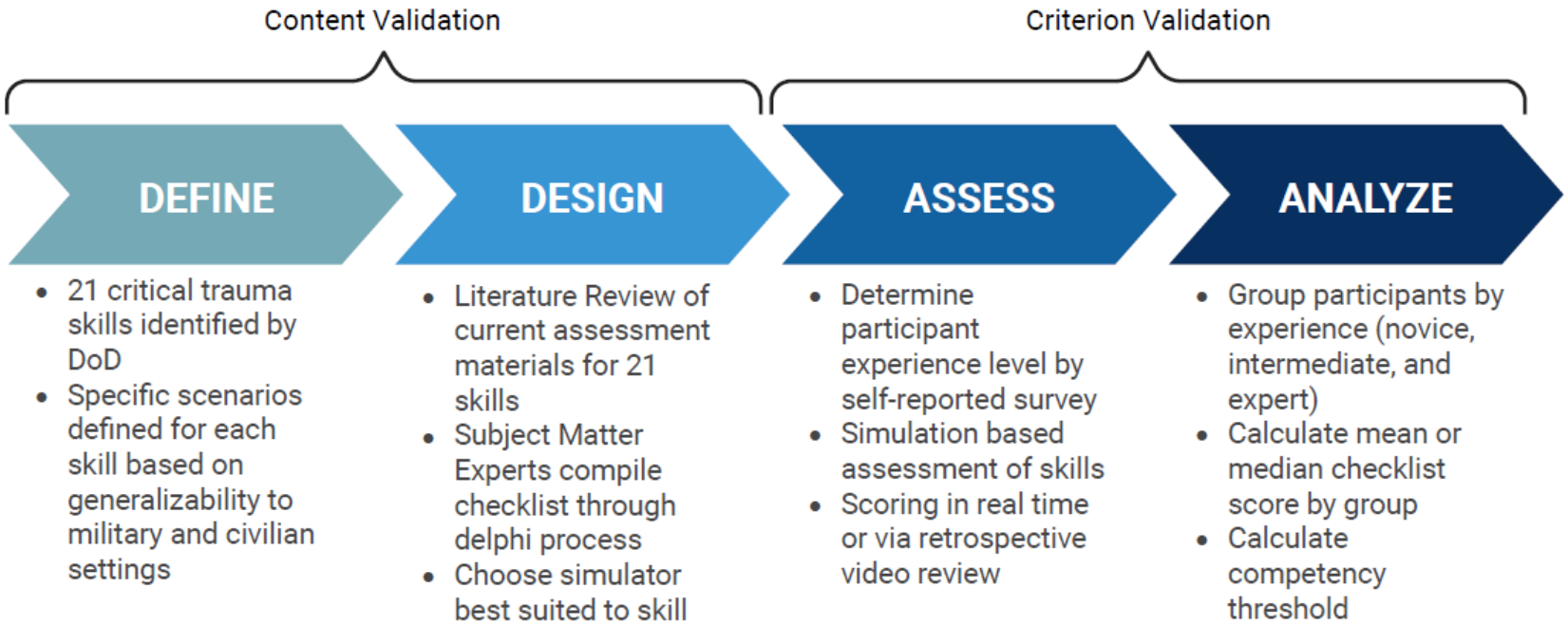
Checklist Development & Validation



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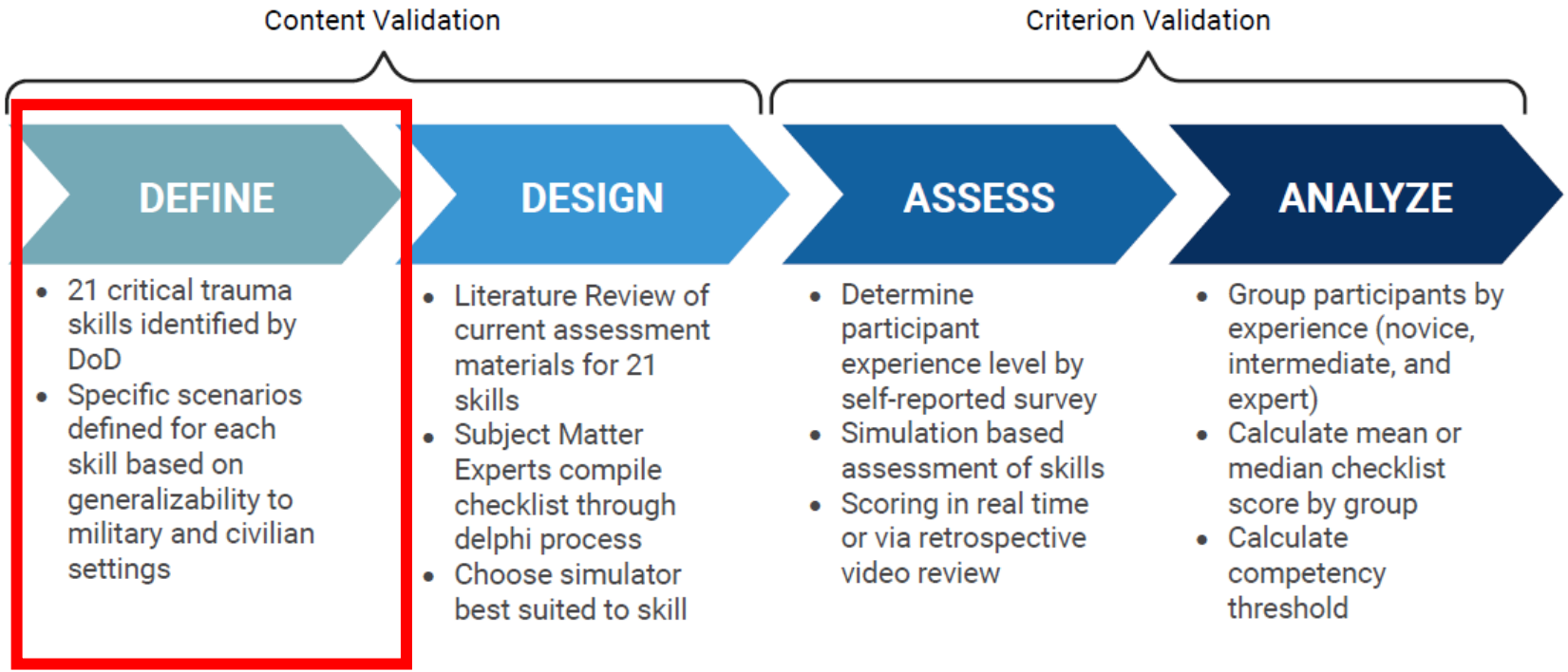
Checklist Development & Validation



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20 Combat Medical Skills (Defense Medical Modeling and Simulation Office)

The DMMSO prioritized 20 trauma and resuscitation skills, subdivided into 21 based on high-level task analysis, aligned with Tactical Combat Casualty Care (TCCC) and Prolonged Casualty Care (PCC) needs.

Tourniquet Application	E-FAST	Femoral Artery Exposure & Control	Lower Leg Fasciotomy
Whole Blood Transfusion	Massive Transfusion	REBOA Procedure & Management	Lateral Canthotomy & Cantholysis
Basic Airway Mgmt	US-Guided Vascular Access	Temporary Vascular Shunt	Ocular Foreign Body Removal
Needle Decompression / Finger Thoracostomy	Mechanical Ventilation Mgmt	Femur Fracture Stabilization	Cricothyrotomy
Advanced Airway Mgmt	Vasopressor Titration	Analgesia & Sedation Titration	Accurate Patient Handover

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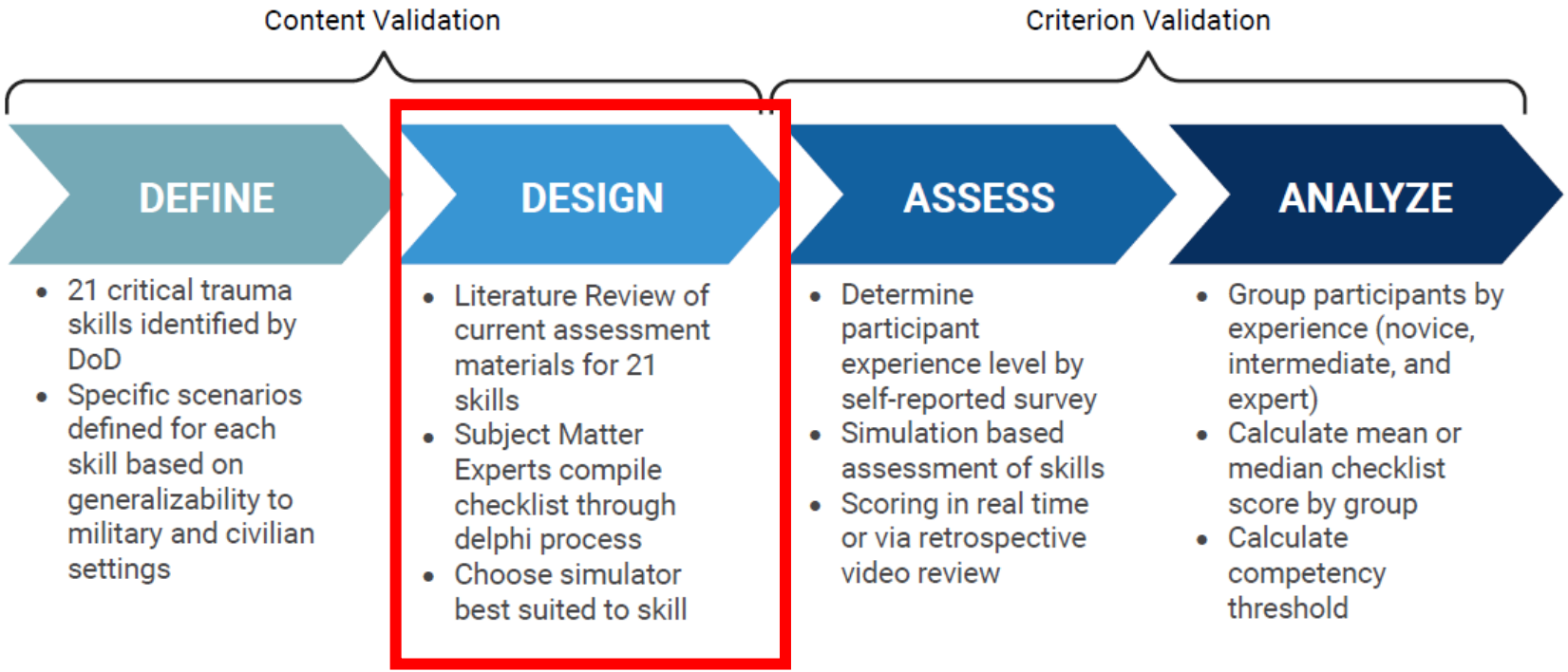
Checklist Development & Validation



Multiple Delphi cycles achieved consensus on critical tasks in Role 2-congruent simulations

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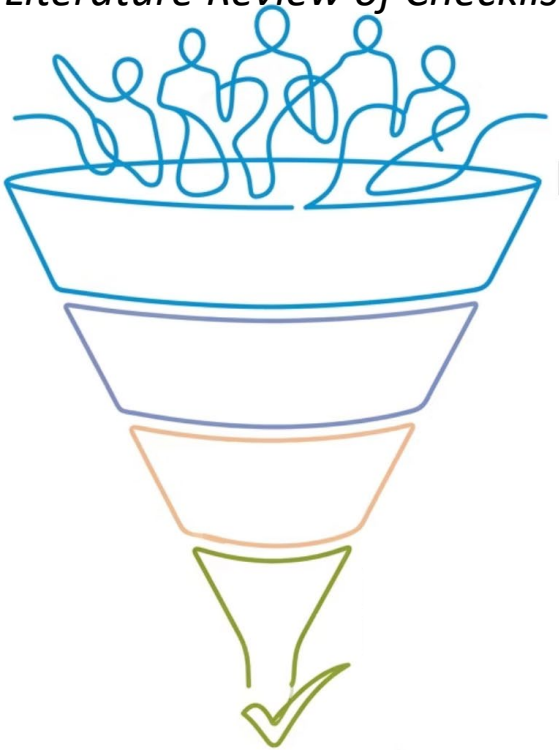
Context/Subject Matter Experts to Validate Checklist Items

Literature Review of Checklists



Broad Expert Pool

Military surgeons/medics, Emergency Medicine, Critical Care, Anesthesiology, RT, RN, APP

Task Analysis

Validated Checklist Items

Hierarchical Task Analysis

1) Define the task and its operational context
2) Decompose it into major subtasks
3) Map each subtask into discrete observable steps
4) Validate the entire map with SMEs through Delphi refinement.

Cognitive Task Analysis (Invisible Curriculum)

1) Anatomical knowledge
2) Equipment knowledge
3) Step sequence knowledge
4) Psychomotor fluidity skills
5) Situational awareness and clinical decision - making
6) Error detection and self - correction
7) Stress regulation under cognitive load.

Pretest & Priming Video

Each one represents a distinct domain of expertise that a checklist alone cannot fully capture.

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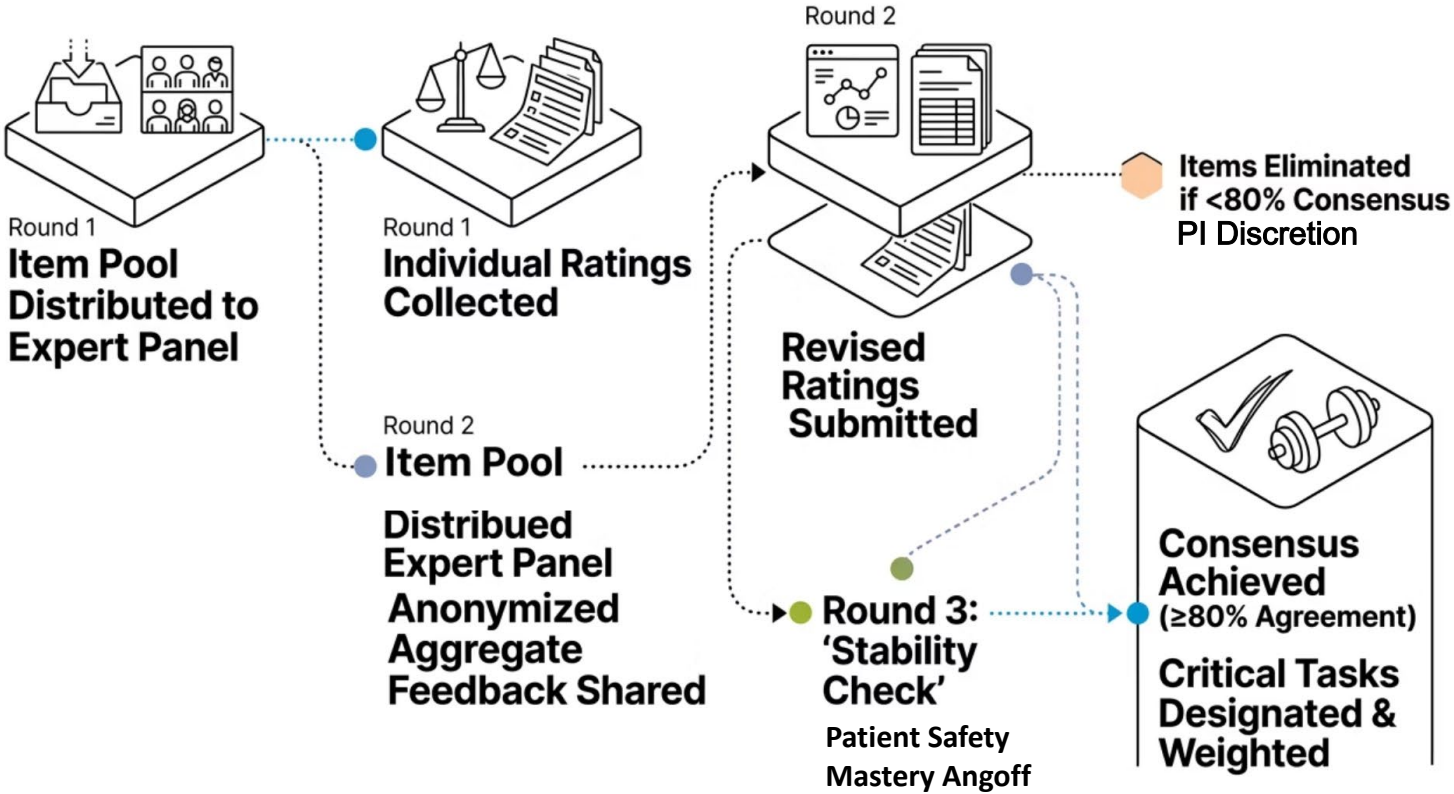
Delphi Process for Checklist Items



Hsu, C. & Sandford, B. A., (2007) "The Delphi Technique: Making Sense of Consensus", Practical Assessment, Research, and Evaluation 12(1): 10.

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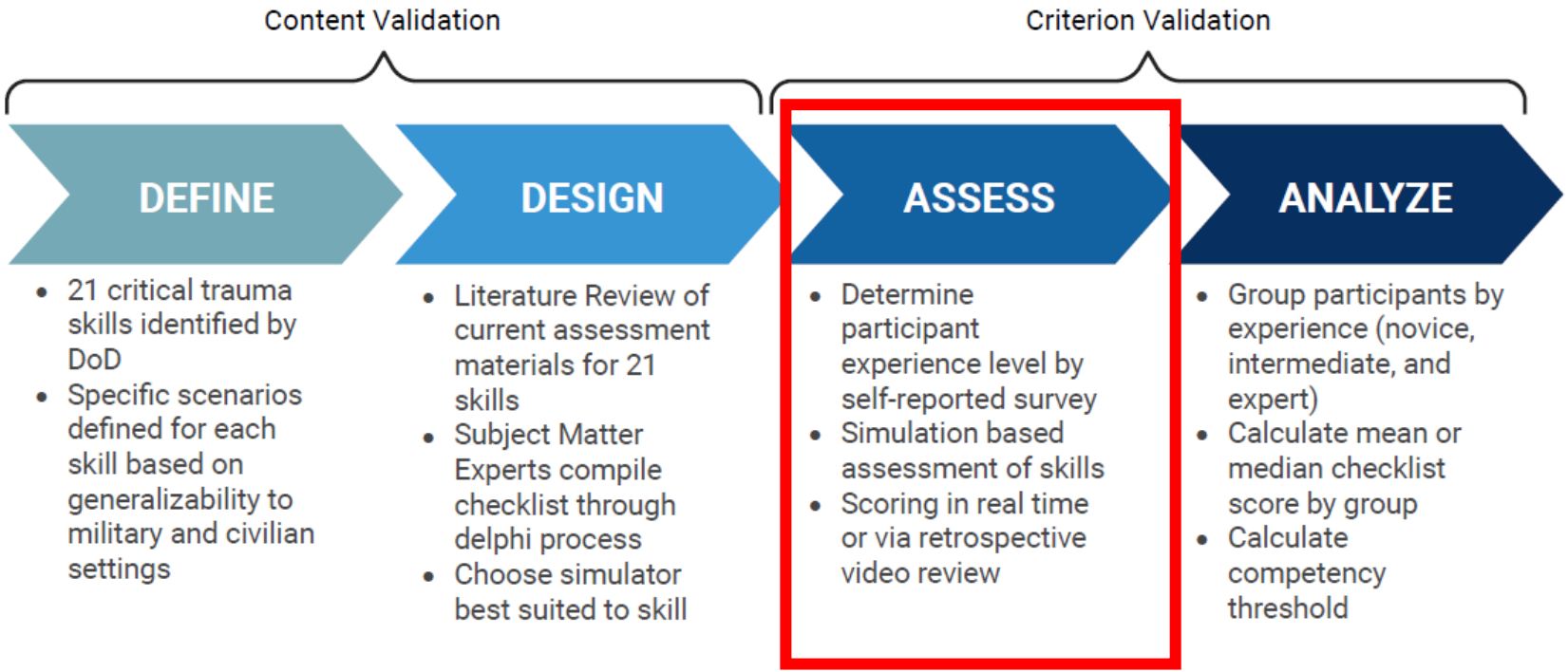
Checklist Development & Validation



Multiple Delphi cycles achieved consensus on critical tasks, with criterion -referenced validation using Role 2 -congruent simulat ions scored in real -time or via asynchronous video review.

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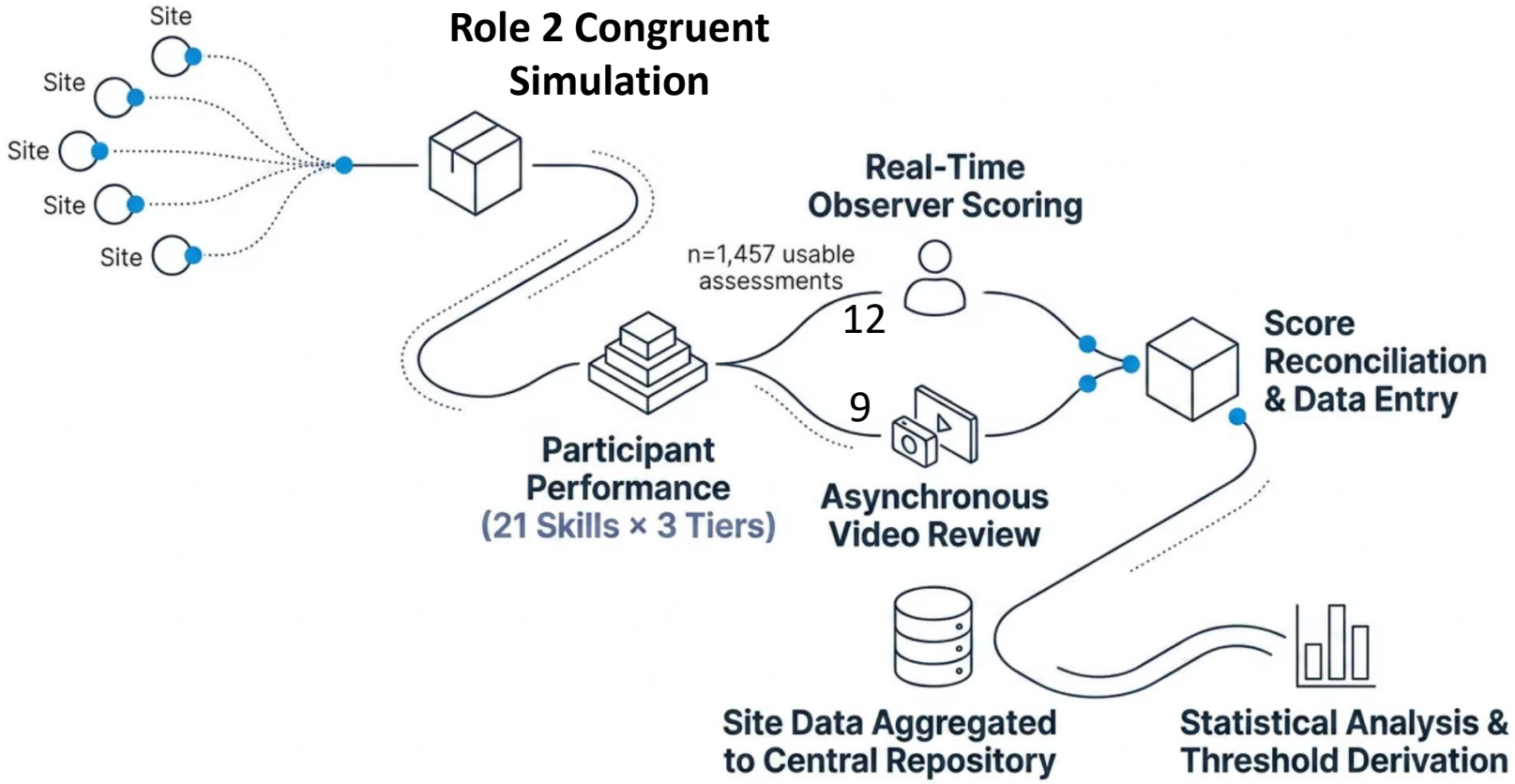
Simulation Design and Assessment



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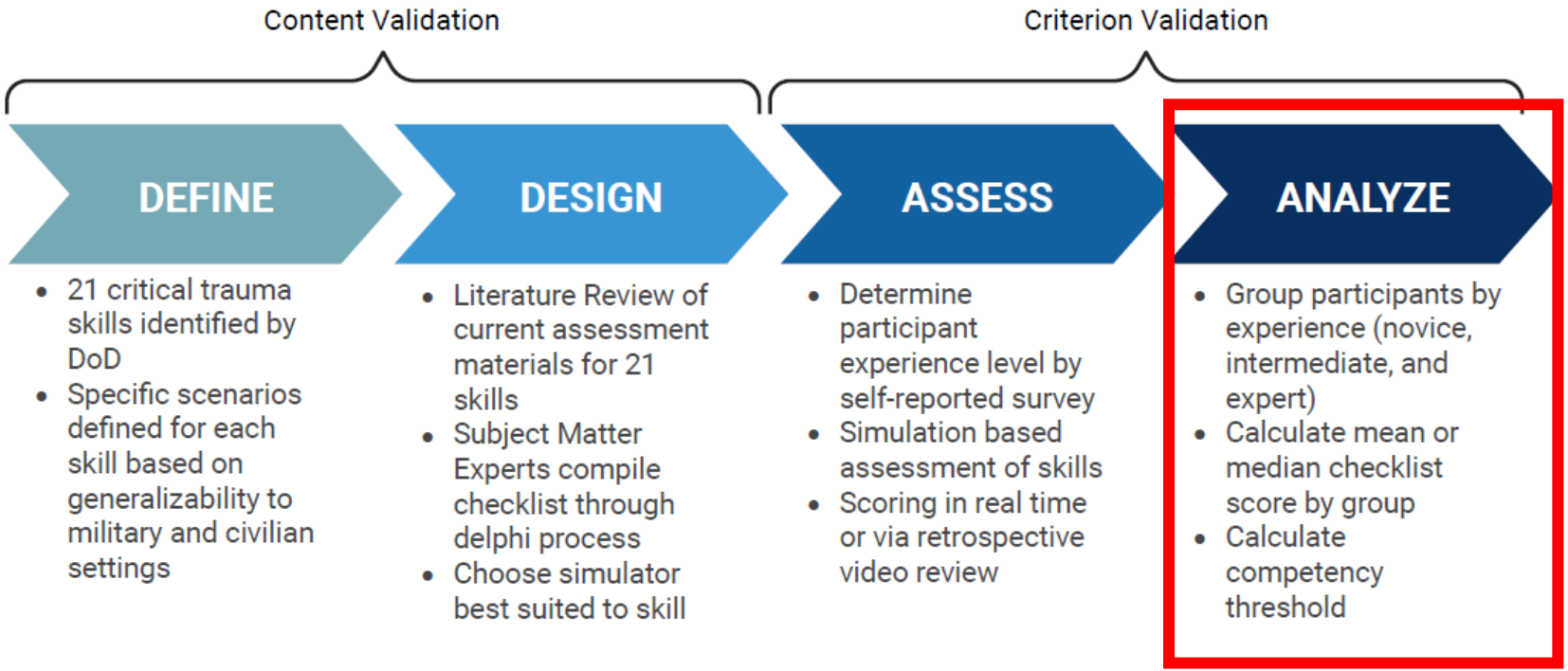
Checklist Development & Validation



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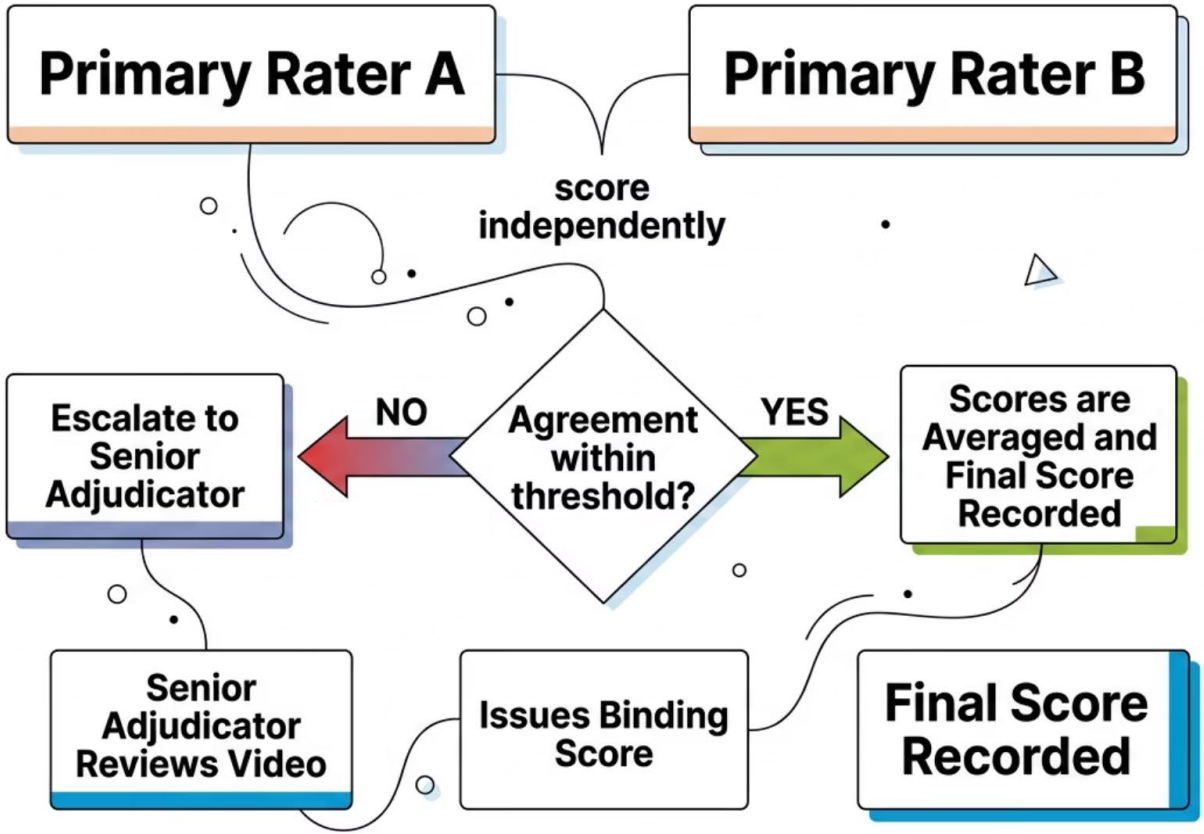
Interrater Comparison and Adjudication



RELIABILITY METRICS

Achieved Reliability:

ICC ≥ 0.70

vs

Cohen's κ ≥ 0.60

vs

Minimum Standard

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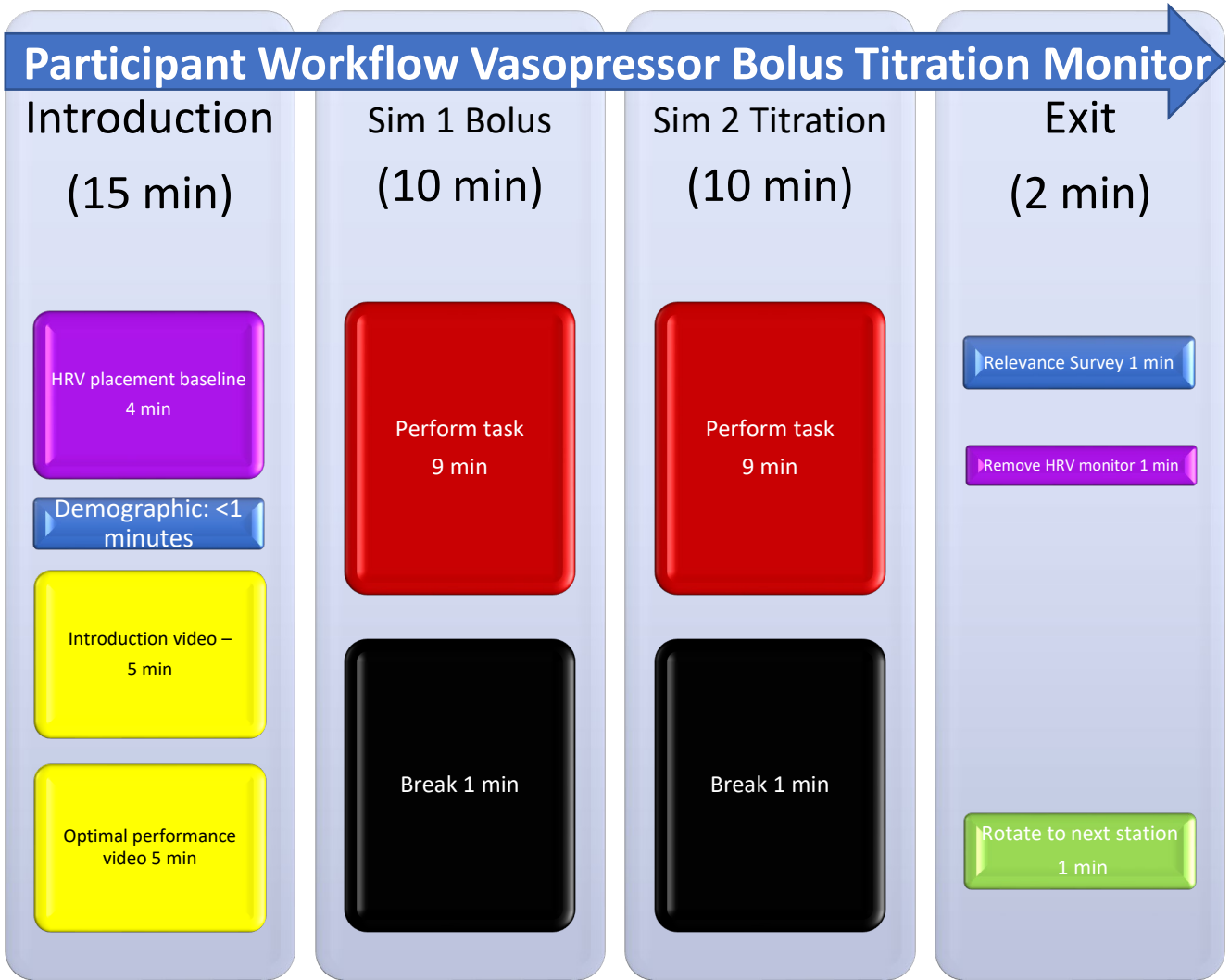
Participant Workflow Vasopressor Bolus Titration Monitor
Introduction
(15 min)
HRV placement baseline
4 min
Demographic: <1 minutes
Introduction video –
5 min
Optimal performance video 5 min
Sim 1 Bolus
(10 min)
Perform task
9 min
Break 1 min
Sim 2 Titration
(10 min)
Perform task
9 min
Break 1 min
Exit
(2 min)
Relevance Survey 1 min
Remove HRV monitor 1 min
Rotate to next station
1 min

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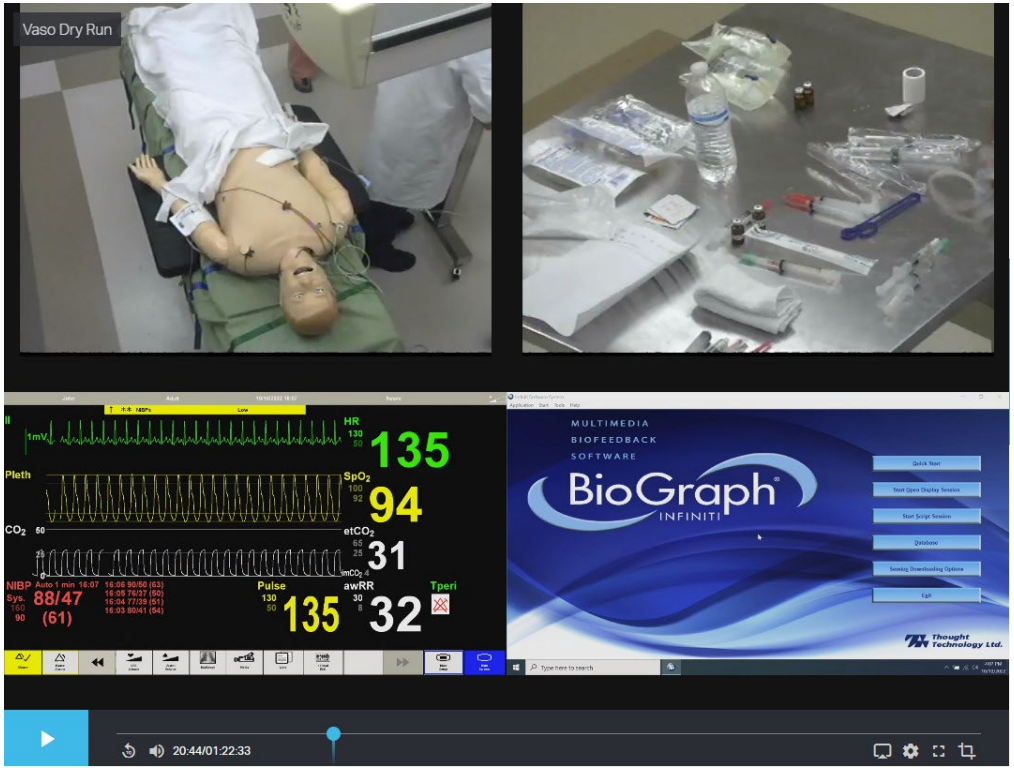
Camera 1
Participant and Patient interaction

Camera 2
Participant and Equipment interaction



All-In-One PC
Patient Vitals with Labs and Radiology images

Heart Rate Variability PC with ECG and Respiration rate monitoring

Statistical Analysis Approach

Mixed Methods

- Kruskal-Wallis, Chi-Square (skewed data)
- ANOVA, t-tests (normally distributed data)
- Logistic regression, quadratic GLM
- Inflection point analysis on least -squares curves

Competency Threshold Derivation

Thresholds empirically derived via inflection point analysis, logistic regression, and expert/intermediate performance averaging.

Software

SPSS, SAS, NCSS, Excel. Interrater reliability assessed throughout.

Competency thresholds were empirically derived informed by data structure, performance progression characteristics and experience stratification.

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Overall Results: Performance by Experience

1,457

Usable Assessments

Of 1,495 enrolled; 38 excluded for incomplete data or compromised simulation environment

45–100%

Threshold Range

REBOA Management (45%) to Handoff (100%) — reflecting wide variation in skill complexity

89%

Expert Median Score

Experts achieved 45–99% (median 89%); intermediates 45–93% (median 84%)

64%

Novice Median Score

Novices achieved 1–97% (median 64%), supporting validity of experience-based stratification

Construct validity: Across all 21 skills, expert performance exceeded intermediate, and intermediate exceeded novice

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Skill	N	Comp % Thresh	Novice % (Range)	Intermediate % (Range)	Expert % (Range)	N-E Change	N-E change p < 0.05
Tourniquet Placement (TQ)	41	83	83 (12)	88 (5)	92 (0)	9	NA
Superficial Ocular Foreign Body Removal (SOFB)	37	85	88(64-92)	92(76-98)	98(82-100)	10	N
Needle Decompression (ND)	42	92	84 (12)	83 (8)	92 (14)	8	N
*Massive Transfusion (MT)	40	88	n/a	n/a	n/a		N
Whole Blood Field Transfusion (WBFT)	41	87	66 (13)	80 (12)	87 (5)	21	Y
Advanced Airway Management (AAW)	41	92	63 (17)	88 (10)	96 (8)	33	N
Finger Thoracostomy (FT)	37	92	69 (21)	85 (13)	89 (12)	20	N
Mechanical Ventilation Mgmt (MVM)	40	77	55 (42-58)	76(68-92)	84(71-87)	29	Y
E-FAST	40	91	69 (14)	88 (8)	91 (7)	22	Y
US Guided Vascular Access (USVA)	40	92	73(51-95)	92(87-95)	92(90-95)	19	N
Femur Fracture Stabilization (FFS)	41	82	73 (15)	91 (14)	82 (14)	9	NA
Basic Airway Management (BAM)	41	87	67 (15)	93 (9)	93 (11)	26	NA
Vascular Shunt (VS)	39	88	64 (20)	79 (10)	88 (11)	24	Y
Vascular Exposure & Access Technique (VEAT)	39	75	50 (21)	76 (14)	77 (15)	27	Y
Vascular Exposure & Access Procedure (VEAP)	38	50	34 (9)	49 (11)	51 (10)	17	Y
REBOA Procedure	38	66	63 (8)	65 (20)	70 (7)	7	N
REBOA Management	38	43	38 (11)	45 (6)	45 (10)	7	N
Vasopressor Bolus/Titration (VASO)	38	82	71(68-80)	89(82-89)	89(88-93)	18	Y
*Analgesia & Sedation Titration (AN/SED)	40	90	n/a	n/a	n/a		N
Lateral Canthotomy & Cantholysis (LC&C)	58	90	1(4)	66(14)	99(5)	98	Y
Lower Leg Fasciotomy (LLF)	271	90	14(14)	69(24)	95(8)	81	Y
Cricothyrotomy (CRIC)	191	90	34(19)	69 (12)	98(14)	64	Y
**Accurate Handover Statement (HOS)	176	100	8	n/a	66	58	Y
**Accurate Handover Readback (HOR)	176	100	30	n/a	48	18	Y

Pattern 1 — tourniquet, needle decompression, SOFB, and manual tourniquet — showed ceiling effects. Novice >80%. N-E <10. these skills are learnable quickly and should be mastered by everyone.

Pattern 2 - Lateral canthotomy: novice 1%, expert 99%, delta of 98 percentage points. Cricothyrotomy: novice 34%, expert 98%, delta of 64. Lower-leg fasciotomy: novice 14%, expert 95%, delta of 81. These are the skills that absolutely require deliberate practice in the Ericsson sense — extended, structured, feedback-rich repetition.

Pattern 3 - endovascular skills. REBOA management threshold of 43%; experts only reach 45%. The delta between novice and expert is 7 percentage points. Read carefully, this is telling us something we need to confront: even our experts are not very far from our novices on this composite score. That can mean the skill is genuinely beyond the deliberate-practice ceiling for current case volumes — nobody is doing enough REBOAs to develop true expertise

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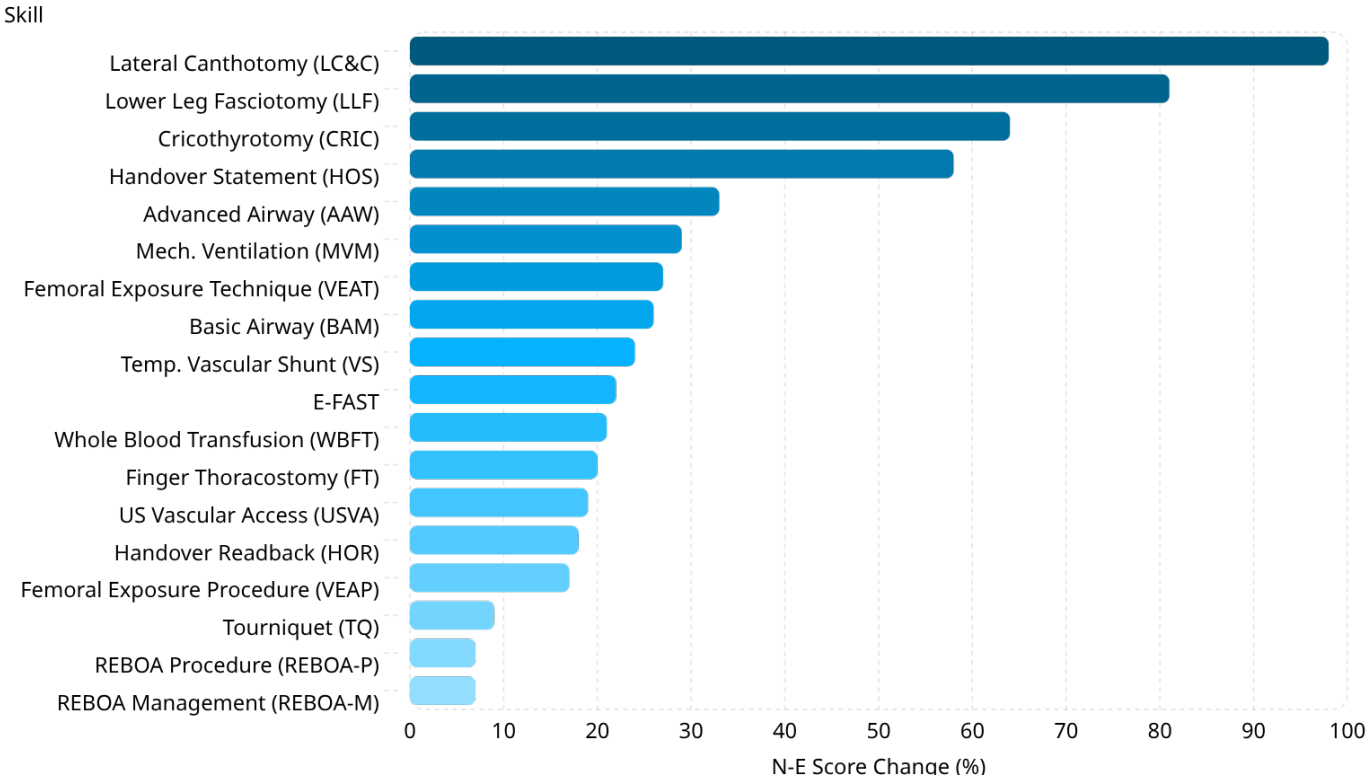
Novice-to-Expert Score Change by Skill



High-risk, rare procedural skills (LC&C, LLF, CRIC) show the largest novice -to-expert gains, confirming the need for extensive d eliberate practice. Low -complexity skills (TQ, REBOA) show minimal gains, reflecting ceiling effects or persistent cognitive load barriers.

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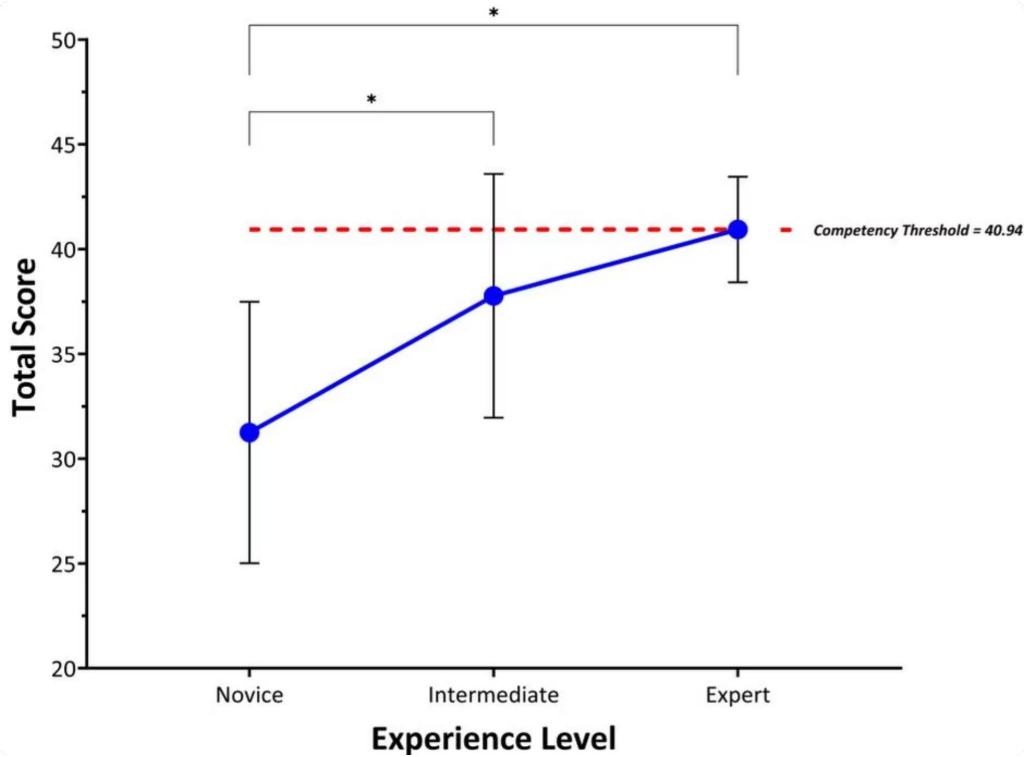
Whole Blood Transfusion: Rubric & Time by Experience



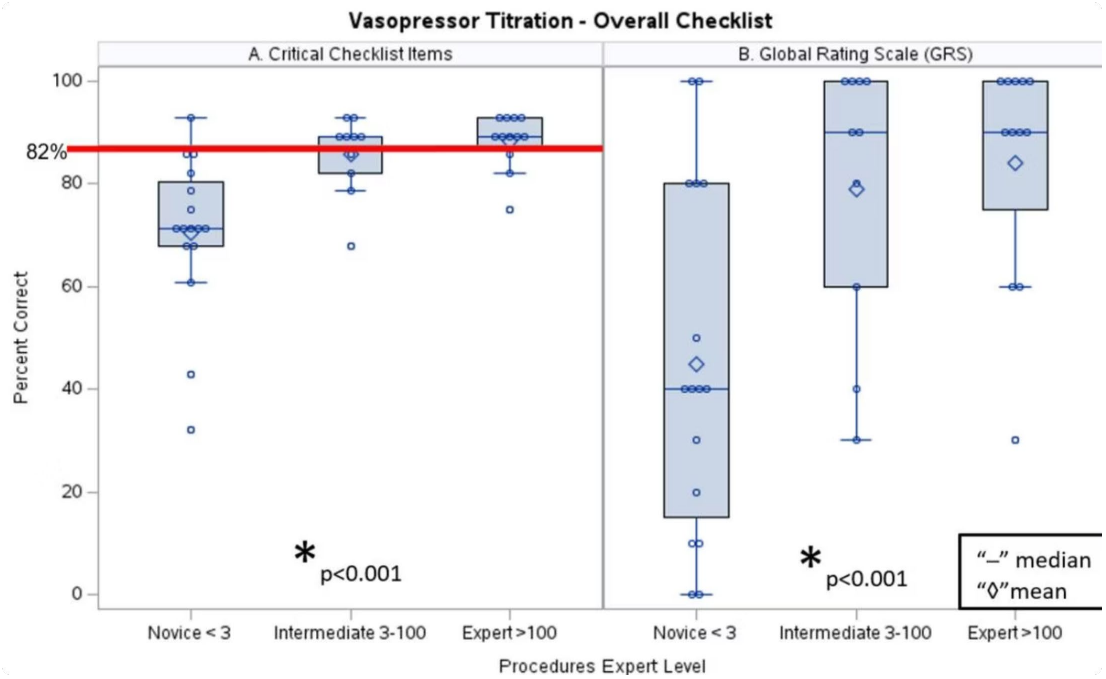
Rubric Scores (N=41)

- Novice: 31.3 ± 6.2 · Intermediate: 37.8 ± 5.8 · Expert: 40.9 ± 2.5
- Competency threshold: **40.94/47**
- Novice significantly lower than Int (p=.002) and Expert (p<.001)

Task Completion Time

- Novice: 41 min 17 s · Intermediate: 33 min 8 s · Expert: 29 min 19 s
- Competency threshold: **33 min 27 s**
- Novice significantly slower than Int (p=.004) and Expert (p<.001)

Vasopressor: Checklist & GRS Performance



Critical Checklist (p<0.001)

- Novice median: ~70% · Expert: ~88%
- Competency threshold: **82%**

GRS Overall Performance (p<0.001)

- Novice median: 2.0 · Intermediate: 4.0 · Expert: 3.5

Prehospital vs. Hospital

- EMT-B/A/p critical items median: 71.4% vs. NP/PA/MD: 89.3% (p=0.002)

Checklist –GRS Pearson r=0.571, p<0.001

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Vasopressor: Key Discriminating Items

Phase I Gaps ⩾30%

- Administers IVP vasopressor in increments: **+85%**
- Spikes vasopressor bag & primes tubing: **+50%**
- Creates IV vasopressor (epi 1mg in 250mL NS): **+33%**

Phase II Gaps ⩾30%

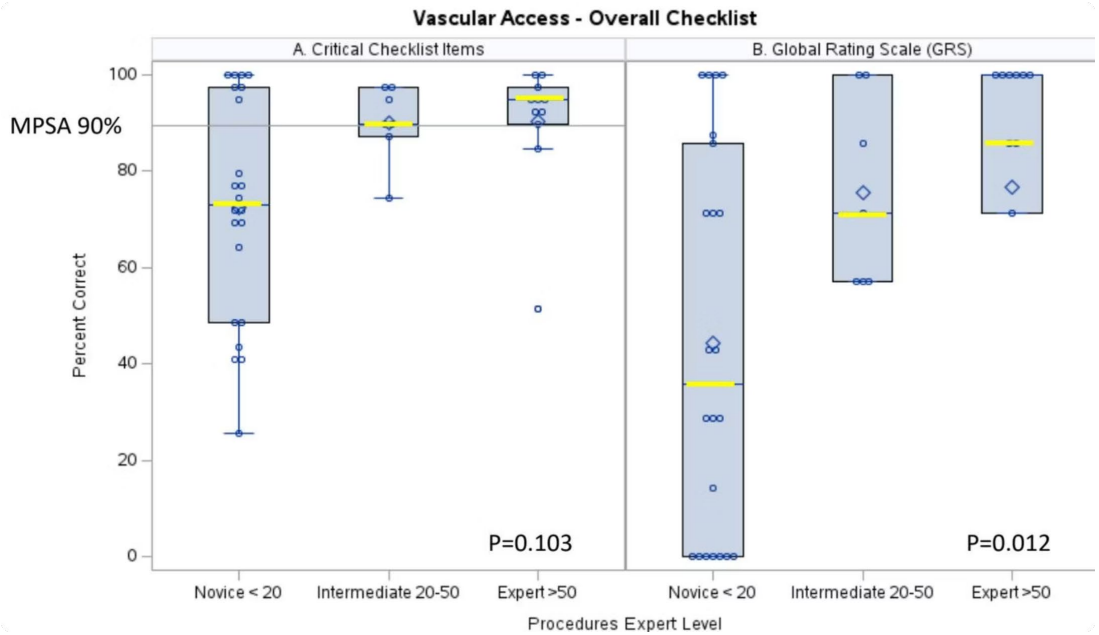
- Recognizes need for advanced interventions: **+58%**
- Adjusts vasopressor dose to response: **+31%**

GRS Gaps ⩾30%

- Overall Performance: **+56%**
- Vasopressor selection & drip creation: **+60%**
- Effective titration: **+56%**

92% of participants recommended this simulation for training.

Vascular Access: Checklist & GRS Performance



Critical Checklist (p=0.103)

- Novice median: 72%
- Intermediate median: 88%
- Expert median: 92%

GRS (p=0.012)

- Novice median: 36%
- Intermediate median: 70%
- Expert median: 86%

GLM competency threshold: **93%** critical items. Checklist – GRS Pearson r=0.779, p<0.001.

Vascular Access: Key Discriminating Items & Velocity

Top Discriminating Items (Expert vs. Novice gap ⩾27%)

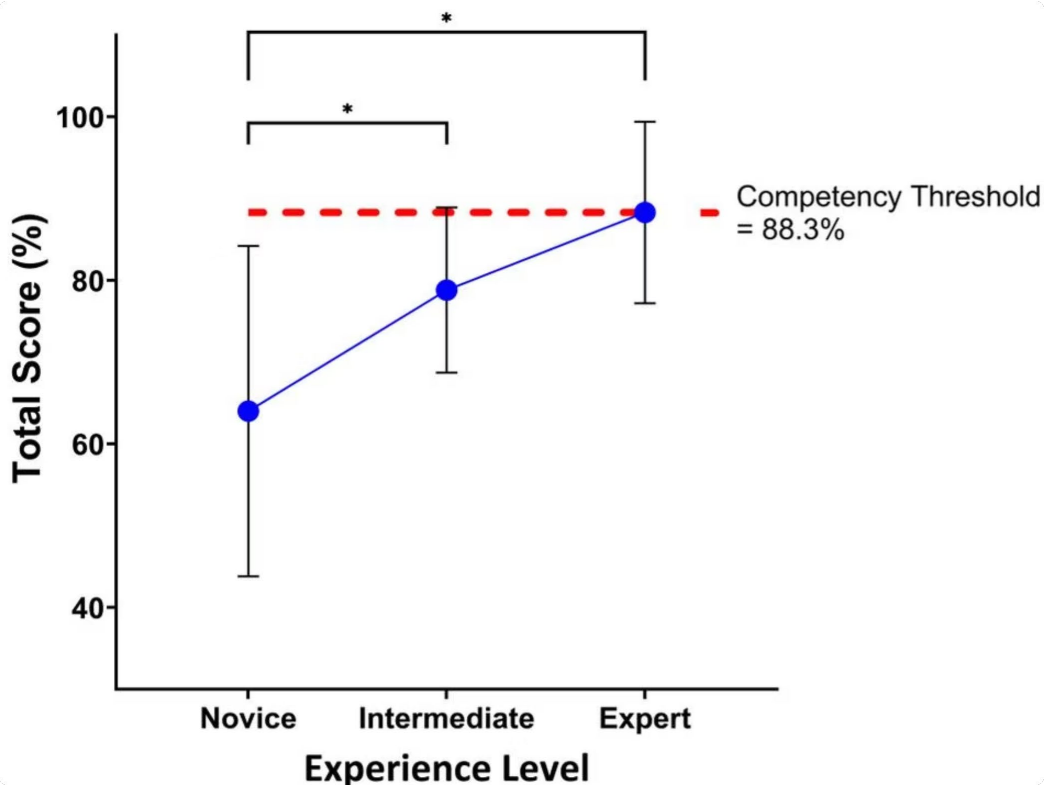
- Inserts catheter into introducer and peels away sheath: **+45%**
- Removes wire/dilator, leaves introducer (2nd attempt): **+56%**
- Dilator/Introducer placed over wire (2nd attempt): **+44%**
- Flow of procedure & forward planning (GRS): **+41%**
- Knowledge of instruments (GRS): **+45%**

Velocity: Needle -to-Catheter Time

- 2nd attempt significantly faster with experience (p=0.029)
- Paired change: Novice −1.76 min · Expert −0.97 min (p=0.008)

90% of participants recommended this simulation for training.

Temporary Vascular Shunt (TVS): Rubric & Time



Rubric Scores (N=39)

- Novice: 64% ± 20.2% · Intermediate: 78.8% ± 10.1% · Expert: 88.3% ± 11.1%
- Competency threshold: **88.3%**
- Novice significantly lower than Int (p=.009) and Expert (p<.001)

Task Completion Time

- Novice: 610.6 s · Intermediate: 418.5 s · Expert: 343.3 s
- Competency threshold: **485 s (8 min 5 s)**
- Novice significantly slower than Int (p=.006) and Expert (p=.002)

Skill Performance Velocity: Novice vs. Expert

Time-to-completion across 7 combat trauma skills

Procedure completion time was measured as a secondary performance metric across selected CMSSC skills. Experts consistently outperformed novices in speed, with velocity gaps ranging from 23% to 55.7% faster. Where set, velocity thresholds reflect expert mean + 1 SD or ANOVA-derived cutpoints.

Skill	Velocity Metric	Novice Mean Time	Expert Mean Time	% Faster	Key Velocity Threshold	Statistical Finding
Mechanical Ventilation Management	Total procedure time + phase-specific times	~200 sec	~125 sec	**37.5%**	Not set	Significant difference (paired t-test)
Ultrasound-Guided Vascular Access	Procedure completion time (Attempt 1 vs 2)	~105 sec	~62.5 sec	**40.5%**	Not set	Significant difference (t-test + ANCOVA)
Vasopressor Bolus Titration & Monitoring	Time to initiation of push-dose epinephrine + phase times	~52.5 sec	~30 sec	**42.9%**	Not set	Significant only for push-dose epinephrine initiation time
Temporary Vascular Shunt	Total procedure completion time	610.6 ± 210.9 sec	343.4 ± 141.7 sec	**43.8%**	485 sec (8 min 5 sec)	ANOVA p = .003; experts significantly faster
Warm Fresh Whole Blood Donation & Transfusion	Total procedure completion time	~1,525 sec	~1,175 sec	**23.0%**	2,007 sec (33 min 27 sec)	ANOVA p < .001
E-FAST	Total procedure completion time	~200 sec	~107.5 sec	**46.3%**	Expert mean + 1 SD	Significant across groups (ANOVA)
Needle Decompression / Finger Thoracostomy (reference)	Total procedure completion time	FT: 126 ± 72.7 sec	FT: 55.8 ± 28.7 sec	**55.7%**	Needle: 66 sec; FT: 84 sec	No significant difference (NS)

23–56%

Expert Speed Advantage

Range of velocity gains across all 7 skills measured

485 sec

Vascular Shunt Threshold

ANOVA-derived velocity threshold; experts significantly faster (p = .003)

55.7%

Largest Gap

Needle Decompression / Finger Thoracostomy — greatest novice-to-expert speed differential

est. = estimated from figure data; FT = Finger Thoracostomy; NS = not significant; SD = standard deviation

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Counterarguments & Rebuttals

Key opposing perspectives from the literature and how the CMSSC's design addresses each.

Simulation Performance Is Context-Specific

Challenge: Simulation performance may be highly context-specific, with >20 scenarios needed for reliability of 0.7 (Sinz et al., BMC Medical Education, 2021).

CMSSC Response: The CMSSC mitigates this through skill-specific Delphi-validated checklists, multi-site replication across 5 centers, and interrater reliability monitoring.

Self-Reported Experience Is a Biased Stratifier

Challenge: Surgical trainees systematically misestimate competency, with female residents underrating themselves by 0.29 points (Karnick et al., Surgery, 2021; Padilla et al., Annals of Surgery, 2022).

CMSSC Response: Self-reported experience is used for initial stratification only — thresholds are derived from observed simulation performance, not self-assessment.

Checklists May Oversimplify True Competency

Challenge: Checklist use can become ritualized and decoupled from safety goals (Facey et al., Sociology of Health & Illness, 2024).

CMSSC Response: CMSSC checklists capture critical decision points via Delphi validation, with video-based scoring enabling nuanced technique review beyond binary done/not-done.

Limitations

Self-Reported Experience

Reliance on procedural volume may not reflect true proficiency; performance variability within tiers is well-documented.

1. **Subjectivity & Recall Bias:** Self-reported case volumes are subject to recall bias and social desirability bias. Participants may overestimate or underestimate their experience, leading to misclassification across tiers.

Choudhry NK et al., Ann Intern Med, 2005 Systematic review of the relationship between clinical experience and quality of health care.

2. **Performance Variability Within Tiers:** Significant intra-tier performance variability is well-documented. Ericsson's deliberate practice framework demonstrates that volume alone does not predict expertise without structured feedback.

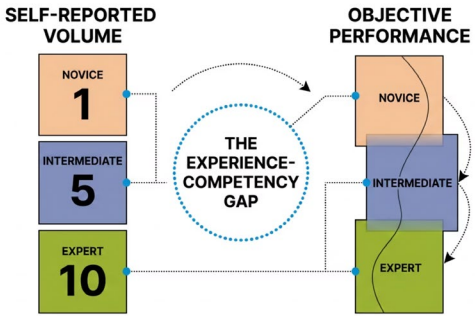
Ericsson KA, Acad Med, 2004 Deliberate practice and the acquisition and maintenance of expert performance in medicine.

3. **Volume vs. Competency Disconnect:** Studies in surgical training show that procedure counts correlate poorly with objective performance metrics.

Reznick RK & MacRae H, N Engl J Med, 2006 Teaching surgical skills — changes in the wind.

4. **Military-Specific Context:** Deployment experience and training frequency are difficult to quantify uniformly across branches and roles, compounding self-report inaccuracy.

Kotwal RS et al., J Trauma Acute Care Surg, 2016 The effect of a golden hour policy on the morbidity and mortality of combat casualties.



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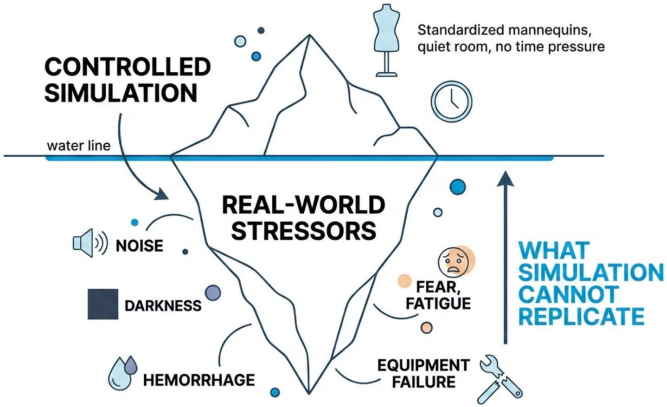
Limitations

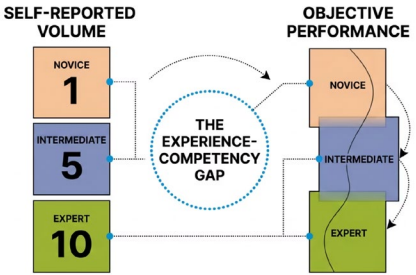
Self-Reported Experience

Reliance on procedural volume may not reflect true proficiency; performance variability within tiers is well-documented.

Simulation-to-Field Gap

Simulated environments cannot fully replicate real-world stressors that influence cognitive load and task execution





- **Cognitive Load Under Stress:** Real combat environments impose extreme cognitive load through noise, threat perception, fatigue, and emotional arousal — factors absent in simulation. These stressors degrade fine motor skills and decision-making.

Starcke K & Brand M, Neurosci Biobehav Rev, 2012 Decision making under stress: A selective review.

- **Mannequin vs. Human Tissue:** Haptic feedback from simulators differs from human tissue, affecting procedural accuracy for skills like needle decompression, fasciotomy, shunt, surgical airway, etc.

Aggarwal R et al., NEJM 2006 Technical skills training in the 21st century.

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Heterogeneous Simulator Fidelity Limits Generalizability

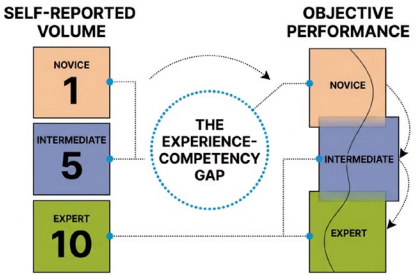
Inherent to multi-site studies and may affect generalizability. This can be mitigated through expert adjudication and consistent methodology.

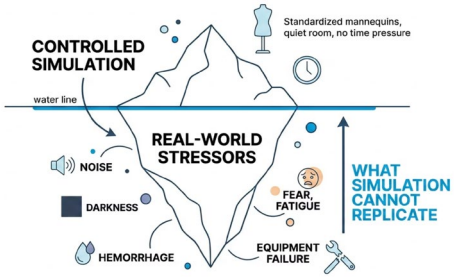
- **Multi-Site Fidelity Variability:** Differences in simulator technology (e.g., high-fidelity vs. partial task trainers) affect learner performance and assessment validity. Standardization of equipment is a recognized challenge in multi-institutional simulation research.

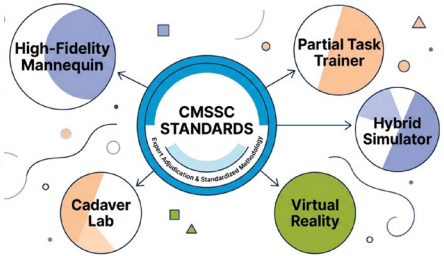
Cook DA et al., JAMA, 2011 Technology-enhanced simulation for health professions education: A systematic review and meta-analysis.

Bacik A, Lopreiato J, et al. Military Medicine, 2024 Survey of Current Simulation Based Training in the US Military Health System

- **Consortium-Level Standardization Challenges:** Multi-site studies in medical education consistently report site-level variation as a primary source of measurement error, requiring robust statistical controls.







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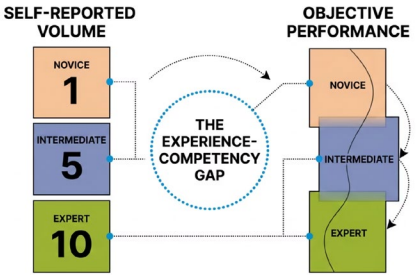
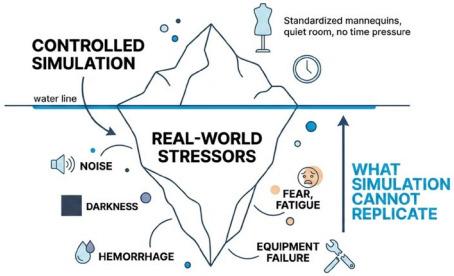
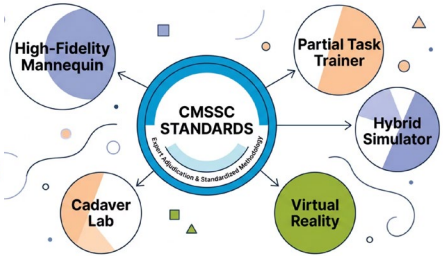
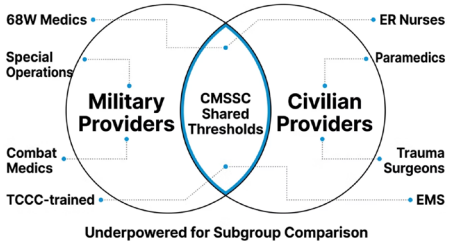
Military vs. Civilian Subgroup Analysis

Comparing military and civilian performance was not a primary objective; the study was not powered for such subgroup analyses.









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Recommendations & Future Work

→ Enhance Rater Training & Reliability

Improve interrater consistency across all four procedures.

→ Refine Cut-Points for Mastery

Validate and tighten competency thresholds using larger samples.

→ Standardize Equipment Across Contexts

Ensure consistent simulation fidelity in field and hospital settings.

→ Integrate Into Training Programs

Embed tools into both field-based and simulation-based curricula.

Conclusion

This multi-institutional consortium validated proficiency standards across 21 combat medical skills, establishing benchmarks applicable across military and civilian settings.

- **Checklist Refinement**

  Context-specific checklists balancing fidelity and usability across varied operational settings. Field validation studies.

- **Longitudinal Skill Decay Studies**

  Next priority: measure degradation over time and determine optimal refresher intervals.

- **Civilian Transferability**

  Assess in rural civilian pre-hospital trauma training, disaster medicine which could enhance readiness.

- **Develop Instructional Strategies**

  Determine optimal training methods to accelerate and maintain skill mastery.

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University of Maryland Baltimore | Uniformed Services University of the Health Sciences | University of Pittsburgh | Mayo Clinic | UT Health San Antonio

COMBAT MEDICAL SKILL SUSTAINMENT CONSORTIUM
THANK YOU

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Mechanical Ventilator Monitoring and Management	Removal of Corneal Ocular Foreign Body	Ultrasound Guided Vascular Access	Vasopressor Titration and Management

Simulator

MV	OFB	VasUS	VPT
Laerdal LLEAP Michigan Lung	3D PRINT	VALKYRIE	PROTOTYPING
PROTOTYPING 9/12/2022	PROTOTYPING 9/16/2022	PROTOTYPING 9/22/2022	LAERDAL SIMMAN3G
COMPLETE	COMPLETE	COMPLETE	COMPLETE

Checklist

MV	OFB	VasUS	VPT
DELPHI R2 • SIM TEST	DELPHI R3 • SIMTEST – 9/13/2022	DELPHI R2 • SIMTEST – 9/14/2022	DELPHI R3 • SIMTEST – 9/14/2022
DELPHI R3- stats review	DELPHI WEIGHTING • SIMTEST FINAL – 9/21/2022	DELPHI WEIGHTING • SIMTEST FINAL – 9/21/2022	DELPHI WEIGHTING • SIMTEST FINAL 9/20/2022
DELPHI WEIGHTING • SIMTEST	ADJUST SIMULATION	ADJUST SIMULATION	ADJUST SIMULATION

Simulation

MV	OFB	VasUS	VPT
Prototype/checklist iteration cycle	Prototype/checklist iteration cycle	Prototype/checklist iteration cycle	Prototype/checklist iteration cycle
Timing	Timing	Timing	Timing
Indicator behaviors	Indicator behaviors	Indicator behaviors	Indicator behaviors
Final prototype	Final prototype	Final prototype	Final prototype
Testing on weighted checklist	Testing on weighted checklist	Testing on weighted checklist	Testing on weighted checklist
Final simulation	Final simulation	Final simulation	Final simulation

Clinical Research Coordinators and Critical Care Nurses

Blake Davisson
Manager of Operations Experiential Learning

Todd Tripoli
Sr Systems Technology Specialist

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Jerry Donney
Multimedia Analyst and Programmer

Mechanical Ventilator Monitoring and Management	Removal of Corneal Ocular Foreign Body	Ultrasound Guided Vascular Access	Vasopressor Titration and Management

Video

MV	OFB	VasUS	VPT
IMAGES	IMAGES	IMAGES	IMAGES
STORYBOARD CHECKLIST	STORYBOARD CHECKLIST	STORYBOARD CHECKLIST	STORYBOARD CHECKLIST
TEAM REVIEW/FB 1	TEAM REVIEW/FB 1	TEAM REVIEW/FB 1	TEAM REVIEW/FB 1
TEAM REVIEW/FB2	TEAM REVIEW/FB2	TEAM REVIEW/FB2	TEAM REVIEW/FB2
FINALIZE	FINALIZE	FINALIZE	FINALIZE

MCQ

MV	OFB	VasUS	VPT
MCQ 5	MCQ 5	MCQ 5	MCQ 5
TEAM REVIEW	TEAM REVIEW	TEAM REVIEW	TEAM REVIEW
POST TO OSARTS	POST TO OSARTS	POST TO OSARTS	POST TO OSARTS

HRV/RR

MV	OFB	VasUS	VPT
Program laptop	Program laptop	Program laptop	Program laptop
Test time synch with video	Test time synch with video	Test time synch with video	Test time synch with video
Sensor workflow	Sensor workflow	Sensor workflow	Sensor workflow
Orient RC	Orient RC	Orient RC	Orient RC

OBJECTIVE STRUCTURED ASSESSMENT OF TECHNICAL AND RESUSCITATION SKILLS PLATFORM

Tammy Simpkins
Instructional Design Specialist

MV	OFB	VasUS	VPT
CAMERA VIEW/AUDIO	CAMERA VIEW/AUDIO	CAMERA VIEW/AUDIO	CAMERA VIEW/AUDIO
HRV/RR	HRV/RR	HRV/RR	HRV/RR
SIMBRIDGE SYNCHRONIZED CAPTURE	SIMBRIDGE SYNCHRONIZED CAPTURE	SIMBRIDGE SYNCHRONIZED CAPTURE	SIMBRIDGE SYNCHRONIZED CAPTURE

Database: REDCap

Consent and Delphi survey, Enrolment survey, Link to Optimal performance video, Baseline knowledge MCQ, Performance checklist

Focus assessment: Heart Rate Variability/Respiratory Rate

Todd Tripoli
Sr Systems Technology Specialist

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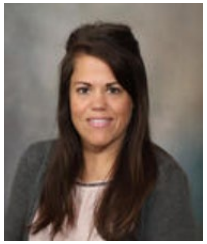
PROJECT ADMINISTRATION



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PROJECT MANAGER

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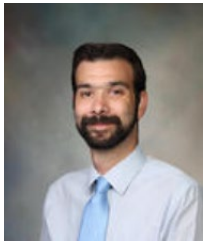
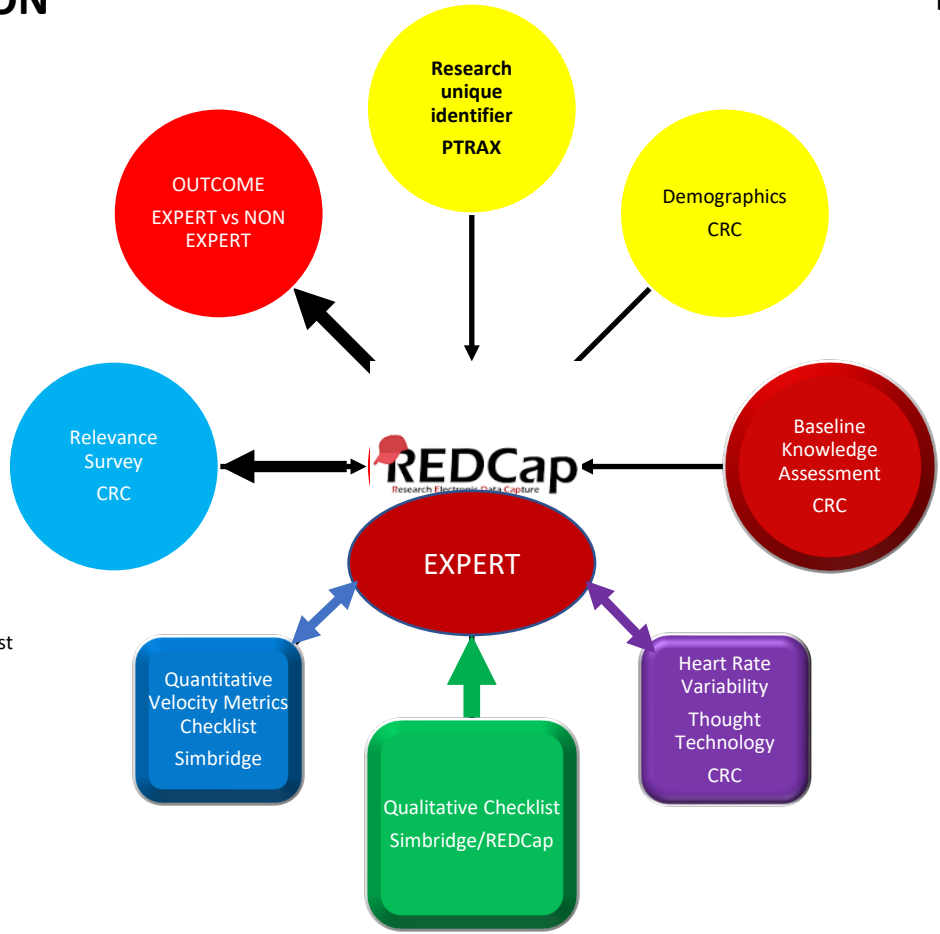
OSPA
Sr Sponsored Project Specialist

Lisa Stewart
Research Protocol Specialist



Jared Medeel
Research Financial Analyst



PROJECT ANALYSIS and STRUCTURE

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Measurement Statistics, Methodological Studies
Education Psychology

Duke Butterfield
Database Manager

Molly Klanderman PhD
Project Statistician

Vy Nguyen
Svr Clinical Studies Unit

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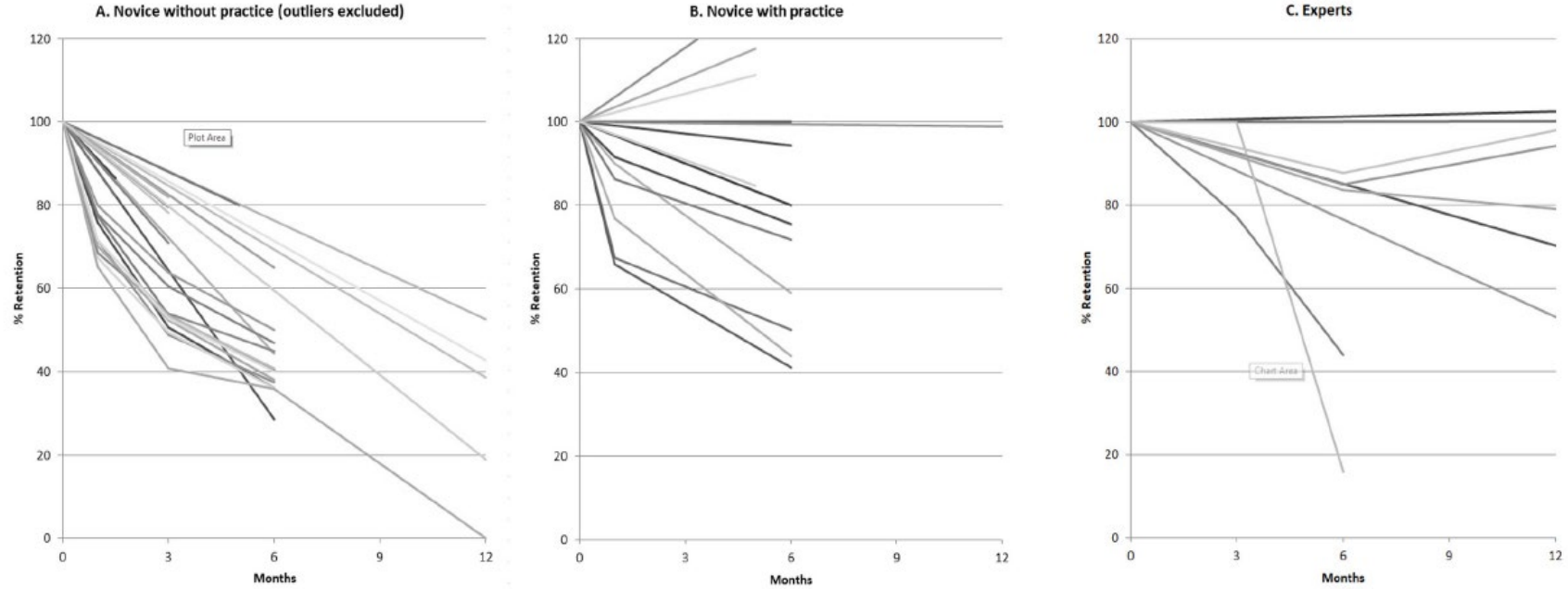
SKILL DECAY OVERTIME: SAFETY CRITICAL PROFESSIONS– 23 manuscripts



1) quality of initial training 2) practice or refreshers 3) personal factors 4)task complexity

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