

AI & the Acute Care Surgeon in the Field



Dual Perspectives: AI & the Acute Care Surgeon in the Field

Trauma Oggi
XVI Edizione
20 Nov 2025
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NOTE: most of the images in this presentation
have been generated with OpenAI SORA

November 2025

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Field Constraints → AI Friction



- Reality first: scarce staff, bandwidth, power, and time.
 - Design for offline/edge use; graceful degradation.
 - Short interactions under stress; zero-click defaults.
- Where AI helps now: fast textual synthesis, guideline checks, handover notes.
- Where AI still struggles: high-stakes imaging, noisy inputs, provenance & hallucinations.

Three Claims from the Debate — With Nuance



- AI often outperforms on average documentation-driven cases.
 - Use uncertainty surfacing, citations, and 'why-not' reasoning before acting.
- Empathy alone isn't a moat; relational accountability is.
 - Own thresholds, escalation, and the explanation to patients & teams.
- Retrain less, redesign more.
 - Build teams and handoffs with AI (scribe, summarizer, risk sentinel).

Now vs Next — and Red Lines



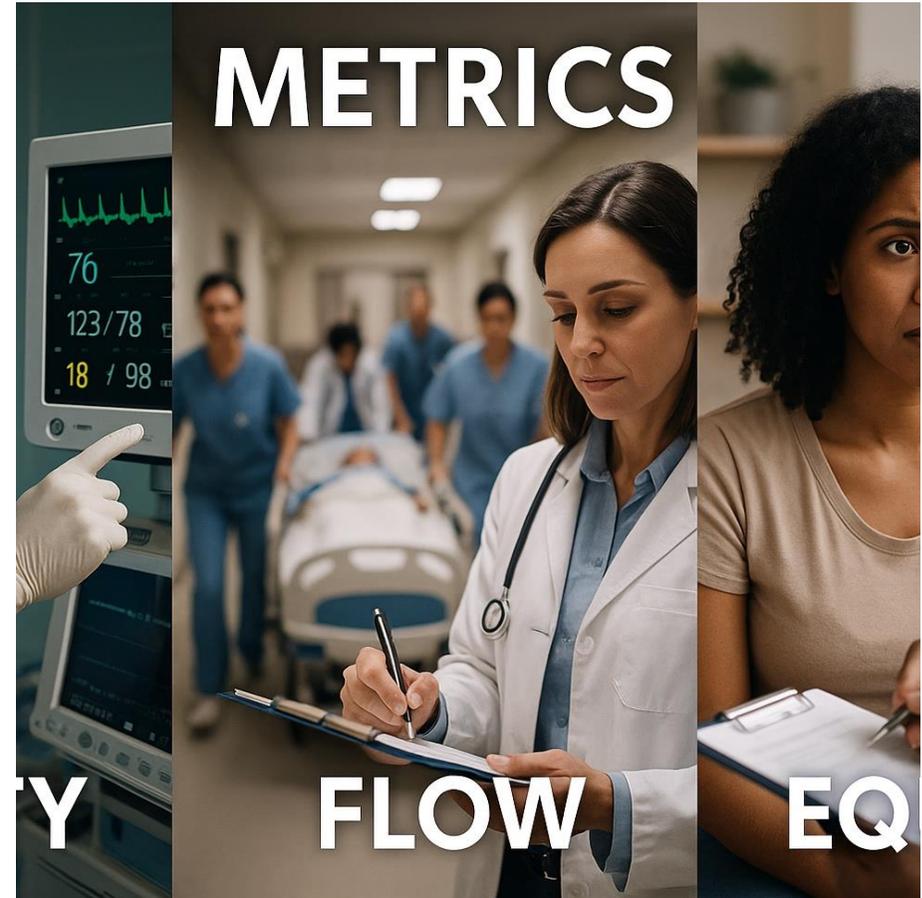
- Deploy now (low-risk, high-yield):
 - Order-set sanity checks (interactions, duplications, doses).
 - Auto-summaries for transfers (ICU↔OR↔Ward).
 - Protocol checklists (sepsis bundles, DCS) with explicit human override.
- Prototype next:
 - Triage co-pilot → priority + rationale + missing-data request.
 - Imaging bridge → structured prompts, rationale linked to bedside actions.
- Red lines:
 - No autonomous med/procedure changes.
 - No image-only diagnoses without verification.
 - No opaque recommendations in critical care.



Metrics that Matter



- Safety: alert PPV/NPV, override rates, near-miss capture.
- Flow: time-to-first-knife, door-to-CT-report delta, documentation time saved.
- Equity: performance across languages/settings; offline uptime %.



Portable Colposcope
Nimmi Ramanujam
Duke University

Example 0



- Polytrauma on anticoagulant; unstable; equivocal FAST; CT pending.
 - AI output (demo): priority, rationale, missing data request.
- Clinician response: accept/reject parts with reasons; call out blind spots.
- Conclude with 2 process changes: uncertainty display; offline-first deploy

Example 1



The screenshot shows a Mac OS desktop environment. At the top, a Terminal window is open, displaying the output of a Whisper AI application. The output includes initialization details for the BLAS backend, memory usage for various buffers (self, cross, pad, conv, encode, cross, decode), and a recording log. The recording log shows a medical simulation transcript with timestamps and speaker labels like [INTERPOSING VOICES], [muffled talking], and [LAUGHS].

Below the terminal, a browser window displays a YouTube video titled "trauma resuscitation simulation full university of southampton". The video player shows a scene from a medical simulation with several people in blue scrubs in a hospital room. The video has 21K views and was uploaded 3 years ago. Below the video player are interaction buttons for likes, comments, share, and download.

At the bottom of the screen, a dock contains various application icons, including Safari, Calendar, Chrome, App Store, Microsoft Edge, Outlook, Photos, System Preferences, Spotlight, Music, and Microsoft Teams. On the right side of the dock, there are icons for Python 3 and a trash bin.

<https://youtu.be/A-Dwqg7rIZw?si=-PJWdfXEWJ1NtoGc>

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Example 1a



```
whisper_real_time
analyze_text.cpp U
config.ini U
results_analysis_demo_trauma.txt U X
results_analysis...

WHISPER_REAL_TIME
.vscode
docs
models
analyze_text.cpp U
analyze_text.exe U
analyze_text.py U
anomalies_detection.py U
CMakeLists.txt U
config.ini U
demo.gif
ESCORT_WP3_Narration_Natural.m... U
Hinton_China.txt U
LaurentAlessandre.txt U
LaurentAlexandre_IT.txt U
LaurentAlexandre.txt U
Makefile U
Makefile.org U
openai.hpp U
oui_client.py U
README.md M
requirements.txt M
results_analysis_demo_cardiac_arr... U
results_analysis_demo_sepsi.txt U
results_analysis_demo_trauma.txt U
results_analysis_mda.txt U
transcribe_audio.cpp U
transcribe_audio.exe U
transcribe_audio.py U
OUTLINE

results_analysis_demo_trauma.txt
260
261 ---
262
263 ## 1. Protocol Adherence Check
264
265 ### 1.1 Attached Protocols
266
267 No protocol documents were attached to the conversation transcript. Consequently, we cannot
268
269 ### 1.2 Search for Relevant Protocols
270
271 Below is a concise list of widely-accepted transfusion-related protocols that are most like
272
273 | Source | Key Elements | Reference |
274 |-----|-----|-----|
275 | **AABB Standards for Transfusion Medicine** | 1:1 ratio of plasma to RBC for patients rec
276 | **WHO Guidelines on Blood Transfusion (2016)** | Evidence-based recommendations on compo
277 | **American College of Surgeons (ACS) Trauma Quality Improvement Program (TQIP) Protocol**
278 | **European Society of Anaesthesiology (ESA) Guidelines** | Recommendations on goal-direct
279
280 ### 1.3 Adherence Assessment
281
282 | Protocol | Observed Action | Adherence? |
283 |-----|-----|-----|
284 | **AABB 1:1 Plasma:RBC Ratio** | "Couple of goes to the plasma and then we'll go to red" -
285 | **MAP Target 65 mmHg** | "Aim for a map of about 65 once we've got him on monitoring." |
286 | **Monitoring During Transfusion** | The transcript mentions "once we've got him on monit
287 | **Documentation & Roles** | The transcript names the transfusion specialist (Rosie) and t
288
289 **Conclusion:**
290 The available transcript demonstrates compliance with the core elements of the AABB massive
291
292 ---
293
294 ## 2. Next Steps / Recommendations
```

Example 2



Terminal Shell Edit View Window Help

RC (UK) Cardiac Arrest Management Demo

youtube.com/watch?v=jQYHQR3ebLo&t=416s

Ask Google

Premium IT

icu assessment session

All From ResusCouncilUK Breathing Hos >

RC (UK) ABCDE assessment demo

whisper_real_time -- analyze_text.exe -- 80x24

in, you said he was...
[2025-11-12 11:43:21] It was a chest pain that he'd got. Can we get a definitive airway in with this chap now, please? Yeah, sure.
[2025-11-12 11:43:41] Let me know when that's done, please, Isabel. So with the history, I'm really thinking Thrombo and Bolic is most likely to be our most probable cause. But let's just investigate the others while we're at that temperature-wise. Yanny, what does he feel like? He feels warm to touch. Feels warm to touch. OK, so thinking, Keith, about ruling out the Hs and Ts, unlikely to be--
[2025-11-12 11:44:02] hypothermia. Hypoxia, we've got the tube going in, we're going to connect that to 15 liters of oxygen. No other signs beforehand. It's earlier looked okay on the chart. Fluids are up, thank you, that's lovely. The tube is in and I've checked the position on auscultation.
[2025-11-12 11:44:22] End title, CO2, is 2.3. 2.3, so we've got a good ETCO2 for this. So our asynchronous chest compressions, please. So continuous chest compressions. Can we support his ventilation, please, to 10 breaths a minute? So we've got the bloods off. We're moving through the Hs and Ts, Keith. 20 seconds until the next--
[2025-11-12 11:44:42] 20 seconds to the next two minutes, OK. Drugs, we need to have some drugs ready, please, in case I'd like a milligram of adrenaline, Yanny, and 300 milligrams of amiodrone, preparing. When we get to the next point, Anita, I'd like you to swap with Bill when we do the rhythm check to manage the CPR. And Keith, I'm going to hand over to you for defibrillation. We're at two minutes now.

Resuscitation Council (UK)
www.resus.org.uk

RC (UK) Cardiac Arrest Management Demo

ResusCouncilUK
33.4K subscribers

Subscribe

12K

Share

Download

Clip

1.3M views 8 years ago

Circle of Life cardiac

<https://www.youtube.com/watch?v=jQYHQR3ebLo>

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Example 2a



```
66 {
67   "entry": [
68     {
69       "resource": {
70         ...
71       }
72     }
73   ]
74 }
75 ...
76 ---
77 ## Protocol Verification
78
79 | Protocol | Key ACLS / Resuscitation Elements | Evidence in Bundle | Assessment |
80 |-----|-----|-----|-----|
81 | **American Heart Association (AHA) 2020 Advanced Cardiac Life Support (ACLS) Guideline -
82 | **European Resuscitation Council (ERC) 2021 Guideline - Basic and Advanced Life Support**
83
84 ---
85
86 ### Summary of Protocol Compliance
87
88 1. **Airway & Breathing** - Endotracheal intubation performed, 15 L/min O2, ETCO2 monitoring
89 2. **Circulation** - Continuous chest compressions (30:2), defibrillation after 1 min, 2 shocks
90 3. **Defibrillation** - Shockable rhythm identified (ventricular fibrillation) and treated
91 4. **Medications** - Epinephrine 1 mg IV at 3rd CPR cycle, amiodarone 300 mg IV after 2 shocks
92 5. **Diagnostics** - Blood gas, electrolytes, ECG, chest X-ray, focused cardiac ultrasound
93 6. **Hs and Ts** - Hypovolemia addressed with fluids; hypoxia addressed with O2; potential
94 7. **Documentation** - All key actions recorded in the bundle with timestamps.
95
96 ---
97
98 ### Next Steps
```

Example 3



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Example 3a



Can you please describe the attached image?

oI **mistral-small3.2:latest**

The image depicts a patient in a hospital bed, connected to various medical devices and equipment. The patient appears to be in an intensive care unit (ICU) or a similar critical care setting. Here are some detailed observations:

1. **Patient:** The patient is lying in a hospital bed, covered with a white blanket. They are connected to multiple tubes and wires, indicating they are receiving intensive medical care.
2. **Medical Equipment:**
 - **Ventilator:** There is a ventilator machine connected to the patient, which is likely providing respiratory support.
 - **Infusion Pumps:** Several infusion pumps are visible, which are used to administer medications or fluids intravenously.
 - **Monitoring Devices:** Various monitoring devices are connected to the patient, including those that measure heart rate, blood pressure, and other vital signs. These devices display numerical readings and graphs on their screens.
 - **ECMO Machine:** There is an Extracorporeal Membrane Oxygenation (ECMO) machine visible at the foot of the bed. This machine is used to provide cardiac and respiratory support to patients whose heart and lungs are not functioning properly.
3. **Environment:** The room is equipped with medical supplies and equipment, indicating a highly specialized and monitored environment. The walls are wooden, and there are several medical devices and screens mounted on them.
4. **Safety Measures:** The patient and the equipment are covered with protective plastic sheets, likely as a precautionary measure to maintain a sterile environment and to protect against infections.

This image highlights the complexity and intensity of care provided in critical care units, where patients often require sophisticated life-support systems and continuous monitoring.

gemma3:27b v +



Could you please read the patient's vital signs?

oI **gemma3:27b**

Okay, let's analyze the visible vital signs from the image.

From the monitor in the upper left corner of the image, I can read the following:

- **SpO2 (Oxygen Saturation):** 94%
- **HR (Heart Rate):** 83 bpm
- **RR (Respiratory Rate):** 13
- **NIBP (Non-Invasive Blood Pressure):** 100/63

Please note that I am limited to reading what is visible in the image and can only provide the information displayed on the visible monitor. There may be other vital signs or patient , not shown.

The New Surgeon Role



- Thresholds • Trade-offs • Trust
- Decide when to act, what risk to accept, and how to explain it – under pressure.

