

Centre for Advanced Patient Care Simulation HP SN



Effective Design and Utilization of EMS Simulation Environments

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Blair Lindsay - Background

- EMS / Fire x 25 years
- Paramedic x 23 years
- Teaching x 15 years
- HF Simulation x 10 years



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- SAIT Established 1916
- 3 campus locations
- Calgary, Alberta
- 2,200+ Employees
- 80+ programs
- CAPCS established 2005



Southern Alberta Institute of Technology

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- CAPCS was built in 2005 in response to a need to increase student learning in a realistic environment



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Why Worry About EMS Specific Sim Lab


Design?

- Most other health care providers work in familiar clinical situations
- EMS workers typically work in one of two areas...

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Design – Team


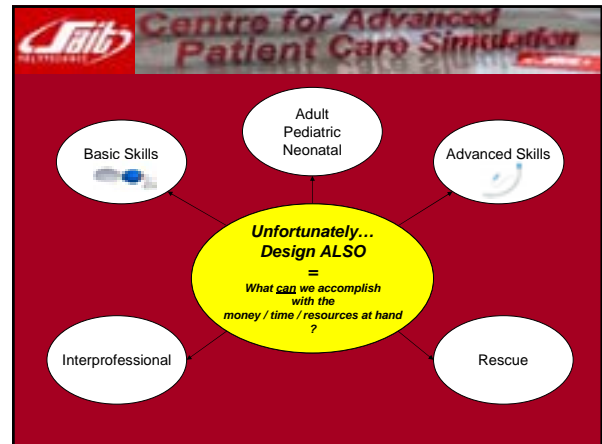
- Manager with clout and 'buy-in'
- Someone with prior sim experience
- Audiovisual and Information Technology
- Curriculum Designers
- Instructor users
- Others?
- Who is the team talking to?
 - Go see other sim centers
 - Steal all their great ideas... but stay rooted in what your needs are



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Design – Environment

- Get these people involved early
 - Fund development – and don't spend it all on the simulation center – you also need
 - Manikins (obviously)
 - Training for staff
 - Curriculum (purchased or internally produced)
 - Architect
 - Because of gases etc. fire and building codes (or if you're mobile – auto standards) may drive design and costs to some extent
 - Audiovisual / IT

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Design – Environment

- Versatile (think theatre) – plan for anything you *may* want to do
 - Extra wiring
 - Lots of display options – same screen displays METI waveform – but tomorrow could broadcast streaming video
 - People rarely say
 - “this sim lab has too many electrical receptacles”
 - “this control room is too cold”

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But Beware – Versatile Can Sometimes = Complicated

- More options in terms of sound / display etc. can mean more things to troubleshoot when things go wrong
- Manikins are sometimes the easiest part of the lab to deal with
- More than one person should be intimately familiar with how the lab works

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Design – Environment

- Ability to control all elements from control room (power, lighting)
- Would you need to cut power to piece of equipment if it wasn't being used correctly?
- Would you want to disable equipment to teach work-arounds / troubleshooting?
- Are there times when you may want lights dimmer or brighter?



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Design – Environment

- **Real** time (as appropriate to teaching)
- **Real** equipment
- **Real** procedures



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Design – Environment

- Make your control area comfortable – you're going to spend a lot of time there!
 - Elevated control room?
 - Position of monitors
 - Line of sight views vs camera views
 - HVAC
 - Ergonomics
 - Soundproofed rooms

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Design – Environment

- What makes the ambulance environment real?
 - Working gases
 - Sound (diesel engine, siren...)
 - Motion
 - Fully stocked
 - Equipment
 - Comm equipment
 - Pencils vs Pens
 -




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Design – Environment

- Cameras Where? What kind? Fixed? Mobile (is manikin tetherless?)

PTZ Full view – what will I see.... And miss?



Closeup of vent settings... until somebody goes to adjust them!




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PTZ Full view – what will I see.... And miss?




Close-up of pacing, joules or sync settings



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- Spend appropriate time figuring out where cameras will need to be based on what you want to do
- Evaluate the positioning and view yourself – non-practitioners may have a different and erroneous idea of what is important to your teaching



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Design – Environment


- Airway cams – where?
- Over top of airway likely to miss some procedures – further back? To Side?



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Design – Environment


- ... **or go there** - take it outside (If You Can)
- Untethered Manikins offer endless opportunities to duplicate real life conditions
- May be more difficult to keep the 'instructor' out of the picture



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Design – Environment

- Consider a 'wet room'
- A place that can be hosed down and has a drain
- Practice in realistically 'bloody' conditions such procedures as
 - Cricothyrotomy
 - Control of arterial bleeding
 - Any SCEs involving other bodily fluids...



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Tetherless Manikins

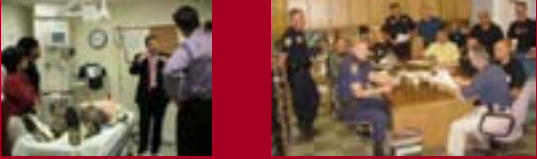
- Particularly well suited to EMS training
- Manikin can go virtually anywhere
- Issue then becomes creating an effective control area
 - Portable
 - Easily deployed
 - If possible conceals instructor operator



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Design – Environment

- Debriefing area
 - Separate or over the manikin?
 - Privacy
 - AV in debriefing room



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Design – Environment

- Audiovisual
 - Consider a sound specialist – needs for a home theatre are different than needs for a sim lab
- Beyond Vital signs screen do you want to...
 - Print 12 leads...
 - Show media (i.e. accident scenes)
- Closed Circuit / Webcam / Network Cam or Pre-purchased Package solution?
 - Support
 - Ease of Use
 - Mobility

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Design – What I Can **NOT** Compromise On

- AV
 - This doesn't mean you need to spend millions, but make sure you spend on something that delivers what you need
 - You need to be able to see and hear very well, even if its only from one camera and microphone
 - Remember students in sim often talk in low voices – don't miss a debriefing gem!

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Design – What I Can **NOT** Compromise On

- Storage Space
 - Often overlooked
 - Again think theatre – prop storage, prep, construction, space for faculty and students to store things – all of this takes more space than the sim area

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Building It

- Spend time communicating needs **and your passion** to all the people building your lab
- Try to be intimately involved with building phase
- Walk through early and often

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Building It

- If you're not around, well intentioned 'minor adjustments' will potentially get made during construction by people who may not understand they are compromising your vision!

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Building It

- Control rooms tend to get 'warm' – make sure the temperature control you've asked for does what it should
- Is security adequate?
 - Physical security
 - AV security – are your webcams accessible by people outside the lab?
- Special lab needs communicated to cleaning staff, other support staff

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Building It

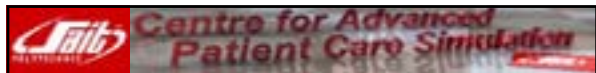
- Test your AV system prior to sign off...
 - With the same sound level as you expect in sim i.e.
 - » With everything running
 - » With several noisy people inside
 - » With monitors beeping
- **Can you see and hear everything you need to?**

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Don't Forget

- To design curriculum as well as the center
- Get people trained and get buy in from instructors
- Most centers have at least one champion who knows everything about the sim center and how to fix it
- **... and pass what you've learned on to the next folks who ask you how YOU did it**





Thank you

Questions?

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<http://learnat.sait.ca/healthpublicsafety/emtp/capcs/simlab.htm>

