

IMSH 2016 Report

Sunday, Jan 17, 2016

7:00 PM - 9:30 PM IGNITE the Night Reception SDCC Exhibit Hall C

The welcome reception featured a cover band with some pyrotechnics, free finger food and an expensive bar. Conversation was almost impossible.

Monday, Jan 18, 2016

Commencement ceremony was the presentation of accreditation certification to over 25 sim centres, including Abu Dabi and Puerto Rico.

Presidential citations: (Merry) Beth Pettit, Dimitros Stefanidis, Rose Hatala.

SSiH Innovation Award went to **Lou Obendorf** (METI Corporation).

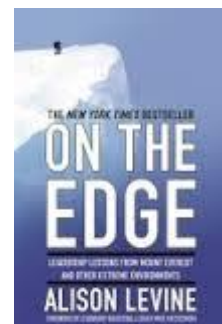


San Diego Convention Center

8:30 AM - 10:00 AM MONDAY PLENARY ADDRESS Lou Oberndorf Lecture on Innovation in Healthcare Simulation: On the Edge - The Art of High-Impact Leadership (#21394) SDCC Ballroom 20 A/B/C. Alison Levine, US Military Academy, MBA, 11 years in Healthcare and Technology, Schwarzenegger's bid for California Governor. Worked with Coach "K". Most successful coach ever in basketball. Author of "**ON THE EDGE**"

Asked to lead the US women's Everest expedition. Do not let fear stop you for doing what you love. Asked Ford Corp for money. New SUV named the "Expedition". They were broke.

How to find the best team members? Coach K looks for EGO first and foremost. Performance ego and team ego (I want to be on the winning team). Fear is OK but complacency will kill you. First attempt ended in failure, several hundred yards from the top. Keep climbing and you will achieve!



10:00 AM - 11:30 AM Assessment Methodologies: Validation, Simulation and Accreditation (#16133) SDCC Ballroom 20 D

Valid and reliable measurements are essential to research. What are we trying to measure?

Focus on Evidence:

1. Content evidence: does the content of the tool match the construct being measured?
2. Response process: what is the quality of the data generated by the questions?
3. Internal structure: how reproducible is the data (reliability)?
4. Relationship to other variables: how well does the data match other accepted measures of the same construct?
5. Consequences: what will the data be used for?

Content Evidence. Have you made a case that you have used the best knowledge to formulate your assessment tool?

Response process. Refers to the usability/ comprehensibility of the individual questioned and the quality of the data from those questions. How is each question scored? How important are items related to each other?

Common Question Types:

1. Likert – agreement with a statement in traditional use
2. Dreyfuss – rates learners' progress (with a view to mastery) in a procedure or technique
3. Behavioural anchor ratings
4. Time to event – time to intervene in a situation
5. Global rating scale

Reliability (Internal structure)

Classic Reliability

1. Internal consistency
 - Do all the questions in the tool measure the same construct?
 - Does the tool actually measure more than one construct (poor internal consistency)?
2. Interpreting alpha
 - a. If the internal consistency is too high (>0.95), redundant questions exist
 - b. Some tools may be extremely uniform, others not
3. Inter-rater reliability
 - a. Do raters perceive the questions in the same way
 - b. Do raters rate similar subjects similarly
 - c. Common measures
 - i. Correlation coefficient
 - ii. Interclass correlation
 - iii. Cohen's kappa

Reliability-Generalizability Theory

1. G Theory improves upon this by allowing for simultaneous measurements
2. (missed this point)

Relationship to other variables

1. Can this tool differentiate between the performance of learners?
2. Proxy commonly used – years of experience to be assessed
3. Example
 - a. Tool assessing performance of lumbar puncture

Consequences: formative (feedback to learners) vs. summative feedback (credentialling)

See Calhoun AW et al. Assessment in paediatric simulation. Cheng A, Grant V (ed). The Comprehensive Textbook of Healthcare Simulation; edited by Adam I. Levine, Samuel DeMaria Jr., Andrew D Schwartz, Alan J. Sim.

Competency measurement is the NEXT accreditation system.

ACGME's Milestone Project – longitudinal progression to towards competency over training – 6 domains

This is a paradigm shift – competency-based assessment

1. Emphasis on outcomes, accountability
2. Still missing robust tools

Is simulation the answer?

1. Structured, reproducible
2. Versatile
3. Possible to elicit desired responses with scripted triggers
4. Debriefing phase offers opportunity to get into someone's head

Where are we now?

1. Many tools out there
2. Most formative, few summative, very few high-stakes
3. USMLE step 3 exam (USA Medical Licensure Exam)
4. PALS, ACLS, NRP certification

See: Targeting simulation-based assessment for the pediatric milestones- a survey of simulation experts and program directors. Academic Pediatrics, 10/13/2015 Mallory LA, et al.

Competency-based assessment is here to stay.

Choose the right modality.

Select knowledge areas and skills most suitable for simulation.

The NCLEX – National Council Licensing Examination (USA)

There are state certification and re-certification of nursing programs.

In California, 25% of clinical hours in a course can be fulfilled by simulation. No requirements on the quality of simulation.

INACSL Standards of Best Practice: Simulation – 9 components. This reflects the QUALITY of simulation experiences. There is also SSIH Certification.

We need additional reliable and valid instruments for use in nursing education.

11:45 AM - 12:45 PM Affinity Group - Book Salon - Lunch provided in the room SDCC Room 33B

Use of SimConnect. Consider SSiH to have an electronic library. Include recommended texts (or references) on simulation books, management, multimedia, education and leadership topics.

1:00 PM - 2:00 PM Address Diagnostic Safety: Incorporate Simulation, Interprofessional Collaboration and Decision Support Tools (#17854) SDCC Room 24C

This was a workshop. Clinical reasoning. How and when do you teach clinical reasoning? Questioning students. Why did you do that? See NEJM 2006; 355:2217-25. Bowen J.

Type 1 (intuitive) and Type 2 (analytical) reasoning.

Diagnostic error is 5-15% (Berner 2008, Graber 2009, Singh et al. 2014, IOM 2015)

Twice as likely to cause death.

1. Are decision-making errors acceptable in training?
2. Are decision-making errors acceptable in practice?
3. Do students practice?
4. Do you teach students about diagnostic error and strategies to minimise the risk of diagnostic error?

See "Improving Diagnosis in Health Care" IOM, 2015.

Eight recommendations are:

https://iom.nationalacademies.org/~media/Files/Report%20Files/2015/Improving-Diagnosis/Diagnosis_Recommendations.pdf

1. Facilitate more effective teamwork around the diagnostic process
2. Enhance health care professional education and training in the diagnostic process
3. Ensure that health information technologies support patients and health care professionals in the diagnostic process
4. Develop and deploy approaches to identify, learn from, and reduce diagnostic errors and near misses in clinical practice
5. Establish a work system and culture that supports the diagnostic process and improvements in diagnostic performance
6. Develop a reporting environment and medical liability system that facilitates improved diagnosis by learning from diagnostic errors and near misses
7. Design a payment and care delivery environment that supports the diagnostic process
8. Provide dedicated funding for research on the diagnostic process and diagnostic errors

Beware of Various Bias

1. Framing effect
2. Anchoring bias

3. Confirmation bias
4. Premature closure
5. Overconfidence bias

Cognitive Forcing strategies exist to reduce bias. E.g. checklists, web-based tools, using others (collaboration). See there is a software diagnostic tool: ISABEL. See: <http://www.isabelhealthcare.com/home/default>

Described 3 studies he has done looking at use of checklists for PA, Internal Physician residents with controls of those who did not use checklists.

See Hanson J: Use of diagnostic reminder systems and checklists ...

These systems are especially suited to specialties with less time pressure, I would say.

2:15 PM - 3:45 PM International Simulation Data Registry: Gathering and Standardizing Our Data (#16131) SDCC Room 33C

Do we have the data from the real world with which we can compare? Should we be comparable with the real world or otherwise?

So the Data should include:

1. Level of evidence
2. Quality of evidence
3. Continuous review

There is a parallel improvement process: individual patient -> hospital specific -> global.

An international data registry can show changes over time. That is, not only longitudinal vs. cross-sectional registry.

Use the Utstein-style applied to registries. Agreement on terminology e.g. when does cardiac arrest start; loss of pulse or when team arrives?

Role of registries

1. Document existing situation
2. Cross community comparison
3. Identify variables predictive of outcome
4. Allow for prospective trials

Is it ok to get benchmarks from simulation for rare events to use them in litigation?

What does it mean if 50% don't perform the intervention in question? Is it true or is there is a sampling error? Is the scenario realistic enough? What do we do with outliers? In manufacturing industry, the traditional tolerance limit is 1:10,000. Biological reference value – above 99% (i.e. 1% are outliers). For laboratory references, it might be 2 SDs. For performance references, it might be 90th percentile.

See publication in PLOS ONE : simulation cardiac arrest registry; Kurrek M. Also see:

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0131064>

Conceived in IMSH 2014 San Francisco. Showed summative data (time to start CPR in seconds) and Radar plots for 5 events (time to CPR, time to defibrillation, etc). But are these data valid and applicable to the real world? Yes, in the few comparisons that have been made.

Barriers to implementation of data registries

1. IRB issues: great heterogeneity, confusion between biomedical and educational research (ISDR work is minimal risk”), issues with multi-site studies
2. Programmatic issues: lack of staff to enter data, sim ctr staff very busy, basic CPR scenarios might not be practiced at sim ctrs
3. Data Definition: what is “in-situ” simulations, confusion about acceptable sequence of events in cardiac arrest, when does the arrest begin

See: <http://simulationregistry.academicanesthesia.com>

See GWTG (Get with The Guidelines)! AHA.

Future directions (Mary Beth Mancini)

1. Research opportunities
 - a. early recognition and remediation (individuals and teams),
 - b. translation of education into practice,
 - c. development of benchmarks,
 - d. identification of best practice.
2. Operational opportunities
 - a. Early recognition and remediation
 - b. Confirmation of translation of organisation’s educational processes into performance and actual enhanced outcomes
 - c. Refined performance targets (benchmarks)
 - d. Framework for system assessment and integration
3. Financial opportunities
 - a. Targeted training -> cost efficacy
 - b. Confirmation of translation of organisation’s educational processes into performance and actual enhanced outcomes -> Insurance savings
 - c. Refined performance improvement targets -> Avoidance of “Never Events”

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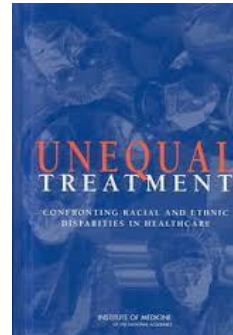
4:00 PM - 5:30 PM Cultural Competence to Cultural Sensitivity: Developing Self Awareness (#17567) SDCC Room 25C Workshop.

See the book: Unequal Treatment, by Brian D Smedley.

By 2050, blacks, Asians and Hispanics will overtake white Americans.

Bias is as natural for us as breathing (Howard Ross).

Cross-cultural medicine – seeing the patient’s illness through the patient’s eyes; i.e. patient-centred.



Cultural competence means having the knowledge to successfully engage with patients of different cultural backgrounds.

Cultural humility involves a self-reflective practice of examining one’s own cultural background; building a knowledge base concerning the world views of people from diverse backgrounds; with lifelong learning.

Exercise 1. 6 questions. Which culture do you identify with? What are some characteristics of your culture? What role did your families’ culture play in your early identity? What are some key messages you received from your cultural environment? How has your culture affected your role as a physician / professional? Tell us about a situation in which you felt you or your values were rejected.

See Video: 148 bad boys, 1 nice couple: <https://www.youtube.com/watch?v=RS3iB47nQ6E>

Exercise 2. Write down some stereotypes. Stick-it notes. 1 note per page. Grouped according to gender, race, education, geography, profession, class, hobbies, size, and religion.

Humans like to categorise cultural groups.

Reflective questions

1. Are there any stereotypes that you identify with, or belong to?
2. Do you notice any stereotypes that you personally have for any of the groups?
3. Were there any positive as well as negative stereotypes?
4. How might be positive stereotypes be problematic?
5. How do you feel about talking about stereotypes?
6. How might these stereotypes impact medical decision-making when caring for persons of the represented groups?

See Video: English guy in a Chinese restaurant: https://www.youtube.com/watch?v=6_WAMt3cMdk

What is the biggest stereotypic hurdle in healthcare treatment? Age, sex, socioeconomic state, disabled, insurance, etc. Answer = Age!

See handout: Stereotypes.

What is the biggest stereotype that patients have about doctors? Answer: age!

How would you incorporate culture within your simulation program?

[Note to RR – give link to video resources to this course director; and Tim Brake’s articles.]

5:45 PM - 6:45 PM SSH Business Meeting - SSH Members Only SDCC Ballroom 20 D

New bylaws to be voted upon in February 2016.

Exhibition

The outstanding device of the healthcare exhibition (“vendors”) was the **VitalsBridge** device that interfaced simulators to actual monitors. This might be a future consideration for consideration by anaesthetists / intensive care / emergency medicine simulations who had previously had to consider buying a METI/CAE high-fidelity simulator that required CO2 and other physiology displayed on existing monitors ->

<http://www.vitalsbridge.com/VitalsBridge/index.html>



Gaumard, CAE, Limbs and Things, Laerdal were present in force.



Surgical (laparotomy) simulator. They have become so much more realistic.



Tuesday, Jan 19, 2016

7:00 AM - 8:15 AM Section - Anesthesia SDCC Room 23B

Reminder to use SimConnect for correspondence between members of this section – approximately 340 anesthesiologists. Topics of discussion included the American Board of Anesthesiology Part 3 exam – possibly released in 2017!

Presidential citation to Prof Debra Nestel (Monash, VIC) and 2 others.

Abstract Awards - 213 abstracts submitted – 143 accepted. Three streams; approx. 15 award recipients.

Research Grants – 2 awards.

Serious Games and Virtual Environments Awards – 7 awards.

8:30 AM - 10:00 AM TUESDAY PLENARY ADDRESS: Michael S. Gordon Lecture Center Lecture in Medical Education: Team Building in Healthcare (#21396) Matt Weinstein (PlayFair President) SDCC Ballroom 20 A/B/C

Author of several books, including Work Like Your Dog; Merrily Down The Stream.

Invited many executives to play childhood games to his centre in Pennsylvania. It backfired. Much conflict and anger. Realised that childhood games do not bond people, they are about pushing boundaries. He needed difference games for adults.

3 exercises- fireworks, celebration gestures, guessing what your colleagues might do (tiger or how-ya-doin' or shooting in the air).

Benefits of fun in the organisation – cheaper to keep staff than train new ones. Do we work like dogs? No, dogs have a great life and are always excited to see you. Wouldn't it be great if people at your workplace gave you the same reception when you arrived? Dogs listen deeply even when they don't understand. Dogs go with the flow.



Story about a successful dental entrepreneur – all staff given \$200 and 1 hour to buy 5 items in the mall for themselves at a half day off – then they had to show them to the company boss in public (1 woman had bought Victoria's Secret items!).

Three best ways to lead: by example, by example, by example. My job is to email the person sitting next to me Giuseppina.Kunstek@regionh.dk to tell her that I gave candies to PACU RNs. This was an exercise to reward people that you work with for no reason in particular.

Buddhist example question: What's NOT wrong in your life right now? You don't have a toothache. Speaker lost all his money when Bernie Madoff investments crashed and the speaker suddenly had no pension plan. His wife's book: Women, Food and God. Featured on Oprah twice. Most of his lost money returned with his wife's book sales.

An act of play is an act of love.
[This speaker is a new version of Patch Adams.]

10:00 AM - 11:30 AM Leadership in Healthcare Simulation in 2016: Lessons Learned from Successful Innovators (#17828) SDCC Ballroom 20 D

Panel: Jeff Cooper, Ignacio del Cooper, Katie Walker, Michael Seropian.

Case 1. Seropian. A new sim ctr is being constructed without your input. There are 4 disparate Administrators say; "Let's just get this thing built and then see what we can do with it". What do you do? Ironic as something like this has occurred twice in Western Australia (&).

Case 2. Walker. Her sim ctr has a hub with 2 satellite centres. 20 hospitals, 5 FTE are too stretched, continually shifting priorities, Faculty scheduling difficulties, tension in team, unable to refuse high priority projects directed by Chief Medical Officer.

Case 3. Cooper. 12 year successful program, 11 FTE, 10 adjunct faculty, dozens of regular courses. Complaints about communication, many don't know about decisions, surprises, scheduling failures and close calls, possibly less trust. The Harvard group had gone from a "family business" to a bigger organisation. They needed some analysis and then coaching by an experienced with an organisational coach.

See book: **The Five Dysfunctions of a Team: A Leadership Fable** 1st Edition by Patrick Lencioni.

See book: **Growing Pains: Transitioning from an Entrepreneurship to a Professionally Managed Firm**, 2007, by Eric G. Flamholtz and Yvonne Randle.

Usefulness of an outside coach (not consultant) to review your organization. It is hard to get honest feedback from your own staff sometimes. It was in the Harvard group. Only 1 staff member gave feedback to Jeff Cooper, who describes himself as a “consensus-builder”.

11:30 AM - 1:00 PM Lunch in the Exhibit Hall

**1:00 PM - 2:00 PM Create a Culture of Excellence: Eradicating Silos School Wide (#16515)
SDCC Room 25A**

This workshop was not advertised as a nursing workshop but it actually is.

Barriers to Nursing Education with Simulation:

1. Time
2. Qualified sim staff
3. Scheduling conflicts

NCSBN report publication allowed 50% of time to be in appropriately supervised simulation time. This has provided major challenges to nursing simulation staff. Experiences from Duke University – 1000 students across all programs.

Skills previously recommended are now mandated; example for CRNA DPN programs – CVC insertion must now be ultrasound-guided, competency-based.

Educational strategies for culture of excellence:

1. Facilitator workshop – 2 hour course – simulation event – template – stem - script – event changes – start with objectives (formative vs. summative)
2. Debriefing workshop
3. Expanding the field (regional, national, international presentations, publications, research collaborations)
4. Innovation (Telehealth, Robotics, Google Glass, Bioengineering) – example, is there Telehealth education / simulation (see Duke Telehealth robot picture, costs \$3000.00)

There is a template for initial planning meetings (Duke will share this form); done 30-90 days prior to planned event.

Use Qualtrics for evaluation survey.

CHSE exam = \$350.00 for simulation educators. There is a book “Defining Excellence in Simulation Programs” by Society for Simulation in Healthcare to assist with exam preparation.

Silos may exist between the following groups within your organisation:

1. Sim staff
2. Educators
3. Clinical experts
4. Researchers
5. Course faculty

Accreditation by SSH may cost around \$US 10,000.00.

2:15 PM - 3:45 PM Paper Airplane Factory Board Game: Systems Thinking for Learning Organizations (#16624) SDCC Room 31B

See www.ihl.org

Paper planes production three times.

“Culture eats strategy for breakfast” Peter Drucker

CLOSING RECEPTION 4:00 PM – 6:00 PM

6:30 PM - 7:30 PM International Reception - By Invitation Only SDCC Ballroom 20 Lobby

Wednesday, Jan 20, 2016

8:30 AM - 10:00 AM In-Situ Simulation: Tool for Diagnosis and Management of Latent Error (#17369) SDCC Room 24B

Panel Workshop: Ellen Deutch, Mike DeVita, May Patterson, Dan Raemer

6 errors may cause harm, on average. You may not know that latent errors even exist.

Two uses of simulation:

1. Finding latent errors through repeated observation (sim ctr or in-situ)

2. Remediating the error (design, rehearsal, dissemination)

Healthcare systems from microsystems to organisations, are complex adaptive systems.

PA-PSRS = Pennsylvania Patient Safety Reporting System. PA was the first state to mandate reporting of patient safety errors. Speaker reported analysis of 2000 reported incidents where terms such as simulation, mock, practice, rehearsal; were used.

Safety concerns about in-situ simulation:

1. Psychological harm
 - a. Is confidentiality possible?
 - b. How can we gain the learners consent?
 - c. Will the learner know what is expected of them?
 - d. How will the learner be treated so that that don't feel tricked, manipulated, or gamed?
2. Environmental problems
 - a. What do we bring into the simulation that might cause harm (2 deaths of patients receiving fake IV fluid)
 - b. What are we taking out of the clinical environment that could be missed (eg real MET teams called during a simulation)
 - c. What needs to be done so that the system is not adversely affected?
3. Negative learning
 - a. Participants often start to leave during the debriefing and miss learning points
 - b. Are learning goals clear

Threats are everywhere:

1. On average, we will identify several latent threats for each in situ simulation
2. If a threat exists in one unit, there is a good chance that the same threat will exist in other units
3. Deliberate dissemination is important
4. Need infrastructure and accountability
5. Needs to be integrated in organisational safety infrastructure

[Note to Dr MH and colleagues – has the FSH safe patient journey testing information been communicated to Safety Office and other new hospitals?]

See article by BMJ Qual Saf. 2013 Jun;22 (6):507-14. High-reliability emergency response teams in the hospital: improving quality and safety using in situ simulation training. Wheeler DS1, Geis G, Mack EH, LeMaster T, Patterson MD.

Reporting Template:

1. Recipients (customise to your local environment)
 - a. Clinical unit leadership
 - b. CMO, CNO
 - c. Residency directors
 - d. Legal and Risk
 - e. Patient Safety
2. Reporting template [Ask Mary P for copy of REPORTING TEMPLATE]

THREATS	LOW RISK	HIGH RISK
HI Frequency	x	x
LO Frequency	x	x

See article by Auerbach and Patterson MD on survey of in-situ simulation (in press).

In-situ sim is a great tool for a HRO (High Reliability Organisation)

Near misses are free gifts. Study them. Review protocols when they don't fit.

When planning in-situ sim, speak to everyone who may be called (eg PICU, laboratory, X-ray). Apply boundaries to the simulation. Be careful of upsetting actual staff in the vicinity (story of happy, laughing participants emerging from an obstetric simulation right next to a labour ward where a baby had died, RN angry Dan Ramer very upset).

10:15 AM - 11:15 AM Enhance your Organization's Meeting by Using Simulation: The National Patient Safety Foundation Story (#17569) SDCC Room 31A

Workshop Panellists: Alison Perry, Jeff Cooper, Connie Lopez

NPSF

- Founded in 1997
- Mission is to create a world where patients are free from harm.
- 8 million people seriously harmed from preventable medical mistakes each year.
- >1,000 deaths / day in USA from medical error
- 440,000 die each year in the USA.

NPSF meeting usually 2 days. Vendors are leaving in droves. This would be disastrous for the meeting's sustainability.

Simulation for a Plenary Session

1. Sets tone for conference
2. Engaging
3. Technique of putting envelopes on chairs with briefing notes
4. "Think, pair, share" technique for audience participation

Exercise: Rejuvenation thru simulation. See handout.

- We chose Cardiac Arrest.
- Always provide time for debrief
- Running scenario twice
- High tech vs. low tech (we chose hi-tech)
- Consider working with EMS (ambulance paramedics), housekeeping and other key personnel
- Involve the vendors
- Tips - signage (directions to the event, actual signs in the booth, brochures about the scenario, learning objectives, checklists, scenario layout – diagrams useful, power sockets,

avoid interference with adjacent exhibitor, chairs for attendees e.g. for 15 mins scenario and 15 min debrief, rehearse your event, survey attendees about this exhibitor hall event.

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11:30 AM - 12:30 PM WEDNESDAY PLENARY ADDRESS: Using Earth-Based Simulations to Advance Long-Duration Human Space Exploration (#21398) SDCC Ballroom 20 A/B/C

Kim Binstead; Hawaii Astrobiologist, HISEAS

NASA plans to send people to Mars in 2023
Round trip 2.5 – 3 years.
Use analogs to discover problems, test solutions. E.g. use desert to replicate Mars. After 100 days of poor sleep, performance deteriorates markedly. It begins after 1 day of poor sleep.
Also use analogs to design in the context of sleep.
Also, to integrate people and systems in realistic scenarios.



HISEAS is on Hawaii, a geodesic dome with solar panels on an abandoned quarry on the northern slope of Mauna Loa, Hawaii.

Retiring risks for long duration human space flight.

Bathrooms are composting toilets. Shower times = 8 mins / person / week.

Some activities are filmed in the habitat. 4 – 25 mins to talk or send email. 40 mins to see a webpage.

No nice mission control. Professional volunteers around the world.

EVA (extra-vehicular activities) – use mock space suits, needs 2 people, and approval.

Explore lava tubes on this Hawaiian desert. Similar to Mars. Use Hollywood and actual HAZMAT suits.

Missions of 4 months. Four missions to date.

Food issues. In space, mass = money. Packaging weighs too much. Shelf-life a problem. Freeze-dried, not fresh ingredients. Astronauts can cook.

Astronauts are liars. They are always fine, always getting on with their team-mates. How to stop astronauts from killing each other. Electronic techniques to detect anger or silence in their voices.

The crews for these simulated missions need to be as close to real astronauts as possible. 800 volunteers but only 150 suitable. Need to select 6 that will work with each other.

Potential issues

1. Crew-ground disconnect

2. Third quarter syndrome (does this really exist – it does in Antarctica – this is when the problems start)
3. Incompatible leadership / followership style
4. Depressions and other mood disorders
5. Diagnosing / detecting problems under high latency conditions

Problems

1. \$1.2 million – a cheap project
2. Fidelity – they need meaningful work as well as just existing in a controlled environment
3. 12 L/water / astronaut / day – this “mission” has rewritten the actual MARS planning document
4. 1 in 6 astronauts with medical training on a crew
5. Need crew autonomy – MARS crews cannot be controlled by earth

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- APMSH: Singapore. Nov 15-17, 2016
(Kirsty Freeman, Convenor)
 - Next IMSH: Orlando, Florida. Jan 28 – Feb 1, 2017
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This report is presented as a service to the WA simulation community.

Please do not share it with others without permission of the author.

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8 February 2016

WITHOUT PREJUDICE