Emergency Medicine Simulation

MARC GUTENSTEIN – EMERGENCY SPECIALIST CDHB
CANTERBURY COLLABORATIVE SIMULATION INTEREST GROUP (CCSIG)
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Why Simulation for Emergency Medicine?

- Human Factors Agenda & Aviation Model
- High Risk Environment
  - Time Critical Situations
  - Stressful
  - Decision Intensive
  - Multi-disciplinary
  - Organisation at performance boundary
Simulation Programme 2014

- Emergency Department CDHB
  - Weekly 2h sessions for junior doctors and Emergency speciality trainees
  - Nursing team days

- University of Otago Rural Hospital Medicine Faculty
  - Trauma and Emergencies Paper
  - Week long residential programme

- Christchurch Emergency Education Series
  - In-house education courses for specialists skill maintenance
Implementing : ED experience

- Moved Quickly
- Did not wait for perfection
- Evolved on the fly
- Permission to enjoy
- Trusted in existing teaching experience to build learning goals
Scenarios

- TCA toxicity
- RSI and Airway Skills
- VF arrest and CPR
- Paediatric Burns
- Severe Asthma
- Spinal Injury
- Post-Intubation Care
- Status Epilepsy
Airway Kit

Christchurch Emergency Department Airway Algorithm

- Optimise for FIRST-PASS SUCCESS:
  - Difficult Airway assessment
  - Optimise patient factors
  - Checklist team, equipment, patient, drugs

- Prepare for FAILURE
  - Ventilator撤离 plan
  - Ask for Help before you need it

Plan A
- Intubate

- Change Something
  - Position, ELM, modality, device size, vs operator

Plan B
- Oxygenate

Plan C
- Cut

HELP
- ED Phone 81444
- ICU register 81515
- Paed Anaesthetist 81000
- Paed Anesthesia
- ICU Ventilator

Plan FOR FAILURE
- Plan discussed A-B-C
- Team suggestions?
- Need Help?

CHCH ED

- Team Leader
- Primary Intubator
- Airway Assistant
- Drug Provider
- Other Roles
  - External Laryngeal Manipulation
  - Manual In Line Stabilisation
  - Backup Intubator

RSI CHECKLIST

- Monitoring
  - Sats, BP, ECG
  - ET-CO2

- Oxygenation
  - Consider PEEP Valve
  - Pre-oxygenation 5min or BVC breaths
  - High Flow Nasal O2

- Positioning
  - Ear to sternal notch

RSI Drugs
- Consider Contraindications!

- Fentanyl
  - 1-3mcg/kg
  - 10mcg

- Propofol
  - 1-2mcg/kg
  - 5mcg/kg

- Pancuronium
  - 1.0-2.0mg/kg
  - 100mcg

Debrief
- Complete Airway Registry form

Version 2 2015 - Contact: 81444; airway基督城@health.nz
Professional Development Unit at Christchurch Hospital

Evolving Equipment from basic mannequins to SimPad
Rural Hospital Programme

SimMan 3G Suite

Immersive experience & very HiFi
Scenarios

- Head trauma
- Pelvic & Femur Trauma
- Spinal Trauma & Neurogenic Shock
- Paediatric Burns & Airway
- CICO scenario & Cricothyroidotomy
Rural Airway Management

- RSI
- LMA
- CRIC
- POSITION
- ADJUNCT
- ASSIST

RISK : BENEFIT ANALYSIS

ASSIST VENTILATION
- POSITION
- ADJUNCT
- ASSIST

MANAGE AIRWAY
- RSI
- LMA
- CRIC

Ven$la$on Secure

Airway Secure
Our Experience
ED Experience

- Great learning modality for procedural skills
- Great for introducing new procedures & airway kit
- At times we overloaded the participants
- Takes time to overcome historical culture of ‘judgemental’ training
- Often paradoxically more difficult for senior trainees
Rural Hospital Experience

- Great interest & enthusiasm from rural practitioners
- Repeating simulations (same scenario back – to – back) worked well
- Large appetite for more in isolated and remote areas!
Feedback – Translation to Practice

“Better communication with staff”
“More confidence with team”
“Clearer thinking”
“Played a more useful role in RSI”
“Managed Burns patient better”
“Considered neurogenic shock in spine trauma”
“Performed 2 person BVM ventilation”
“Used paediatric calculator”
“Used ketamine for severe asthma”
ED Feedback - Qualitative

CLINICAL LEARNING

NTS LEARNING

[Diagram showing the feedback distribution for CLINICAL LEARNING and NTS LEARNING, with very useful, moderately useful, and not useful categories represented]
RHM Feedback - Qualitative

SIMULATION SCENARIOS

INDISPENSABLE  USEFUL  OTHER
Future Directions

Short Term Win!  ⇒  Create New Culture
Refining the Experience

- Discriminating learning objectives
- Refining debrief methods
- Evaluation of learning and feedback
- Academic input
- Flipped Classroom
- Workplace ergonomics and discovery moments
- Real multidisciplinary teams
Blinded Simulation!
Risks

Hype Cycle and Technology Adoption Lifecycle Plotted together

- Technology Trigger
- Peak of Inflated Expectation
- Trough of Disillusionment
- Slope of Enlightenment
- Plateau of Productivity

- Innovators
- Early Adopters
- Early Majority
- Late Majority
- Laggards

"The Chasm"
Future Directions

- **Weekly Sessions**: For clinical and NTS content
  - Flipped Classroom
  - Repeating same simulations to reinforce learning

- **In-Situ Simulation**: For teamwork and workplace
  - Actual working teams
  - Real time “Discovery moments”

- **Nursing Team Days**: For multidisciplinary education
  - Team
In-Situ Simulation
Tips & Challenges

- Create quickly and get a short term win...
  ...Then create a new culture with more methodology

- Stay flexible!

- Get feedback. Learn to deliver SIM better

- Identify specific learning recipients, objectives and domains

- Know who is who in the simulation team to make things happen
Teamwork Credits

- Christine Beasley
- Claire Dillon
- Colleen Fluharty
- Evan Cameron
- Laura Joyce
- Laurence Walker
- Leona Robertson
- MaryLeigh Moore
- Michael Sheedy
- Sampsa Kiuru
- Stefan James