

Toby Everett, The Hospital for Sick Children, Toronto  
National MEPA Meeting, Great Ormond Street Hospital, London,  
Friday 07 March 2014

# MEPA INTERNATIONAL - UPDATE



# North America

## Canada

- Toronto
- Hamilton
- Kingston
- Ottawa
- Saskatoon
- Calgary
- Edmonton
- Montreal
- Vancouver

## USA

- Mott's Children, Ann Arbor
- Wash U, St Louis
- CHOP
- Cleveland Clinic
- UC Davis, Sacramento
- West Virginia
- Vanderbilt, Nashville



## Australia

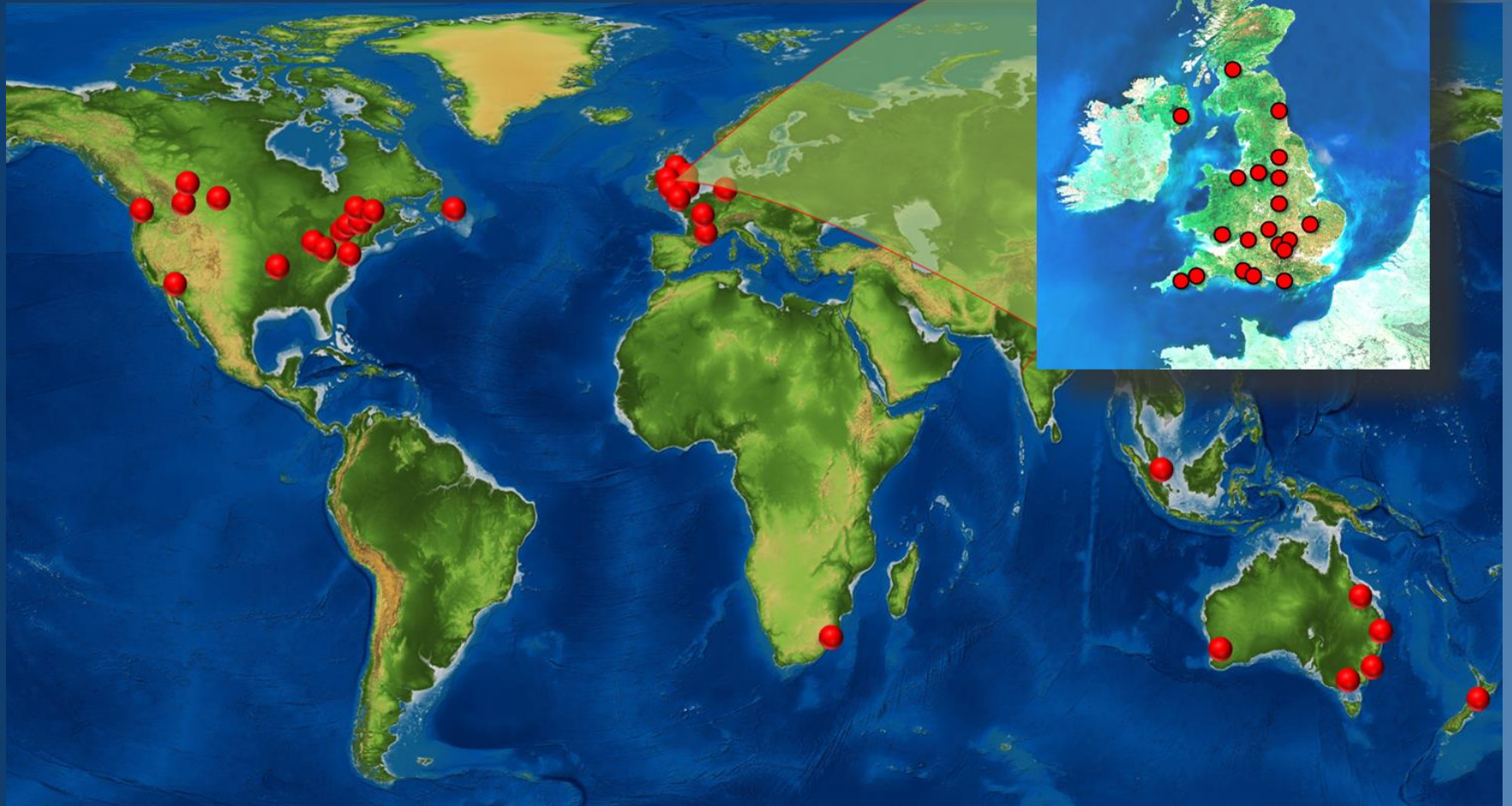
- Perth
- Sydney
- Melbourne
- Townsville
- Victoria
- Brisbane

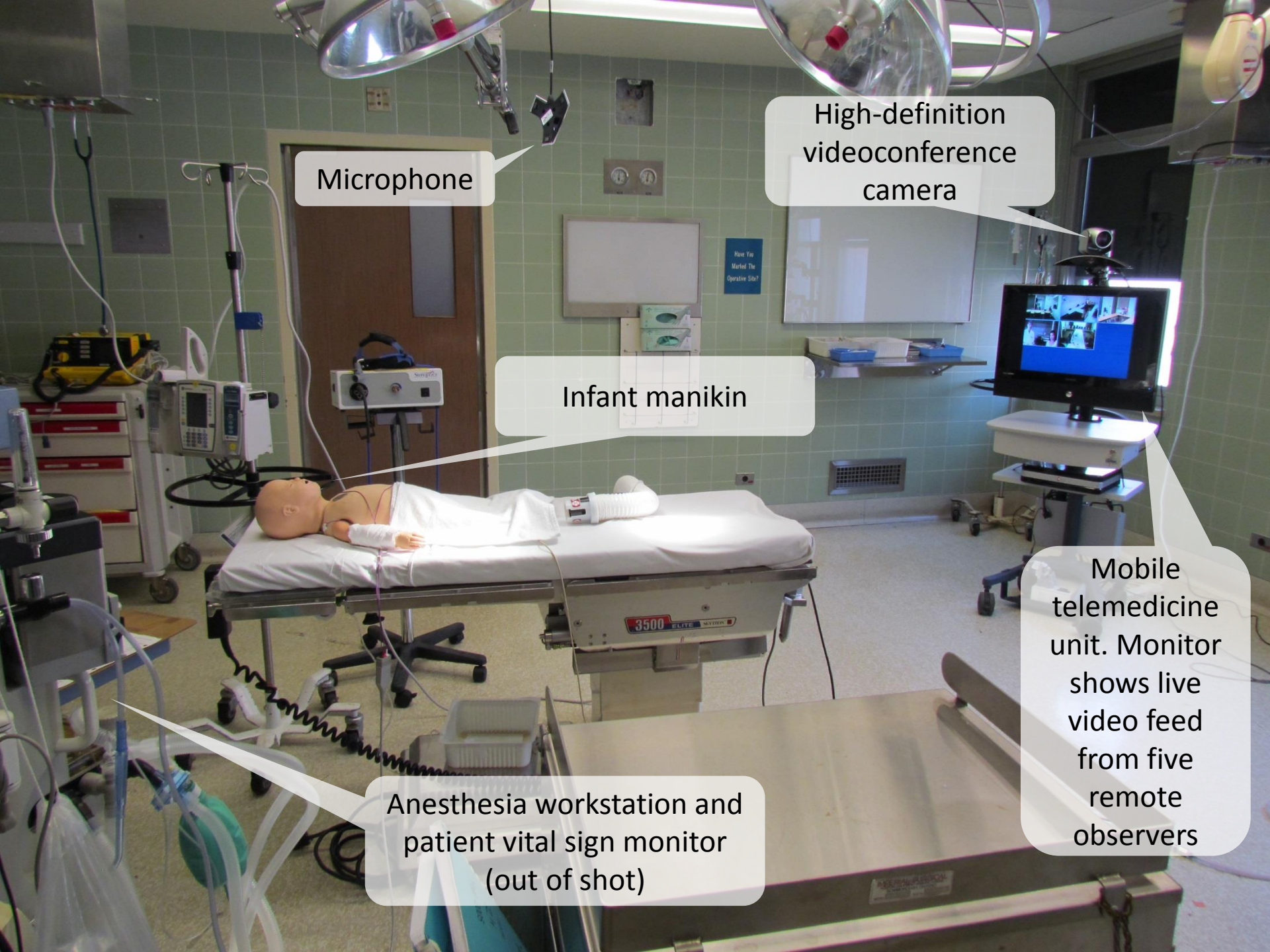
## New Zealand

- Wellington

## Elsewhere

- Durban
- Singapore
- Cape Town
- Basel
- Dubai





Microphone

High-definition  
videoconference  
camera

Infant manikin

Anesthesia workstation and  
patient vital sign monitor  
(out of shot)

Mobile  
telemedicine  
unit. Monitor  
shows live  
video feed  
from five  
remote  
observers

MEDIA

Scenar

Scenar



## Characterizing the debriefer: a mixed-methods, sequential-explanatory study of debriefing

Tobias Everett, Toronto, Canada  
Dylan Bould, Ottawa, Canada  
Adam Cheng, Calgary, Canada  
Walter Eppich, Chicago, USA  
Katherine Moreau, Ottawa, Canada  
Ralph MacKinnon, Manchester, UK

- Acknowledge grants:
- Academic Health Sciences Centres Innovation Fund
  - Academy for Innovation in Medical Education
  - Stanley Foulds Educational Research Fund

Everett

SickKids

Everett

SickKids

SickKids

SickKids



UNIVERSITY  
of TORONTO



UNIVERSITY  
of TORONTO



UNIVERSITY  
of TORONTO

SickKids

# MEPA III

- >20 sites interest declared
- All running MEPA scenarios regularly
- Building on MEPA II
- Using tools we have validated as outcome measures
- Investigating impact of critical event checklist in Pediatric ORs

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

## Simulation-Based Trial of Surgical-Crisis Checklists

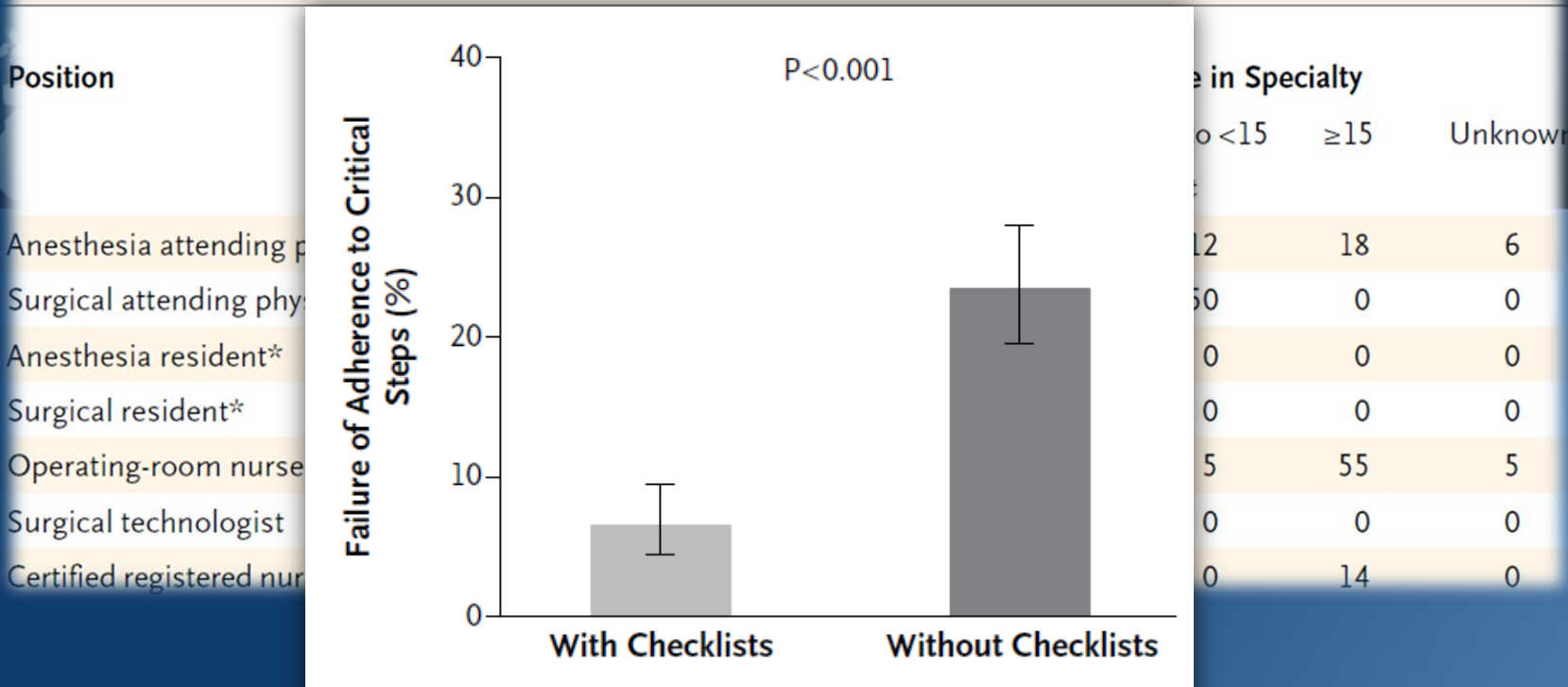
Alexander F. Arriaga, M.D., M.P.H., Sc.D., Angela M. Bader, M.D., M.P.H.,  
Judith M. Wong, M.D., M.P.H., Stuart R. Lipsitz, Sc.D.,  
William R. Berry, M.D., M.P.H., M.P.A., John E. Ziewacz, M.D., M.P.H.,  
David L. Hepner, M.D., Daniel J. Boorman, B.S., Charles N. Pozner, M.D.,  
Douglas S. Smink, M.D., M.P.H., and Atul A. Gawande, M.D., M.P.H.

N Engl J Med 2013;368:246-53.

DOI: 10.1056/NEJMsa1204720



**Table 1.** Professional Characteristics of the Participants.



**Figure 1.** Association between Use or Nonuse of Operating-Room Crisis Checklists and Failure to Adhere to Critical Steps in Management.

Position

Anesthesia attending physician  
 Surgical attending physician  
 Anesthesia resident\*  
 Surgical resident\*  
 Operating-room nurse  
 Surgical technologist  
 Certified registered nurse

Years in Specialty

<15	≥15	Unknown
12	18	6
50	0	0
0	0	0
0	0	0
5	55	5
0	0	0
0	14	0

# Pediatric Critical Events Checklists: “Just In Case”



**Call for help**

**Overhead** \_\_\_\_\_

**Blood Bank** \_\_\_\_\_

**PICU** \_\_\_\_\_

**Fire** \_\_\_\_\_

Air Embolism	2
Anaphylaxis	3
Bradycardia	4
Cardiac Arrest	5-7
Difficult Airway	8
Fire: Airway and OR	9-10
Hyperkalemia	11
Hypertension	12
Hypotension	13
Hypoxia	14-15
Local Anesthetic Toxicity	16
Loss of Evoked Potentials	17
Malignant Hyperthermia	18
Myocardial Ischemia	19
Tachycardia	20
Transfusion & Reactions	21-22
Trauma	23-24

# Malignant Hyperthermia

↑ Temp, ↑HR, ↑CO<sub>2</sub>, Acidosis

18

MH hotline 1-800-644-9737

- Call for help.
- Get Malignant Hyperthermia (MH) Kit.
- Stop procedure if possible
- Stop Volatile Anesthetic, transition to non-triggering anesthetic
- Request chilled IV saline.
- Hyperventilate pt to reduce CO<sub>2</sub>: 2-4 times patient's minute ventilation
- Dantrolene 2.5 mg/kg IV every 5 min until symptoms resolve
- Assign dedicated person to mix dantrolene (20mg/vial) with 60 mL sterile water.
- Bicarbonate 1-2 meq/kg IV for suspected metabolic acidosis; maintain pH > 7.2.
- Cool patient if temperature > 38.5° C
  - NG lavage with cold water.
  - Apply ice externally.
  - Infuse cold saline intravenously.
- \*\* Stop cooling if temperature < 38° C.
- Hyperkalemia treatment: (See green hyperkalemia card)
  - Ca gluconate 10 mg/kg IV or Ca chloride 10 mg/kg IV;
  - Sodium bicarbonate 1-2mEq/kg IV;
  - Regular insulin 10 Units IV with 1-2 amps D50 (0.1 units insulin/kg and 1mL/kg D50)
- Dysrhythmia treatment: Standard antiarrhythmics; do **not** use calcium channel blocker
- Send labs: ABG or VBG, electrolytes, serum CK, serum/urine myoglobin, coagulation
- Place Foley catheter to monitor urine output.
- Call ICU to arrange disposition



Email Log

Done

2014-01-07 13:05:17

*Event created*

2014-01-07 13:05:26

*Patient weight selected: 10.000 kg*

2014-01-07 13:06:04

*Option selected: Call for help (within US)*

2014-01-07 13:06:05

*Option selected: Call for MH cart*

2014-01-07 13:06:05

*Option selected: Stop volatile anesthetic / succinylcholine*

2014-01-07 13:06:06

*Option selected: Stop procedure if possible*

2014-01-07 13:06:06

*Option selected: Request chilled Intravenous saline*

2014-01-07 13:06:07

*Option selected: Assign person to mix dantrolene*

2014-01-07 13:06:07

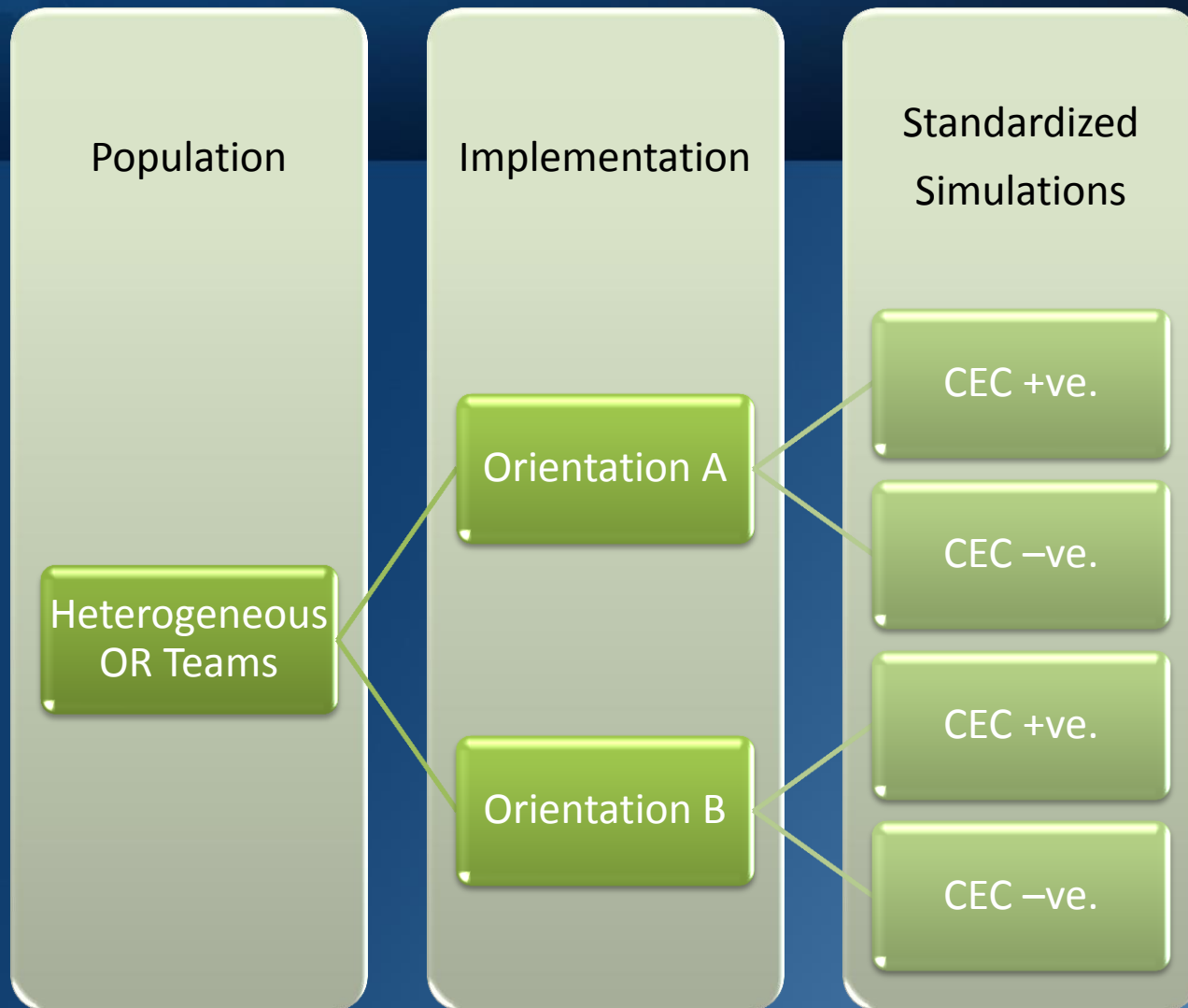
*Option selected: Send labs: ABG or VBG, electrolytes, serum CK*

2014-01-07 13:06:07

*Option selected: Place foley*

2014-01-07 13:06:16

*Option selected: NG lavage with cold*



## Critical Event Checklists Improve Medical Management and Teamwork in Pediatric Operating Room Crisis Simulations

“...using validated performance rating instruments, we demonstrated that practitioners performed at a level above their grade (i.e. equivalent to a more experienced practitioner) if the checklists were available. We further demonstrated that teamwork scores were significantly improved in those scenarios where the checklists were available, regardless of the grade of practitioner...”





esia

Pediatric Anesthesia ISSN 1155-5645

# CALGARY

CAS ANNUAL MEETING

June 21 – 24, 2013

## ic Anaesthesia imulation-based s management

Stephen Tolchard<sup>4</sup>,

of Toronto, Toronto, ON, Canada



## Award for Best Paper in Education and Simulation in Anesthesia

**Dr Tobias Everett**

*The Hospital for Sick Children and  
Un... , Toronto, ON*

Managing Emergencies in Pediatric Anesthesia (MEPA) Global Rating Scale is a Reliable Tool for Assessment in Pediatric Anesthesia Crisis



**Keywords**

anesthesiology/education; p  
simulation; pediatrics; emer  
assessment; educational; cl  
competence

**Correspondence**

Tobias C. Everett, Departme  
Anesthesiology and Pain Me  
Hospital for Sick Children, 5  
Ave, Toronto, ON, Canada M

# 26th Pediatric Anesthesia Conference

Anesthesia and the Environment

Practical Solutions to Common Problems

Neonates, Anesthesia and the Future

Perioperative Management of  
Challenging Patients

The Hospital for Sick Children,  
Toronto, ON, Canada

November 8 - 10, 2013

# Simulation Summit

2013

November 8-9, Vancouver

Promoting professional proficiencies

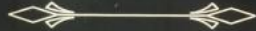




Society for Simulation in Healthcare

**Program Innovation**

**3rd Place**



**Transcontinental Telesimulation: The Global Proliferation of the Managing Emergencies in Paediatric Anaesthesia (MEPA) Course**

**Authors:**

Tobias Everett, MBChB, FRCA, Dylan Bould, MBChB, MEd,  
Elaine Ng, MD, FRCPC, MSHPEd, Matthew Taylor, MBBS, FRCPC, FRCA  
David deBeer, BSc, MBChB, FRCA, Catherine Doherty, MBChB,  
Deborah Marsh, MD, DCH, FRCA, and Ralph MacKinnon, BSc, MBChB, FRCA

14th Annual International Meeting on  
Simulation in Healthcare  
January 2014 - San Francisco, CA

Tobias Everett\*, Toronto, Canada  
Dylan Bould, Ottawa, Canada  
Matthew Taylor, Sheffield, UK  
Elaine Ng, Toronto, Canada  
David DeBeer, London, UK  
Deborah Marsh, Portsmouth, UK  
Catherine Doherty, Manchester, UK  
Ralph MacKinnon, Manchester, UK  
**IMSH, San Francisco, 27 January 2014**

# TRANSCONTINENTAL TELESIMULATION: THE GLOBAL PROLIFERATION OF THE MANAGING EMERGENCIES IN PEDIATRIC ANESTHESIA (MEPA) COURSE

# Making Connections



The Royal College of Anaesthetists  
Educating, Training and Setting Standards  
in Anaesthesia, Critical Care and Intensive Medicine



Association of Paediatric Anaesthetists  
of Great Britain and Ireland



IPSS

International Pediatric Simulation Society



International Network for Simulation-based Pediatric Innovation, Research and Education

Toby Everett, The Hospital for Sick Children, Toronto  
National MEPA Meeting, Great Ormond Street Hospital, London,  
Friday 07 March 2014

# MEPA INTERNATIONAL - UPDATE