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WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

# **CS09-03: Online Disaster Training for Clinicians and Non-Clinicians at a Children's Hospital**

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### DISCLOSURE INFORMATION

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- Children are most vulnerable in disasters, yet there are gaps in healthcare systems regarding pediatric disaster preparedness
- Pediatric disaster preparedness pertains to all clinical personnel who provide direct pediatric care
- Non-clinical hospital personnel should likewise be trained to facilitate integrative efforts that help protect children from further harm (American Academy of Pediatrics, 2015; California Emergency Medical Services Authority, 2010)
  - Maintenance engineers, housekeeping service workers, administrative staff, laboratory and clinical researchers, etc.

- Pediatric Disaster Resource and Training Center
  - Pediatric disaster preparedness online training course
  - 5 modules:
    - **Planning:** types of disasters, pediatric vulnerabilities, patient flow, identification of staff, developing response teams, supplies, language services
    - **Triage:** triaging children during disasters, different levels of patient acuity
    - **Age-Specific Care:** patient care considerations by group (newborn, infant, toddler, preschool, primary school, adolescent)
    - **Disaster Management:** patient safety, transport, family reunification, infection control, evacuation
    - **Emergency Code Response:** hospital disaster policy
- Hospital-wide completion of pediatric disaster preparedness online training course mandated since 2009

- **Aim:** To better understand how clinical and non-clinical hospital personnel interface with online training for pediatric disaster preparedness
  - Archival data from July 2009-August 2012 available for analysis
- **Rationale:** Research on pediatric disaster preparedness training is necessary before a standardized national curriculum can be designed and implemented
- **Objective:** To examine changes in knowledge acquisition of pediatric disaster preparedness among clinicians and non-clinicians

- **Outcome:** module score (0-100 points)
- **“Within” participants:** module attempts (unlimited)
- **“Between” participants:** hospital role (clinician or non-clinician)
- **“Interaction”:** hospital role x module attempts
- **Analytic approach:** growth curve multi-level modeling (MLM) (applied 5 times to examine the 5 modules)
  - **Intercept:** average module score upon first attempt
  - **Slope:** average rate of score change per attempt
  - **Hospital role effect:** whether clinicians and non-clinicians differed in how they scored in first and additional attempts
  - **Cross-level interaction effect:** whether clinicians and non-clinicians had different average rates of score change per attempt

- 44,115 module attempts by 5733 participants (3686 clinicians, 2087 non-clinicians)
- Across all participants, average module score upon first attempt (intercept) ranged from approx. 60-80 points
- Planning, Triage, Age-Specific Care Modules:
  - Non-clinicians initially had lower scores than clinicians (hospital role effect)
    - Average difference ranged from approx. 13-16 points
  - Across all participants, average rate of score change per attempt (slope) ranged from approx. 1-2 points
- Disaster Management, Emergency Code Response Modules:
  - Clinicians and non-clinicians had different average rates of score change per attempt (cross-level interaction effect)
    - Non-clinicians' scores increased per attempt by approx. 4 points in Disaster Management and by approx. 6 points in Emergency Code Response
    - Clinicians' scores did not significantly improve from additional attempts



- Contribution to research literature on pediatric disaster preparedness training
  - Necessary before a standardized national curriculum can be designed and implemented
- Clinical and non-clinical hospital personnel alike can acquire knowledge of pediatric disaster preparedness
  - Key content can be reinforced or improved through successive use
- Knowledge may not necessarily translate into action
  - Notwithstanding the need for **all** hospital personnel to respond effectively to disasters, acquiring preparatory knowledge is a critical first step





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## Thank you!

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## Growth Curve MLM Applied

- Baseline model (unconditional means model)
  - Fixed and random effects of the intercept
- Unconditional growth model
  - Fixed and random effects of the intercept
  - **Fixed and random effects of the slope**
- Conditional growth model
  - Fixed and random effects of the intercept
  - Fixed and random effects of the slope
  - **Fixed effect of hospital role (clinician/non-clinician)**
- Conditional growth model with cross-level interaction
  - Fixed and random effects of the intercept
  - Fixed and random effects of the slope
  - Fixed effect of hospital role (clinician/non-clinician)
  - **Cross-level interaction (slope by hospital role)**

## Growth Curve MLM Results

Module	Best-Fitting Model	Fixed Effect of Intercept	Random Effect of Intercept	Fixed Effect of Slope	Random Effect of Slope	Fixed Effect of Role <sup>§</sup>	Cross-Level Interaction (Slope by Role) <sup>§</sup>
Planning	Conditional growth	62.16***	127.69***	1.84***	0.86***	16.24***	N/A
Triage	Conditional growth	70.41***	117.05***	0.97***	0.07	13.25***	N/A
Age-Specific Care	Conditional growth	60.28***	122.91***	0.59***	0.06	15.27***	N/A
Disaster Management	Conditional growth with interaction	71.09***	123.54***	3.77*	0.28**	12.62***	-3.77*
Emergency Code Response	Conditional growth with interaction	80.11***	64.60***	6.40*	N/A (Constant Slope)	10.95***	-7.45**

<sup>§</sup>Clinicians as the reference group. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p \leq .001$ .