Background

- Personal protective equipment (PPE) is worn by healthcare providers (HCPs) to protect them from toxic or infectious agents.
- Studies of HCPs performing simulated adult CPR have shown that chest compression (CC) quality declines more rapidly while wearing PPE.
- Data on PPE use during pediatric procedures is lacking in current literature.

Hypothesis

- During simulated pediatric CPR, HCPs wearing PPE will demonstrate faster deterioration in CPR quality and report greater fatigue than during CCs in normal attire.

Methods

- Prospective multicenter observational study.
- HCPs (nurses, physicians, and prehospital HCPs) completed two study sessions separated by at least two weeks.
  - Session 1: Normal attire.
  - Session 2: Full PPE.
- During each session, each subject performed 5 mins of uninterrupted chest compressions (CC) on a pediatric manikin.

Methods (cont.)

- CC quality was measured using a monitor/feedback device which was set to stop compressions with any deviation from target CC parameters.
- CC rate, depth, and release velocity (RV) were reported in ten sequential 30-second epochs.
- Change in rate, depth, and RV was measured:
  - Between epoch 1 and epoch 10.
  - Between epoch 1 and epoch 4 (corresponding to the 2 min recommended duration of CPR prior to provider switch).
- At 60 sec increments, subjects self-reported their level of fatigue on a scale of 1 to 10.
- Change in fatigue score was measured between time zero and time 5 minutes as well as between time zero and time 2 minutes.

Conclusions and Next Steps

- Change in CC quality and provider fatigue was not significantly different over 5 min.
- The trend towards higher fatigue in PPE group at 5 min was not statistically significant.
- Over a clinically realistic 2 minute period, neither CC quality deterioration nor self-reported fatigue was significantly worse while wearing PPE compared to normal attire.
- Our data suggest that pediatric BLS recommendations for CC providers to change every 2 minutes need not be altered in the setting of PPE use.

Impact of Personal Protective Equipment on Pediatric CPR Performance

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### Results

- 109 HCPs completed both sessions.
- Change from Baseline (No PPE) CPR Fatigue Score
  - Mean Change ± SD
  - Mean ± SD
  - Time (min)
  - 0 1 2 3 4 5
  - Epoch
  - Epoch 1 to Epoch 10
  - Epoch 1 to Epoch 4
  - Epoch 1 to Epoch 2 mins
  - Epoch 1 to Epoch 5 mins
  - Epoch 4 to Epoch 10
  - Epoch 4 to Epoch 5 mins
  - Epoch 4 to Epoch 2 mins
  - Epoch 4 to Epoch 0

### Results (cont.)

- Change from Baseline
  - PPE Level B
  - Baseline (No PPE)
  - CPR Fatigue Score
  - Mean Change ± SD
  - Mean ± SD
  - Time (min)
  - 0 1 2 3 4 5
  - Epoch
  - Epoch 1 to Epoch 10
  - Epoch 1 to Epoch 4
  - Epoch 1 to Epoch 2 mins
  - Epoch 1 to Epoch 5 mins
  - Epoch 4 to Epoch 10
  - Epoch 4 to Epoch 5 mins
  - Epoch 4 to Epoch 2 mins
  - Epoch 4 to Epoch 0

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