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Clinical paper

Development of a strategic process using checklists to facilitate team preparation and improve communication during neonatal resuscitation☆

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ABSTRACT

Background: To improve our neonatal resuscitations we review video recordings of actual high-risk deliveries as an ongoing quality review process. In order to help identify and review errors that occurred during resuscitation we educated our resuscitation teams using crew resource management and in March 2009 developed a checklist to be used for potentially high-risk resuscitations.
Objective: To describe our experience using checklists as an essential component of the actual resuscitation of potentially high-risk infants.
Design/methods: The checklist includes pre- and debrief components, along with duty-specific sub-lists (MD, RT, RN). The debrief is conducted upon completion of the resuscitation and addresses what was done well, what was not done well, and how it could have been improved. We reviewed all available checklists from March 2009 to November 2011 ($n = 260$). We then performed a second review to determine if experience has changed the leaders perception of how resuscitation was being performed from November 2011 to May 2012 ($n = 185$).
Results: We reviewed 445 completed checklists with quality assurance video review. During the initial cohort the most commonly described problems were: communication ($n = 58$), equipment preparation and use ($n = 56$), inappropriate decisions ($n = 87$), leadership ($n = 56$), and procedures ($n = 25$). The number of debriefs where communication was identified as a problem decreased from 23% in the first time period to 4% ($p < 0.001$) in the latter.
Conclusions: The use of checklists during neonatal resuscitation was helpful in improving overall communication, and allowed for rapid identification of issues that need to be addressed by institutional leaders. There needs to be further evaluation of the utility and benefit of checklists for neonatal resuscitation. Based on our past and present experience we encourage the use of checklists for neonatal resuscitation teams.

1. Introduction

Checklists have been used in the aviation industry for many years to reduce errors and improve safety of passengers. Over the last several years these tools have begun to be embraced by the medical community to improve patient safety and patient care. They have been found to be useful in helping teams function more effectively, both in the simulated and clinical environments. Their use is not entirely without risk,[1,2] and has been shown to yield low compliance when first introduced.[3,4] However, the use of checklists has become the standard for high-risk interventions such as emergency room traumas and surgical procedures.[5–7]

The process of neonatal resuscitation requires the medical team to make rapid medical decisions to effectively transition a newborn from fetal to neonatal life. The use of checklists in neonatal resuscitation therefore would seem logical. Our quality efforts to improve resuscitation had previously been based on video recordings where the video of the resuscitation was reviewed. This meeting is attended by staff, neonatal fellows, house staff, and representatives from nursing and respiratory therapy. We learned that despite our frequent thorough and organized reviews there remained a need to improve certain aspects of resuscitation, with an emphasis on communication and effective leadership. Our aim was to improve the communication and leadership seen on video recordings of actual neonatal resuscitations. We determined that

Abbreviations: DR, delivery room; PO, pulse oximeter; GA, gestational age; NRP, neonatal resuscitation practice; VLBW, very low birth weight.

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UCSD DR Resuscitation Checklist

Pre-Resuscitation Briefing

Leader _____
MD(s) _____
RN(s) _____
RT(s) _____

- ☐ Introductions/Roles
- ☐ Discuss Plan, communication expectations
  - Special considerations?"
  - Additional personnel/equipment?
  - **"If any team member sees any developing problem or concern, I want to have it brought to my attention as soon as possible."**
  - **Please call back all orders from Leader (e.g. "PIP is now 40")**

Pre-Resuscitation Checklist

Lead Resuscitator

- ❖ **Need urgent assistance, call x*****
- ☐ Ensure briefing completed and introductions done
- ☐ Ensure RT checklist done
- ☐ Ensure RN checklist done
- ☐ Check status with resident receiving infant

Respiratory Therapy

- Brings RT bag (bring surfactant for < 28 weeks)
- Sets up Neopuff (30/5 and FiO2 .21, flow 8-10), appropriate masks
- Pedicap
- Sets up hand bag, checked (black bag if expecting difficult resus.)
- Intubation equipment checked, appropriate sized tubes
- Suction set at 80-100 mmHg, catheters, meconium aspirator if needed
- Pulse ox on and probe out
- EtCO2 sensor
- Turn on video recorder

Nursing

- If crash C/section (call 2nd RN/MD) ensure line is set up, Epi drawn up.
- Barney bag
- Radiant warmer on MANUAL at 100%, probe and cover available, hat
- Stethescope
- Plastic wrap for < 28 weeks, Chemical mattress for <25 weeks
- ECG Leads

Debrief

Did we have all the information we need to admit this patient? Y/N
What did we do well? (Resident, Nurse, RT, Fellow, Attending in that order)
What can we improve upon? _____
Do we need follow-up on any items: _____

Fig. 1. Delivery room resuscitation checklist.