


The Multidisciplinary Approach to the Development of Clinical Practice Guidelines:

Piloting Management of the Patient Requiring Inhaled Nitric Oxide for Acute Pulmonary Hypertension in the Neonatal Intensive Care Unit

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Background

Clinical progress may result in variation in practice.

RDS

- Surfactant delivery thresholds, mechanism of delivery, premedication, comfort strategies during administration, family education

ELBW

- Age of viability, resuscitation, skin care, fluid management





PH

- Ventilation technology, hemodynamic management, approaches to sedation



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Rationale

- ☒ Clinical interest and no current guideline for inhaled nitric oxide used, variations in practice
-  Selective pulmonary vasodilator used to treat neonates with progressive hypoxic respiratory failure secondary to pulmonary hypertension (focus on acute PH)
-  Significant cost
-  Complications of inhaled nitric oxide therapy
-  If the patient is not responding to inhaled nitric oxide therapy, possible escalation to Extracorporeal Membrane Oxygenation (ECMO)


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Clinical practice guidelines (CPG)

Concisely communicate recommendations supported by evidence for clinicians to make informed decisions and reduce complications. Team and family communication can be improved by incorporating equity endorsing models of family integrated care in the development process of clinical practice guidelines.

By establishing an evidence supported, standardized method to clinical practice:

- Optimize safety and efficiency
- QI evaluation
- Standardized reevaluation intervals and improvements



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Specific Aims

- Use an evidence based, scientific process to develop and evaluate a clinical practice guideline for the NICU patient requiring inhaled nitric oxide for the management of acute pulmonary hypertension.
- Outline the steps necessary to create and implement evidence-based guidelines in the NICU with a family integrated and equity endorsing approach.

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Methods



The NICU at the Bernard and Millie Duker Children's Hospital at Albany Medical Center (AMC) is a Level IV Regional Perinatal Center

- over 30,000 births within the region, 300 neonatal air/ground transports, 800 admissions per year
- Identified stakeholders representing Neonatology, Pediatric Cardiology, and Pediatric Respiratory Therapy were invited to multidisciplinary NICU pulmonary hypertension team
- Albany Medical Center Institutional Review Board (IRB) online rapid determination exemption for a quality improvement project
- NICU pulmonary hypertension team reviewed evidence supported practices, clinical practice guidelines from clinical leaders including Brigham and Women's Hospital and Children's Hospital of Philadelphia and began to develop a clinical practice guideline with a health equity and family integrated approach. The team held bimonthly meetings in person with an online option to identify goals, share updates, review drafts, and provide feedback.
- Representatives of the NICU pulmonary hypertension team actively participate in the NICU QIT monthly meeting
- Shared with team members regarding the required quality elements, created family education for the practice guideline, held team meetings, and oversaw the clinical guideline development process.

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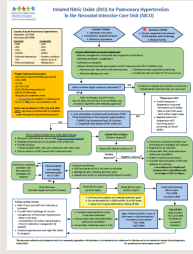
CPG 4th and final draft

Background information, inclusion and exclusion criteria

Target treatment parameters defined

Hyperlinks to vasoactive medication information and parent education

Post treatment follow up



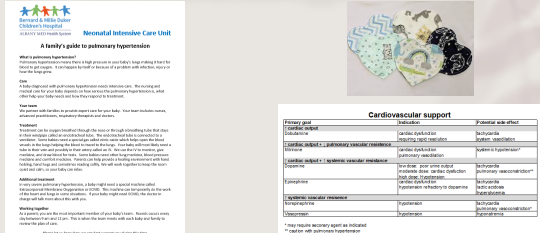
Initiation of treatment process refined

Positive and negative response defined

Titration process standardized

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Family education/PFAC and Cardiovascular support reference



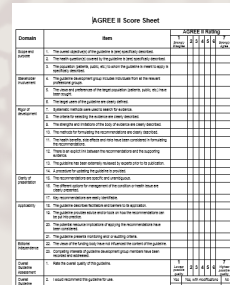
Family guide to pulmonary hypertension

Cardiovascular support

Intervention	Indication	Contraindication	Monitoring
Fluid restriction	Fluid overload	Dehydration	Weight, intake/output, electrolytes
Diuretics	Fluid overload	Dehydration	Weight, intake/output, electrolytes
Fluid restriction	Fluid overload	Dehydration	Weight, intake/output, electrolytes
Diuretics	Fluid overload	Dehydration	Weight, intake/output, electrolytes
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GRADE and AGREE II



Are there groups or settings that might be disadvantaged in relation to the problem or intervention of interest?

Are there plausible reasons for anticipating differences in the relative effectiveness of the intervention for disadvantaged groups or settings?

Are there different baseline conditions across groups or settings that affect the absolute impact of the intervention or the importance of the problem for disadvantaged groups or settings?

Are there important considerations that people implementing the intervention should consider to ensure that inequities are reduced, if possible, and that they are not increased?


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Results

Overall guideline assessment:

Rate the overall quality of this guideline 92%

I would recommend this guideline for use 100%



Grade Assessment

Are there important considerations that people implementing the intervention should consider to ensure that inequities are reduced, if possible, and that they are not increased?

Are there different baseline conditions across groups or settings that affect the absolute impact of the intervention or the importance of the problem for disadvantaged groups or settings?

Are there plausible reasons for anticipating differences in the relative effectiveness of the intervention for disadvantaged groups or settings?

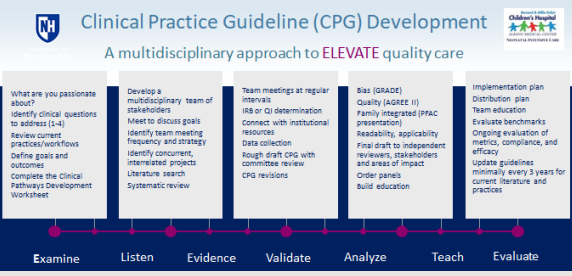
Are there groups or settings that might be disadvantaged in relation to the problem or intervention of interest?

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What clinical practice do you want to ELEVATE?

Clinical Practice Guideline (CPG) Development

A multidisciplinary approach to ELEVATE quality care



Examine **Listen** **Evidence** **Validate** **Analyze** **Teach** **Evaluate**

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Limitations, Conclusion and Future considerations

Limitations

- Project timeline associated with DNP program
- Low response rates

Conclusions

- CPG can enhance care delivery especially in the NICU
- Readability and applicability are necessary in creating a sustainable, quality guidelines
- AGREE II and GRADE are validated assessment tools
- ELEVATE method employs an evidence supported, standardized approach to create quality CPGs including assessment tools and a family integrated approach. Reviewing this process may benefit future projects.
- Process enhances team communication and collaboration

Future considerations

- Guideline evaluation with quality measures
- ELEVATE method validation
- CPG for postnatal cord blood analysis

CLINICAL REPORT Guidelines for the Clinician in Postnatal Pediatric Care

American Academy of Pediatrics

Postnatal Cord Blood Sampling: Clinical Report

David A. Linder, MD, MPH, Nancy M. Linder, MD, MPH, Nancy L. Linder, MD, MPH, and the Committee on the Fetus and Newborn

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AMC PFAC

The babies and families we serve

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My family: Carl, Maya, Abby, Tadhg, and Bridget

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References

1. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

2. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

3. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

4. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

5. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

6. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

7. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

8. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

9. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

10. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

11. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

12. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

13. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

14. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

15. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

16. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

17. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

18. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

19. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

20. American Academy of Pediatrics. (2017). *Guidelines for the Clinician in Postnatal Pediatric Care*. American Academy of Pediatrics, Committee on the Fetus and Newborn.

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