



**Loyola  
University  
Medical  
Center**

A Member of Trinity Health

# Admission Bloodwork from Umbilical Cord Segment: Striving to Make the First Hour Golden

*Anne Cunningham MSN, RNC-NIC, Lisa Festle, MSN, RNC-NIC, APRN/CNS, Roia Katebian, MD  
Loyola University Medical Center, Maywood, IL*



## Introduction

The Golden Hour presents challenges to the Neonatal ICU (NICU) healthcare team, particularly when obtaining bloodwork and administering dextrose and antibiotics within the first hour of life. Admission bloodwork can require up to 10% of the neonate's blood, especially in extremely low birth weight infants. The umbilical cord offers an abundant blood supply, but is an often underutilized source.

Multiple studies have demonstrated that blood drawn from an umbilical cord segment is equivalent to blood drawn directly from the neonate, with the exception of blood gases and POC glucose. Using umbilical cord blood from a cord segment can decrease time to draw blood cultures (i.e. waiting for line placement or obtaining peripheral sample) and administer antibiotics in a timely manner.

Additional benefits of obtaining admission bloodwork from an umbilical cord segment include:

- Decreased pain/procedures for the newborn
- Decreased blood loss for the neonate and the need for transfusion(s) and related complications (i.e. IVH)
- Decreased hypotension and vasopressor use

## Purpose/AIM

To improve IV antibiotic and dextrose administration times within the first hour of life by 20% by obtaining admission blood cultures and bloodwork from an umbilical cord segment.

## Population

### Inclusion Criteria

- All neonates in L&D expected to require NICU admission, or if a prenatal diagnosis will require NICU admission

### Exclusion Criteria

- Neonates  $\geq$  35 wks GA with unplanned NICU admission (i.e. delayed transitioning, etc.)
- Any neonates with a short umbilical cord
- Umbilical cord gases by OB Team is always PRIORITY

## Team Members

- NICU Physicians & Nurses
- Obstetric (OB) Physician & Nurse Partners
- Pharmacy
- NICU Service Coordinators

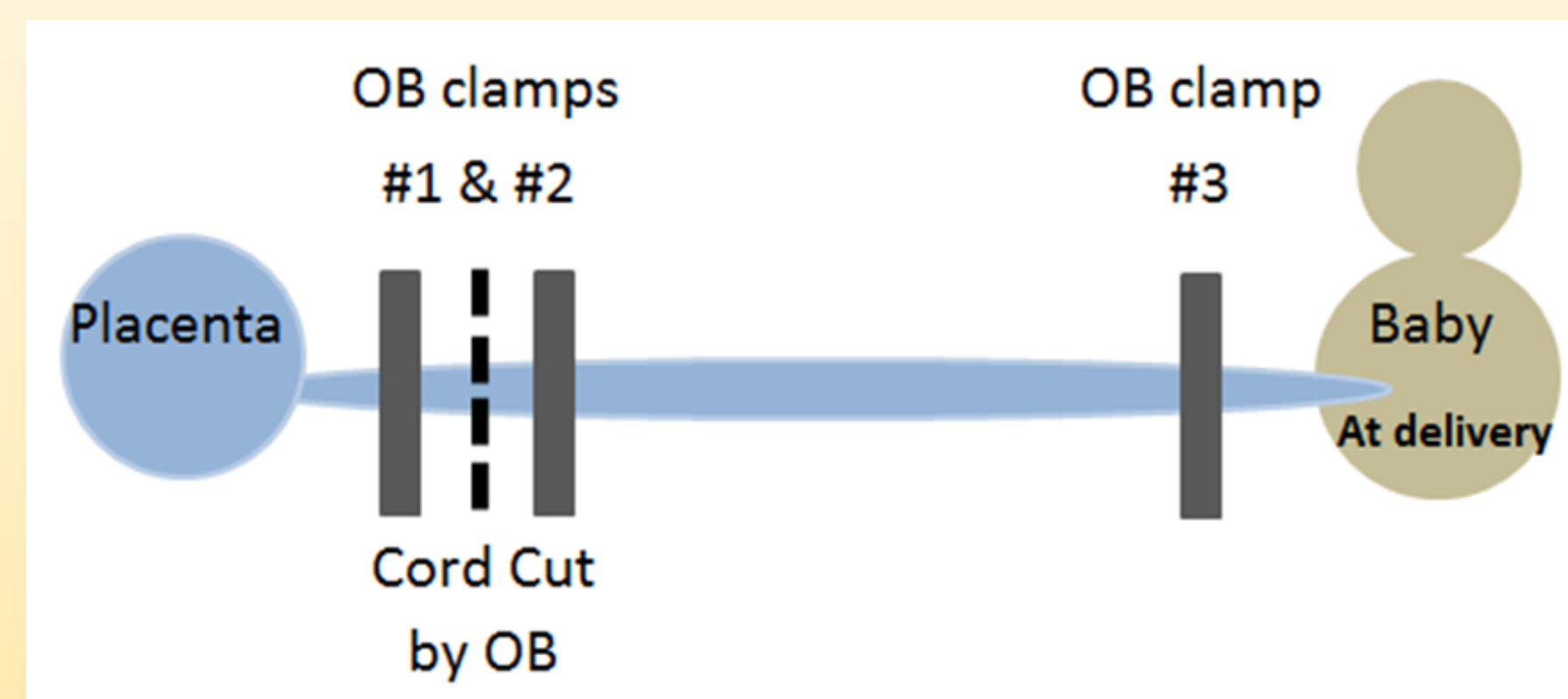
## Methods

### Implementation

- Education for all NICU and OB physicians and nurses
  - live in-services, grand rounds, literature and new protocol review, slide show, and video
- Fellows/Nurses remind OB Team during huddle and/or prior to delivery to give NICU Team a long cord

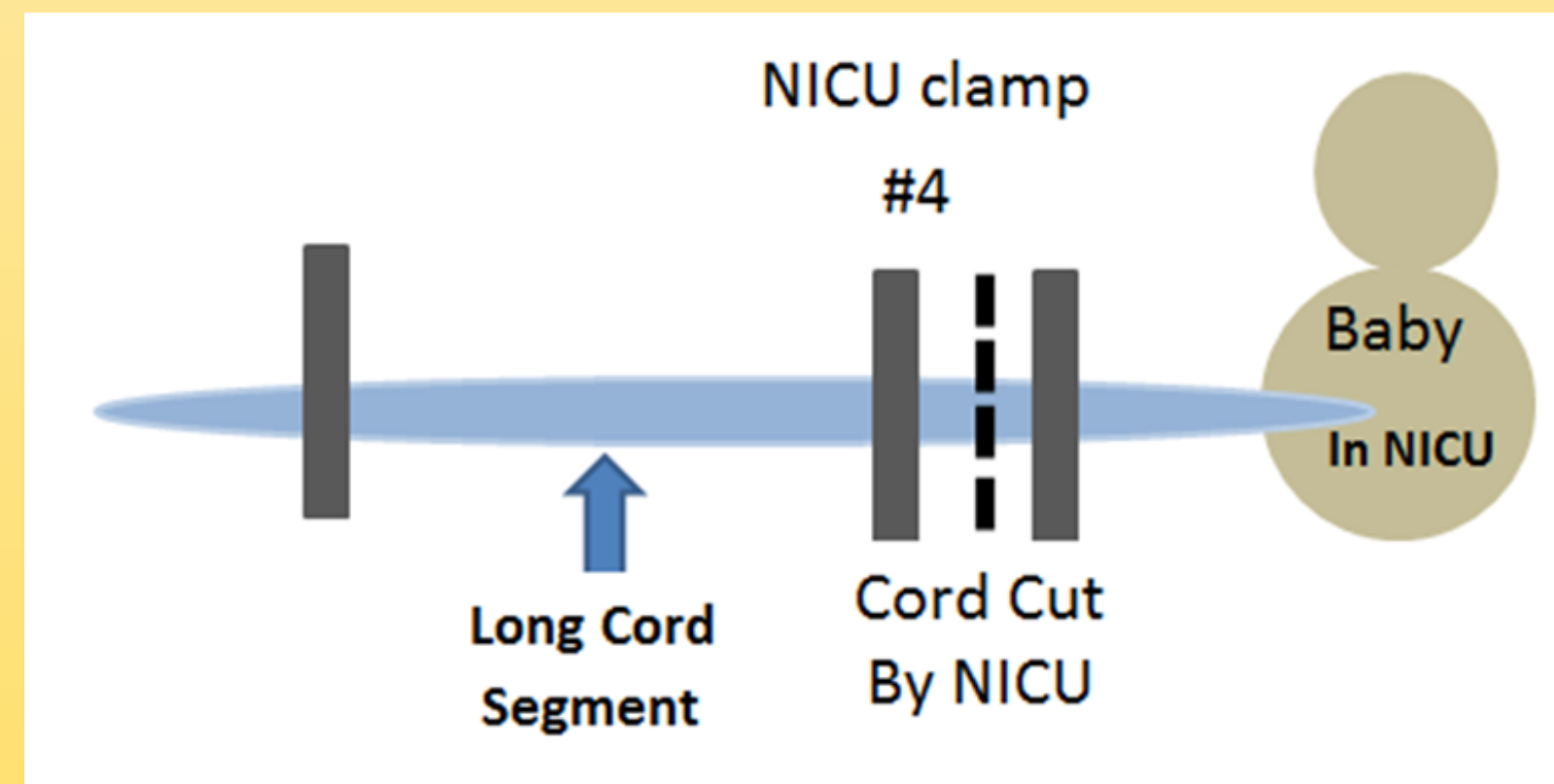
### Upon Delivery

- OB places 3 clamps; length of cord should be 15 to 20 cm
- Delayed cord clamping can still be done



### NICU Admission

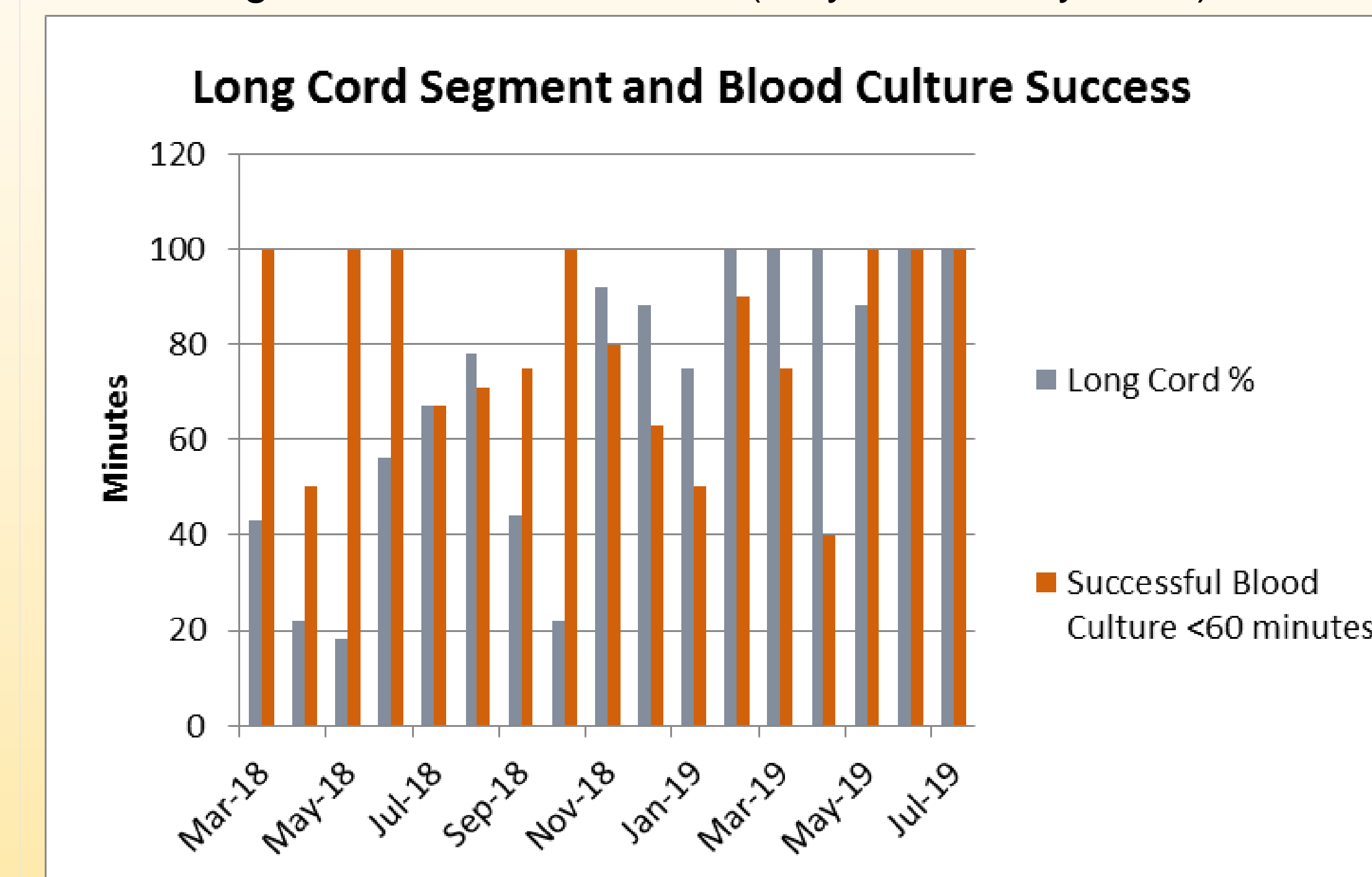
- Check neonate's temperature and weigh infant
- Provide respiratory support as needed
- Apply another cord clamp in proximity to the clamp nearest the umbilicus and cut cord segment with scalpel



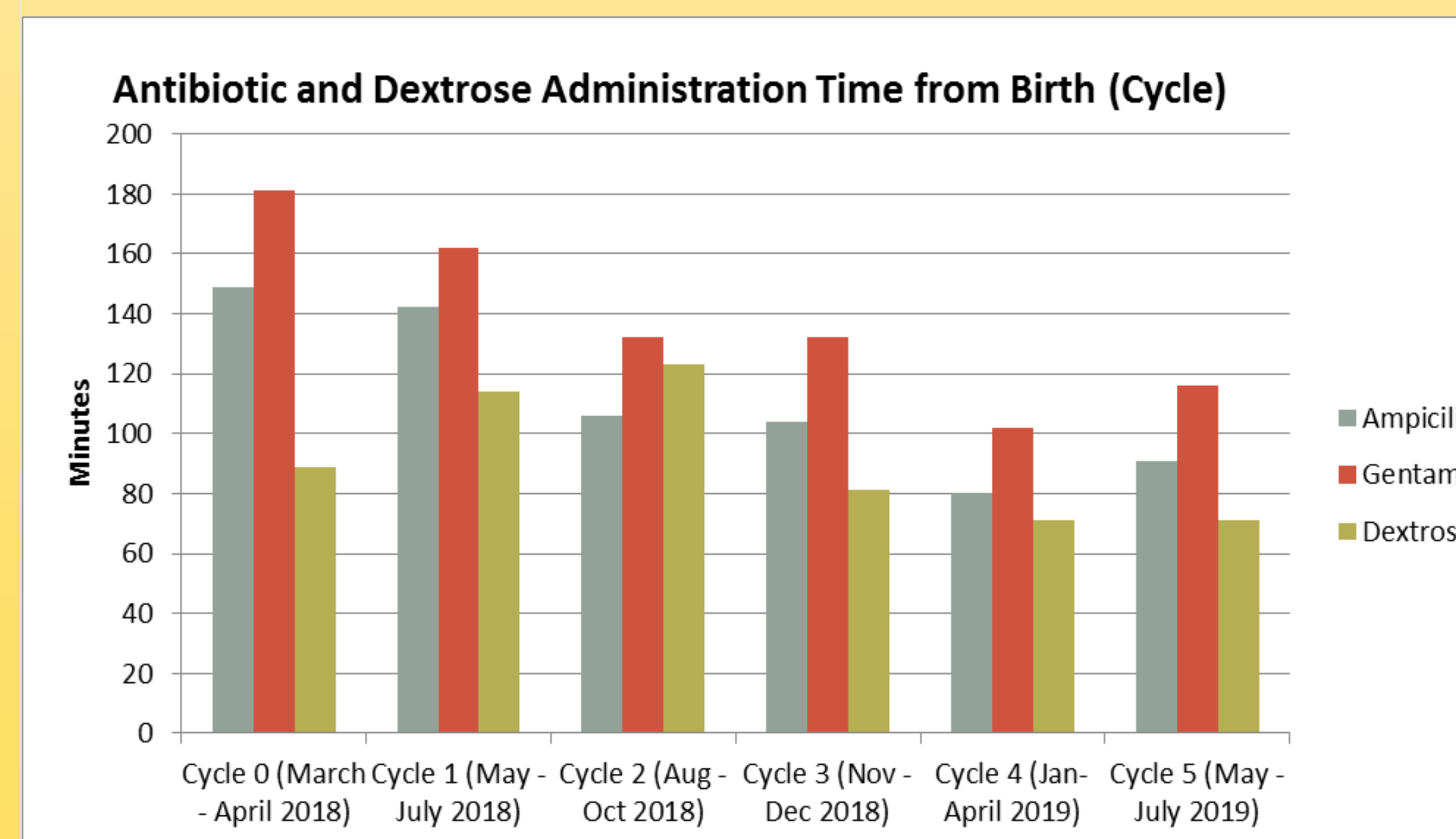
- MD/NNP utilizes STAT dextrose and drug ordering panel
- Start peripheral IV and dextrose infusion
- Obtain admission bloodwork from umbilical cord segment; pre-made kits with all supplies made by Service Coordinators
- Blood should be drawn within 15 - 20 minutes from admission
  - **PRIORITY** is always blood culture and type and screen

## Results

- Success at obtaining a long umbilical cord segment increased from 43% (March 2018) to 100% (July 2019).
- Success at obtaining BCs < 60 minutes of life from the long cord segment have been 100% (May, June, July 2019).



- Cycle 4 (Jan – April 2019): fastest antibiotic and dextrose administration times
- Cycle 5 (May – July 2019): slightly longer antibiotic administration times; specifically in June & July



## Barriers & Solutions

- Physician & nursing disciplines and two departments must collaborate for this practice to be successful; As an academic center with new residents/staff rotation, education must be on-going and reminders given at team huddles/prior to deliveries.
- Feedback from nurses and residents indicated lack of urgency in placing orders/confusion with electronic orders; Infants can now be pre-admitted and orders placed, and STAT Order Panel for ampicillin, gentamicin, and dextrose was created
- Delay in starting antibiotics resulted in STAT doses of ampicillin and gentamicin sent by Pharmacy to NICU ahead of other admission orders, when possible; in addition, to expedite initial doses of antibiotics, ampicillin administration time on pump changed to infuse over 10 minutes (instead of 15)
- Golden Hour Admission Data Collection sheets did not include time PIV was placed; Time PIV started was added.
- Different times recorded on data collection sheets and in EMR for PIV start time; Data shared and education given on importance of consistency.

## Implications

Utilizing an umbilical cord segment for admission bloodwork increases the number blood cultures drawn within one hour of life and antibiotics can be given sooner; the infant is not exposed to painful procedures (i.e. venipuncture/arterial sticks).

## References

- Baer VL, Lambert DK, Carroll PD, Gerday E, Christensen RD. (2013). Using umbilical cord blood for the initial blood tests of VLBW neonates results in higher hemoglobin and fewer RBC transfusions. J Perinatol, 33(5), 363–5.
  - Carroll PD, Nankervis CA, Iams J, Kelleher K. (2012). Umbilical cord blood as a replacement source for admission complete blood count in premature infants. J Perinatol. 32(2), 97–102.
  - Polin JI, Knox I, Baumgart S, Campman E, Mennuti MT, Polin RA. (1981). Use of umbilical cord blood culture for detection of neonatal bacteremia. Obstet Gynecol, 57(2), 233–7.
  - Video:<http://origin-qps.onstreammedia.com/origin/sheridan/WomenChildrenServices/HHWC%20Cord%20Milking%20Video%20FINAL.wmv>
- Additional references available upon request.

## Acknowledgements

We would like to thank Larry Bennett, MD, Neonatologist; Sachin Amin, MD, Director of Neonatology; Pele Dina MD, former Fellow; Pamela Nicoski, Pharm D; Barbara Hering, CNS (retired); the NICU Nursing Staff and Physicians, and the OB team for working to make this new practice a success.

## Author Contact Information

[acunnin@lumc.edu](mailto:acunnin@lumc.edu); [lfestle@lumc.edu](mailto:lfestle@lumc.edu); [Roia.Katebian@lumc.edu](mailto:Roia.Katebian@lumc.edu)