



DECREASING NEONATAL JAUNDICE READMISSION RATES THROUGH IMPLEMENTATION OF A JAUNDICE MANAGEMENT GUIDE

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1. BACKGROUND

- Baylor Scott and White Medical Center at Waxahachie (BSWMCW), a level 1 neonatal designated facility, delivers an approximately 1000 newborns annually. The BSWMCW neonatal jaundice readmission rate was noted to be rising over time from 1.7% in FY2017 to 2.6% in FY 2018.
- Neonatal jaundice readmissions have several effects on families and the neonate related to increased costs, stress on bonding, and increased risk for hospital acquired infections.
- Between July 1, 2017 and June 30, 2018, the neonatal jaundice readmission rate at BSWMCW was 2.6%. Based off literature review, this was above the average rate for hospitals with similar populations (0.5% - 2.0%).

2. PROBLEM

- By June 30, 2019, BSWMCW will reduce the rolling neonatal jaundice readmission rate from 2.6% (July 1, 2017-June 30, 2018) to less than 1% (July 1, 2018 – June 30, 2019).

3. UNDERSTANDING THE PROBLEM

- A multidisciplinary Quality Assurance and Process Improvement (QAPI) committee met to identify why excessive neonatal jaundice readmissions occurred. Issues identified were inconsistent practices in starting and stopping phototherapy, timing of discharge, and timing of newborn follow up in infants with jaundice. The team prioritized management of jaundice through recognizing plan of care modifications during the initial hospitalization which would impact newborn readmission rates.

3. UNDERSTANDING THE PROBLEM

Brainstormed Issues	< Why It Happens	< Why It Happens	<Why It Happens
Neonatal Jaundice Readmission	<Inadequate Breastfeeding	<Excessive weight loss not identified	<Infant weighed nightly versus hours of age
		<Mothers and nursing staff resistant to formula supplementation	<Concerned will adversely affect breastfeeding
Neonatal Jaundice Readmission	<Inconsistent Jaundice management practices	<Timing of discharge	<Variable baseline practices of Neonatal Nurse Practitioners rotating to facility due to lack of standardized published guidelines
		<Timing of start/stop of phototherapy treatment	<Different analytic instruments
		<Timing of newborn follow up post discharge	<Testing less accurate for severe jaundice
		<Inconsistent lab values between different facilities	

4. IMPLEMENTED CHANGE

After reviewing the root causes, the team implemented several changes over a 5-month period.

- Intervention #1 – Implemented Jaundice Management Guide**
 - Created clear guidelines on when to start or stop phototherapy including discharge criteria. (08/01/2018)
- Intervention #2 – New Supplementation Guidelines**
 - Implementation of new supplementation guidelines. Donor milk offered as alternative to formula supplementation. All supplementation based off of calculated neonate weight loss, with weight loss $\geq 7\%$ from birth weight at 24 hours of life being the standardized threshold for supplementation. (11/1/2018)

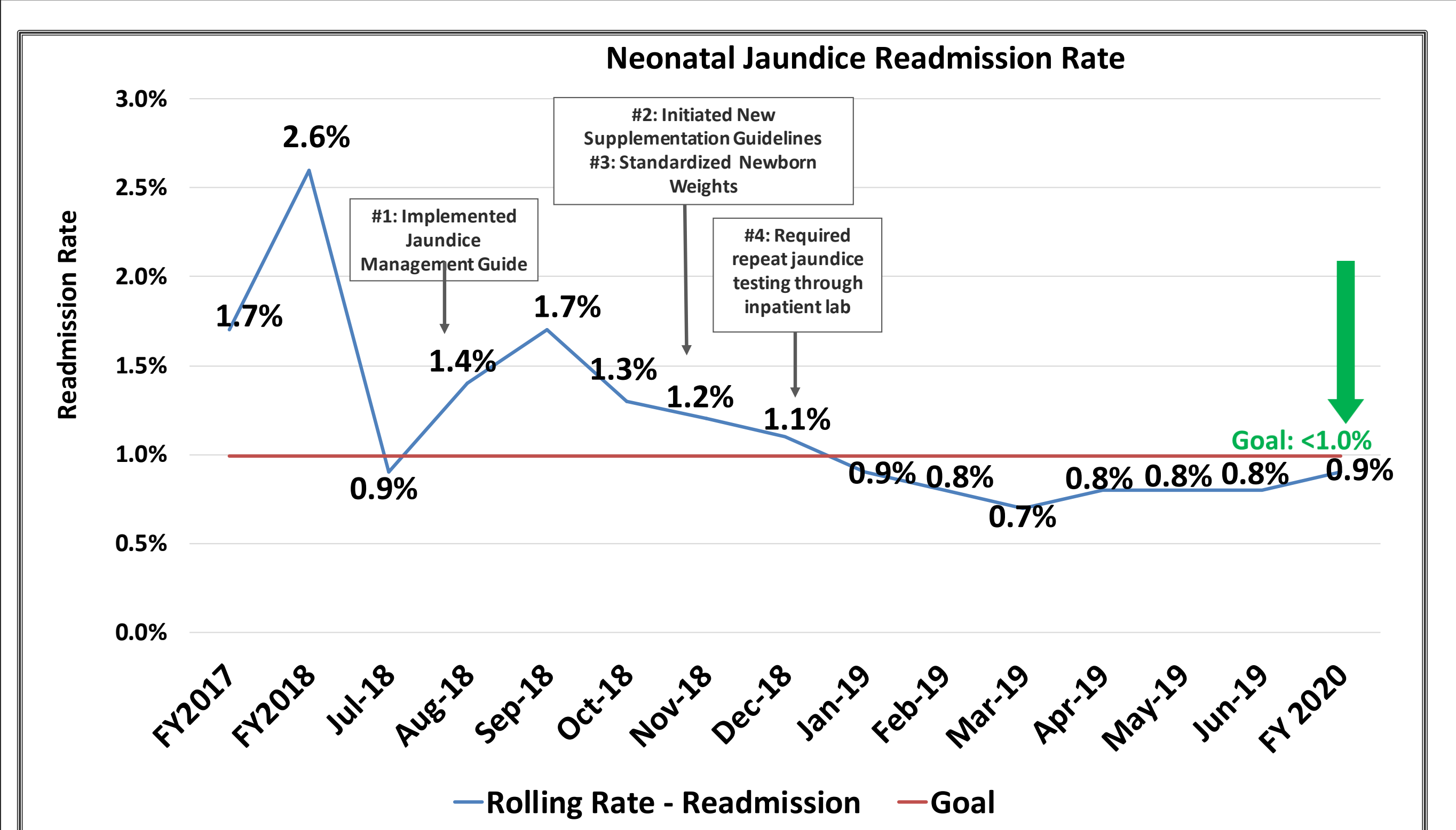
The QAPI team discovered the current process of weighing newborns nightly did not correspond with the new supplementation guidelines based on hours of life.

- Intervention #3 – Standardized Newborn Weights**
 - Standardized newborn weight at 24 hours of life to adhere to supplementation guidelines (11/1/2018)
- Intervention #4 – Repeat Jaundice Lab Testing**
 - Required jaundice testing through BSWMCW inpatient lab prior to admission rather than accepting lab values from other facilities which were often found to be different. (12/01/2018)

4. IMPLEMENTED CHANGE

JAUNDICE MANAGEMENT GUIDE	
Indications to Start Phototherapy for Inpatients	
1. Serum Bilirubin \geq treatment threshold based on hours of life, risk factors and Gestational Age at birth	
2. Consider phototherapy with serum bilirubin below treatment threshold IF infant otherwise expected to go home in the next 12hrs AND one of the following criteria are met: <ul style="list-style-type: none"> o Serum bilirubin $< 1\text{mg/dl}$ below treatment threshold and infant with no risk factors on Bhutani phototherapy nomogram (i.e. $\geq 38\text{wks}$, DAT negative) o Serum bilirubin $< 2\text{mg/dl}$ below treatment threshold and infant is medium- or high-risk based on Bhutani phototherapy nomogram (i.e. $< 38\text{wks}$ and/or DAT+) o Serum bilirubin $< 2\text{mg/dl}$ below treatment threshold AND bilirubin rate of rise $> 0.2\text{mg/dl/hr}$ 	
How to Provide Phototherapy	
Bilirubin Level	Treatment
Below treatment threshold	o Bilirubin blanket
At threshold	o Bilirubin blanket +/- overhead light, depending on rate of rise, risk factors, target day of discharge, etc.
Above treatment threshold	o Bilirubin blanket and at least one overhead light
Bilirubin within 3-4mg/dl of threshold for exchange transfusion	o Bilirubin blanket and at least two overhead lights
Bilirubin ≥ 3 of treatment	o 3 total lights needed (i.e. blanket and double bank overhead) and/or infant needing IV and/or any concerns for poor parental compliance with treatment: treatment should occur physically in intermediate care nursery
*Outpatient phototherapy can be considered ONLY if no risk factors are present (i.e. full term, no ABO set-up, etc.), feeding is going well and family is reliable with good access to care	
Stopping Phototherapy	
Estimated Gestational Age ≥ 38 weeks at birth	o Serum bilirubin $\geq 2\text{mg/dl}$ below treatment threshold for current hours of life
Estimated Gestational Age < 38 weeks at birth	o Serum bilirubin $\geq 4\text{mg/dl}$ below treatment threshold for current hours of life
Schedule follow-up within 24hrs if bilirubin is high intermediate risk and continuing to rise and/or if infant has persistent feeding difficulties (i.e. excessive weight loss, not latching well, etc.) associated with jaundice; otherwise follow-up should be scheduled within 48 hours.	
Determining Readiness for Discharge	
1. Recheck serum bilirubin 6-8hrs after stopping phototherapy	
o Bilirubin should rebound $< 2\text{mg/dl}$ from previous bilirubin and remain at least 3mg/dl below treatment threshold for current hours of life	
2. Consider holding discharge and/or starting phototherapy if: <ul style="list-style-type: none"> o Bilirubin is high risk OR o Bilirubin is high intermediate risk with rate of rise $> 0.2\text{mg/dl/hr}$, particularly if infant is medium or high risk on Bhutani curve. 	
Indications to Supplement Breastfeeding Infants with High Intermediate or High Risk Bilirubin	
One or more of the following: <ul style="list-style-type: none"> o weight loss $> 7\%$ for age on NEWT calculator (newbornweight.org) and/or $\geq 7\%$ at 24h o poor skin turgor, dry mucous membranes, sunken fontanelle or other clinical signs of dehydration o decreased output (fewer voids/stools than number of days old) o hypernatremia (Na > 145) o hypoglycemia (BS < 50) 	

5. RESULTS



- Overall, the percentage of neonatal jaundice readmissions for BSWMCW decreased from 2.6% to 0.8% in FY 2019 (July 1, 2018 – June 30, 2019), meeting the goal of less than 1%. This goal was met after 6 months then sustained for the rest of the fiscal year 2019.

6. LESSONS LEARNED

- Changing timing of neonatal weights has improved neonatal care, even for those without jaundice, as well as increased nursing and provider satisfaction.