

# Reduction in Unplanned Extubations through Education and Team Based Intervention In the NICU

## **Unplanned Extubation Prevention**

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Unified Quality Improvement  
Symposium

March 31, 2017

# Background / Introduction

- The unplanned extubation (UE) rate is an important quality indicator. A benchmark UE of 0.1 to 2.6 per 100 device days is documented in the literature.
- UE may lead to significant cardiovascular or respiratory compromise.
- The population affected: all intubated infants in the NICU
- VMC NICU ventilator days in fiscal year 2012 averaged over 200 ventilator days per month. In 2012, VMC rate of UE was more than 2 times the benchmark VMC had set of  $<1/100$  device days.

# Collaborative Team Members

- Sharon Buckwald, physician
- Martha Naylor, physician
- Ryan Moore, physician
- Jason Higginson, physician
- Debora Williams, data analyst/respiratory
- Rhonda Creech, RN, NICU Nurse Manager
- Neva Pyles-Peaden, RRT
- April Russell, RRT
- Jennie Martin, RN

Team Key Contact Info: Martha Naylor, 744-4670  
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# AIM Statement

A quality improvement project was undertaken in February 2012 to decrease unplanned extubations in our NICU with a goal to be below the national benchmark of 1/100 device days.

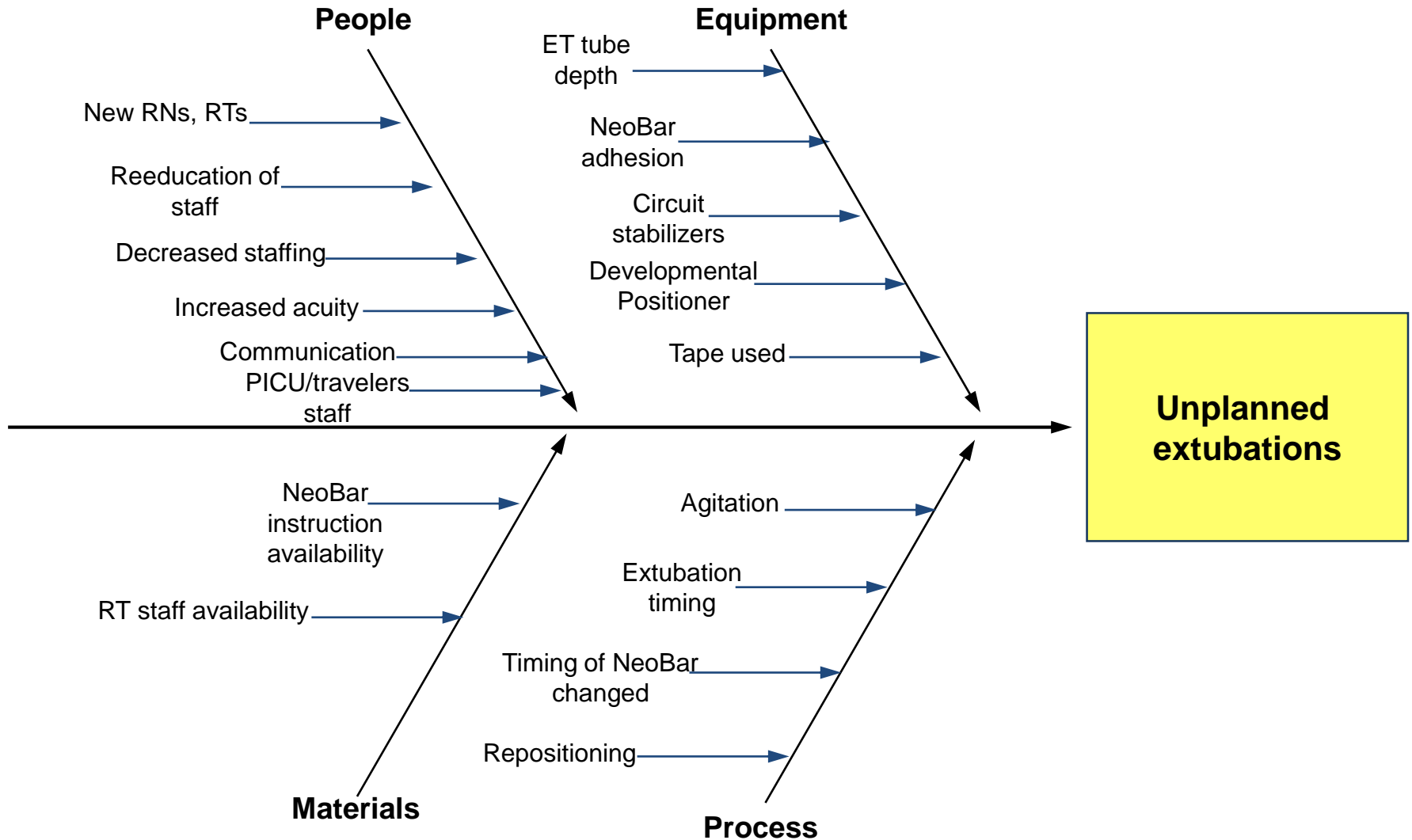
# Measures

- Unplanned extubations per device day
- NICU device days
- NICU rate per 100 device days
- Number of reintubations after unplanned extubations
- Number of planned extubations
- Number of reintubations after planned extubations

# Baseline Data

<b>NICU Respiratory Data</b>	<b>Fiscal year 2012</b>
Intubations	344
Unplanned Extubations	70
# UE reintubated within 48 hours	42
UE Rate	2.83
Planned Extubations	351
# of planned extubations reintubated within 48 hours	42
Reintubation rate	20.98

# Causes of Unplanned Extubations

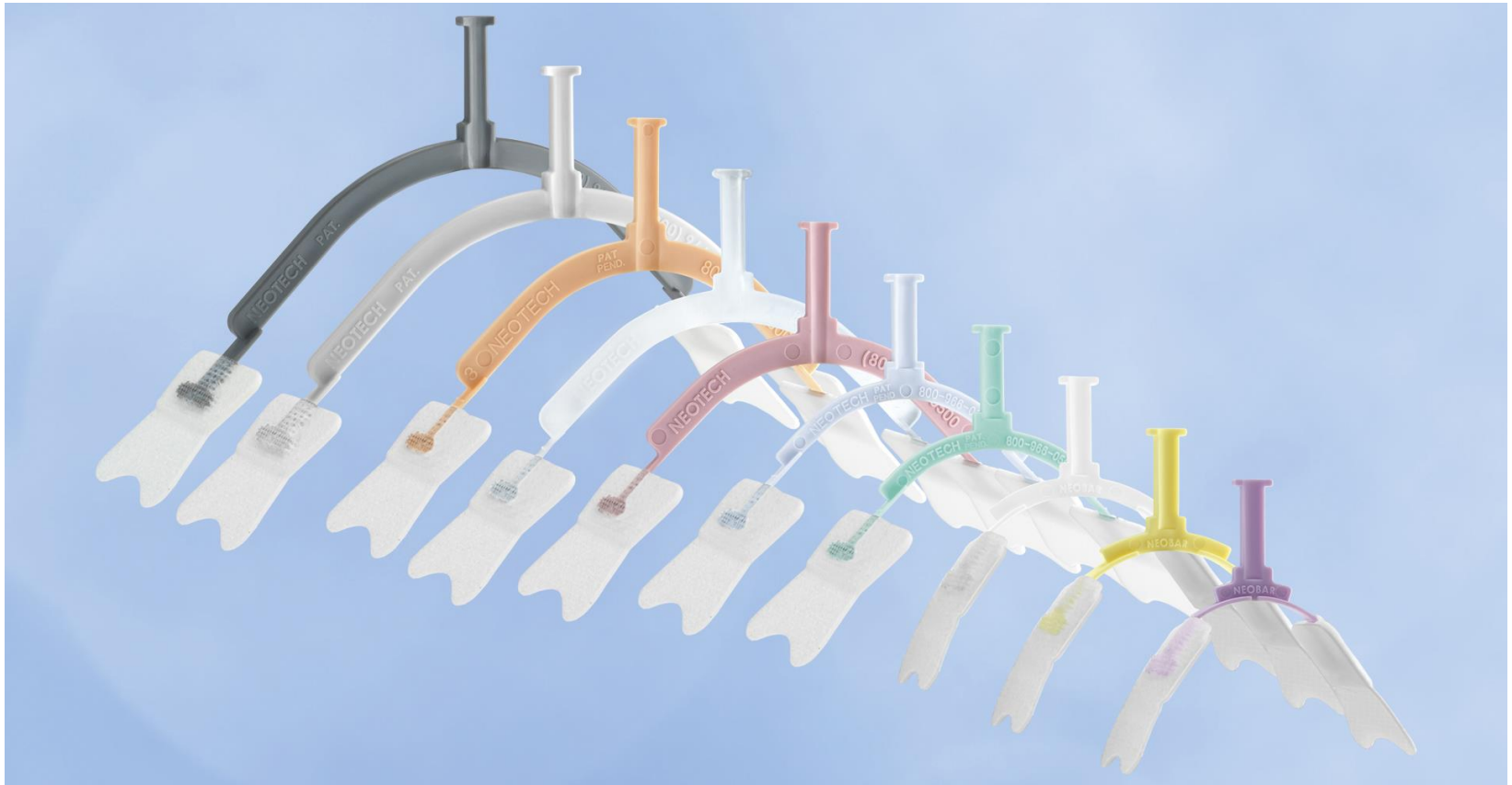


# Improvement Strategies Employed

- Staff re-education on NeoBar®
- ET tube/NeoBar® rounds
- White board updated
- Implementing 2 staff members to reposition intubated patients
- More frequent x-rays
- Creation of a database for UE
- 2<sup>nd</sup> in-service on NeoBar®
- Monitoring ET tube position in growing ELBW's
- Determining proper tape to use on ET tubes
- Re-education on developmental positioners



# NeoBar®



## NICU Unplanned Extubation Rate FY 2011-2016 (FYTD 2017)

\* Goal = < 1 UE / per 100 device days

**FYTD 2016 UE Rate  
1.57**

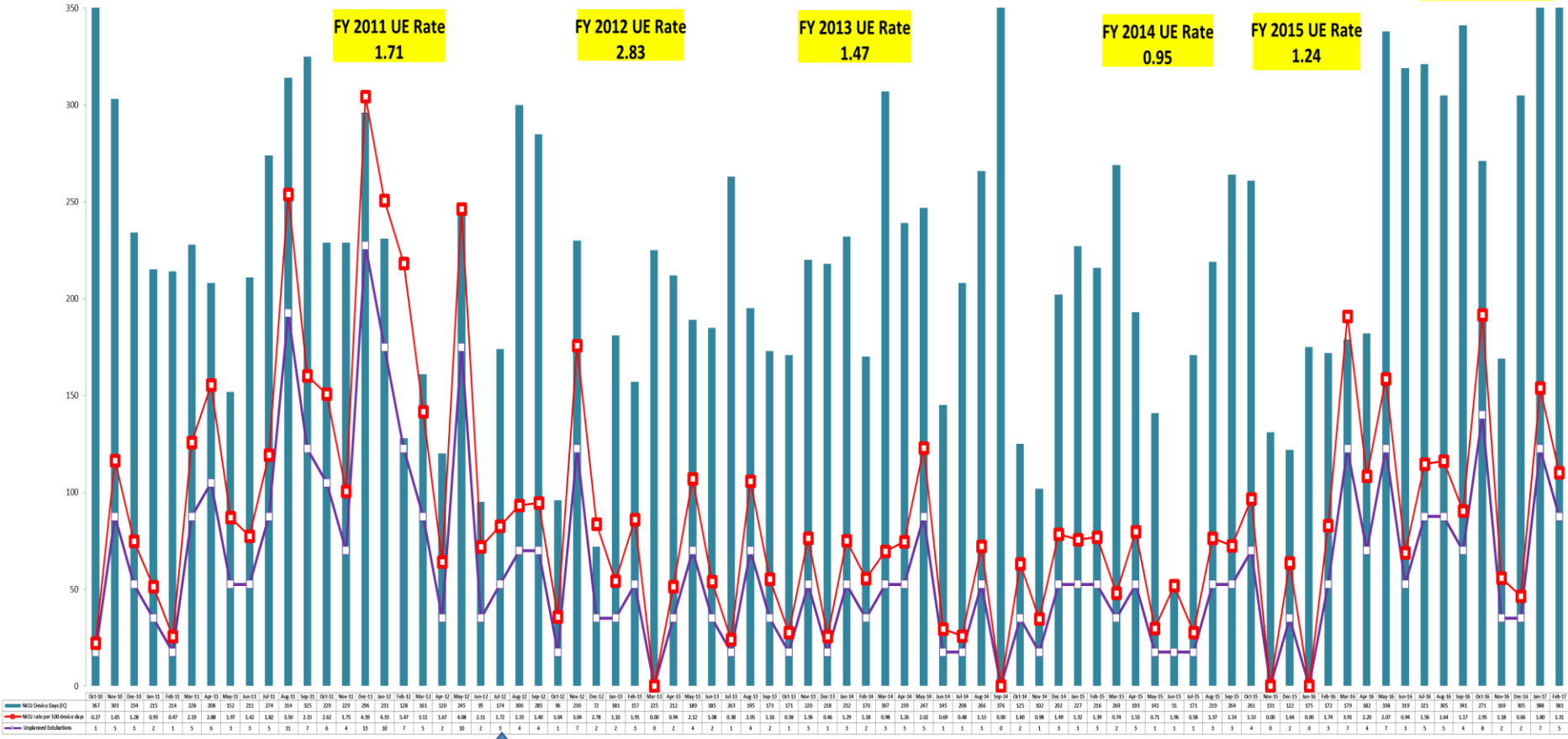
**FY 2011 UE Rate  
1.71**

**FY 2012 UE Rate  
2.83**

**FY 2013 UE Rate  
1.47**

**FY 2014 UE Rate  
0.95**

**FY 2015 UE Rate  
1.24**



↑  
new staff  
July 1

↑  
new staff  
July 1

↑  
new staff  
July 1

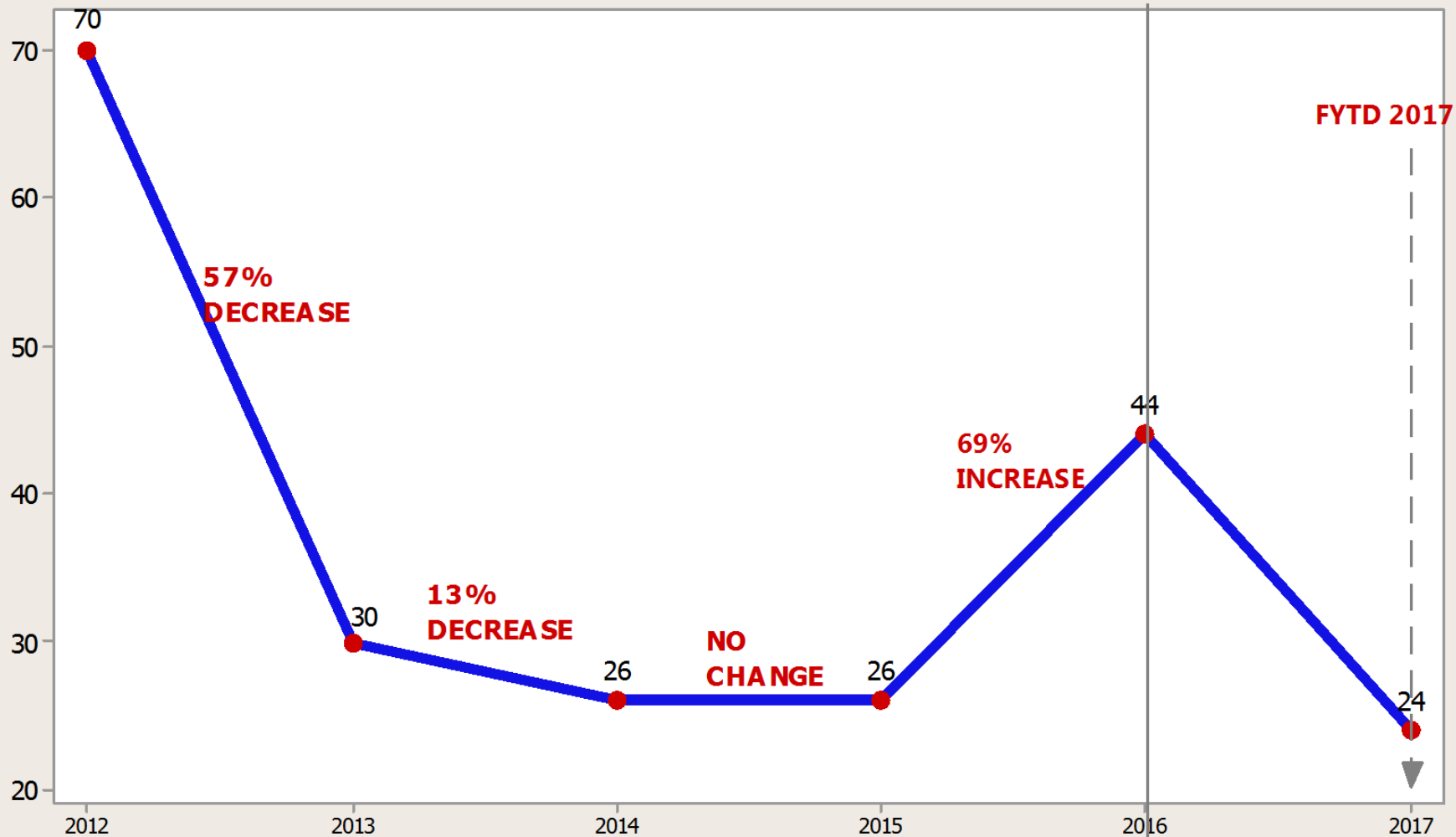
↑  
new staff  
July 1

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new staff  
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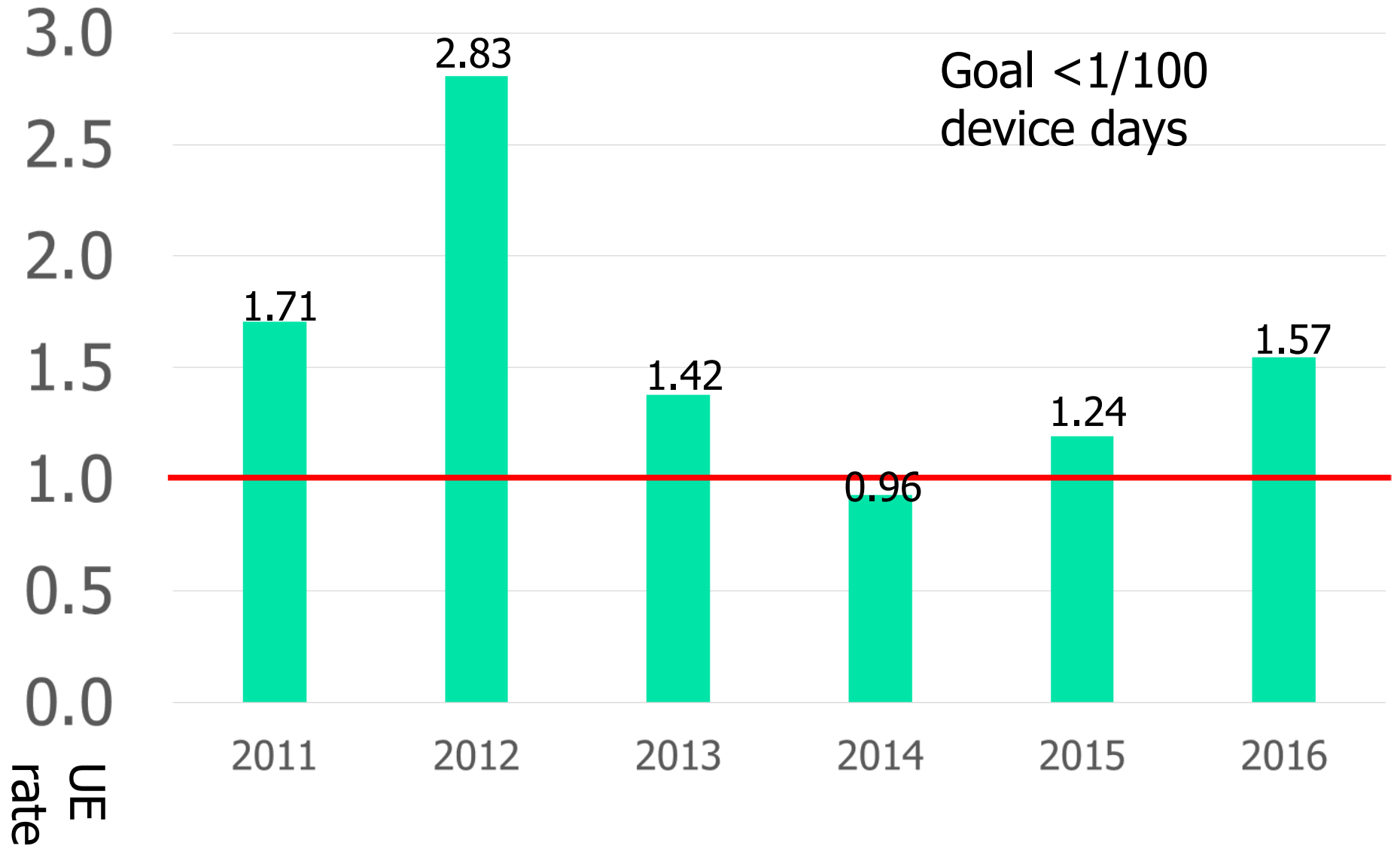
■ NICU Device Days (IC)
 —■ Unplanned Extubations
 —■ NICU rate per 100 device days

# NICU UNPLANNED EXTUBATIONS

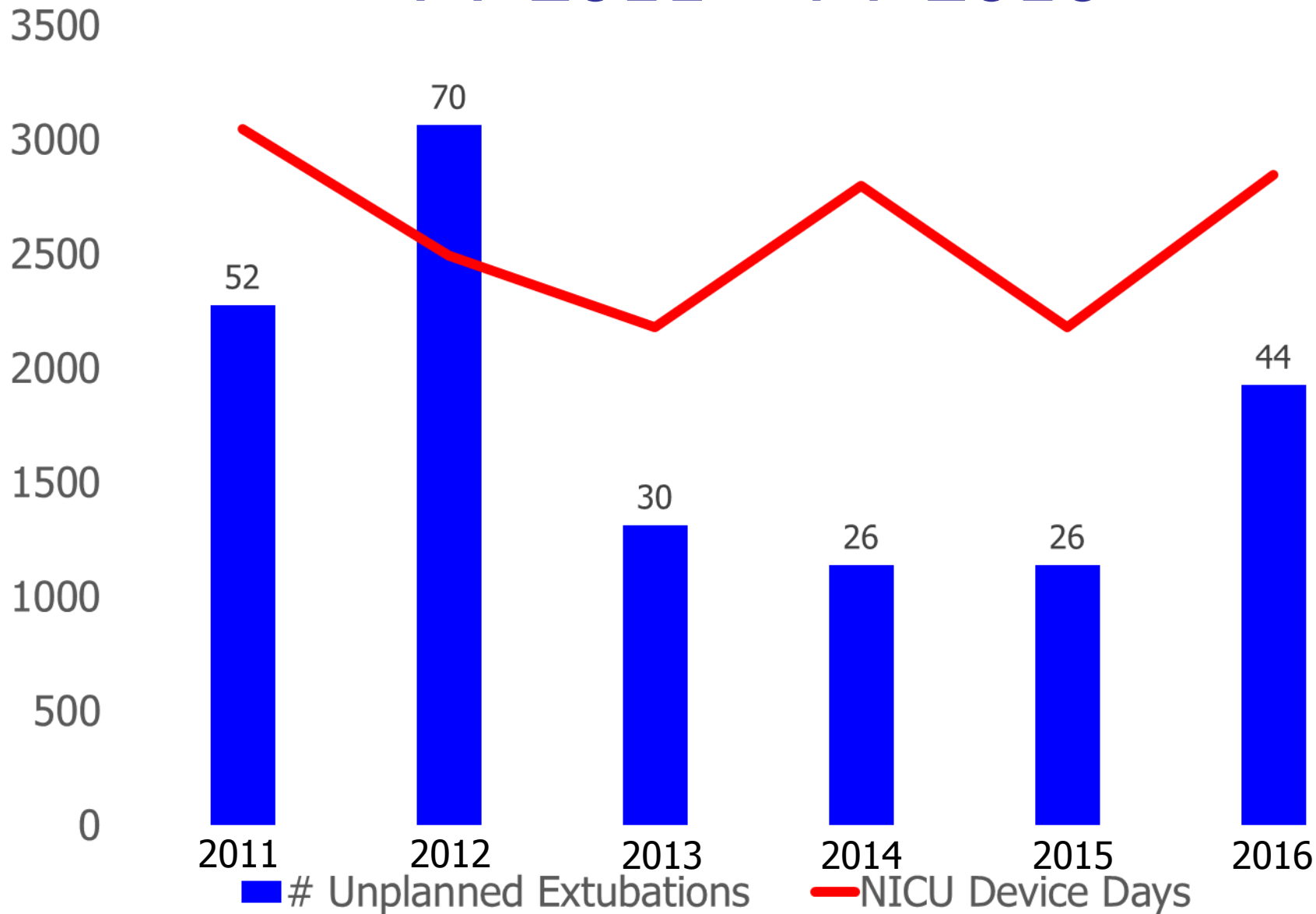
## FY 2012 - FYTD 2017



# NICU Unplanned Extubation Rates FY 2011 – FY 2016



# NICU Ventilator Device Days FY 2011 – FY 2016



# Challenges Encountered in QI Process

- New staff (RNs and RTs)
  - Ongoing education
- Tape discontinued
  - Discussion with other NICUs to determine what tape to try
- Increase in number of unplanned extubation
  - Determine reasons and possible solutions
  - Respiratory manager met with PICU/NICU Medical Directors

# Lessons Learned Through QI Efforts

- Ongoing education
- Continued analysis/discussion
- Input from all disciplines
- Team meetings

# Next Steps

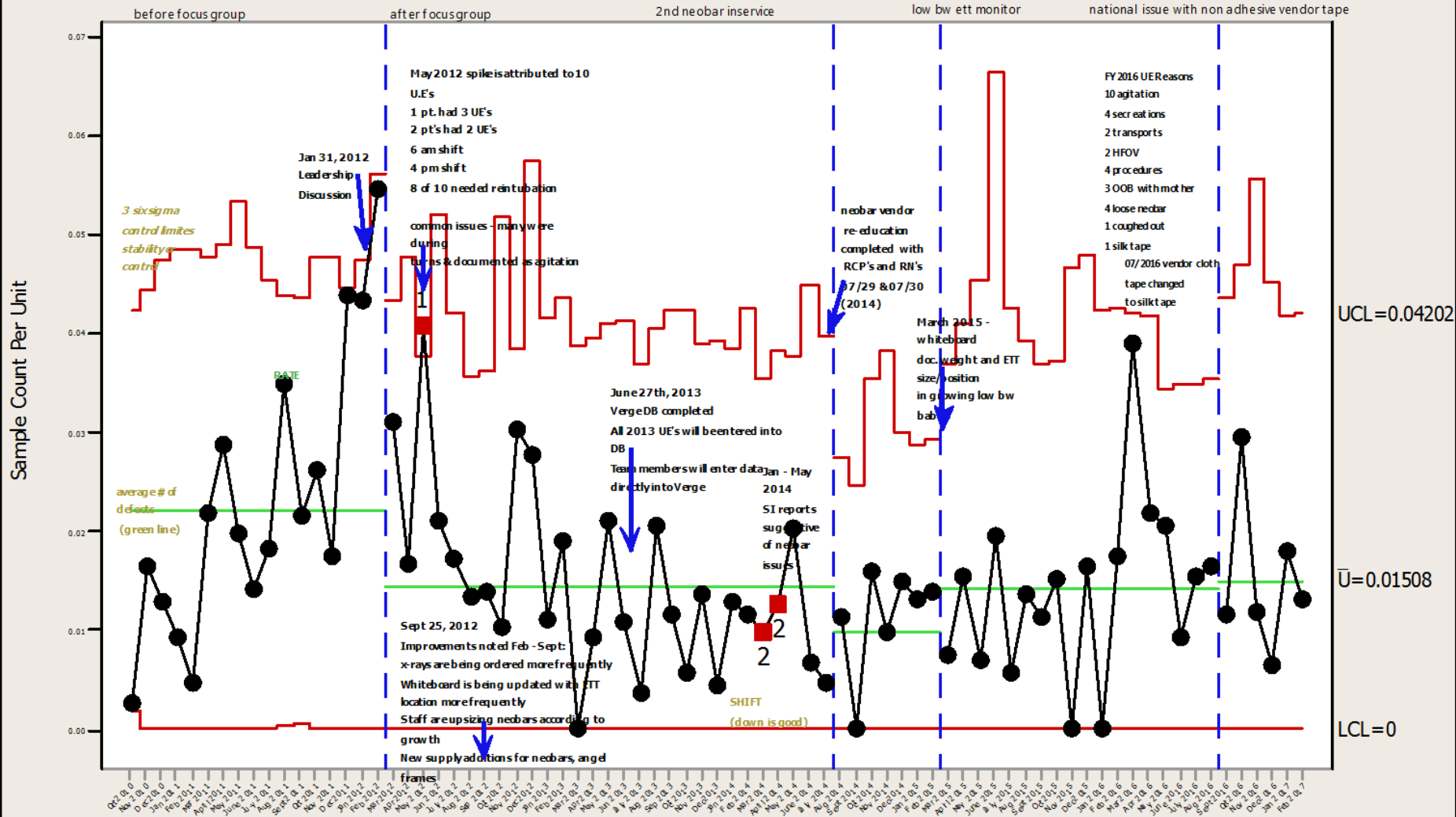
- Continued ongoing education for re-positioning/procedures with RNs and RTs
- All unplanned extubations must be reported to Respiratory Shift supervisor
- Include in database if infant secured in ROO positioner
- Consider new ET tube fixation devices
- Consider weekly chest x-ray for ET tube position



# Acknowledgements

- Debora Williams
- NICU Nursing
- Respiratory Therapists
- TQA mentors

# U Chart of VMC NICU UnpExt Rate FY 2011 - FYTD 2017



**FIG 1**  
Tests are performed with unequal sample sizes.

Nov '12 RN/RP's reminded to use neobars in the delivery room instead of pink tape  
Make sure angel frames are available to RCP's for use.

Staffing levels:  
Nurse/Patient ratio 1/2 in ICU