Increasing Pulmonary Hypertension Screening via Echocardiography in Neonates with Bronchopulmonary Dysplasia in the NICU

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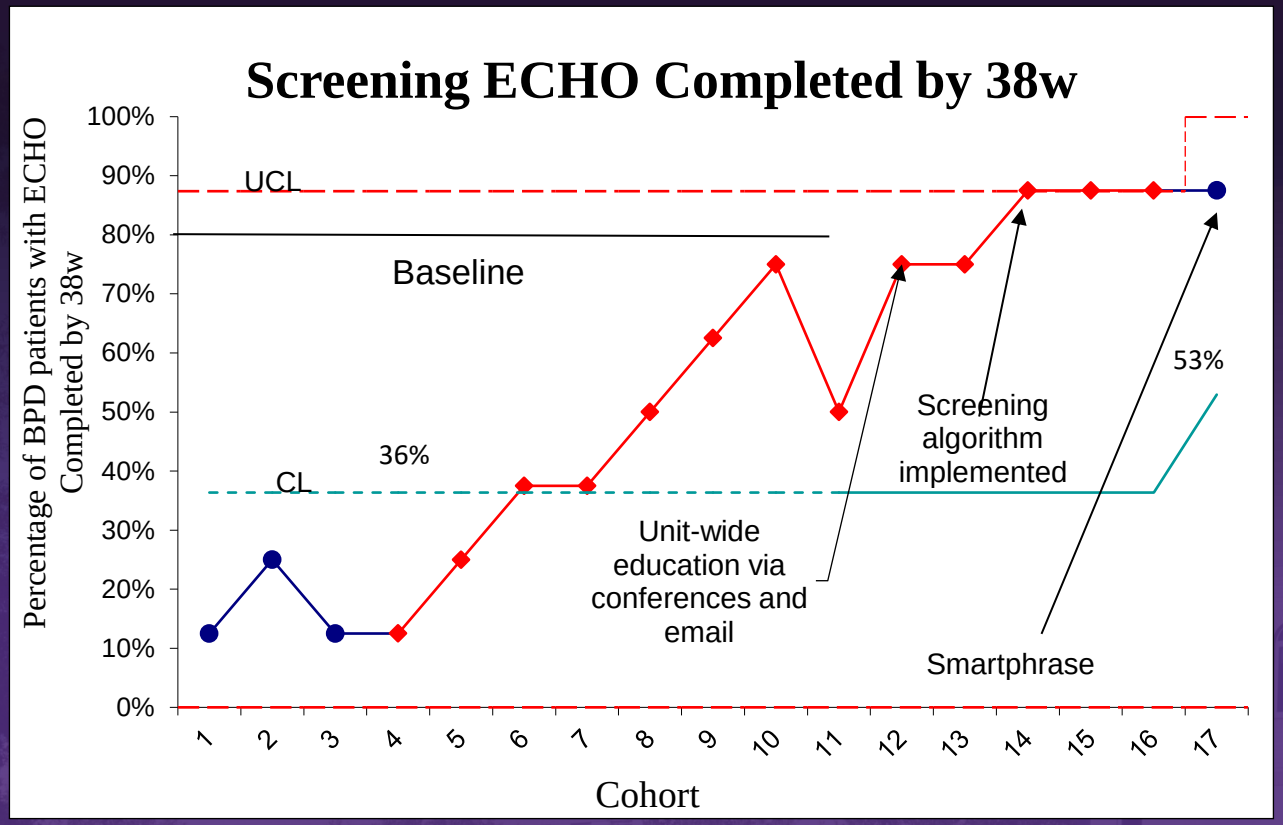
Introduction

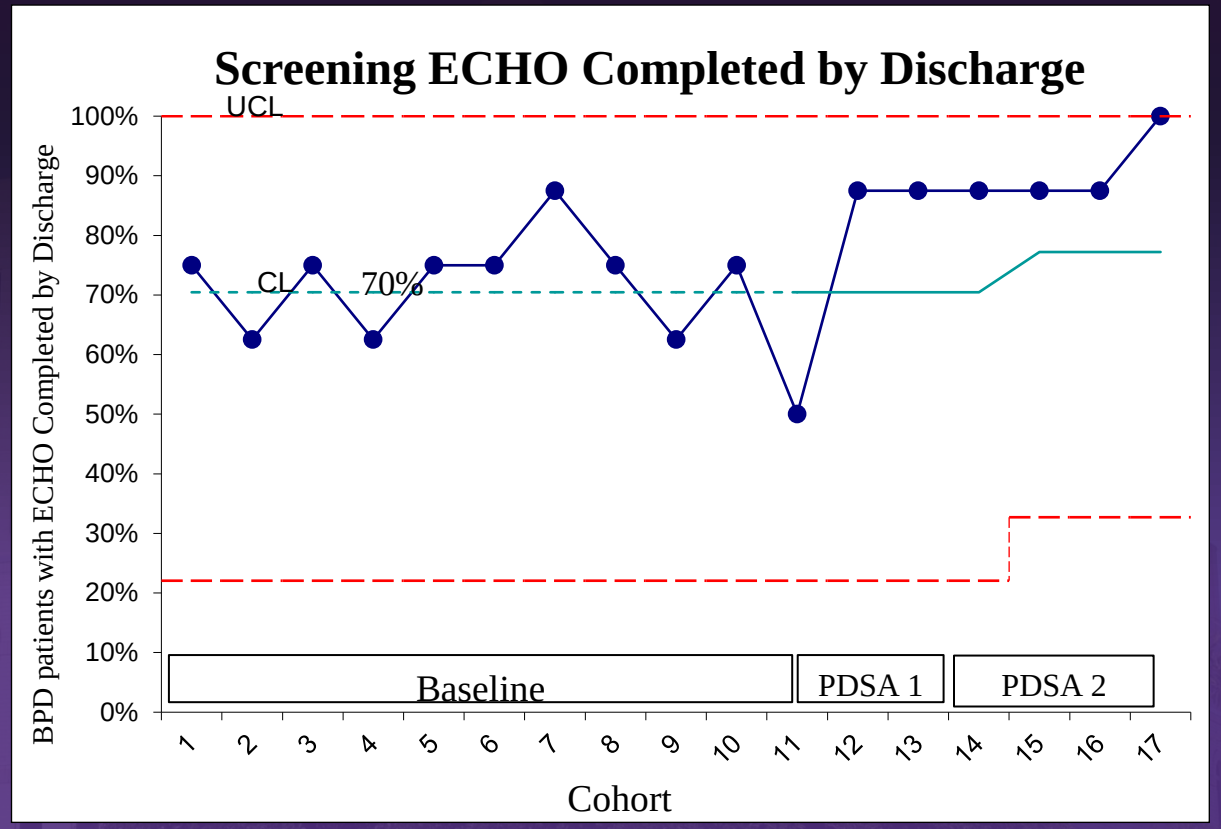
- Bronchopulmonary Dysplasia (BPD) is a chronic lung disease in preterm infants and a risk factor for the development of secondary pulmonary hypertension (PH)
- Up to 41% of infants born <32 weeks gestational age develop BPD
  - 20% of these infants will develop secondary PH
  - Comorbid BPD and PH has a 2-year mortality rate of 40%
- Current guidelines recommend PH screening via echocardiogram at 36 weeks post-menstrual age (PMA) and at discharge
- Aim: To increase PH screening by 20% via Echo in neonates diagnosed with BPD by 38 weeks PMA within 1 year

Methods

- Setup
  - Target population is neonates born <32 weeks gestation and diagnosed with BPD
  - Multidisciplinary team formed
  - Baseline data collected on 88 patients from Jan-Dec 2023
- PDSA Cycles:
  - Cycle 1 (Dec 2023): unit-wide education via conferences and emails
  - Cycle 2 (April 2024): implementation of a PH screening algorithm
  - Cycle 3 (Sep 2024): introduced a smartphrase in the EMR
- Measures
  - Outcome:
    - Percentage of neonates who had a screening Echo performed by 38 weeks PMA
    - Percentage of neonates with screening completed by discharge
  - Process:
    - Percentage of neonates with documented BPD in their chart
    - Percentage of neonates in whom providers adhered to the entire screening algorithm.
  - Balancing:
    - Number of patients with excessive Echos (>3) between BPD diagnosis and discharge

Results

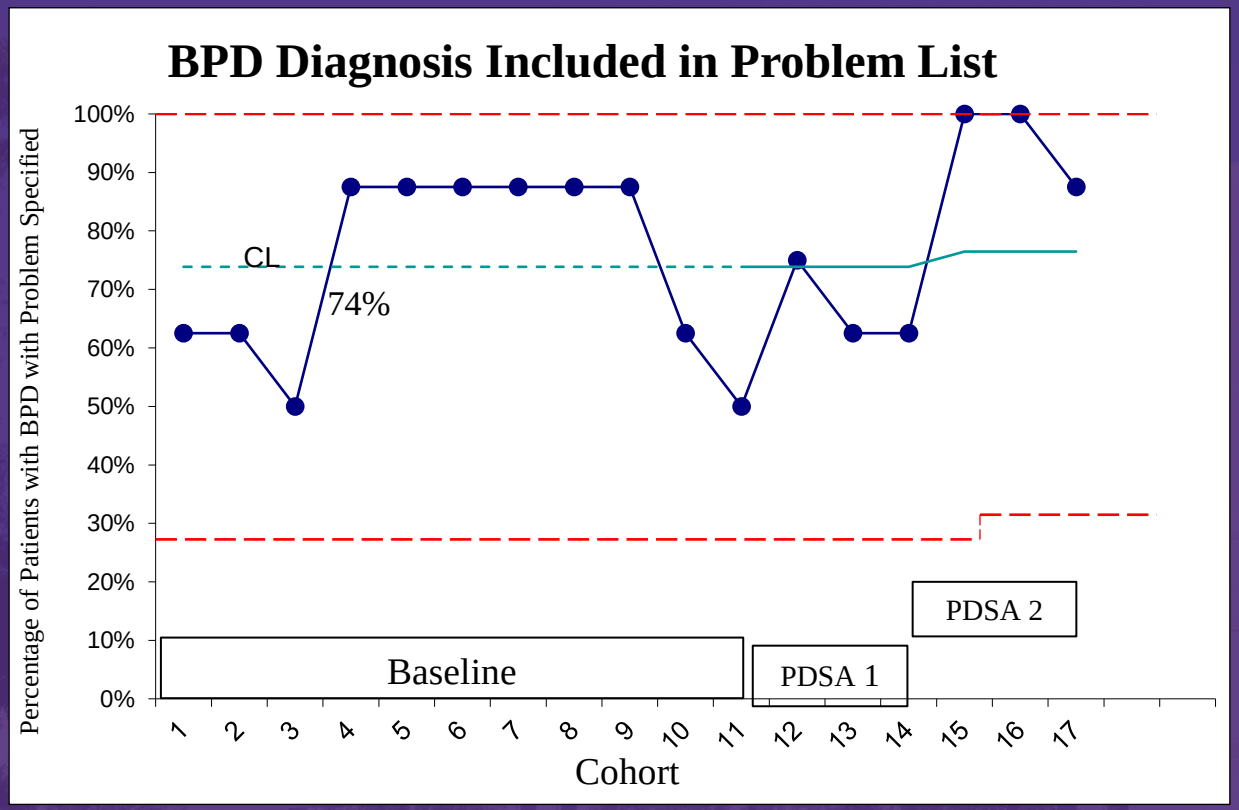


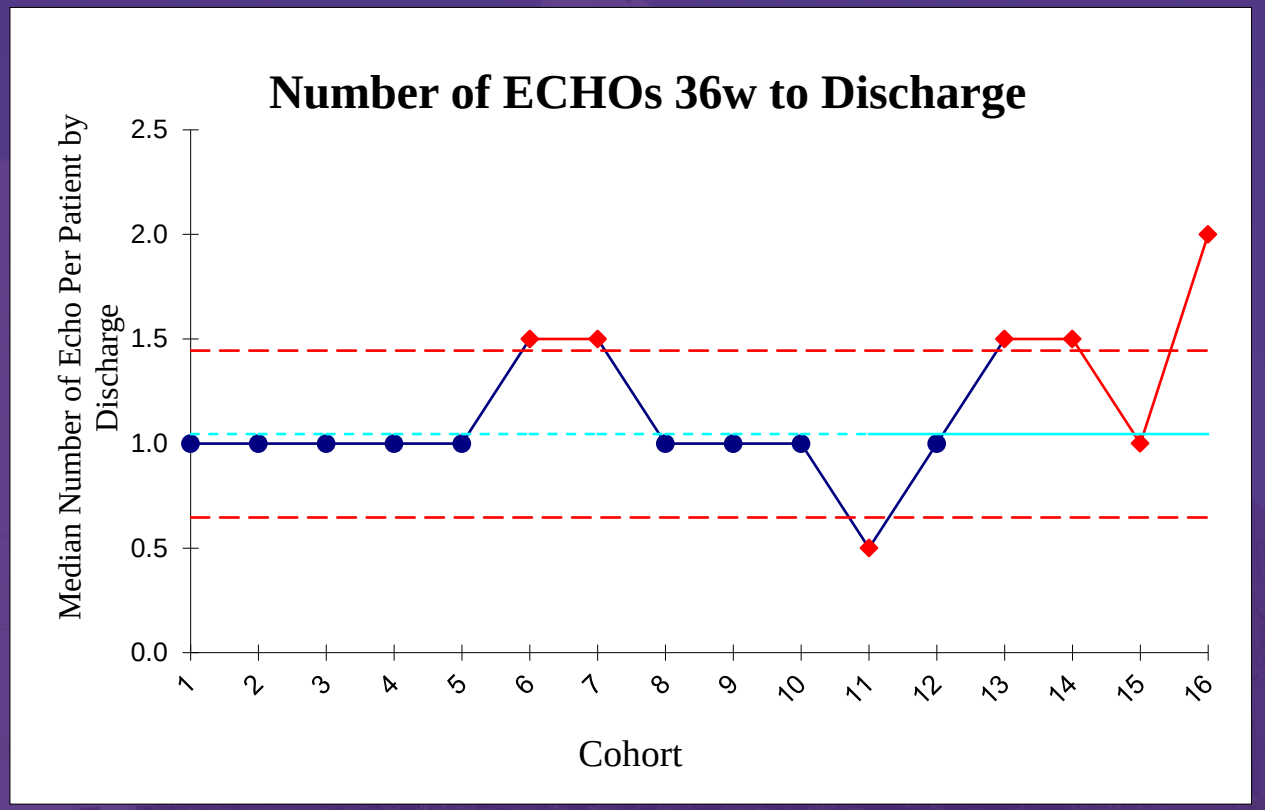


- Patients were distributed into cohorts of 8 neonates each
- Echo screening by 38 weeks PMA has increased from 36% to 53%
- Echo screening by discharge has increased from 70% to 76%

** Statistical process control charts were utilized to track project measures over time*

Results





- No increase in BPD problem specification
- No increase in the mean number of Echos performed by discharge

Conclusions

- This is an ongoing project
- So far, results have demonstrated:
  - Improvement in the outcome measures
  - No significant changes in the balancing measure
- Changes that led to improvement include multi-disciplinary team input and implementing an algorithm
- Challenges faced include culture change, education, and timely identification of patients diagnosed with BPD