

# Reducing necrotising enterocolitis (NEC): A quality improvement initiative

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## Background

- Necrotising enterocolitis (NEC) is a neonatal emergency mainly seen in preterm infants. It can have devastating consequences including delayed feeding, surgery, short gut, poor growth, increased hospital stays, delayed neurodevelopment and death. In the UK, 1 in 20 preterm infants born at less than 32 weeks gestation are at risk of NEC with high mortality rates of more than 20%.
- In 2017, the neonatal unit at Watford General Hospital stood out as having a high rate of NEC compared to units of the same level, our network and nationally (Table 1).
- The study aim was to understand the risk factors linked to NEC and decrease the incidence of NEC at our unit by 50% within one year using structured quality improvement (QI) methodology.

**Table 1. NEC results, NNAP 2018 report (2017 data)**

<b>Watford</b>	<b>LNU</b>	<b>Network</b>	<b>National</b>
18.5% (5/27)	3% (68/2,305)	6.9% (42/607)	5.6% (428/7,628)

## Measures

- External thematic review was sought in view of the high incidence of NEC.
- Modifiable contributing/causative factors and themes were identified.
- Extrinsic risk factors such as enteral feeding practices, compliance with network NEC bundle, relevant medication exposure (ibuprofen, anti-reflux medication), blood transfusion and sepsis were investigated.
- Appropriate QI tools were used to drive changes to decrease the NEC rate (Figure 1).
- Process changes were monitored by iterative plan, do, study, act (PDSA) cycles and NEC occurrences were tracked using statistical process control (SPC) charts - 'days between NEC' for the next 12 months.

Figure 1. Driver diagram to inform change in ideas.

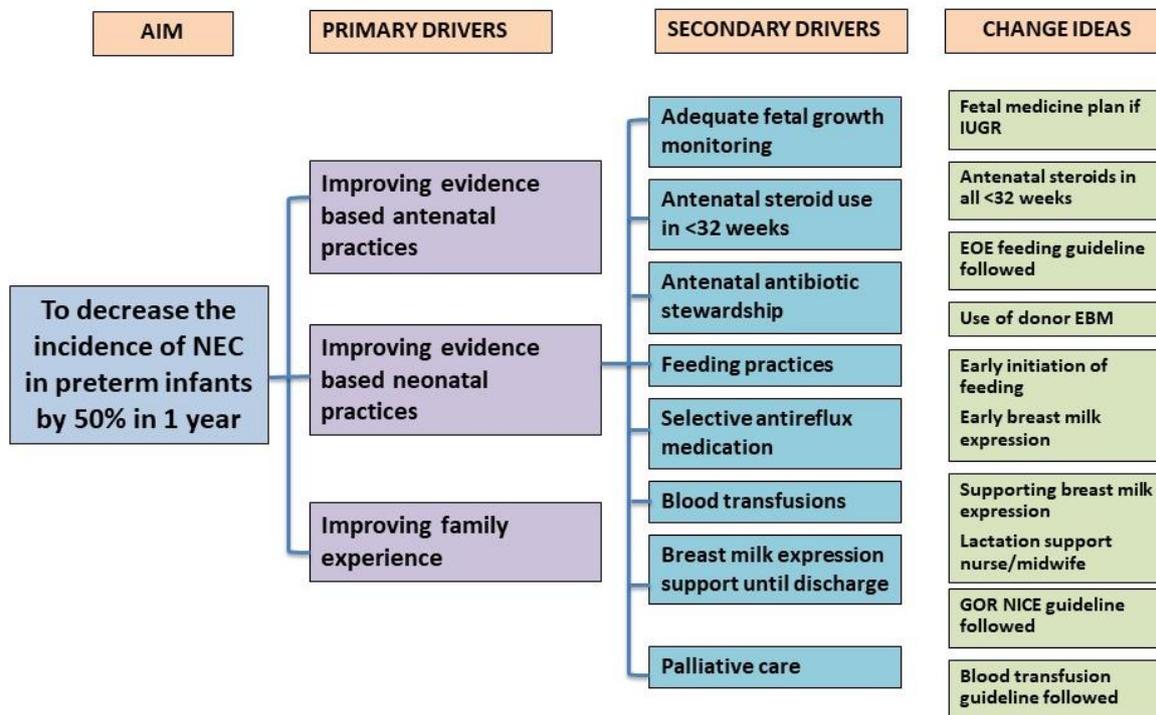
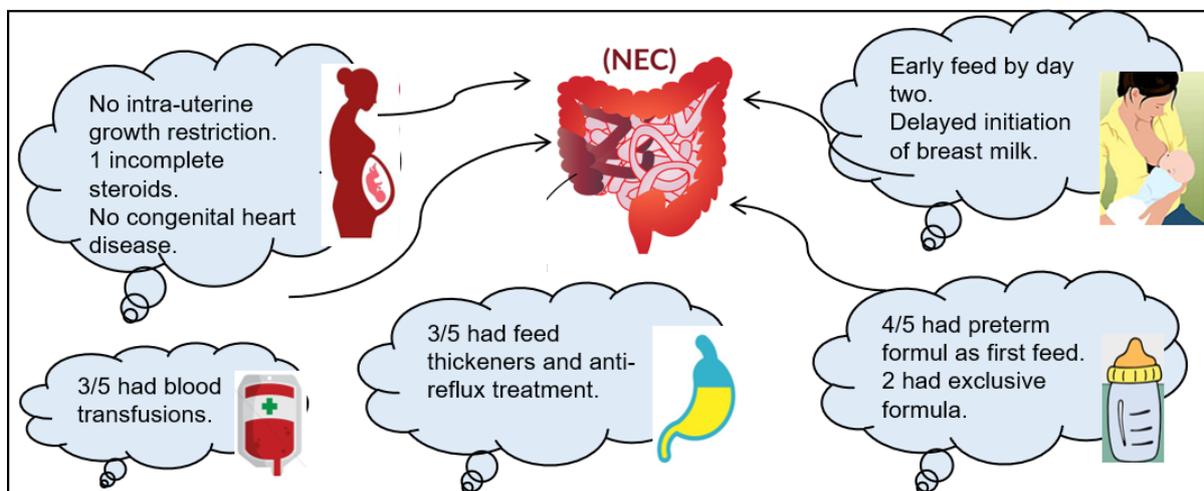


Figure 2. Factors related to NEC.



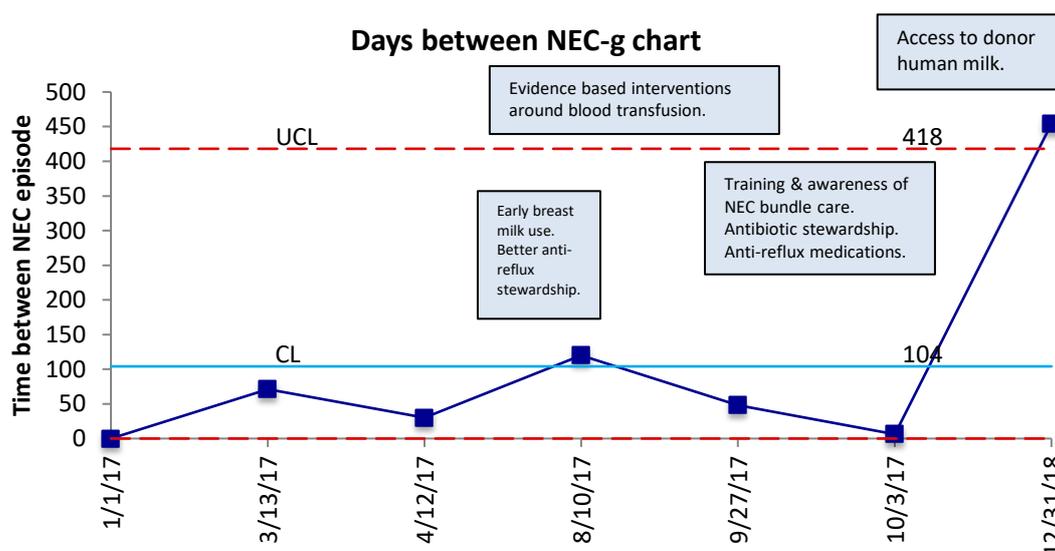
## Our improvement plan:

- A pareto chart identified key risk factors for NEC and raised awareness of key issues (i.e. early initiation of formula feeds when mother's own milk was not available, anti-reflux medication and blood transfusion).
- Awareness was raised about NEC related complications: antibiotic duration, prolonged parenteral nutrition, surgery, delayed discharge and poorer developmental outcome.
- All key stakeholders were engaged (including parents) in these discussions.

## Outcomes

- Following QI initiatives in 2018, 0 of 29 eligible babies had NEC.
- The average number of NEC-free days increased from 55 to 350. The average number of patients between NEC events increased from 4 to 32 (Figure 3).

**Figure 3. Days between NEC-g chart.**



## Top tips for implementation

- Engage all key stakeholders including parents when discussing NNAP report findings.
- Use statistical process control tools for real-time monitoring of adverse events.
- Scale-up and spread findings to the wider neonatal community.

## **Acknowledgements**

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