# Neonatal jaundice in infants born at 37 weeks: is NICE treating too many?

Neonatal jaundice affects approximately 60% of term and 80% of preterm infants within the first week of life. Gestation-based treatment threshold graphs by the National Institute of Health and Care Excellence are used to guide jaundice management in the UK.[1] NICE treatment thresholds at 37-week gestation are much lower compared with ≥38 weeks and also when compared with the previous and recently updated American Academy of Paediatrics guidelines.[1–3] This results in an increased treatment burden and hospitalisation of 37-week infants, including mother–baby separation. Infants born at 37 weeks usually are grouped with those born at ≥38 weeks for most neonatal pathologies under the label 'term infants'. Whether kernicterus develops at a lower serum bilirubin (SBR) level in 37-week infants compared with those ≥38-week has not been established.

We aimed to ascertain the impact on admissions and medical interventions in jaundiced infants born at 37 weeks if they were managed based on

- NICE thresholds for ≥38 weeks.
- Previous AAP thresholds for 37 weeks (2004).
- Updated AAP thresholds for 37 weeks (2022).

We retrospectively reviewed the electronic patient records of all infants born at 37 weeks with a birth weight of ≥2.5 kg who received treatment for jaundice at Birmingham Heartlands Hospital between April 2019 and March 2021. Their SBR levels were plotted on the ≥38-week NICE and both 37-week AAP charts.[1–3]Infants with jaundice but with other principal diagnoses were excluded.

We included 184 infants who had 188 episodes of inpatient phototherapy. The mean birth weight was 3128 g (SD±430 g), and the median age at admission was 36 hours (IQR 25–73 hours). While 23 (13%) infants were admitted to the neonatal unit (NNU) for jaundice close to exchange transfusion, 102 (55%) and 58 (32%) were admitted to the postnatal ward and transitional care, respectively. Their median duration of hospital stay was 45 hours (IQ 33–57 hours). Figure 1 shows the interventions received by infants admitted to NNU apart from phototherapy. None received exchange transfusion or developed kernicterus.

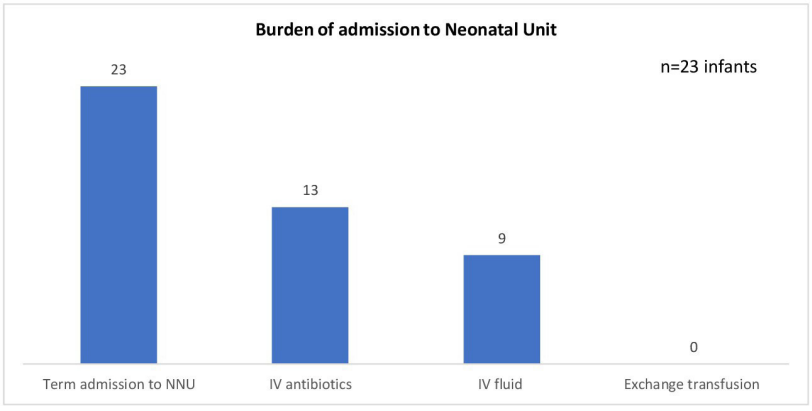


**Figure 1** Burden of admission and interventions received by infants born at 37 weeks admitted to the NNU due to jaundice. NNU, neonatal unit.

Only 17 (9%) infants would have needed phototherapy if NICE ≥38-week threshold was used (p<0.00001); 42 (23%) and 19 (10%) based on the previous (2004) and updated AAP (2022) guidance, respectively (p<0.00001) (table 1). As per AAP 2022 guidelines, 10 (5.4%) infants had hyperbilirubinaemia neurotoxicity risk factors; however, only five qualified for treatment when plotted on higher-risk AAP 2022 charts (table 1).

In conclusion, applying AAP risk-based recommendations for 37-week jaundiced infants or using NICE ≥38-week charts could significantly decrease the treatment burden at this gestation. The updated (2022) AAP 37-week treatment thresholds are quite similar to the ≥38-week NICE but have lower thresholds for those with hyperbilirubinaemia neurotoxicity risk factors.

NICE has already implemented measures for primary prevention (antenatal antibodies and blood group screening and Rhesus factor prophylaxis) and early postnatal care emphasising feeding support and close monitoring of jaundice.[1 4 5] Adoption of risk factor-based approach to jaundice management by NICE may safely minimise treatment burden not only for 37-week infants but also across all gestational ages.

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**Contributors** PS and VF conceived the idea of the study. MN and PS designed the study. MN led the coordination of data collection, analysis and writing the first draft of the manuscript. CH, AA, SG-O and MA collected the data. All authors edited the manuscript and critically assessed and approved its final form.

**Table 1** Plotting SBR of 37-week infants on ≥38-week NICE, AAP 2004 and AAP 2022 charts

| | 37-week NICE n=188 episodes | ≥38-week NICE n=188 P value* | | AAP 2004 n=188 P value* | | AAP 2022 n=188 P value* | |
|---|---|---|---|---|---|---|---|
| Infants needing phototherapy, n (%) | 188 (100) | 17 (9) | <0.00001 | 43 (23) | <0.00001 | 19 (10) | <0.00001 |
| Infants whose SBR was above exchange transfusion, n (%) | 15 (8) | 2 (1) | 0.0012 | 7 (3.7) | 0.078 | 0 | 0.0002 |
| Infants needing phototherapy with risk factors of neurotoxicity, n | 10† | – | – | – | – | 5 | |
| Infants whose SBR was above exchange transfusion with risk factors of neurotoxicity, n | 4 | – | – | – | – | 1 | |

*$\chi^2$ comparing 37 weeks' treatment threshold to 38 weeks' NICE, AAP 2004 and AAP 2022 thresholds.
†Eight infants had ABO incompatibility; one had possible glucose-6-phosphate dehydrogenase (G6PD) deficiency; and one had maternal anti-M antibodies.
AAP, American Academy of Pediatrics; NICE, National Institute of Health and Care Excellence; SBR, serum bilirubin.

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