



Background

- Data regarding NICU radiation exposure is scarce.
- Point of Care Ultrasound (POCUS) enhances procedural safety and offers high sensitivity and specificity for various diagnostic indications.
- POCUS has demonstrated the potential to reduce neonatal X-ray (XR) exposure. This study aims to outline X-ray utilization patterns in NICU-admitted neonates for indications that can be safely and accurately addressed with POCUS.

Objectives

To describe patterns of XR use in the NICU for four specific clinical indications where POCUS is considered either equivalent or superior for diagnosis.

	22 0/7 - 25 0/7	25 1/7 - 28 0/7	28 1/7 - 32 0/7	> 32 1/7	Total
No. of infants enrolled, n (%)	33 (8)	53 (12)	151 (36)	188 (44)	425
Birth weight (in g, [IQR])	437 [360-569]	725 [480-976]	956 [876-1201]	1460 [1101-2109]	1325 [465 - 1927]
Female, n (%)	17 (53)	26 (49)	81 (54)	96 (51)	220 (52)
C-section, n (%)	12 (37)	21 (40)	68 (45)	81 (43)	204 (48)
SGA, n (%)	5 (17)	10 (18)	18 (12)	21 (11)	54 (13)
No. XRs received, median [IQR]	48 [32-118]	38 [28-98]	32 [16-54]	25 [8-32]	36 [18-98]
% of infants receiving > 10 XRs	85	82	65	25	68

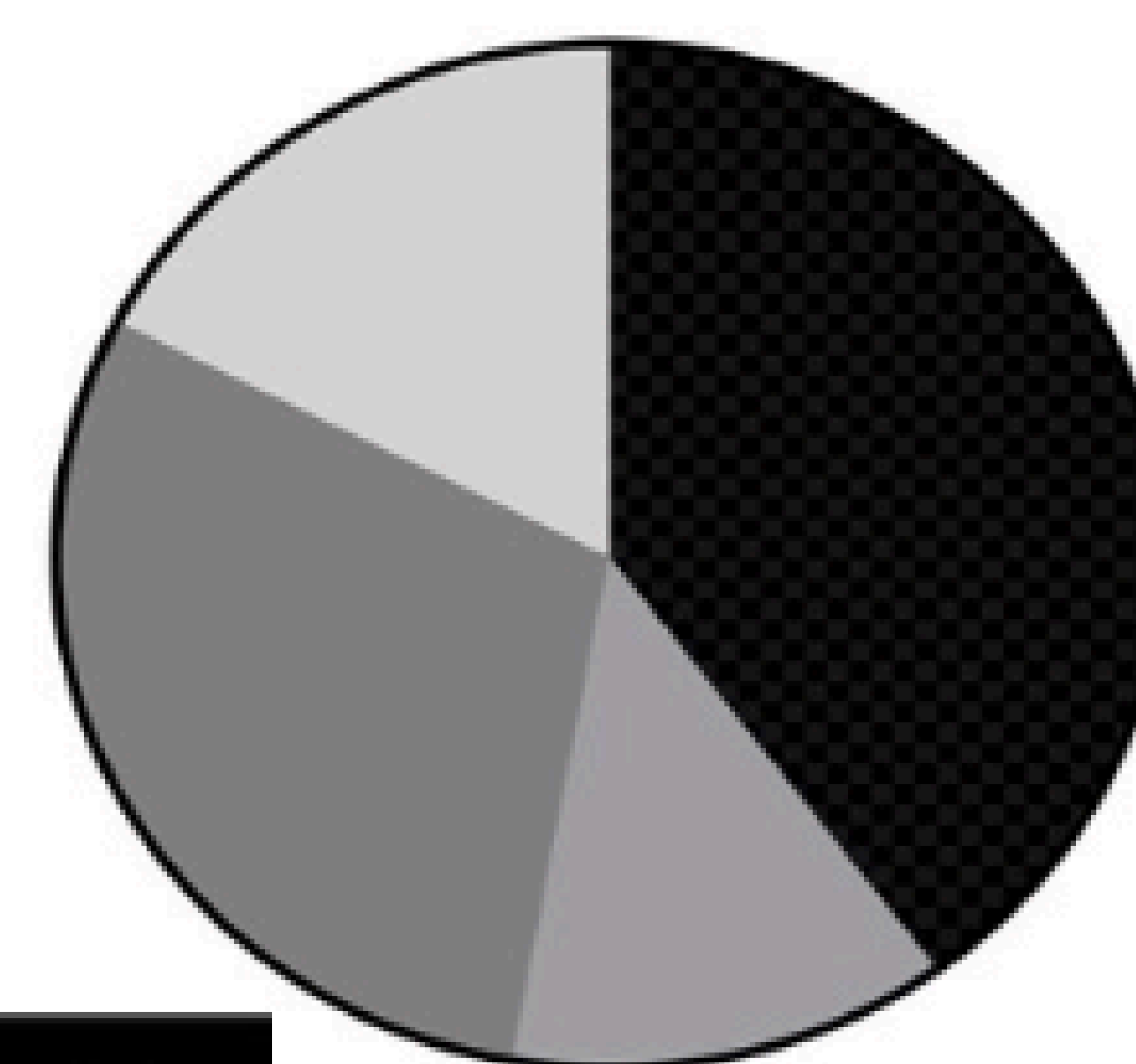
Methods

- A retrospective chart review was conducted on all inborn infants admitted to a large Level IV NICU and discharged between January 1 and December 31, 2022 who received at least 1 XR for either of four indications - **central line insertion, endotracheal intubation, evaluation of respiratory distress and bowel gas pattern.**
- Indication for each XR ordered was identified through EMR charting.
- Findings were reported using descriptive statistics and differences analyzed using Kruskal-Wallis and student t-tests.

Results

- A total of 425 infants were included with median birthweight 1325g [465 - 1927].
- Median number of XRs received for select indications was 36 [18-98] with infants < 28 wga constituting 71% of all XRs.
- Verification of central line tip position accounted for 40% of all XRs (Figure 1). 60% of these were performed at the time of PICC line placement.
- Average days of XR exposure per 1000 patient days was 143.2, which was significantly higher in the 22 0/7 - 25 0/7 wga group (Figure 2).

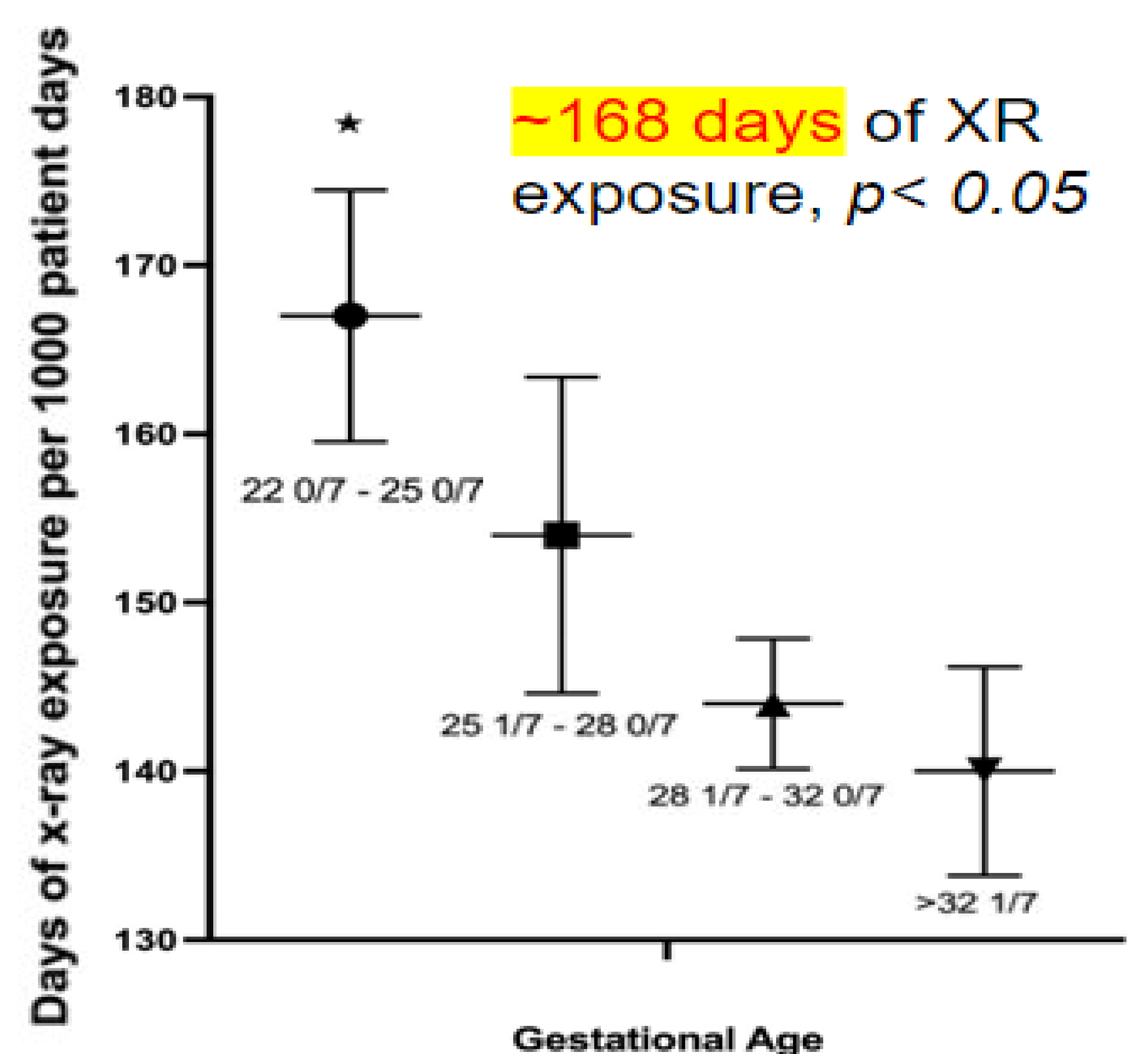
Distribution of XRs by indication (all GA)



- 39.89% Central Line Position
- 12.92% Endotracheal Intubation
- 29.78% Respiratory Distress
- 17.42% Bowel Gas Pattern

68% of infants received more than 10 XRs.

60% of XRs were performed at the time of PICC line placement.



Conclusion

We have described patterns of XR use in the NICU for four diagnostic and procedural indications where POCUS offers high sensitivity and specificity and could be used as a potential alternative.