

Improving the Reporting of Nasogastric Tube Check Chest Radiographs

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BACKGROUND

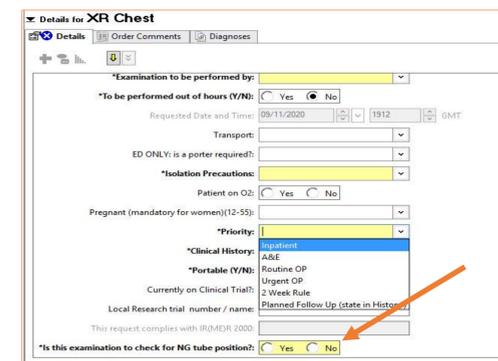
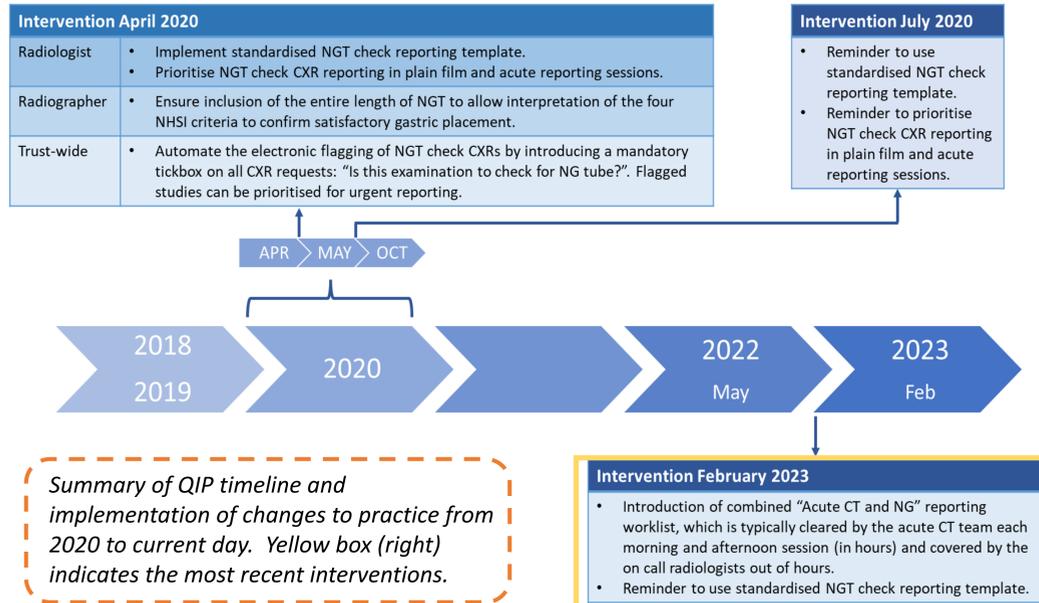
The COVID-19 pandemic resulted in a higher number of critically unwell patients in hospital, which in turn led to a manifold increase in chest radiographs (CXRs) requested for nasogastric tube (NGT) position check. Rapid turnaround of these CXR reports is paramount to ensure safe and timely patient care. Feeding, flushing or administering medication through a misplaced NGT in the tracheobronchial tree is an NHS "Never Event". Analysis of national Serious Untoward Incidents (SUIs) indicates that NGT check CXR misinterpretation accounts for the majority of NGT-related SUIs.

This quality improvement project (QIP) stems from a Trust SUI arising from instillation of feed through an NGT sited in the lung. Recommendations from the SUI included standardisation of NGT check CXR reports to ensure a definitive radiologist view on the position of the NGT. A subsequent NGT-related Trust SUI prompted further changes to the Radiologist reporting worklists.

METHODS

Retrospective data collection using Soliton (RIS). Data recorded over 8 day intervals during the following periods: April, May and October 2020; May 2022; and February 2023. Inclusion criteria: adult A&E and inpatients. Exclusion criteria: paediatric and neonatal patients.

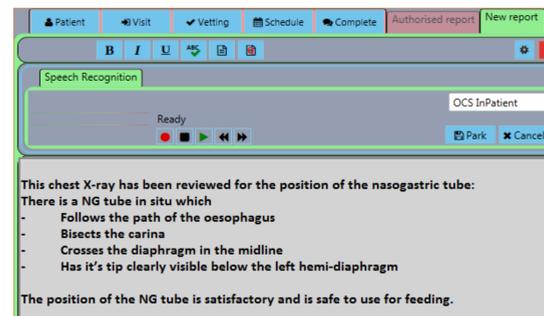
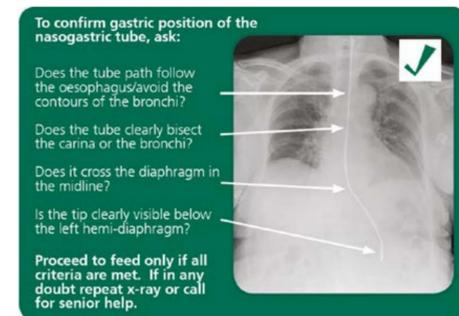
INTERVENTION



Left: Screenshot of electronic CXR request on iClip illustrating the mandatory "Is this examination to check for NG tube position?" tickbox.

Bottom left: Four criteria for NGT position check as per NHS Improvement (NHSI).

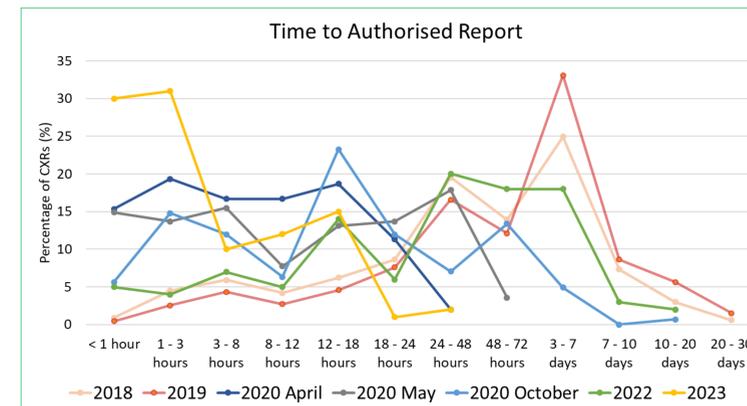
Bottom right: Standardised report template for NGT check CXR on Soliton (RIS). This template is based on the NHSI criteria.



RESULTS

	DATA FOR 8 DAY PERIOD							
	2018	2019	2020		2022		2023	
			April	May	October			
Total no. CXR	28	42	158	168	230	169	190	
Average no. CXR/day	4	5	20	21	29	21	24	
Total reported within 3 hours	9%	4%	35%	29%	20%	9%	61%	
Median reporting time	3-7 days	3-7 days	8-12 hours	8-12 hours	12-18 hours	24-48 hours	1-3 hours	

Table: Collated data of audit cycles between 2018 and 2023. Total number of NGT check CXRs performed in an 8 day period have increased manifold (peak during COVID-19 pandemic). Comparison of percentage of NGT check CXRs reported within 3 hours and review of median reporting times confirm significant improvement in turnaround of NGT check CXR reports.



Graph: Line chart depicting time to authorised report by audit cycle. This demonstrates a definite improvement in NGT check CXR reporting times, particularly in the February 2023 cycle (yellow). Comparing the longest reporting times also confirms a significant improvement since the implementation of automated flagging and the new "Acute CT and NG" reporting worklist. In the latest audit cycle, all NGT check CXRs were reported within 48 hours (compared to up to 30 days on previous cycles).



Chart: Evaluating the effect of whether study acquisition time "in-hours" or "out-of-hours" affects the reporting times for NGT check CXRs.

- In-hours:** Mon-Fri 9am-5pm.
- Out-of-hours:** Mon-Friday 5pm-9am, Sat and Sun.

RESULTS

Turnaround of NGT check CXR reports prior to the COVID-19 pandemic was variable, mostly due to assignment of these radiographs to the general X-ray reporting worklist. In addition, the flagging of NGT check CXRs for reporting was a manual process, completed by Radiographers at time of image acquisition so most NGT check CXRs were not flagged for urgent reporting.

In 2020, introduction of a mandatory tickbox on all electronic CXR requests (on Cerner iClip) resulted in automated flagging of NGT check CXRs for urgent reporting on Soliton (RIS). This resulted in a significant improvement in NGT check CXR reporting times (20-29% reported within 3 hours in 2020, compared to 4-9% in 2018 and 2019).

In 2023, implementation of a new combined "Acute CT and NG" reporting worklist further expedited the reporting of NGT check CXRs when compared to prior audit cycles. All studies assigned to this worklist are treated with similar priority to emergency CT. In the latest cycle, the majority of NGT check CXRs are reported within 3 hours (61%). Overall reporting times were marginally longer for CXRs acquired "out-of-hours" than those "in-hours" (median reporting time 3-8 hours and 1-3 hours, respectively).

All audit cycles demonstrated excellent uptake of the standardised reporting template. In February 2023, the template was used in 161/190 (85%) of NGT check CXRs. Reasons for non-utilisation of template included: no NGT in situ, CXR reported with CT, and most importantly, NGT not in satisfactory position. In February 2023, a total of 17/190 (9%) studies demonstrated NGT in unsafe position (most commonly sited in a bronchus or oesophagus).

CONCLUSION

This QIP aimed to improve the turnaround of NGT check CXR reports, paramount during the COVID-19 pandemic. The results during COVID-19 were overwhelmingly positive, but re-audit in 2022 demonstrated a decline in reporting times. More recent introduction of a combined "Acute CT and NG" reporting worklist has resulted in a significant improvement in reporting times when compared to all prior audit cycles. Furthermore, implementation of a standardised template has ensured clarity of reports for NGT position.

REFERENCES

- The insertion, placement and checking of naso/oro-gastric tubes and Nasojejunal tubes; Adults/Children/Neonates St George's University Hospitals NHS Foundation Trust. Policy Reference Clin.4.6; Version 2.7 (issue date October 2019, review date October 2021)
- Resource set: Initial placement checks for nasogastric and orogastric tubes; NHS Improvement (issue date July 2016).