



Evaluation of Decision to Delivery time Interval in Emergency caesarean section.

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Introduction :
Caesarean section (CS) is one of the common procedures performed by modern day Obstetricians. Royal College of Obstetricians and Gynaecologist (RCOG) had modified caesarean section classification based on urgency in year 2010. Category 1 and 2 defined as a compromise health for mother/foetus with and without immediate threat to life respectively. Recently an audit was conducted in our hospital, which concluded that less than half of category 1 and almost one third of category 2 caesarean sections did not match the set standards in relation to the target times from decision to delivery. Moreover, it did not comment on reasons for the delay and its implication on foetal-maternal outcome. Therefore, we conducted a retrospective audit with the objective of identifying the decision to delivery interval (DDI) for Category 1 and 2 caesarean sections in and identify various factors that determine the DDI and what could be done to improve the quality care for patients

- Aim and Objective:**
1. To find out DDI in category-1 and category-2 emergency caesarean section.
 2. To identify various factors that determine in DDI.
 3. To improve the quality of care for patients

Methodology:
A retrospective audit was undertaken, with data collected from Careflow Maternity of the patients who underwent Category 1 and 2 Caesarean section between January and March 2023, at NGH

Audit criteria and standards:

1	Decision Delivery Interval for Category 1 caesarean section	100%	None	Cat 1 within 30 mins NGH enhance recovery and caesarean guideline (NGH-GU-N37) and NICE guideline (NG 192)
2	Decision Delivery Interval for Category 2 caesarean section	100%	None	Cat 2 within 75 mins NGH enhance recovery and caesarean guideline (NGH-GU-N37) and NICE guideline (NG 192)

Reference:

1. NGH Clinical Audit Quality Improvement report (registered audit number 1065), Emergency Caesarean Sections (2021)
2. NGH-GU-AN37 Caesarean Section and Enhanced Recovery guideline
3. NG192 Caesarean Birth NICE guideline

Result: Among 181 mothers who underwent caesarean sections, 80 were primiparas and 101 were multiparous, with the majority aged between 20–40 years and a mean gestational age of 39.2 weeks. The most common indications for caesarean were fetal distress, pathological CTG, and non-progress of labour, with a few emergency cases due to malpresentation and one due to cord prolapse. In terms of anesthesia, spinal was the most commonly used (109 cases), followed by epidural (35), combined epidural and spinal (18), general anesthesia (13), and a combination of general and epidural anesthesia in 6 cases.

Audit Criteria 1	Standard	Achieved
The decision to delivery interval for Category 1 caesarean sections will be 30 minutes or less	100%	45%

Out of 181 emergency caesarean sections, 33 were classified as Category 1, with only 15 (45%) performed within the recommended 30-minute Decision to Delivery Interval (DDI), and the mean DDI recorded at 45 minutes. Breakdown of mean time intervals showed transportation took 23 minutes, anesthesia 11 minutes, in-theatre preparation 4 minutes, and delivery 4 minutes. Despite the delays, the mean cord pH was 7.283 and the median Apgar score at 5 minutes was 9, indicating generally good neonatal outcomes.

Audit Criteria 2	Standard	Achieved
The decision to delivery interval for Category 2 caesarean sections will be 75 minutes or less	100%	61%

Remaining 148 were Category 2, with 90 cases (61%) completed within the 75-minute target. The mean Decision to Delivery Interval (DDI) was 74.33 minutes, with average times of 28 minutes for transportation, 20 minutes in-theatre, 19 minutes for anesthesia, and 5 minutes for delivery. Despite being close to the time limit, neonatal outcomes remained positive, with a mean cord pH of 7.301 and a median Apgar score of 10 at 5 minutes.

Discussion: The comparison between the current audit and the previous one indicates a decline in performance for both standards evaluated. Standard 1, concerning category 1 caesarean sections, showed a decrease from 57% compliance to 45%. Similarly, standard 2, related to category 2 caesarean sections, declined from 74% compliance to 61%. This decline suggests a need for comprehensive review and enhancements in operational protocols.

Conclusion: While the decision-to-theatre time generally remained within acceptable limits for both Category 1 and 2 caesarean sections, improvements are needed—especially for Category 1—to consistently meet recommended timelines. A notable delay was observed in the anesthesia preparation phase, particularly for Category 2 cases, highlighting the need for streamlined workflows. Additionally, the actual anesthesia procedure took longer in Category 2 cases, indicating areas where efficiency can be enhanced. Though delivery times were fairly consistent overall, prolonged anesthesia in Category 1 cases contributed to extended total delivery times, underscoring its impact on timely interventions.

Category 2 caesarean sections showed the greatest delays in transportation, anesthesia preparation, and the anesthesia procedure itself, indicating a need to streamline these stages to enhance efficiency while maintaining safety. In contrast, Category 1 caesarean sections faced prolonged times primarily in transportation and anesthesia procedures, underscoring the critical need for rapid response and coordination during emergency situations to meet time-sensitive clinical standards.

Conclusion: The audit findings emphasize the critical need for process refinement and stringent adherence to time constraints in emergency caesarean sections. While improvements are necessary, it's noteworthy that patient outcomes in terms of mean pH and Apgar scores remain within acceptable limits.

- Recommendation:**
1. Share findings from the audit with labour ward team
 2. Re-audit of category 1-2 caesarean section in 6 months' time with larger sample size.
 3. Needs to improve all three variables of DDI (Transportation, In theatre preparation and surgical skills).