

ECMO PRE-PRIMED SYSTEM

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INTRODUCTION

Minimizing ECMO Application Time for Emergency Patients: A Quality Improvement Initiative

This study presents the findings of a quality improvement initiative conducted at Kangbuk Samsung Hospital to reduce the time required for ECMO (Extracorporeal Membrane Oxygenation) application in emergency cases. The aim was to minimize patients' exposure to ischemia and hypoxia by optimizing the efficiency of ECMO initiation.

AIM

The objective of this study was to reduce the required time for ECMO application in emergency cases, aiming to minimize patients' exposure to ischemia and hypoxia. The study focused on implementing improvement activities, such as ECMO pre-priming, creating an ECMO cart, simplifying procedures, and providing education and training to enhance efficiency and timeliness in ECMO initiation.

METHOD

1. ECMO Pre-Primed & ECMO cart preparation

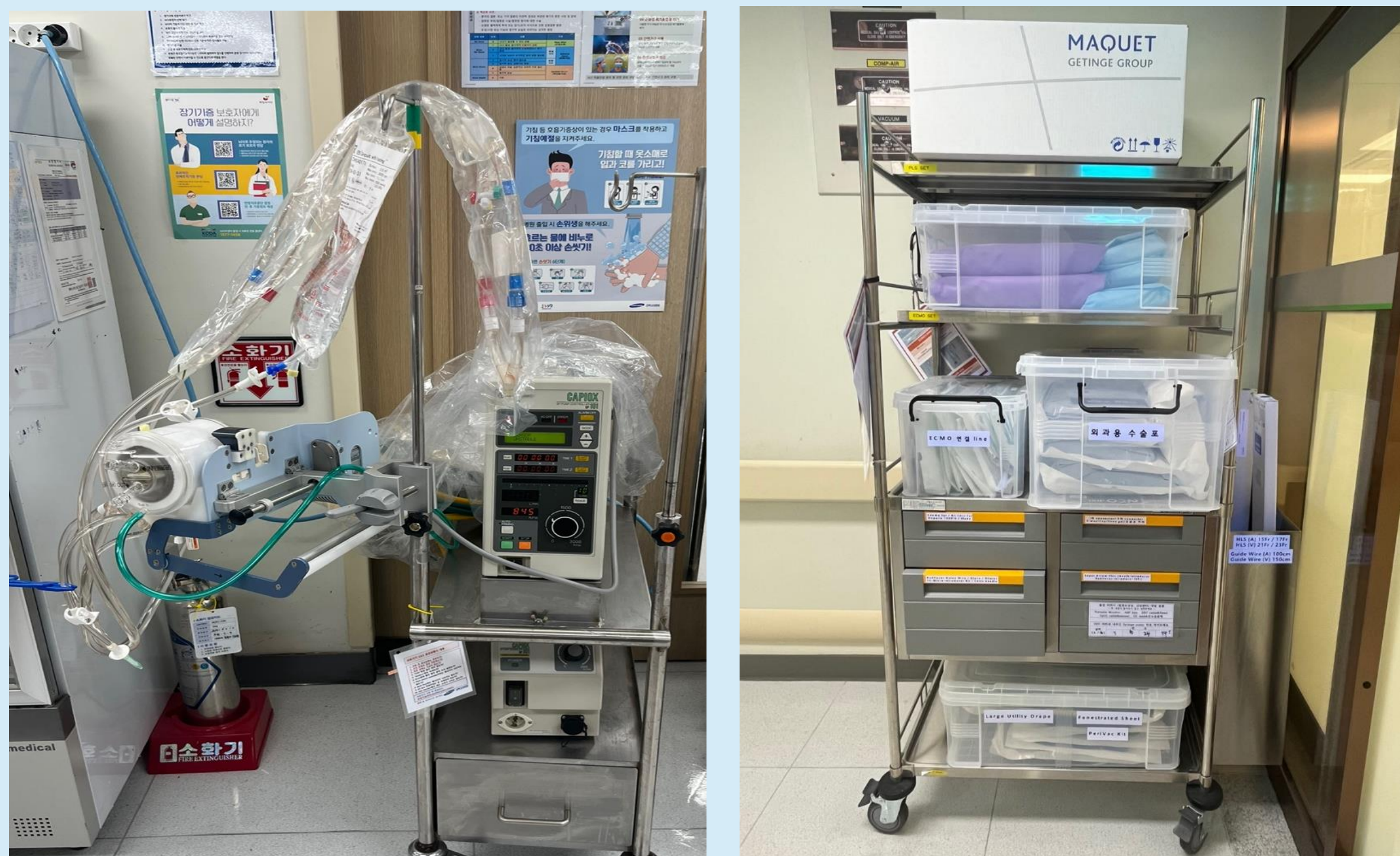


Fig 1. (a) ECMO pre-priming stand-by in ICU, (b) ECMO cart

2. ECMO activation process simplification

3. Education and Training

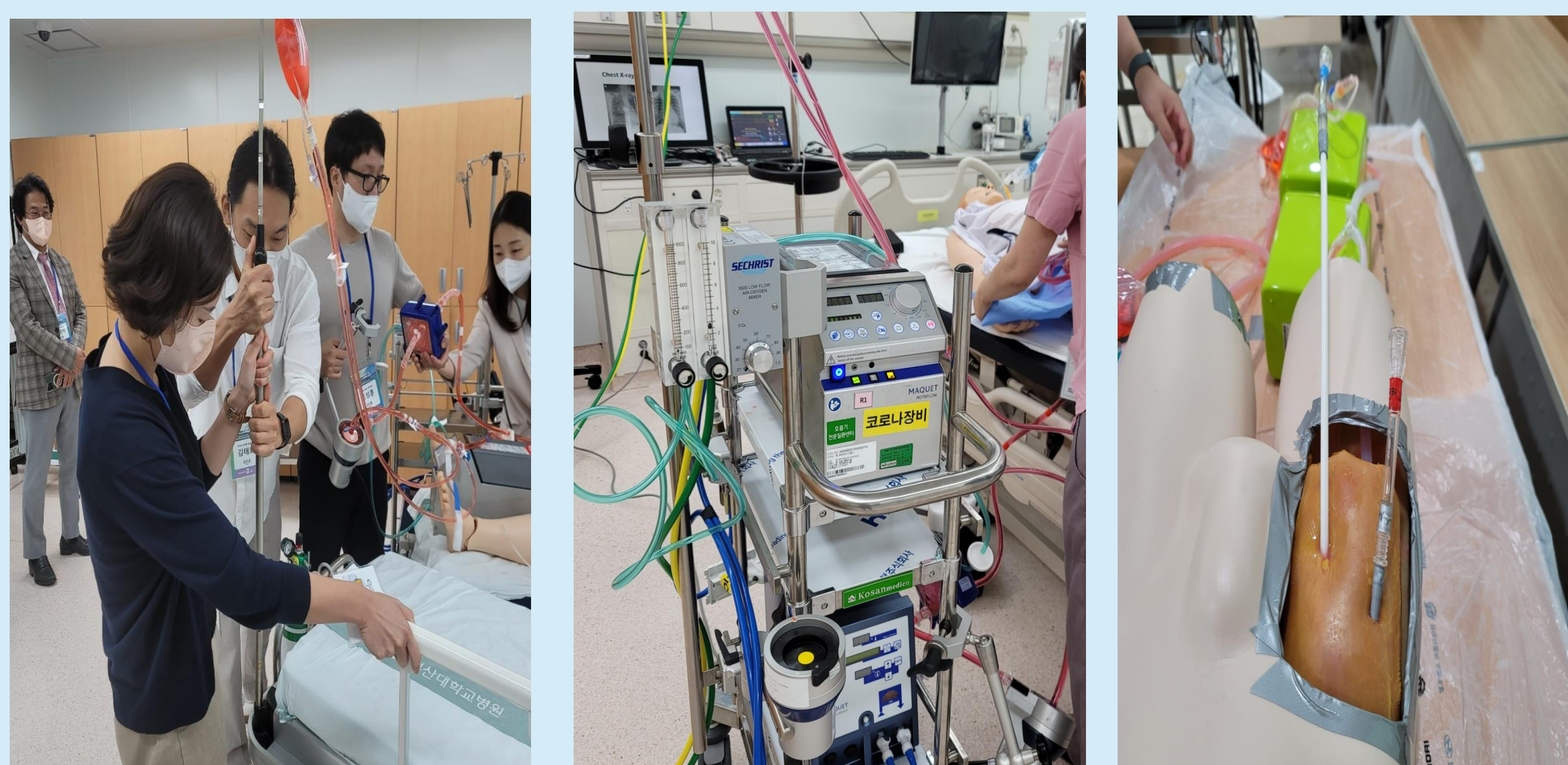


Fig 2. ECMO simulation training

4. out of 61 patients, 40 were treated with VA ECMO during the study period. A total of 21 patients were excluded, including 8 COVID-19 ECMO cases, 9 deaths within 24 hours, and 4 out-of-hospital transfers. Among the 40 patients included in the study

RESULTS

ECMO activation process QI

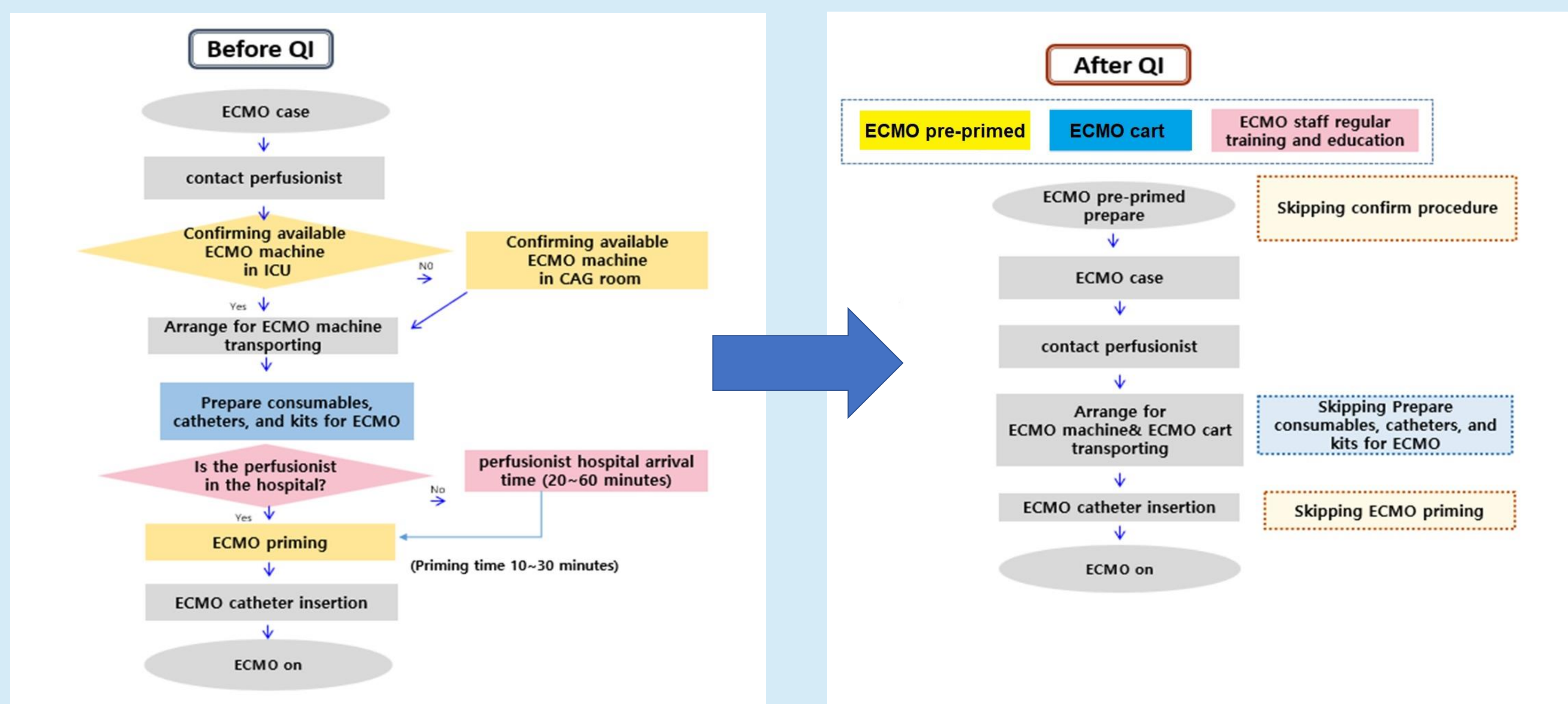


Fig 3. Changes in the process from the start of ECMO application to readiness for ECMO completion before and after QI

- Implementation of ECMO pre-priming significantly reduced the time required for ECMO readiness.
- Pre-priming contributed to a decrease in patient infections, vascular injuries, and failed ECMO during emergency priming.
- Prompt ECMO application improved organ preservation and helped prevent vasoplegic shock
- Average time from emergency ECMO case to ECMO readiness reduced from 31 minutes to 11 minutes.
- Time to call the ECMO team decreased by 20 minutes.
- Improved success rate of patients weaned from ECMO (from 58.5% to 65.2%).

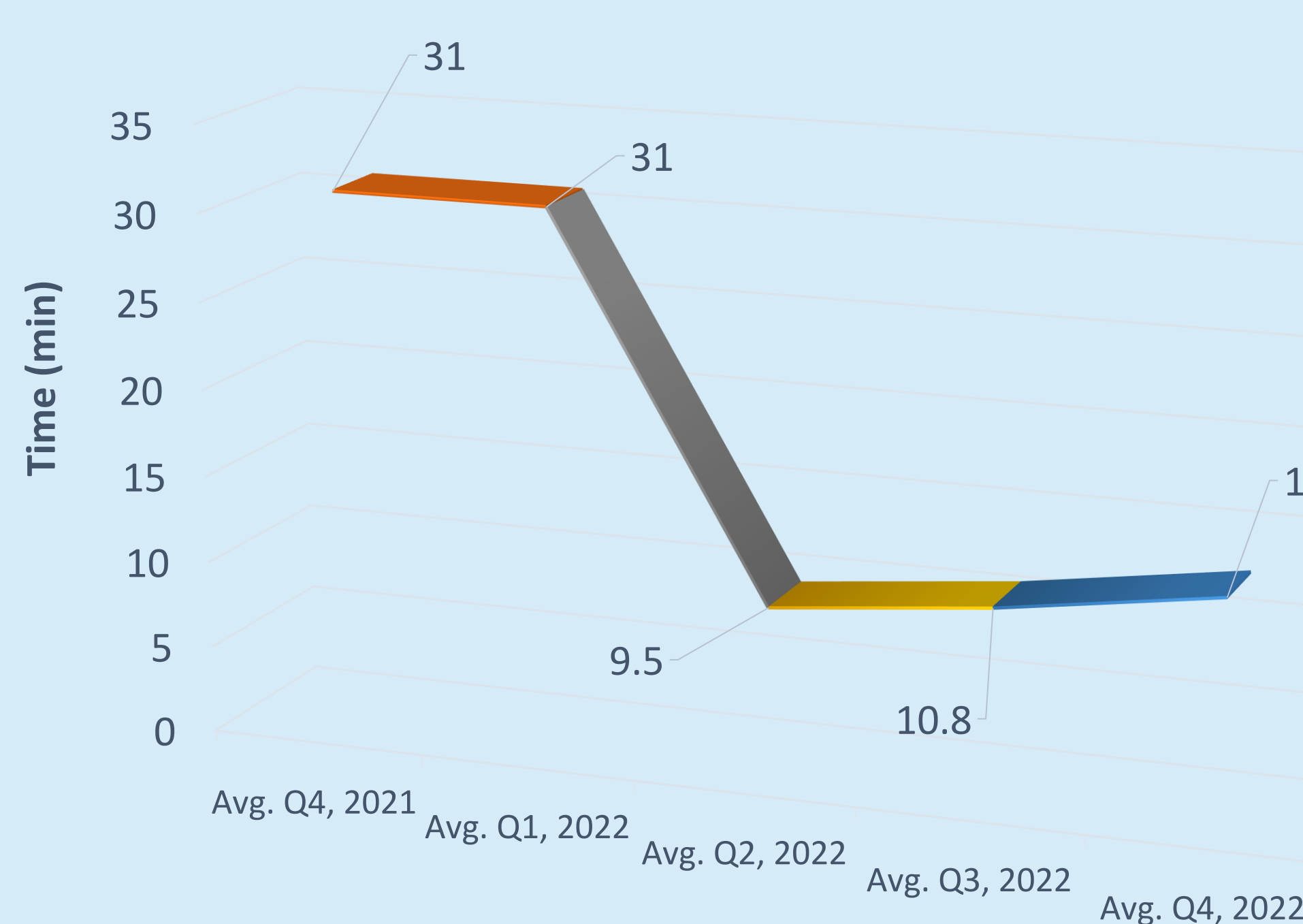


Fig 4. Average preparation time for ECMO (per quarter)



Fig 5. Comparison of ECMO weaning rates before and after implementing ECMO pre-priming.

CONCLUSIONS

- The study highlights the importance of reducing the time required for ECMO application.
- ECMO pre-priming, along with other improvement activities, proved effective in minimizing patient exposure to risks and improving outcomes.
- Continued focus on ECMO pre-priming is recommended to optimize patient prognosis.

ACKNOWLEDGEMENT

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