

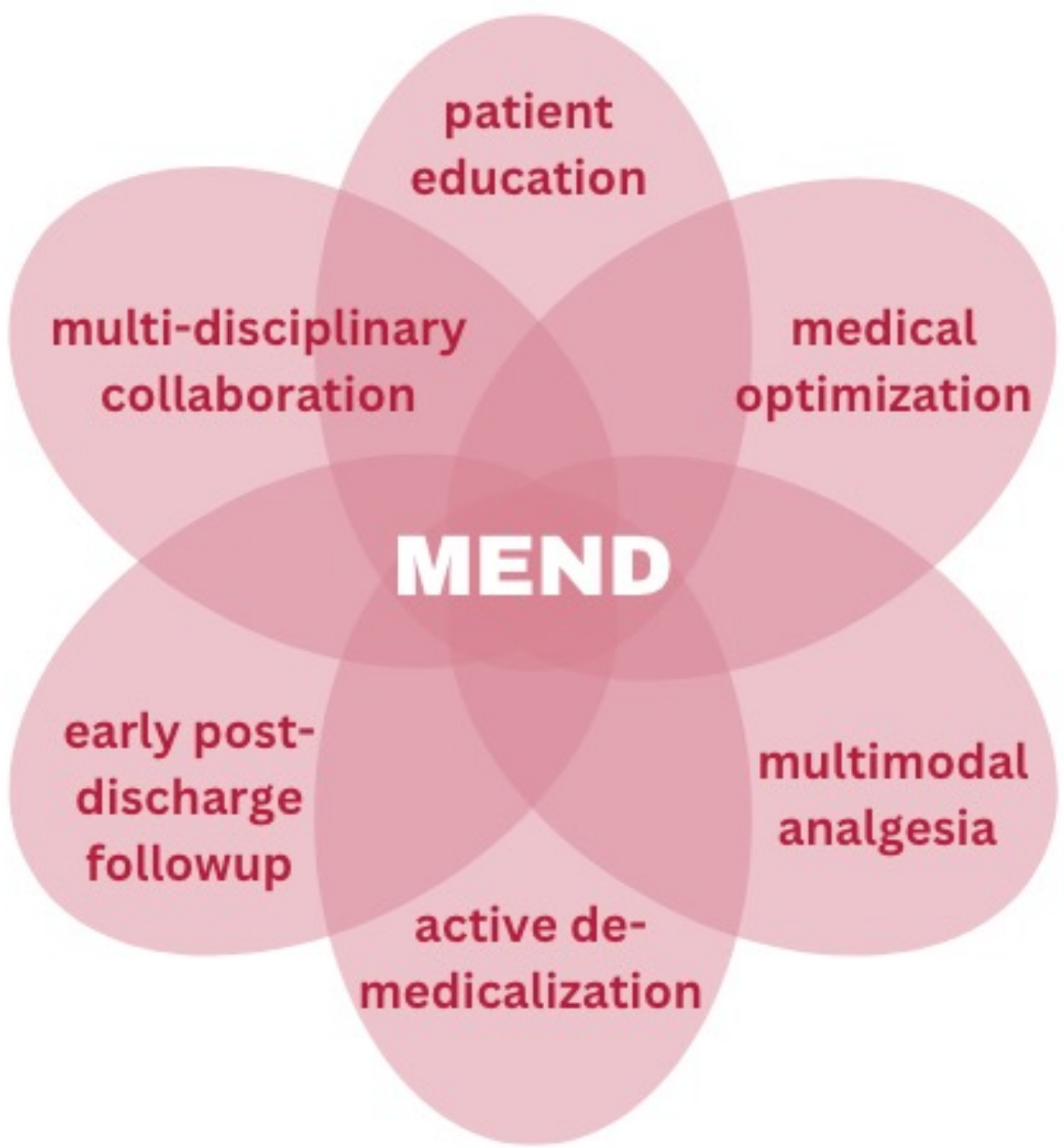
COMPREHENSIVE PERIOPERATIVE PROGRAM HAS POTENTIAL TO REDUCE PATIENT LENGTH OF STAY FOLLOWING MINIMALLY INVASIVE CORONARY ARTERY BYPASS GRAFTING

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OBJECTIVE

In this single center, retrospective study, we sought to observe the impact of a comprehensive, multi-phasic approach to minimally invasive coronary artery bypass grafting (MICS CABG) on patient length of stay (LOS). Targeting decreased LOS after MICS CABG is predicated on recognizing the importance of collaboration to achieve patient-centered care, and on prioritizing individualization of care over protocols. The **Multimodal ENhanced Discharge (MEND)** program's multi-disciplinary facets include dedicated medical and functional pre-operative optimization; education to enable preparedness for short LOS; around the clock multimodal analgesia; early feeding, mobilization, and active demedicalization after surgery; and early post-discharge follow-up.



METHODS

The University of Ottawa Heart Institute (UOHI) introduced the **MEND** program in January 2021. The program's surgeon has been performing, and contributed to the development of, MICS CABG procedures since its inception in 2009. Given the surgical expertise and experience prior to 2018, the standard of surgical performance before and after the implementation of MEND is assumed to be comparable.

- In this single-center, retrospective analysis of patients who underwent MICS CABG by a single surgeon from January 2018 to December 2023 inclusive (N=198), data on LOS and readmissions were collected by reviewing patients' electronic charts.
 - The **“Routine Care”** group is defined as patients who underwent surgery from January 1st, 2018, to December 31st, 2020 (N = 91).
 - The **“MEND”** group is defined as patients who underwent surgery from Jan. 1st, 2021, to Dec. 31st, 2023 (N =107).
- Electronic charts were reviewed and the LOS in days for each patient was recorded confidentially.
 - The total length of stay was further divided into time spent in the intensive care unit (ICU) and the ward.
 - Other data, including internal readmissions and complications were recorded, although not the primary outcome.
- LOS data was further analyzed using R Studio (Version 2023.12.0+369). Confidence intervals were calculated with an alpha of 0.05 and Welch t-tests were used to compare total, ICU, and ward LOS and number of readmissions between “Routine Care” and “MEND” program patients.

Ethics: Ethics for this analysis were obtained by the Ottawa Health Science Research Ethics Board through the Minimally Invasive coronary surgery compared to Sternotomy coronary artery bypass grafting: the MIST trial

Disclosures: Dr. Ruel is a MICS CABG proctor and PI for the MIST trial (both with support from Medtronic, Inc). All other authors declared that there are no relevant conflicts of interest.

RESULTS

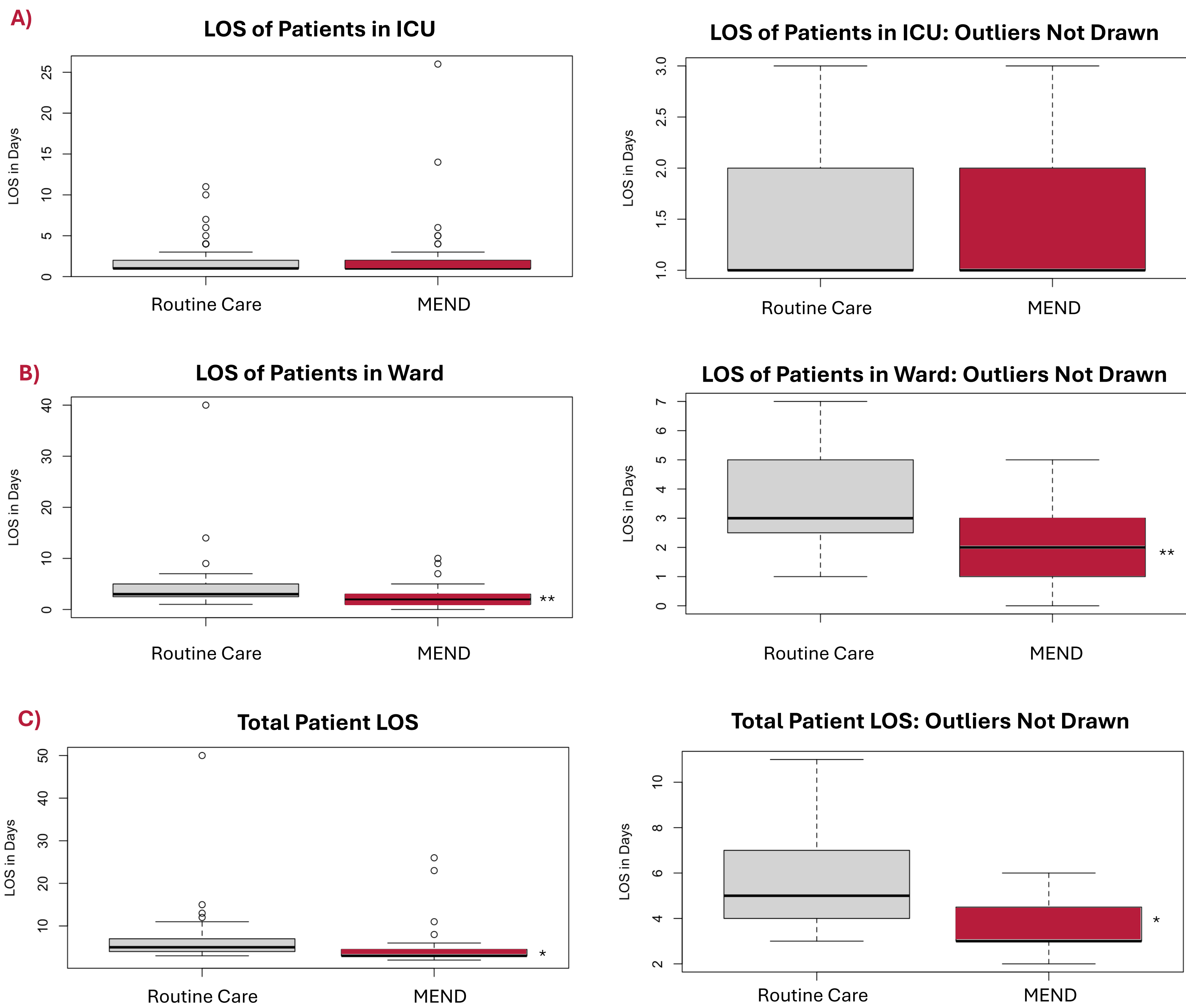


Table 1. Summary statistics for patient length of stay data following MICS CABG performed by a single surgeon and at a single center.

	Routine Care	MEND	p Value
N =	91	107	-
Mean LOS ICU Days (95% CI)	1.8 ± 0.4	1.9 ± 0.5	0.9
Mean LOS Ward Days (95% CI)	4.4 ± 0.9	2.3 ± 0.3	0.00006**
Mean LOS Total Days (95% CI)	6 ± 1	4.1 ± 0.6	0.002*
Total Readmissions	13	7	0.08

DISCUSSION

The LOS in the ICU for both cohorts were comparable, and no statistical difference was found between the “Routine Care” and “MEND” patient LOS (p>0.05). Ward stay was significantly lower**(p<0.0001) for “MEND” patients, averaging 2.3±0.3 days, compared to the “Routine Care” patients Ward LOS of 4.4 ± 0.9 days at 95% confidence interval (CI). The mean total LOS at 95% CI for the “Routine Care” patients was 6±1 days and 4.3±0.6 days for “MEND” patients which was statistically significant*(p<0.05). Combined, these results indicate a favorable reduction in LOS following the implementation of MEND.

Figure 1. Calculation of patient LOS following MICS was performed via retroactive, confidential collection of patient and statistical analyses were performed using R Studio (Version 2023.12.0+369). A boxplot showing all data points and one with outliers excluded were produced for each LOS category investigated.

CONCLUSION

This preliminary comparison indicates a favorable change in patient LOS after the implementation of our program, which may have positive implications in patient satisfaction and organizational flow. The time spent in ICU was similar in both study groups and has little space for further reduction. However, patient LOS on the ward was significantly decreased, which reduced the total LOS considerably. Although the impact of the COVID-19 pandemic may be a statistically confounding variable, its onset created the impetus to reduce potential COVID-19 exposure by targeted efforts to decrease patient stays following elective MICS CABG. Ultimately, enabling pre-operative medical optimization of comorbidities and increasing patient preparedness for short LOS, active de-medicalization, multi-disciplinary collaboration and early post-discharge follow up decreases LOS in hospital and can increase institutional capacity. Future directions for this research could include propensity matched analysis and a multi-center randomized control trial to reduce inherent biases and demonstrate generalizability.