

Improving outcomes in Multisystem Inflammatory Syndrome in Children (MIS-C)

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BACKGROUND: Multisystem inflammatory syndrome in children (MIS-C) was first identified in April 2020 as a post-infectious complication of COVID-19 infection. Due to the novelty of MIS-C, there were no consensus guidelines on management, but as data has been collected, we have worked towards a more unified evidence-based approach.

OBJECTIVES: We created an MIS-C pathway with the goal of decreasing length of stay, PICU admission, escalation of treatment, and re-admission rates, all by at least 10%.

METHODS: A multidisciplinary meeting (pediatric hospitalists, infectious disease, rheumatologists, hematology oncologists) was held and a clinical pathway for MIS-C was created on 2/19/21, based on available evidence. This pathway outlines workup, diagnosis, and management. An accompanying order set was created. We used PDSA cycles to implement and then reinforce usage of the evidence-based MIS-C pathway. Our outcome measures included length of stay, PICU admission, escalation of treatment (from IVIG and low-dose steroids to anakinra and high-dose steroids), and re-admission rates.

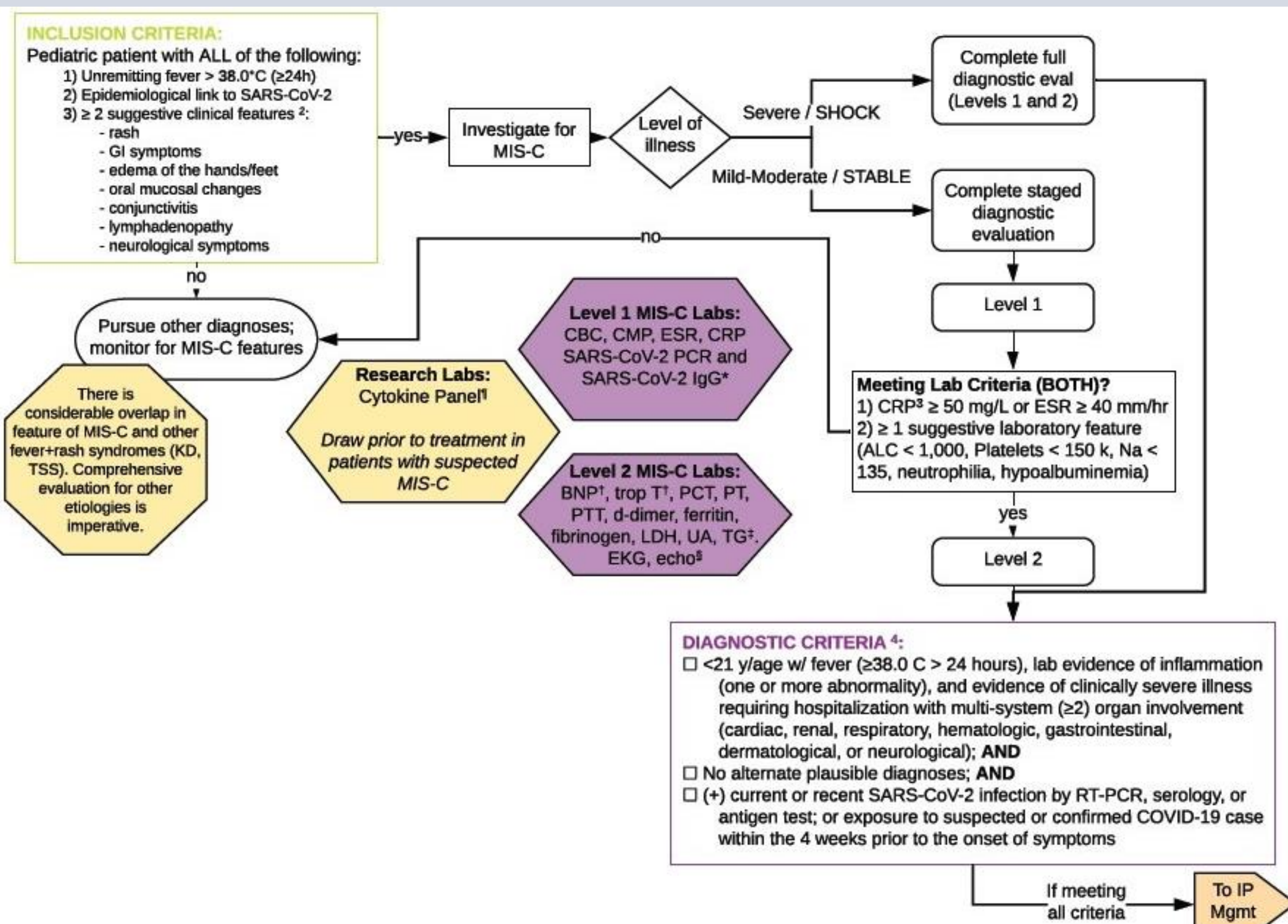


Image 1a. MIS-C pathway, diagnostic phase.

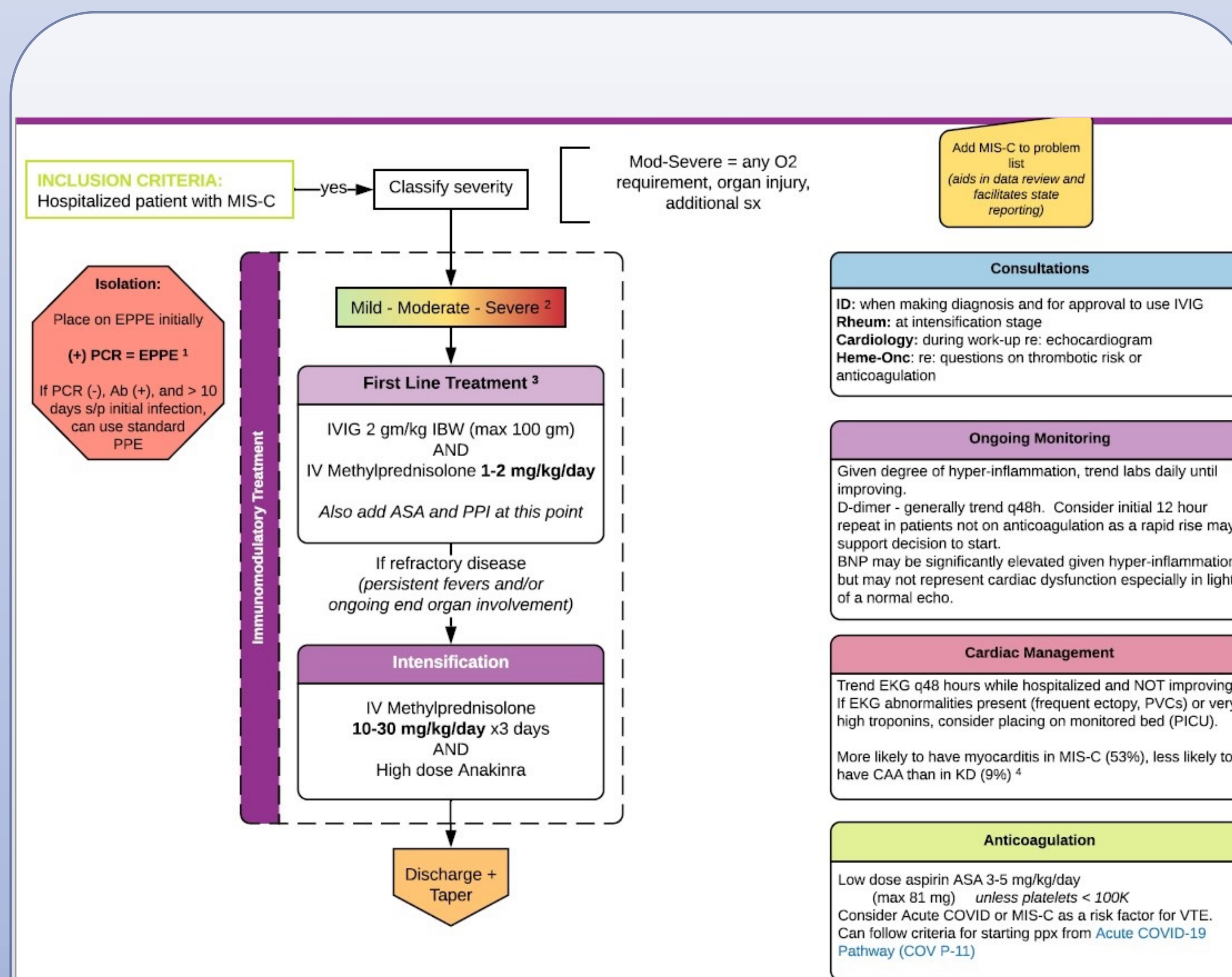


Image 1b. MIS-C pathway, inpatient management phase. Not pictured: follow-up management phase, which describes outpatient follow-up with subspecialists.

RESULTS: 81 patients were admitted to Upstate Golisano Children's Hospital from 4/2020 to 12/2021. Our intervention points included implementation of the pathway (2/2021) and updates to the order set with reminder emails (11/2021). Length of stay decreased from a mean of 120 to 102 hours after implementation of the pathway (a 15% decrease). There was no change in rate of PICU admission. Steroid intensification decreased from 22% to 13% (a 41% decrease), anakinra use decreased from 15% to 13% (a 13% decrease). Rate of re-admission increased from 8% (2 of 25 cases) to 14% (4 of 28 cases).

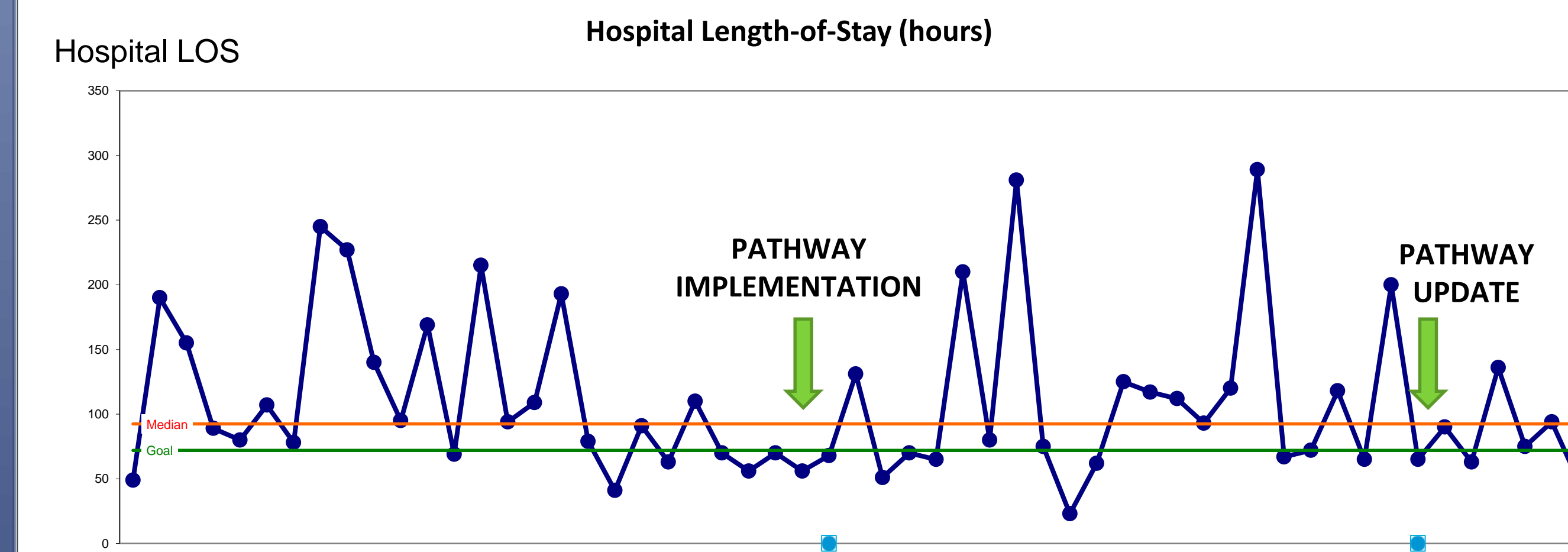


Table 1. Hospital length of stay over time. The two arrows indicate when the pathway was implemented and when it was updated with reminders sent out. Median length of stay decreased after implementation of the pathway, and we had a higher proportion of patients reach the goal length of stay, although some patients still had prolonged hospital courses.

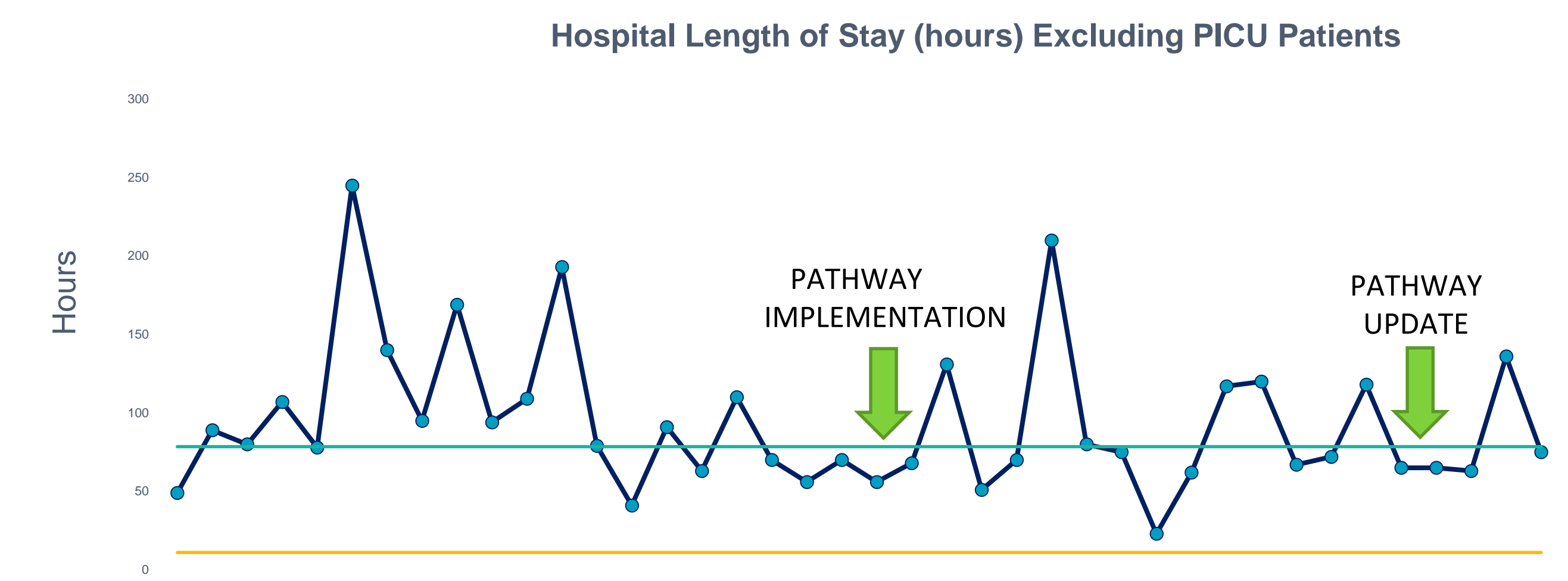


Table 2. Hospital length of stay for patients on the inpatient floor, excluding patients who were transferred to the PICU. When critically ill patients are excluded, the effect of the pathway on length of stay is more apparent. There are still a few patients with prolonged length of stay even on the floor.

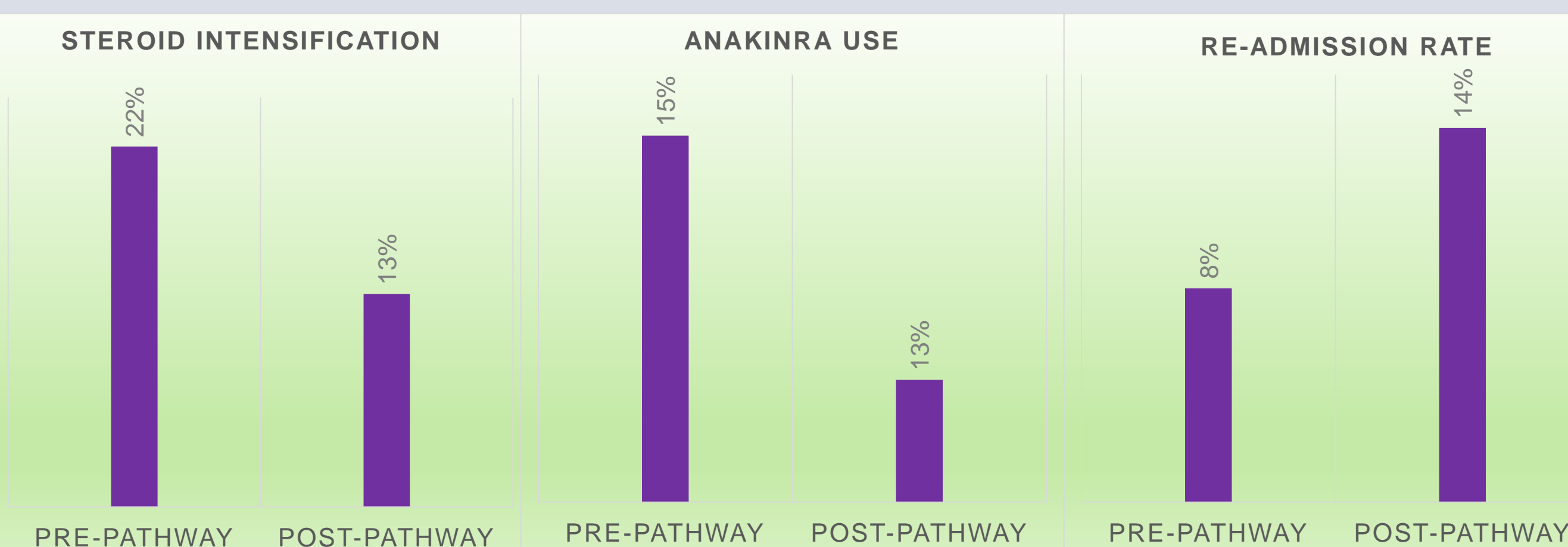


Table 3. a) Need for steroid intensification (from 2 mg/kg to 30 mg/kg) decreased after implementation of the pathway. B) Need for anakinra decreased after implementation of the pathway. c) Re-admission rate increased after implementation of the pathway, but this represents just two additional re-admissions compared to prior to pathway.

CONCLUSION: Implementation of an evidence-based pathway for MIS-C at our center resulted in a decrease in length of stay and a decrease in need for medication intensification. Both our overburdened hospital system and our patients benefit from these changes. There was no change in need for PICU, which reflects that the disease remains severe in a subset of patients despite standardization of treatment. However, we discovered that patients may be more likely to be re-admitted to the hospital after implementation of the pathway. We plan to investigate this further to see if patients would benefit from a longer observation period on their steroid taper prior to hospital discharge.

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