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Implementation of Stroke Pathways to Reduce Length of Stay, Cost, Readmissions, and Mortality

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OBJECTIVE

To reduce length of stay (LOS) and variable cost per case for stroke cases on a Neuroscience unit in a community Comprehensive Stroke Center using standardized, evidence-based clinical pathways.

BACKGROUND

Acute stroke is a major contributor to healthcare costs. In 2012, estimated direct costs associated with stroke were $71B, which is projected to double to $184B by 2030. As healthcare evolves and reimbursements decrease, cost control is critical. In January 2017, LOS, variable and total cost/case peaked at our hospital at 5.25 days, $7.8K and $18K, respectively. In fiscal year 2017 the 30-d readmission rate was 9% and the mortality rate was 12%. Compliance with stroke admission order sets was at 55%.

METHODS

A multidisciplinary committee was formed in 02/2017 to develop standardized, evidence-based clinical pathways for three populations:

- Ischemic stroke (IS) treated with IV t-PA
- TIA/IS without IV t-PA
- Intracerebral hemorrhage

The team met biweekly to standardize clinical pathways, decrease time to follow-up imaging, focus on physician order set utilization, and control costs. A comprehensive education program was rolled out and implementation of the pathways was in 11/2017. Pathways are discussed daily in stroke and rapid discharge rounds to ensure compliance and identify opportunities for improvement.

RESULTS

We reviewed a retrospective financial report of all in-hospital cases coded as MS-DRG 61-69 from 12/2017 through 12/2018 and compared it the 1/2017 report for **adjusted LOS (ALOS)** (Fig. 1), **case mix index (CMI)** (Fig. 2), **variable and total costs per case** (Fig.3), **readmissions** (Fig.4), and **mortality** (Fig. 5).

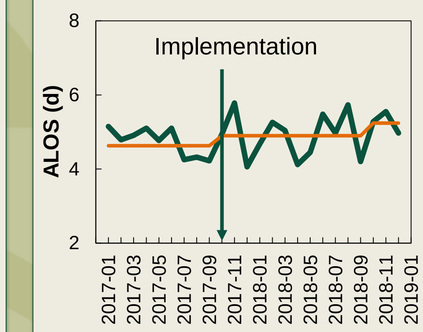

Figure 1. **Monthly** and **fiscal year** ALOS

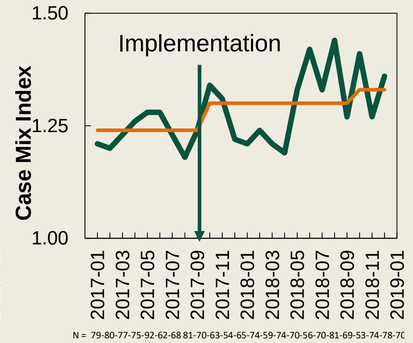

Figure 2. **Monthly** and **fiscal year** CMI

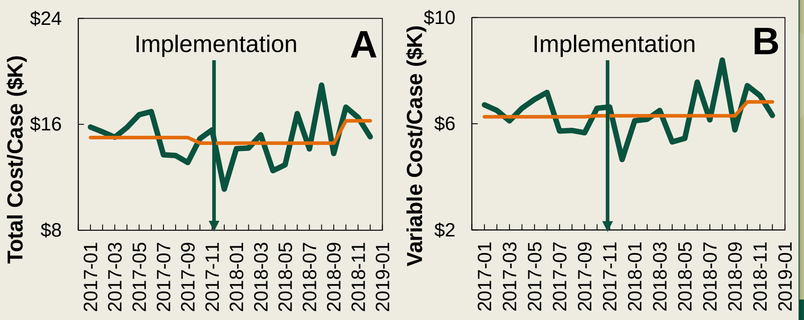

Figure 3. Total (A) and Variable (B) cost/case **per month** and **by fiscal year**

RESULTS

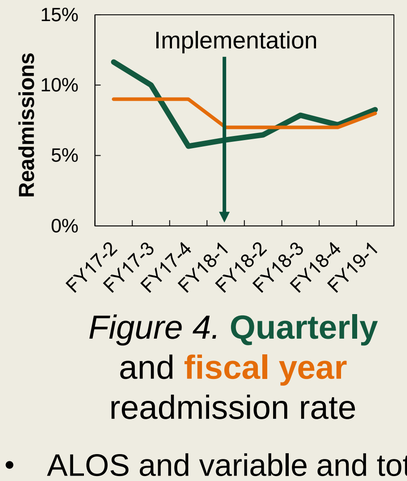

Figure 4. **Quarterly** and **fiscal year** readmission rate

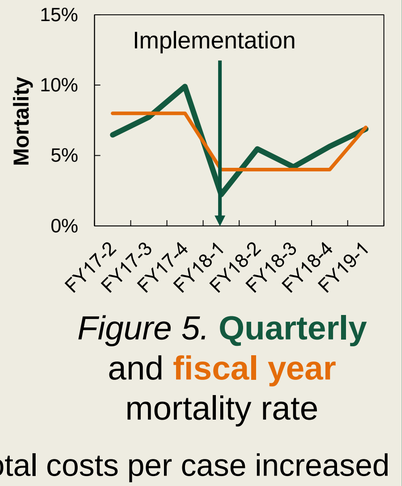

Figure 5. **Quarterly** and **fiscal year** mortality rate

- ALOS and variable and total costs per case increased starting in June 2018
- Mimicked CMI increase which started in June 2018
- Readmission and mortality rates decreased since January 2017, and then increased slightly since implementation in November 2017
- Order set compliance was 91% as of June 2018, but dropped to 87% by December 2018

CONCLUSIONS

- Standardization of stroke clinical pathways may lead to reductions in variable and total costs per case, and shorten length of stay without increasing mortality or readmission rate, however the effect was not sustained.
- This result may be because of increased CMI or a drop in order set compliance rates. Further analyses are required.