



Background

- A North Carolina based population study found a total of 10.1% of visits for women aged 15–44 years were pregnancy-associated in 2016–2021 with 15.5% of those resulting in hospital admission
- Maternal mortality has increased in the last decades in the United States as a result of increasing maternal age and prevalence of coexisting medical diseases such as hypertension, diabetes, and both acquired and congenital heart diseases
- Pregnant patients using the ED represent a high-risk, vulnerable population and may benefit from routine ED screening and linkage to early prenatal care and psychosocial interventions
- Pregnant patients are more likely to be under-triaged with an overall theme of acuity blindness, with identified barriers to assessment that included educational needs and triage processes and workflow issues.
- Many hospital have adopted an OB triage model in which pregnant patients present to labor and delivery unit for assessment and treatment of acute medical complaints often with a cutoff of >20 weeks gestation
- The Maternal Urgent Care was introduced to Stony Brook in December of 2018 with the goal of improving care for patients with pregnancy related complaints, reducing hospital stay time for this population, and streamlining the surgical/admissions process where applicable
- Per MUC algorithm, patients ESI level 3-5 patients <36 weeks pregnant OR >36 weeks pregnant not presenting for delivery should be triaged and evaluated in ED for clinical stability to be sent to MUC whereas all pregnant patients >36 weeks pregnant presenting for delivery should be registered in ED and immediately sent to MUC. Patients of ESI level 1-2 or patients with homicidal/suicidal ideation, are confused/lethargic/disoriented, or requiring negative pressure isolation shall be evaluated in ED by consulting OB team

Objective

- Analyze impact of the Maternal Urgent Care on workflow metrics including ED length of stay, time to admission, and time to discharge
- Evaluate for statistically significant changes in use of formal ultrasound, operative procedures, diagnosis of miscarriage in pre and pos MUC periods
- Identify common complaints/concerns of pregnant patients that prompt them to seek medical evaluation

Methods

- Study Design
- Structured, Retrospective Electronic Medical Record Review

- Patients and Setting
- Patients presenting to Stony Brook Hospital Emergency Department between 7/1/2018-6/30/2019
 - Patients identified to have OB related complaints (while pregnant or recently postpartum)

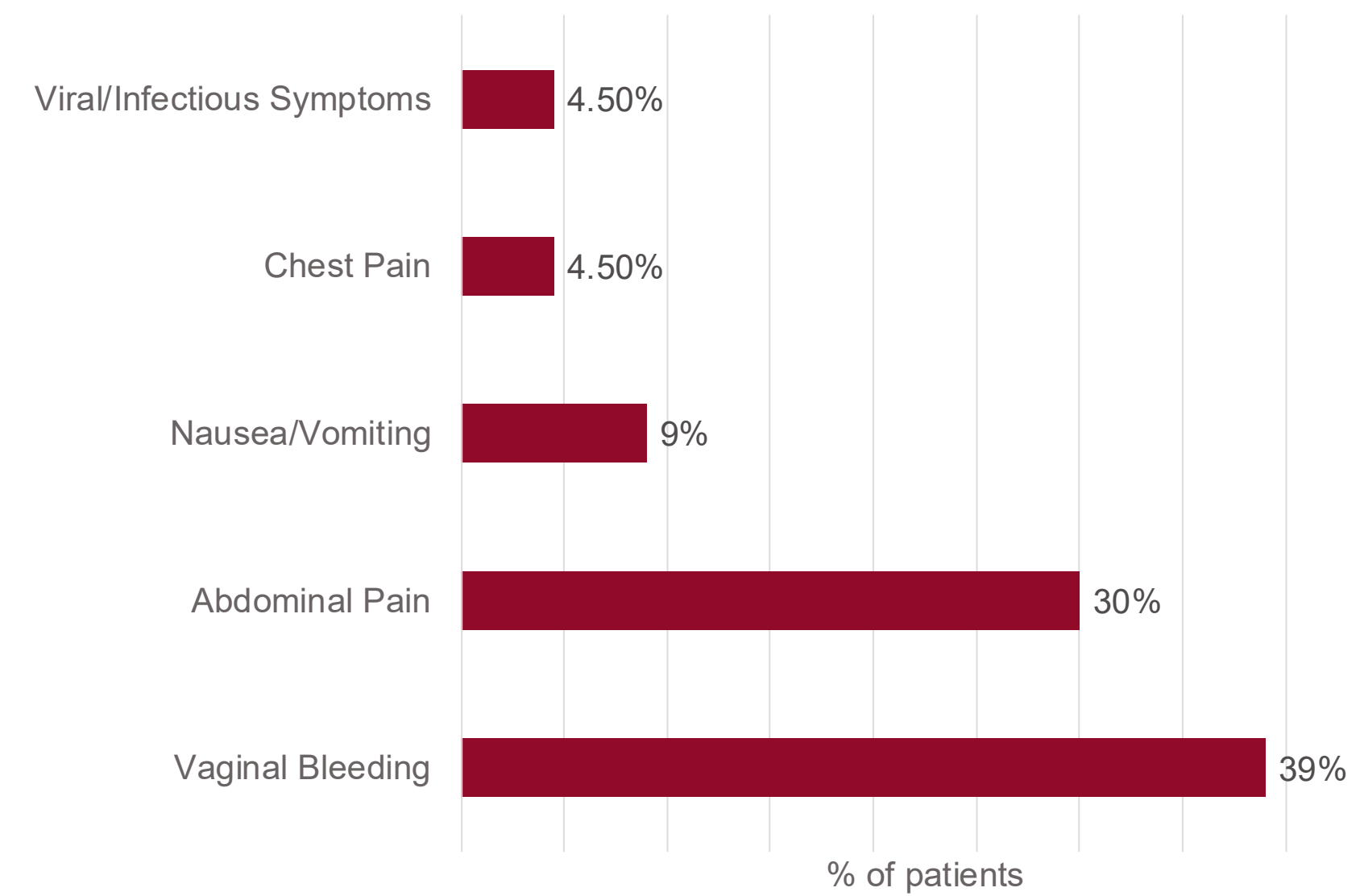
- Data Source and Collection
- Retrospective Chart review of patients from 7/1/2018-6/30/2019
 - Times to triage, lab draw, admission/discharge, ED length of stay; presenting complaint, final diagnosis, OB/GYN consults, formal ultrasounds, diagnosis of miscarriage, operative procedures

- Outcomes
- Primary outcome: Change in ED length of stay, Hospital length of stay for discharged patients, Time to admission, time to lab draw
 - Secondary outcome: change in frequency of admission/discharge, formal ultrasounds, operative procedures, diagnosis of miscarriage

- Data Analysis
- 2 sample T-test to evaluate change in mean from Pre-MUC and Post-MUC time data
 - Chi-square analysis to evaluate for statistical significance in whether patient was discharged/admitted, had a formal ultrasound, required operative intervention

Results

Most Prevalent Chief Complaints



Chief Complaint	# of patients (%)
Vaginal bleeding	78 (39%)
Abdominal pain	60 (30%)
Nausea/vomiting	18 (9%)
Chest Pain	9 (4.5%)
Viral/Infectious Symptoms	9 (4.5%)
Ectopic Pregnancy (follow up)	8 (4%)
Positive Pregnancy Test	6 (3%)
Trauma (MVC or fall)	6 (3%)
Shortness of Breath	4 (2%)
Headache	3 (1.5%)

LOS data	Pre-MUC (min)	Post-MUC (min)	Difference (p value)
Mean ED LOS (±SD)	389.29	142.23	247.06 (<0.01)
Mean MUC LOS (±SD)		200.42	
Mean total LOS (±SD)	391.89	294.01	97.88 (<0.01)
Mean time to lab draw (±SD)	70.14	47.57	22.57 (<0.01)
Mean time to admission (±SD)	449.66	307.40	142.26 (0.34)

Raw Demographics Data	Pre-MUC	Post-MUC
Total patients sampled	98	103
Discharges	90	98
Admissions	6	5
LWBS/eloped	2	0
Formal ultrasounds	69	38
Patients diagnosed with miscarriage	18	9
Operative procedures	10	10
Patients that remained in ED for evaluation		25
OB/GYN consults	52	18

Results

- Mean ED length of stay decreased by 247.06 minutes following initiation of MUC with a p-value of <0.01 (1.21x10⁻¹⁷)
- Mean total length of stay decreased by 97.88 minutes with a p-value of <0.01 (1.37x10⁻⁴)
- Mean time to lab draw decreased by 22.57 minutes with a p-value of <0.01 (5.86x10⁻³)
- Mean time to admission decreased by 142.26 with a p-value of 0.34 which did not represent a statistically significant change.
- Of patients admitted after initiation of MUC initiative, only 2 out of 5 were admitted from MUC while the remainder remained in the ED until admission.
- Chi-square testing revealed a statistically significant decrease in formal ultrasound orders (p-value 2.47x10⁻⁶) but no statistically significant change in patient demographics including age, discharge/admission rate, operative intervention rate, rh status
- Across all data approximately 93.5% of all patients were discharged, 5.5% of patients were admitted, 0.01% LWBS/eloped before completion of workup, and 10.0% received operative interventions
- Prior to MUC, 53.1% of patients had OB/GYN consults, following the initiation of MUC approximately 24.3% of patients remained in ED for treatment of which 72% had OB/GYN consults in ED.

Discussion

- The MUC initiative was successful in reducing length of stay for pregnant patients thereby also limiting exposure time to pathogens they might contract in a hospital setting and freeing ED rooms. This would be especially beneficial during the COVID pandemic (though this study did not include visits during that time period).
 - Given that a large majority of patients presented with chief complaints of vaginal bleeding and abdominal pain, additional targeted education on these topics during routine outpatient visits, prenatal visits, or ED visits for other complaints may be beneficial.
- Limitations
- This data set did not differentiate between patient with single or multiple visits which may have affected LOS data. Some patients presented multiple times for 2nd/3rd dosing of methotrexate with overall short length of stay.
 - This study is limited in admission information due to overall low number of admitted patients, future work can be done with a more robust or expanded data set to capture more admissions data for changes in time to admission, admitting diagnoses, total hospital LOS for admitted patients, etc.
 - While this data is useful to SBUH, OB triage at other locations may differ in practice and protocol and may see different results.

Conclusions

- Following initiation of the MUC initiative, there was a statistically significant decrease in mean ED length of stay, mean time to lab draw, and mean total length of hospital stay for patients presenting with pregnancy/postpartum related complaints to the ED.
- There was no statistically significant change in patient demographic data following initiation of MUC
- There was not a statistically significant change in mean time to admission; however, admission data is limited due to small sample size of admitted patients and would benefit from more robust sampling.
- Furthermore, as the majority of admitted patients following initiation of the MUC initiative did not get transferred to MUC, but rather remained in the ED for treatment, it is difficult to draw conclusions on the impact of MUC on time to admission.