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Research Article

Hazm Mebaireek General Hospital's Effective Strategy to Improve Healthcare Outcomes for Pneumonia Patients

Manish Barman[1]*, Muhammad Sharif[2], Mohamedali Gaafar[3] and Muayad Kasem Khaled Ahmad[4]

[1]*Hospitalist, Hamad Medical Corporation, Doha, Qatar*

[2]*Consultant Medicine, Hamad Medical Corporation, Doha, Qatar*

[3]*Consultant and Head Hospital Medicine, Hamad Medical Corporation, Doha, Qatar*

[4]*Assistant Chair, Department of Medicine, Hamad Medical Corporation, Doha, Qatar*

***Corresponding Author:** Manish Barman, Hospitalist, Hamad Medical Corporation, Doha, Qatar.

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Abstract

Hazm Mebaireek General Hospital as part of an integrated delivery system of Hamad Medical corporation serves predominantly young male worker communities throughout Qatar. We recently challenged ourselves to improvise the care process workflow for pneumonia patients visiting our hospital. This meant building improvised evidenced-based protocols (and driving their adoption) by assigning a team of physician group to research and improve patient flow, communication, and eventually plan to undertake deploying an analytics application in the Electronic health record-CERNER to provide near real-time feedback on compliance and performance. Through these efforts, HMGH has realized significant outcome improvements in the initial trial phase of 6 months as documented by increased compliance of CURB65 screening and further management in an appropriate setting leading to decrease in LOS for pneumonia patients, increasing capacity building, reduction in average variable cost per patient, reducing healthcare waste and increased patient satisfaction rates.

Keywords: *Cost Effectiveness; Length of Stay; Population Health; Quality and Process Improvements; Outcomes*

Abbreviations

HMGH: Hazm Mebaireek General Hospital; HMC: Hamad Medical Corporation; CCITP: Clinical care improvement training program; HHQI: Hamad healthcare Quality Institute; EMR: Electronic medical records; LOS: Length of stay; ED: Emergency Department; CURB 65 (Acronym): Confusion, Urea, Respiratory rate, Blood pressure, Age 65 years.

Introduction

Hazm Mebaireek General Hospital and pneumonia

Community-acquired pneumonia (CAP) is a very common diagnoses managed by a public hospital (Figure 1) and provides good opportunity for providing value-based care and minimizing care process variation [1,2]. Severity assessment of pneumonia at presentation is of utmost importance to chart out further management plan. Although enough recommendations have been made to standardize the care process, many variations do exist in any given facility due to physician practice. Health systems often endeavor to align with evidence based best practices to reduce healthcare waste [1,2]. Analytics showing appropriate risk stratification based on prognostic tools and scores should ideally benefit the healthcare providers for making a correct judgment.

In January 2019 as part of a Clinical care improvement training program (CCITP-2) of Hamad Healthcare Quality Institute HHQI we established a workgroup taskforce to develop a pilot project under the able sponsorship of Medical Director- Dr Hani Ben Hassen Al

Kilani, to improve pneumonia patient outcomes based on established evidence based best practices worldwide. Under guidance from senior leadership at HMGH and our Quality Coach Dr Sikandar Aftab, we established a strong performance improvement structure in place led by physician and operational leaders, comprising of Clinical Collaboratives and Workgroups, that is, teams focused on improving patient outcomes and reducing cost in each one's assigned focus area.

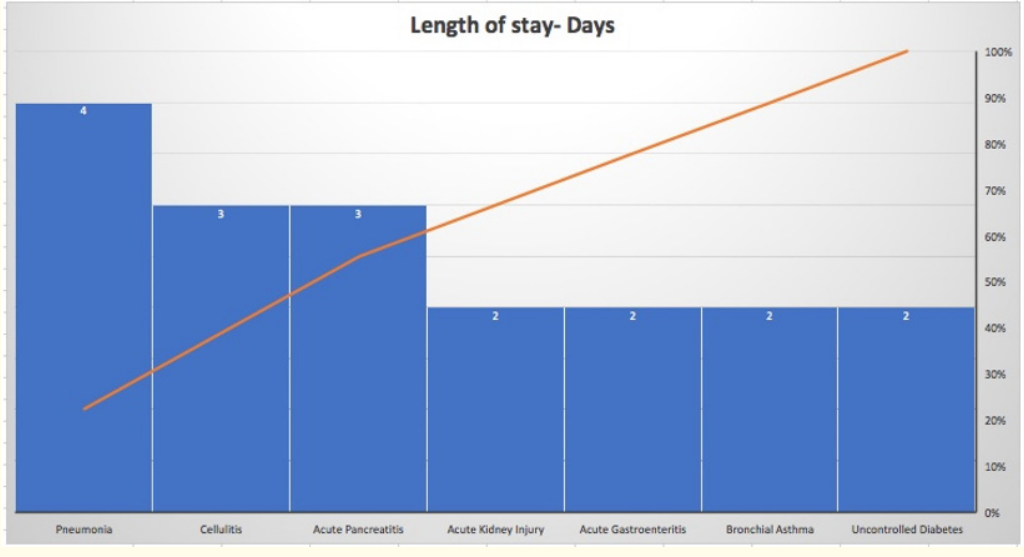

Figure 1: *LOS (Length of stay) for top 7 common diagnoses in HMGH.*

Methods

Challenges to improving outcomes for Pneumonia patients

A wide range of service providers and service venues, Emergency department, Outpatient clinics, Inpatient services etc. are inevitably involved in the care of pneumonia, which meant that our team be diverse and varied to focus different care locations and personnel of the hospital. Each staff involved in the care process was heard, all workflows and patterns studied to creative and improvise the approach to process improvement, effective communication, and content deployment. That said, Workgroup members shared a common purpose to improve the care of their patients, and a common set of overarching goals:

- Increase compliance of validated and evidence based prognostic tools for admission to hospital recommended by International thoracic societies and guidelines.
- Reduce pneumonia readmission rate.
- Reduce healthcare waste (Resource utilization, IV Antibiotic use, In hospital infection rates etc.)
- Prevents exposure of patients to hospital-acquired infections.
- Reduces length of in hospital stay, staff overtimes and bed utilization.
- Reduction in providers average cost per case.
- Build on both patient and hospital staff satisfaction rates.

To achieve these goals, Workgroup members worked collectively to overcome several challenges that stood in the way, some related to being part of a large health system with different beliefs, culture and skills, and all underscored by limited access to quality data.

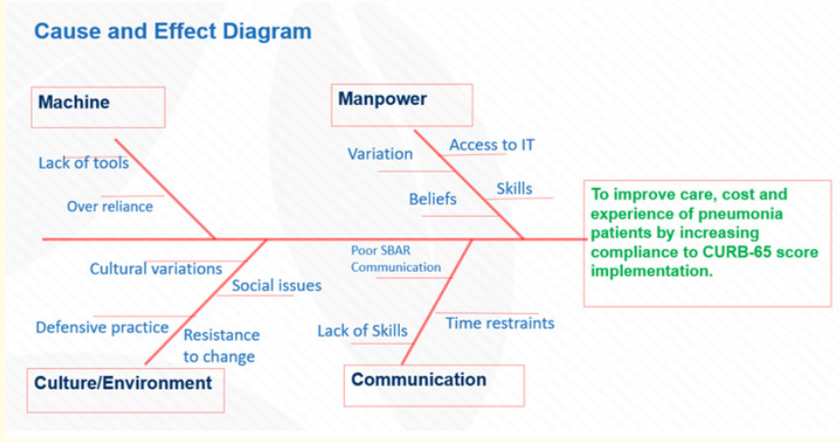

Figure 2: *Cause and Effect diagram depicting several challenges.*

Aggregating data for root cause analysis: To fully understand the problems and root causes, members had multiple brainstorming sessions to have a deep and data-supported understanding of patient flow, workflows, disease process, prognostic severity scores, care routines, and patient outcomes associated with pneumonia. Across the board surveys were conducted for data analysis (Figure 3). To ensure sustainability we intended to target simple strategies which could translate into meaningful metrics and rewarding impact.

Survey Questionnaire. Project CCITP

Why Health Care Practitioners are not implementing Pneumonia scoring systems in their practice?

1. Do you manage pneumonia patients in your practice? A) Yes B) No
2. If Yes- Specify location.

   A) Outpatient clinic B) ED C) Ward
3. How is disease severity of CAP currently assessed? .....

   .....
4. Do you use a scoring system for pneumonia patients? A) Yes B) No
5. What influences your decision making in planning the management?

   A. Scores B. Pure Clinical Judgement C. Both D. None
6. Can you identify at least 2 scoring systems for Pneumonia patients?

   1) 2)
7. What are the benefits of using scoring systems in practice?

   A. Evidence based B. Discharge planning C. Value based D. All of above
8. Can it be implemented at your work place? A) Yes B) No
9. Is the CURB-65 tool used by your practice/department? A. Yes B. No

   a. If yes, how is it used? 1. To direct your disposition 2. To refer to Inpatient services

   b. Who completes the tool? 1. Triage Nurse 2. Physician 3. I don't know

   c. Are the elements captured electronically? 1) Yes 2) No
10. Would you be happy to risk stratify pneumonia patients using CURB 65 scoring for their further management planning? A) Yes B) No C) Not sure

Figure 3: *Pre-survey questionnaire.*

Content deployment: The diversity of our team helped us to eventually develop a standardized protocol which was easy to contrive, administrable and proved effective to define best practices amongst all healthcare workers. This required building consensus across the system. We built a business case through repeated PDSA cycles in a pilot case to demonstrate the evidence to convince the management to adopt a standardized protocol to be later incorporated in electronic health record system CERNER across the corporation.

Results and Discussion

Efficacious planning, resources and processes amalgamate to make consequential alterations in pneumonia patient care

The diversity of our taskforce helped us to target isolated care locations and stich the workflows in a bead to address a complex clinical condition. The diversity did not pose a threat to the process, it instead led multiple stakeholders to create an exceptionally effective, patient-centered and outcomes-focused approach. The brainstorming sessions helped us to focus on the key issues that needed to be. Here Workgroup members critiqued, abstracted and surveyed and analyzed charts to pinpoint the processes, interventions, and outcomes that pneumonia patients were experiencing. Simultaneously we did an extensive literature review to benefit from other practice experiences to formulate a workflow best suited for our hospital.

What became evident through intensive research and chart audits was that not all pneumonia is the same. The orders and processes needed to entertain the statutory variations and account for the local population needs amongst the patients. Based on these analytics we focused our efforts on the most pertinent process change which can garner a mutual acceptance and show beneficial results.

- Focus a sub-group on developing strategies for effective 'double' initial screening of pneumonia patients- On arrival and once before admission is considered- against validated CURB-65 pneumonia severity score (Figure 4).
- Formulating comprehensive order set for pneumonia.
- Focus a sub-group on developing orders to reduce the overuse of radiology procedures and assure patients receive the right level of care in the right clinical setting.
- Improve process for discharge appointments and follow up phone calls.

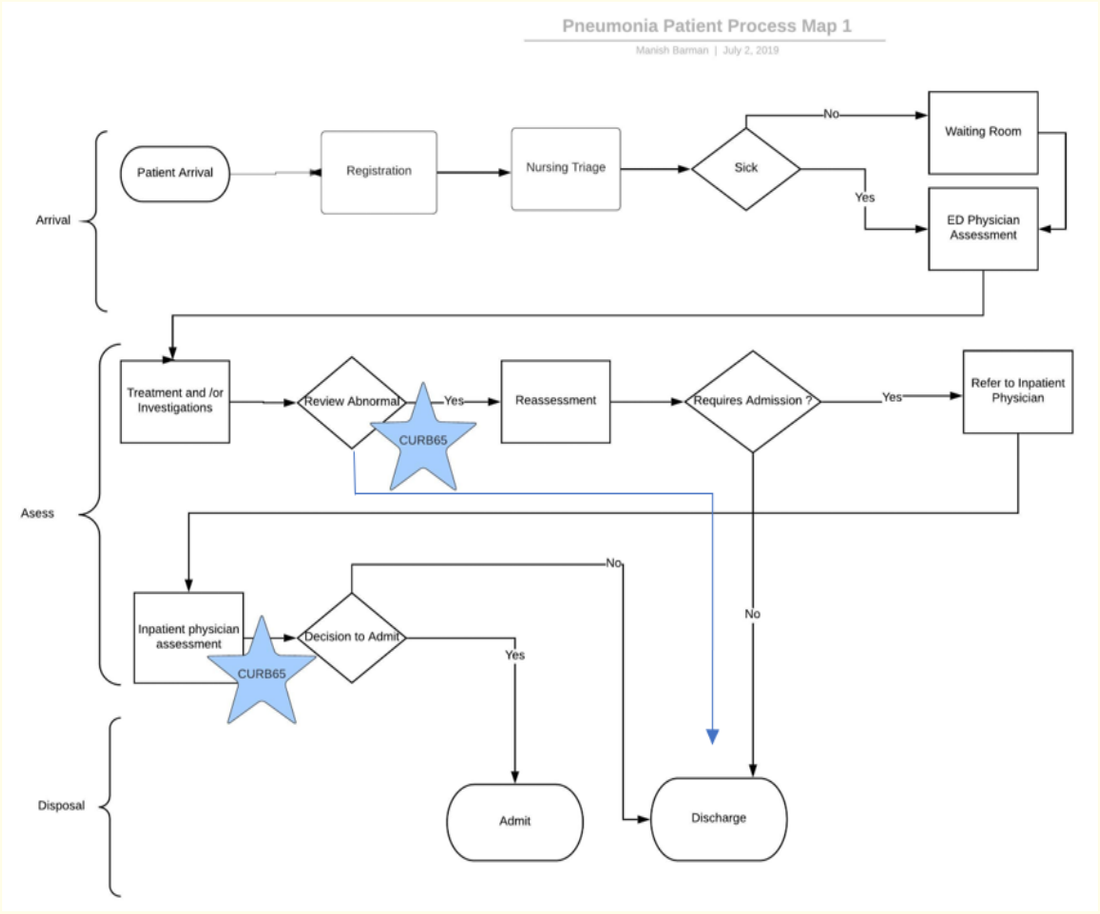

Figure 4: *Interventions across Pneumonia patient flow.*

Content and deployment

Creating pathways systemwide: Constructing a workflow with flexibility to account for variation for subsets of pneumonia patients involved comprehensive work from various departments, right from the triage team in emergency department up till case manager at discharge. To identify the appropriate care for each subset of pneumonia patient, physicians were entrusted with score tagging each pneumonia patient with CURB65 criterion seen by them on first encounter to guide further processes of care, the pharmacists contributed with best practice recommendations to formulate a list of appropriate antibiotics with correct dose regime for each subset of pneumonia patients. Meanwhile, nursing and respiratory therapists also contributed in for provision of more effective care and patient education. The case manager was entrusted for checking the appropriate discharge instructions and follow up appointments.

Cost efficiency: Targeted implementation to reduce waste. Among the most notable were the initial screening by CURB65 for help deciding appropriate care setting- Outpatient Vs Inpatient, concerted effort to eliminate unnecessary radiology procedures etc.

Engagement and adoption: The protocols were carefully constructed to respect the individual department workflows and was implemented simultaneously across the board. Feedback loop was reviewed and analyzed every week. Workgroup members overcame provider resistance by acting as external change agents charged with the task of motivating changes in physician behavior by increasing compliance to initial screening tools.

Establishing post-discharge care: Fixing follow up appointments in medical outpatient clinics at two weeks.

Results

This Workgroup's achievement was not just what was achieved, but how. The Pneumonia Workgroup set an exemplar using creative communication tools ensuring active involvement, participation, acceptance, and cooperation across the organization and the communities it represents. Within 6 months of the initiative, the Pneumonia Workgroup provided the following results.

High-level outcome measures:

- Overall increase in Compliance rate of CURB-65 Screening in pneumonia patients from 15% in February 01 to 65% by June 30th, 2019.
- 33% drop in length of stay for patients with pneumonia.
- Drop upto 50% in pneumonia readmissions.
- Total variable cost drop of 25% per patient (charge ratio). By providing cost-effective services.

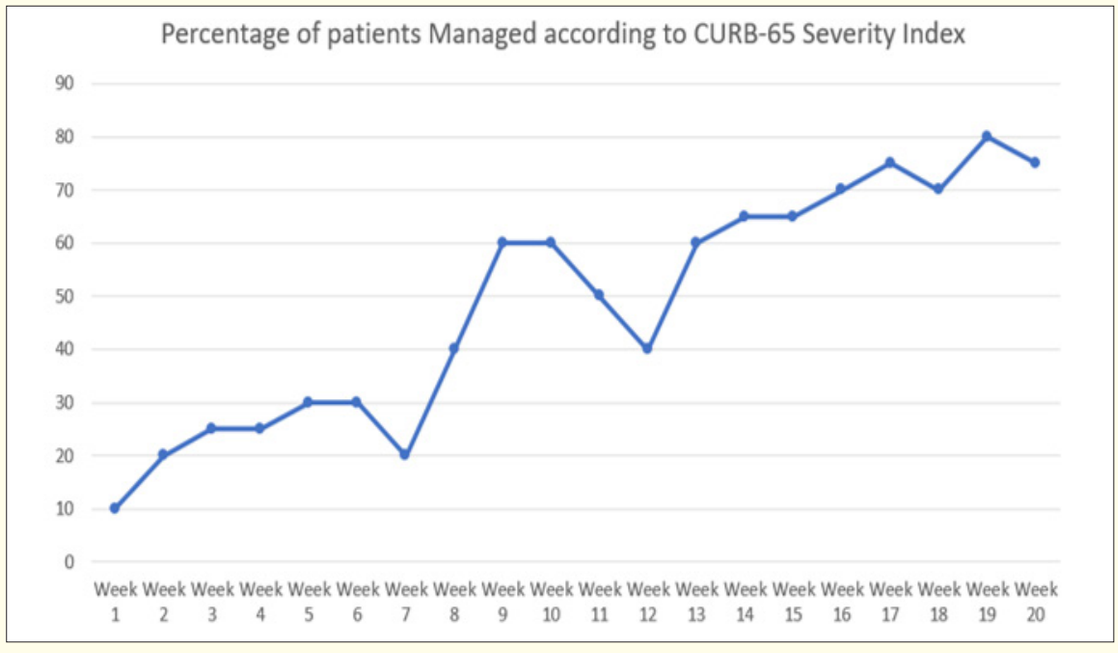

Figure 5: *Percentage of pneumonia patients managed according to CURB 65 screening.*

Process improvements:

- Adopting best practices suited for local population.
- Improve patient triage on the basis of CURB-65 scoring system.

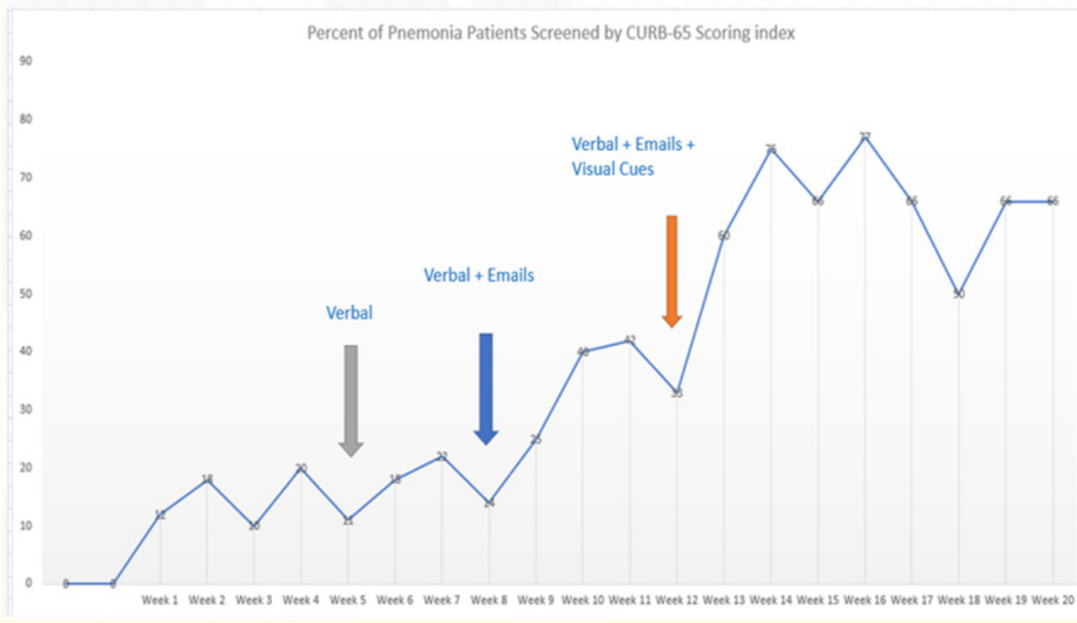

Figure 6: *Increasing compliance to CURB65 Screening.*

Balancing measures:

- Staff and Patient Satisfaction.
- Cost Effectiveness reduction in IV Antibiotics use and bed utilization.
- Increasing Capacity.

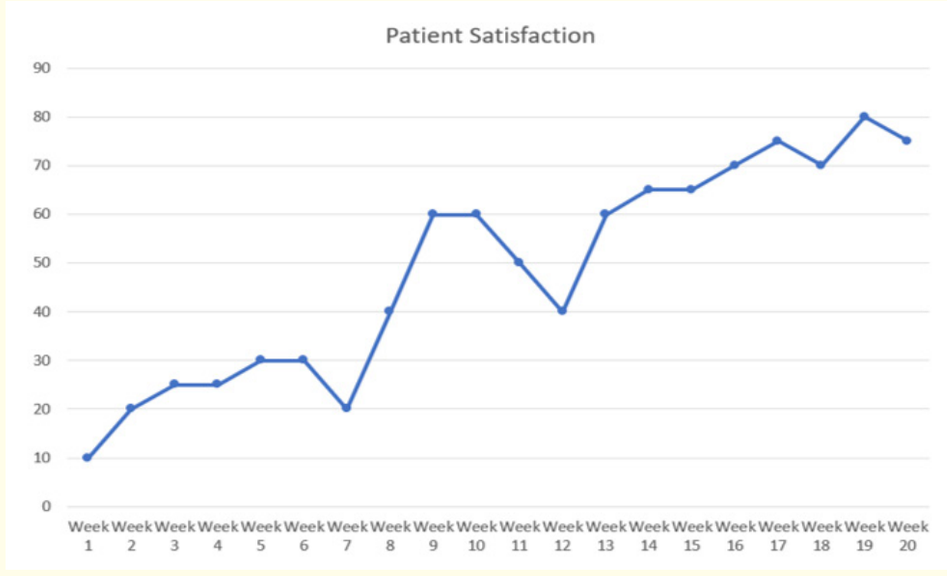

Figure 7: *Patient satisfaction rates (percentage).*

Conclusion

Improvement in processes of care achieved by these interventions in our hospital resulted because of help by voluntary participation of most of the staff. Team members acted as external change agents charged with the task of motivating changes in physician to improve patient outcomes by increasing compliance to evidence based initial screening tool for pneumonia patients. The project has demonstrated that effective initial screening of pneumonia patients has the potential to reduce unwanted use of inpatient care and hence reducing healthcare waste as has been carried out in our hospital unit.

What's next- sustainability

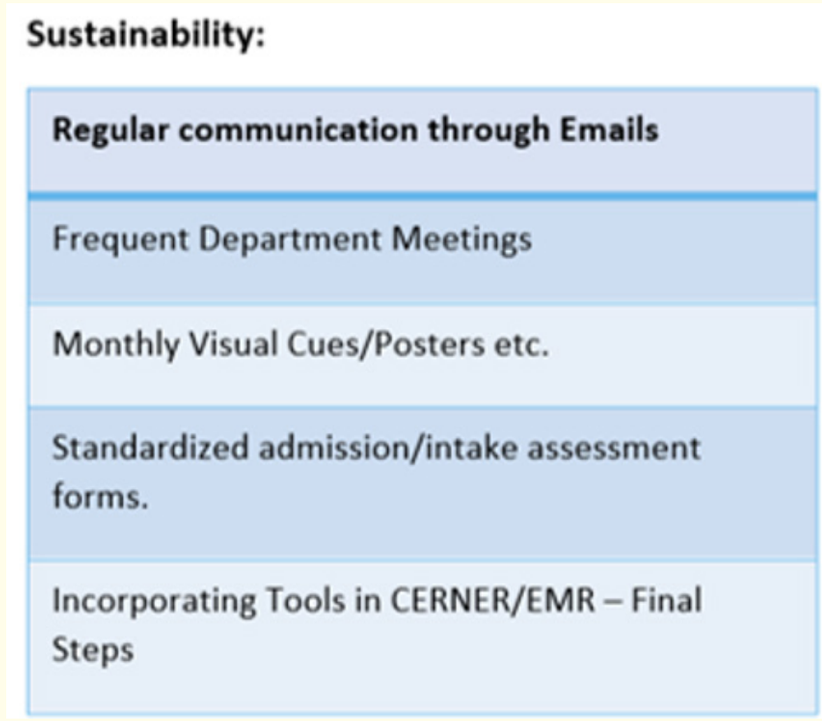

Figure 8: *Sustainability plans.*

Our next steps are to standardize the triage and admission intake forms until we implement the use of the CURB-65 Severity Score [3] in the electronic health care records system CERNER used across the medical corporation. The taskforce is optimistic and is dedicated to optimize the process outcomes ensuring value in healthcare provision [4-9].

Acknowledgement

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Nil.

Conflicts of Interest

All authors declare that there are no conflicts of interest.

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