

GROOM-Q4: An Innovative, Consolidated Workflow to Improve ICU Efficiency and Reduce Viral Exposure

Abstract

SARS-CoV2 is a strain of Coronavirus which has been shown to rapidly spread, causing a respiratory illness called “COVID-19”. Many institutions have implemented extreme measures to try decrease the spread of disease but find that they are increasingly lacking in both material and social resources. In this article we propose an efficient, consolidated, easy-to-remember workflow protocol. This will allow an intensive care unit to cope with large volume of patients without compromising on patient care. We have titled our protocol “**GROOM-Q4**”. This protocol allows efficient workflow and decreases need for documentation, exposure risks, PPE use and nursing fatigue, even in non-pandemic situations.

Introduction

Health disasters, such as pandemics, create new challenges for providers and often strain the resources of affected healthcare facilities. Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV2), a novel type of Coronavirus which in many cases causes a severe respiratory infection termed COVID19, now has over one million worldwide cases. (1, 2)

Healthcare systems face numerous challenges during a pandemic. These challenges include scarcity of material resources such as ventilators or personal protective equipment (PPE), and staff to treat an increasing number of affected patients. (3, 4) One significant concern posed in a time of pandemic, and in particular with SARS-COV2, is the number of infected persons who remain asymptomatic. This, combined with the limited availability of testing, has led to increased proliferation of the disease before identification. Health care workers are frequently becoming infected, further straining hospitals that are already under staffed. To address the growing workforce scarcity, the Society of Critical Care Medicine (SCCM) has proposed a tiered staffing strategy which utilizes providers trained in other specialties to manage the increased patient load. However, patient volumes may still prove to be overwhelming in the event of continued outbreak. (4)

Another important obstacle hindering Intensive Care Unit (ICU) nursing staff is patient care tasks scattered around different times. Examples of this include medication administration, measuring urine output and patient re-positioning. These tasks create redundancies throughout the day. Additionally, each of these tasks must be separately documented in the electronic medical record (EMR). The lack of coordination in patient care plans paired with extensive documentation decreases efficiency which leads to both physical as well as mental exhaustion for staff. Recognition of this problem prompted an alternative workflow plan to consolidate all elements of nursing care in order to reduce time spent on documentation, time spent at bedside and in turn limiting viral exposure.

Methods

We looked into various aspects of nursing care plans and consolidated daily activities into a more efficient, cohesive workflow. Those tasks included re-positioning or turning of patients, documentation of urine output, administration of medications, oral care and point of care glucose testing.

All nursing orders were consolidated into discrete time slots every four hours. We chose 0400, 0800, 1200, and so forth as our designated times for all nursing tasks, and limited all non-emergent or non-urgent patient contact to these time slots. Non-emergent tasks between scheduled times should be completed in the next time slot. We have titled the system **GROOM-Q4**, an easy-to-remember acronym which encapsulates and condenses the vital tasks that nursing staff accomplishes in a critical care setting. (Figure 1)

Discussions

Numerous tasks in an ICU must be completed, many of which are accompanied by frequent and extensive documentation. In our facility, the documentation of urinary output is conducted every two hours, creating excessive time spent in both checking and then documenting. The benefit to the patient from such a routine is trivial at best. In clinical experience, management of most critically ill patients does not change based upon urinary output checked hourly or bi-hourly. The administration of many medications follows the same principle: it is less important that a daily aspirin is given at a certain time in the morning, rather than that it is given daily and consistently.

We found similar redundancies in other common nursing tasks, such as the repositioning of patients. It is standard practice in the ICU, to turn or reposition every two hours in order to reduce the development of bed sores. However, there is limited data to support this practice compared to repositioning every four hours, especially with the utilization of alternating pressure mattresses available in most ICUs. (5, 6)

Implementation of the GROOM-Q4 protocol was not onerous in our ICU. Routine blood testing easily adjusted to 0400, complementing the checking of point of care blood glucose simultaneously. Glycemic control in patients with tube-feeding is routinely done every eight hours, and hence can easily be adjusted to an every four hour schedule. Oral care with chlorhexidine in intubated patients is already conducted every four hours routinely. Therefore, this can be accommodated by the new workflow with only minor adaptation.

Checking for gastric residuals in patients undergoing tube-feeding is a common practice in some ICUs. This practice does not predict aspiration risk and routine checking of gastric residuals is not recommended. (7,8,9) However, even those facilities that have a routine practice of checking gastric residuals can easily adapt GROOM-Q4 using the same scheduled time slots.

GROOM-Q4 is a consolidated approach to improve efficiency in nursing workflow in the ICU and decreases the need for additional documentation and travel time between rooms. This promotes the reduction of nursing fatigue. The workflow also limits viral spread by reducing staff exposure to infected patients and the use of PPE. It is well known that higher patient to nurse ratios is detrimental to care and is associated with an increase in sentinel events. Additionally, a large influx of patients expected with COVID19 may force providers to treat larger numbers of patients than they are accustomed to without the option of additional available staff. (10) We believe that by utilizing GROOM-Q4, along with a tiered staffing system, ICU staff will be able to provide more effective and efficient care to a greater number of patients.

Limitations

GROOM-Q4 has not yet been validated by a formal study. During this time of crisis, we lack sufficient time to test the system against a control. A formal study would be beneficial to determine efficiency of the GROOM-Q4 system as well as determine its impact on patient care. In addition, the GROOM-Q4 system primarily encompasses non-emergent or non-urgent care.

In any acute care setting, the reality of patient care is fluid and frequently changing, and not all care can be restricted to a four-hour model. Staff must be prepared to deal with sudden changes in patient condition, as in any ICU. Thus, certain interactions with patients outside appointed times, leading to additional exposure, will inevitably occur. This protocol also requires close coordination with the hospital's pharmacy in order to adjust medication times, which in our experience is not tedious. This protocol is mainly designed for patients on mechanical ventilator support. However, this consolidated approach can be used for non-ventilated patients as well.

Point of care glucose checks may be required to be done more frequently on patients requiring continuous intravenous insulin and may need adjustment of the protocol in that specific situation. Some of the elements in nursing care, such as checking for gastric residuals, are institution dependent. We understand the acronym may not be appropriate with those institutions. However, our intention is to promote a consolidative approach for the patient care.

Conclusions

During pandemics, hospitals must be able to utilize limited resources for maximum efficiency. By compressing the vital tasks of patient care management to every four hours, we believe an ICU can promote efficiency, decrease staff fatigue, minimize extraneous use of PPE, and reduce viral exposure. Our workflow, **GROOM-Q4**, emphasizes both staff and patient safety while addressing the issue of personnel and material resource scarcity. We believe that many institutions could benefit from adoption of a similar system, even in a non-pandemic situation.

Bibliography

1. European Centre for Disease Prevention and Control. 27 March 2020. <https://www.ecdc.europa.eu/en/novel-coronavirus-china/questions-answers>
2. Symptoms of Coronavirus. Centers for Disease Control and Prevention. 20 March 2020. <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>
3. Schoch-Spana M. A scarcity of life-saving resources during COVID-19 pandemic. The Hill. 22 March 2020. <https://thehill.com/opinion/healthcare/488915-a-scarcity-of-life-saving-resources-during-covid-19-pandemic>
4. Halpern NA, Tan KS. United States Resource Availability for COVID-19. Society of Critical Care Medicine 3/19/2020 [cited 3/28/2020].
5. Bergstrom N, Horn S, Rapp M, Stern A, Barrett R, Watkiss M. Turning for Ulcer Reduction: A Multisite Randomized Clinical Trial in Nursing Homes. Journal of the American Geriatrics Society 13 September 2013
6. Gillespie BM, Chaboyer WP, McInnes E, Kent B, Whitty JA, Thalib L. Repositioning to prevent pressure ulcers. Cochrane Review. 3 April 2014
7. McClave SA, Lukan JK, Stefater JA, Lowen CC, Looney SW, Matheson PJ, Gleeson K, Spain DA. Poor validity of residual volumes as a marker for risk of aspiration in critically ill patients.

Critical Care Medicine Volume 33(2), February 2005, pp 324-330

8. Poulard F, Dimet J, Martin-Lefevre L, Bontemps F, Fiancette M, Clementi E, Lebert C, Renard B, Reignier J. Impact of not measuring residual gastric volume in mechanically ventilated patients receiving early enteral feeding: a prospective before-after study. JPEN J Parenter Enteral Nutr. 2010 Mar-Apr;34(2):125-30
9. Reignier J, Mercier E, Le Gouge A, Boulain T, Desachy A, Bellec F, Clavel M, Frat J, Plantefeve G, Quenot J, Lascarrou J, Clinical Research in Intensive Care and Sepsis (CRICS) Group FT. Effect of Not Monitoring Residual Gastric Volume on Risk of Ventilator-Associated Pneumonia in Adults Receiving Mechanical Ventilation and Early Enteral Feeding A Randomized Controlled Trial. JAMA. 2013;309(3):249-256.
10. Sakr Y, Moreira C, Rhodes A, Ferguson N, Kleinpell R, Pickkers P. The Impact of Hospital and ICU Organizational Factors on Outcome in Critically Ill Patients Results From the Extended Prevalence of Infection in Intensive Care Study. Critical Care Medicine, March 2015.

Authors -

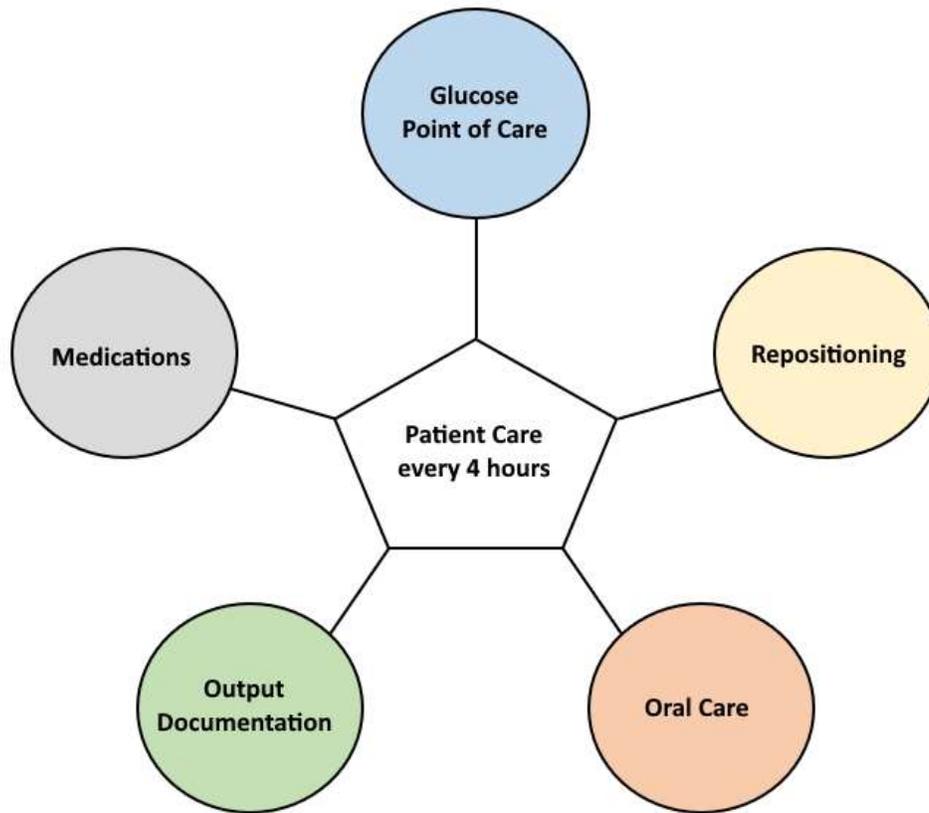
- 1) Navin Bajaj MD
- 2) Connor Ludovissy DO
- 3) James Pursglove DO
- 4) Kristen Womble-Smith PharmD, BCCCP
- 5) Stephanie C Morton BSN, RN
- 6) Jonathon Lee DO

Corresponding Author –
Bajajnavin@yahoo.com

Hospital Affiliation –
Southeastern Regional Medical Center
Lumberton, North Carolina 28358

ICU Patient Care Workflow

Figure 1 : GROOM-Q4 hourly



GROOM Q4 hour Checklist

GROOM	0400	0800	1200	1600	2000	0000
Glucose Point of Care		✓		✓		✓
Re-positioning	✓	✓	✓	✓	✓	✓
Output documentation	✓	✓	✓	✓	✓	✓
Oral Care	✓	✓	✓	✓	✓	✓
Medications	✓	✓	✓	✓	✓	✓