

Improving Reliability to a Care Goal Rounding Template in the Pediatric Intensive Care Unit

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Abstract

Background: Effective pediatric intensive care requires addressing many important aspects of care delivery during morning rounds, often achieved using a rounding checklist. Our objective was to develop a care goal rounding template and then double the reliability of discussion of rounding topics during morning rounds without the use of a checklist. **Methods:** The Institute for Healthcare Improvement Model for Improvement was used for this initiative. A care goal rounding template was established through discussions and consensus with pediatric intensive care unit (PICU) faculty. Rounds were audited in a blinded fashion over a 3-month period to obtain baseline data on rounding topic discussion. Three interventions were then trialed (plan, do, study, act cycles) over a 12-month period. Weekly reliability in rounding topic discussion was tracked. **Results:** Baseline reliability with discussion of rounding topics was 36%. The first intervention included the use of a standardized progress note in the electronic health record, which contained topics and served to prompt the discussion on rounds. The second intervention was implementation of laminated cards provided to PICU fellows highlighting the elements of the care goal rounding template. The third intervention addressed a standardized handoff sheet often used during rounds. Mean reliability for discussion of rounding topics improved to 52% shortly following the second intervention. Reliability was sustained more than 1 year later. **Conclusions:** Following the establishment of a PICU care goal rounding template and various interventions, the reliability in discussing important care goal elements on patient rounds improved. (*Pediatr Qual Saf* 2018;3:e117; doi: 10.1097/pq9.000000000000117; Published online November 8, 2018.)

INTRODUCTION

Effective pediatric intensive care requires addressing many important aspects of care during rounds. Failure to communicate or discuss essential information may lead to care failures and effect patient outcomes.¹

SUMMARY OF AVAILABLE KNOWLEDGE

The Institute for Healthcare Improvement has designed various healthcare bundles consisting of



a small set of evidence-based interventions that are generally accepted as “elements of care that should be delivered as usual practice.”² The first 2 bundles developed, the ventilator bundle and the central line bundle, were designed to improve outcomes in the intensive care unit (ICU). To achieve that goal, a high degree of bundle compliance is necessary. Rounding checklists can increase compliance with ICU bundles and may improve various outcomes, including decreases in ventilator-associated pneumonia and central line-associated blood stream infections,^{3,4} improving healthcare provider satisfaction and understanding of patient care goals,⁵⁻⁸ and decreasing ICU length of stay.⁸ Furthermore, prompted checklist may decrease both ICU mortality and hospital mortality, with checklist availability alone failing to achieve these improved outcomes.⁹ Processes that reduce variation, such as Six Sigma, teach that defects can be eliminated through variation reduction, which in turn leads to high quality and reliable care.

AIMS

At our institution, discussing certain ICU care goals were encouraged by using a paper checklist on rounds. This had limited buy-in and poor compliance. Barriers included the perception that the checklist was cumbersome/time consuming and not a worthwhile task. It was also difficult to train rotating residents on checklist use. Furthermore, the checklist was viewed as an additional visual prompt for

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providers to reference on rounds (in addition to the prompts usually utilized on rounds, such as handoff guides or daily progress notes), and this additional prompt was considered a nuisance. Thus, variability existed in covering the important care elements on morning rounds. Although checklist use typically results in the greatest reliability, our lack of compliance led us to seek alternative strategies to operationalize and promote the discussion of ICU care goals during daily rounds. Our project had several aims: first, to develop a care goal rounding template for use during rounds; second, to assess baseline reliability of discussion of rounding topics; and third, if baseline reliability was low, to improve reliability through various interventions. Specifically, we aimed to double the reliability in 12 months.

METHODS

The project was deemed quality improvement by our institutional review board and thus received exempt status. The Institute for Healthcare Improvement Model for Improvement was used for this initiative. A care goal rounding template was established. Rounding topics were derived through discussions with pediatric ICU (PICU) faculty until consensus was achieved. These discussions were held informally during PICU division meetings. Many of the rounding topics were adapted from our previously trialed rounding checklist. The template included evidence-based ICU standards of care to decrease the incidence of various hospital-acquired conditions, as well as various patient goal-directed topics designed to improve communication within the team (Fig. 1).

Sedation	Goal Sedation holiday Paralytic holiday Signs of withdrawal
Line removal	Central venous line Arterial line Foley
Medications	Discontinue/change to enteral? Drug levels Adjustment for organ dysfunction Gastrointestinal prophylaxis Deep venous thrombosis prophylaxis
Respiratory	Goal blood gas Goal oxygen saturation Extubation readiness test performed Extubation readiness test result Endotracheal tube cuff leak Hold feeds for extubation
Patient care	Head of bed elevated/oral care Skin integrity/regimen Bowel regimen Initiate or advance feeds
Labs	Lab schedule
Goals	Goal blood pressure Goal fluid balance
Care coordination	Milestones necessary for discharge

Fig. 1. Care goal rounding template.

MEASURES

To obtain baseline data on the reliability of discussion of rounding topics, auditing PICU morning rounds was performed for 3 months, from March 2015 through May 2015. Auditors were 3 individuals: 2 PICU fellows and 1 PICU pediatric nurse practitioner (NP). Auditors received the same training regarding completion of the audits and multiple discussions were held to ensure standardization of auditing. The rounding teams were blinded to the auditors' purpose. We refrained from auditing the rounds of those ICU attendings who were familiar with the project, leaving 90% of the attendings available for audit. The rounding teams in our unit consist of an ICU attending, an ICU fellow, residents (from various fields, the majority being pediatric residents), NPs, nurses, respiratory therapists, pharmacists, and dieticians.

Each week, the "percent reliability" was calculated by dividing the number of patient pertinent rounding topics appropriately discussed by the total number of patient pertinent rounding topics. This was plotted on a control chart (p chart) along with calculated upper and lower control limits (Figs. 3, 4). The study period by week is displayed on the horizontal axis, and the percent reliability is displayed on the vertical axis. The baseline mean (solid centerline) was calculated up to the first intervention. Subsequently, the centerline is displayed as a dashed line. Control chart rules were used to determine centerline shifts; specifically, the rule of 8 data points lying above the centerline was used to determine a shift on our control chart. Weekly percent reliability was our outcome measure of interest; process measures (compliance with interventions) were not explicitly tracked over the course of the project.

INTERVENTIONS

In planning our first intervention, the rounding process was mapped (Fig. 2), and the first plan, do, study, act cycle was implemented. As the residents in our unit historically use their daily progress note in the electronic health record (EHR) as a script for patient presentations, a new standardized daily progress note was designed with input from a team of pediatric residents and NPs. This new progress note served as our first intervention and incorporated the rounding topics as prompts to trigger the ICU provider to address these topics on rounds. Additionally, several of the topics (such as lines, deep venous thrombosis (DVT) prophylaxis, etc) autopopulated into the note from the EHR. The ICU providers were made aware of the new note template through e-mail and in-person communications, including posted signs with instructions on how to access the new template. The note was reviewed with the residents during their PICU orientation at the start of each new rotation and they were informed that the use of the template was mandatory. The new daily note template was placed in the EHR on June 1, 2015.

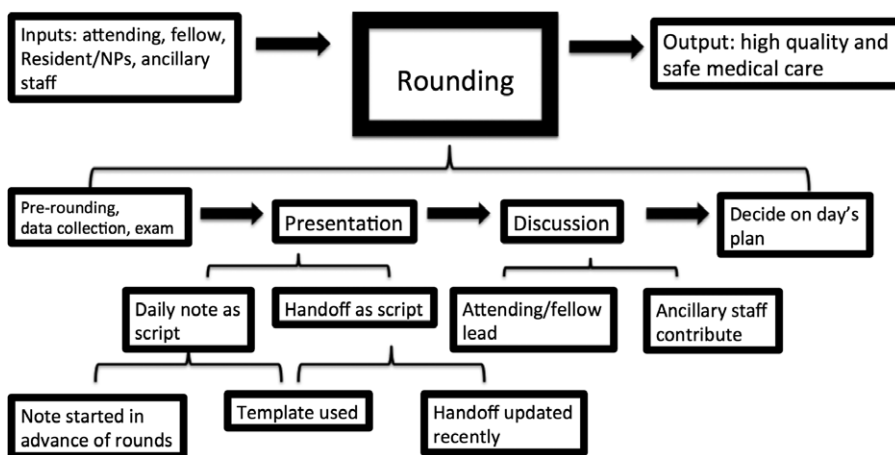


Fig. 2. Rounding process map depicting the makeup of the rounding team, the steps involved in the rounding process, and the tools necessary for the process.

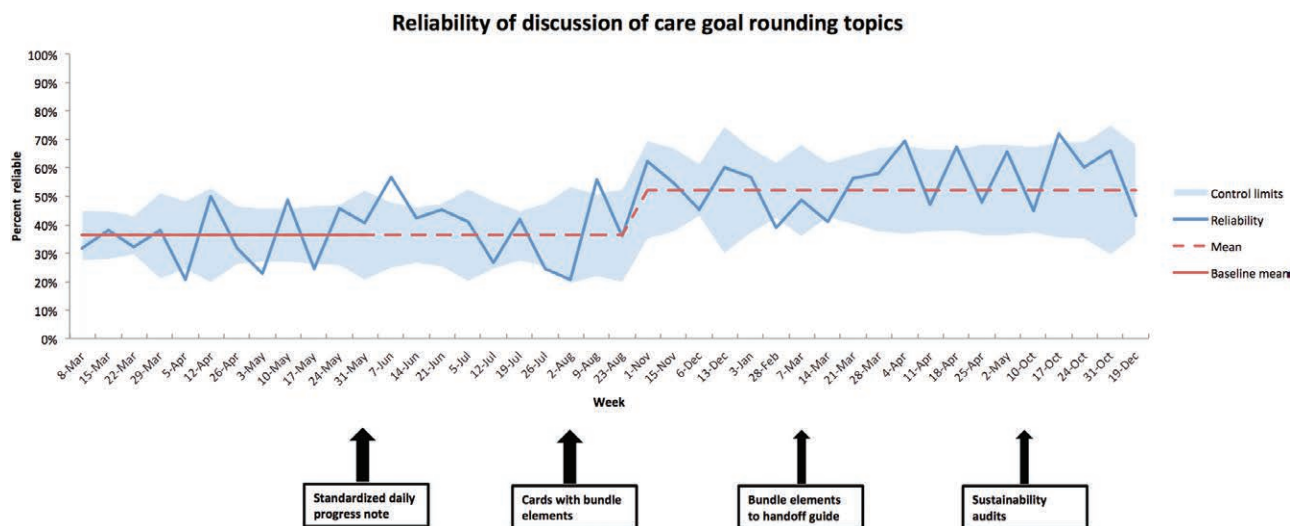


Fig. 3. The horizontal axis displays weeks for which measurements were obtained and the vertical axis displays the percent reliability.

We underwent 2 more plan, do, study, act cycles using the rounding process map. For the second intervention, small laminated cards with the rounding topics were created and distributed to the ICU fellows beginning August 3, 2015. The fellows were instructed through in-person communications and periodic text message reminders to consult the cards at the completion of each patient presentation to ensure all applicable topics were discussed. This intervention was designed after it was discovered that most of the NPs were not using the new progress note template. The third intervention consisted of adding several rounding topics to a handoff guide that was already in place for ICU providers. This handoff guide was previously designed as an aid to help with transition of patient care in the EHR and is printed by team members daily and referenced multiple times throughout the day. Importantly, the handoff is used frequently by providers as a script for patient presentations during morning rounds, which offered another opportunity to incorporate topics into the rounding

workflow. The handoff includes basic demographic information, a short “one-liner,” and medications and therapeutics organized by organ system. Important tasks/topics to monitor closely are also included. Instructions on use of the handoff guide were already posted strategically in the PICU provider workrooms; these instructions were modified to highlight the additions that were made. This intervention was implemented on March 8, 2016. Rounding audits continued for 2 months following this last intervention and resumed several months later to assess for sustainability of the interventions.

Midway through the study period we were not on track to achieve our aim. Consequently, the PICU attendings were surveyed to re-assess their opinions with the daily discussion of the rounding topics. The survey posed the following 2 questions about each rounding topic: “Which of the following elements do you think should be discussed on rounds?” and “which of the following elements do you think should be discussed every day on rounds?”

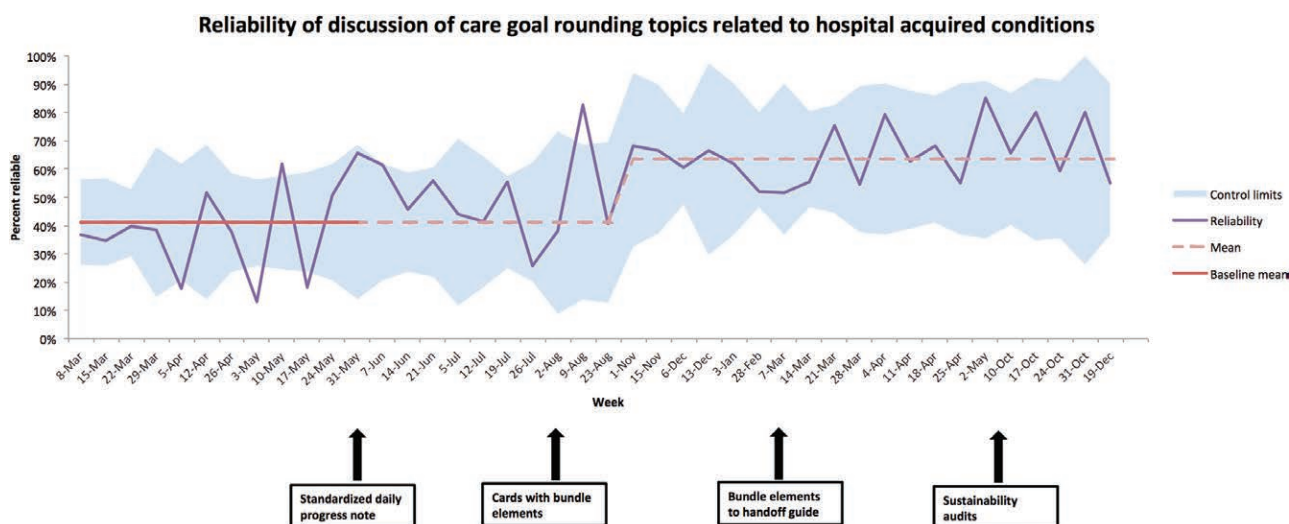


Fig. 4. The horizontal axis displays weeks for which measurements were obtained and the vertical axis displays the percent reliability.

These questions were posed to elucidate whether there were some rounding topics that the faculty felt never needed to be discussed on rounds at all and further to assess which topics they felt were important enough to be discussed daily, at the cost of redundancy. The survey results were used to inform next steps.

RESULTS

A total of 582 patient rounding presentations were observed over the course of the study. Baseline reliability with discussion of rounding topics was 36%. A centerline shift was noted shortly following the second intervention (distribution of laminated cards to the PICU fellows) when 8 consecutive data points lay above the previous centerline. The mean reliability of discussion of rounding topics increased to 52% at this time (Fig. 3). Overall, only 3.3% of patient rounding presentations addressed 100% of the rounding topics. By study period, the percentage of rounding encounters which addressed 100% of the rounding topics are as follows: baseline - 1.4%, following first intervention - 1.8%, following second intervention - 3.8%, following third intervention - 4.7%, and during the sustainability audits - 11%.

The data were examined by provider type. The residents had a baseline mean reliability of 34.1%. Reliability improved to 42.2% following the first intervention, 45% following the second, and 55% following the third. Sustainability audits revealed a mean reliability of 53%. The NPs had a baseline reliability of 45.2%. As one would expect given the observation that the NPs were not using the new daily progress note, reliability decreased to 40% following the first intervention, but thereafter increased to 52% after the second intervention, and 61% following the third intervention. The mean reliability was 67% during sustainability audits.

There has recently been a focus on preventing hospital-acquired conditions. The data were examined by looking exclusively at rounding topics pertaining to these hospital-acquired conditions (ie, central line-associated bloodstream infections, catheter-associated urinary tract infections, pressure ulcer injuries, etc). The baseline mean reliability with discussing elements related to hospital-acquired conditions on rounds was 41%. A centerline shift (8 consecutive data points above the previous centerline) was noted shortly following the second intervention with a new mean reliability of 63% (Fig. 4).

Eleven of 18 PICU faculty members who did not have knowledge of the project protocol responded to our survey midway through the project. More than 80% of respondents agreed that 11 of the rounding topics should be discussed daily on rounds (Fig. 5 for these 11 items; they are denoted by ** and displayed on the left side of the graph). There were only 2 rounding topics, which fewer than 80% of respondents felt should be discussed on rounds at all: elevation of the head of the bed/oral care in mechanically ventilated patients, and milestones necessary for discharge from the PICU. We compared the overall mean reliability of discussion of these 11 topics during the baseline period to the period following the first intervention until the sustainability audits were started. Except for “paralytic holiday,” reliability of discussing these 11 topics improved following our interventions (Fig. 5). Further analysis revealed greater improvement in overall reliability of discussion of these 11 topics as compared with the remaining rounding topics (35.2% pre-interventions to 51.4% postinterventions versus 40.4% pre to 43.7% post).

DISCUSSION

Through the application of performance improvement techniques, we improved the reliability in discussing

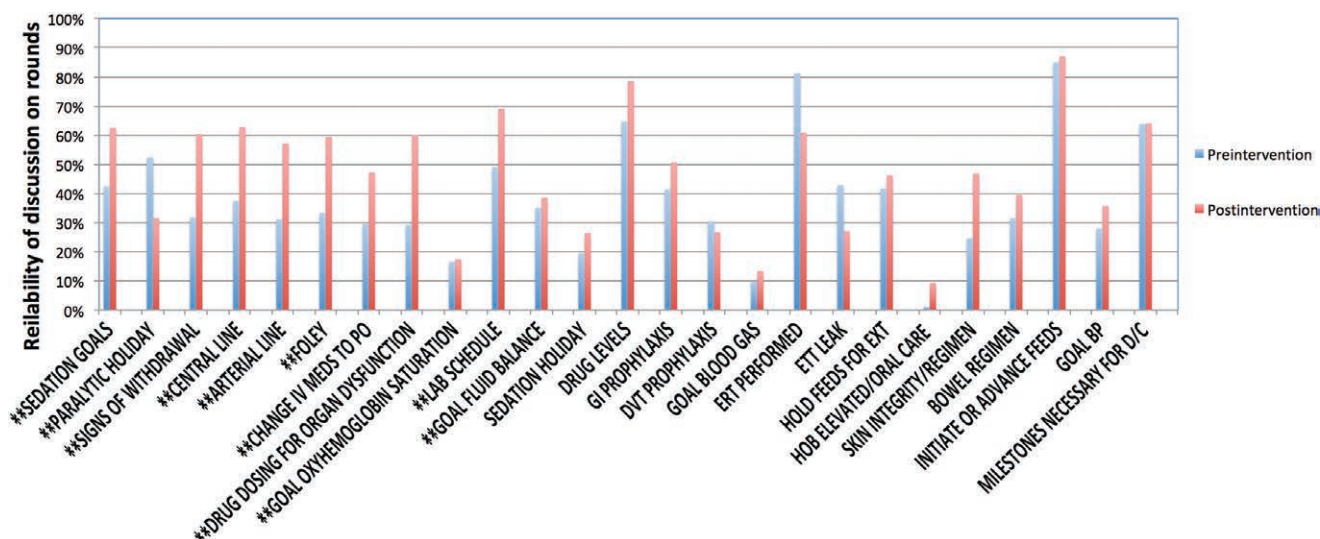


Fig. 5. The horizontal axis denotes individual rounding topics and the vertical axis denotes the percent reliability. Eleven topics for which >80% of attendings felt should be discussed daily on rounds are denoted by ** and are displayed toward the left of the graph.

important care goal elements on patient rounds following the establishment of a PICU care goal rounding template. Although we did not achieve our aim of doubling the mean reliability in 12 months, we did improve our mean reliability by 44%. In planning our interventions, we sought novel strategies to implement and operationalize the discussion of key rounding topics.

Previous studies have already shown improvement in patient outcomes with ICU rounding checklists/templates^{3,8,9}; hence, we chose to examine ways to improve adherence to a rounding template. Due to the previous significant barriers to checklist implementation in our unit, we chose to design interventions that targeted prompting discussion at steps in the rounding process. We postulated that by infiltrating the rounding process at various levels, we would increase reliability of discussion of key care goal topics, which was our outcome measure of interest. The integrated use of rounding checklists or templates has been previously suggested by Hallam et al.¹⁰ as being fundamental to success based on their qualitative study of the perception of ICU rounding checklists by providers. Other studies have found the integration of checklists into the EHR beneficial. Tarrago et al.¹¹ showed a decrease in invasive device use, medication costs, antibiotic and laboratory test use, and compliance with standards of care by utilizing a PICU safety checklist incorporated into the EHR. Additionally, Hulyalkar et al.¹² showed the integration of a PICU rounding tool into the EHR significantly increased discussion of rounding tool topics. Similarly, our incorporation of rounding topics into the daily progress note and handoff tool was an integrative strategy, albeit more subtly since we did not require completion of a rounding checklist/tool in the EHR. Another interesting study incorporated an “intelligent dynamic clinical checklist” into the EHR. Algorithms were utilized to determine which checklist items were relevant for a specific patient,

while also automatically checking certain items based on available information in the EHR. In a simulation-based study, the median percentage of checked items was 100% for the dynamic checklist, versus 73.6% for a paper checklist.¹³ In our study, the automatic retrieval of rounding template topics from the EHR into the standardized progress note, which served as a discussion prompt on rounds, mimics the concept of an “intelligent” design to rounding checklists.

Reliability remained consistent during sustainability audits, even though no further interventions were made. It is possible this was due to a shift in culture. As an unmeasured observation, the rounding teams were noted to increasingly speak toward care goals and safety issues on rounds, without the deliberate prompting of progress notes, handoff scripts, or laminated cards. Similarly, this phenomenon was noted by Newkirk et al.¹⁴ in their study on prompted ICU rounding checklist use, in which they showed that discussion of checklist topics before prompting increased on rounds as the study period progressed.¹⁰

From the survey conducted midway through the study, it seems probable we did not achieve the originally perceived consensus with the PICU faculty regarding the rounding topics. As such, we may have benefited from additional brainstorming with PICU faculty before the start of the project. As checklists and standardization procedures are becoming more prevalent in healthcare, the phenomenon of checklist “fatigue” has emerged, which serves to decrease compliance and therefore effectiveness.¹⁵ It is also possible that some of that fatigue may have led the faculty to reconsider which rounding topics they felt were necessary to discuss each day, and perhaps contributed to less improvement in reliability over the course of the study as we measured all the rounding topics.

STRENGTHS

Our project had multiple strengths. We offered unique interventions that incorporated rounding topics seamlessly into the rounding process (ie, incorporation of rounding topics into templated progress notes and hand-off guides), without requiring prompting by a team member to address these elements. In the busy PICU setting, it is difficult to consistently offer checklist or rounding prompters, and it has been established that discussion of these rounding topics requires discrete prompting to be effective in impacting patient outcomes.⁹ Shortly after the second intervention, we noted special cause variation with a centerline shift on our control chart. We also demonstrated sustained reliability over time, likely due to the fact we incorporated discussion of rounding topics into the existing rounding process.

LIMITATIONS

Our study had some limitations. We did not explicitly track provider use of the various implementation strategies (ie, whether providers added rounding topics to the PICU handoff guide). Additionally, the difference in performance noted between the resident and NP group following the standardization of the daily progress note highlights the need for more careful baseline analysis before instituting our first intervention. As well, the fact that when surveyed, the PICU faculty felt that only 11 of the rounding topics should be discussed daily reinforces the need for more involvement of stakeholders before embarking on the project. Lastly, we did not survey rounding team members before and after our interventions to assess satisfaction with the level of communication and understanding of care goals from rounds, which would have been a valuable outcome to measure.

FUTURE DIRECTIONS

Our next steps involve further brainstorming and re-evaluation of the process map with PICU faculty to improve consensus with the rounding topics. We will use our survey results as a spring board with the eventual goal of streamlining the care goal rounding to include only those elements felt necessary for daily discussion by the PICU faculty. We can then amend our daily progress note, laminated cards, and handoff guide to include only those topics, and continue to assess reliability of discussion of the rounding topics.

CONCLUSIONS

Following the establishment of a PICU care goal rounding template and discrete interventions, the reliability in discussing important care goal elements on patient rounds improved. We achieved these results through novel strategies to operationalize the discussion of ICU care goals.

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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