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Safety Conversations: A Decade of Experience

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Mount Sinai

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BACKGROUND

The Mount Sinai Hospital is a 1,134 bed, tertiary care teaching facility in the heart of Manhattan in New York City. In 2012, hospital leadership closed the hospital's main operating rooms for 4 hours to teach TeamSTEPPS, a team dynamics and communication program based upon a decade's worth of research from business, technology, the military, medicine and aviation. This was implemented in our operative arena of 50 operating rooms where surgeons from over a dozen surgical specialties, anesthesiologists, nurses, surgical technicians, perfusionists, physician assistants, students and other team members work together to take care of patients having procedures.

The overarching goal of the program was to prevent the "never events" of wrong site/side/person/procedure surgery and unintentionally retained foreign bodies, as well as to improve the overall team dynamics and safety of the care we deliver in the main operating room.

This safety conversation journey is over a decade in the making with more work to do. We share some data and key lessons learned as we continue to evolve this initiative from year to year.

METHODS

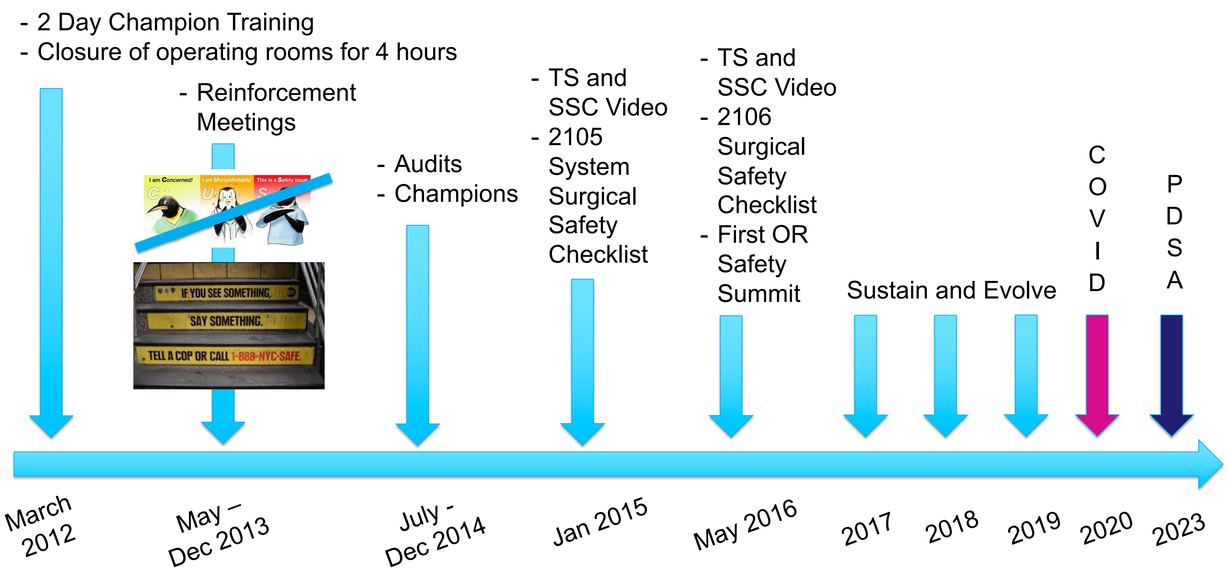


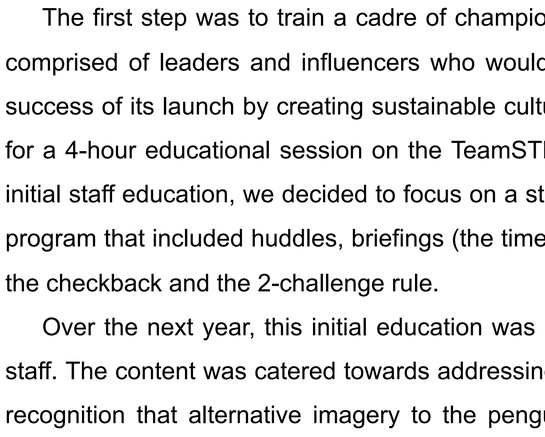
Figure 1: Timeline of major events starting with a strategic launch of the TeamSTEPPS program within the main operating rooms at Mount Sinai Hospital and how the program was evolved and sustained for each year.

The first step was to train a cadre of champions in a 2-day training retreat. The group of champions was comprised of leaders and influencers who would then teach and support the program to better ensure the success of its launch by creating sustainable culture change. Next, the main operating rooms were all closed for a 4-hour educational session on the TeamSTEPPS program to all staff who work in this space. After the initial staff education, we decided to focus on a strategic selection of key components from the TeamSTEPPS program that included huddles, briefings (the time-out conversation), debriefings, and skills called the call out, the checkback and the 2-challenge rule.

Over the next year, this initial education was reinforced during departmental grand rounds meetings with staff. The content was catered towards addressing feedback received from the initial roll out which included a recognition that alternative imagery to the penguin mascot provided a book called Our Iceberg Is Melting would better engage staff.

The year 2014 was dedicated to providing live, real-time coaching and data collecting using a data collection tool that was created by our medical malpractice insurance company, Healthcare Risk Advisors. The key parts of this intervention were the live coaching and the partnering of the auditors with a clinical leader or influencer, usually a department chair or residency program director.

These coaching audits continued for a number of years and allowed us to evolve our surgical safety checklist (Figure 1) and to cater education towards areas where the data showed we needed to improve. We continued the audits until the COVID-19 pandemic forced us to remove the coaching auditors from operating rooms for staff and patient safety. Since then, continuing the coaching has been challenging due to loss of staff and funding to continue the endeavor, but we are looking for ways to maintain the sustainability such as with video monitoring and the BlackBox program as well as training clinical teams to continue coaching and auditing.


Mount Sinai Hospital
The Mount Sinai Hospital
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Surgical Safety Checklist

Pre–Procedure Verification (Holding Area)

Has the patient's identity, site, procedure and consent been confirmed with each team member using name and DOB? ○ Yes
Was the consent verified against the schedule? ○ Yes
Is the site/side correctly identified and marked (or silver armband) with the surgeon's initials? ○ Yes ○ N/A
H&P completed within 30 days, 24 hour surgical confirmation present, signed, timed, and dated? ○ Yes
Does the patient have any known allergies? ○ Yes ○ No
If yes, does the patient have an allergy band? ○ Yes ○ N/A
Type & Screen completed? ○ Yes ○ N/A
Blood Products Available? ○ Yes ○ N/A
Radiologic/diagnostic tests available and labeled with patient name, DOB & laterality (if applicable) ○ Yes ○ N/A
Are the correct implant(s)/special equipment available (if applicable or requested)? ○ Yes ○ N/A
ADDITIONAL NOTES

Team Huddle (in procedure room, prior to administration of anesthesia)

Have all OR team members introduced themselves by name, role and confirmed the patient name, procedure and any allergies? ○ Yes
Anesthesia team states any airway-specific concerns and addresses airway fire safety ○ Yes ○ N/A
Are there any safety (fire safety) equipment, supply, instrument, or implant concerns? ○ Yes ○ No
Appropriate patient positioning plan reviewed, including the minimization of injury to pressure points. ○ Yes ○ N/A
Will frozen section be required? ○ Yes ○ No
Surgeon/Proceduralist team member reviews the risk of EBL>500 (7ml/kg in children) with OR team. ○ Yes ○ N/A
DVT prophylaxis plan reviewed? ○ Yes ○ N/A

TIME OUT

RN initiates, states planned procedure from consent and all members of OR team actively concur. ○ Yes
Has antibiotic prophylaxis been given as per SCIP guidelines within 60 minutes of procedure start time (within 120 minutes for fluoroquinolones and vancomycin)? ○ Yes ○ N/A
Proceduralist team member verifies correct image(s) and confirms laterality/site markers with OR Team. ○ Yes ○ N/A
Surgical scrub person points to and verifies that site mark is visible for OR team and patient is in correct position? ○ Yes ○ N/A

PATIENT LABEL

Debriefing (Post-Procedure)

OR team verbally confirms with attending surgeon: ○ Postoperative diagnosis ○ Name of the procedure performed
Anesthesiology team reviews key concerns for recovery and disposition with OR team. ○ Yes
Specimen(s) identified, reviewed, solution confirmed, and form signed by attending surgeon? ○ Yes ○ N/A
Completion of final surgical count verified and reported to OR team prior to skin closure. ○ Yes ○ N/A
Surgeon/Proceduralist team member performs wound sweep (if applicable). ○ Yes ○ N/A
Surgical instruments accounted for and intact. ○ Yes ○ N/A
Were there any opportunities for improvement regarding equipment, instruments or supplies to be addressed by the OR team? ○ Yes ○ No

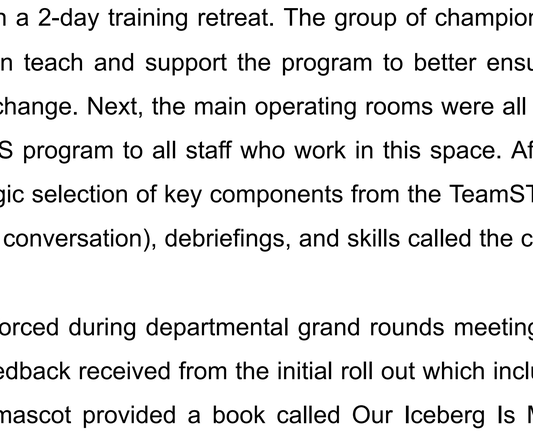
STAFF SIGNATURES

SURGEON/PROCEDURALIST Team Member – After completion of Pre-Procedure verification and prior to OR entry
Print _____ Sign _____
Dictation # _____ Date/Time _____

NURSING Team Member –
After completion of Team Huddle and Time Out
Print _____ Sign _____
Date/Time _____

ANESTHESIA Team Member –
After completion of Post-Procedure Debrief
Print _____ Sign _____
Dictation # _____ Date/Time _____

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Mount Sinai

Surgical Safety Checklist

Brief – Pre-procedure verification, in holding area prior to entering procedure room

Nurse:
Confirm patient name, date of birth, site, procedure, H&P, consent? Yes___
H&P completed within 30 days of procedure and surgeon attestation within 24 hours? Yes___
POMA form completed for BMI>40 or ASA ≥3 and signed? Yes___
Reconcile consent form with OR schedule? Yes___
Known allergy? Yes___ No___ Identified with patient's wristband? Yes___ No___ N/A___

Anesthesiologist:
Pre-op assessment & airway/aspiration risk evaluated? Yes___
Type and screen/blood or blood products available (if indicated?) Yes___ N/A___

Surgeon:
Imaging or pathology report labeled with patient name, date of birth and laterality
Imaging available? Yes___ N/A___
Pathology report available? Yes___ N/A___
Confirmation for site of surgery, marked by surgeon's initials to be visible after draping? Yes___ N/A___
Blood loss likely > 500 ml or 7 ml/kg for child) Yes___ No___
If yes, coil saver present? Yes___ No___
If yes, specimen in blood bank? Yes___
Special equipment needed and available? Yes___ N/A___
Implants required? Yes___ No___ N/A___
Frozen section needed? Yes___ No___

Team Huddle – In procedure room

Introduction of team members to patient? Yes___ N/A___

Nurse:
Sterility confirmed? Yes___
Final time-safety check? Yes___

Anesthesiologist:
Anesthesia medications, equipment safety check? Yes___
Antibiotic prophylaxis strategy reviewed? Yes___
DVT prophylaxis initiated and documented according to SCIP guidelines? (with checkback) Yes___ N/A___
Plan for beta-blockers reviewed and documented? Yes___ N/A___
Two experienced anesthesia providers available for intubation? (BMI>40, known difficult airway) Yes___ N/A___

Surgeon:
Equipment and/or implant concerns resolved? Yes___ N/A___
Verification of preoperative imaging or pathology report for site/laterality? Yes___ N/A___

Time Out
(after prepping and draping completed and prior to incision)

All:
Roles and Responsibilities of team members known? Yes___
Patient's name, date of birth confirmed? Yes___
List known allergies. Yes___
Antibiotic prophylaxis given and documented according to SCIP guidelines (with checkback)? Yes___ N/A___
Procedure, laterality check? Yes___
Proper positioning and padding? Yes___
Sufficient time elapsed for the skin prep to dry? Yes___
Marked surgical site visible? Yes___ N/A___
Patient condition (ASA Score ___)
Critical steps and complexity of procedure reviewed with team including special circumstances and anticipated critical steps? Yes___
I have all team members been encouraged to speak out if concerned? Yes___

Debrief and Sign-Out – Prior to leaving procedure room

Nurse:
Closing count now complete? Yes___

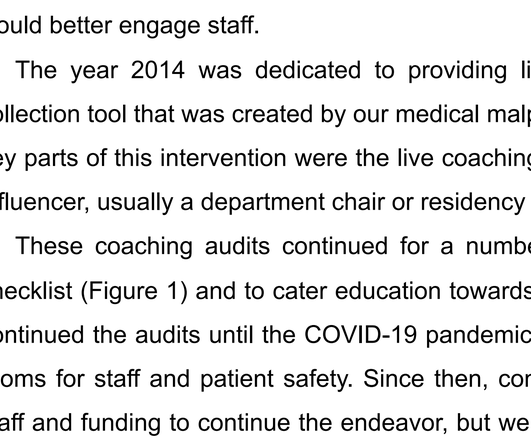
Attending Surgeon (reviews with team):
Name of procedure? Yes___
Pre-and post-operative diagnoses? Yes___
Specimen labeling: read labels aloud including patient name? Yes___ N/A___

Attending Anesthesiologist (reviews with team):
Antibiotic plan post op reviewed? Yes___
DVT prophylaxis post op reviewed? Yes___
Beta-blocker plan post op reviewed? Yes___
EBL, intake/output reviewed? Yes___

Surgical Team Member:
Foley catheter management plan? Yes___ N/A___
Surgeon confirmed instrument, sponge, needle counts completed? Yes___
Brief operative note completed? Yes___

All team members (including scrub and circulator) discuss:
Any equipment malfunction(s)? Yes___ No___
Untoward events reviewed? Yes___ No___
Were there any opportunities for improvement? Yes___ No___
Other post op plan of care (airway, disposition, pain management, etc)? Yes___ No___
Feedback for all staff? Yes___ No___

Please see reverse for anesthesia block, time out(s), and team sign offs


Mount Sinai

Surgical Safety Checklist
STOP, LOOK, and LISTEN

Pre-Procedure Verification
Complete prior to entering procedure room

Nursing Team:
Confirm patient name and date of birth, procedure, site, and consent? ☐ Yes
Documentation Review:
Surgical H&P within 30 days of procedure and attested to by surgeon within 24 hours? ☐ Yes ☐ N/A
Preoperative medical evaluations and consents completed? (POMA) ☐ Yes ☐ N/A
Procedure and laterality match final OR schedule and consent? ☐ Yes ☐ No

Anesthesiology Team:
Pre-anesthetic assessment, medical & airway/aspiration risk evaluated? ☐ Yes
Type and screen/blood products ordered? ☐ Yes ☐ N/A

Surgeon:
All necessary imaging/imaging reports and pathology reports are labeled with patient name, date of birth, and available? ☐ Yes ☐ N/A
Laterality verified using images? ☐ Yes ☐ N/A
Attending surgeon marks surgical site with initials to be visible after draping? ☐ Yes ☐ N/A
Special equipment or implants needed and available? ☐ Yes ☐ N/A

Discuss Plans with Team Members
N/A = not applicable

Time Out
Complete after prep and drape, immediately prior to incision

✓ **Each Team Member announces his/her name and role.**
✓ Is this cross/zipping surgery? (If so, identify any co- or backup surgeons)
✓ Patient's name and date of birth confirmed?
✓ Site and Laterality verified by review of imaging?
✓ Procedure and laterality verified on consent form?
✓ Proper positioning/padding reviewed and marked surgical site visible?
✓ Sufficient time elapsed for skin prep to dry and fire safety check?
✓ HIGH RISK FIRE CASES: Discussed preparatory plan and delineated roles in case of fire?
✓ Equipment/implants available?
✓ Diagnosis, allergies, and patient condition verified (ASA score)?
✓ DVT prophylaxis initiated and antibiotics given (if applicable)?
✓ Complexity of procedure and any critical steps reviewed? (e.g blood, second timeout, specimen handling)
✓ Disposition planning made (e.g. ICU bed)?
✓ Any other concerns (e.g. special precautions, needle stick prevention)?

Incision can be made after timeout is complete!

☐ **Check here when time out complete**

Debrief and Sign-Out
Complete before attending proceduralist leaves room or before drapes removed

✓ Name of procedure?
✓ Pre- and postoperative diagnosis?
✓ Specimens handled correctly (2 patient identifiers, preservation, containers)?
✓ EBL, fluid intake, and output reviewed?
✓ Postoperative medical concerns addressed (Antibiotics, DVT prevention, Foley plan)?
✓ Disposition addressed (e.g, home, ICU, PACU bypass)
✓ Field reviewed for retention of foreign bodies or plan in place for removal of intentionally left foreign bodies?
✓ Any unexpected events (e.g, needle stick) or equipment malfunction?
✓ What could we have done better?
✓ Are the instrument, sponge, and needle counts correct? (Must notify attending surgeon of miscounts)

Drapes can be removed after debrief is complete

☐ **Check here when debrief complete**

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Figure 2: The surgical safety checklist evolved from 2013 (upper left) to 2015 (upper right) with the most current version in 2022 (bottom left). Each version represents revisions meant to target areas of performance where auditing data showed room for improvement. The 2022 version represents a more streamlined checklist with a revision of the debrief conversation that includes more precise event triggers.

RESULTS

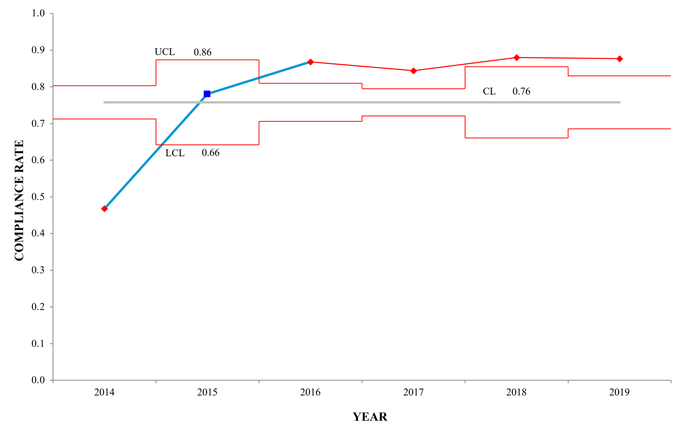


Figure 3: A control chart showing one of the nine different performance components that were tracked during the coaching audits

Table 3. Time Out Statistical Analysis.[a]

Questions	Number Compliant/ Total Observations (% Compliance), July	Number Compliant/ Total Observations (% Compliance), December	χ^2 *P* Value	Linear Regression Estimate	Linear Regression Standard Error	Linear Regression *P* Value
Compliant of team assembly: Team Structure	177/257 (68.87%)	91/106 (85.85%)	<.001	0.049	0.031	.19
Compliant of a leader is established and a time out called: Leadership	257/257 (100%)	105/106 (99.06)	.119	−0.001	0.001	.28
Compliant of recognition of team membership: Communication	27/257 (10.51%)	105/106 (99.06%)	<.001	0.080	0.023	.027
Compliant of discussion of plan of care: Situation monitoring—patients, procedure, side	256/257 (99.61%)	104/106 (98.11%)	.152	−0.002	0.002	.31
Compliant of anticipation of events: Situation monitoring—complexity of procedure and anticipated critical events	81/257 (31.52%)	82/106 (77.36%)	<.001	0.071	0.039	.15
Compliant of anticipation of events: Situation monitoring 2—ASA status, medical status	57/257 (22.18%)	92/106 (86.79%)	<.001	0.103	0.029	.025
Compliant of status of resources (staff and/or equipment): Situation monitoring	150/257 (58.37%)	103/106 (97.17%)	<.001	0.089	0.023	.019
Compliant of active engagement of all team members: Mutual support	113/257 (43.97%)	88/106 (83.02%)	<.001	0.058	0.041	.23
Compliant of check-back: Communication	215/257 (83.66%)	106/106 (100%)	<.001	0.031	0.009	.024
Overall compliance	1333/2313 (57.63%)	876/954 (91.82%)	<.001	0.120	0.042	.047

Abbreviation: ASA, American Society of Anesthesiologists.
[a]A χ^2 analysis comparing qualitative metrics between the first and last months of auditing demonstrated sustainment of excellent results or statistically significant improvement. The linear regression analysis showed improvement in 4 out of the 9 qualitative metrics.

Table 1: List of the nine performance components and the improved metrics comparing 2012 to 2014. [2]

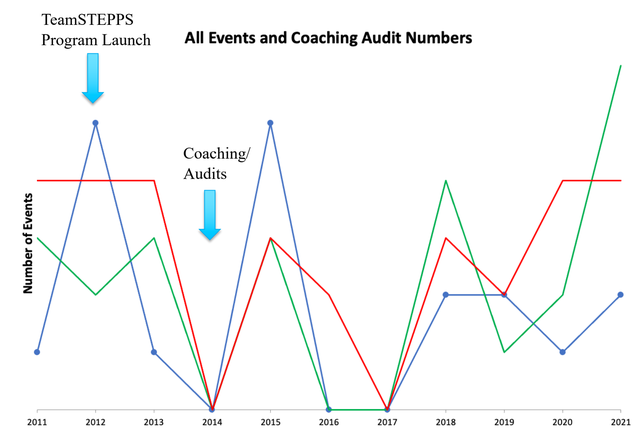


Figure 4: Run chart of wrong site/side/person/procedure surgery (blue) and unintentionally retained foreign body (green) overlayed with an inverted representation of the number of audits performed for each year (red). It appears that in the years more audits were performed, there were fewer events.

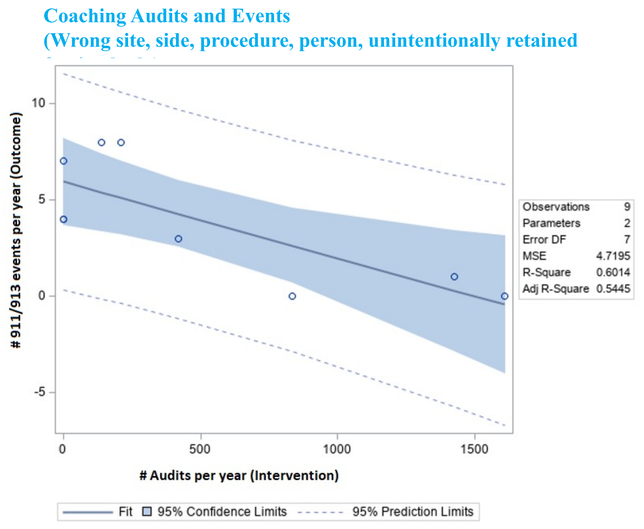


Figure 5: There is a strong inverse correlation between the number of coaching audits and wrong site/side/person/procedure/unintentionally retained foreign body events in a given year. The more coaching audits that were performed in a year the fewer the events.

Over the last decade, we have seen improvement in never event outcomes (wrong site, side, procedure, person surgery and unintentionally retained foreign bodies) upon implementation of a strategic excerpt of the TeamSTEPPS program at our highest surgical volume hospital. Our results show an initial improvement followed by years of struggle with sustainability. Having said that, we had never seen years of zero events and in the span of time shown we had three. We also saw an inverse correlation between the number of never events and the number of audits performed in a year.

CONCLUSIONS

- A strategic subset of TeamSTEPPS (time-out, debrief, check back, call out, 2-challenge rule) implemented at our highest surgery volume hospital showed a reduction of wrong site, side, person, procedure surgeries and unintentionally retained foreign body.
- The surgical safety checklist is an important tool to better ensure performance and standardization, even on a system level, for safety conversations.
- Coupling coaching auditors with clinical leaders or influencers made culture change more effective.
- The coaching audits are inversely correlated with the number of never events. Maintaining a steady presence and continued awareness about the importance of these safety conversations is key to driving outcomes and sustainability.
- The COVID-19 pandemic and other challenges have required that we explore new ways to maintain the sustainability of this program and the outcome improvements we have achieved.

REFERENCES

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