UTSW Perioperative Optimization of Senior Health: Initiatives to Reduce Delirium After Spine Surgery

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Introduction

The UT Southwestern Perioperative Optimization of Senior Health (UTSW POSH) program is a multidisciplinary approach involving surgery, geriatrics, and anesthesia in an effort to reduce morbidity in high-risk elderly patients undergoing elective surgery. Modeled after the original POSH program developed at Duke University[1], one goal of the UTSW POSH program is to prevent delirium, an often-unrecognized source of adverse outcomes[2]. In this two-phase project, a validated chart review tool[3] was used to determine delirium rates in UTSW POSH patients undergoing spine surgery. Concurrently, an initiative began to educate postoperative nurses about delirium risk assessment, recognition and management. As part of the initiative, nurses implemented a standardized screening tool (the 4 A's Test or 4AT[4]) with the goal of increasing recognition of postoperative delirium in older adults undergoing spine surgery.

Local Problem

Specifically at Zale Lipshy University Hospital, there is no evidence that the neurosurgical nursing staff caring for elderly spine surgery patients actively screen for or prevent delirium, which can lead to unnecessary costs due to increased length of stays and associated complications.[5]

Methods

The records of 148 elderly patients who had undergone elective spine surgery were retrospectively reviewed. A chart review-based method was utilized to retrospectively identify delirium by applying CAM criteria. For intervention, nurses on the neurosurgical floor were asked to attend a 45-minute educational session conducted by a geriatric health care provider. Surveys regarding delirium knowledge were administered before and after each session. Three Registered Nurses (RNs) became nurse champions to implement the 4AT and facilitate change in nursing workflow. Patient charts were audited using an EMR Reporting Tool to monitor rates of delirium screening.
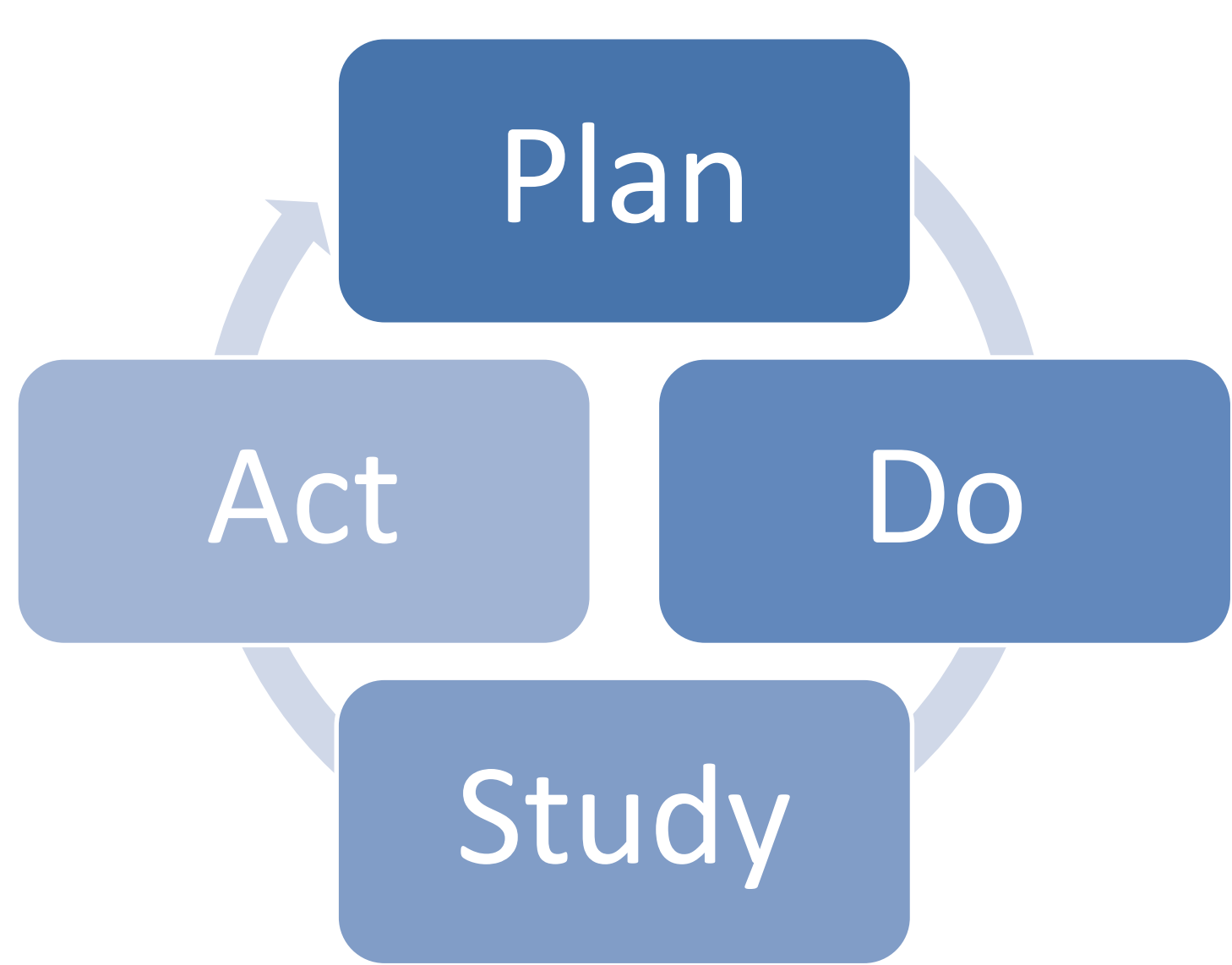
Quality Tools and Figures

Figure 1: PDSA Cycle as a QI Methodology Iterative cycles of improvement by identifying the problem, carrying out the test, analyzing the results, and implementing the best solution
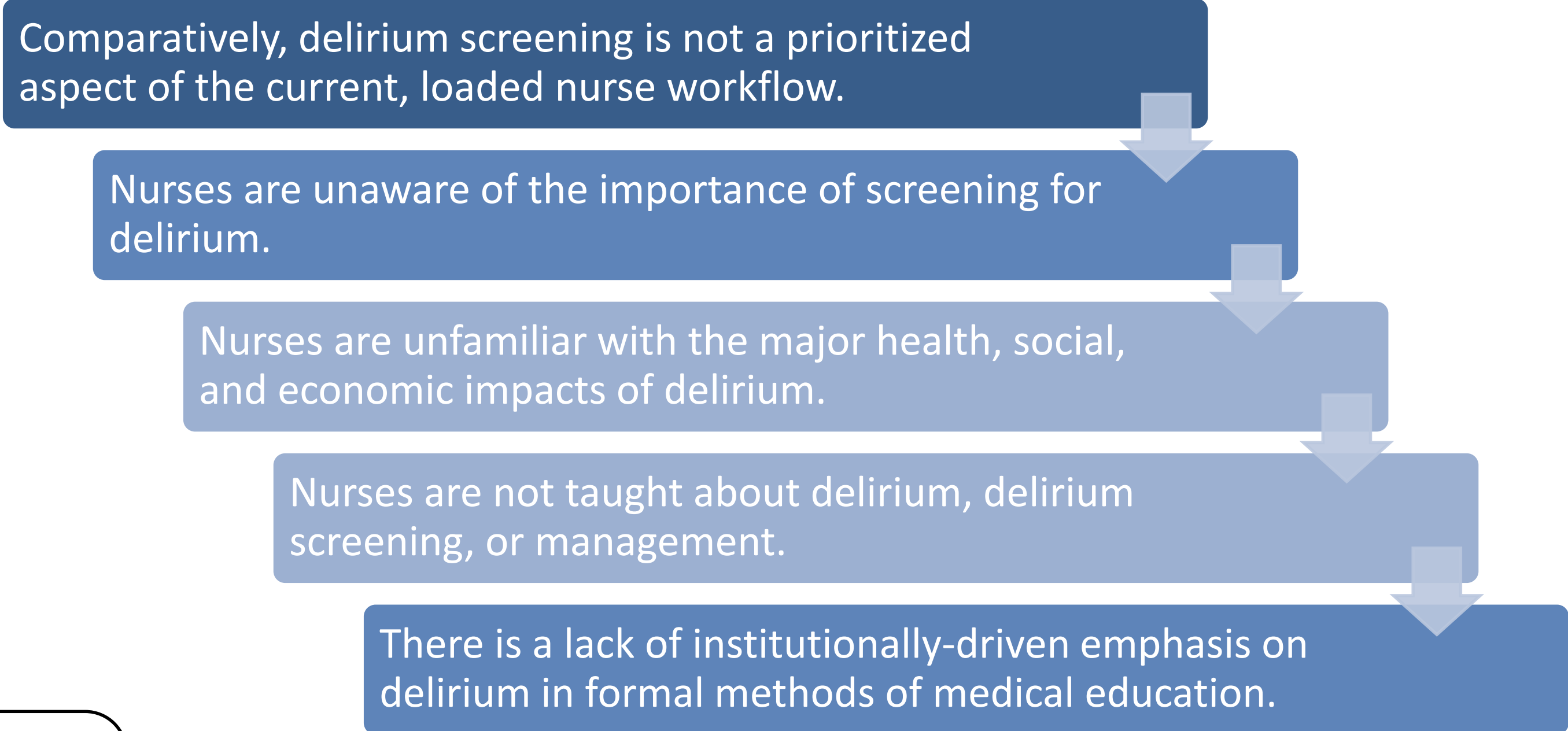
Comparatively, delirium screening is not a prioritized aspect of the current, loaded nurse workflow.

Nurses are unaware of the importance of screening for delirium.

Nurses are unfamiliar with the major health, social, and economic impacts of delirium.

Nurses are not taught about delirium, delirium screening, or management.

There is a lack of institutionally-driven emphasis on delirium in formal methods of medical education.

Figure 2: 5 Whys Analysis to determine why nurse-driven delirium screening is not implemented as part of the status quo

Variable	POSH No Delirium	POSH Delirium	p
n (% total N)	130 (88.4%)	17 (11.6%)	
Levels of Fusion	4.38 (3.84)	5.76 (4.05)	0.17
Underwent Pelvic Fusion	35.3%	41.2%	0.79
7-day readmission	1.54%	5.88 %	0.31
30-day readmission	3.85%	11.8%	0.19
Hospital LOS	4.52 (2.06)	5.76 (2.11)	0.021
ICU LOS	0.70 (0.90)	1.27 (1.26)	0.034
Glasses	35.4%	29.4%	0.79
Hearing Aids	5.39%	29.4%	0.006
Baseline dementia	0.76%	29.4%	<0.001
Polypharmacy (>5 Rx)	65.4%	76.5%	0.43
High Risk Medication Use	33.8%	41.2%	0.59
BMI	29.47 (7.18)	26.96 (3.70)	0.16
Age	75.39 (5.03)	77.06 (6.07)	0.21
Sex	42.3%	58.8%	0.21

Table 1: Incidence of Delirium in UTSW POSH Patients Means compared using a two-tailed t-test. Patients with delirium were found to have higher rates of baseline dementia, hearing aid use, longer hospital stays, and longer ICU stays.
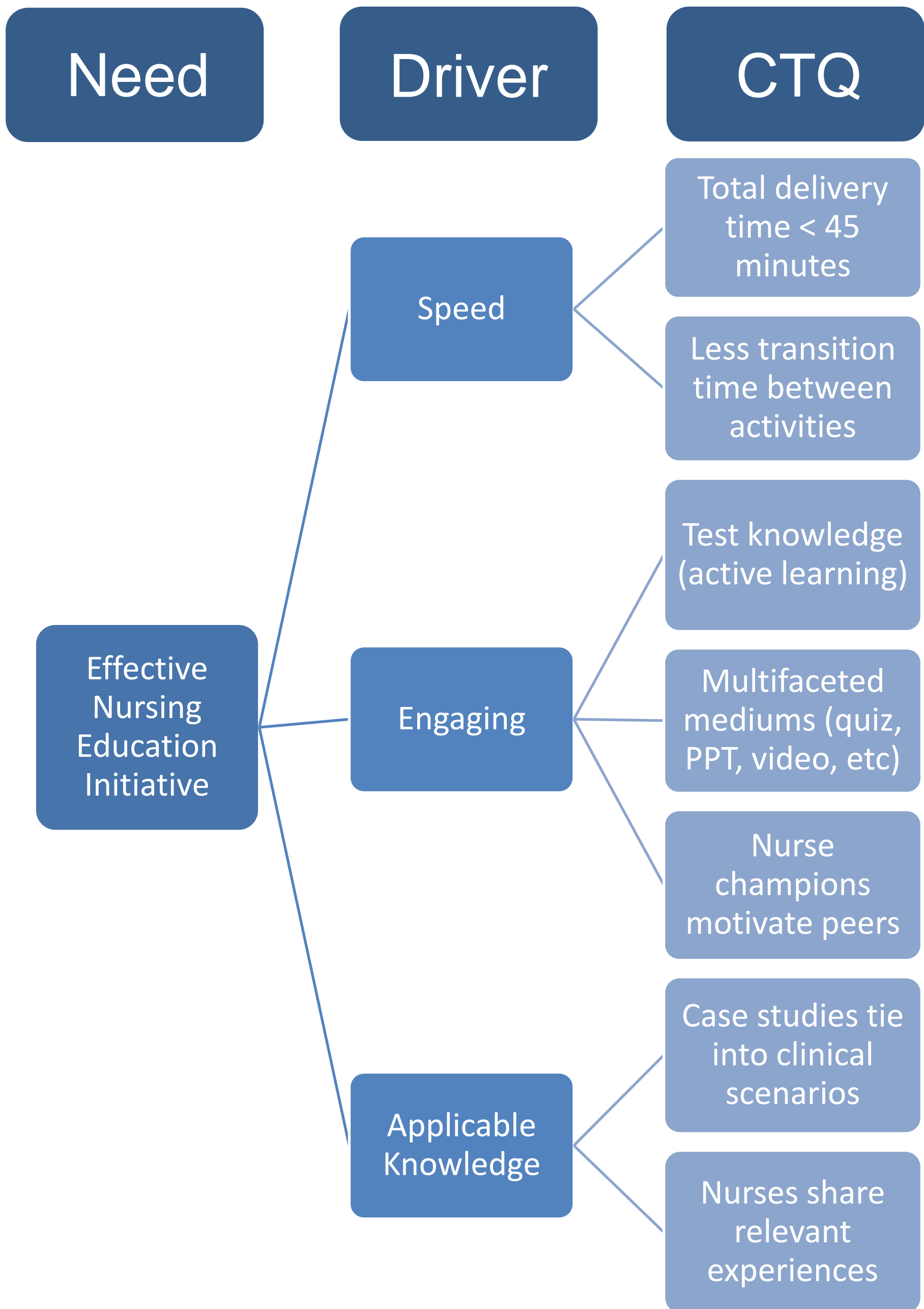

Need — Driver — CTQ

- Effective Nursing Education Initiative
  - Speed
    - Total delivery time < 45 minutes
    - Less transition time between activities
  - Engaging
    - Test knowledge (active learning)
    - Multifaceted mediums (quiz, PPT, video, etc)
    - Nurse champions motivate peers
  - Applicable Knowledge
    - Case studies tie into clinical scenarios
    - Nurses share relevant experiences

Figure 3: Critical-to-Quality (CTQ) Tree Needs, drivers, and critical to quality characteristics of implementing an effective nursing education initiative as identified by physicians and nurses

Results

Phase 1: The incidence of delirium found in UTSW POSH patients through chart review was 11.6% (Table 1). The patients retrospectively found to have experienced delirium had a higher rate of baseline dementia (29.4% vs 0.76%, p=<0.001) and hearing aid use (29.4% vs 5.39%; p=0.006) compared to patients who did not develop delirium postoperatively. The average length of hospital stay (5.76 days vs 4.52 days, p=0.021) and average length of ICU stay (1.27 days vs 0.70 days, p=0.034) were longer among patients who developed delirium.
Phase 2: A greater proportion of nurses (76.07%) answered delirium knowledge questions correctly post-intervention as compared to pre-intervention (67.86%). The chi-square test showed the impact of nursing education was statistically significant (p = 0.0167, CI = 0.4763-0.9294). Daily delirium screening rates improved from 0% at baseline to 81.6% in a randomly selected 5-day period 7 weeks post-intervention.

Conclusion

The incidence of delirium found in UTSW POSH patients was lower than most published rates, however there is still room for improvement. Our findings indicate that patients with baseline dementia and sensory impairment are at increased risk for delirium postoperatively. A delirium initiative utilizing nurse champions can be effective in educating nurses about delirium and initiating screening on a postoperative neurosurgical floor. Programs that provide multidisciplinary, specialized perioperative care for high-risk elderly patients may be effective in reducing the incidence of postoperative delirium.

References

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