Chapter 57. Practices Rated by Strength of Evidence

After rating practices on a metric for potential impact, and on the strength of the evidence, we grouped them into 5 categories (Tables 57.1-57.5). These categorizations reflect the current state of the evidence. If a practice that addresses a highly prevalent or severe patient safety target receives a low rating on the impact/evidence scale, it may be because the strength of the evidence base is still weak due to lack of evaluations. As a result the practice is likely to show up at a high level on the research priority scale. However, if the practice has been studied rigorously, and there is clear evidence that its effectiveness is negligible, it is rated at the low ends of both the "strength of the evidence" (on impact/effectiveness) scale and the "research priority" scale.

For each practice listed in Tables 57.1 through 57.5, a designation for the cost and complexity of implementation of the practice is included. The ratings for implementation are "Low," which corresponds to low cost and low complexity (eg, political, technical); "Medium," which signifies low to medium cost and high complexity, *or* medium to high cost and low complexity; and "High," which reflects medium to high cost and high complexity.

Several practices are not included in the tables because they were not rated. This set of practices have long histories of use outside of medicine, but have not yet received enough evaluations for their potential health care applications:

- Promoting a Culture of Safety (Chapter 40)
- Use of Human Factors Principles in Evaluation of Medical Devices (Subchapter 41.1)
- Refining Performance of Medical Device Alarms (eg, balancing sensitivity and specificity of alarms, ergonomic design) (Subchapter 41.2)
- Fixed Shifts or Forward Shift Rotations (Chapter 46)
- Napping Strategies (Chapter 46)

Table 57.1. Patient Safety Practices with the Greatest Strength of Evidence Regarding their Impact and Effectiveness

Chapter	Patient Safety Target	Patient Safety Practice	Implementation Cost/Complex
31	Venous thromboembolism (VTE)	Appropriate VTE prophylaxis	Low
25	Perioperative cardiac events in patients undergoing noncardiac surgery	Use of perioperative beta-blockers	Low
16.1	Central venous catheter-related bloodstream infections	Use of maximum sterile barriers during catheter insertion	Low
20.1	Surgical site infections	Appropriate use of antibiotic prophylaxis	Low
48	Missed, incomplete or not fully comprehended informed consent	Asking that patients recall and restate what they have been told during informed consent	Low
17.2	Ventilator-associated pneumonia	Continuous aspiration of subglottic secretions (CASS)	Medium
27	Pressure ulcers	Use of pressure relieving bedding materials	Medium
21	Morbidity due to central venous catheter insertion	Use of real-time ultrasound guidance during central line insertion	High
9	Adverse events related to chronic anticoagulation with warfarin	Patient self management using home monitoring devices	High
33	Morbidity and mortality in post-surgical and critically ill patients	Various nutritional strategies	Medium
16.2	Central venous catheter-related bloodstream infections	Antibiotic-impregnated catheters	Low

Table 57.2 Patient Safety Practices with High Strength of Evidence Regarding their Impact and Effectiveness

Chapter	Patient Safety Target	Patient Safety Practice	Implementation Cost/Complex
18	Mortality associated with surgical procedures	Localizing specific surgeries and procedures to high volume centers	High (varies)
17.1	Ventilator-associated pneumonia	Semi-recumbent positioning	Low
26.5	Falls and fall injuries	Use of hip protectors	Low
8	Adverse drug events (ADEs) related to targeted classes (analgesics, KCl, antibiotics, heparin) (focus on detection)	Use of computer monitoring for potential ADEs	Medium
20.3	Surgical site infections	Use of supplemental perioperative oxygen	Low
39	Morbidity and mortality	Changes in nursing staffing	Medium
48	Missed or incomplete or not fully comprehended informed consent	Use of video or audio stimuli	Low
17.3	Ventilator-associated pneumonia	Selective decontamination of digestive tract	Low
38	Morbidity and mortality in ICU patients	Change in ICU structure—active management by intensivist	High
42.1	Adverse events related to discontinuities in care	Information transfer between inpatient and outpatient pharmacy	Medium
15.1	Hospital-acquired urinary tract infection	Use of silver alloy-coated catheters	Low
28	Hospital-related delirium	Multi-component delirium prevention program	Medium
30	Hospital-acquired complications (functional decline, mortality)	Geriatric evaluation and management unit	High
37.4	Inadequate postoperative pain management	Non-pharmacologic interventions (eg, relaxation, distraction)	Low

Table 57.3 Patient Safety Practices with Medium Strength of Evidence Regarding their Impact and Effectiveness

Chapter	Patient Safety Target	Patient Safety Practice	Implementation Cost/Complex
6	Medication errors and adverse drug events (ADEs) primarily related to ordering process	Computerized physician order entry (CPOE) and clinical decision support (CDSS)	High
42.4	Failures to communicate significant abnormal results (eg, pap smears)	Protocols for notification of test results to patients	Low
47	Adverse events due to transportation of critically ill patients between health care facilities	Specialized teams for interhospital transport	Medium
7	Medication errors and adverse drug events (ADEs) related to ordering and monitoring	Clinical pharmacist consultation services	Medium
13	Serious nosocomial infections (eg, vancomycin-resistant enterococcus, *C. difficile*)	Barrier precautions (via gowns & gloves; dedicated equipment; dedicated personnel)	Medium
20.4	Surgical site infections	Perioperative glucose control	Medium
34	Stress-related gastrointestinal bleeding	H_2 antagonists	Low
36	Pneumococcal pneumonia	Methods to increase pneumococcal vaccination rate	Low
37.2	Inadequate pain relief	Acute pain service	Medium
9	Adverse events related to anticoagulation	Anticoagulation services and clinics for coumadin	Medium
14	Hospital-acquired infections due to antibiotic-resistant organisms	Limitations placed on antibiotic use	Low
15.2	Hospital-acquired urinary tract infection	Use of suprapubic catheters	High
32	Contrast-induced renal failure	Hydration protocols with acetylcysteine	Low
35	Clinically significant misread radiographs and CT scans by non-radiologists	Education interventions and continuous quality improvement strategies	Low
48	Missed or incomplete or not fully comprehended informed consent	Provision of written informed consent information	Low
49	Failure to honor patient preferences for end-of-life care	Computer-generated reminders to discuss advanced directives	Medium (Varies)
9	Adverse events related to anticoagulation	Protocols for high-risk drugs: nomograms for heparin	Low

17.1	Ventilator-associated pneumonia	Continuous oscillation	Medium
20.2	Surgical site infections	Maintenance of perioperative normothermia	Low
26.2	Restraint-related injury; Falls	Interventions to reduce the use of physical restraints safely	Medium
26.3	Falls	Use of bed alarms	Medium
32	Contrast-induced renal failure	Use of low osmolar contrast media	Medium

Table 57.4 Patient Safety Practices with Lower Impact and/or Strength of Evidence

Chapter	Patient Safety Target	Patient Safety Practice	Implementation Cost/Complex
16.3	Central venous catheter-related bloodstream infections	Cleaning site (povidone-iodine to chlorhexidine)	Low
16.4	Central venous catheter-related bloodstream infections	Use of heparin	Low
16.4	Central venous catheter-related bloodstream infections	Tunneling short-term central venous catheters	Medium
29	Hospital-acquired complications (eg, falls, delirium, functional decline, mortality)	Geriatric consultation services	High
37.1	Inadequate pain relief in patients with abdominal pain in hospital patients	Use of analgesics in the patient with acute abdomen without compromising diagnostic accuracy	Low
45	Adverse events due to provider inexperience or unfamiliarity with certain procedures and situations	Simulator-based training	Medium
11	Adverse drug events (ADEs) in drug dispensing and/or administration	Use of automated medication dispensing devices	Medium
12	Hospital-acquired infections	Improve handwashing compliance (via education/behavior change; sink technology and placement; washing substance)	Low
49	Failure to honor patient preferences for end-of-life care	Use of physician order form for life-sustaining treatment (POLST)	Low
43.1	Adverse events due to patient misidentification	Use of bar coding	Medium (Varies)
10	Adverse drug events (ADEs) in dispensing medications	Unit-dosing distribution system	Low
24	Critical events in anesthesia	Intraoperative monitoring of vital signs and oxygenation	Low
42.2	Adverse events during cross-coverage	Standardized, structured sign-outs for physicians	Low
44	Adverse events related to team performance issues	Applications of aviation-style crew resource management (eg, Anesthesia Crisis Management; MedTeams)	High
46	Adverse events related to fatigue in health care workers	Limiting individual provider's hours of service	High

57.5 Patient Safety Practices with Lowest Impact and/or Strength of Evidence

Chapter	Patient Safety Target	Patient Safety Practice	Implementation Cost/Complex
23	Complications due to anesthesia equipment failures	Use of pre-anesthesia checklists	Low
42.3	Adverse events related to information loss at discharge	Use of structured discharge summaries	Low
22	Surgical items left inside patients	Counting sharps, instruments and sponges	Low
17.4	Ventilator-associated pneumonia	Use of sucralfate	Low
26.4	Falls and fall-related injuries	Use of special flooring material in patient care areas	Medium
43.2	Performance of invasive diagnostic or therapeutic procedure on wrong body part	“Sign your site” protocols	Medium
26.1	Falls	Use of identification bracelets	Low
32	Contrast-induced renal failure	Hydration protocols with theophylline	Low
47	Adverse events due to transportation of critically ill patients within a hospital	Mechanical rather than manual ventilation during transport	Low
16.4	Central venous catheter-related bloodstream infections	Changing catheters routinely	High
16.4	Central venous catheter-related bloodstream infections	Routine antibiotic prophylaxis	Medium