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High Reliability and Safety Culture: Focus on Leadership

High reliability organizations consistently eliminate or minimize adverse events despite carrying out intrinsically complex and hazardous work. This annotated bibliography includes recent peer-reviewed articles and conceptual frameworks discussing organizational behavior essential to obtaining high reliability, and leadership's role in implementing high reliability principles to advance the culture of safety. Citations are linked to full-text articles **[*]** when available. **[PG]** denotes Press Ganey research.

Study	Objective	Conclusion
Berry, J. C., Davis, J. T., Bartman, T., Hafer, C. C., Lieb, L. M., … Brilli, R. J. (in press). Improved safety culture and teamwork climate are associated with decreases in patient harm and hospital mortality across a hospital system. *Journal of Patient Safety*.	To document an association between improved safety and teamwork culture and decreased patient harm across an entire hospital system.	▪ As hospital safety attitude scores improve, teamwork attitude scores increase and all harm, serious safety events, and mortality decrease. ▪ Improvements in teamwork and safety followed a quality improvement initiative rooted in the Institute for Healthcare Improvement's "Model for Improvement" and Healthcare Performance Improvement's program for culture change and high-reliability principles.
Mohr, D. C., Eaton, J. L., McPhaul, K. M., & Hodgson, M. J. (in press). Does employee safety matter for patients too? Employee safety climate and patient safety culture in health care. *Journal of Patient Safety*.	To examine relationships between employee safety climate and patient safety culture.	▪ Higher employee safety climate scores are positively associated with nine patient safety culture measures. ▪ Facilities have more positive assessments of patient safety culture when staff members have more positive perceptions of workplace safety culture. ▪ Patient safety culture and employee safety climate are mutually reinforcing: improvements in one positively impacts the other.
[*] The Joint Commission. (2017). The essential role of leadership in developing a safety culture. *Sentinel Event Alert*, 57, 1-8.	To report The Center for Transforming Healthcare's findings relative to leadership impact on safety culture.	▪ Leadership's inability to create a culture of safety is a contributing factor to many types of adverse events. Barriers to success include: – Insufficient support of patient safety event reporting – Lack of feedback or response to staff and others who report safety vulnerabilities – Allowing intimidation of staff who report events – Refusing to consistently prioritize and implement safety recommendations – Not addressing staff burnout ▪ Maintaining a safety culture requires leaders to consistently and visibly promote safety measures.
McGaffigan, P. A., Daley Ullem, B., Gandhi, T. K. (2017). Closing the gap and raising the bar: Assessing board competency in quality and safety. *Joint Commission Journal on Quality and Patient Safety, 43*(6), 267-274.	To identify board members' and CEOs' self-reported and perceived knowledge and understanding of specific safety and quality concepts and related practices.	▪ A large percentage of hospital board members reported that safety is ranked as their number one strategic priority, yet they do not consistently review quality and safety dashboards at board meetings. ▪ Board members report a low understanding of safety principles, especially high reliability methods and transparency of safety events data.

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Saysana, M., McCaskey, M., Cox, E., Thompson, R., Tuttle, L. K., & Haut, P. R. (2017). A step toward high reliability: implementation of a daily safety brief in a children's hospital. *Journal of Patient Safety, 13*(3), 149-152.	To describe a safety brief protocol associated with and increased awareness of daily events and improved communication and relationships between departments.	▪ There is significant improvement in awareness of daily events, communication, and relationships between departments following the implementation of a daily safety brief. ▪ The daily brief improves identification of system weaknesses related to resource use and availability, and the impact of functional interactions between departments on individual department operations. ▪ The process consists of a daily, 15-minute, face-to-face situation update with quality and safety leadership, chief officers, and department directors each presenting department updates.
Bishop, A. C., & Boyle, T. A. (2016). The role of safety culture in influencing provider perceptions of patient safety. *Journal of Patient Safety, 12*(4), 204-209.	To determine how perceptions of safety culture influence providers' involvement in patient safety practices.	▪ Safety culture promotes patient safety activities among health-care providers. ▪ Safety culture contributes to: – Provider perceptions of the organizational commitment to patient safety – Provider perceptions of patients' level of risk for experiencing a patient safety incident – Patient collaboration and disclosure – Sharing lessons learned from past patient safety incidents with staff ▪ Patient safety strategies that emphasize patient risk and harm may improve provider engagement. ▪ Safety culture helps facilities overcome obstacles to adopting patient safety strategies. ▪ Patient safety strategies are more successful following a thorough exploration of an organization's safety culture.
Cooper, M. R., Hong, A., Beaudin, E., Dias, A., Kreiser, S., Ingersol, C. P., & Jackson, J. (2016). Implementing high reliability for patient safety. *Journal of Nursing Regulation, 7*(1), 46-52.	To describe an organizational model using high reliability principles to decrease the incidence of safety events in Connecticut hospitals.	▪ 50% reduction in the incidence of serious preventable harm. ▪ 86.7% reduction in catheter-associated urinary tract infections. ▪ Keys to success include: – Identify a champion for culture change – Perform an organizational readiness assessment – Train everyone in high reliability and safety – Provide necessary equipment and resources – Start every day with safety huddles and include safety in every discussion – Promote transparency about safety events – Participate in a patient safety organization collaborative – Classify event data utilizing the SSE system
O'Connor, S., & Carlson, E. (2016). Safety culture and senior leadership behavior: Using negative safety ratings to align clinical staff and senior leadership. *Journal of Nursing Administration, 46*(4), 215-220.	To examine how behavioral changes among senior leaders impact clinical nursing staff and the culture of safety in a community hospital.	▪ The volume of risk and near-miss reports increases and harm rates decrease as senior leader communication, access, and visibility increases. ▪ Senior leader behaviors that positively impact the culture of safety include: – Attendance at staff meetings – Collaborate with nursing staff on safety initiatives – Visible advocacy for safety

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		– Communicate lessons learned and improvement plans – Leadership rounds with staff to discuss safety concerns
Etchegaray, J. M., & Thomas, E. J. (2015). Engaging employees: The importance of high-performance work systems for patient safety. *Journal of Patient Safety, 11*(4), 221-227.	To examine associations between High-Performance Work Systems (HPWSs) and teamwork culture, safety culture, and overall patient safety grade.	▪ The HPWS survey is a stronger predictor of speaking up and overall patient safety grade than the Safety Attitudes Questionnaire. ▪ The HPWS survey is a stronger predictor of continuous improvement than the Hospital Survey on Patient Safety Culture. ▪ Information sharing, empowerment, and teamwork were rated as the most important HPWSs practices for health care quality and safety.
McAlearney, A. S. (2015). High-performance work practices in CLABSI prevention interventions. *Agency for Healthcare Research and Quality, Publication No. 15-0044-EF*. Rockville, MD.	To explore how the implementation of High Performance Work Practices (HPWPs) facilitates successful reduction of central line-associated bloodstream infections (CLABSIs).	▪ HPWPs facilitate the consistent application of practices known to prevent CLABSIs. ▪ Employee engagement practices (e.g., communicating CLABSI goals, keeping staff informed of progress, and involving staff in decision making) are important to motivate staff to accomplish CLABSI reduction goals. ▪ Lower CLABSI incidence is found among facilities that broadly disseminate education about CLABSI and develop employees' skills for CLABSI prevention. ▪ High performers emphasize the following as critical for success: – A belief that a rate of zero CLABSIs is attainable – Strong leadership at all levels – A supportive organizational culture – Engaged caregivers – Accountability for results – Resources to support improvement efforts – Effective use of data
McFadden, K., Stock, G., Gowen, C., (2015). Leadership, safety climate, and continuous quality improvement: Impact on process quality and patient safety. *Health Care Management Review, 40*(1), 24–34.	To assess how transformational leadership, safety climate, and continuous quality improvement (CQI) initiatives are related to objective quality and patient safety outcome measures.	▪ Transformational leadership style in the CEO—empowering through inspirational motivation and encouraging innovation—is directly related to employees' perception of a strong safety climate. ▪ Hospitals with a strong patient safety culture were more likely to successfully implement CQI. ▪ Findings support the need to simultaneously apply patient safety culture (PSC) and CQI initiatives.
[PG] Press Ganey. (2015). Reducing serious safety events: A critical dimension of the patient experience. South Bend, IN: Author.	To discuss the interrelated domains of safety, quality, and patient experiences.	▪ From the patient's perspective, safety is fundamental to the health care experience. Safety and quality initiatives should incorporate consideration of patient perceptions of care. ▪ Tactics designed to improve patient perceptions of care (e.g., communication training and leadership rounding) also positively and directly influence patient safety.

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		▪ Organizations that perform well in patient experience have lower mortality, improved rescue rates for critically ill patients, and fewer complications. ▪ Safety data transparency is integral to eliminating patient harm. ▪ Resources for teaching and reinforcing empathy, communication, compassion, and service for all practitioners and employees are essential to highly reliable operations. ▪ Health care organizations that focus on high reliability principles to create a more robust culture of safety will improve multiple other dimensions of performance.
Pronovost, P. J., Armstrong, C. M., Demski, R., Callender. T., Winner, L., Miller, M. R, … Rothman, P. B. (2015). Creating a high-reliability health care system: Improving performance on core processes of care at Johns Hopkins Medicine. *Academic Medicine, 90*(2), 165-172.	To describe a safety initiative at a health care system that improved performance on core measures for acute myocardial infarction, heart failure, pneumonia, surgical care, and children's asthma.	▪ A high-reliability governance structure with interrelated committees that results in high core measure compliance across medical and surgical services includes: – A system-level committee of quality and safety leaders to compare data against benchmarks, identify improvement priorities, and communicate priorities to everyone from presidents to staff. – Hospital-specific clinical work groups with at least one member being Lean Six Sigma certified to manage prioritized initiatives using Lean Six Sigma tools for assessment and improvement. – A tiered performance review process with action and sustainability plans for unmet targets. Hospital-specific clinical work groups answer first to a hospital-level Quality Committee, then to a system-level Quality Board, and finally to the Board of Trustees. – An electronic dashboard to provide system-wide transparency to enhance accountability.
[*] Auer, C., Schwendimann, R., Koch, R., De Geest, S., & Ausserhofer, D. (2014). How hospital leaders contribute to patient safety through the development of trust. *Journal of Nursing Administration, 44*(10 Suppl), S38-44.	To explore the associations between hospital management support for patient safety, registered nurses' trust in hospital management, and their perception of patient safety.	▪ There are direct associations between ‘‘management support for patient safety’’ and both ‘‘trust in management’’ and ‘‘overall perception of patient safety.’’ ▪ Safety communication—including nonpunitive response to error, communication openness, organizational learning and feedback, and communication of errors—plays a mediating role between ‘‘management support for patient safety’’ and nursing professionals’ assessments of patient safety. ▪ Higher management support for patient safety was related to overall higher perceptions of safety.
McFadden, K. L., Stock, G. N., & Gowen, C. R. (2014). Leadership, safety climate, and continuous quality improvement: impact on process quality and patient safety. *Journal of Nursing Administration, 44*(10 Suppl), S27-S37.	To assess how transformational leadership, safety climate, and continuous quality improvement (CQI) initiatives are related to objective quality and patient safety outcome measures.	▪ Findings support the need to simultaneously apply patient safety culture (PSC) and CQI initiatives. ▪ PSC and CQI are not interchangeable. – CQI—statistical process control, benchmarking, and employing quality teams—is positively associated with improved process quality. – PSC—reporting errors without blame, redesigning systems, and openly discussing errors—is directly related to improved clinical outcomes.

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		▪ Transformational leadership style in the CEO—empowering through inspirational motivation and encouraging innovation—is directly related to employees' perception of a strong safety climate. ▪ Hospitals with a strong PSC were more likely to successfully implement CQI.
Sexton, J. B., Sharek, P. J., Thomas, E. J., Gould, J. B., Nisbet, C. C., Amspoker, A. B., … Profit, J. (2014). Exposure to Leadership WalkRounds in neonatal intensive care units is associated with a better patient safety culture and less caregiver burnout. *BMJ Quality and Safety, 23*(10), 814-822.	To evaluate the association between leadership rounds and health care worker assessments of patient safety culture and burnout in neonatal intensive care units.	▪ Leadership walking rounds is associated with: – Higher scores in two Safety Attitudes Questionnaire domains: safety climate and teamwork climate – Higher scores in two Hospital Survey on Patient Safety Culture domains: overall perceptions of safety and feedback and communication about error ▪ More walking rounds feedback is associated with better teamwork within units and lower burnout. ▪ Rates of direct participation in leadership walking rounds and exposure to feedback during rounds are significantly lower in NICUs compared to adult units.
Weaver, S. J., Weeks, K., Pham, J. C., & Pronovost, P. J. (2014). On the CUSP: Stop BSI: Evaluating the relationship between central line-associated bloodstream infection rate and patient safety climate profile. *American Journal of Infection Control, 42*(10 Suppl), S203-S208.	To investigate the relationship between intensive care unit (ICU) patient safety climate profiles and central line-associated bloodstream infection (CLABSI) rates.	▪ Safety climate profile is a significant predictor of infection risk even after adjusting for unit type and size. ▪ The incidence of CLABSI is significantly lower in organizations where high levels of hospital leadership support for patient safety and collaboration across units and services is perceived as a priority, even relative to teamwork. ▪ CLABSI risk is higher in specialty units. ▪ The larger the ICU the higher the risk for CLABSI.
Chassin, M. R., & Loeb, J. M. (2013). High-reliability health care: Getting there from here. *Milbank Quarterly, 91*(3), 459-490.	To describe a conceptual framework for hospitals to evaluate readiness for high reliability.	▪ All the following behaviors are necessary for hospitals to make progress toward high reliability: – All leadership—including the board—must share a vision of zero harm and identify quality and patient safety as the organization's highest strategic goal. – Physicians must routinely champion quality improvement initiatives throughout the hospital. – Quality and safety must be measured, the data must be widely transparent and financial and advancement opportunities should be tied to quality performance. – Health information technology must be employed for process automation to support quality and safety improvement. – The reporting of close calls and unsafe conditions must be prioritized. Eliminate intimidating behavior that suppresses reporting, act in a timely way to fix problems reported by workers, and consistently communicate improvements to the individuals who reported the problems. – Employees must be held accountable for adhering to safety protocols and procedures.

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		▪ Robust process improvement (RPI)—widespread deployment of lean, Six Sigma, and change management—is associated with significant improvement in safety events including hand hygiene, handoff communications, wrong-site surgery, and surgical site infection. ▪ The perspective of patients on what constitutes high-quality outcomes is vital for improvement.
McAlearney, A. S., Robbins, J. (2013). Using high-performance work practices in health care organizations: A perspective for nursing. *Journal of Nursing Care Quality, 29*(2), E11-20.	To determine how High-Performance Work Practices (HPWPs) improve the work environment for nurses and improve the quality of care.	▪ Communication—including organization wide messages that emphasize a cultural commitment to HPWPs; cascading leadership communication; and educational and informational campaigns—is particularly important to facilitate HPWP use. ▪ Findings suggest a link between HPWPs—engaging staff, aligning leaders, acquiring and developing talent, and empowering the frontline—and Magnet related practices. ▪ The implementation of HPWPs is most successful when framed as a long-term organizational culture change effort linked to the organization's mission and goals.
Pronovost, P. J., Demski, R., Callender, T., Winner, L., Miller, M. R., Austin, J. M., & Berenholtz, S. M. (2013). Demonstrating high reliability on accountability measures at the Johns Hopkins Hospital. *Joint Commission Journal on Quality and Patient Safety, 39*(12), 531-544.	To describe high reliability systems associated with improved core measure performance.	▪ A safety initiative with leadership program stewardship (including board members), a standard communication model, robust process improvement, and accountability plans is credited with improving the reliability in maintaining a 95%+ pass rate in The Joint Commission accountability measures across nine core process measures.
Weinberg, D. B., Avgar, A. C., Sugrue, N. M., & Cooney-Miner D. (2013). The importance of a high-performance work environment in hospitals. *Health Services Research, 48*(1), 319-332.	To examine the benefits of a high-performance work environment (HPWE) for employees, patients, and hospitals.	▪ HPWE is related to lower odds that a patient will experience an adverse outcome during the hospital stay and to higher patient survey ratings of the hospital stay overall. ▪ Providers in more supportive work environments also report higher levels of professional empowerment. ▪ There is a relationship between higher RN-reported HPWE on their units and lower nurse turnover. ▪ Work environments vary by unit and occupation. Measure the environment at the workgroup or unit level.

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Hilliard, M. A., Sczudlo, R., Scafidi, L., Cady, R., Villard, A., & Shah, R. (2012). Our journey to zero: Reducing serious safety events by over 70% through high-reliability techniques and workforce engagement. *Journal of Healthcare Risk Management, 32*(2), 4-18.	To describe safety practices associated with a reduction in serious safety events.	▪ The Safety Transformation Initiative reduced costs by an estimated $35 million (following an estimated $1.7 million investment), and reduced serious safety events (SSEs) by 71% over a three-year period. ▪ Incident reporting increase as SSEs decrease. ▪ Safety Culture Survey scores improved following the initiative. ▪ Key program components include: – Bringing in leaders from other hospitals to testify to the validity of the high reliability approach to gain executive buy-in. – Mandatory training for board members, leadership and all employees. – Linking the SSE reduction goal to the strategic plan and compensation programs. – Holding monthly senior executive and board member rounds with front-line staff. – Applying an aggregate SSE metric to assess the relative frequency of all SSEs. – Including senior executives in the investigation and root causing of individual and system failures.
Miller, M. A., Krein, S. L., Saint, S., Kahn, J. M., & Iwashyna, T. J. (2012). Organizational characteristics associated with the use of daily interruption of sedation in US hospitals: A national study. *BMJ Quality and Safety, 21*(2), 145-151.	To identify hospital characteristics associated with routine use of daily interruption of sedation (DIS), an evidence-based practice.	▪ Leadership emphasis on safety culture, staff receptivity to change, and involvement with an infection prevention collaborative are significantly associated with regular DIS use. ▪ Combine administrative approaches—cultivating a culture of clinical excellence, overcoming barriers, inspiring staff, and acting strategically—with strategies to encourage receptivity to change (e.g., the presence of a team champion) to successfully implement evidence-based practices.
Chassin, M. R., & Loeb, J. M. (2011). The ongoing quality improvement journey: Next stop, high reliability. *Health Affairs, 30*(4), 559-568.	To propose a conceptual framework for health care organizations to use to move toward high reliability.	▪ Leadership—including board members—must commit to high reliability as the top priority for the long-term. This requires: – Embedding the aim of high reliability into the vision and mission statements – Setting measurable goals – Monitoring achievement – Taking a prospective approach to discovering potential failure ▪ All employees of high reliability organizations search for indications that the environment or a process might lead to failure. Deficiencies are eliminated using robust process improvement tools—Six Sigma, lean management, and change management—collectively. ▪ The key to effective improvement is to identify the root causes of a problem specific to the organization and deploy targeted interventions. ▪ High reliability depends on a high rate of error reporting driven by trust that it is safe to report problems and that management will act to fix the problem(s) reported.

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Sutcliffe, K. M. (2011). High reliability organizations (HROs). *Best Practice and Research: Clinical Anaesthesiology, 25*(2), 133-144.	To examine concepts from the literature on high reliability organizations (HROs).	▪ The best HROs foster a resistance to operational hazards by: – Pursuing safety as a priority objective – Building in redundancy – Decentralizing decision making – Shaping culture towards reliable performance – Investing heavily in training and simulation – Learning from close calls – Aggressively seeking to know what one does not know – Emphasizing communication of the big picture and where people fit into the big picture – Rewarding people who report failures
Taylor, S. L., Dy, S., Foy, R., Hempel, S., McDonald, K. M., Ovretveit, J., … Shekelle, P. G. (2011). What context features might be important determinants of the effectiveness of patient safety practice interventions? *BMJ Quality and Safety, 20*(7), 611-617.	To examine associations between organizational characteristics and patient safety practices (PSPs).	▪ Contextual features that are important for PSP implementations include: – Safety culture, teamwork and leadership involvement – Structural characteristics (e. g., bed size, organizational complexity, or financial status). – External factors (e. g., performance incentives or PSP regulations) – Availability of implementation and management tools (e. g., training resources or internal organizational incentives). ▪ Patient safety culture, teamwork, and leadership contexts are rated as high priority for impacting Patient Safety Practice implementations.
Goeschel, C. A., Holzmueller, C. G., Berenholtz, S. M., Marsteller, J. A., Murphy, D. J., Sawyer, M., … Pronovost, P. J. (2010). Executive/senior leader checklist to improve culture and reduce central line-associated bloodstream infections. *Joint Commission Journal on Quality and Patient Safety, 36*(11), 519-524.	To describe a tool identified during a central line-associated bloodstream infection (CLABSI) reduction effort to help leaders incorporate quality improvement into the institutional culture.	▪ The Executive/Senior Leader Checklist is a one-page list to help CEOs facilitate the Stop Blood Stream Infections national program. The program pairs: – Safety principles, multidisciplinary teamwork, identifying factors contributing to hazards, and system redesign – The CDC bundle of evidence-based practices to reduce CLABSI ▪ To implement the checklist the CEO: – Presents the checklist and program overview to executive and medical leadership – Assigns checklist tasks to VP level leaders or above and sets target completion dates – Holds assigned leaders accountable for project plans, monitoring progress, providing updates, and collaborating with colleagues and frontline staff – Reviews progress at monthly leadership, and quarterly board meetings – Reports suggestions offered by hospital leaders at monthly unit based meetings – Reviews data and communicates infection rates hospital wide, unit level to board level quarterly – Holds staff accountable for infection rates ▪ CEOs must use data, improving the climate for safety and teamwork, and ensure patients receive evidence-based interventions to successfully reduce hospital acquired infections.

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Paine, L. A., Rosenstein, B. J., Sexton, J. B., Kent, P., Holzmueller, C. G., & Pronovost, P. J. (2010). Assessing and improving safety culture throughout an academic medical center: A prospective cohort study. *Quality and Safety in Health Care, 19*(6), 547-554.	To assess the effectiveness of interventions to improve safety climate at a large academic medical center.	▪ Hospital-wide interventions are associated with improvements in safety climate. Key interventions include: – A comprehensive unit-based safety program – An electronic event reporting system – Hospital-wide training on the science of safety – Communicating lessons learned during rounds and in newsletters – A safety dashboard reporting harmful events to leaders and board members – Annual review of Safety Attitudes Questionnaire (SAQ) findings with all staff and employees. ▪ SAQ scores improved significantly over a three-year period for every domain and item except stress recognition. ▪ Management changes, unit construction and implementation of information technology appeared to contribute to lower SAQ results.
Singer, S. J., Falwell, A., Gaba, D. M., Meterko, M., Rosen, A., Hartmann, C. W., & Baker, L. (2009). Identifying organizational cultures that promote patient safety. *Health Care Management Review, 34*(4), 300-311.	To examine the impact of organizational characteristics on hospital safety climate.	▪ Safety climate and organizational culture are positively related. ▪ A higher level of group culture correlates with a higher level of safety climate, while a hierarchical culture is associated with lower safety climate. ▪ Group culture is most highly correlated with organizational resources and work-unit support for safety. ▪ Strategies that advance group culture and safety climate include multidisciplinary team training, continuous quality improvement tools, and human resource practices and policies.
Pronovost, P., Needham, D., Berenholtz, S., Sinopoli, D., Chu, H., Cosgrove, S., … Goeschel, C. (2006). An intervention to decrease catheter-related bloodstream infections in the ICU. New England Journal of Medicine, 355(26), 2725-2732.	To evaluate the effect of the Michigan Keystone ICU project intervention on CLABSI rates up to 18 months after its implementation.	▪ The project interventions included a comprehensive unit-based safety program to improve the safety culture, communication, and education; implement a bundle for infection prevention; and using a daily goals sheet for clinician-clinician communication. ▪ There was a significant decrease in rates of catheter-related bloodstream infection compared with baseline rates. – The overall median rate of catheter-related bloodstream infection was sustained at 0 (mean, 1.4) during 18 months of follow-up. ▪ A large-scale project focused on reducing the incidence of catheter-related bloodstream infection is feasible and can have important public health consequences.