Stage 1 (Screening Title and Abstract) Form

1. Does this article report or evaluate the results of an intervention (whether performed by the investigators or not)?
- o Yes
- o No
- o Can't tell

2. Does the article involve quality improvement or a QI strategy?
- o Yes - involves quality improvement or a QI strategy
- o Yes - systematic review of evaluations of a QI strategy
- o No
- o Can't tell

3. Should this article proceed to article abstraction stage for this topic?
- o Yes - evaluates a QI strategy involving nosocomial infections
- o No – ineligible topic* (focused on community-acquired infections, outpatient care, or specific nosocomial infection other than CLABSI, VAP, SSI, or UCUTI)
- o No - not an evaluation or not QI
- o Can't tell - need article
- o No - but useful background article
- o No - foreign language article

4. What type of study design was used?
- o RCT or quasi-RCT
- o CBA** or ITS ***
- o Simple before-after study or time series not meeting ITS definition
- o Observational (e.g., cohort study, cross-section, case-control)
- o Systematic review or meta-analysis
- o Economic or decision analysis, modeling
- o Non-research (commentary, review, news)
- o Qualitative research (e.g., focus groups)
- o Guideline or consensus statement
- o Can't tell (need article)

** Note that at this stage, err in favor of including articles unless they clearly address infections other than those listed below. Also, if an article addresses general nosocomial infection prevention, err in favor of including it at this stage.*

CLABSI = central line associated blood stream infection (synonyms: central venous catheter associated infection, central venous catheter sepsis, central line sepsis)
VAP = ventilator associated pneumonia
SSI = surgical site infection (synonyms: surgical wound infection, postoperative infection)

UCUTI = urinary catheter associated urinary tract infection (synonyms: foley catheter associated urinary tract infection, urinary catheter related infection, urinary catheter associated cystitis)

*** Controlled Before After (CBA) requires contemporaneous observation periods for control and intervention groups AND judgment that control represents a comparable group or setting*

**** Interrupted time series (ITS) requires statement of well-defined time period for intervention implementation AND at least three time points both before and after*

Note: At this stage of triage, if there is a reasonable chance article is a clinical trial, CBA or ITS, err on the side of inclusion at that level. Stricter criteria can be applied more reliably at next stage of abstraction using full text of article. Similarly, if there is a reasonable chance article is a systematic review, designate it as such so article can be pulled.

5. What category of study question is addressed by the article?
   - o Can the incidence of CBSI be reduced?
   - o Can the incidence of SSI be reduced?
   - o Can the incidence of VAP be reduced?
   - o Can the incidence of UCUTI be reduced?
   - o Can nosocomial infections in hospitals be reduced?
   - o Not applicable – excluded above [answer only if excluded at Q1 or Q2 above]
   - o Can't tell (need article)

Stage 2 (Full Text) Abstraction Form

1. Does this article merit full text abstraction?
   - o Yes
   - o No – not QI or not an evaluation of a QI strategy* ***[exclusion]***
   - o No – ineligible study design (i.e., not RCT, CBA, or ITS) ***[exclusion]***
   - o No - excluded topic (Focus on evaluation of infections which are not hospital acquired or not CLABSI, SSI, VAP, or UTI) ***[exclusion]***
   - o No – no eligible outcomes** ***[exclusion]***
   - o No- other ***[exclusion]***

**Treatment evaluation studies (studies of the effect of a specific preventive intervention or therapy on nosocomial infection rates) should not be included. To be included, studies should explicitly attempt to promote use of a particular intervention, rather than evaluating the effect of the intervention itself.*

***Eligible outcomes include physician or staff adherence to recommended practices, or improvement in rate of SSI, CLABSI, VAP, or UTI. Article must report at least one of these two outcomes to be eligible for full text abstraction. Studies that addressed general nosocomial infection prevention should be abstracted ONLY if they report outcomes pertaining to SSI, CLABSI, VAP or UTI.*

2. Does this article present data overlapping with another article?
   - o Exclude this article as a duplicate publication (identify included citation being duplicated) ***[exclusion]***

- o Include this article, but obtain listed citation to help with abstraction (e.g., separate methods paper; identify required citation)
- o No or N/A

3. Does abstraction of this study require information from methods or results reported in other citations?
- o Yes (specify)
- o No

4. Does the article report data for more than one comparison (i.e., should it be abstracted as more than one study)?
- o Yes (specify which comparison is being abstracted here and which others will be abstracted elsewhere)
- o No

5. What category of study question is addressed by the article? [check all that apply]
- o Surgical Site Infections
- o Central Line Infections
- o Ventilator Acquired Pneumonia
- o Urinary Catheter-related UTI
- o Other [describe; discuss with Sumant before proceeding]

6. For studies addressing Surgical Site Infections: which of the following specific preventive interventions were targeted?
- o Hand hygiene
- o appropriate use of perioperative antibiotics
- o decreasing use of preoperative shaving of the operative site
- o improving perioperative glucose control
- o perioperative normothermia
- o audit and feedback of infection rates to hospitals or individual clinicians
- o None of the above (discuss with Sumant before proceeding)
- o N/A – article does not address surgical site infections

7. For studies addressing central line-associated bloodstream infections: which of the following specific preventive interventions were targeted?
- o hand hygiene
- o maximal sterile barrier precautions
- o appropriate insertion site selection
- o chlorhexidine skin disinfection
- o prompt removal of unnecessary catheters
- o None of the above (discuss with Sumant before proceeding)
- o N/A – article does not address central line-associated bloodstream infections

8. For studies addressing ventilator-associated pneumonia: which of the following specific preventive interventions were targeted?
- o hand hygiene
- o head of bed elevation above 30 degrees
- o daily interruption of sedation
- o None of the above (discuss with Sumant before proceeding)
- o N/A – article does not address ventilator-associated pneumonia

9. For studies addressing urinary catheter-associated urinary tract infections: which of the following specific preventive interventions were targeted?
- o hand hygiene
- o elevation of the head of the bed
- o aseptic insertion and catheter care

- o None of the above (discuss with Sumant before proceeding)
- o N/A – article does not address urinary catheter-associated urinary tract infections

10. Describe the QI strategy used and its salient features. **[text box]**

A) Study Setting and Participants

11. In what country did the study take place?
    - o US
    - o Non-US [specify]

12. When did the study take place?
    - o If supplied, give exact dates of study period (beginning to end of intervention period)
    - o Not reported

13. In what type of hospital did the study take place?
    - o Tertiary care or university hospital
    - o Community hospital with residents
    - o Non-teaching community hospital
    - o More than one hospital of different types (specify)
    - o Other or unclear (specify)

14. Who was targeted by the intervention? (check all that apply)
    - o All clinical staff
    - o Physicians
    - o Nurses
    - o Respiratory therapists
    - o Other ancillary staff [specify]
    - o Patients
    - o Other [specify]

15. In what clinical setting did the study take place? (check all that apply)
    - o Intensive care unit (specify if medical, surgical, pediatric or other)
    - o Operating room
    - o General inpatient ward (non-ICU)
    - o Other [specify]

16. Were patients in the study selected on the basis of specific clinical characteristics? (check all that apply)
    - o Postoperative patients (specify type of surgery, if supplied)
    - o Patients with specific disease process (specify)
    - o Intubated (mechanically ventilated) patients
    - o Other (specify)
    - o No specific clinical characteristics

17. Were patients in the study selected on the basis of specific demographic characteristics? (check all that apply)
    - o Children (specify age groups)
    - o Elderly (specify age groups)
    - o Specific type of insurance (i.e., patients within a particular HMO) (describe)
    - o Other demographic characteristic (describe)
    - o No specific demographic targeted

18. What type of intervention was provided to the control population?
    - o No intervention or usual care
    - o Some form of low intensity intervention (describe)
    - o No true control - just two or more different types of intervention (discuss with other reviewers; study may need to be excluded)

B) Study Design

19. What was the study design?
    - o Randomized trial (state method of randomization if described)
    - o Quasi-randomized trial (state basis for treatment allocation, e.g.,alternating patients, calendar date, even or odd identification numbers)
    - o Controlled before-after study*
    - o Interrupted time series**
    - o Simple before-after***

**Controlled Before After (CBA) requires contemporaneous observation periods for control and intervention groups AND judgment that control represents a comparable group or setting*

*** Interrupted time series (ITS) requires statement of well-defined time period for intervention implementation AND measurement of data at three or more time points both before and after intervention.*

**** Simple before-after (SBA) requires defined observation period for control and intervention periods.*

20. What was the unit of randomization or treatment allocation?
    - o Patient
    - o Provider
    - o Hospital ward or unit
    - o Entire hospital
    - o Firm (describe)
    - o Institution
    - o Other
    - o Not applicable—ITS or simple before-after study (skip to question 24)

21. For the unit of treatment allocation above, state sample size in each group:
    - o control group
    - o intervention group
    - o Not stated or not clear (explain)

**If sample size differs for outcomes, detail differences in "Not stated or not clear" text box. For simple before-after studies, enter pre-intervention sample size in "control group" box and post-intervention sample size in "intervention group" box*

22. If unit of analysis differed from unit of treatment allocation (e.g., providers randomized, but patient outcomes analyzed), state sample size in each group:
    - o control group
    - o intervention group
    - o Not stated or not clear
    - o Not applicable (unit of analysis same as unit of treatment allocation above)

23. If unit of analysis differed from unit of treatment allocation, did authors acknowledge this issue and/or make appropriate adjustments?

- o Yes (describe)
- o No
- o Not applicable (unit of analysis did not differ from unit of treatment allocation)

24. Were the patients and providers in the control site (or pre-intervention period for SBA or ITS studies) comparable to the intervention site?

- o Yes (skip to question 26)
- o No (explain why not)
- o Unclear (describe)

25. If "no", were efforts made to adjust outcomes for underlying baseline differences in patient and provider characteristics?

- o Yes
- o No (explain why not)
- o Unclear (describe)

Design criteria for randomized and quasi-randomized trials
(If study is a CBA, skip to question 31; if SBA, skip to question 33; if ITS, skip to question 35)

26. Did the study have a cross over design? (Patients randomized to a sequence of interventions such as treatment A followed by treatment B in one group and treatment B followed by treatment A in the other group).

- o Yes (describe)
- o No
- o Not sure - clarify with other reviewers before proceeding

27. Was there adequate concealment of treatment allocation?

- o Yes *(unit of allocation was institution, team or professional and randomization process explicity described,OR unit of allocation was patient or episode of care and some form of centralized randomization scheme or sealed envelopes used)*
- o Not clear (only partially meets above criteria) or not stated - specify which
- o No - inadequate concealment *(enrollment of patients in alternation or through use of even/odd identifying numbers OR unit of allocation was patient or episode of care and reported use of any allocation process that is entirely transparent before assignment (e.g., open list of random numbers) OR allocation was altered byinvestigators, professionals or patients)*

28. Were patients blind to intervention/treatment allocation?

- o Yes
- o No
- o Not sure (explain)
- o Not applicable (patients not actively involved in study - e.g., provider-focused intervention with patient level data obtained retrospectively from charts)

29. Were providers blind to intervention/treatment allocation?

- o Yes
- o No
- o Not sure (explain)
- o Not applicable (explain)

30. Were outcomes assessors blinded to intervention/treatment allocation?
    - o Yes
    - o No
    - o Not sure (explain)
    - o Not applicable (explain)

Design criteria for CBA trials

31. Were measurements in the control group performed at the same time as the intervention group?
    - o Yes
    - o No
    - o Unclear

32. Were the criteria used for selecting the control site explained?
    - o Yes (describe)
    - o No

Design criteria for SBA trials

33. Was the data for the "before" period collected during the same time of the year as the "after" period (e.g., data collected from June-November, but during different years)?
    - o Yes
    - o No (describe)

34. If the data was collected at different times of the year, were efforts made to correct for this?
    - o Yes (describe)
    - o No

Design criteria for ITS trials

35. Was the data analyzed using a formal test for trend (time series ANOVA or regression)?
    - Yes
    - No
    - Unclear

36. **(For all studies)** Do any methodologic aspects of the study design not captured above seriously undermine
appropriateness of inclusion?
    - Yes (explain)
    - No (use text box to document any non-fatal, but still noteworthy methodological features)

C) Quality Improvement Attributes of Intervention

37. Was the intervention performed independent of other quality improvement efforts or other changes?
    - Yes
    - No (specify other interventions that took place)
    - Unclear

38. Did the investigators identify a specific quality gap (a difference between optimal and actual care) in the study population?
    - Yes (describe)
    - No

39. Did the QI strategy involve PATIENT EDUCATION?
    - o Yes
    - o No patient education (skip to question 43)

40. Which of the following educational strategies was used? (check all that apply)
    - o One-on-one session, in person or via telephone
    - o Group session (e.g., classes)
    - o Distribution of printed or audiovisual materials (e.g., pamphlets or poster in waiting room)
    - o Interactive computer-based learning
    - o Provision of clinical data to patient (e.g., test results)
    - o Not sure or other (describe)

41. In what setting was the educational content delivered? (check all that apply)
    - o Clinical setting (e.g., office or emergency department)
    - o Other or unclear (describe)

42. Who was responsible for delivery of the educational content? (check all that apply)
    - o Physician
    - o Nurse or nurse practitioner
    - o Other ancillary health provider (describe)
    - o No specific delivery person (e.g., entirely mailed, computer-based, or passively distributed content)

43. Did the intervention involve PROVIDER EDUCATION?
    - o Yes
    - o No (skip to question 49)

44. Who was the target of the educational intervention? (check all that apply)
    - o Attending (staff) physicians
    - o Residents or fellows
    - o Medical students
    - o Nurse practitioners
    - o Nurses
    - o Respiratory therapists
    - o Other (specify)

45. Which of the following educational strategies was used? (check all that apply)
    - o Distribution of educational materials (published or printed recommendations for clinical care, including clinical practice guidelines, audio-visual materials and electronic publications)
    - o Meetings or lectures (e.g., traditional CME)
    - o Educational outreach visits (e.g., “academic detailing”—a trained person who met with providers in their practice settings to give information with the intent of changing the provider's practice)
    - o Interactive in-person education (e.g., workshops or procedure demonstrations)
    - o Computer- or internet-based interactive tutorials (e.g., self-study modules)
    - o Consensus-building sessions (e.g.,for development of guideline)
    - o Not sure or other (describe)

46. Were all components of the educational intervention delivered to all targets of the intervention?
    - o Yes
    - o No (specify which targets received which components of the intervention)
    - o Unclear or not specified

47. In what setting was the educational content delivered? (check all that apply)
    - o Regularly scheduled staff meeting (specify)
    - o Specially scheduled on-site educational meeting (i.e., in-service class)
    - o Off-site meeting (e.g., CME)

- o Independent study (e.g., computer- or paper-based tutorial)
- o Other (describe)
- o Not clear or not specified

48. Who was responsible for delivery of the educational content? (check all that apply)
    - o Physician expert opinion leader (describe how selected)
    - o Other physician (including colleagues)
    - o Infection control practitioner
    - o Nurse
    - o Pharmacist
    - o Other (describe)
    - o Not clear or not specified
    - o No specific delivery person (entirely independent study or passively delivered content)

49. Did the QI strategy involve a PROVIDER REMINDER system*?
    - o Chart based decision support or reminder system*
    - o Computer based decision support or reminder system
    - o Not sure
    - o No or N/A

** Patient or provider encounter specific information, provided verbally, on paper or on a computer screen, which is intended to prompt provider to recall information at the time of the patient encounter (e.g., reminder to remove catheter)*

50. Did the QI strategy involve provider AUDIT AND FEEDBACK*? (check all that apply)
    - o feedback of infections (or infection rates) to individual provider
    - o feedback of infections/infection rates to practice or hospital
    - o feedback of rate of adherence to preventive interventions to individual provider
    - o feedback of rate of adherence to preventive interventions to practice or hospital
    - o Public reporting of performance data (state if individual data or data for a group or institution)
    - o Benchmarking**
    - o Not sure or other
    - o No or N/A

**Any summary of clinical performance of health care over a specified period of time, e.g., reporting of surgical site infection rates.*
***Benchmarking refers to the provision of performance data from institutions or providers regarded as "leaders in the field." These data provide targets for other providers and institutions to emulate.*

51. Did the QI strategy involve ORGANIZATIONAL CHANGE?
    - o Changes in team structure (e.g., creation of a dedicated procedure team) (specify)
    - o Revision of professional roles among health professionals (e.g., authorizing nurse to stop a procedure if proper infection control procedures were not followed) (specify)
    - o Increased staffing without changes in roles (e.g., adding more nurses) (specify)
    - o TQM/CQI - cycles of measurement of quality problems, design of interventions, implementation and remeasurement
    - o Changes in medical records systems -- e.g.,changing from paper to computerized records, patient tracking systems (specify)
    - o Communication and case discussion between distant health professionals (e.g., telemedicine)
    - o Not sure or other (describe)
    - o No or N/A

52. Did the intervention involve FINANCIAL OR REGULATORY INCENTIVES DIRECTED AT PROVIDERS?
- o Financial incentives for achievement of performance goals (describe)
- o Regulatory mandates (e.g., need for completion of educational module before performing procedures) (describe)
- o Other (describe)
- o No component of provider-directed financial or regulatory incentives

53. Did the intervention involve FINANCIAL OR REGULATORY INCENTIVES DIRECTED AT A PRACTICE OR HEALTH SYSTEM?
- o Yes (describe)
- o No component of health-system-directed financial or regulatory incentives

54. Did the study use an explicit clinical guideline, checklist, or "bundle" of multiple types of interventions?
- o Yes
- o No

55. Use textbox to state any important study features or concerns not captured above.

D) Results

56. For unit of treatment allocation (e.g., clinics, providers, patients), were results reported for at least 80% of participants?
- o Yes (state %)
- o No (state %)
- o Not stated
- o Does not apply – SBA or ITS study

57. If unit of analysis differed from unit of treatment allocation (e.g., providers randomized, but patient level outcomes
analyzed), were results reported for at least 80% of participants?
- o Yes (state %)
- o No (state %)
- o Not stated or not clear
- o Not applicable (unit of analysis same as unit of treatment allocation, or study is SBA or ITS)

58. What was the length of the study follow-up period? (describe)

Studies addressing Surgical Site Infections

59. Did the study address Surgical Site Infections?
- o Yes
- o No (go to question 85)

60. Which specific surgeries were targeted by the intervention? (select all that apply)
- o Cardiothoracic surgery (includes coronary artery bypass graft) (specify)
- o Vascular surgery (specify)
- o Orthopedic surgery (includes total knee replacement, total hip replacement) (specify)
- o Gynecologic surgery (includes hysterectomy) (specify)
- o Colorectal surgery (specify)
- o Other type of surgery not listed above (specify)
- o All surgeries performed at a hospital or hospitals
- o Not clear or not specified

61. What were the outcome types? (check all that apply)
- o Surgical site infection rate
- o Compliance with Hand hygiene
- o Compliance with appropriate timing of perioperative antibiotics (enter definition of appropriate timing as specified in study)
- o Compliance with administering perioperative antibiotics for the appropriate duration (enter definition of appropriate duration as defined in the study)
- o Compliance with appropriate selection of perioperative antibiotics (list which antibiotics were recommended and nonrecommended)
- o Compliance with decreasing use of preoperative shaving of the operative site
- o Compliance with improving perioperative glucose control
- o Compliance with perioperative normothermia
- o Compliance with a clinical guideline for preventing surgical site infections (use this if study mandated an explicit guideline or "bundle" incorporating more than one of the interventions described above)
- o Costs associated with intervention
- o Adverse effects of the intervention [specify]
- o Provider satisfaction with QI strategy
- o Not sure or other (describe)

62. If the study reported surgical site infection rates, did the study define infections according to Centers for Disease Control (CDC) or National Nosocomial Infection Surveillance System (NNIS) protocols?
- o Yes
- o No
- o Unclear

63. Which SSI were measured? (check all that apply)
- o Superficial wound infections
- o Deep incisional or organ space infections
- o All surgical site infections
- o Other (describe)
- o No specific definition provided

64. If wound infection was used as an outcome, what was the duration of surveillance?
- o If specified, enter length of post-operative surveillance (text box)

65. For studies reporting data in the form of surgical site infection rate, provide the following data for the CONTROL group. *If data is missing, record "NR"*
- o Exact units of measurement
- o Infection rate prior to intervention (s)
- o Infection rate after intervention(s) (Not applicable to SBA studies)
- o Percentage change in infection rate (Not applicable to SBA studies)
- o Does not apply – simple before-after study

66. For studies reporting data in the form of surgical site infection rate, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: for simple before-after studies, enter "before" data in "prior to intervention" box and "after" data in "after intervention" box*
- o Exact units of measurement
- o Infection rate prior to intervention
- o Infection rate after intervention

67. Enter any data on surgical site infection rates not abstracted above here:
- o Control group before intervention
- o Control group after intervention
- o Intervention group before intervention
- o Intervention group after intervention

68. For studies reporting data in the form of adherence to hand hygiene, provide the following data for the CONTROL group; if data is missing, record “NR”

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

69. For studies reporting data in the form of adherence to hand hygiene, provide the following data for the INTERVENTION group; if data is missing, record “NR”. *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

70. For studies reporting data in the form of adherence to appropriate timing of perioperative antibiotics, provide the following data for the CONTROL group; if data is missing, record “NR”

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

70. For studies reporting data in the form of adherence to administering perioperative antibiotics for the appropriate duration, provide the following data for the CONTROL group; if data is missing, record “NR”

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

70. For studies reporting data in the form of adherence to appropriate selection of perioperative antibiotics, provide the following data for the CONTROL group; if data is missing, record “NR”

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

71. For studies reporting data in the form of adherence to appropriate use of perioperative antibiotics, provide the following data for the INTERVENTION group; if data is missing, record “NR”. *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

72. For studies reporting data in the form of adherence to protocols for perioperative shaving of the surgical site, provide the following data for the CONTROL group; if data is missing, record “NR”

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

73. For studies reporting data in the form of adherence to protocols for perioperative shaving of the surgical site, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

74. For studies reporting data in the form of adherence to protocols for perioperative normothermia, provide the following data for the CONTROL group; if data is missing, record "NR"

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

75. For studies reporting data in the form of adherence to protocols for perioperative normothermia, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

76. For studies reporting data in the form of adherence to protocols for perioperative glucose control, provide the following data for the CONTROL group; if data is missing, record "NR"

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

77. For studies reporting data in the form of adherence to protocols for perioperative glucose control, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

78. Provide the following data for other types of measurements of adherence to preventive interventions not abstracted above:

- o Specific preventive intervention and units of measurement
- o Value in CONTROL group before intervention
- o Value in CONTROL group after intervention
- o Value in INTERVENTION group before intervention
- o Value in INTERVENTION group after intervention

Measures of costs

Note: cost outcomes should be abstracted only if the study also has usable data for one of the primary outcomes (nosocomial infection rate or provider compliance rate)

79. For studies reporting cost outcomes, what specific measures were used?
- o Total cost of surgical site infection to hospital or health system
- o Total cost of inappropriate antimicrobial prophylaxis averted
- o Total cost of interventions to prevent surgical site infection
- o Other (describe)
- o No measurement of costs

80. For studies reporting the total cost of surgical site infections, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)
- o Exact units of measurement
- o Total costs in CONTROL group before intervention
- o Total costs in CONTROL group after intervention
- o Cost difference before intervention (intervention – control)
- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

81. For studies reporting the total cost of inappropriate antimicrobial prophylaxis avoided, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)
- o Exact units of measurement
- o Total costs in CONTROL group before intervention
- o Total costs in CONTROL group after intervention
- o Cost difference before intervention (intervention – control)
- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

82. For studies reporting the total cost of interventions to prevent surgical site infections, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)
- o Exact units of measurement
- o Total costs in CONTROL group before intervention
- o Total costs in CONTROL group after intervention
- o Cost difference before intervention (intervention – control)
- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

Studies addressing Central Line Infections

83. Did the study address Central Line Infections?
- o Yes
- o No (go to question 104)

84. What were the outcome types? (check all that apply)
- Central line infection rate
- Compliance with Hand hygiene
- Compliance with maximal sterile barrier precautions
- Compliance with appropriate catheter site selection
- Compliance with use of chlorhexidine skin prophylaxis

- Compliance with prompt removal of unnecessary catheters
- Compliance with a clinical guideline for preventing central line infections (use this if study mandated an explicit guideline, checklist or "bundle" incorporating more than one of the interventions described above)
- Costs associated with intervention
- Adverse effects of the intervention [specify]
- Provider satisfaction with QI strategy
- Not sure or other (describe)

85. If the study reported central line infection rates, did the study define infections according to Centers for Disease Control (CDC) or National Nosocomial Infection Surveillance System (NNIS) protocols?
- Yes
- No (enter definition of CLABSI as documented in article)
- Does not apply – did not report infection rates

86. If the study reported central line infection rates, for which specific types of central lines were infections measured?
- o All central lines
- o Only non-tunnelled central lines
- o Not specified
- o Other or unclear (enter relevant information from article)
- o Does not apply – did not report infection rates

87. For studies reporting data in the form of CLABSI rate, provide the following data for the CONTROL group. *If data is missing, record "NR"*
- o Exact units of measurement
- o Infection rate prior to intervention (s)
- o Infection rate after intervention(s) (Not applicable to SBA studies)
- o Percentage change in infection rate (Not applicable to SBA studies)
- o Does not apply – simple before-after study

88. For studies reporting data in the form of CLABSI rate, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: for simple before-after studies, enter "before" data in "prior to intervention" box and "after" data in "after intervention" box*
- o Exact units of measurement
- o Infection rate prior to intervention
- o Infection rate after intervention

89. Enter any data on CLABSI rates not abstracted above here:
- o Control group before intervention
- o Control group after intervention
- o Intervention group before intervention
- o Intervention group after intervention

90. For studies reporting data in the form of adherence to hand hygiene, provide the following data for the CONTROL group; if data is missing, record "NR"
- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

91. For studies reporting data in the form of adherence to hand hygiene, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

92. For studies reporting data in the form of adherence to appropriate use of maximal sterile barrier precautions, provide the following data for the CONTROL group; if data is missing, record "NR"

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

93. For studies reporting data in the form of adherence to appropriate catheter site selection, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

94. For studies reporting data in the form of adherence to use of chlorhexidine for skin disinfection, provide the following data for the CONTROL group; if data is missing, record "NR"

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

95. For studies reporting data in the form of adherence to protocols for prompt removal of unnecessary catheters, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

96. For studies reporting data in the form of adherence to an explicit clinical guideline for preventing CLABSI, provide the following data for the CONTROL group; if data is missing, record "NR"

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

97. For studies reporting data in the form of adherence to an explicit clinical guideline for preventing CLABSI, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*

- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

98. Provide the following data for other types of measurements of adherence to preventive interventions not abstracted above:
- o Specific preventive intervention and units of measurement
- o Value in CONTROL group before intervention
- o Value in CONTROL group after intervention
- o Value in INTERVENTION group before intervention
- o Value in INTERVENTION group after intervention

Measures of costs
Note: cost outcomes should be abstracted only if the study also has usable data for one of the primary outcomes (nosocomial infection rate or provider compliance rate)

99. For studies reporting cost outcomes, what specific measures were used?
- o Total cost of CLABSI to hospital or health system
- o Total cost of interventions to prevent CLABSI
- o Other (describe)
- o No measurement of costs

100. For studies reporting the total cost of CLABSI, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)
- o Exact units of measurement
- o Total costs in CONTROL group before intervention
- o Total costs in CONTROL group after intervention
- o Cost difference before intervention (intervention – control)
- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

101. For studies reporting the total cost of interventions to prevent CLABSI, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)
- o Exact units of measurement
- o Total costs in CONTROL group before intervention
- o Total costs in CONTROL group after intervention
- o Cost difference before intervention (intervention – control)
- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

Ventilator-Associated Pneumonia

102. Did the study address Ventilator Associated Pneumonia (VAP)?
- o Yes
- o No (go to question 121)

103. What were the outcome types? (check all that apply)
- VAP rate
- Compliance with Hand hygiene
- Compliance with head of bed elevation
- Compliance with protocols to assess readiness for ventilator weaning (includes daily lifting of sedation)

- Compliance with a clinical guideline for preventing VAP (use this if study mandated an explicit guideline, checklist or "bundle" incorporating more than one of the interventions described above)
- Costs associated with intervention
- Adverse effects of the intervention [specify]
- Provider satisfaction with QI strategy
- Not sure or other (describe)

104. If the study reported VAP rates, did the study use invasive methods to establish the diagnosis of VAP? (check all that apply)
- Yes – used bronchoalveolar lavage (BAL)
- Yes – used sampling with protected specimen brush (PSB)
- No – used clinical criteria only (specify criteria, e.g., new infiltrate on chest x-ray, fever, elevated white blood cell count)
- Study used both invasive and clinical criteria to diagnose VAP
- Not clear or not specified
- Does not apply – did not report VAP rates

105. For studies reporting data in the form of VAP rate, provide the following data for the CONTROL group. *If data is missing, record "NR"*
- o Exact units of measurement
- o Infection rate prior to intervention (s)
- o Infection rate after intervention(s) (Not applicable to SBA studies)
- o Percentage change in infection rate (Not applicable to SBA studies)
- o Does not apply – simple before-after study

106. For studies reporting data in the form of VAP rate, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: for simple before-after studies, enter "before" data in "prior to intervention" box and "after" data in "after intervention" box*
- o Exact units of measurement
- o Infection rate prior to intervention
- o Infection rate after intervention

107. Enter any data on VAP rates not abstracted above here:
- o Control group before intervention
- o Control group after intervention
- o Intervention group before intervention
- o Intervention group after intervention

108. For studies reporting data in the form of adherence to hand hygiene, provide the following data for the CONTROL group; if data is missing, record "NR"
- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate before intervention
- o Percentage change in compliance rate
- o Not applicable – simple before-after study

109. For studies reporting data in the form of adherence to hand hygiene, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*
- o Exact units of measurement
- o Adherence rate before intervention
- o Adherence rate after intervention
- o Percentage change in compliance rate

110. For studies reporting data in the form of adherence to head of the bed elevation, provide the following data for the CONTROL group; if data is missing, record "NR"
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate before intervention
- Percentage change in compliance rate
- Not applicable – simple before-after study

111. For studies reporting data in the form of adherence to head of the bed elevation, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate after intervention
- Percentage change in compliance rate

112. For studies reporting data in the form of adherence to an explicit clinical guideline for preventing VAP, provide the following data for the CONTROL group; if data is missing, record "NR"
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate before intervention
- Percentage change in compliance rate
- Not applicable – simple before-after study

113. For studies reporting data in the form of adherence to an explicit clinical guideline for preventing VAP, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate after intervention
- Percentage change in compliance rate

114. Provide the following data for other types of measurements of adherence to preventive interventions not abstracted above:
- Specific preventive intervention and units of measurement
- Value in CONTROL group before intervention
- Value in CONTROL group after intervention
- Value in INTERVENTION group before intervention
- Value in INTERVENTION group after intervention

Measures of costs

Note: cost outcomes should be abstracted only if the study also has usable data for one of the primary outcomes (nosocomial infection rate or provider compliance rate)

115. For studies reporting cost outcomes, what specific measures were used?
- Total cost of VAP to hospital or health system
- Total cost of interventions to prevent VAP
- Other (describe)
- No measurement of costs

116. For studies reporting the total cost of VAP, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)
- Exact units of measurement
- Total costs in CONTROL group before intervention
- Total costs in CONTROL group after intervention
- Cost difference before intervention (intervention – control)

- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

117. For studies reporting the total cost of interventions to prevent VAP, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)

- o Exact units of measurement
- o Total costs in CONTROL group before intervention
- o Total costs in CONTROL group after intervention
- o Cost difference before intervention (intervention – control)
- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

Urinary Catheter-associated UTI

118. Did the study address urinary catheter-associated UTI (UTI)?

- o Yes
- o No (go to question xx)

119. What were the outcome types? (check all that apply)

- Rate of symptomatic urinary tract infection
- Rate of asymptomatic bacteriuria
- Rate of use of indwelling urinary catheters
- Compliance with Hand hygiene
- Compliance with prompt removal of unnecessary catheters
- Compliance with aseptic insertion and catheter care
- Compliance with a clinical guideline for preventing UTI (use this if study mandated an explicit guideline, checklist or "bundle" incorporating more than one of the interventions described above)
- Costs associated with intervention
- Adverse effects of the intervention [specify]
- Provider satisfaction with QI strategy
- Not sure or other (describe)

120. If the study reported rates of symptomatic UTI, did the study define infections according to Centers for Disease Control (CDC) or National Nosocomial Infection Surveillance System (NNIS) protocols?

- Yes
- No (enter definition of UTI as documented in article)
- Does not apply – did not report rates of symptomatic UTI

121. If the study reported rates of asymptomatic bacteriuria, how was this defined?

- o Enter definition of asymptomatic bacteriuria[text box]
- o Does not apply – did not report rates of asymptomatic bacteriuria

122. For studies reporting symptomatic UTI rate, provide the following data for the CONTROL group. *If data is missing, record "NR"*

- Exact units of measurement
- Infection rate prior to intervention (s)
- Infection rate after intervention(s) (Not applicable to SBA studies)
- Percentage change in infection rate (Not applicable to SBA studies)
- Does not apply – simple before-after study

123. For studies reporting symptomatic UTI rate, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: for simple before-after studies, enter "before" data in "prior to intervention" box and "after" data in "after intervention" box*

- Exact units of measurement
- Infection rate prior to intervention
- Infection rate after intervention

124. For studies reporting rate of asymptomatic bacteriuria, provide the following data for the CONTROL group. *If data is missing, record "NR"*

- Exact units of measurement
- Infection rate prior to intervention (s)
- Infection rate after intervention(s) (Not applicable to SBA studies)
- Percentage change in infection rate (Not applicable to SBA studies)
- Does not apply – simple before-after study

125. For studies reporting rate of asymptomatic bacteriuria, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: for simple before-after studies, enter "before" data in "prior to intervention" box and "after" data in "after intervention" box*

- Exact units of measurement
- Infection rate prior to intervention
- Infection rate after intervention

126. Enter any data on rate of symptomatic UTI or asymptomatic bacteriuria not abstracted above here:

- Exact units of measurement
- Control group before intervention
- Control group after intervention
- Intervention group before intervention
- Intervention group after intervention

127. For studies reporting rate of use of indwelling urinary catheters, provide the following data for the CONTROL group. *If data is missing, record "NR"*

- Exact units of measurement
- Rate of use of catheters prior to intervention (s)
- Rate of use of catheter after intervention(s) (Not applicable to SBA studies)
- Percentage change in rate of use of catheters (Not applicable to SBA studies)
- Does not apply – simple before-after study

128. For studies reporting rate of use of indwelling urinary catheters, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: for simple before-after studies, enter "before" data in "prior to intervention" box and "after" data in "after intervention" box*

- Exact units of measurement
- Infection rate prior to intervention
- Infection rate after intervention

129. For studies reporting data in the form of adherence to hand hygiene, provide the following data for the CONTROL group; if data is missing, record "NR"

- Exact units of measurement
- Adherence rate before intervention

- Adherence rate before intervention
- Percentage change in compliance rate
- Not applicable – simple before-after study

130. For studies reporting data in the form of adherence to hand hygiene, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate after intervention
- Percentage change in compliance rate

131. For studies reporting data in the form of adherence to aseptic catheter care, provide the following data for the CONTROL group; if data is missing, record "NR"
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate before intervention
- Percentage change in compliance rate
- Not applicable – simple before-after study

132. For studies reporting data in the form of adherence to aseptic catheter care, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate after intervention
- Percentage change in compliance rate

133. For studies reporting data in the form of adherence to an explicit clinical guideline for preventing UTI, provide the following data for the CONTROL group; if data is missing, record "NR"
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate before intervention
- Percentage change in compliance rate
- Not applicable – simple before-after study

134. For studies reporting data in the form of adherence to an explicit clinical guideline for preventing UTI, provide the following data for the INTERVENTION group; if data is missing, record "NR". *Note: enter all data for simple before-after studies here*
- Exact units of measurement
- Adherence rate before intervention
- Adherence rate after intervention
- Percentage change in compliance rate

135. Provide the following data for other types of measurements of adherence to preventive interventions not abstracted above:
- Specific preventive intervention and units of measurement
- Value in CONTROL group before intervention
- Value in CONTROL group after intervention
- Value in INTERVENTION group before intervention
- Value in INTERVENTION group after intervention

Measures of costs

Note: cost outcomes should be abstracted only if the study also has usable data for one of the primary outcomes (nosocomial infection rate or provider compliance rate)

136. For studies reporting cost outcomes, what specific measures were used?
- o Total cost of UTI to hospital or health system
- o Total cost of interventions to prevent UTI
- o Other (describe)
- o No measurement of costs

137. For studies reporting the total cost of UTI, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)
- o Exact units of measurement
- o Total costs in CONTROL group before intervention
- o Total costs in CONTROL group after intervention
- o Cost difference before intervention (intervention – control)
- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

138. For studies reporting the total cost of interventions to prevent UTI, record the following data:
(Note: for simple before-after studies, enter all data in "intervention" boxes)
- o Exact units of measurement
- o Total costs in CONTROL group before intervention
- o Total costs in CONTROL group after intervention
- o Cost difference before intervention (intervention – control)
- o Total costs in INTERVENTION group before intervention
- o Total costs in INTERVENTION group after intervention
- o Cost difference after intervention (intervention – control)
- o Net change in costs attributable to intervention (cost difference after – cost difference before)

For all studies

Provider satisfaction with intervention
Note: provider satisfaction should be abstracted only if the study also has usable data for one of the primary outcomes (nosocomial infection rate or provider compliance rate)

139. For studies reporting data on PROVIDER satisfaction with the intervention, provide the following data; if data is missing,record "NR"
- o No measure of provider satisfaction
- o Percent satisfaction in CONTROL group after intervention
- o Percent satisfaction in INTERVENTION group after intervention
- o Absolute difference (intervention – control)

Adverse events associated with the intervention

Note: adverse events should be abstracted only if the study also has usable data for one of the primary outcomes (nosocomial infection rate or provider compliance rate)
140. Did the study report data on adverse events associated with the intervention?
- o Yes (specify)
- o No

141. If the study reported data on adverse events associated with the intervention, enter data here: [text box]

142. Use textbox to state any important study results or concerns not documented above. **[text box]**