HEALTHCARE-ASSOCIATED INFECTION (HAI)

OUTBREAK INVESTIGATION

USER'S GUIDE FOR COMPLETING THE

ABSTRACTION FORM

Introduction: The purpose of this user's guide is to provide basic instructions for completing the abstraction form, which is designed to systematically collect data as part of an healthcare-associated infection (HAI) outbreak investigation. The abstraction form was designed for common healthcare-associated infections; however the investigator will need to modify the form based on the nature of the outbreak investigation. Because outbreaks vary based on the setting, site of infection/disease, and type of pathogen involved, only some of the sections in the abstraction form may be relevant to a specific investigation. For example, an outbreak of respiratory infections in an acute care hospital may require a better understanding of a patient's location within the hospital, history of ventilation, and receipt of respiratory treatments/medications. In contrast, an outbreak of infections associated with an outpatient clinic may require a better understanding of vascular access type or details about procedures/infusions received in that clinic.

A carefully constructed abstraction form can be very useful in describing the epidemiology of the disease and assessing for preventable risk factors. This user's guide contains general information or 'variables' that might be collected during HAI outbreak investigations in a variety of different settings. Tailoring this tool to meet your specific needs may require additional consultation with subject matter experts in the field or a review of the scientific literature describing similar outbreaks in the past.

INSTRUCTIONS

I.   Cover Page

For each chart review, the abstractor should complete the information listed in the box below on the cover page of the form. The cover page identifies the patient's name, medical record number, ID number, and the facility name. Each patient in the investigation is given a unique ID number which is listed on the cover page and copied at the top of every subsequent page. At the conclusion of the investigation, the cover page can be removed and stored safely at the healthcare facility for record keeping. In this way, the ID number can be linked back to the patient, but no patient identifiers will be carried back to the health department.

ABSTRACTION FORM

Name: _____

Medical Record Number: _____

ID Number: _____

Facility Name: _____

II. **Chart Abstraction Period** -

The Chart Abstraction Period or Exposure Period will help determine the relevant information that should be abstracted from the chart. The end of the abstraction period is usually the date of illness onset. Depending on the nature of the disease or condition you are investigating, the exposure period of interest may vary. If, for example, you are investigating possible contamination of an intravenously administered product, the period between exposure and onset of illness may be shorter than if you were investigating transmission of an organism with a longer incubation period within a healthcare facility. In this abstraction form tool, we used a 30 day exposure period as an example. Note, however, that for certain exposures you may only be interested in a particular time period within the exposure period (e.g., 7 days before illness onset for blood products vs. 14 days for medications). Creating the ideal chart abstraction tool often requires striking the right balance between collecting enough exposure information during the 'at risk' period while trying to minimize the burden of chart abstraction.

The abstractor's goal is to collect relevant medical information during the exposure period. Data should not be compiled for medical information recorded before the chart abstraction start date or after the end date. Prior to completing the chart abstraction forms, the abstractor should document the following information on page one of the chart abstraction form:

1. - **ID/Patient Number:** A unique ID number is usually assigned by the investigators; note that this is different than a medical record number or other ID number assigned by the healthcare facility. To help protect tpatient's privacy, the uniqueID number is printed on all pages of the form, rather than the patient's name or other identifiable information.

2. - **Chart Abstraction Dates (Exposure Period):** The abstractor should record the dates of the alleged exposure period.

3. - **Case/Control Study:** If you are conducting a case/ control study, this section will allow you to mark whether or not this form is being completed for a case vs. a control. If conducting a matched case-control study, you may also include a space to identify which case-patient the control is matched to**.** At a minimum, a ratio of 2:1 (control: case) is recommended to optimize the power of the study. However, a ratio greater than 3:1 does not usually provide much added benefit.

ID #:_____
Chart Abstraction Dates (Exposure Period) _____to_____

Today's Date:	Abstractor Initials:

Date of Illness Onset: ____/_____/_____
For Case/Control Study

Patient is a: ☐ Case ☐ Control- Linked to Case ID#:(_____)

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III. - **Inpatient admission information**

If the outbreak occurred in an inpatient facility, then the questions found in the "Inpatient" section will likely be relevant. You may need to modify questions depending on whether the outbreak occurred in an acute care hospital, long term acute care hospital, or a skilled nursing facility as the services provided at each facility type differ from one another.

The Inpatient section of the form should be completed for hospitalizations, emergency room visits, or urgent care visits during the **Chart Abstraction Period (Exposure Period)**.

4. Admit Source: Check the appropriate box to indicate the source of referral for this admission. This information is particularly important when conducting investigations on pathogens such as multidrug-resistant organisms and *C. difficile* as movement between healthcare facilities is important in understanding the epidemiology of these organisms.

Admit Source:
☐ Home
☐ Long-term Acute Care Hospital   (LTACH)
☐ Nursing Home
☐ Rehabilitation Facility
☐ Other Facility -- In any ICU prior to this ICU admit: ☐ Y   ☐ N
☐ Other _____

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5. - **Status of Hospitalization:** Check the appropriate box to indicate the patient's status as:

    a. - **Currently Inpatient**

    b. - **Discharged Home:** Record the date of discharge

    c. - **Transfer to other facility:** Provide facility name

    d. - **Deceased:** Record date and causeof death.

        i. - **Autopsy Performed:** Check "Yes" or "No". If yes, provide autopsy date and the autopsy findings listed in the medical chart.

6. - **Diagnoses at Discharge:** Document all patient diagnoses noted in medical record at time of discharge.

Status of Hospitalization:
☐ Still Inpatient
☐ Discharged Home: _____/_____/_____

☐ Transfer to other facility- Name:_____   Date: _____/_____/_____

☐ Deceased- Date of Death: _____/_____/_____   Cause of Death : _____

If deceased, was autopsy performed? ☐ Yes ☐ No If yes, Autopsy Date: _____/_____/_____
Autopsy Findings:_____
_____
_____

Diagnoses at Discharge: (List all diagnoses appearing in the chart)
_____
_____
_____
_____
_____

IV. -   Outpatient

This section may be relevant if the investigation involves an outpatient clinic and should be modified to fit the needs of your particular investigation. Information on vascular access type may be important, for example, if conducting an investigation of bloodstream infections in an outpatient hemodialysis facility. On the other hand, information on neutropenia or other patient risk factors may be relevant if conducting an investigation in an outpatient infusion center for oncology patients.

7. - Procedure or Infusion: The definition of a procedure may range from a simple bedside procedure to a more complex procedure in an operating room depending on the nature of the outbreak investigation.

Outpatient		
Date started in clinic: _____ / _____ / _____		
Date	**Procedure or Infusion**	**Additional Visit Information**
		☐ Neutropenia ☐ Vascular access Site/Type: _____
		☐ Neutropenia ☐ Vascular access Site/Type: _____
		☐ Neutropenia ☐ Vascular access Site/Type: _____
		☐ Neutropenia ☐ Vascular access Site/Type: _____

V.   Medical History

This section contains information that is relevant for HAI outbreaks occurring in either the inpatient or outpatient setting. Abstractors should review the patient's medical record for the entire abstraction period (in addition to capturing information on prior illnesses)**.** Refer to the top of the page for the exact start and end date. This section includes questions about the medical history, signs/symptoms, laboratory, and radiology which are helpful in providing some baseline information about case-patients and describing illnesses/ outcomes. The subsequent sections include questions about healthcare exposures (e.g., medications, procedures, devices) that may be important in assessing risk factors for disease when conducting an analytic study.

8. - **History of Present Illness:** Record a brief summary of the medical history noted. Often, this includes information that is relevant to the outbreak investigation, but cannot otherwise be easily captured on this form.

9. - **Past Medical History:** Check the appropriate box to indicate if the patient has a history of the listed risk factor or disease. Note that many of these illnesses may not occur within the defined abstraction period, but are still important to record as prior/ chronic illnesses may be risk factors for the disease in question. Depending on the nature of the disease you are investigating, there may be additional comorbidities that are important to add to the list.

Clinical History

History of Present Illness (Give a brief summary of the patient's illness and include any other relevant information not otherwise collected on this form):

_____
_____
_____
_____
_____

Past Medical History:

☐ Chronic Lung Disease

☐ Coronary Artery Disease

☐ Congestive Heart Failure (EF_____)

☐ Diabetes (AIC_____)

☐ Peripheral Vascular Disease

☐ Gastrointestinal disease/bleeding

☐ Liver Disease/Cirrhosis

☐ Chronic kidney disease (creatinine _____)
  ☐ Dialysis Dependent

☐ HIV/AIDS (CD4 _____)

☐ Major Trauma (30d PTA)

☐ Previous Surgery (30d PTA)

☐ Obesity

☐ Malignancy (type_____)

☐ Cerebrovascular Disease

☐ Hypertension

☐ Other _____

☐ Other _____

☐ Other Immunosuppression (specify: _____)

VI. - **Clinical Course**

This section is used to describe the clinical course resulting from infection or the disease in question. Note that if conducting a case-control study, this section will be relevant to case-patients only. Abstractors will review and record the patient's medical events and signs and symptoms that occurred during the defined window period (48 hours of illness onset for this example); date fields are **MM/DD/YY**.

10. **Site of Infection:** Check the appropriate box to indicate the patient's site of infection (if applicable).

11. **Date of Illness Onset:** Record the date of illness onset as noted in the chart.
12. **Date of Positive Culture:** Provide the date of positive culture if applicable.
13. **Previous History of Infection:** Document additional notes if patient has previous history of the disease in question in the last 30 days.
14. **Antimicrobial Therapy:** Check "Yes" or "No" to indicate if patient received antimicrobial therapy for their illness if applicable. If yes, provide the date of the therapy and list the antimicrobial treatment in Section VII. Check "N/A" if this does not apply.
15. **Vital Signs:** Check if any abnormal vital signs were present during the window period.

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Site of Infection (check all that apply): ☐ Respiratory ☐ Blood ☐ Surgical/Wound ☐ Urine ☐ Other:_____

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Date of Illness Onset: _____/_____/_____   Date of positive culture (if applicable): _____/_____/_____

Previous history of this infection in last 30 days? (Specify:_____)

Did patient receive antimicrobial therapy for this illness? ☐ Yes ☐ No ☐ N/A   Date: _____/_____/_____

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Abnormal Vital Signs (within 48 hours of illness onset):
☐ Fever >38°C or 100.4°F   ☐ Hypoxia (O2Sat < 92% on room air)   ☐ Tachypnea (RR > 25)
☐ Hypotension (BP <(90/60))   ☐ Tachycardia (HR > 100)

16. For **Signs and Symptoms,** record any signs and symptoms during the defined window period. This section is used to describe signs and symptoms resulting from the infection.

General:
☐ Altered Mental Status   ☐ Loss of appetite
☐ Chills   ☐ Weight Loss
Respiratory:
☐ Dyspnea (i.e., difficulty breathing)   ☐ Rales/Crackles
☐ Hemoptysis (i.e., coughing up blood)   ☐ Rhinorrhea (i.e., runny nose)
☐ New Increased Sputum: ☐ Sore throat
   ☐ Purulent   ☐ Wheezing
   ☐ Change in character (e.g., color, quantity, etc.)   ☐ Worsening gas exchange (e.g., increased O2, PEEP, TV)
☐ New onset cough
GI:
☐ Abdominal Pain   ☐ Diarrhea   ☐ Nausea/Vomiting
☐ Bloating   ☐ Hematochezia (i.e., red blood in stool)
☐ Constipation   ☐ Melena (i.e., black, tarry stool)

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Urinary:
☐ Dysuria
☐ Suprapubic Tenderness
☐ Urinary urgency
Skin:
☐ Abscess
☐ Cellulitis
☐ Furuncle (i.e., skin boil)
☐ Rash
☐ Wound – Description (include # of wounds, sites, draining and other characteristics)
_____
_____
_____

Labs/Microbiology/Radiology

17. **Labs:** List any documented abnormal values for the specified lab tests. Note, in this example we are only recording abnormal values to minimize the burden of chart abstraction from

collecting normal values. However, there may be certain instances when the abstractor is interested in recording normal lab values as well. For example, when calculating comorbidity indices (e.g., Charlson score, Child-Pugh score for liver disease, etc.) to compare severity of illness between case-patients and control-patients, specific laboratory values will be necessary regardless of whether they fall within the normal range or not.

18. **Microbiology:** The abstractor should record the date, specimen source, site, and result (including 'no growth').

19. **Radiology:** If any radiology services were performed during the abstraction period, list the date, type of study, location, and result.

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Laboratory: List abnormal labs within 48 hours of illness onset (if more than one, list the value closest to illness onset)

1. Creatinine _____
2. HCO3 _____
3. Hematocrit _____
4. INR _____
5. pH _____
6. Platelets _____
7. PTT _____
8. WBC _____

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Microbiology: (7 days prior to illness onset until end of abstraction period)			
Date	Specimen Source (e.g., blood, urine)	Site (e.g., catheter, peripheral)	Result (e.g., organism)

Radiology (e.g., X-rays, CTs, U/S, etc.): (7 days prior to illness onset until end of abstraction period)			
Date	Type of Study	Location (e.g., bedside, radiology)	Result

VII. - **Medications**

In this section, abstractors should list all medications that were prescribed during the defined window period. A 14 day window period prior to the end of the abstraction period is used in this example, though you may find for the purposes of your investigation that this exposure period may be different. The medications are separated by type; **Antimicrobials, IV Medications,** and **Other Medications (e.g., immunosuppressives).** When recording the medication names in the table, provide the brand name or its generic equivalent. Do not list medications more than once.

20. Medications: List all medications prescribed according to their category, the dose/route and the start and end date. (MM/DD/YY).

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ANTIMICROBIALS	Name	Dose/Route	Start Date	End Date

IV MEDICATIONS	Name	Dose/Route	Start Date	End Date

OTHER MEDICATIONS (e.g., immunosuppressives or inhaled/nebulized medications)	Name	Dose/Route	Start Date	End Date

21. **Blood Products:** List all blood products administered during the defined window period (7 days prior to end of abstraction period is used in this example). Include type (e.g., packed red blood cells, fresh frozen plasma, and platelets), volume transfused, and date of transfusion.

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Blood Products (7 days prior to end of abstraction period)		
Type of Blood Product	**Volume Transfused**	**Date**

22. **Mechanical Ventilation:** –If patient was on a ventilator during the abstraction period, record the type and start and end date.
23. **CPAP/BIPAP:** –If patient received CPAP/BIPAP ventilation, check "Yes" or "No". If yes, provide start and end date.

Mechanical Ventilation (7 days prior to end of abstraction period)

Type: (Endotracheal, Tracheostomy)	Start Date	End Date
CPAP/BIPAP: ☐ Yes ☐ No	Start Date: _____/_____/_____	End Date: _____/_____/_____

24. **Devices:** –Complete the following table if patient had contact with the listed devices. If a device is not listed, write it in the "Other" box. Abstractor should record the site, date inserted, and date removed.

Devices (7 days prior to end of abstraction period)

Device	Site	Date Inserted	Date Removed
☐ Central Venous Catheter			
☐ Central Venous Catheter			
☐ Central Venous Catheter			
☐ Condom Catheter			
☐ Foley Catheter			
Feeding Tube: ☐ Nasogastric /Nasoduodenal ☐ PEG/PEJ (stomach)			
☐ Other			

25. **Point of care testing injections/infusions:** Provide the procedure type and dates of all point of care testing (e.g., blood glucose monitoring) the patient received during the window period of interest.
26. **Invasive Procedures:** –Document all invasive procedures patient received during the window period of interest. Abstractor should include the date the procedure was performed, the type of procedure, and the location where the procedure was performed.

Point of care testing/injections/infusions (7 days prior to end of abstraction period)	
Procedure	Dates
☐ Blood Glucose Monitoring	

Invasive Procedures (7 days prior to end of abstraction period)		
Date	Type of procedure	Location (e.g. Bedside, OR, Radiology)

27. **Consult Services:** Check "Yes" or "No" to indicate if patient had any consultation visits with clinical staff not considered their primary care provider. If yes, complete the following and identify the service(s), start and end dates. If a consult service is not listed, complete the other box. Note, in this example we did not collect information on specific staff members involved in the patient's care. However, depending on the nature of the outbreak investigation, this information may be useful, particularly when investigating a pathogen that is transmitted through person-to-person contact. For example, if investigating an outbreak of respiratory infections, it may be helpful to have a record of respiratory therapists and nurses involved in the patient's care during the outbreak period. Similarly, if investigating an outbreak of surgical site infections, it might be important to record the surgeon, scrub technician, circulator nurse, and others involved in the surgical case. Since this information can be sensitive, it might be best to separately assign a unique ID number to each healthcare worker in advance and record only the ID number on your abstraction form. The list of healthcare worker names with correlating ID numbers can be stored securely at the healthcare facility so that only de-identified information is brought back to the health department.

Consult Services: ☐ Yes ☐ No		
Service	**Start Date**	**End Date**
☐ Occupational Therapy		
☐ Physical Therapy		
☐ Speech Therapy/Language		
☐ Respiratory Therapy		
☐ Wound Care Team		
☐ Other: _____		
☐ Other: _____		
☐ Other: _____		

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VIII.   Conclusion

The abstraction form and user's guide should be used in conjunction with the other resources on CDC's website: www.cdc.gov/hai. The abstraction form is a general data collection instrument for investigating a healthcare-associated infection outbreak and should be adjusted for each specific outbreak situation. There may be other questions of interest that are not captured on this form and consultations with experts in the field and/or queries of published literature can provide additional guidance.