Management of Foodborne Illness and Malnutrition in Prison Populations

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1. PURPOSE

The Federal Bureau of Prisons (BOP) *Technical Guidance for Responding to Foodborne Illness Outbreaks* provides recommendations for the identification and management of foodborne illness outbreaks.

➔ *The outbreak response measures outlined below will often be occurring simultaneously.*

2. HEALTH SERVICES: IDENTIFICATION OF GASTROINTESTINAL (GI) ILLNESS OUTBREAK AND COLLECTION OF DATA

When an unusual number of inmates present with vomiting and/or diarrhea, the institution's Health Services staff should immediately report this to the Clinical Director, Health Services Administrator (**HSA**), and Infection Prevention and Control (**IP&C**) Coordinator.

The HSA should report the issue to the local Executive Staff and local Food Service Administrator (**FSA**).

Health Services staff should be advised to collect and record data on every inmate who presents with GI illness:

- Data should be recorded on a *GI Illness Linelist* in EXCEL that can be accessed on Sallyport at: *http://sallyport.bop.gov/co/hsd/infectious_disease/index.jsp*. The *GI Illness Linelist* should be utilized to systematically collect data on inmate housing assignment, work, date and time of illness onset, signs and symptoms, etc.
- Each ill inmate should be coded in BEMR with problem code AO9 (*Gastroenteritis and colitis, unspecified*), along with the symptoms and the date and time of illness onset.

Local Health Services staff should consult with Regional and Central Office IP&C staff to review the collected data to determine if a foodborne illness outbreak investigation is needed:

- All gastroenteritis illness outbreaks should be considered a potential foodborne outbreak until otherwise determined.
- The data should be analyzed—to determine the proportion of inmates with each sign/symptom, the range of onset dates and times, and duration of illness—and compared to the Centers for Disease Control and Prevention (CDC) *Guide to Confirming an Etiology in Foodborne Disease Outbreak* at: *http://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/confirming_diagnosis.html*
- A hypothesis should be developed regarding possible organisms that may be causing the illness. This hypothesis will help identify the timeframe in which inmates may have been infected and the possible cause of the illness.

3. COMMUNICATION REGARDING POSSIBLE FOODBORNE ILLNESS OUTBREAK

- If a foodborne illness is suspected, based on analysis of the collected data, the Central Office and Regional IP&C staff should notify the National and Regional FSAs. Likewise, the institution's HSA should notify the local Executive Staff of a possible foodborne illness outbreak (even if it has not been confirmed that it is tied to food).
- **A local OUTBREAK INVESTIGATION TEAM should be formed as soon as possible to coordinate the outbreak investigation.** The team should consist of representation from Executive Staff, Health Services, Food Services, and Environmental and Safety Compliance staff. A team leader should be identified. The team should determine what information needs to be gathered, the infection prevention and control measures that need to be implemented, and whether kitchen mitigation strategies are necessary, taking into consideration the type of outbreak. The identified team leader should continue to communicate with the Central Office and Regional IP&C and Food Service staff.
- The local IP&C Coordinator should complete and distribute the *Infectious Disease/Outbreak Report* (available at: http://sallyport.bop.gov/co/ipp/policy/forms/BP_A0664.pdf). A copy should be forwarded to the following personnel: Local Executive Staff, local FSA, local HSA, Central Office IP&C Coordinator, Regional IP&C Coordinator, Regional FSA, and National FSA.
- The local Outbreak Investigation Team should develop a plan for communicating with inmates and staff regarding the outbreak. Staff and inmates should be encouraged to report to Health Services if they develop GI illness. Their symptoms and date and time of onset of symptoms should be recorded on the *GI Illness Linelist*. Staff may want to consider contacting their personal primary care provider.
- The Central Office IP&C Coordinator and National FSA should coordinate conference calls with the team leader of the local Outbreak Investigation Team to begin information gathering and coordination of an appropriate response.
- In accordance with state/local regulations, Health Services staff should report the GI illness outbreak to the local public health department. When contact is made with the local public health department, it should be determined if public health laboratory services can be utilized to process lab specimens.

4. HEALTH SERVICES: INITIAL RESPONSE

- **CLINICAL INTERVENTION:** An assessment should be made to determine if there are any immediate steps that should be implemented to assure ill inmates are adequately hydrated and seriously ill inmates are promptly assessed, treated, and considered for isolation.
- **STAFFING:** If large numbers of acutely ill inmates require evaluation and treatment, health services staffing adjustments may be needed to assure adequate health care coverage is provided during the outbreak.
- **SPECIMEN COLLECTION:** The public health department should be consulted on appropriate specimens to collect. It is strongly recommended that specimens be sent to the public health lab, if possible.
- **DATA COLLECTION AND ANALYSIS:** Health Services staff should continue to systematically update the *GI Illness Linelist* as more inmates with GI illness are identified.
- **FOOD HISTORY:** If a foodborne outbreak is suspected, ill inmates should be systematically interviewed for their recent food history (see *Attachment 1, Inmate Interview – Food History*).

5. FOOD SERVICE: INITIAL RESPONSE

During the outbreak, the following control measures should be implemented immediately:

- All Food Service staff and inmate workers should be systematically interviewed before each shift for GI symptoms, and excluded from Food Service work if they have symptoms.
- Hand hygiene before and during work hours must be strongly emphasized.
- Inmate workers should be directly observed performing hand hygiene prior to work.

The FSA should assist the local Outbreak Investigation Team to begin gathering information related to the outbreak, including environmental assessment and internal system variables. Time frames noted on documentation can be extended as necessary for the type of foodborne illness identified.

Documentation should contain, but not be limited to, the following:

- Inmate Interview – Food History (see *Attachment 1*)
- Staff Interview – Food Preparation History (see *Attachment 2*)
- Food Flow Chart and Process Guide (see *Attachment 3*)
- Food Safety Checklist Form (see *Attachment 4*)
- As Served Menu for the last 72 hours
- Recipes for all meals identified on the As Served Menu for the last 72 hours
- Inmate Schedule/Work Assignments/Work History for the last 72 hours
- Emails of all notifications
- Temperature Logs for the last 72 hours
- Sentry Roster of Food Service Workers including MDS assignment
- Latest Form of Sanitation Inspection
- Store Room Requisition from FNS for the last 72 hours
- Staff Schedule for the last 72 hours

If a foodborne illness is indicated and a food product is identified, the FSA should perform the following:

- **SEGREGATING PRODUCT:** Set the remainder of the suspected food product aside (if any remains). Label it as "**DO NOT USE – DO NOT DISCARD**."
- **RECALLED PRODUCT:** If the suspected food product is identified on a USDA or FDA Food Recall, refer to the *BOP Guidance for Food Recalls*.

6. EXECUTIVE STAFF: INITIAL RESPONSE

- A plan should be developed to assure inmate housing units have a sufficient supply of cleaning supplies and that inmate orderlies increase the frequency of cleaning bathroom fixtures and high-touch surfaces in bathrooms and housing units.
- Ongoing updates should be provided to staff and inmates via town halls or memoranda. The Public Information Officer should be involved in preparation and approval of any information provided to staff and inmates, and should be prepared to respond to the local community and the media.

7. ENVIRONMENTAL & SAFETY COMPLIANCE: INITIAL RESPONSE

- Environmental & Safety Compliance staff should be made available to assist with conducting inspections in the Food Service Department, as determined by the local Outbreak Investigation Team.
- Environmental & Safety Compliance staff should be made available for consultation in regards to the proper type of disinfectant(s) to use for the identified outbreak.
  - ➔ *If norovirus is suspected, a disinfectant effective against norovirus will be required to manage the outbreak. Consult Regional/Central Office infection control staff.*
- The local Environmental & Safety Compliance staff should consult with the Regional and Central Office Environmental & Safety Compliance staff as needed.

8. ROLE OF THE FOOD ASSET SUPPORT TEAM (FAST)

The FAST is a trained team of Food Service and IP&C personnel that can be deployed by the Health Services Division (HSD), Assistant Director to assist with a foodborne outbreak investigation.

- The FAST members serve in this role as a collateral duty, appointed by the Assistant Director, HSD in consultation with respective applicant's CEO. (See *FAST* definition under *Terminology*.)
- The FAST can assist with data gathering; conducting the outbreak investigation environmental assessment; making recommendations to institution staff for controlling the outbreak; assist with determining if kitchen mitigation strategies are indicated; and helping to coordinate with local, state, and federal public health officials if further investigation is needed.
- The FAST can identify factors that contributed to the outbreak and provide immediate recommendations. These recommendations and a summary can be provided by the FAST Lead after the assistance is provided.
- The Assistant Director, HSD will determine the need to deploy FAST in consultation with the respective Regional Director and Warden.

9. MULTI AGENCY COOPERATION

The U.S. Department of Agriculture (USDA)/ Food Safety and Inspection Service (FSIS), the CDC, and the state or local public health department may request information regarding the foodborne illness outbreak during an investigation. Full cooperation and documentation should be provided as requested, and in accordance with BOP Health Information Policy. It may be necessary for one or all of these agencies to visit the institution. A Central Office IP&C Coordinator, National or Regional FSA, and/or FAST member should assist with the coordination of these visits with institution Executive Staff.

10. TRAINING

All local and Regional FSAs are encouraged to complete the e-Learning course entitled *Environmental Assessment of Foodborne Illness Outbreaks* provided by the CDC at:
http://www.cdc.gov/nceh/ehs/eLearn/EA_FIO/

TERMINOLOGY

OUTBREAK: Two or more cases of a similar illness shown by an investigation to result from a common exposure, such as ingestion of a common food. An outbreak is a cluster with a clear association between cases, with or without a recognized common source or known disease agent. However, even single cases of certain rare and serious conditions—such as gastrointestinal anthrax, botulism, or cholera—are considered public health emergencies and should elicit an outbreak-like response.

INTERNAL AUTHORITY: The entity responsible for matters of public health and/or regulatory jurisdiction over the food establishment. The **FAST** (see below) will be the internal authority for any food illness outbreak in the Federal Bureau of Prisons.

FAST: The BOP Food Asset Support Team (FAST) includes a minimum of one Central Office Food Service Staff Member, one Regional FSA, and one local FSA (who is selected as FAST Collateral Duty Staff Member), and one IP&C staff person. The FAST is available to provide assistance via phone/email or immediate response to the institution in the event of a food-related illness outbreak. Deployment of FAST is determined by the Assistant Director, HSD, in consultation with the respective Regional Director and Warden.

FEDERAL AGENCIES:

- The **USDA** (U.S. Department of Agriculture) is a regulatory agency that monitors meat, poultry, or egg products through the **FSIS** (Food Safety and Inspection Service).
- The **FDA** (Food and Drug Administration) is a regulatory agency that monitors other food items (approximately 80 percent of the food consumed in the United States).
- The **CDC** (Centers for Disease Control and Prevention), through its Food Safety Office, tracks cases of foodborne illness and investigates outbreaks.

REFERENCES

Council to Improve Foodborne Outbreak Response (CIFOR). Webpage located at: http://www.cifor.us/

CIFOR Industry Guidelines: Foodborne Illness Response Guidelines. Developed by the Council to Improve Foodborne Outbreak Response (CIFOR). Atlanta: Council of State and Territorial Epidemiologists, 2009.

Centers for Disease Control and Prevention, Foodborne Illness. Webpage located at: http://www.cdc.gov/foodsafety/foodborne-germs.html

ATTACHMENTS

The following Attachments can be printed out and filled in as needed:

- ***Attachment 1:*** *Inmate Interview – Food History (one page)*
- ***Attachment 2:*** *Staff Interview – Food Preparation History (one page)*
- ***Attachment 3:*** *Food Flow Chart and Process Guide (two pages)*
- ***Attachment 4:*** *Food Safety Checklist Form (one page)*

Attachment 1

Guidelines for Foodborne Illness Outbreaks
Inmate Interview - Food History

Institution: _____ Date: _____

Inmate Name: _____ Reg. No.: _____

Housing Unit Assignment: _____ Work Assignment: _____

List all food consumed in the past 72 hours at each meal and/or consumed in the housing unit.

Day of Illness: _____ Date: _____

Breakfast: _____

Lunch: _____

Dinner: _____

Did you eat anything in the housing unit? ☐ Yes ☐ No If yes, list all items, times consumed, and date purchased below.

Food Item: _____ Time Consumed: _____ _____ Date Purchased from Commissary: _____

Day Before Illness: _____ Date: _____

Breakfast: _____

Lunch: _____

Dinner: _____

Did you eat anything in the housing unit? ☐ Yes ☐ No If yes, list all items, times consumed, and date purchased below.

Food Item: _____ Time Consumed: _____ _____ Date Purchased from Commissary: _____

2 Days Before Illness: _____ Date: _____

Breakfast: _____

Lunch: _____

Dinner: _____

Did you eat anything in the housing unit? ☐ Yes ☐ No If yes, list all items, times consumed, and date purchased below.

Food Item: _____ Time Consumed: _____ _____ Date Purchased from Commissary: _____

Any visits in the past 72 hours? ☐ Yes ☐ No Visitor Names: _____

Date of last sick call request to medical for any reason: _____

Type of illness/symptoms? _____

(Request copy of BEMR report from Health Services Staff for date of sick call visit for verification).

Completed by (Name/Title): _____

Attachment 2

Guidelines for Foodborne Illness Outbreaks
Staff Interview - Food Preparation History

Institution: Date:

AM Cook Supervisor: PM Cook Supervisor:

List all foods prepared and served on each of the meals indicated. Include items on the menu, any leftovers prepared, and if you served extra items on the trays provided to lockdown units. Cooking temperatures of each item and if you noticed anything different with any item should be noted.

Day of Illness: Date:

Breakfast:

Prepared by (Inmate Names):

Lunch:

Prepared by (Inmate Names):

Dinner:

Prepared by (Inmate Names):

Day Before Illness: Date:

Breakfast:

Prepared by (Inmate Names):

Lunch:

Prepared by (Inmate Names):

Dinner:

Prepared by (Inmate Names):

2 Days Before Illness: Date:

Breakfast:

Prepared by (Inmate Names):

Lunch:

Prepared by (Inmate Names):

Dinner:

Prepared by (Inmate Names):

What time was the health/hygiene check conducted on inmates?

Did any of your inmate workers appear sick or go to sick call?

Completed by (Name/Title):

Guidelines for Foodborne Illness Outbreaks
FOOD FLOW CHART AND PROCESS GUIDE

Institution: _____ Date: _____

Cook Supervisor: _____ Suspected Food: _____

List all steps in the preparation process for the food product listed above. Refer to the process guide on the next page to complete the form. List all ingredients used in each step.

STEP NUMBER	STEP COMPLETED	NOTES	INMATE NAME	REG. NO.
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				

Completed by (Name/Title): _____

Guidelines for Foodborne Illness Outbreaks
FOOD FLOW CHART AND PROCESS GUIDE

Institution: _____ Date: _____

Cook Supervisor: _____ Suspected Food: _____

STEP NAME	QUESTIONS
RECEIVING/REMOVAL FROM FREEZER	DATE & TIME PRODUCT WAS REMOVED FROM FREEZER?
STORAGE	LOCATION? TEMPERATURE? FIFO?
PREP/DEFROST/THAW	HOW WAS FOOD THAWED? WAS TEMPERATURE MONITORED? WAS THERE DISCOLORATION OR ODOR?
PREP/BREAKDOWN	WERE INGREDIENTS PROCESSED ON THE SAME WORK SURFACE? WERE MULTIPLE LOTS OF SOURCES MIXED?
PREP/MIX	HOW WAS FOOD MIXED? WAS THERE HAND CONTACT?
PREP/SERVING SIZE	HOW WAS FOOD PORTIONED (BY UTENSIL OR HAND)? WAS THE FOOD MEASURED (BY UTENSIL OR HAND)?
COOL PROCESS/CLOSE	HOW WAS FOOD COOLED? WAS TEMPERATURE MONITORED? COOLING TIME? TEMPERATURE? COOLING AT END OF SHIFT?
COOK-KILL	EQUIPMENT AND THERMOMETERS CALIBRATED? TEMPERATURE?
RE-HEAT	HOW WAS FOOD REHEATED? WAS TEMPERATURE MONITORED? TEMPERATURE? TIME?
HOT-HOLD	TEMPERATURE? HOW WAS IT HELD? (PASS THRU/MOBILE HOT BOX?) EQUIPMENT FUNCTIONING?
COLD-HOLD	TEMPERATURE? HOW WAS IT HELD? (PASS THRU/MOBILE COOLER/LARGE COOLER?) EQUIPMENT FUNCTIONING?
SERVICE	CONTAMINATION? HOLDING FOOD WITHOUT TEMPERATURE CONTROL? CONTROLLING THE HOT/COLD BAR?
OTHER	

Attachment 4

Guidelines for Foodborne Illness Outbreaks
Food Safety Checklist Form

Institution: _____ Date: _____

INSIDE FROZEN STORAGE

1. Walk-In Freezer _____ Temp: _____
2. Walk-In Freezer _____ Temp: _____

INSIDE COLD STORAGE

1. Walk-In Cooler _____ Temp: _____
2. Walk-In Cooler _____ Temp: _____
3. Walk-In Cooler _____ Temp: _____

Are leftovers covered, labeled, and dated? ☐ Yes ☐ No

INSIDE STORAGE (Freezer, Cooler, Dry, etc.)

Any expired products. Rotation evident? ☐ Yes ☐ No
All food labeled, dated and covered? ☐ Yes ☐ No
Any food/ingredients been recalled? ☐ Yes ☐ No
Any damaged, dented, or swollen packages? ☐ Yes ☐ No

THAWING

Items thawed using approved methods? ☐ Yes ☐ No
How long have items been pulled/thawing? Days: _____

EQUIPMENT

Are staff using thermometers? Calibrated? ☐ Yes ☐ No
Are thermometers on equipment accurate? ☐ Yes ☐ No
Is any equipment not functioning properly? ☐ Yes ☐ No
Is the dish machine functioning properly? ☐ Yes ☐ No
Wash: _____ Final Rinse: _____ Flow Pressure: _____

CLEANING & CHEMICALS

Are chemical control procedures in place? ☐ Yes ☐ No
Cleaning towels properly stored in sanitizer? ☐ Yes ☐ No
Are pot and pan procedures being followed? ☐ Yes ☐ No
Trays, cups, utensils, and equipment clean? ☐ Yes ☐ No
Any issues with plumbing or sewage waste? ☐ Yes ☐ No

COOKING TEMPERATURES

1. Food Item _____ Temp: _____
2. Food Item _____ Temp: _____
3. Food Item _____ Temp: _____
4. Food Item _____ Temp: _____
5. Food Item _____ Temp: _____

HOLDING TEMPERATURES

1. Food Item _____ Temp: _____
2. Food Item _____ Temp: _____
3. Food Item _____ Temp: _____
4. Food Item _____ Temp: _____
5. Food Item _____ Temp: _____

PEST CONTROL

Any evidence of pest infestation? ☐ Yes ☐ No
Is a pest control plan in place? ☐ Yes ☐ No

HEALTH & HYGIENE

Gloves used/worn properly? ☐ Yes ☐ No
Any staff or inmate workers sick? ☐ Yes ☐ No
Any eating/drinking in unapproved areas? ☐ Yes ☐ No
Staff & inmates in clean proper uniforms? ☐ Yes ☐ No
Hand wash stations fully operational? ☐ Yes ☐ No

FOOD SAFETY PRACTICES

Any possible hazards present? ☐ Yes ☐ No
Any possible contamination issues present? ☐ Yes ☐ No
Are Food Prep areas cleaned and sanitized? ☐ Yes ☐ No
Any cross contamination during preparation? ☐ Yes ☐ No
Produce and other foods properly washed? ☐ Yes ☐ No

Specify any policy deviations, discrepancies, or concerns that are noted above.

Comments: _____

Comments: _____

Completed by (Name/Title): _____

Table of Contents

1. Purpose and Terminology

The Federal Bureau of Prisons (BOP) Clinical Practice Guidelines for the *Medical Management of Malnutrition (Undernutrition)* provide recommendations for the assessment and nutritional augmentation of inmates who are in a malnourished state. *Malnutrition*, which can be defined as inadequate and/or unbalanced nutritional intake, may arise in cases of either *undernutrition* (insufficient calories) or *overnutrition* (too many calories).

The term *undernutrition* applies to individuals who lack the calories, protein, or other nutrients needed for tissue maintenance and repair. Identification and treatment of adult undernutrition is a major concern in acute, chronic, and transition care settings. **For the purposes of these guidelines, therefore, the term *malnutrition* will be used to refer solely to *undernutrition*.**

2. Importance of Early Intervention and Monitoring

Malnutrition in adults is a major health problem that continues to go unrecognized and, therefore, untreated. It is both a cause and a consequence of ill health across many patient groups and healthcare settings. Current estimates of the prevalence of adult malnutrition range from 15% to 60%, depending on the patient population and the criteria used to identify its occurrence.

It is estimated that at least one-third of the patients admitted to the hospital in developed countries are malnourished; if their malnutrition is left untreated, approximately two-thirds of these patients will experience a further decline in their nutritional status during inpatient stay. Moreover, among patients who are not malnourished upon admission, approximately one-third may become malnourished while in the hospital. A variety of factors may contribute to a decline in nutritional status such as mental/cognitive status, illness-induced poor appetite, gastrointestinal symptoms, reduced ability to chew or swallow, or nil per os (NPO) status for diagnostic and therapeutic procedures.

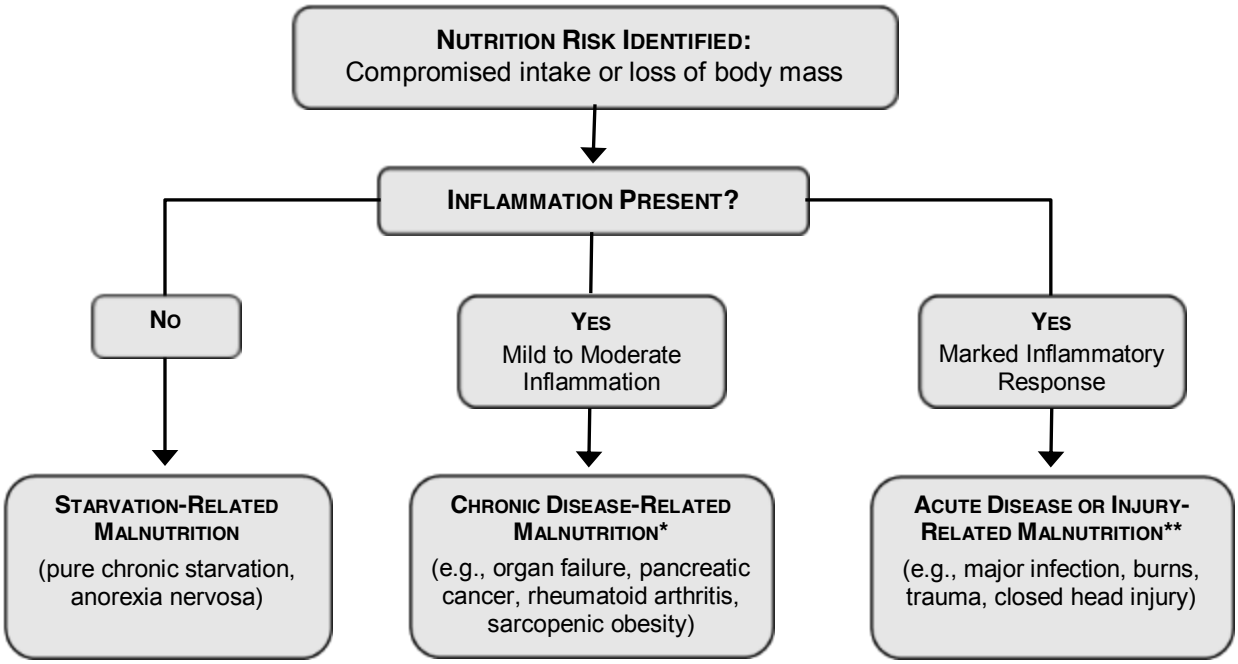
According to the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.), although data vary across studies, available evidence shows that early nutrition intervention can reduce complication rates, length of hospital stay, readmission rates, mortality, and cost of care. Evidence-based recommendations support the screening, assessment, intervention, and monitoring of malnutrition.

➔ See the following sections of these guidelines for information on *Etiologies*, *Screening*, *Advanced Clinical Assessment*, *Diagnosis*, and *Intervention*.

3. Etiologies

A recommended etiology-based approach to the diagnosis of adult malnutrition in clinical settings was endorsed in 2009 by the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) and the European Society for Clinical Nutrition and Metabolism (ESPEN). This approach (see *Figure 1* below) focuses on three etiologies: *starvation-related malnutrition*, *chronic disease-related malnutrition*, and *acute disease or injury-related malnutrition*. It also takes into consideration the role of inflammation as an important factor in the increased risk for malnutrition.

FIGURE 1. Etiology-Based Malnutrition Definitions



Adapted from: White JV, Guenter P, Jensen G, Malone A, Schofield M. Consensus statement of the Academy of Nutrition and Dietetics/A.S.P.E.N: characteristics recommended for the identification and documentation of adult malnutrition (undernutrition). *J Acad Nutr Diet*. 2012;112(5):732. Available at: http://malnutrition.andjrnl.org/Content/articles/1-Consensus_Statement.pdf

* ***Other chronic diseases or conditions that can result in malnutrition:*** *Cardiovascular disease, cancer, celiac disease, chronic pancreatitis, chronic obstructive pulmonary disease, congestive heart failure, cystic fibrosis, dementia, diabetes mellitus, IBD, gastrointestinal and liver disease, hematologic malignancies, HIV and AIDS, metabolic syndrome, neurological disease, neuromuscular disease, obesity, old age, organ failure/transplant, poor dentition/oral condition, pressure wounds, renal disease, respiratory disease, solid tumors.*

** ***Other acute diseases/injuries that can result in malnutrition:*** *Adult respiratory distress syndrome, closed head injury, critical illness, major abdominal surgery, major infection/sepsis, multi-trauma, orthopedic injury, systemic inflammatory response syndrome, severe burns, severe acute pancreatitis.*

Patients with acute or chronic illness present a more complex challenge in determining the presence, etiology, and extent of malnutrition—and in determining the appropriate nutrition interventions.

Progression of Malnutrition

According to the 2012 *Consensus Statement* published by A.S.P.E.N. and the Academy of Nutrition and Dietetics (see *References* page), malnutrition in adults "typically occurs along a continuum of inadequate intake and/or increased requirements, impaired absorption, altered transport, and altered nutrient utilization. Weight loss can, and frequently does, occur at any one or more points along this continuum. Individuals may also present with inflammatory, hypermetabolic, and/or hypercatabolic conditions."

The *Consensus Statement* also noted "that inflammation is increasingly identified as an important underlying factor that increases risk for malnutrition, [one] that may contribute to suboptimal responses to nutrition intervention and increased risk for mortality. As such, individuals may exhibit a wide range of characteristics," starting with non-severe (mild to moderate) malnutrition—that if left unrecognized and unaddressed, is likely to progress to a severely malnourished state.

4. Malnutrition Screening

Acute and Long-Term Care Screening

Comprehensive nutrition screening for all hospitalized patients should occur in the acute and long-term care settings *within 24 hours of admission*, to identify individuals who are at risk for malnutrition and allow for nutrition care planning. Malnutrition screening should be performed as part of Medical Referral Center (MRC) nursing admission assessments for inpatient, mental health, and long-term care units, using the Malnutrition Screening Tool (MST) (see *Appendix 1*). Repeat malnutrition screening for patients initially screened as low-risk should be performed according to the policies of the individual facility or as determined by the patient care team.

Ambulatory Care Screening

If malnutrition is suspected in patients seen in ambulatory care settings, screening can be performed by nursing staff, nursing assistants, administrative staff, physicians, or dietitians. In the ambulatory care setting, screening should be performed in accordance with the Mini Nutrition Assessment® (see *Appendix 2*). If malnutrition is identified in ambulatory care patients, the physician, ideally in concert with a BOP registered dietitian, should provide advanced clinical assessment (see *Section 5* below). Dentists who suspect malnutrition should refer patients to the medical staff or a BOP registered dietitian for malnutrition assessment.

5. Advanced Clinical Assessment

If a patient is considered to be at-risk for malnutrition, the medical provider and an MRC dietitian should work together to determine the potential etiology—conducting a careful review of the patient's chief complaint, as well as the patient's systems; medical, nutrition, and psychosocial histories; mental health status; physical exam; laboratory markers of inflammation; anthropometric parameters; food intake; oral/dentition conditions, and functional status.

6. Diagnosis

Since no single factor is conclusive in determining the presence of adult malnutrition, diagnosis should be based on identifying at least two of the following characteristics, as described in more detail in *Appendix 3*.

(1) Insufficient energy intake
(2) Weight loss
(3) Loss of subcutaneous fat
(4) Loss of muscle mass
(5) Localized or generalized fluid accumulation, which may sometimes mask weight loss
(6) Diminished functional status, as measured by hand grip strength

Assessment of these characteristics aids in distinguishing between *non-severe* (mild to moderate) malnutrition (263.0: Malnutrition of a Moderate Degree) and *severe* malnutrition (262: Other Severe Protein Calorie Malnutrition). While these characteristics are assessed along a continuum, rather than as discrete variables, they are useful in formulating and documenting a diagnosis of malnutrition.

Serum Protein

Serum protein such as albumin and prealbumin are not included as defining characteristics of malnutrition. Recent analysis shows that serum levels of those proteins are not considered reliable or specific biomarkers for malnutrition.

7. Intervention

The goals of intervention in cases of adult malnutrition are to:

- *Prevent decline in nutritional status and the onset of associated adverse outcomes* such as increased complications (including infections), incidence of pressure ulcer formation, and mortality.
- *Optimize nutrition status and other health outcomes* through improved total nutrient intake, body anthropometry, and other timely interventions geared to the patient's needs—in collaboration with a multidisciplinary team.

Severe Malnutrition

In cases of severe malnutrition, consideration should be given to the potential for *refeeding syndrome*. Identification of individuals at high-risk, clinical and biochemical monitoring, initiation of refeeding, and potential related clinical manifestations of electrolyte abnormalities should be managed as outlined in the BOP Clinical Practice Guidelines, *Medical Management of Inmates with Hunger Strike*.

➔ See *Appendix 4*, *Recommended Outcome Measures for Severe Malnutrition*, for information on establishing and monitoring desired outcomes in cases of severe malnutrition.

Nutrition Intervention

Nutrition intervention strategies represent a broad spectrum of options that fall into four categories:

- Food and/or nutrient delivery
- Nutrition education
- Nutrition counseling
- Coordination of nutrition care

Consultation with a BOP registered dietitian should be undertaken—locally at MRCs or via tele-health consultation at non-MRCs—to determine the appropriate, clinically indicated intervention strategies. The consultation should result in determination of whether a special diet, supplemental feeding, or dietary supplement is clinically indicated, in accordance with *Program Statement 4700.06, Food Service Manual, Program Statement 6031.03, Patient Care, and BOP*

National Formulary. An individualized plan to address and monitor the patient's observed nutrition deficits should be developed, implemented, and revised as necessary until nutrition status is optimized.

Pharmacology

In addition to oral nutrition supplementation, medications to stimulate the patient's appetite—if appropriate—may be used to increase nutritional intake. BOP pharmacy staff should be consulted regarding available formulary options.

Parenteral and Enteral Nutrition

Enteral or parenteral nutrition may be indicated if other nutrition support fails; however, it is outside the scope of these guidelines to address the planning and administration of enteral or parenteral nutrition. The Regional Medical Director, a BOP dietician, or Medical Referral Center staff experienced in parenteral and enteral nutrition therapy should be consulted on a case-by-case basis, as needed.

References

Malnutrition coding. In Biesemeier C, ed. *Nutrition Care Manual*. Academy of Nutrition and Dietetics; 2013. Available at: *http://nutritioncaremanual.org/content.cfm?ncm_heading=&ncm_toc_id=144942* Accessed October 17, 2013.

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APPENDIX 1: Malnutrition Screening Tool (MST)

STEP 1: Ask screening questions to obtain score.

QUESTION 1: Have you recently lost weight without trying?

UNSURE = 2
NO = 0
If YES, how much weight have you lost?
2–3 lbs = 1
14–23 lbs = 2
24–33 lbs = 3
34 lbs or more = 4

WEIGHT LOSS SCORE: ☐

QUESTION 2: Have you been eating poorly because your appetite is decreased?

NO = 0
YES = 1

APPETITE SCORE: ☐

STEP 2: Assess score to determine risk of malnutrition.

MST SCORE
(WEIGHT LOSS SCORE + APPETITE SCORE): ☐

MST SCORE = 0–1 ➜ Not at risk
MST SCORE = 2 or more ➜ At risk

STEP 3: If at risk for malnutrition (MST SCORE of 2 or more), make referral to dietitian who can provide advanced malnutrition assessment and potential intervention.

APPENDIX 2: Mini Nutrition Assessment (MNA®)

What is the MNA?

"The MNA is a validated nutrition screening and assessment tool that can identify geriatric patients age 65 and above who are malnourished or at risk of malnutrition. The MNA was developed nearly 20 years ago and is the most well validated nutrition screening tool for the elderly. Originally comprised of 18 questions, the current MNA now consists of 6 questions and streamlines the screening process. The current MNA retains the validity and accuracy of the original MNA in identifying older adults who are malnourished or at risk of malnutrition. The revised MNA Short Form makes the link to intervention easier and quicker and is now the preferred form of the MNA for clinical use."

> Source: *http://www.mna-elderly.com/*. Use this link for more information about the form, which is available in a variety of languages.

A copy of the MNA appears on the next page. To access the form directly, use the following link: *http://www.mna-elderly.com/forms/mini/mna_mini_english.pdf*

Mini Nutritional Assessment

MNA®

Nestlé Nutrition Institute

Last name: First name:

Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F1 Body Mass Index (BMI) (weight in kg) / (height in m²) ☐
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm
0 = CC less than 31
3 = CC 31 or greater ☐

Screening score ☐☐
(max. 14 points)

12-14 points: ☐ Normal nutritional status
8-11 points: ☐ At risk of malnutrition
0-7 points: ☐ Malnourished

Save Print Reset

Ref. Vellas B, Villars H, Abellan G, et al. *Overview of the MNA® - Its History and Challenges*. J Nutr Health Aging 2006;10:456-465.
Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. *Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF)*. J. Geront 2001;56A: M366-377.
Guigoz Y. *The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us?* J Nutr Health Aging 2006; 10:466-487.
Kaiser MJ, Bauer JM, Ramsch C, et al. *Validation of the Mini Nutritional Assessment Short-Form (MNA®-SF): A practical tool for identification of nutritional status.* J Nutr Health Aging 2009; 13:782-788.

For more information: www.mna-elderly.com

APPENDIX 3: Clinical Characteristics That Support a Diagnosis of Malnutrition

➔ ***A minimum of two characteristics is recommended for diagnosis of either severe or non-severe malnutrition.***

<table>
<tr><th>Clinical Characteristics</th><th colspan="2">In NON-SEVERE (moderate) MALNUTRITION</th><th colspan="2">In SEVERE MALNUTRITION</th></tr>
<tr><td>(1) Energy Intake
Malnutrition is the result of inadequate food and nutrient intake or assimilation; thus, recent intake compared to estimated requirements is a primary criterion defining malnutrition.
The clinician may obtain or review the food and nutrition history, estimate optimum energy needs, compare them with estimates of energy consumed, and report inadequate intake as a percentage of estimated energy requirements over time.</td><td colspan="2"><75% of estimated energy requirement for ≥3 months</td><td colspan="2"><50% of estimated energy requirement for ≥1 month</td></tr>
<tr><td rowspan="5">(2) Interpretation of Weight Loss
The clinician may evaluate weight in light of other clinical findings, including the presence of under- or over-hydration. The clinician may assess weight change over time, reported as a percentage of weight lost from baseline.</td><td>Time</td><td>%</td><td>Time</td><td>%</td></tr>
<tr><td>1 mo</td><td>5</td><td>1 mo</td><td>>5</td></tr>
<tr><td>3 mo</td><td>7.5</td><td>3 mo</td><td>>7.5</td></tr>
<tr><td>6 mo</td><td>10</td><td>6 mo</td><td>>10</td></tr>
<tr><td>1 year</td><td>20</td><td>1 year</td><td>>20</td></tr>
<tr><td>(3) Body Fat
Loss of subcutaneous fat: e.g., orbital, triceps, fat overlying the ribs.</td><td colspan="4">See Appendix 3a: Subcutaneous Fat Loss</td></tr>
<tr><td>(4) Muscle Mass
Muscle loss: e.g., wasting of the temples (temporalis muscle); clavicles (pectoralis and deltoids); shoulders (deltoids); dorsal interosseous muscles in the hand; scapula (latissimus dorsi, trapezious, deltoids); thigh (quadriceps); and calf (gastrocnemius).</td><td colspan="4">See Appendix 3b: Muscle Loss</td></tr>
<tr><td>(5) Fluid Accumulation
The clinician may evaluate generalized or localized fluid accumulation evident on exam (extremities; vulvar/scrotal edema or ascites). Weight loss is often masked by generalized fluid retention (edema), and weight gain may be observed.</td><td colspan="4">See Appendix 3c: Edema</td></tr>
<tr><td>(6) Reduced Grip Strength
Consult normative standards supplied by the manufacturer of the measurement device.</td><td colspan="2">N/A</td><td colspan="2">Measurably reduced for age and gender.</td></tr>
<tr><td colspan="5">Adapted from: White JV, Guenter P, Jensen G, Malone A, Schofield M. Consensus statement of the Academy of Nutrition and Dietetics/A.S.P.E.N: characteristics recommended for the identification and documentation of adult malnutrition (undernutrition). J Acad Nutr Diet. 2012;112(5):734–735. Available at: http://malnutrition.andjrnl.org/Content/articles/1-Consensus_Statement.pdf</td></tr>
</table>

APPENDIX 3a: Subcutaneous Fat Loss

EXAM AREAS	TIPS	SEVERE MALNUTRITION	MILD-MODERATE MALNUTRITION	WELL-NOURISHED
Orbital region – surrounding the eye	View patient while standing directly in front of him/her; touch face above cheekbone.	Hollow look; depressions, dark circles, loose skin around the eyes.	Slightly dark circles; somewhat hollow look.	Slightly bulged fat pads; fluid retention may mask loss.
Upper arm region – triceps/biceps	With patient's arm bent, roll skin between your fingers; do not include muscle in pinch.	Very little space between folds; your fingers touch.	Some depth to the pinch, but not ample.	Ample fat tissue is obvious between folds of skin.
Thoracic and lumbar region – ribs, lower back, midaxillary line	Have patient press hands hard against a solid object.	Depression between the ribs is very apparent; iliac crest is very prominent.	Ribs are apparent; depressions between them are less pronounced; iliac crest is somewhat prominent.	Chest is full; ribs do not show; slight-to-no protrusion of the iliac crest.

Source: "Physical Exam – Parameters Useful in Assessment of Physical Status" developed by White J, Merriman L, Scollard T, Cleveland Clinic Center for Human Nutrition. Malnutrition coding. In Biesemeier C, ed. *Nutrition Care Manual*. Academy of Nutrition and Dietetics; 2013.
Available at http://fnce.eatright.org/fnce/uploaded/635126818215788680-179%20Barrocas%202.pdf.

APPENDIX 3b: Muscle Loss

EXAM AREAS	TIPS	SEVERE MALNUTRITION	MILD-MODERATE MALNUTRITION	WELL-NOURISHED
Upper Body				
Temple region – temporalis muscle	View patient while standing directly in front of him/her; ask patient to turn head side to side.	Hollowing, scooping, depression.	Slight depression.	Well-defined muscle can been seen/felt.
Clavicle bone region – pectoralis major, deltoid, trapezius muscles	Look for prominent bone; make sure the patient is not hunched forward.	Protruding, prominent bone.	Visible in male; some protrusion in female.	Not visible in male; visible, but not prominent, in female.
Clavicle and acromion bone region – deltoid muscle	With patient's arms at side, observe shape.	Shoulder-to-arm joint looks square; bones are prominent; acromion protrusion is very prominent.	Acromion process may protrude slightly.	Rounded curves at arm/shoulder/neck.
Scapular bone region – trapezius, supraspinus, infraspinus muscles	Ask patient to extend hands straight out and push against a solid object.	Prominent, visible bones; depressions between ribs/scapula or shoulder/spine.	Mild depression or bone may show slightly.	Bones are not prominent; no significant depressions.
Dorsal hand – interosseous muscle	Look at thumb-side of the hand; look at pads of the thumb, with tip of the forefinger touching tip of the thumb.	Depressed area on thumb-side of the hand, between thumb and forefinger.	Slightly depressed area.	Muscle bulges, although could be flat in some well-nourished people.
Lower Body (Less Sensitive to Change)				
Patellar region – quadriceps muscles	Ask patient to sit with leg propped up, bent at the knee.	Bones prominent; little sign of muscle around the knee.	Knee cap is less prominent, more rounded than in severe malnutrition.	Muscles protrude; bones are not prominent.
Anterior thigh region – quadriceps muscles	Ask patient to sit; prop up leg on low furniture. Grasp quads to determine amount of muscle tissue, differentiating from fat tissue.	Depression/line on inner thigh; obviously thin.	Mild depression on inner thigh.	Well-rounded, well-developed inner thigh.
Posterior calf region – gastrocnemius muscle	Grasp the calf muscle to determine amount of tissue.	Thin; minimal to no muscle definition.	Muscle not well-developed.	Well-developed bulb of muscle.

Source: "Physical Exam – Parameters Useful in Assessment of Physical Status" developed by White J, Merriman L, Scollard T, Cleveland Clinic Center for Human Nutrition. Malnutrition coding. In Biesemeier C, ed. *Nutrition Care Manual*. Academy of Nutrition and Dietetics; 2013.
Available at http://fnce.eatright.org/fnce/uploaded/635126818215788680-179%20Barrocas%202.pdf

APPENDIX 3c: Edema

EXAM AREAS	TIPS	SEVERE MALNUTRITION	MILD-MODERATE MALNUTRITION	WELL-NOURISHED
Rule out other causes of edema; determine patient's dry weight	View scrotum or vulva in activity-restricted patient; examine ankles in mobile patient.	Deep to very deep pitting; depression lasts a short to moderate time (31–60 seconds); extremity looks swollen (3–4+).	Mild to moderate pitting; slight swelling of the extremity; indentation subsides quickly (0–30 seconds).	No sign of fluid accumulation.

Source: "Physical Exam – Parameters Useful in Assessment of Physical Status" developed by White J, Merriman L, Scollard T, Cleveland Clinic Center for Human Nutrition. Malnutrition coding. In Biesemeier C, ed. *Nutrition Care Manual.* Academy of Nutrition and Dietetics; 2013.
Available at http://fnce.eatright.org/fnce/uploaded/635126818215788680-179%20Barrocas%202.pdf

APPENDIX 4: Recommended Outcome Measures for Severe Malnutrition

Outcome	Measure
Improved nutrition knowledge	Measure knowledge gained, behavioral changed, and adherence to plan.
Improved nutrient intake: • Energy • Protein • Fluid	• Monitor intake, using direct observation and quantitative dietary intake methods, especially intake of energy and protein. • Monitor fluid balance. • Review progress towards nutrient goals; set criteria for commencing interventions such as higher energy diets.
Improved nutrition anthropometry	Monitor body weight.
Improve nutritional biochemistry	Caution should be exercised when monitoring and interpreting the patient's biochemistry, particularly in the acute care setting; consideration should be given to the burden of testing on the patient.
Prevention of pressure ulcers	As outlined in BOP CPG on *Wound Care Management*.
Improved wound healing	As outlined in BOP CPG on *Wound Care Management*.
Reduced infections and use of antibiotics	Monitor at population level.
Increase peak expiratory flow	To be performed by appropriate health professional.
Decreased nausea, vomiting, and/or diarrhea	Intervene with early feeding when necessary. Review tolerance to formula/feeding regimen to ensure achievement of goals.
Improved physical function	Monitor handgrip strength.
Improved life expectancy	Monitored at population level.

Source: Watterson C, Fraser A, Banks M, Isenring E, Miller M, et al. (2009). Evidence based practice guidelines for the nutritional management of malnutrition in adult patients across the continuum of care. Nutrition and Dietetics. 2009;66:S1–S34.