



The ICU Patient: A General Approach In Management

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ABSTRACT

Outcomes for patients in the Intensive Care Unit (ICU) can vary widely, and ICU nurses play a significant role in those results. An ICU nurse's responsibilities include assessing a patient's needs, making sure the patient has adequate medication, nutrition, and hygiene, and even keeping the patient's spirits high by demonstrating a positive attitude. It often falls on the nursing staff's shoulders to ensure that patients feel comfortable and secure so that they can begin their healing journey. This course aims to serve as a general and basic approach to nursing responsibility in the ICU setting.

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Statement of Learning Need

The important skills of managing the ICU patient are essential for nurses to master in order to ensure appropriate and safe patient care.

Course Purpose

To provide nursing professionals with knowledge of the basic skills to manage the patient in the ICU setting.

Target Audience

Advanced Practice Registered Nurses and Registered Nurses

(Interdisciplinary Health Team Members, including Vocational Nurses and Medical Assistants may obtain a *Certificate of Completion*)

Course Author & Planning Team Conflict of Interest Disclosures

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Completing the study questions is optional and is NOT a course requirement.

- 1. Which type of localized pain is caused by tissue injury?**
 - a. Visceral
 - b. Neuropathic
 - c. Somatic
 - d. Abdominal

- 2. Which opiate is rarely used in the intensive care unit because of the potential for neurologic toxicity?**
 - a. Meperidine
 - b. Oxycodone
 - c. Oxymorphone
 - d. Propoxyphene

- 3. It is important to assess a patient's pain levels every _____ to ensure the pain medication is working properly.**
 - a. 30 minutes
 - b. hour
 - c. 3 – 6 hours
 - d. 12 hours

- 4. One of the potential side effects of opioid use is:**
 - a. respiratory depression.
 - b. anxiety and agitation.
 - c. an increase in breaths per minute.
 - d. None of the above.

- 5. The most important hygiene measure for ICU medical staff is:**
 - a. Equipment sterilization
 - b. Patient care
 - c. Frequent bed linen changes
 - d. Hand washing

Introduction

The Intensive Care Unit (ICU) is intended for patients who are recovering from severe medical complications, surgery, traumatic injuries and critical illness. In most instances, patients in an intensive care unit are unstable and their conditions are life threatening. Outcomes for patients in Intensive Care Units can vary widely, and ICU nurses play a significant role in those results. As a result, these patients require continuous care and monitoring by skilled nurses who understand the special needs of the ICU patient. An ICU nurse's responsibilities include assessing a patient's needs, making sure the patient has adequate medication, nutrition, and hygiene, and even keeping the patient's spirits high by demonstrating a positive attitude. By carrying out these responsibilities, the nurse may ensure that the ICU patient feels comfortable and secure so that he or she can begin the journey toward healing.

Pain Management

It is difficult for patients who are critically ill to accurately describe the level and type of pain they are experiencing, which can result in incorrect pain treatment.¹ In most instances, patients will be undertreated as the provider will be unaware of the extent and level of pain a patient is experiencing.² Typically, pain occurs as the result of an injury, the treatment provided for the injury, or as a result of the stress the patient experiences. Regardless of the cause of pain, it is important to treat the patient's pain appropriately. Untreated pain can have detrimental effects on the patient, and can increase the incidence of complications as well as the patient's length of stay in the intensive care unit.³

Pain can occur in three different forms. The following is a list of the types of pain that a patient in the intensive care unit may experience:⁴

- Somatic Pain

Somatic pain is caused by tissue injury, is well localized, and it is sharp, aching, or gnawing in character.

- Visceral Pain

Visceral pain is caused by compression or distention and is vague, dull, or aching in character. It may be referred to other areas of the body.

- Neuropathic

Neuropathic pain results from injury to the peripheral nerves or the central nervous system.

Assessment

To properly treat pain in a patient, a thorough assessment must be performed. The assessment should be reproducible so that pain levels can be continuously monitored. This will allow for proper, long-term treatment and continuous pain management.⁵

The initial assessment should include the patient's self-reported level of pain, if the patient is able to communicate. As part of the assessment, the provider should have the patient rate his or her pain using a rating scale.¹

In most instances, patients will be asked to self-report the level of pain using a horizontal rating scale as the guide.⁶ However, many patients are unable to accurately report pain levels due to incoherence, inability to

communicate, unconsciousness, or other complications. When this is the case, the provider will need to use an assessment tool to accurately diagnose pain levels.⁷

Pain in ICU patients should be assessed regularly throughout the duration of the patient's stay. This will enable the provider to establish a pain management treatment plan for the patient, as well as modify the plan if the patient's pain treatment needs change. The following guidelines have been provided by the American College of Critical Care Medicine to ensure that pain assessment is consistent throughout intensive care units.⁴

- I. We recommend that pain be routinely monitored in all adult ICU patients (+1B).***
- II. The Behavioral Pain Scale (BPS) and the Critical-Care Pain Observation Tool (CPOT) are the most valid and reliable behavioral pain scales for monitoring pain in medical, postoperative, or trauma (except for brain injury) adult ICU patients who are unable to self-report and in whom motor function is intact and behaviors are observable. Using these scales in other ICU patient populations and translating them into foreign languages other than French or English require further validation testing (B).***
- III. We do not suggest that vital signs (or observational pain scales that include vital signs) be used alone for pain assessment in adult ICU patients (-2C).***
- IV. We suggest that vital signs may be used as a cue to begin further assessment of pain in these patients, however (+2C).***

Treatment

Once a patient's pain levels have been assessed and accurately measured, the provider will determine a specific treatment plan that best meets the needs of the patient. Depending on the needs of the patient, the treating provider will typically prescribe opiates or other types of analgesics for pain management.

Opiates

Opiates are the most common type of pain management drugs used in the intensive care unit. Opiates are a group of controlled substances that include a number of the prescription painkillers on the market. Opiates, which are also called opioids, are either derivatives of opium or a synthetic version of opium.⁸ Opiates decrease pain sensations by binding to the receptors in the brain, thereby interrupting the pain signal. In addition to pain relief, opiates often produce a sensation of euphoria.⁵

In addition to the reduction of pain and the sense of euphoria, opiates can produce a number of common side effects. The most common side effects for opiates include:⁸

- Sedation
- Dizziness
- Nausea or vomiting
- Constipation
- Physical dependence
- Tolerance
- Respiratory depression

The most common opiates include:⁹

- Fentanyl (Duragesic®)
- Hydrocodone (Vicodin®)
- Oxycodone (OxyContin®)
- Oxymorphone (Opana®)
- Propoxyphene (Darvon®)
- Hydromorphone (Dilaudid®)
- Meperidine (Demerol®)
- Diphenoxylate (Lomotil®)

The specific type of opiate and the dosing regimen will be dependent on the patient's needs and the specific properties of the pharmaceutical agent. However, meperidine is rarely used in the intensive care unit because of the potential for neurologic toxicity.⁵

Nonopiates

Although opiates are the most commonly prescribed painkillers in the intensive care unit, there are many nonopiates that are also used to treat pain in patients. In many instances, other analgesics will be used to reduce the amount of opiates given to the patient.³ The most common analgesics used in the intensive care unit include:¹⁰

- local and regional anesthetics (*i.e.*, bupivacaine),
- nonsteroidal anti-inflammatory medications (*i.e.*, ketorolac, ibuprofen)
- IV acetaminophen
- Anticonvulsants

In most instances, the substances listed above will be combined with opiates as there is no significant evidence that these agents are effective, sole pain management medications.¹¹ However, when combined with reduced

amounts of opiates, they can help manage a patient's pain and stress levels.¹⁰

Dosing

There are a number of dosing options available in the intensive care unit. The specific method used will depend on the needs of the patient, the severity of pain, the frequency of pain, and the physical abilities of the patient.⁹ In some instances, methods will be combined to ensure that a patient receives the appropriate amount of pain management medications. The following is a list of the different types of dosing methods:¹²

Intravenously – This strategy is the most widely used in the intensive care unit. Patients may receive intermittent or continuous dosing, which will depend on the type of medication used, the frequency and severity of pain, and the patient's level of stress and mental fortitude.

Enteral - This dosing method works quite well, but is not effective if the patient does not have adequate gastrointestinal absorptive capacity as well as adequate mobility.

Spinal/Epidural – This mode of delivery is typically limited to use for postoperative treatment following specific surgical procedures. It is not recommended as a delivery method for general pain management due to the lack of mobility necessary.

The American College of Critical Care Medicine provides the following guidelines for the treatment of pain in the intensive care unit:⁴

- I. We recommend that preemptive analgesia and/or nonpharmacologic interventions (i.e., relaxation) be administered to alleviate pain in adult ICU patients prior to chest tube removal (+1C).**
- II. We suggest that for other types of invasive and potentially painful procedures in adult ICU patients, preemptive analgesic therapy and/or nonpharmacologic interventions may also be administered to alleviate pain (+2C).**
- III. We recommend that intravenous (IV) opiates be considered as the first-line drug class of choice to treat non-neuropathic pain in critically ill patients (+1C).**
- IV. All available IV opiates, when titrated to similar pain intensity endpoints, are equally effective (C).**
- V. We suggest that nonopioid analgesics be considered to decrease the amount of opiates administered (or to eliminate the need for IV opiates altogether) and to decrease opioid-related side effects (+2C).**
- VI. We recommend that either enterally administered gabapentin or carbamazepine, in addition to IV opiates, be considered for treatment of neuropathic pain (+1A).**
- VII. We recommend that thoracic epidural anesthesia/analgesia be considered for postoperative analgesia in patients undergoing abdominal aortic aneurysm surgery (+1B).**
- VIII. We provide no recommendation for using a lumbar epidural over parenteral opiates for postoperative analgesia in patients undergoing abdominal aortic aneurysm surgery, due to a lack of benefit of epidural over parenteral opiates in this patient population (0,A).**
- IX. We provide no recommendation for the use of thoracic epidural analgesia in patients undergoing either intrathoracic or nonvascular abdominal surgical procedures, due to insufficient and conflicting evidence for this mode of analgesic delivery in these patients (0,B).**
- X. We suggest that thoracic epidural analgesia be considered for patients with traumatic rib fractures (+2B).**
- XI. We provide no recommendation for neuraxial/regional analgesia over systemic analgesia in medical ICU patients, due to lack of evidence in this patient population.**

Side Effects and Complications

Analgesics are necessary to manage pain in patients in the intensive care unit. However, they can also cause a number of side effects and complications. Therefore, the treating provider must assess each patient individually to determine the best type of medication for pain management.

Potential complications from analgesics:²

Opiate	Side Effects and Other Information
Fentanyl	Less hypotension than with morphine. Accumulation with hepatic impairment.
Hydromorphone	Therapeutic option in patients tolerant to morphine/fentanyl. Accumulation with hepatic/renal impairment.
Morphine	Accumulation with hepatic/renal impairment. Histamine release.
Methadone	May be used to slow the development of tolerance where there is an escalation of opioid dosing requirements. Unpredictable pharmacokinetics; unpredictable pharmacodynamics in opiate naïve patients. Monitor Q-T interval (corrected) (QTc).
Remifentanyl	No accumulation in hepatic/renal failure. Use IBW if body weight >130% IBW.

Nonopiate	Side Effects and Other Information
Ketamine	Attenuates the development of acute tolerance to opiates. May cause hallucinations and other psychological disturbances.
Keterolac	Avoid nonsteroidal anti-inflammatory drugs in following conditions: renal dysfunction; gastrointestinal bleeding; platelet abnormality; concomitant angiotensin converting enzyme inhibitor therapy, congestive heart failure, cirrhosis, asthma.
Ibuprofen	Avoid nonsteroidal anti-inflammatory drugs in following conditions: renal dysfunction; gastrointestinal bleeding; platelet abnormality; concomitant angiotensin converting enzyme inhibitor therapy, congestive heart failure, cirrhosis, asthma. Contraindicated for the treatment of perioperative pain in coronary artery bypass graft surgery.
Gabapentin	Side effects: (common) sedation, confusion, dizziness, ataxia. Adjust dosing in renal failure pts. Abrupt discontinuation associated with drug withdrawal syndrome, seizures.
Carbamazepine	Side effects: (common) nystagmus, dizziness, diplopia, lightheadedness, lethargy; (rare) aplastic anemia, and agranulocytosis; Stevens–Johnson syndrome or toxic epidermal necrolysis with HLA-B1502 gene. Multiple drug interactions due to hepatic enzyme induction.

Monitoring

It is important to monitor patients continuously once pain medication has been administered to assess the effects of the medication, as well as to identify any complications or side effects.⁵ Continuous pain is common in ICU patients, and can interfere with the recovery process.¹³ Therefore, regular reassessment is necessary to ensure the treatment is working effectively.

Routine assessments should include a patient self-report, if the patient is able to communicate. If the patient is unable to self-report, other assessments must be used.⁹ It is recommended that the patient be assessed hourly to ensure that he or she is responding appropriately to the treatment. If the patient is not responding appropriately, the treatment must be modified. In some instances, this will include increasing the dosage or the addition of medications, and in other instances it will require a complete change in medication.¹⁴

Part of the patient monitoring process includes assessing the patient for any side effects that may be caused by the medication. Many side effects are not dangerous but may cause discomfort in the patient. Therefore, part of the treatment plan will include the addition of any agents that will help prevent or reduce the side effects caused by the analgesics.⁶

The following table provides information on the most common analgesic side effects and the recommended treatment.¹

Nausea and Vomiting	Nausea and vomiting occurs in about 25% of persons on opioid therapy. There are multiple mechanisms including decreased gastrointestinal activity, stimulation of the chemoreceptive trigger zone, and enhanced vestibular sensitivity. Treatment options include the use of prokinetics, antipsychotics, serotonin antagonists, antihistamines, and corticosteroids. Optimally, the choice should depend on the mechanism of action, patient characteristics, risk of adverse effects, and cost. Trials of anti-emetics from different classes may be necessary to control nausea. If nausea persists despite the use of anti-emetics of different classes, one should consider opioid rotation.
Constipation	Constipation is the most common side effect of chronic opioid use and must be controlled prophylactically. This may not be an initial concern for ICU patients who are not taking anything orally. However, once oral intake is initiated, measures such as adequate fluid intake, routine administration of stool softeners, and peristaltic agents should be instituted to prevent opioid-induced constipation. As with the treatment of all side effects, rotation of agents may be necessary to minimize this complication.
Pruritis	Pruritis is a side effect—more commonly seen with intraspinal opiates—precipitated by the release of histamine from mast cells or a centrally-mediated process. Antihistamines are often used but evidence from prospective studies is lacking. In some cases of refractory pruritis, low dose parenteral naloxone may be warranted. Consider opioid rotation if pruritis persists.
Sedation and Cognitive Adverse Effects	Sedation and cognitive adverse effects may occur with opiates. Since many patients in the ICU are sedated for ventilatory support, these side effects may be difficult to assess. If the patient begins to take oral medications but sedation or cognitive changes persists, the treatment of sedation may include reduced doses or rotation of opiates, adjuvant therapy, and possibly the use of psychostimulants.
Respiratory Depression	Respiratory depression can occur with opioid use; the patient not on ventilatory support may be a concern. Careful monitoring and adjustment of opioid medications may avoid an adverse effect. For patients not arousable with respiratory rates < 8 breaths/minute, naloxone should be given (dilution of 0.4 mg in 10 mL of normal saline) in 1 mL increments over 2 minutes until respiratory rate increases and arousal occurs.

Sedation

It is common for patients in the intensive care unit to experience agitation and anxiety, which can occur in response to a number of factors, including but not limited to pain, delirium, hypoxemia, hypoglycemia, hypotension, or withdrawal from alcohol and other drugs.¹⁵ Therefore, many patients will benefit from the administration of sedatives to reduce the level of anxiety and agitation. However, prior to administering sedatives, the provider should attempt to reduce anxiety and agitation through non-pharmaceutical means.¹⁶

Typically, most patients will require only light sedation to reduce the levels of anxiety and agitation. When a patient receives light sedation, he or she will still be able to be aroused and will understand basic commands.⁸ In extreme instances, the patient may require deep sedation, which will render him or her unresponsive. Deep sedation is only recommended in extreme situations as it can have negative consequences on the patient's brain function.¹⁷

Treating providers will utilize sedation scales and protocols to ensure proper sedative administration. When administered properly, sedatives are associated with improved patient outcomes. They are shown to shorten the duration of mechanical ventilation and are also associated with shorter ICU stays and overall hospital length of stay.¹⁸

Agitation Management

Sedatives are most commonly used to treat agitation in patients. However, as mentioned above, improper administration of sedatives can have negative effects on the patient. Therefore, the American College of Critical Care

Medicine provides the following clinical guidelines for agitation and sedation:⁴

Agitation and Sedation

I. Depth of sedation vs. clinical outcomes

- **Maintaining light levels of sedation in adult ICU patients is associated with improved clinical outcomes (i.e., shorter duration of mechanical ventilation and a shorter ICU length of stay [LOS]) (B).**
- **Maintaining light levels of sedation increases the physiologic stress response, but is not associated with an increased incidence of myocardial ischemia (B).**
- **The association between depth of sedation and psychological stress in these patients remains unclear (C).**
- **We recommend that sedative medications be titrated to maintain a light rather than a deep level of sedation in adult ICU patients, unless clinically contraindicated (+1B).**

II. Monitoring depth of sedation and brain function

- **The Richmond Agitation-Sedation Scale (RASS) and Sedation-Agitation Scale (SAS) are the most valid and reliable sedation assessment tools for measuring quality and depth of sedation in adult ICU patients (B).**
- **We do not recommend that objective measures of brain function (i.e., auditory evoked potentials [AEPs], Bispectral Index [BIS], Narcotrend Index [NI], Patient State Index [PSI], or state entropy [SE]) be used as the primary method to monitor depth of sedation in noncomatose, nonparalyzed critically ill adult patients, as these monitors are inadequate substitutes for subjective sedation scoring systems (-1B).**
- **We suggest that objective measures of brain function (i.e., AEPs, BIS, NI, PSI, or SE) be used as an adjunct to subjective sedation assessments in adult ICU patients who are receiving neuromuscular blocking agents, as subjective sedation assessments may be unobtainable in these patients (+2B).**

- ***We recommend that EEG monitoring be used to monitor nonconvulsive seizure activity in adult ICU patients with either known or suspected seizures, or to titrate electrosuppressive medication to achieve burst suppression in adult ICU patients with elevated intracranial pressure (+1A).***

III. Choice of sedative

- ***We suggest that sedation strategies using nonbenzodiazepine sedatives (either propofol or dexmedetomidine) may be preferred over sedation with benzodiazepines (either midazolam or lorazepam) to improve clinical outcomes in mechanically ventilated adult ICU patients (+2B).***

Potential Complications from Sedatives:

Sedatives provide ICU patients with relief from agitation and anxiety. However, they are also known to cause a number of side effects, which will vary depending on the specific sedative used. The following table provides a list of the different side effects for each type of sedative:⁸

Agent	Adverse Effects
Midazolam	Respiratory depression, hypotension
Lorazepam	Respiratory depression, hypotension; propylene glycol-related acidosis, nephrotoxicity
Diazepam	Respiratory depression, hypotension, phlebitis
Propofol	Pain on injection, hypotension, respiratory depression, hypertriglyceridemia, pancreatitis, allergic reactions, propofol related infusion syndrome; deep sedation with propofol is associated with significantly longer emergence times than with light sedation
Dexmedetomidine	Bradycardia, hypotension; hypertension with loading dose; loss of airway

Delirium Management

Many patients in the intensive care unit will experience delirium either as the result of the illness or the treatment the patient receives in the ICU.¹⁹

Sedative and analgesic medications can cause delirium in patients, especially in those with other associated complications.²⁰ Unfortunately, delirium is associated with an increase in morbidity and mortality in the intensive care unit, as well as long term cognitive damage.²¹ To ensure that the incidence of delirium in intensive care unit patients is reduced, the American College of Critical Care Management has established clinical guidelines for delirium management in the intensive care unit:⁴

Delirium

I. Outcomes associated with delirium

- ***Delirium is associated with increased mortality in adult ICU patients (A).***
- ***Delirium is associated with prolonged ICU and hospital LOS in adult ICU patients (A).***
- ***Delirium is associated with the development of post-ICU cognitive impairment in adult ICU patients (B).***

II. Detecting and monitoring delirium

- ***We recommend routine monitoring of delirium in adult ICU patients (+1B).***
- ***The Confusion Assessment Method for the ICU (CAM-ICU) and the Intensive Care Delirium Screening Checklist (ICDSC) are the most valid and reliable delirium monitoring tools in adult ICU patients (A).***
- ***Routine monitoring of delirium in adult ICU patients is feasible in clinical practice (B).***

III. Delirium risk factors

- **Four baseline risk factors are positively and significantly associated with the development of delirium in the ICU: preexisting dementia, history of hypertension and/or alcoholism, and a high severity of illness at admission (B).**
- **Coma is an independent risk factor for the development of delirium in ICU patients (B).**
- **Conflicting data surround the relationship between opioid use and the development of delirium in adult ICU patients (B).**
- **Benzodiazepine use may be a risk factor for the development of delirium in adult ICU patients (B).**
- **There are insufficient data to determine the relationship between propofol use and the development of delirium in adult ICU patients (C).**
- **In mechanically ventilated adult ICU patients at risk of developing delirium, dexmedetomidine infusions administered for sedation may be associated with a lower prevalence of delirium compared to benzodiazepine infusions (B).**

IV. Delirium prevention

- **We recommend performing early mobilization of adult ICU patients whenever feasible to reduce the incidence and duration of delirium (+1B).**
- **We provide no recommendation for using a pharmacologic delirium prevention protocol in adult ICU patients, as no compelling data demonstrate that this reduces the incidence or duration of delirium in these patients (0,C).**
- **We provide no recommendation for using a combined nonpharmacologic and pharmacologic delirium prevention protocol in adult ICU patients, as this has not been shown to reduce the incidence of delirium in these patients (0,C).**
- **We do not suggest that either haloperidol or atypical antipsychotics be administered to prevent delirium in adult ICU patients (-2C).**
- **We provide no recommendation for the use of dexmedetomidine to prevent delirium in adult ICU patients, as there is no compelling evidence regarding its effectiveness in these patients (0,C).**

V. Delirium treatment

- ***There is no published evidence that treatment with haloperidol reduces the duration of delirium in adult ICU patients (No Evidence).***
- ***Atypical antipsychotics may reduce the duration of delirium in adult ICU patients (C).***

- ***We do not recommend administering rivastigmine to reduce the duration of delirium in ICU patients (-1B).***
- ***We do not suggest using antipsychotics in patients at significant risk for torsades de pointes (i.e., patients with baseline prolongation of QTc interval, patients receiving concomitant medications known to prolong the QTc interval, or patients with a history of this arrhythmia) (-2C).***
- ***We suggest that in adult ICU patients with delirium unrelated to alcohol or benzodiazepine withdrawal, continuous IV infusions of dexmedetomidine rather than benzodiazepine infusions be administered for sedation to reduce the duration of delirium in these patients (+2B).***

Nutrition

Proper nutrition management in the intensive care unit is crucial. Patients who are critically ill have a number of nutritional and metabolic needs that are difficult to manage as part of the overall treatment of the patient.²²

Nutritional support is important in two regards. First, it helps maintain the basic metabolic functions of the patient, thereby preserving lean body mass and maintaining general physical function.²³

Nutritional support also improves the body's metabolic response to stress, prevents cellular injury and improves the stability and function of the immune system.²⁴ Therefore, nutrition is considered part of the patient's treatment plan rather than as a secondary component of general patient

care.²⁵ To ensure that the patient receives the best nutritional treatment, the provider will assess the patient's status and needs and use the data to develop a nutritional plan that will help minimize damage from the illness, reduce secondary complications, and positively impact patient outcomes.²⁶

Assessment

The patient should be assessed using a variety of assessment tools that will help determine the specific dietary needs and treatment protocol required. The assessment will help determine the types of nutrition needed, as well as the method of delivery. In addition, the patient's biochemistry will be assessed to determine specific nutritional needs beyond the scope of those indicated in the basic dietary assessment.²⁷

The first part of the patient assessment will focus on dietary and fluid intake. This assessment will be used to define the specific diet the patient will follow, with consideration made for any known allergies or restrictions.²⁵ If possible, the patient will provide information regarding his or her current and past dietary intake so that a similar plan can be created.²²

The following is a list of the components that will be addressed as part of the dietary and fluid intake assessment.²²

Dietary and fluid intake:

- Current and past dietary intake – if possible
 - When was the last meal taken?
 - Known allergies
- Special diets?
 - Self-imposed/prescribed
- Oral/nasogastric (NG)/percutaneous endoscopic gastrostomy

(PEG)/jejunal percutaneous endoscopy (JPE)

- Texture of food/fluids
- IV fluids
 - Nutrients supplied by IV fluids
- Fat intake
- Maintenance intake – glucose
- Nutrients supplied by dialysis fluids
- Medication (oral and/or IV)
 - Note daily
 - Nutrient-medication interactions
- Blood and blood products
- Appetite, nausea, vomiting, satiety
- Constipation, diarrhea, cramping, flatus
- Pain, fatigue, depression
- Religion/spiritual beliefs about diet
- Preferences, likes/dislikes

In addition to a dietary intake assessment, the patient's chewing and swallowing ability will need to be assessed. This assessment will help determine the type and texture of foods to be given, as well as the delivery method.

In patients who display difficulty with chewing or swallowing, nutrition will be given enterally or parenterally. Patients who have no difficulty chewing and swallowing, and who have no other complications, will receive their food orally.²⁴

Finally, the patient will require a thorough clinical assessment and a physical examination. The clinical assessment should assess the following components:²³

- Presence of nutrient deficiencies
- Presence of edema/dehydration
- Fluid balance
- Vital signs [blood pressure, breathing rate (if applicable), temperature, pulse rate]
- Presence of pressure ulcers
- Gastrointestinal function

Delivery Methods

The method of delivery for nutrition in the intensive care unit depends on the condition of the patient, the patient's nutritional needs, and his or her ability to chew and swallow food.

Enteral Nutrition

Enteral nutrition is a common feeding method in the intensive care unit, as many patients are unable to ingest food orally. With this method, patients receive their nutrition directly through a tube in the stomach or small intestine.²⁸ The patient is prescribed a liquid formula that meets his or her specific dietary needs, and the formula is delivered slowly over a period of approximately twenty four hours.²⁹

In many instances, the patient will receive all nutrition enterally at the beginning of his or her stay in the intensive care unit, and will slowly transition to eating foods orally.³⁰

There are different types of feeding tubes that are used in enteral feeding. The specific type of tube used will depend on the specific needs of the patient. The following table provides descriptions of each type of tube:²⁸

Tube	Use
Nasogastric tubes (NGT)	This is the most common type of feeding tube used in the ICU. A nasogastric tube is a thin tube that is put into the patient’s nose and down their throat into their stomach. It is usually used if they need feeding for less than 3 weeks.
Nasojejunal tubes (NJT)	A NJT is like a nasogastric tube but the tip goes into the first part of the bowel (the jejunum). NJTs are used <ul style="list-style-type: none"> • When the stomach cannot empty properly • To get past a blockage in the small bowel • If the patient has a condition affecting his or her pancreas
Gastrostomy tubes	A gastrostomy tube goes into the stomach through an opening made on the outside of the abdomen. This type of tube is used for people who have long term problems with eating and swallowing. A gastrostomy tube can be placed by special procedures in the ICU.

Patients must have a normally functioning digestive tract to receive nutrition enterally. While the patient does not ingest the food orally, it still follows the standard digestive process. If a patient does not have a functioning digestive tract, he or she will be unable to digest the formula.²⁹ Some patients may experience complications and side effects associated with enteral feeding.

The most common complication is gastric reflux and aspiration, which occur when the formula is not digested properly and moves backwards into the esophagus.²⁶ When this occurs, the patient will inhale the formula into the

airway and lungs. If this happens, the patient is at risk of developing pneumonia.²² To prevent gastric reflux and aspiration from occurring, the treating team will utilize the following preventative strategies:²⁸

- drugs to increase the rate of stomach emptying
- monitoring the volume of the stomach contents
- raising the head of the bed
- putting the feeding tube down farther into the intestines

Parenteral Nutrition

If a patient is unable to digest food, or if another complication is present, he or she will be fed intravenously. This form of feeding is referred to as parenteral nutrition. With this method of delivery, the patient receives nutrition directly into the bloodstream through a drip in the vein.³¹ This process does not require digestion.²⁴ With parenteral feeding, the patient receives nutritional support through a central line or a PICC line inserted into the blood vessel in their arm. In many instances, a central line that has been inserted for general treatment use will also be used for parenteral feeding.³²

Parenteral feeding is most common in patients who have:³³

- severe problems with their stomach or intestine, or if these have been removed.
- severe nutritional problems before surgery and can't have enteral feeding.
- a hole (fistula) in their stomach or esophagus.
- a lot of weight loss or not coping well with enteral feeding.

The specific nutritional composition of the intravenous solution will be tailored to patient's specific nutritional needs. A dietitian will consult with the treatment provider to ensure that the patient's needs are being met.³⁴

Oral Nutrition

If a patient is conscious and able to swallow and digest food, he or she will receive nutrition orally.²⁵

Malnutrition

Malnutrition is a significant problem with hospitalized patients, especially those in the intensive care unit. Many patients enter the hospital already malnourished, yet a number of them are undiagnosed.³⁵ Malnutrition is a concern as it can affect the patient's recovery. If the immune system is impacted by lack of adequate nutrients, it is unable to successfully respond to an illness.³⁶ Other patients will become malnourished during their stay in the hospital as the result of complications from illness, lack of interest in or an inability to eat, or any other factor that impacts the patient's ability to absorb nutrients.³⁷ In general, malnutrition can be a result of any of the following factors:³⁶

- reduced food intake
- malabsorption
- modified metabolism
- increased nutrient and energy requirements
- lack of early nutritional assessment and treatment
- drug-nutrient interactions
- mechanical reasons
- disease/infection

Malnutrition can affect any patient. However, some patients will be at a higher risk of becoming malnourished. The following is a list of the risk factors for malnutrition:³⁸

- Being grossly underweight (< 80% ideal body weight)
- Being grossly overweight (> 120% ideal body weight)
- Recent weight loss (> 10% over 3 months)
- Being alcoholic/substance dependent
- Nil per mouth for > 5 days
- Increased nutrient losses
- Malabsorption
- Short bowel syndrome
- Fistulae
- Draining abscesses or wounds/burns
- Renal dialysis
- Increased nutrient requirements
- Trauma
- Burns
- Sepsis
- Taking medication with anti-nutrient properties

Hygiene

General hygiene is crucial in the intensive care unit as patients are critically ill and are unable to fight off any additional infections. Without proper attention, germs will spread rapidly from patient to patient due to the nature of the environment. Therefore, all hospitals have strict hygiene protocol that medical staff must follow. In each institution, there is protocol for the staff, as well as patient hygiene and visitor protocol. By instituting strict measures, the risk of cross-contamination is reduced.³⁹

Healthcare Staff Hygiene

Healthcare staff must adhere to strict hygiene protocol within the intensive care unit. The most important hygiene measure is hand washing. Hand washing alone can prevent the spread of most infections in the intensive care unit.⁴⁰ The Center for Disease Control guidelines recommend the use of alcohol based hand rubs, as they are effective against:⁴¹

- Gram-positive and gram-negative bacteria, including multidrug-resistant pathogens, such as methicillin-resistant staphylococcus aureus and vancomycin-resistant enterococci
- Mycobacterium tuberculosis
- Variety of fungi
- Majority of viruses

To ensure proper hand hygiene, intensive care units include hand rub dispensers for each patient area, regular compliance monitoring, and provider education.⁴² In addition to hand washing, medical staff members are required to follow protocol regarding equipment sterilization, patient care, medical waste disposal, and general department hygiene. In special instances, additional protocols will be put into place to address high-risk situations, such as highly contagious viruses or severely immunocompromised patients.³⁹

Patient Hygiene

The second component of an intensive care hygiene program involves patient hygiene. Patients are at risk of developing additional infections such as staphylococcus or ventilator assisted pneumonia as the result of lack of personal hygiene.⁴³ Therefore, proper patient care involves ensuring that the patient receives general hygiene, as well as oral hygiene.

Oral Care

Proper oral care is crucial in intensive care patients, especially those on a ventilator. Studies have shown that the risk of developing hospital acquired pneumonia and ventilator associated pneumonia is reduced when a patient receives appropriate oral care during his or her stay in the intensive care unit.⁴⁴ To ensure that oral hygiene standards are consistent throughout all facilities, the following guidelines, from the American Association of Critical Care Nurses, were developed:⁴⁵

Recommended oral care interventions for all hospitalized patients

Written Protocol and Training

- Intervention: Written oral care protocol and training should be in place.
- Rationale: Policy is designed to provide a standard of care which should be reinforced in training and should allow for consistent care of all patients.

Initial Assessment

- Intervention: Conduct an initial admission assessment of the patient's oral health and self-care deficits.
- Rationale: Assessment allows for initial identification of oral hygiene problems.

Dental Plaque Removal

Intervention: Use a small, soft toothbrush to brush teeth, tongue and gums at least twice daily to remove dental plaque. Foam swabs or gauze should not be used, as they are not effective tools for this task.

Rationale: Dental plaque, identified as a source of pathogenic bacteria associated with respiratory infection, requires mechanical debridement from tooth, tongue and gingival surfaces.

Toothpaste

Intervention: Use toothpaste, which contains additives that assist in the breakdown of mucus and biofilm in the mouth.

Rationale: Additives such as sodium bicarbonate have been shown to assist in removing debris accumulations on oral tissues and teeth.

Antiseptic Mouth Rinse

Intervention: Use an alcohol-free, antiseptic rinse to prevent bacterial colonization of the oropharyngeal tract.

Rationale: Mouthwashes with alcohol cause excessive drying of oral tissues. Hydrogen peroxide and CHG-based rinses have been shown to assist in removing oral debris as well as provide antibacterial properties.

Moisturizer

Intervention: Use a water-soluble moisturizer to assist in the maintenance of healthy lips and gums at least once every two hours.

Rationale: Dryness and cracking of oral tissues and lips provide regions for bacterial proliferation. A water-soluble moisturizer allows tissue absorption and added hydration.

Avoid Lemon Glycerin Swabs

Intervention: Avoid using lemon-glycerin swabs for oral care to moisten oral mucosa.

Rationale: Lemon-glycerin compounds are acidic and cause drying of oral tissues.

Assessment of Oral Cavity

Intervention: Conduct an initial admission as well as daily assessment of the lips, oral tissue, tongue, teeth, and saliva of each patient on a mechanical ventilator.

Rationale: Assessment allows for initial identification of oral hygiene problems and for continued observation of oral health.

Elevate Head

Intervention: Keep head of bed elevated at least 30 degrees; position patient for oral secretions to pool in the buccal pocket; important during feeding, brushing teeth, etc.

Rationale: Elevation prevents reflux and aspiration of gastric contents; oral secretions may drain into the subglottic area where they can become rapidly colonized with pathogenic bacteria.

Oral and Orotracheal Suctioning

Intervention: Suction patient's mouth and oropharynx routinely and as indicated by patient's secretion production, using either continuous subglottic suctioning or manual method. Do not use same catheter to suction both mouth and trachea.

Rationale: Minimize aspiration of contaminated secretions into lungs.

Bed/Bath Care

Bed/Bath Care is another component of patient hygiene. Many patients in an intensive care unit are required to remain in bed for the duration for their stay. Therefore, it is important that the patient be regularly bathed and that the bed linens are changed frequently to prevent the spread of any germs. Patients who do not receive regular or adequate bed and bath care are at an increased risk of developing infections such as staphylococcus.⁴³

The Importance Of A Positive Attitude

Patients in the intensive care unit often struggle with increased levels of anxiety, agitation, and depression as the result of the illness or injury they are healing from. In many instances, the patient is facing a diagnosis that will have long-term implications, or that poses the risk of death. Therefore, patient attitudes are often poor.

Studies have shown that patients heal easier and faster when they are able to maintain a positive attitude. It is important that the healthcare staff work with the patient to establish a positive attitude.¹⁶

Summary

Patients in an Intensive Care Unit require continuous care and monitoring as they are recovering from severe medical conditions, surgery and or traumatic injuries. Unlike patients in other areas of the hospital, ICU patients are considered critical and their status is typically unstable and life threatening. Outcomes for patients in Intensive Care Units can vary widely, and ICU nurses play a significant role in those results.

Nursing care above and beyond that provided for a standard patient is needed in the ICU setting. This includes assessing a patient's needs, making sure the patient has adequate medication, nutrition, and hygiene, and even keeping the patient's spirits high by demonstrating a positive attitude. By carrying out these responsibilities, the nurse may ensure that the ICU patient feels comfortable and secure so that he or she can begin the journey toward healing.

Please take time to help NurseCe4Less.com course planners evaluate the nursing knowledge needs met by completing the self-assessment of Knowledge Questions after reading the article, and providing feedback in the online course evaluation.

Completing the study questions is optional and is NOT a course requirement.

1. Which type of localized pain is caused by tissue injury?

- a. Visceral
- b. Neuropathic
- c. Somatic
- d. Abdominal

2. Which opiate is rarely used in the intensive care unit because of the potential for neurologic toxicity?

- a. Meperidine
- b. Oxycodone
- c. Oxymorphone
- d. Propoxyphene

3. It is important to assess a patient's pain levels every _____ to ensure the pain medication is working properly.

- a. 30 minutes
- b. hour
- c. 3 – 6 hours
- d. 12 hours

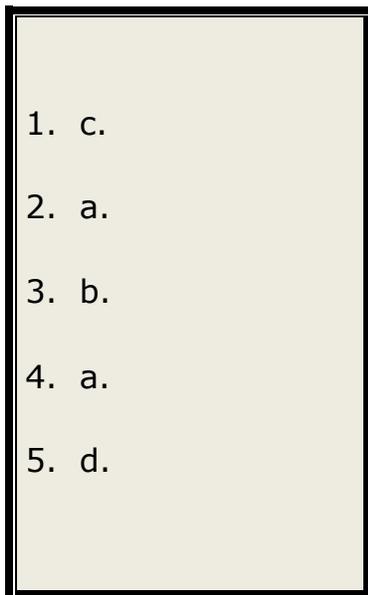
4. One of the potential side effects of opioid use is:

- a. respiratory depression.
- b. anxiety and agitation.
- c. an increase in breaths per minute.
- d. None of the above.

5. While all hygiene measures are important, the most important hygiene measure for medical staff in ICU is:

- a. Equipment sterilization
- b. Patient care
- c. Frequent bed linen changes
- d. Hand washing

CORRECT ANSWERS:

- 
1. c.
 2. a.
 3. b.
 4. a.
 5. d.

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