

David G. Jaimovich, MD, and the Committee on Hospital Care and Section on Critical Care

Admission and Discharge Guidelines for the Pediatric Patient Requiring Intermediate Care

ABSTRACT. During the past 3 decades, the specialty of pediatric critical care medicine has grown rapidly, leading to a number of pediatric intensive care units opening across the country. Many patients who are admitted to the hospital require a higher level of care than routine inpatient general pediatric care, yet not to the degree of intensity of pediatric critical care; therefore, an intermediate care level has been developed in institutions providing multidisciplinary subspecialty pediatric care. These patients may require frequent monitoring of vital signs and nursing interventions, but usually they do not require invasive monitoring. The admission of the pediatric intermediate care patient is guided by physiologic parameters depending on the respective organ system involved relative to an institution's resources and capacity to care for a patient in a general care environment. This report provides admission and discharge guidelines for intermediate pediatric care. Intermediate care promotes greater flexibility in patient triage and provides a cost-effective alternative to admission to a pediatric intensive care unit. This level of care may enhance the efficiency of care and make health care more affordable for patients receiving intermediate care. *Pediatrics* 2004; 113:1430–1433; coordination of care, admission, discharge, multidisciplinary, intermediate care.

The purpose of this statement is to provide lists of criteria that may be incorporated into multidisciplinary guidelines for the admission and discharge of children requiring intermediate care. Because of the continuous and rapidly changing developments in critical care pediatrics, these criteria may require periodic revision. Equally important, because of significant differences in personnel, facilities, and diagnostic and treatment capabilities from hospital to hospital, no single set of criteria will apply to every institution providing intermediate care.

Intermediate care is provided in acute care hospitals to a patient population with a severity of illness that does not require intensive care but does require greater services than those provided by routine inpatient general pediatric care. These patients may require frequent monitoring of vital signs and/or nursing interventions but usually will not require

invasive monitoring. The development of intermediate care services has been proposed as an appropriate means to enhance resource utilization for intermediately ill patients.^{1–4} In light of the recent emphasis on cost containment, intermediate care promotes flexibility in patient triage, provides pediatric patients with monitoring and therapies tailored to their severity of illness, and may be a cost-effective alternative to admission to a pediatric intensive care unit. Patients with a low risk of, but potential for, significant deterioration and who are admitted for routine monitoring are excellent candidates for intermediate care.

Intermediate care is ideally provided in facilities that have a pediatric intensive care unit.⁵ However, these resources may not be widely available, particularly in geographically remote regions, where tertiary pediatric centers may be several hours and hundreds of miles away. Therefore, this statement is also intended to provide guidance for the care of children requiring intermediate care in hospitals without a pediatric intensive care unit. These hospitals should ensure that the resources, facilities, and personnel needed to provide care beyond the level of a general pediatric medical-surgical unit are available; furthermore, they should have the ability to immediately stabilize a child who becomes critically ill. In addition, these hospitals should identify facilities with pediatric intensive care units to which patients can be transferred if their condition worsens.⁶ Established transfer policies with these facilities can ensure timely and effective transition of care for these patients.

In a hospital that has a pediatric intensive care unit, these intermediate care admission and discharge guidelines should be compatible with the admission and discharge guidelines for the hospital's pediatric intensive care unit.⁶ This statement provides a framework for individual hospitals to establish admission and discharge criteria for intermediate pediatric care. It is intended that these guidelines be modified by individual institutions, depending on the availability of resources, personnel, and equipment necessary to evaluate and treat a seriously ill child.

Physiologic parameters may be added to these guidelines according to individual patient care unit and institutional policies so that triage may be pro-

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vided appropriately into and out of intermediate care. These criteria will need to be studied in relation to outcomes over the next several years, such as is done for pediatric intensive care units nationwide. Until that time these criteria, based on expert opinion, may assist hospitals and physicians in creating a safe environment for children with a higher intensity of service needs.

GUIDELINES FOR THE PATIENT REQUIRING INTERMEDIATE CARE

I. Respiratory Diseases

Patients with moderate pulmonary or airway disease requiring multidisciplinary intervention and frequent monitoring, including but not limited to the following, may be admitted:

- A. Patients with the potential need for endotracheal intubation.
- B. Patients requiring minimal support with mechanical ventilation delivered by mature and stable tracheostomy. This would apply primarily to children with chronic respiratory insufficiency.
- C. Patients with progressive pulmonary (lower or upper airway) disease of moderate severity with risk of progression to respiratory failure or with obstruction potential.
- D. Patients acutely requiring supplemental oxygen (fraction of inspired oxygen ≥ 0.5), regardless of cause.
- E. Stable tracheotomy patients.
- F. Patients requiring frequent (at intervals < 2 hours), intermittent, or continuous nebulized medications (according to institutional guidelines).
- G. Patients requiring apnea work-up and cardiorespiratory monitoring.

II. Cardiovascular Diseases

Patients with moderate cardiovascular disease requiring multidisciplinary intervention and frequent monitoring, including but not limited to the following, may be admitted:

- A. Patients with non-life-threatening dysrhythmias with or without the need for cardioversion.
- B. Patients with non-life-threatening cardiac disease requiring low-dose intravenous inotropic or vasodilator therapy.
- C. Patients undergoing high-risk cardiac procedures who require close monitoring and who do not have hemodynamic or respiratory compromise.
- D. Patients who have undergone closed-heart cardiovascular and intrathoracic surgical procedures, including patent ductus-arteriosus repair, vascular shunts, permanent pacemaker placement, and open thoracotomy who do not have hemodynamic or respiratory compromise.

III. Neurologic Diseases

Patients with non-life-threatening neurologic disease requiring multidisciplinary intervention, frequent monitoring, and neurologic assessment not

more than every 2 hours, including but not limited to the following, may be admitted:

- A. Patients with seizures who are responsive to therapy but require continuous cardiorespiratory monitoring and who do not have hemodynamic compromise but have the potential for respiratory compromise.
- B. Patients with altered sensorium in whom neurologic deterioration or depression is unlikely and neurologic assessment is required.
- C. Postoperative neurosurgical patients requiring cardiorespiratory monitoring.
- D. Patients with acute inflammation or infections of the central nervous system without neurologic deficiency or other complications.
- E. Patients with head trauma without progressive neurologic signs or symptoms.
- F. Patients with progressive neuromuscular dysfunction without altered sensorium requiring cardiorespiratory monitoring.

IV. Hematologic/Oncologic Diseases

Patients with potentially unstable hematologic or oncologic disease or non-life-threatening bleeding requiring multidisciplinary intervention and frequent monitoring, including but not limited to the following, may be admitted:

- A. Patients with severe anemia without hemodynamic or respiratory compromise.
- B. Patients with moderate complications of sickle cell crisis, such as respiratory distress, without acute chest syndrome.
- C. Patients with thrombocytopenia, anemia, neutropenia, or solid tumor who are at risk of cardiopulmonary compromise but who are currently stable and, as a result, require close cardiorespiratory monitoring.

V. Endocrine/Metabolic Diseases

Patients with potentially unstable endocrine or metabolic disease requiring multidisciplinary intervention and frequent monitoring, including but not limited to the following, may be admitted:

- A. Patients with moderate diabetic ketoacidosis (blood glucose concentration < 500 mg/dL or pH ≥ 7.2) requiring continuous insulin infusion therapy without altered sensorium.
- B. Patients with other moderate electrolyte and/or metabolic abnormalities (requiring cardiac monitoring and therapeutic intervention), such as:
 1. Hypokalemia (blood potassium concentration < 2.0 mEq) and hyperkalemia (blood potassium concentration > 6.0 mEq)
 2. Hyponatremia and hypernatremia with alterations in clinical status (ie, seizures or altered mental status)
 3. Hypocalcemia or hypercalcemia.
 4. Hypoglycemia or hyperglycemia.
 5. Moderate metabolic acidosis requiring bicarbonate infusion.
- C. Patients with inborn errors of metabolism requiring cardiorespiratory monitoring.

VI. Gastrointestinal Diseases

Patients with potentially unstable gastrointestinal disease requiring multidisciplinary intervention and frequent monitoring, including but not limited to the following, may be admitted:

- A. Patients with acute gastrointestinal bleeding but who do not have hemodynamic or respiratory instability.
- B. Patients with a gastrointestinal foreign body or other gastrointestinal problem requiring emergency endoscopy but who do not have cardiorespiratory compromise.
- C. Patients who have chronic gastrointestinal or hepatobiliary insufficiency but do not have coma, hemodynamic, or respiratory instability.

VII. Surgery

All patients requiring multidisciplinary intervention and frequent monitoring who have undergone surgical procedures but who do not have hemodynamic or respiratory instability, including but not limited to the following, may be admitted:

- A. Patients who have undergone cardiovascular surgery.
- B. Patients who have undergone thoracic surgery.
- C. Patients who have undergone neurosurgical procedures.
- D. Patients who have undergone upper or lower airway surgery.
- E. Patients who have undergone craniofacial surgery.
- F. Patients who have had thoracic or abdominal trauma.
- G. Patients being treated for multiple traumatic injuries.

VIII. Renal Diseases

Patients with potentially unstable renal disease requiring multidisciplinary intervention and frequent monitoring, including but not limited to the following, may be admitted:

- A. Patients with hypertension without seizures, encephalopathy, or other symptoms, but who require frequent intermittent therapeutic intravenous or orally administered medication.
- B. Patients with noncomplicated nephrotic syndrome (regardless of cause) with chronic hypertension requiring frequent blood pressure monitoring.
- C. Patients with renal failure, regardless of cause.
- D. Patients requiring chronic hemodialysis or peritoneal dialysis.

IX. Multisystem and Other Diseases

Patients with potentially unstable multisystem disease requiring multidisciplinary intervention and frequent monitoring, including but not limited to the following, may be admitted:

- A. Patients requiring the application of special technologic needs, including:
 - 1. Use of respiratory assistance, such as continuous positive airway pressure, bilevel positive airway pressure, or chronic home ventilation.
 - 2. Tracheostomy care requiring frequent pulmonary hygiene and suctioning.
 - 3. Pleural or pericardial drains after initial stabilization (for patients who do not have respiratory or hemodynamic compromise).
 - 4. Medications or resource needs in excess of those provided in the general patient care unit.
- B. Patients who are direct admissions from another health care facility outside the hospital (may be directly admitted for intermediate care).
- C. Patients with uncomplicated toxic ingestion who do not have cardiovascular or respiratory compromise and who require cardiorespiratory monitoring.

DISCHARGE AND TRANSFER GUIDELINES FOR THE INTERMEDIATE CARE PATIENT

Patients will be evaluated and considered for transfer to general care or special care units when the disease process has reversed or the physiologic condition that prompted admission has resolved and the need for multidisciplinary intervention and treatment is no longer present.

The decision to transfer or discharge to home will be made on the basis of the following criteria:

- A. If patient's condition deteriorates and he or she requires care beyond the capabilities of the unit providing intermediate care, he or she should be admitted or readmitted to a pediatric intensive care unit.
- B. Patient should be transferred to a floor or specialty care unit or discharged from the hospital, as appropriate, if the following criteria apply:
 - 1. Patient has stable hemodynamic parameters for at least 6 to 12 hours.
 - 2. Patient has stable respiratory status and has been extubated with evidence of acceptable gas exchange for more than 4 hours.
 - 3. Patient has minimal oxygen requirements as evidenced by a fraction of inspired oxygen of 0.4 or less.
 - 4. Intravenous inotropic support, vasodilators, and antiarrhythmic drugs are no longer required, or, when applicable, low doses of these medications may be administered to otherwise stable patients in a designated patient care unit.
 - 5. Cardiac arrhythmias are controlled for a reasonable period of time but not less than 24 hours.
 - 6. Patient has neurologic stability with control of seizures for a reasonable period of time.
 - 7. All invasive hemodynamic monitoring devices have been removed (eg, arterial lines).
 - 8. Patient who had required chronic mechanical ventilation and has experienced resolution of the acute illness that required intermediate or

intensive care has now returned to baseline clinical status.

9. Patient will require peritoneal dialysis or hemodialysis on a routine basis and therefore may receive these treatments as an outpatient or in a designated patient care unit.
10. The need for multidisciplinary intervention is predictable and compatible with policies of the receiving patient care unit.
11. The health care team, after careful multidisciplinary assessment and together with the patient's family, decides that there would be no benefit to keeping the child hospitalized or that the course of treatment is medically futile.

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