Nephrectomy by Laparoscopy

ORG: S-872 (ISC)
Link to Codes

MCG Health
Inpatient & Surgical Care
30th Edition

Care Planning - Inpatient Admission and Alternatives

Clinical Indications for Procedure

- Procedure is indicated for **1 or more** of the following(1): N N N N N
  - Kidney donation(2)(3)
  - Kidney tumor (eg, resectable primary, cytoreductive nephrectomy (surgical debulking), palliative nephrectomy (for tumor-related symptoms or hematuria))(4)(5)(6)(7)(11)(12)
  - Urothelial cell carcinoma of upper urinary tract or renal pelvis[A](13)
  - Bosniak class 3 (thick or multiple septations with mural nodule) or class 4 (solid mass with cystic spaces) complex renal cyst(4)
  - Consequences of polycystic kidney disease (eg, respiratory failure, feeding intolerance, pain, bleeding, infection) not treatable by other means(14)(15)

- Symptomatic renal cyst (eg, pain, bleeding) not treatable by other means(1)
- Nonfunctioning or hypofunctional kidney and condition not treatable by other means, including **1 or more** of the following:
  - Refractory pain(8)
  - Hypertension[B](1)(8)
  - Hemorrhage(8)
  - Obstruction(1)(8)
- Infection (eg, pyonephrosis, calculus pyelonephritis, abscess, tuberculosis) not treatable by other means(1)
- Severe trauma (eg, vascular injury)(17)
- Duplex kidney with recurrent infection, vesicoureteral reflux, obstruction, hydronephrosis, or incontinence(18)(19)
- Pretransplant or post-transplant native kidney nephrectomy required, as indicated by **1 or more** of the following(9)(10):
  - Native kidney disease with severe recurrent complications (eg, bleeding, infection, stones)(9)(10)
  - Insufficient space for the transplant kidney(9)
  - Excessive urine volume (eg, child with output greater than 2.5 mL/kg/hr)(9)
  - Nephrotic syndrome with heavy proteinuria and hypoalbuminemia(10)
  - Native kidney disease or genetic defect that predisposes to increased cancer risk(10)

Alternatives to Procedure

- Alternatives include(1)(6)(7):
  - Active surveillance for(4):
    - Patient with decreased life expectancy
    - High-surgical-risk patient
    - Incidentally found renal mass in patient of advanced age
    - Small renal mass less than 3 cm(7)
    - Predominantly cystic mass 4 cm or smaller(7)
    - Clear cell renal carcinoma with indolent progression and no symptoms(7)
  - Percutaneous or laparoscopic radiofrequency, cryosurgical, or microwave ablation for(4)(7)(20):
    - High-surgical-risk patient
    - Localized small or moderate-size kidney tumor (7 cm or smaller, T1)(7)
    - Multiple small tumors
    - Resectable mass in patient who chooses not to undergo surgical procedure
  - For upper tract urothelial carcinoma: endoscopic therapy (photodynamic, electrocautery, laser or thermal ablation, cryosurgery, or excisional biopsy with ureteral application of topical chemotherapy gel) for patient who chooses not to undergo surgical procedure or who has contraindications to nephroureterectomy(13)(21)(22)
  - For upper tract urothelial carcinoma: renal-sparing segmental or distal ureteral resection(13)(22)
  - Radiation therapy for:
    - Unresectable tumor
    - Tumor in patient unwilling or medically unfit to undergo more invasive procedure
  - Immunotherapy (eg, cytokine therapy, tyrosine kinase inhibitor, mTOR inhibitor, checkpoint inhibitor, or vascular endothelial growth factor inhibitors) for(7):
    - Unresectable tumor
    - Tumor in patient unwilling or medically unfit to undergo more invasive procedure
  - Noninvasive management, including close hemodynamic monitoring and as-needed transfusion, for hemodynamically stable renal trauma(17)
  - Angiography with selective embolization for hemorrhage due to trauma or tumor not responding to noninvasive management(17)

- Embolization for palliation of massive hematuria or flank pain due to tumor (eg, for unresectable patient, or patient unwilling or medically unfit for surgery), or for nonfunctioning renal transplant graft with graft intolerance syndrome or rejection(23)
- For polycystic kidney disease(15):
  - Cyst aspiration, sclerotherapy, decortication, or deroofing for complications due to kidney enlargement
  - Nerve block or renal denervation for intractable pain
- Open surgical nephrectomy. See Nephrectomy ISC guideline.

Operative Status Criteria

Goal Length of Stay: Ambulatory

Note: The definition of an ambulatory procedure depends on payer-provider contractual agreement or regulatory language (eg, CMS' Two-Midnight Rule). An ambulatory procedure may include one postoperative overnight stay in a facility; therefore, MCG's ambulatory Goal Length of Stay (GLOS) attainment calculation reports the sum of same-day and next-day postoperative discharges. Depending on various patient and procedural factors, some patients undergoing a procedure with an ambulatory GLOS require inpatient care (eg, medical necessity for hospital-based care across 2 or more postoperative midnights). Some of these factors are described in the Extended Stay section of this guideline.

- Ambulatory
- Inpatient (eg, medical necessity for hospital-based care across 2 or more postoperative midnights)
- Inpatient (Medicare patient, and specific procedure is on CMS Inpatient Only List)

Hospitalization

Optimal Recovery Course

Day	Level of Care	Clinical Status	Activity	Routes	Interventions	Medications
1	• Social Determinants of Health Assessment • OR to recovery to discharge[C] • Discharge planning	• **No evidence of ileus or bowel obstruction** • **Renal function as expected** • **Hemodynamic stability** • **No evidence of postoperative or surgical site infection** • **Pain absent or managed** • **Discharge plans and education understood**	• **Ambulatory or acceptable for next level of care[D]**	• **Oral hydration[E]** • **Oral medications or regimen acceptable for next level of care** • **Oral diet or acceptable for next level of care**		• Perioperative antibiotics • Multimodal analgesia or individual analgesic agent as indicated • Prophylactic antiemetics[F]

(1)(5)(24)(25)(26)NN

Recovery Milestones are indicated in **bold**.

Goal Length of Stay: Ambulatory

Note: Goal Length of Stay assumes optimal recovery, decision making, and care. Patients may be discharged to a lower level of care (either later than or sooner than the goal) when it is appropriate for their clinical status and care needs.

Extended Stay

Minimal (a few hours to 1 day), Brief (1 to 3 days), Moderate (4 to 7 days), and Prolonged (more than 7 days).

- Inpatient stay (eg, need for hospital-based care beyond postoperative day 1) may be needed for(28)(29):
  - Failure to meet discharge criteria (recovery milestones in Optimal Recovery Course)
    - Expect brief stay extension.
  - Larger (eg, greater than 3.5 cm) or more complex (eg, nephrometry score greater than 7.5) tumors
    - Expect brief stay extension.
  - Care for comorbidities
    - Patient with active comorbidities, such as infection, heart failure, or pulmonary disease, may require continued inpatient care.
    - Expect brief stay extension.
  - Complications of procedure(30)
    - Operative complications may include hemorrhage, puncture or laceration of blood vessel or internal organ, diaphragmatic and pleural injury, or urinary leak.
    - Postoperative complications may include cardiac or respiratory events, venous thromboembolism, ileus, renal dysfunction, postoperative infection, electrolyte abnormalities, or late bleed due to inadvertent arteriovenous fistula or pseudoaneurysm formation.
    - Expect brief stay extension.
  - Conversion to open procedure
    - Expect brief stay extension.
  - Patient with dialysis-dependent end-stage renal disease
    - Expect brief stay extension.
  - Frail patient(31)(32)
    - Frail patients have a higher risk of complications and non-home discharge.
    - Expect brief to moderate stay extension.

See Common Complications and Conditions ISC for further information.

Discharge

Discharge Planning

- Discharge planning includes[G]:
  - Assessment of needs and planning for care, including(34)(35):
    - Develop and modify treatment plan (involving multiple providers) as needed.
    - Evaluate and address preadmission functioning as needed.
    - Evaluate and address psychosocial status issues as indicated. See Psychosocial Assessment SR for further information.

- Evaluate and address social determinants of health (eg, housing, food). See Social Determinants of Health Screening Tool SR for further information.
- Evaluate and address patient or caregiver preferences as indicated.
- Identify skilled services needed at next level of care, with specific attention to:
  - Genitourinary status assessment(36)
  - Pain management(36)
  - Wound or dressing management(37)

- Early identification of anticipated discharge destination; options include(35)(38):
  - Home; considerations include:
    - Home safety assessment. See Home Safety Assessment SR for further information.
    - Patient safe to go home; examples include(39)(40)(41):
      - Medical status stable for patient's condition
      - Functional care can safely be provided with available resources.
      - Mental status stable for patient's condition
      - Medication availability confirmed and reconciliation complete
      - Patient/caregiver education completed with written discharge instructions provided
      - Community resources identified and referrals made, as needed
      - Home care arranged, if indicated
      - Necessary medical equipment delivery arranged or available in home, if indicated
      - Necessary medical supplies ordered, or patient/caregiver can obtain, if indicated
    - Access to follow-up care
    - Self-management ability if appropriate. See Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Assessment SR for further information.
    - Caregiver need, ability, and availability
  - Post-acute skilled care or custodial care as indicated. See Discharge Planning Tool SR for further information.
- Transitions of care plan complete, including(35)(38)(42):
  - Patient and caregiver education complete.
    - See Teach-Back Tool SR for further information.
    - See Nephrectomy by Laparoscopy: Patient Education for Clinicians SR for further information.
  - Medication reconciliation completion includes(43)(44):
    - Compare patient's discharge list of medications (prescribed and over-the-counter) against provider's admission or transfer orders.
    - Assess each medication for correlation to disease state or medical condition.
    - Report medication discrepancies to prescribing provider, attending physician, and primary care provider, and ensure accurate medication order is identified.
    - Provide reconciled medication list to all treating providers.
    - Confirm that patient or caregiver can acquire medication.
    - Educate patient and caregiver.
      - Provide complete medication list to patient and caregiver.
      - Importance of presenting personal medication list to all providers at each care transition, including all provider appointments
      - Reason, dosage, and timing of medication (eg, use "teach-back" techniques)(45)

- Encourage communication between patient, caregiver, and pharmacy for obtaining prescriptions, setting up home medication delivery, and reviewing for drug-drug interactions.
- See Medication Reconciliation Tool SR for further information.

- Plan communicated to patient, caregiver, and all members of care team, including(46):
  - Inpatient care and service providers
  - Primary care provider
  - All post-discharge care and service providers
- Appointments planned or scheduled, which may include(47):
  - Primary care provider(48)
  - Chemotherapy or radiation therapy(36)(49)
  - Nephrologist(50)
  - Oncologist(49)
  - Palliative or end-of-life care provider(51)
  - Specialists for management of comorbidities as needed(50)
  - Urologist
  - Other
- Outpatient testing and procedure plans made, which may include(52):
  - Laboratory testing
  - Radiology
  - Other
- Referrals made for assistance or support, which may include:
  - Community services(36)
  - End-stage disease planning(51)
  - Financial, for follow-up care, medication, and transportation(50)(53)
  - Self-help or support groups(54)
  - Social services (eg, social programs, advance directives)(55)
  - Tobacco use treatment(56)(57)
  - Other
- Medical equipment and supplies coordinated (ie, delivered or delivery confirmed), which may include:
  - Wound care equipment and supplies(37)(58)
  - Other

Discharge Destination

- Post-hospital levels of admission may include:
  - Home.
  - Home healthcare. See Home Care Indications for Admission Section HC in Nephrectomy guideline in Home Care.

Evidence Summary

Background

This guideline may be used for total or partial nephrectomy.

Criteria

The evidence for the clinical indications found in this guideline includes 8 published peer reviewed articles, 3 specialty society or other evidence-based guidelines, 1 Cochrane systematic review, and 4 book sections.

For kidney donation, a specialty society guideline recommends minimally invasive nephrectomy over open procedures; however, open procedures may be preferable if there are extensive adhesions or prior surgery, or if the donor nephrectomy is performed at a center where laparoscopy is either not available or not routinely performed.(2)(3) **(EG 2)**

For surgical excision of renal masses, a specialty society guideline recommends minimally invasive (laparoscopic or robot-assisted) procedures over open surgical procedures unless oncologic efficacy or renal function would be compromised by a minimally invasive approach.(4) **(EG 2)**

For renal neoplasia, a urology surgery textbook and specialty society guidelines state that partial, total, radical, or cytoreductive nephrectomy may be appropriate depending on the extent of the disease.(5)(6)(7) **(EG 2)** A clinical guideline states that cancer-free survival rates are equivalent for open vs laparoscopic radical nephrectomy (eg, for a tumor extending into the vena cava).(7) **(EG 2)** The same guideline states that partial nephrectomy is preferred over radical nephrectomy for localized disease and that open, laparoscopic, and robotic partial nephrectomy provide comparable oncologic outcomes.(7) **(EG 2)**

For symptomatic renal cyst (eg, pain, bleeding) not treatable by other means, a urology surgery textbook states that traditional or laparoscopic simple nephrectomy may be appropriate in the setting of a nonfunctioning or poorly functioning kidney.(1)(8) **(EG 2)**

A specialty society guideline recommends native kidney nephrectomy prior to, during, or following renal transplant for polycystic kidney disease with severe recurrent complications (eg, bleeding, infection, stones) if there is insufficient space for the transplanted kidney or if the native kidney is producing excessive urine volume (eg, child with output greater than 2.5 mL/kg/hr).(9) **(EG 2)** A narrative review states that native kidney nephrectomy is also appropriate for kidney transplant patients who have nephrotic syndrome with heavy proteinuria and hypoalbuminemia, or if the native kidney is subject to increased cancer risk due to kidney disease or a genetic defect.(10) **(EG 2)**

Hospitalization

A meta-analysis of 4 studies encompassing 343 living kidney donors (mean age 43 years) undergoing donor nephrectomy randomized to an Enhanced Recovery After Surgery (ERAS) program or usual care found that the ERAS group had a lower incidence of complications, less opioid use, better quality-of-life scores, and shorter hospital stays.(27) **(EG 1)**

Length of Stay

Analysis of 255 patients (median age 60 years) undergoing robot-assisted partial nephrectomy for renal tumor reported 65% were discharged in 1 day.(25) **(EG 2)** Analysis of procedure data for a commercially insured population shows 68% of patients undergoing laparoscopic nephrectomy were discharged the day of or the day after surgery.(26) **(EG 3)** Analysis of procedure data for a Medicare-insured population shows 49% of patients undergoing laparoscopic nephrectomy were discharged the day of or the day after surgery.(26) **(EG 3)**

Rationale

Use of this MCG care guideline helps the clinician identify, for a given procedure, which patient-specific factors and clinical conditions are appropriate for that procedure. The evidence-based clinical criteria assist the clinician in the decision to appropriately perform a procedure, evaluating whether the potential benefits of a procedure outweigh the potential risks. For Medicare enrollees, surgical MCG care guidelines also identify which procedures CMS has designated as inpatient only.

Use of these evidence-based clinical criteria to support decision making around the need for a given procedure is of benefit to the patient, as all procedures come with inherent risk that must be balanced by anticipated clinical benefit. Utilizing evidence-based clinical criteria enables a more accurate and patient-specific decision-making process. In addition, the use of evidence-based guidelines can help reduce unwarranted variation in care, such as divergent clinical thresholds to perform a procedure for clinically similar patients that vary across geographic regions, between facilities, and among individual clinicians.

Related CMS Coverage Guidance

This guideline supplements but does not replace, modify, or supersede existing Medicare regulations or applicable National Coverage Determinations (NCDs) or Local Coverage Determinations (LCDs).

Code of Federal Regulations (CFR): 42 CFR 412.3(59); 42 CFR 419.22(60); 42 CFR 422.101(61)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 1 - Inpatient Hospital Services Covered Under Part A(62); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 6 - Hospital Services Covered Under Part B(63); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(64); CMS IOM Publication 100-08, Medicare Program Integrity Manual, Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment(65)

Medicare Coverage Determinations: Medicare Coverage Database(66)

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Footnotes

[A] The procedure may include resection of the kidney, ureter, and cuff of the bladder and regional lymphadenectomy depending on the location and grade of the tumor.(13) [A in Context Link 1]

[B] Resistant hypertension is defined as a blood pressure above goal despite treatment with 3 antihypertensive medications with complementary mechanisms, including a diuretic at maximally tolerated doses, or blood pressure at goal but requiring 4 or more medications for control.(16) [B in Context Link 1]

[C] See Ambulatory Surgery Discharge and Complications: Common Complications and Conditions ISC for further information. [C in Context Link 1]

[D] Patient is ambulatory or near baseline activity for age and development. [D in Context Link 1]

[E] Some patients may have their hydration needs met via alternative means (eg, percutaneous endoscopic gastrostomy tube). [E in Context Link 1]

[F] Patients at risk for postoperative nausea and vomiting may be given antiemetics preoperatively as prophylaxis.(24) [F in Context Link 1]

[G] Discharge instructions should be given in the patient's and caregiver's native language using trained language interpreters whenever possible.(33) [G in Context Link 1]

Definitions

Hemodynamic stability

- Hemodynamic stability, as indicated by **1 or more** of the following:
  - Hemodynamic abnormalities at baseline or acceptable for next level of care
  - Patient hemodynamically stable, as indicated by **ALL** of the following(1)(2):
    - Tachycardia absent
    - Hypotension absent
    - No evidence of inadequate perfusion (eg, no myocardial ischemia)
    - No other hemodynamic abnormalities (eg, no Orthostatic hypotension)

References

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Hypotension absent

- Hypotension absent,[A] as indicated by **1 or more** of the following:
  - Hypotension absent in adult patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure greater than or equal to 90 mm Hg[A](1)
    - Mean arterial pressure[B] greater than or equal to 70 mm Hg MAP Calculator[A](1)(2)
    - Blood pressure at patient's baseline (eg, healthy adult with low systolic blood pressure), at intentional therapeutic goal (eg, patient with heart failure), or acceptable for next level of care (eg, blood pressure stable and no significant signs or symptoms due to low blood pressure)
  - Hypotension absent in pediatric patient, as indicated by **1 or more** of the following:
    - Systolic blood pressure greater than or equal to 110 mm Hg in child 13 to 17 years of age[A](3)
    - Systolic blood pressure greater than or equal to 100 mm Hg in child 6 to 12 years of age[A](3)
    - Systolic blood pressure greater than or equal to 95 mm Hg in child 3 to 5 years of age[A](3)
    - Systolic blood pressure greater than or equal to 90 mm Hg in child 1 or 2 years of age[A](3)
    - Systolic blood pressure greater than or equal to 80 mm Hg in infant 6 to 11 months of age[A](3)
    - Systolic blood pressure greater than or equal to 70 mm Hg in infant 3 to 5 months of age[A](3)
    - Systolic blood pressure greater than or equal to 65 mm Hg in infant 1 or 2 months of age[A](3)
    - Blood pressure at patient's baseline (eg, healthy child with low systolic blood pressure), at intentional therapeutic goal, or acceptable for next level of care (eg, blood pressure stable and no significant signs or symptoms due to low blood pressure)

References

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Footnotes

A. Criteria based upon clinician-acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.
B. The mean arterial pressure (MAP) takes into account both SBP and DBP readings.

Multimodal analgesia

- Multimodal analgesia involves the utilization of 2 or more analgesic agents with different mechanisms of action in order to provide additive or synergistic pain control, while minimizing side effects and reliance on opioids.(1)(2)(3)

References

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Orthostatic hypotension

- Orthostatic hypotension,[A][B] as indicated by **1 or more** of the following(1)(2)(3):
  - Fall in SBP of 20 mm Hg or more 1 to 3 minutes after patient sits or stands from recumbent position
  - Fall in DBP of 10 mm Hg or more 1 to 3 minutes after patient sits or stands from recumbent position

References

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Footnotes

A. Concomitant measurements of the heart rate are important to measure to help diagnose subtypes of orthostatic hypotension (eg, the lack of a compensatory increase in heart rate is typical of autonomic failure and an exaggerated tachycardia may be reflective of volume depletion). However, the heart rate is not a component of the definition of orthostatic hypotension, which relies upon blood pressure alone.(1)(2)(3)

B. Criteria based upon clinician acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.

Social Determinants of Health Assessment

- Risk of poor health outcomes may be increased by the presence of **1 or more** of the following social determinants of health(1)(2)(3):
  - Housing insecurity, as indicated by **1 or more** of the following:
    - Individual or caregiver's current living situation is **1 or more** of the following(4):
      - Does not have own housing (eg, staying in a hotel, shelter, or with others)
      - Has own housing (eg, house, apartment), but at risk of losing it in the future (ie, behind on rent or mortgage)
      - Has own housing (eg, house, apartment), but has lived in 3 or more places in past year
    - Current housing has **1 or more** of the following:
      - Electrical appliances (eg, stove, refrigerator) not working or unavailable
      - Insufficient heating or cooling
      - Insufficient ventilation
      - Lead paint or pipes
      - Mold
      - Pests (eg, bugs) or rodents
      - Smoke detectors not working or unavailable
  - Food insecurity, as indicated by **1 or more** of the following(5):
    - In the past year, individual or caregiver ran out of food and did not have money to buy more food.
    - In the past year, individual or caregiver worried that they would run out of food before they received money to buy more food.
  - Insufficient transportation, as indicated by **1 or more** of the following(6):
    - In the past year, individual or caregiver missed medical appointments or could not get medications due to lack of transportation.
    - In the past year, individual or caregiver missed nonmedical activities, work, or could not get things needed for daily living due to lack of transportation.
  - Insufficient utilities, as indicated by **1 or more** of the following(7):
    - Utilities (eg, electricity, water, gas, or oil) are currently shut off or unavailable.
    - In the past year, electric, water, gas, or oil company threatened to shut off services.
  - Personal safety risk, as indicated by **2 or more** of the following(5):
    - Individual is sometimes or frequently physically hurt by another person (including family member).
    - Individual is sometimes or frequently insulted or talked down to by another person (including family member).
    - Individual is sometimes or frequently threatened with physical harm by another person (including family member).
    - Individual is sometimes or frequently screamed or cursed at by another person (including family member).
  - Insufficient dependent care, as indicated by **1 or more** of the following:
    - In the past year, individual or caregiver was unable to work due to lack of dependent care.
    - In the past year, individual or caregiver was unable to work more (additional) hours due to lack of dependent care.
    - In the past year, individual or caregiver missed medical appointments or could not get medications due to lack of dependent care.
    - In the past year, individual or caregiver missed nonmedical activities (eg, school, church, social activity) due to lack of dependent care.
  - Depression risk, as indicated by **ALL** of the following(8):
    - In the past 2 weeks, individual had little interest or pleasure in normal activities on at least several days.

- In the past 2 weeks, individual felt down, depressed, or hopeless on at least several days.

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Tachycardia absent

- Tachycardia[A][B] absent, as indicated by **1 or more** of the following:
  - Heart rate less than or equal to 100 beats per minute in adult[A][B](1)
  - Heart rate less than or equal to 85 beats per minute in child 13 to 17 years of age[A][B](2)
  - Heart rate less than or equal to 95 beats per minute in child 6 to 12 years of age[A][B](2)
  - Heart rate less than or equal to 110 beats per minute in child 1 to 5 years of age[A][B](2)
  - Heart rate less than or equal to 120 beats per minute in infant 3 to 11 months of age[A][B](2)
  - Heart rate less than or equal to 150 beats per minute in infant 1 or 2 months of age[A][B](2)

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2. Anderson CC, Kapoor S, Mark TE. Pediatric parameters and equipment. In: Anderson CC, Kapoor S, Mark TE, editors. The Harriet Lane Handbook: A Manual for Pediatric House Officers. 23rd ed. Elsevier; 2024:i-iii.

Footnotes

A. Criteria based upon clinician acquired numeric values (eg, vital signs, oxygen saturation) should be used if they are accurate reflections of the patient's condition. Transitory findings (eg, abnormal only upon initial emergency department intake or only one time out of multiple readings) that rapidly improve with no or minimal treatment usually do not reflect disease severity or risk for deterioration. This does not imply that an initial or one-time reading cannot ever be applicable. The goal is to separate erroneous or incidental findings from those that truly represent the patient's clinical picture.

B. Interpretation of heart rate requires clinical judgment and consideration of several patient-specific factors, such as the patient's baseline heart rate, medications, and clinical impact. For example, an elderly patient on a beta-blocker medication with a baseline resting heart rate of 60 beats per minute may be clinically

tachycardic at a heart rate of 94 beats per minute. Likewise, a patient who is upset, in pain, or nervous in the emergency department with a heart rate of 106 beats per minute may meet the technical definition of tachycardia, but this tachycardia (absent associated findings such as chest pain or hypotension) may not be clinically important. The numeric values included in this definition are provided to allow for consistency in terms of a technical definition of the term tachycardia. Whether a heart rate above or below the technical threshold is clinically meaningful is a matter of persistence, context, and clinical judgment.

Codes

ICD-10 Diagnosis: C64.1, C64.2, C64.9, C65.1, C65.2, C65.9, C79.00, C79.01, C79.02, D30.00, D30.01, D30.02, D30.10, D30.11, D30.12, D41.00, D41.01, D41.02, D41.10, D41.11, D41.12, D41.20, D41.21, D41.22, D49.511, D49.512, D49.519, N13.0, N13.1, N13.2, N13.30, N13.39, N13.6, N15.1, N18.4, N18.5, N18.6, N19, N28.1, Q61.02, Q61.11, Q61.19, Q61.2, Q61.3, Q61.4, Q61.5, Q61.8, Q62.0, Q62.11, Q63.0, Q63.1, Q63.2, Q63.3, Q63.8, Q63.9, T86.10, T86.11, T86.12, T86.13, T86.19 [Hide]

ICD-10 Procedure: 0TB04ZZ, 0TB14ZZ, 0TB34ZZ, 0TB44ZZ, 0TT04ZG, 0TT04ZZ, 0TT14ZG, 0TT14ZZ, 0TT24ZG, 0TT24ZZ, 0TT34ZZ, 0TT44ZZ

CPT®: 50543, 50545, 50546, 50547, 50548

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