Anthem

Clinical UM Guideline

Subject: Preoperative Testing for Low Risk Invasive Procedures and Surgeries
Guideline #: CG-MED-61
Status: Reviewed
Publish Date: 09/27/2023
Last Review Date: 08/10/2023

Description

This document addresses the appropriate use of preoperative testing for certain elective, low risk invasive procedures and non-cardiac surgeries. The specific tests included in this document are complete blood count (CBC), white blood cell count (WBC), prothrombin time (PT)/ partial thromboplastin time (PTT), metabolic panel, urinalysis, chest x-rays, resting electrocardiogram (ECG), resting echocardiogram and pre-procedure consultations.

Clinical Indications

Medically Necessary:

Preoperative testing is considered **medically necessary** when ALL the following criteria are met (A, B, and C):

A. Preoperative testing may include any, or all, of the following when done as part of a preoperative evaluation before low risk invasive procedures or non-cardiac surgeries:
   1. Comprehensive blood counts (CBC, WBC, PT/PTT, metabolic panel);
   2. Urinalysis;
   3. Chest X-rays;
   4. Resting ECG;
   5. Resting echocardiogram;
   6. Pre-procedure consultations.

   and
B. Low risk invasive procedures and surgeries may include the following when criteria are met:
   1. Cataract surgery;
   2. Glaucoma surgery;
   3. Upper endoscopy;
   4. Colonoscopy;
   5. Cystoscopy;
   6. Arthroscopy.

   and
C. Preoperative testing is considered **medically necessary** for persons 65 years of age or older **or** for persons less than 65 years of age with risk factors for postoperative complications or symptoms suggestive of a significant systemic disease process (ASA III or IV*) when the same tests have not been performed in the previous 30 days **and** when **ANY** of the following conditions are present:
   1. Anemia; **or**
   2. Bleeding disorders; **or**
   3. Other hematologic disorders; **or**
   4. Cardiovascular disease; **or**
   5. Pulmonary disease; **or**
   6. Renal disease; **or**
   7. Liver disease; **or**
   8. Endocrine disease; **or**
   9. Malignancy; **or**
   10. Hypertension; **or**
   11. Diabetes; **or**
   12. Recent upper respiratory infection; **or**
   13. History of smoking; **or**
   14. History of alcohol abuse; **or**
   15. History of steroid use; **or**
   16. History of anticoagulant therapy.

Note: *For definitions of American Society of Anesthesiologists (ASA) physical status classifications, see the Definitions section.

Not Medically Necessary:

Preoperative testing is considered **not medically necessary** when **ALL** of the following criteria are met:

- Age between 16 and 65 years of age; **and**
- When the same tests have been performed within 30 days prior to the planned procedure; **and**
- Asymptomatic persons without significant systemic disease (ASA I or II*) of any system or risk factors for postoperative complications.

Coding

The following codes for treatments and procedures applicable to this guideline are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

When services may be Medically Necessary when criteria are met:
For the following procedures performed preoperatively for the surgical procedures described in the Clinical Indications section:

CPT	
80047	Basic metabolic panel [including calcium, ionized; carbon dioxide; chloride; creatinine; glucose; potassium; sodium; urea nitrogen (BUN)]
80048	Basic metabolic panel [including calcium, total; carbon dioxide; chloride; creatinine; glucose; potassium; sodium; urea nitrogen (BUN)]
85025	Blood count; complete (CBC), automated (Hgb, Hct, RBC, WBC and platelet count) and automated differential WBC count
85027	Blood count; complete (CBC), automated (Hgb, Hct, RBC, WBC and platelet count)
85610	Prothrombin time
85730	Thromboplastin time, partial (PTT); plasma or whole blood
93000	Electrocardiogram, routine ECG with at least 12 leads; with interpretation and report
93005	Electrocardiogram, routine ECG with at least 12 leads; tracing only, without interpretation and report
93010	Electrocardiogram, routine ECG with at least 12 leads; interpretation and report only
93306	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, complete, with spectral Doppler echocardiography, and with color flow Doppler echocardiography
93307	Echocardiography, transtho3racic, real-time with image documentation (2D), includes M-mode recording, when performed, complete, without spectral or color Doppler echocardiography
93308	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, follow-up or limited study
99242	Office or other outpatient consultation for a new or established patient, which requires a medically appropriate history and/or examination and straightforward medical decision making
99243	Office or other outpatient consultation for a new or established patient, which requires a medically appropriate history and/or examination and low level of medical decision making
99244	Office or other outpatient consultation for a new or established patient, which requires a medically appropriate history and/or examination and moderate level of medical decision making)
99245	Office or other outpatient consultation for a new or established patient, which requires a medically appropriate history and/or examination and high level of medical decision making)

ICD-10 Diagnosis	
Z01.810	Encounter for preprocedural cardiovascular examination
Z01.811	Encounter for preprocedural respiratory examination
Z01.812	Encounter for preprocedural laboratory examination
Z01.818	Encounter for other preprocedural examination

When services are Not Medically Necessary:
For the procedure and diagnosis codes listed above when criteria are not met, or for situations designated in the Clinical Indications section as not medically necessary.

Discussion/General Information

Multiple medical specialty societies have published recommendations on the need for performing routine tests (for example, blood counts, chest x-ray and ECG), as part of the preoperative work-up before invasive procedures and surgeries considered low risk for postoperative complications in healthy individuals less than 65 years of age.

The following are excerpts from the American Society of Anesthesiologists (ASA) on considerations regarding preoperative testing:

> Performing routine laboratory tests in patients who are otherwise healthy is of little value in detecting disease. Evidence suggests that a targeted history and physical exam should determine whether pre-procedure laboratory studies should be obtained…The risk specifically related to the surgical procedure could, however, modify the preoperative recommendation to obtain laboratory studies and, when the need arises, the decision to implement should include a joint decision between the anesthesiologists and surgeons. This should be applicable to all outpatient surgery...The role of preoperative cardiac stress testing has been reduced to the identification of extremely high-risk individuals, for instance, those with significant left main disease for which preoperative revascularization would be beneficial regardless of the impending procedure. In other words, testing may be appropriate if the results would change management prior to surgery, could change the decision of the patient to undergo surgery, or change the type of procedure that the surgeon will perform (Apfelbaum, ASA, 2012).

Regarding the performance of 12-lead resting ECG, the American College of Cardiology, American Heart Association (ACC/AHA) guideline on Perioperative Cardiovascular Evaluation and Management of Patients undergoing Non-cardiac Surgery (2014) provided the following guidance:

> Preoperative resting 12-lead electrocardiogram (ECG) is reasonable for patients with known coronary heart disease, significant arrhythmia, peripheral arterial disease, cerebrovascular disease, or other significant structural heart disease, except for those undergoing low-risk surgery (Class IIa; Level of Evidence: B).
>
> Preoperative resting 12-lead ECG may be considered for asymptomatic patients without known coronary heart disease, except for those undergoing low-risk surgery (Class IIb; Level of Evidence: B).
>
> Routine preoperative resting 12-lead ECG is not useful for asymptomatic patients undergoing low-risk surgical procedures (Class III Harm; Evidence level: B). (Fleisher, 2014)

A number of retrospective studies with large sample sizes (minimum of 15,000) used data from the National Surgical Quality Improvement Program (NSQIP) database to evaluate the association between preoperative testing and surgical outcomes. Studies addressed a variety of clinical areas. Study findings were mixed, with many studies finding that the findings of at least some tests predicted postoperative outcomes.

In 2022, Taylor and colleagues published an analysis of outcomes after preoperative testing in 111,589 individuals in the NSQIP database who underwent low-risk ambulatory surgery. About half of individuals (n=57,590, 51.8%) had preoperative laboratory testing. Individuals who were undergoing gynecologic, urologic, endocrine or vascular surgery were more likely than the overall cohort to have had preoperative testing. The most common tests were at least one component of a CBC (40.7% of participants), basic metabolic panel (BMP) (41.9%), liver function test (LFT) (20.5%) and a coagulation study (10.7%). There was not a statistically significant difference in the mortality rate between individuals with preoperative testing (0.02%) versus those without preoperative testing (0.01%), p=0.12. The rate of serious morbidity was 1.2% among tested individuals and 1.1% among non-tested individuals.

The difference between groups was statistically significant (p=0.01), but this is likely due to the large sample size and the difference does not appear to be clinically significant. There were no statistically significant differences between groups in the specific complications of unplanned reoperation, infection, deep surgical site infection, deep vein thrombosis, pulmonary embolism, cardiac arrest and septic shock. Among individuals who had preoperative testing, there were small (less than 1% difference) but statistically significantly higher rates of several complications including superficial surgical site infection, unplanned reintubation, renal insufficiency, urinary tract infection, unplanned reoperation and sepsis. Individuals who underwent preoperative testing tended to be at higher risk e.g., were older and had more comorbidities.

Several analyses addressed gynecological surgery. Muller and colleagues (2021) included 19,855 individuals from the NSQIP database who had gynecological surgery. Of these, 14,258 (71.8%) had at least one preoperative laboratory test, the most common of which were CBC (70.4%) and chemistry panels (33.5%). The analysis did not find a statistically significant difference in the overall complication rate in the group that did receive preoperative testing (2.5%) versus those who did not receive preoperative testing (2.2%, p=0.30). More specifically, there were not significant differences in the rate of major complications (1.0% versus 0.8%, respectively, p=0.11), wound complications (1.0% versus 1.0%, p=0.78) or the unplanned readmission rate (0.7% versus 0.5%, p=0.10). Sears (2020) utilized data on 24,752 hysterectomies in the NSQIP database to study the utility of preoperative testing. Most of the individuals (92.5%) had laboratory testing prior to surgery, most commonly CBC (92.5%), renal function panel (RFP) (84.5%), LFT (70.5%) and coagulation studies (63.2%). A total of 7680 of 22,905 (33.5%) individuals who underwent preoperative testing had at least one abnormal result. A low hematocrit was the most common abnormality, occurring in 14% of individuals who underwent CBC testing. Individuals with normal preoperative testing values had a significantly lower rate of complications (6.2%) than those with abnormal findings (10.6%) and those who did not get tested (10.3%); the difference among groups was p<0.001. The most common surgical complication was blood transfusion, which occurred less frequently in individuals with normal laboratory test results (1.6%) compared with those with abnormal results (5.8%) or no preoperative testing (5.1%), p<0.001. In a multivariate logical regression model adjusting for a variety of clinical and demographic factors, WBC count and low hematocrit were significantly associated with an increased rate of complications. In the multivariate model, other tests such as the RFP and LFT were not significantly associated with the complication rate.

There are also studies focusing on laboratory testing prior to orthopedic surgery. Ondeck and colleagues (2019) examined data from NSQIP on 92,093 individuals who underwent primary total hip arthroplasty (THA). The authors evaluated the association between preoperative sodium, blood urea nitrogen (BUN) and creatinine levels and adverse events after surgery. A total of 13,736 (14.9%) individuals experienced an adverse event and 2025 (3.2%) experienced a serious adverse event. In multivariate logistic regression models, low preoperative sodium was significantly (p<0.001) associated with all adverse events (minor or major adverse event, extended hospital stay, discharge to a higher level of care and readmission). Elevated preoperative sodium was not associated with any type of adverse event. Low preoperative BUN was significantly associated with an extended hospital stay (p<0.001) and discharge to a higher level of care (p<0.006). Elevated preoperative BUN was significantly associated with all adverse outcomes except hospital readmission (p<0.005). For the third laboratory test, preoperative creatinine, in multivariate models low values were significantly associated with any adverse event, minor adverse events, extended hospital stay and discharge to a higher level of care (p<0.001). Elevated preoperative creatinine was associated with all postoperative adverse events (p<0.001).

An NSQIP analysis by Zreik and colleagues (2020) studied the association between preoperative laboratory testing and adverse outcomes in 47,111 individuals who underwent anterior cervical discectomy and fusion (ACDF). A number of laboratory values were examined including blood urea, nitrogen, creatinine, hematocrit, platelet count, sodium and white blood cell count. Outcomes of interest were any 30-day complication, serious 30-day complications, 30-day unplanned readmissions and discharge to a non-home facility. A total of 22,019 (46.7%) of individuals had at least one abnormal preoperative laboratory test. At least several abnormal (high or low) laboratory tests were associated with each of the above outcomes. For example, high creatinine, low hematocrit, low sodium and high white blood cell count were associated with any 30-day complication.

Taylor (2021) published an analysis of 35,745 individuals from the NSQIP database who underwent elective endocrine surgery. A total of 20,972 (58.7%) underwent preoperative laboratory testing, defined as receipt of a blood test captured by the database within 30 days of surgery, excluding components of a chemistry panel. At least one component of a CBC was obtained for 20,029 (56.0%) individuals, at least one component of an LFP was obtained by 10,193 (28.5%) of individuals and at least one coagulation study was done in 6096 (17.1%) individuals. Abnormal tests were found in 25.9% of CBCs, 25.2% of LFPs and 21.8% of coagulation studies. The overall complication rate, 1.8%, differed significantly between individuals who received preoperative tests and those who did not (1.9% versus 1.7%, p=0.12). Moreover, rates of wound complications (0.3% versus 0.2%, p=0.33), procedure-related complications (0.3% versus 0.2%, p=0.32), major complications (0.4% versus 0.4%, p=0.25) or mortality (0.0% versus <0.1%, p=0.17) also did not differ by preoperative testing status. In a multivariate analysis of factors associated with poor outcomes, hypertension requiring medication, but not preoperative testing was significantly associated with morbidity or unplanned hospital readmission.

Benarroch-Gampel (2012) analyzed data on 73,596 individuals identified from the NSQIP database who underwent elective hernia repair. Preoperative laboratory testing was defined as any laboratory test obtained within 30 days of surgery. Laboratory tests collected in the NSQIP included hematocrit, white blood cell count, platelet count, sodium, BUN, creatinine, PTT, PT, International Normalized Ratio (INR), albumin, total bilirubin, aspartate aminotransferase, and alkaline phosphatase. A total of 46,977 (63.8%) subjects underwent testing, with at least one abnormal test recorded in 61.6% of trial participants. Major complications (reintubation, pulmonary embolus, stroke, renal failure, coma, cardiac arrest, myocardial infarction, septic shock, bleeding, or death) occurred in 0.3% of the included subjects. After adjusting for individual and procedure characteristics, neither testing nor abnormal results were associated with postoperative complications.

A smaller retrospective study focused on the pediatric population. The study aimed to determine the utility of routine preoperative coagulation tests (PT and activated partial prothrombin time [APTT]) (Alzahrani, 2019). The study included 2078 healthy children under 15 years old who were admitted to the hospital for elective mild to intermediate surgery or for invasive procedures. A total of 1940 out of 2078 cases (93.4%) had normal coagulation tests, 77 cases (3.7%) had abnormal test results and 61 individuals (2.9%) did not undergo preoperative testing. Postoperative bleeding occurred in 3 individuals (0.1%), 3 of which had normal findings on preoperative testing and 1 of which had not undergone preoperative testing. The authors concluded that routine preoperative coagulation screening in healthy individuals is not recommended.

Definitions

Physical Status Classification System: This was established by the American Society of Anesthesiologists (ASA) to provide a basic scale for use in determining an individual's fitness to undergo anesthesia as follows:

ASA grade I: A normal healthy person;
ASA grade II: A person with mild systemic disease;
ASA grade III: A person with severe systemic disease;
ASA grade IV: A person with severe systemic disease that is a constant threat to life

Risk Factors for Coronary Artery Disease (CAD): Long-standing risk factors for the development of CAD have typically included age, blood levels of total and high-density lipoprotein (HDL) cholesterol, blood pressure, cigarette use, diabetes mellitus, and left ventricular hypertrophy on ECG.

Surgical Grades: A classification system adopted by the Guideline Development Group of the National Institute for Health and Care Excellence (NICE, updated 2016) with examples as follows:

Minor surgery:

- Removal of skin lesions;
- Draining an abscess;

Intermediate surgery:

- Primary repair of inguinal hernia;
- Excision of varicosities of lower extremities;
- Knee arthroscopy;
- Tonsillectomy or adenotonsillectomy;

Major or Complex surgery:

- Total abdominal hysterectomy;
- Endoscopic resection of prostate;
- Lumbar discectomy;
- Thyroidectomy;
- Total joint replacement;
- Lung operations;
- Colonic resection;
- Radical neck dissection.

References

Peer Reviewed Publications:

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7. Soares Dde S, Brandao RR, Mourao MR, et al. Relevance of routine testing in low risk patients undergoing minor and medium surgical procedures. Rev Bras Anestesiol. 2013; 63(2):197-201.
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9. Taylor GA, Oresanya LB, Kling SM et al. Rethinking the routine: Preoperative laboratory testing among American Society of Anesthesiologists class 1 and 2 patients before low-risk ambulatory surgery in the 2017 National Surgical Quality Improvement Program cohort. Surgery. 2022; 171(2):267-274.
10. Zreik J, Goyal A, Alvi MA, et al. Utility of preoperative laboratory testing in assessing risk of adverse outcomes after anterior cervical discectomy and fusion: insights from national surgical registry. World Neurosurg. 2020; 136:e398-e406.

Government Agency, Medical Society, and Other Authoritative Publications:

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3. Douglas PS, Garcia MJ, Haines DE. ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Society of Echocardiography, American Heart Association, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance. J Am Soc Echocardiogr. 2011; 24:229-267.
4. Fleisher LA, Beckman JA, Brown KA, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery). J Am Coll Cardiol. 2007; 50:e159-242.
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the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. J Am Coll Cardiol. 2009; 53:2201-2229.
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Websites for Additional Information

1. MedlinePlus Medical Encyclopedia. Tests and visits before surgery. Updated February 28, 2022. Available at: https://medlineplus.gov/ency/patientinstructions/000479.htm. Accessed on July 5, 2023.

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The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

History

Status	Date	Action
Reviewed	08/10/2023	Medical Policy & Technology Assessment Committee (MPTAC) review. References and Websites for Additional Information sections updated. Updated Coding section with 01/01/2023 CPT descriptor changes and removed 99241 deleted as of 01/01/2023.
Reviewed	08/11/2022	MPTAC review. Discussion/General Information, References and Websites for Additional Information sections updated.
Reviewed	08/12/2021	MPTAC review. Discussion/General Information, References and Websites for Additional Information sections updated.
Reviewed	08/13/2020	MPTAC review. Discussion/General Information, References and Websites for Additional Information sections updated. Reformatted Coding section.
Reviewed	08/22/2019	MPTAC review. Discussion/General Information, References and Websites for Additional Information sections updated.
Reviewed	09/13/2018	MPTAC review. Description, Discussion/General Information, References sections updated.
New	11/02/2017	MPTAC review. Initial document development.