MASSACHUSETTS

Blue Cross Blue Shield of Massachusetts is an Independent Licensee of the Blue Cross and Blue Shield Association

Medical Policy

Postsurgical Home Use of Limb Compression Devices for Venous Thromboembolism Prophylaxis

Table of Contents

Policy Number: 541

BCBSA Reference Number: 1.01.28 (For Plan internal use only)
NCD/LCD: N/A

Related Policies

Pneumatic Compression Pumps for Treatment of Lymphedema and Venous Ulcers, #354

Policy

Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity Members:

Postsurgical home use of limb compression devices for venous thromboembolism (VTE) prophylaxis may be considered **MEDICALLY NECESSARY** in patients with a contraindication to pharmacologic agents (e.g. high risk of bleeding), in the following situations:

- After major orthopedic surgery (total hip arthroplasty, total knee arthroplasty, hip fracture surgery); **OR**
- After major non-orthopedic surgery or other orthopedic procedures in patients who are at moderate or high risk of VTE.

Postsurgical home use of limb compression devices for VTE prophylaxis is considered **INVESTIGATIONAL** in all other situations, including but not limited to:

- After major orthopedic surgery (total hip arthroplasty, total knee arthroplasty, hip fracture surgery) in patients without a contraindication for anticoagulation; OR
- After major non-orthopedic surgery or other orthopedic procedures in patients without a contraindication for anticoagulation who are at moderate or high risk of VTE.

Postsurgical home use of limb compression devices for VTE prophylaxis for periods longer than 30 days post-surgery is **NOT MEDICALLY NECESSARY**.

Prior Authorization Information

Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** if the procedure is performed **inpatient**.

Outpatient

- For services described in this policy, see below for situations where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	Prior authorization is **not required**.
Commercial PPO and Indemnity	Prior authorization is **not required**.

CPT Codes / HCPCS Codes / ICD Codes

Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity:

HCPCS Codes

HCPCS codes:	Code Description
E0676	Intermittent limb compression device (includes all accessories), not otherwise specified

The following ICD Diagnosis Codes are considered medically necessary when submitted with the HCPCS codes above if medical necessity criteria are met:

ICD-10-CM Diagnosis Coding

ICD-10-CM diagnosis codes:	Code Description
M17.11	Unilateral primary osteoarthritis, right knee
M17.12	Unilateral primary osteoarthritis, left knee
M16.11	Unilateral primary osteoarthritis, right hip
M16.12	Unilateral primary osteoarthritis, left hip
M24.151	Other articular cartilage disorders, right hip
M24.152	Other articular cartilage disorders, left hip
Z47.1	Aftercare following joint replacement surgery
Z48.89	Encounter for other specified surgical aftercare
Z86.718	Personal history of other venous thrombosis and embolism
Z96.641	Presence of right artificial hip joint
Z96.642	Presence of left artificial hip joint
Z96.643	Presence of artificial hip joint, bilateral
Z96.649	Presence of unspecified artificial hip joint
Z96.651	Presence of right artificial knee joint
Z96.652	Presence of left artificial knee joint
Z96.653	Presence of artificial knee joint, bilateral
Z96.659	Presence of unspecified artificial knee joint

Z98.890	Other specified postprocedural states

Description

Risk of Venous Thromboembolism

Orthopedic Surgery

Antithrombotic prophylaxis is recommended for surgical patients at moderate-to-high risk of postoperative venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE). Patients may be classified as moderate-to-high risk of VTE based on the surgical procedure and/or patient characteristics. For some types of surgery, such as major orthopedic surgery, there is a particularly high-risk of VTE due to the nature of the procedure and the prolonged immobility during and after surgery. The specific orthopedic procedures of concern are total knee arthroplasty, total hip arthroplasty, and hip fracture surgery. For these surgeries, all patients undergoing the procedure are considered at high-risk for VTE.

Other surgeries with an increased risk of VTE include abdominal surgery, pelvic surgery, cancer surgery, and surgery for major trauma. For these types of surgeries, the risk varies. There are numerous patient-related risk factors such as increasing age, prior VTE, malignancy, pregnancy, and significant comorbidities that can be used in conjunction with the type of surgery to determine risk. There are tools for assessing VTE risk in surgical patients, such as the modified Caprini Risk Assessment Model used in developing the 2012 American College of Chest Physicians (ACCP) guidelines on VTE prevention. However, in clinical practice, this and similar instruments are not regarded as definitive for assessment of individual patient risk. Pharmacologic prophylaxis is indicated for patients at moderate-to-high risk for VTE. As described in the ACCP guidelines, there are preferred antithrombotic prophylaxis regimens according to procedure and patient risk characteristics.[1,2,]

Pharmacologic Prophylaxis

Pharmacologic prophylaxis is effective at reducing postoperative VTE but also has risks. The main risk is bleeding, although other adverse events such as allergic reactions and development of heparin antibodies can occur. Contraindications to pharmacologic prophylaxis include previous intolerance to these agents and increased risk of bleeding. Most patients undergoing major surgery will not have an increased risk of bleeding precluding the use of anticoagulants, because these patients would also likely have had a contraindication to the surgery itself and, thus, are likely to avoid the procedure. However, there are some cases in which patients with a high bleeding risk will undergo major surgery, such as patients with severe renal failure who require an essential procedure. Other patients may develop contraindications during the episode of care. For example, patients who have excessive bleeding during or after surgery, or patients who develop bleeding complications such as a gastrointestinal bleed, are considered to have a contraindication to anticoagulants. There are a few surgeries for which anticoagulants are contraindicated or avoided, most notably some neurosurgical procedures. Assessment and quantitation of bleeding risk can be performed using instruments such as HAS-BLED scoring system,[3,] although these tools were not developed specifically for the postoperative period.

Major orthopedic surgeries have a high-risk of DVT due to venous stasis of the lower limbs as a consequence of immobility during and after surgery. Also, direct venous wall damage associated with the surgical procedure itself may occur. DVTs are frequently asymptomatic and generally resolve when mobility is restored. However, some episodes of acute DVT can be associated with substantial morbidity and mortality. The most serious adverse consequence of acute DVT is PE, which can be fatal. PE occurs when a DVT blood clot detaches and migrates to the lungs. Also, DVT may produce long-term vascular damage that leads to chronic venous insufficiency. Without thromboprophylaxis, the incidence of venographically detected DVT is approximately 42% to 57% after total hip replacement, and the risk of PE is approximately 1% to 28%.[4,] Other surgical patients may be at increased risk of VTE during and after hospitalization. For example, it is estimated that rates of VTE without prophylaxis after gynecologic surgery are 15% to 40%.[5,]

Thus, antithrombotic prophylaxis is recommended for patients undergoing major orthopedic surgery and other surgical procedures who are at increased risk of VTE. For patients undergoing major orthopedic surgery, clinical practice guidelines published by the ACCP (2012) recommended that one of several pharmacologic agents or mechanical prophylaxis be provided rather than no thromboprophylaxis.[1,] The guidelines further recommended the use of pharmacologic prophylaxis during hospitalization, whether or not patients are using a limb compression device. A minimum of 10 to 14 days of prophylaxis is recommended, a portion of which can be post discharge home use.

Limb Compression Prophylaxis
The ACCP guidelines have also noted that compliance is a major issue with the home use of limb compression devices for thromboprophylaxis and recommended that, if this prophylactic option is selected, use should be limited to portable, battery-operated devices. Moreover, ACCP recommended that devices be used for 18 hours a day. A 2009 nonrandomized study found that there was better compliance with a portable battery-operated limb compression device than with a nonmobile device when used by patients in the hospital following hip or knee replacement surgery.[6,]

Nonorthopedic Surgery

Pharmacologic and Limb Compression Prophylaxis
The ACCP (2012) also issued guidelines on VTE prophylaxis in nonorthopedic surgery patients.[2,] For patients undergoing general or abdominal-pelvic surgery who have a risk of VTE of 3% or higher, the ACCP has recommended prophylaxis with pharmacologic agents or intermittent pneumatic compression rather than no prophylaxis. For patients at low-risk for VTE (»1.5%), the guidelines have suggested mechanical prophylaxis. Unlike the guidelines on major orthopedic surgery, which recommends a minimum of 10 to 14 days of VTE prophylaxis, the guidelines on nonorthopedic surgery patients do not include a general timeframe for prophylaxis. They have, however, defined “extended duration” pharmacologic prophylaxis as lasting four weeks; the latter is recommended only for patients at high-risk for VTE, undergoing abdominal or pelvic surgery for cancer, and who are not otherwise at high-risk for major bleeding complications.

National clinical guidelines have not specifically recommended the use of limb compression devices in the postdischarge home setting. However, given the availability of portable, battery-operated devices, there is interest in the home use of limb compression devices for VTE prevention following discharge from the hospital for major orthopedic and nonorthopedic surgery.

Summary
Antithrombotic prophylaxis is recommended for surgical patients at moderate-to-high risk of postoperative venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism, based on the surgical procedure and/or patient characteristics. For some types of surgery (eg, major orthopedic surgery), there is a particularly high-risk of VTE due to the nature of the procedure and the prolonged immobility during and after surgery. Common patient risk factors include increasing age, prior VTE, malignancy, pregnancy, and significant comorbidities. Increased risk of bleeding is a contraindication to anticoagulation as are adverse events and allergic reactions. Limb compression devices have been used as an adjunct or alternative to anticoagulation in the home setting for patients in the postoperative period as a method to reduce VTEs.

For individuals who have moderate-to-high postsurgical risk of VTE and no contraindication to pharmacologic prophylaxis who receive home use of a limb compression device as an adjunct to anticoagulation, the evidence includes no randomized controlled trials (RCTs) assessing any incremental benefit of home use of a limb compression device, plus pharmacologic agents. The relevant outcomes are overall survival, symptoms, morbid events, and treatment-related morbidity. Four meta-analyses of RCTs have compared medication plus intermittent pneumatic compression with medication alone in surgical patients in the hospital setting. These trials do not permit inferences to the postdischarge home setting. Results of the meta-analyses have suggested that in-hospital addition of limb compression devices to pharmacologic management improves DVT prophylaxis. Limitations are: not distinguishing between asymptomatic and symptomatic DVT; sparse data on pulmonary embolism; and results generally

not stratified by patient risk or specific intervention. Moreover, the postdischarge setting differs in important respects from the hospital setting. Discharged patients tend to be healthier than those in the hospital. Factors such as treatment consistency, duration, and application errors in use differ in the home. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have moderate-to-high postsurgical risk of VTE and a contraindication to pharmacologic prophylaxis who receive home use of a limb compression device, the evidence includes a meta-analysis of inpatients and a study comparing the use of postdischarge limb compression in the home setting to no prophylaxis. The relevant outcomes are overall survival, symptoms, morbid events, and treatment-related morbidity. The meta-analysis showed significantly fewer incidence of DVT (40 RCTs) and pulmonary embolism (26 RCTs) with limb compression. Despite limitations related to stratification of patient risk and pharmacologic prophylaxis, the meta-analysis showed that limb compression is superior to no prophylaxis. A study of the post discharge use of a limb compression device combined with home visits showed that home use is feasible. With post discharge planning and support, home use of limb compression devices in moderate-to-high risk patients who have a contraindication to pharmacologic prophylaxis is likely to improve VTE prevention. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

Policy History

Date	Action
4/2022	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
10/2021	Clarified coding information
4/2021	Clarified coding information. Annual policy review. Description, summary, and references updated. Policy statements unchanged.
5/2020	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
4/2019	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
5/2018	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
4/2017	Annual policy review. New references added.
6/2016	Annual policy review. Document substantially rewritten for coherence and clarity. Policy statements and Policy Guidelines rewritten for clarity; intent of statements is unchanged. In title, “Outpatient” deleted and “Home” added.
2/2015	Annual policy review. New references added.
5/2014	Annual policy review. “Pneumatic” removed from policy statements and policy title. Major nonorthopedic surgery changed to “major nonorthopedic surgery or nonmajor orthopedic surgery” in 3rd and 4th policy statements. “Postsurgical” added to policy. Effective 5/1/2014. Clarified coding information.
6/2013	New policy describing coverage and non-coverage. Effective 6/1/2013.

Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:
Medical Policy Terms of Use
Managed Care Guidelines
Indemnity/PPO Guidelines
Clinical Exception Process
Medical Technology Assessment Guidelines

References

1. Falck-Ytter Y, Francis CW, Johanson NA, et al. Prevention of VTE in orthopedic surgery patients: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians

Evidence-Based Clinical Practice Guidelines. Chest. Feb 2012; 141(2 Suppl): e278S-e325S. PMID 22315265
2. Gould MK, Garcia DA, Wren SM, et al. Prevention of VTE in nonorthopedic surgical patients: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest. Feb 2012; 141(2 Suppl): e227S-e277S. PMID 22315263
3. MD+CALC. HAS-BLED Score for Major Bleeding Risk. http://www.mdcalc.com/has-bled-score-for-major- bleeding-risk/. Accessed January 25, 2021.
4. Fisher WD. Impact of venous thromboembolism on clinical management and therapy after hip and knee arthroplasty. Can J Surg. Oct 2011; 54(5): 344-51. PMID 21774881
5. Committee on Practice Bulletins--Gynecology, American College of Obstetricians and Gynecologists. ACOG Practice Bulletin No. 84: Prevention of deep vein thrombosis and pulmonary embolism. Obstet Gynecol. Aug 2007; 110(2 Pt 1): 429-40. PMID 17666620
6. Froimson MI, Murray TG, Fazekas AF. Venous thromboembolic disease reduction with a portable pneumatic compression device. J Arthroplasty. Feb 2009; 24(2): 310-6. PMID 18534456
7. Kakkos SK, Caprini JA, Geroulakos G, et al. Combined intermittent pneumatic leg compression and pharmacological prophylaxis for prevention of venous thromboembolism. Cochrane Database Syst Rev. Sep 07 2016; 9: CD005258. PMID 27600864
8. O'Connell S, Bashar K, Broderick BJ, et al. The Use of Intermittent Pneumatic Compression in Orthopedic and Neurosurgical Postoperative Patients: A Systematic Review and Meta-analysis. Ann Surg. May 2016; 263(5): 888-9. PMID 26720432
9. Zareba P, Wu C, Agzarian J, et al. Meta-analysis of randomized trials comparing combined compression and anticoagulation with either modality alone for prevention of venous thromboembolism after surgery. Br J Surg. Aug 2014; 101(9): 1053-62. PMID 24916118
10. Sobieraj DM, Coleman CI, Tongbram V, et al. Comparative effectiveness of combined pharmacologic and mechanical thromboprophylaxis versus either method alone in major orthopedic surgery: a systematic review and meta-analysis. Pharmacotherapy. Mar 2013; 33(3): 275-83. PMID 23401017
11. Fan C, Jia L, Fang F, et al. Adjunctive Intermittent Pneumatic Compression in Hospitalized Patients Receiving Pharmacologic Prophylaxis for Venous Thromboprophylaxis: A Systematic Review and Meta-Analysis. J Nurs Scholarsh. 2020;52(4):397-405. doi:10.1111/jnu.12566
12. Ho KM, Tan JA. Stratified meta-analysis of intermittent pneumatic compression of the lower limbs to prevent venous thromboembolism in hospitalized patients. Circulation. Aug 27 2013; 128(9): 1003-20. PMID 23852609
13. Wang X, Zhang Y, Fang F, et al. Comparative efficacy and safety of pharmacological prophylaxis and intermittent pneumatic compression for prevention of venous thromboembolism in adult undergoing neurosurgery: a systematic review and network meta-analysis [published online ahead of print, 2020 Apr 16]. Neurosurg Rev. 2020;10.1007/s10143-020-01297-0. doi:10.1007/s10143-020-01297-0
14. Haykal T, Zayed Y, Dhillon H, et al. Meta-Analysis of the Role of Intermittent Pneumatic Compression of the Lower Limbs to Prevent Venous Thromboembolism in Critically Ill Patients. Int J Low Extrem Wounds. Mar 2022; 21(1): 31-40. PMID 32527203
15. Sobieraj-Teague M, Hirsh J, Yip G, et al. Randomized controlled trial of a new portable calf compression device (Venowave) for prevention of venous thrombosis in high-risk neurosurgical patients. J Thromb Haemost. Feb 2012; 10(2): 229-35. PMID 22188037
16. Guyatt GH, Akl EA, Crowther M, et al. Introduction to the ninth edition: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest. Feb 2012; 141(2 Suppl): 48S-52S. PMID 22315255
17. Kearon C, Akl EA, Ornelas J, et al. Antithrombotic Therapy for VTE Disease: CHEST Guideline and Expert Panel Report. Chest. Feb 2016; 149(2): 315-352. PMID 26867832
18. Stevens SM, Woller SC, Kreuziger LB, et al. Antithrombotic Therapy for VTE Disease: Second Update of the CHEST Guideline and Expert Panel Report. Chest. Dec 2021; 160(6): e545-e608. PMID 34352278
19. Mont MA, Jacobs JJ, Boggio LN, et al. Preventing venous thromboembolic disease in patients undergoing elective hip and knee arthroplasty. J Am Acad Orthop Surg. Dec 2011; 19(12): 768-76. PMID 22134209
20. American Orthopaedic Foot & Ankle Society (AOFAS). Position Statement: The Use of VTED Prophylaxis in Foot and Ankle Surgery. 2020; https://www.aofas.org/docs/default-source/research-

and-policy/vted-prophylaxis-in-foot-and-ankle-surgery-position-statement.pdf?sfvrsn=21490028_2. Accessed February 22, 2021.
21. Anderson DR, Morgano GP, Bennett C, et al. American Society of Hematology 2019 guidelines for management of venous thromboembolism: prevention of venous thromboembolism in surgical hospitalized patients. Blood Adv. Dec 10 2019; 3(23): 3898-3944. PMID 31794602
22. Key NS, Khorana AA, Kuderer NM, et al. Venous Thromboembolism Prophylaxis and Treatment in Patients With Cancer: ASCO Clinical Practice Guideline Update. J Clin Oncol. Feb 10 2020; 38(5): 496-520. PMID 31381464