APPENDIX A. SEARCH STRATEGIES

Database: MEDLINE (via PubMed)

Search date: 10/30/14

Set #	Search Terms	Results
#1	Search "venous thrombosis"[MeSH Terms] OR venous thrombo*[tiab] OR deep-venous thrombo*[tiab] OR deep vein thrombo*[tiab] OR deep-vein thrombo*[tiab] OR phlebothrombo*[tiab] OR "Thromboembolism"[Mesh:NoExp] OR “thrombophlebitis”[tiab] OR thromboemboli*[tiab] OR "Venous Thromboembolism"[Mesh] OR venothrombolic event*[tiab] OR "VTEs"[tiab] OR "VTE"[tiab] OR "Thrombosis"[Mesh:NoExp] OR "Thrombosis"[tiab]	187,263
#2	Search "intermittent pneumatic compression devices"[MeSH Terms] OR compression device*[tiab] OR “intermittent compression”[tiab] OR “intermittent pneumatic”[tiab] OR foot pump*[tiab] OR foot-pump*[tiab] OR "Gravity Suits"[Mesh] OR "compression garment"[tiab] OR "inflatable garment"[tiab] OR "pneumatic pump"[tiab] OR "gradient pressure"[tiab] OR "Pneumatic compressor"[tiab] OR "pneumatic appliance"[tiab] OR “WizAIR”[tiab] OR “Flowtron”[tiab] OR “Phlebo”[tiab] OR “Kendall”[tiab] OR air massage*[tiab] OR “A-V impulse system”[tiab] OR “VenaFlow”[tiab] OR “Jobst”[tiab] OR “ArtAssist”[tiab] OR “Plexipulse”[tiab] OR “SC-2004 Sequential Circulator PCD”[tiab] OR “Walkcare”[tiab] OR “Venodyne”[tiab] OR “IPC”[tiab] OR “PIC”[tiab] OR “EPIC”[tiab] OR “IPEC”[tiab] OR "Bandages"[Mesh:NoExp] OR "Assisted Circulation"[Mesh:NoExp]	28,466
#3	Search #1 AND #2	1923
#4	Search #3 NOT (animals[mh] NOT humans[mh])	1879
#5	#4 NOT (Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR Comment[ptyp]) Sort by: Author Filters: Publication date from 1995/01/01; English	963

Database: Embase

Search date: 10/30/14

Set #	Search Terms	Results
#1	'vein thrombosis'/exp OR 'thrombosis'/de OR thrombo*:ab,ti OR phlebothrombo*:ab,ti OR "venothrombolic event":ab,ti OR "VTE":ab,ti OR "VTEs":ab,ti	460,903
#2	'intermittent pneumatic compression device'/exp OR “A-V Impulse System”:ab,ti OR “ArtAssist”:ab,ti OR “Flexitouch system”:ab,ti OR “FLOWTRON”:ab,ti OR “intermittent pneumatic compression devices”:ab,ti OR “Plexipulse”:ab,ti OR “pneumatic intermittent impulse device”:ab,ti OR “SC-2004 Sequential Circulator PCD”:ab,ti OR “Walkcare”:ab,ti OR 'assisted circulation'/de OR 'bandage'/de OR 'mast suit'/exp OR 'compression instrument'/de OR “compression device”:ti,ab OR “intermittent compression”:ti,ab OR “intermittent pneumatic”:ti,ab OR “foot pump”:ti,ab OR “foot-pumps”:ti,ab OR “foot-pump”:ti,ab OR "compression garment":ti,ab OR "inflatable garment":ti,ab OR "pneumatic pump":ti,ab OR "gradient pressure":ti,ab OR "Pneumatic compressor":ti,ab OR "pneumatic appliance":ti,ab OR “WizAIR”:ti,ab OR “Phlebo”:ti,ab OR “Kendall”:ti,ab OR “air massage”:ti,ab OR “air massages”:ti,ab OR “VenaFlow”:ti,ab OR “Jobst”:ti,ab OR “Venodyne”:ti,ab	25,460
#3	#1 AND #2	2519
#4	#3 AND ([embase]/lim OR [embase classic]/lim) NOT [medline]/lim	807
#5	#4 NOT ('case report'/exp OR 'editorial'/exp OR 'letter'/exp OR 'note'/exp)	735
#6	#5 AND [humans]/lim AND [english]/lim	437
#7	#6 AND [1995-2014]/py	425

Database: CINAHL (Key Question 4 only)

Search date: 10/30/14

Set #	Search Terms	Results
S1	(MH "Compression Garments")	1634
S2	(MH "Compression Therapy")	1673
S3	(MH "Bandages and Dressings")	7649
S4	TI (“intermittent pneumatic compression device” or "A-V Impulse System" or "ArtAssist" or "Flexitouch system" or "FLOWTRON" or "intermittent pneumatic compression devices" or "Plexipulse" or "pneumatic intermittent impulse device" or "SC-2004 Sequential Circulator PCD" or "Walkcare" or "assisted circulation" or "bandage" or "compression instrument" or "compression device" or "intermittent compression" or "intermittent pneumatic" or "foot pump" or "foot-pumps" or "foot-pump" or "compression garment" or "inflatable garment" or "pneumatic pump" or "gradient pressure" or "Pneumatic compressor" or "pneumatic appliance" or "WizAIR" or "Phlebo" or "Kendall" or "air massage" or "air massages" or "VenaFlow" or "Jobst" or "Venodyne") OR AB (“intermittent pneumatic compression device” or "A-V Impulse System" or "ArtAssist" or "Flexitouch system" or "FLOWTRON" or "intermittent pneumatic compression devices" or "Plexipulse" or "pneumatic intermittent impulse device" or "SC-2004 Sequential Circulator PCD" or "Walkcare" or "assisted circulation" or "bandage" or "compression instrument" or "compression device" or "intermittent compression" or "intermittent pneumatic" or "foot pump" or "foot-pumps" or "foot-pump" or "compression garment" or "inflatable garment" or "pneumatic pump" or "gradient pressure" or "Pneumatic compressor" or "pneumatic appliance" or "WizAIR" or "Phlebo" or "Kendall" or "air massage" or "air massages" or "VenaFlow" or "Jobst" or "Venodyne")	1187
S5	S1 OR S2 OR S3 OR S4	10,761
S6	TI (thrombo* or phlebothrombo* or "venothrombolic event" or "VTE" or "VTEs") OR AB (thrombo* or phlebothrombo* or "venothrombolic event" or "VTE" or "VTEs")	25,614
S7	(MH "Venous Thrombosis+") OR (MH "Thromboembolism+") OR (MH "Thrombosis+")	21,952
S8	S6 OR S7	36,538
S9	S5 AND S8	841
S10	S9 Limiters - English Language; Published Date: 19950101-20141231; Exclude MEDLINE records; Language: English; Search modes - Find all my search terms	309
S11	(MH "Prospective Studies+") OR (MH "Cross Sectional Studies") OR (MH "Quasi-Experimental Studies+") OR (MH "Retrospective Design")	433,714
S12	S10 AND S11	18

Database: Cochrane CENTRAL

Search date: 10/30/14

Set #	Search Terms	Results
#1	deep vein thrombosis:ti,ab,kw (Word variations have been searched)	2205
#2	deep vein thromboses:ti,ab,kw (Word variations have been searched)	40
#3	thrombo* or phlebothrombo* or "venothrombolic event" or "VTE" or "VTEs":ti,ab,kw (Word variations have been searched)	22,495
#4	[or #1-#3]	22,495

Set #	Search Terms	Results
#5	“intermittent pneumatic compression device” or "A-V Impulse System" or "ArtAssist" or "Flexitouch system" or "FLOWTRON" or "intermittent pneumatic compression devices" or "Plexipulse" or "pneumatic intermittent impulse device" or "SC-2004 Sequential Circulator PCD" or "Walkcare" or "assisted circulation" or "bandage" or "compression instrument" or "compression device" or "intermittent compression" or "intermittent pneumatic" or "foot pump" or "foot-pumps" or "foot-pump" or "compression garment" or "inflatable garment" or "pneumatic pump" or "gradient pressure" or "Pneumatic compressor" or "pneumatic appliance" or "WizAIR" or "Phlebo" or "Kendall" or "air massage" or "air massages" or "VenaFlow" or "Jobst" or "Venodyne":ti,ab	1984
#6	[and #4-#5] Publication Year from 1995 to 2014, in Cochrane Reviews (Reviews and Protocols) and Trials	205

APPENDIX B. QUALITY (RISK OF BIAS) ASSESSMENT OF RCTS—CRITERIA USED AND DETAILED RATINGS

General Instructions: Rate each risk of bias item listed below as **Low risk/High risk/Unclear risk** (see Cochrane guidance to inform judgements). Add comments to justify ratings. After considering each of the quality items, give the study an overall rating of "**Low risk**," "**Moderate risk**," or "**High risk**" (see below).

Rating of individual items:

1. **Selection bias:**
   a. **Randomization adequate* (Adequate methods include: random number table, computer-generated randomization, minimization w/o a random element) **Low risk/High risk/Unclear risk**
   b. **Allocation concealment* (Adequate methods include: pharmacy-controlled randomization, numbered sealed envelopes, central allocation) **Low risk/High risk/Unclear risk**
   c. *Baseline characteristics* (Consider whether there were systematic differences observed in baseline characteristics and prognostic factors between groups, and if important differences were observed, if the analyses controlled for these differences) **Low risk/High risk/Unclear risk**
2. **Performance bias:**
   a. **Concurrent interventions or unintended exposures:* (Consider concurrent intervention or an unintended exposure [eg, crossovers; contamination – some control group gets the intervention] that might bias results) **Low risk/High risk/Unclear risk**
   b. *Protocol variation:* (Consider whether variation from the protocol compromised the conclusions of the study) **Low risk/High risk/Unclear risk**
3. **Detection bias:**
   a. **Subjects Blinded?:* (Consider measures used to blind subjects to treatment assignment and any data presented on effectiveness of these measures) **Low risk/High risk/Unclear risk**
   b. **Outcome assessors blinded (hard outcomes):* (Outcome assessors blind to treatment assignment for "hard outcomes" such as mortality) **Low risk/High risk/Unclear risk**
   c. **Outcome assessors blinded (soft outcomes):* (Outcome assessors blind to treatment assignment for "soft outcomes" such as symptoms) **Low risk/High risk/Unclear risk**
   d. *Measurement bias:* (Reliability and validity of measures used-**VTE**) **Low risk/High risk/Unclear risk**

e. *Measurement bias:* (Reliability and validity of measures used- **Ease of use/Acceptability Low risk/High risk/Unclear risk**

4. Attrition bias:

a. **Incomplete outcome data:* (Consider whether incomplete outcome data were adequately addressed, including: systematic differences in attrition between groups [differential attrition]; overall loss to follow-up [overall attrition]; and whether an "intention-to-treat" [ITT; all eligible patients that were randomized are included in analysis] analysis was performed) (Note – mixed models and survival analyses are in general ITT) **Low risk/High risk/Unclear risk**

5. Reporting bias:

a. **Selective outcomes reporting:* (Consider whether there is any suggestion of selective outcome reporting (eg, systematic differences between planned and reported findings)? **Low risk/High risk/Unclear risk**

*Items contained in Cochrane Risk of Bias Tool

Overall study rating:

Please assign each study an overall quality rating of "Low risk," "High risk," or "Unclear risk" based on the following definitions:

A "**Low risk**" study has the least bias, and results are considered valid. A low risk study uses a valid approach to allocate patients to alternative treatments; has a low dropout rate; and uses appropriate means to prevent bias, measure outcomes, and analyze and report results. [Items 1a and 1c; 2a; 3b and 3c; and 4a are all rated low risk]

A "**Moderate risk**" study is susceptible to some bias but probably not enough to invalidate the results. The study may be missing information, making it difficult to assess limitations and potential problems (unclear risk). As the moderate risk category is broad, studies with this rating vary in their strengths and weaknesses. [Most, but not all of the following items are rated low risk: Items 1a and 1c; 2a; 3b and 3c; and 4a]

A "**High risk**" rating indicates significant bias that may invalidate the results. These studies have serious errors in design, analysis, or reporting; have large amounts of missing information; or have discrepancies in reporting. The results of a high risk study are at least as likely to reflect flaws in the study design as to indicate true differences between the compared interventions. [At least one-half of the individual quality items are rated high risk or unclear risk]

Conflict of interest: (Record but not used as part of Risk of Bias Assessment)

a. *Was there the absence of potential important conflict of interest?:* The focus here is financial conflict of interest. If no financial conflict of interest (eg, if funded by government or foundation and authors do not have financial relationships with drug/device manufacturer), then answer "Yes." **Yes/No/Unclear**

Appendix Table B1. Detailed Risk-of-Bias Ratings for Included RCTs*

Study	Individual Quality Assessment Criteria Ratings												Overall Rating	COI Absent?
	1a	1b	1c	2a	2b	3a	3b	3c	3d	3e	4	5		
Blanchard,1999[52]	UR	LR	UR	LR	LR	LR	UR	UR	LR	UR	LR	LR	**High**	Yes
Colwell, 2010[17]	LR	HR	LR	UR	LR	HR	LR	UR	LR	UR	LR	LR	**Moderate**	No
Edwards, 2008[58]	UR	UR	LR	UR	HR	HR	UR	UR	LR	UR	UR	LR	**High**	No
Ginzburg, 2003[55]	LR	UR	LR	LR	HR	LR	LR	UR	LR	UR	HR	LR	**Moderate**	Unclear
Greenfield, 1997[61]	UR	UR	UR	LR	LR	LR	UR	UR	LR	UR	UR	UR	**High**	Unclear
Lachiewicz, 2004[46]	UR	LR	LR	LR	LR	LR	LR	UR	LR	UR	LR	LR	**Moderate**	Yes
Murakami, 2003[23]	LR	HR	LR	LR	LR	HR	UR	UR	LR	LR	LR	LR	**Moderate**	Yes
Pagella, 2007[47]	LR	LR	LR	LR	LR	HR	UR	HR	UR	UR	LR	LR	**Moderate**	Unclear
Pambianco, 1995[59]	LR	LR	LR	LR	LR	LR	UR	UR	LR	UR	HR	LR	**Moderate**	Yes
Pitto, 2004[18]	LR	UR	LR	LR	UR	LR	LR	HR	LR	UR	HR	LR	**Moderate**	No
Rokito, 1996[49]	UR	UR	LR	UR	LR	HR	LR	UR	UR	UR	LR	LR	**Moderate**	No
Silbersack, 2004[57]	UR	UR	LR	UR	HR	LR	LR	UR	LR	UR	LR	LR	**Moderate**	No
Stannard, 2001[50]	LR	UR	LR	UR	UR	UR	LR	UR	LR	UR	HR	LR	**Moderate**	No
Stone, 1996[56]	UR	UR	LR	LR	UR	LR	UR	UR	LR	UR	UR	LR	**Moderate**	Unclear
Warwick,2002[19]	LR	UR	LR	UR	UR	LR	LR	HR	LR	UR	UR	LR	**Moderate**	No
Warwick, 1998[53]	LR	UR	LR	LR	HR	HR	LR	HR	LR	LR	LR	LR	**Moderate**	No
Windisch, 2011[54]	UR	UR	UR	LR	LR	HR	LR	UR	LR	UR	LR	LR	**Moderate**	Unclear
Wood, 1997[51]	UR	UR	HR	UR	UR	HR	LR	HR	LR	UR	UR	LR	**High**	Unclear

*The quality rating criteria described above were not used for the 3 included observational studies.[48,60,62] They were evaluated using the 5 domains of basic design, selection bias, performance bias, attrition bias, and detection bias, and only the overall score is reported in the body of the report.

Abbreviations: COI=conflict of interest; HR=high risk; LR=low risk; RCTs=randomized controlled trials; UR=unclear risk

References to Appendix B:

1. Blanchard J, Meuwly JY, Leyvraz PF, et al. Prevention of deep-vein thrombosis after total knee replacement. Randomised comparison between a low-molecular-weight heparin (nadroparin) and mechanical prophylaxis with a foot-pump system. *J Bone Joint Surg Br.* 1999;81(4):654-659.

2. Colwell CW, Jr., Froimson MI, Mont MA, et al. Thrombosis prevention after total hip arthroplasty: a prospective, randomized trial comparing a mobile compression device with low-molecular-weight heparin. *J Bone Joint Surg Am.* 2010;92(3):527-535.

3. Edwards JZ, Pulido PA, Ezzet KA, Copp SN, Walker RH, Colwell CW, Jr. Portable compression device and low-molecular-weight heparin compared with low-molecular-weight heparin for thromboprophylaxis after total joint arthroplasty. *J Arthroplasty.* 2008;23(8):1122-1127.

4. Ginzburg E, Cohn SM, Lopez J, Jackowski J, Brown M, Hameed SM. Randomized clinical trial of intermittent pneumatic compression and low molecular weight heparin in trauma. *Br J Surg.* 2003;90(11):1338-1344.

5. Greenfield LJ, Proctor MC, Rodriguez JL, Luchette FA, Cipolle MD, Cho J. Posttrauma thromboembolism prophylaxis. *J Trauma.* 1997;42(1):100-103.

6. Lachiewicz PF, Kelley SS, Haden LR. Two mechanical devices for prophylaxis of thromboembolism after total knee arthroplasty. A prospective, randomised study. *J Bone Joint Surg Br.* 2004;86(8):1137-1141.

7. Murakami M, McDill TL, Cindrick-Pounds L, et al. Deep venous thrombosis prophylaxis in trauma: improved compliance with a novel miniaturized pneumatic compression device. *J Vasc Surg.* 2003;38(5):923-927.

8. Pagella P, Cipolle M, Sacco E, Matula P, Karoly E, Bokovoy J. A randomized trial to evaluate compliance in terms of patient comfort and satisfaction of two pneumatic compression devices. *Orthop Nurs.* 2007;26(3):169-174.

9. Pambianco G, Orchard T, Landau P. Deep vein thrombosis: prevention in stroke patients during rehabilitation. *Arch Phys Med Rehabil.* 1995;76(4):324-330.

10. Pitto RP, Hamer H, Heiss-Dunlop W, Kuehle J. Mechanical prophylaxis of deep-vein thrombosis after total hip replacement a randomised clinical trial. *J Bone Joint Surg Br.* 2004;86(5):639-642.

11. Rokito SE, Schwartz MC, Neuwirth MG. Deep vein thrombosis after major reconstructive spinal surgery. *Spine (Phila Pa 1976).* 1996;21(7):853-858; discussion 859.

12. Silbersack Y, Taute BM, Hein W, Podhaisky H. Prevention of deep-vein thrombosis after total hip and knee replacement. Low-molecular-weight heparin in combination with intermittent pneumatic compression. *J Bone Joint Surg Br.* 2004;86(6):809-812.

13. Stannard JP, Riley RS, McClenney MD, Lopez-Ben RR, Volgas DA, Alonso JE. Mechanical prophylaxis against deep-vein thrombosis after pelvic and acetabular fractures. *J Bone Joint Surg Am.* 2001;83-a(7):1047-1051.

14. Stone MH, Limb D, Campbell P, Stead D, Culleton G. A comparison of intermittent calf compression and enoxaparin for thromboprophylaxis in total hip replacement. A pilot study. *Int Orthop.* 1996;20(6):367-369.

15. Warwick D, Harrison J, Whitehouse S, Mitchelmore A, Thornton M. A randomised comparison of a foot pump and low-molecular-weight heparin in the prevention of deep-vein thrombosis after total knee replacement. *J Bone Joint Surg Br.* 2002;84(3):344-350.

16. Warwick D, Harrison J, Glew D, Mitchelmore A, Peters TJ, Donovan J. Comparison of the use of a foot pump with the use of low-molecular-weight heparin for the prevention of deep-vein thrombosis after total hip replacement. A prospective, randomized trial. *J Bone Joint Surg Am.* 1998;80(8):1158-1166.

17. Windisch C, Kolb W, Kolb K, Grutzner P, Venbrocks R, Anders J. Pneumatic compression with foot pumps facilitates early postoperative mobilisation in total knee arthroplasty. *Int Orthop.* 2011;35(7):995-1000.

18. Wood KB, Kos PB, Abnet JK, Ista C. Prevention of deep-vein thrombosis after major spinal surgery: a comparison study of external devices. *J Spinal Disord.* 1997;10(3):209-214.

19. Bockheim HM, McAllen KJ, Baker R, Barletta JF. Mechanical prophylaxis to prevent venous thromboembolism in surgical patients: a prospective trial evaluating compliance. *J Crit Care.* 2009;24(2):192-196.

20. Proctor MC, Greenfield LJ, Wakefield TW, Zajkowski PJ. A clinical comparison of pneumatic compression devices: the basis for selection. *J Vasc Surg.* 2001;34(3):459-463; discussion 463-454.

21. Robertson KA, Bertot AJ, Wolfe MW, Barrack RL. Patient compliance and satisfaction with mechanical devices for preventing deep venous thrombosis after joint replacement. *J South Orthop Assoc.* 2000;9(3):182-186.

APPENDIX C. PEER REVIEW COMMENTS/AUTHOR RESPONSES

Reviewer	Comment	Response
Question 1. Are the objectives, scope, and methods for this review clearly described?		
1	Yes	Acknowledged
2	Yes	Acknowledged
3	Yes	Acknowledged
4	Yes	Acknowledged
6	Yes	Acknowledged
Question 2. Is there any indication of bias in our synthesis of the evidence?		
1	No	Acknowledged
2	No	Acknowledged
3	No	Acknowledged
4	No	Acknowledged
6	No	Acknowledged
Question 3. Are there any published or unpublished studies that we may have overlooked?		
1	No	Acknowledged
2	No	Acknowledged
3	No	Acknowledged
4	No	Acknowledged
6	Yes - Colwell report from 2014 JBJS of large cohort trial with IPCD	This article was identified in our search, but did not meet inclusion criteria at the comparator level. This Colwell study is a non-randomized registry trial that compares VTE events of an IPCD with published symptomatic rates for anticoagulants. This study, however, does not directly compare IPCDs with pharmacological prophylaxis, which is required for inclusion. Furthermore, this study did not report on outcomes of interest (such as ease of use or adherence) required for inclusion of non-randomized trials in our review.

Reviewer	Comment	Response
Question 4: Please write additional suggestions or comments below. If applicable, please indicate the page and line numbers from the draft report.		
1	The purpose of the study that I had in mind when I asked for your assistance in evaluating pneumatic compression devices used to prevent DVT and PE in post-op surgical patients was for you to evaluate and critically compare the various devices used to provide compression. Since there were several different devices available using different modes of compression, my hope was that if one method was superior to the others we could identify it and direct the VA to use it preferentially. Your study was most helpful in that it shows, within the limits of the evaluation, that all of the devices provide similar prophylaxis for DVT and similar levels of comfort for the patient during their use. This was most helpful as it means that we should primarily select a device or pneumatic compression system on value which equals quality divided by cost.	Thank you. While the existing data do not allow any strong conclusions about differential effectiveness or ease of use, we noted other factors to consider: 1) Clinical guidelines from ACCP and AAOS, and 2) safety features, ease-of-use features, and most frequently studied devices. We have added a new table providing more details about the characteristics of the devices examined in the included studies (Appendix E).
2	Word missing from line 14. "The committee is interested ____ developing policy...."	Thank you. This error has been corrected.
3	[No comments submitted]	–
4	Overall well done review and the reports in concise and transparent with appropriate methodology. Search date (consider an update)	Thank you. An updated search is not part of the standard processes for the Evidence Synthesis Program.
4	English language restriction is problematic. At a minimum there should be a rationale provided for doing so.	We restricted eligible studies to those published in English because we did not have the resources to translate non-English publications. Although this restriction introduces the chance of publication bias, we were reassured that the risk was low after reviewing a recent study without this restriction (Ho 2013) and finding that it had not identified any eligible non-English language studies.
4	Agreement among reviewers is not reported or described (I apologize if I missed it).	Inter-rater agreement is not reported. However, in the methods section we specify, “All data abstractions were confirmed by a second investigator. Disagreements were resolved by consensus or by obtaining a third investigator’s opinion.”

Reviewer	Comment	Response
4	Figure 1 (and other figures) that reference to the questions (KQ1, KQ2, etc) are hard to read. I suggest you add the question in a shortened format to remind readers. For example, you can say "KQ1-surgical patients", etc.	Acknowledged. We modified the labels to reference the KQs in Figure 1, and we have clarified that the other figures reference surgical patients.
4	Major bleeding in KQ1 is clearly not precise: RD=25 fewer (34 fewer to 19 more) and such direct evidence is clearly not moderate, but rather of low quality. Nonetheless, indirect evidence (from people treated with anticoagulation in other settings and conditions) tells us that bleeding risk increases with anticoagulation. So, in this case, the indirect evidence is probably better to use for the outcome of bleeding (you can list both in the evidence profile as two subsequent lines).	The denominator for this calculation was missing from the draft table and has been corrected to show a risk difference of 25 fewer per 1000 patients (34 fewer to 19 more). However, this RD was based on few events and we agree that this is an imprecise result. We have re-rated the SOE as "Low". Although it is well established that long-term anticoagulation does increase the risk of bleeding, the SOE in Table 3 is based only on studies included in the current review.
6	The report concludes that IPCD prophylaxis is equivalent to anticoagulation in prevention of VTE and that the risk of bleeding from using chemoprophylaxis is higher. Because ACCP guidelines recommend that IPCD devices be portable, battery powered and record compliance and because the ACCP guidelines have always been the gold standard for VTE prophylaxis recommendations in orthopaedics, a comparison of various IPCD devices can be done by just comparing characteristics of each of the devices as to whether they all conform to these recommendations (only one device is portable, battery-powered and records compliance). Also, this device has documented efficacy in prevention of symptomatic VTE in a very large (>3000 total hip and knee patients) multicenter study that is similar (non-inferior) to that of LMWH. Also, several studies have been published indicating a higher rate of readmission in patients treated with chemoprophylaxis compared to IPCD, this fact should be presented in the study.	Our conclusions states, "Although IPCDs differ in practical features and in effects on physiology, current evidence does not show a clear difference in effects on clinically important outcomes." In the discussion, we cite the ACCP guidelines and note that "for orthopedic procedures, portable battery powered IPCDs and devices capable of recording wear time are recommended as an option for patients at low risk of bleeding, but pharmacological prophylaxis with or without IPCD is preferred." We give characteristics of devices evaluated in the studies included in this review (Table 2 and Appendix E)) but note that this is not a comprehensive listing of all the devices on the market. We believe the multicenter study cited by the reviewer is Colwell et al, Journal of Bone and Joint Surgery, 2014;96: 177-83. This study was identified by our search and excluded because it is a non-randomized trial reporting VTE outcomes. It also does not report any outcomes required for inclusion of non-randomized studies. Readmission was not an outcome identified by our content experts or stakeholders. Further, it is a potentially problematic outcome because many factors contribute to rehospitalization.

Reviewer	Comment	Response
	Extra comments	
1	Extra comments from an email from Reviewer 1 on 05/18/15 (he turned in comments via the form on 05/27/15, so the comments below precede those): "I have read and re-read the results of your research into the effectiveness of the various types of pneumatic compression devices for DVT/PE prophylaxis in high risk surgical and medical patients. It is a truly excellent document - clearly written with easily comprehendable study objectives and outcomes. I was amazed to see how few studies out of the 1500+ total actually provided meaningful information. You have out done yourselves in providing me (and other clinicians, I suspect) with very useful information. It will help our team understand that most of the pneumatic compression devices perform well and with the exceptions you identify, we can recommend that the VA use competitive price for the basis for acquisition of these devices. My sincere thanks for all you effort and dedication. I will send any thoughts for improvement in the publication as I find them - if I can note any."	Acknowledged. Thank you.

APPENDIX D. STUDY CHARACTERISTICS

Study Information **Author, year** **Number randomized** **Risk of bias** **KQ(s)**	**Population** **Country** **Procedure** **Sex (mean % men)** **Age (mean [range])**	**Intervention (IPCD)** **Device** **Location** **Initiation** **Duration**	**Comparator** **Name** **Dosage or location** **Initiation** **Duration**	**Adjunctive Therapy*** **ASA** **GCS** **Other**
Blanchard, 1999[52] 130 High KQ 1	Switzerland TKA 23.8% 73 (49-88)	A-V Impulse System™ Foot 12 hours pre-op 8-12 days	LMWH (nadroparin) 2850-5700 IU daily 12 hours pre-op 10-12 days	NR No Acenocoumarol after 8-12 days over 6-8 weeks
Bockheim, 2009[60] 150 High KQ 4	United States Trauma 51% 62 (NR)	SCD Calf NR NR	Venous pump Foot NR NR	NR NR NR
Colwell, 2010[17] 386 or 392 Moderate KQ 1	United States THA 45% 63 (20-88)	ActiveCare+S.F.T.® Calf Intra-op 10 days post-op	LMWH (enoxaparin) 30 mg per 12 hours to discharge, then 40 mg daily 1 day post-op 10 days post-op	81 mg/day allowed No NR
Edwards, 2008[58] 277 High KQ 1	United States TKA, THA 42.5% 68 (32-88)	ActiveCare DVT® Calf Intra-op To discharge	LMWH (enoxaparin) 30 mg per 12 hours 1 day post-op 8 days post-op	NR No Intervention: Enoxaparin 30 mg per 12 hours until 8 days post-op
Ginzburg, 2003[55] 442 Moderate KQ 2	United States Trauma 74.0% 41.5 (NR)	Flowtron® Calf Post-op within 24 hours 30 days, discharge, or death	LMWH (enoxaparin) 30 mg per 12 hours Post-op within 24 hours 30 days, discharge, or death	NR No NR
Greenfield, 1997[61] 53 High KQ 2	United States Trauma 60.4% 44 (NR)	IPCD Calf Post-admission Up to 4 weeks	Low dose unfractionated heparin 5000 U SC twice daily Post-admission Up to 4 weeks	NR NR Intervention: AV foot pump Comparator: LMWH

Study Information **Author, year** **Number randomized** **Risk of bias** **KQ(s)**	**Population** **Country** **Procedure** **Sex (mean % men)** **Age (mean [range])**	**Intervention (IPCD)** **Device** **Location** **Initiation** **Duration**	**Comparator** **Name** **Dosage or location** **Initiation** **Duration**	**Adjunctive Therapy*** **ASA** **GCS** **Other**
Lachiewicz, 2004[46] 423 Moderate KQ 3	United States TKA 35.5% 66.8 (23-94)	VenaFlow® Calf During surgery NR, probably discharge	Kendall SCD™ Calf During surgery NR, probably discharge	325 mg pre-op; 650 mg twice daily, post-op Yes Continuous passive movement machine, 1 hour, 3 times daily
Murakami, 2003[23] 33 Moderate KQ 4	United States Trauma 60.6% 48.4 (NR)	WizAir DVT™ CECT Calf Immediately post-randomization NR	Kendall SCD Calf Immediately post-randomization NR	NR NR Addition of heparin at the discretion of the MD
Pagella, 2007[47] 65 Moderate KQ 4	United States THA or TKA 41.5% 57.6 (NR)	Kendall SCD Calf NR NR	Flowtron Calf NR NR	NR Allowed Warfarin, LMWH, unfractionated heparin, and IVC filters also allowed
Pambianco, 1995[59] 360 Moderate KQ 2	United States Stroke patients 41.5% 71.4 (NR)	Anthrombic pump (Jobst) Calf Post-admission Discharge or day 28	Adjusted dose heparin; 5000-10,000 U SC every 8 hours Post-admission Discharge or day 28	NR Yes NR
Pitto, 2004[18] 216 Moderate KQ 1	New Zealand THA 31% 57.7 (NR)	A-V Impulse System Foot Post-op, in recovery room NR	LMWH (nadroparin) NR Post-op, in recovery room Until discharge	NR Yes LMWH given to both groups at 12 hours pre-op
Proctor, 2001[62] 1350 High KQ 4	United States Surgical & medical NR 54.3 (NR)	NR Foot, calf, or calf-thigh Admission Discharge or 30 days	NR Foot, calf, or calf-thigh Admission Discharge or 30 days	NR Allowed Heparin allowed

Study Information **Author, year** **Number randomized** **Risk of bias** **KQ(s)**	**Population** **Country** **Procedure** **Sex (mean % men)** **Age (mean [range])**	**Intervention (IPCD)** **Device** **Location** **Initiation** **Duration**	**Comparator** **Name** **Dosage or location** **Initiation** **Duration**	**Adjunctive Therapy*** **ASA** **GCS** **Other**
Robertson, 2000[48] 224 High KQ 4	United States THA or TKA NR NR	Kendall SCD Calf-thigh NR NR	PlexiPulse® Foot NR NR	NR Yes with Intervention, NR with Comparator Enoxaparin and warfarin allowed per MD
Rokito, 1996[49] 110 Moderate KQ 1	United States Spinal surgery 39.5% 44.5 (22-77)	Kendall SCD Calf-thigh Intra-op (“at surgery”) 5-7 days post-op	Warfarin 10 mg Day before surgery 5-7 days post-op	NR Yes No
Silbersack, 2004[57] 131 Moderate KQ 1	Germany THA or TKA 35.7% 64 (29-90)	VenaFlow Calf Immediately post-op NR	LMWH (enoxaparin) 40 mg daily Evening prior to surgery 30 days	Allowed Yes (Comparator only) Intervention: Enoxaparin 40 mg daily until 30 days
Stannard, 2001[50] 107 Moderate KQs 3 and 4	United States Trauma NR NR	Kendall SCD Calf-thigh <72 hours from injury NR	PlexiPulse Calf-foot <72 hours from injury NR	No NR NR
Stone, 1996[56] 50 Moderate KQ 1	United Kingdom THA NR NR	Flowtron Calf Immediately post-op NR	LMWH (enoxaparin) 40 mg daily Evening prior to surgery Until discharge	No NR NR
Warwick, 2002[19] 229 Moderate KQ 1	United Kingdom TKA 40% 72 (NR)	A-V Impulse System Foot In recovery room Until discharge	LMWH (enoxaparin) 40 mg daily 12 hours pre-op Until discharge	Allowed Yes NR
Warwick, 1998[53] 290 Moderate KQ 1	United Kingdom THA 62.5% 68 (NR)	A-V Impulse System Foot In recovery room 7 days post-op	LMWH (enoxaparin) 40 mg daily 12 hours pre-op 7 days post-op	Allowed Yes NR

Study Information **Author, year** **Number randomized** **Risk of bias** **KQ(s)**	**Population** **Country** **Procedure** **Sex (mean % men)** **Age (mean [range])**	**Intervention (IPCD)** **Device** **Location** **Initiation** **Duration**	**Comparator** **Name** **Dosage or location** **Initiation** **Duration**	**Adjunctive Therapy*** **ASA** **GCS** **Other**
Windisch, 2011[54] 80 Moderate KQ 1	Germany TKA NR 68.9	A-V Impulse System Foot Immediately post-op 8 days post-op	LMWH (enoxaparin) 40 mg daily 24 hours pre-op 8 days post-op	Yes NR Intervention: Enoxaparin 40 mg daily until 8 days post-op
Wood, 1997[51] 136 High KQs 3 and 4	United States Spinal surgery 59% 39.5 (NR)	PlexiPulse Foot Intra-op or at surgery Until discharge	Kendall SCD Calf-thigh Post-op Until discharge	NR Yes No

*Adjunctive therapies (ASA, GCS, or Other) apply to both Intervention and Comparator groups unless otherwise noted.

Abbreviations: ASA=acetylsalicylic acid (aspirin); AV=arteriovenous; CECT=Continuous Enhanced Circulation Therapy; GCS=graduated compression stockings; IPCD=intermittent pneumatic compression device; IVC=inferior vena cava; KQ(s)=key question(s); LMWH=low molecular weight heparin; NR=not reported; PCD=pneumatic compression device; SC=subcutaneously; SCD=sequential compression device; S.F.T.=Synchronized Flow Technology; THA=total hip arthroplasty; TKA=total knee arthroplasty

References to Appendix D:

1. Cohen AT, Agnelli G, Anderson FA, et al. Venous thromboembolism (VTE) in Europe. The number of VTE events and associated morbidity and mortality. *Thromb. Haemost.* Oct 2007;98(4):756-764.
2. Beckman MG, Hooper WC, Critchley SE, Ortel TL. Venous thromboembolism: a public health concern. *Am. J. Prev. Med.* Apr 2010;38(4 Suppl):S495-501.
3. Kim YH, Oh SH, Kim JS. Incidence and natural history of deep-vein thrombosis after total hip arthroplasty. A prospective and randomised clinical study. *J. Bone Joint Surg. Br.* Jul 2003;85(5):661-665.
4. O'Reilly RF, Burgess IA, Zicat B. The prevalence of venous thromboembolism after hip and knee replacement surgery. *Med. J. Aust.* Feb 21 2005;182(4):154-159.
5. Oda T, Fuji T, Kato Y, Fujita S, Kanemitsu N. Deep venous thrombosis after posterior spinal surgery. *Spine (Phila Pa 1976).* Nov 15 2000;25(22):2962-2967.
6. Geerts WH, Pineo GF, Heit JA, et al. Prevention of venous thromboembolism: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. *Chest.* Sep 2004;126(3 Suppl):338s-400s.
7. Kahn SR, Hirsch A, Shrier I. Effect of postthrombotic syndrome on health-related quality of life after deep venous thrombosis. *Arch. Intern. Med.* May 27 2002;162(10):1144-1148.
8. Pengo V, Lensing AW, Prins MH, et al. Incidence of chronic thromboembolic pulmonary hypertension after pulmonary embolism. *N. Engl. J. Med.* May 27 2004;350(22):2257-2264.
9. Anderson FA, Jr., Zayaruzny M, Heit JA, Fidan D, Cohen AT. Estimated annual numbers of US acute-care hospital patients at risk for venous thromboembolism. *Am. J. Hematol.* Sep 2007;82(9):777-782.
10. Cohen AT, Tapson VF, Bergmann JF, et al. Venous thromboembolism risk and prophylaxis in the acute hospital care setting (ENDORSE study): a multinational cross-sectional study. *Lancet.* Feb 2 2008;371(9610):387-394.
11. Qaseem A, Chou R, Humphrey LL, Starkey M, Shekelle P. Venous thromboembolism prophylaxis in hospitalized patients: a clinical practice guideline from the American College of Physicians. *Ann. Intern. Med.* Nov 1 2011;155(9):625-632.
12. Adam SS, McDuffie JR, Lachiewicz PF, Ortel TL, Williams JW, Jr. Comparative effectiveness of new oral anticoagulants and standard thromboprophylaxis in patients having total hip or knee replacement: a systematic review. *Ann. Intern. Med.* Aug 20 2013;159(4):275-284.
13. Kahn SR, Lim W, Dunn AS, et al. Prevention of VTE in nonsurgical 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):e195S-226S.
14. Mont MA, Jacobs JJ. AAOS clinical practice guideline: preventing venous thromboembolic disease in patients undergoing elective hip and knee arthroplasty. *J. Am. Acad. Orthop. Surg.* Dec 2011;19(12):777-778.
15. 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-277S.

16. 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-325S.

17. Colwell CW, Jr., Froimson MI, Mont MA, et al. Thrombosis prevention after total hip arthroplasty: a prospective, randomized trial comparing a mobile compression device with low-molecular-weight heparin. *J. Bone Joint Surg. Am.* Mar 2010;92(3):527-535.

18. Pitto RP, Hamer H, Heiss-Dunlop W, Kuehle J. Mechanical prophylaxis of deep-vein thrombosis after total hip replacement a randomised clinical trial. *J. Bone Joint Surg. Br.* Jul 2004;86(5):639-642.

19. Warwick D, Harrison J, Whitehouse S, Mitchelmore A, Thornton M. A randomised comparison of a foot pump and low-molecular-weight heparin in the prevention of deep-vein thrombosis after total knee replacement. *J. Bone Joint Surg. Br.* Apr 2002;84(3):344-350.

20. 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):1003-1020.

21. Kakkos SK, Warwick D, Nicolaides AN, Stansby GP, Tsolakis IA. Combined (mechanical and pharmacological) modalities for the prevention of venous thromboembolism in joint replacement surgery. *J. Bone Joint Surg. Br.* Jun 2012;94(6):729-734.

22. Glotzbecker MP, Bono CM, Wood KB, Harris MB. Thromboembolic disease in spinal surgery: a systematic review. *Spine (Phila Pa 1976).* Feb 1 2009;34(3):291-303.

23. Murakami M, McDill TL, Cindrick-Pounds L, et al. Deep venous thrombosis prophylaxis in trauma: improved compliance with a novel miniaturized pneumatic compression device. *J. Vasc. Surg.* Nov 2003;38(5):923-927.

24. Cornwell EE, 3rd, Chang D, Velmahos G, et al. Compliance with sequential compression device prophylaxis in at-risk trauma patients: a prospective analysis. *Am. Surg.* May 2002;68(5):470-473.

25. Anderson FA, Jr., Spencer FA. Risk factors for venous thromboembolism. *Circulation.* Jun 17 2003;107(23 Suppl 1):I9-16.

26. Kearon C. Natural history of venous thromboembolism. *Circulation.* Jun 17 2003;107(23 Suppl 1):I22-30.

27. Malone MD, Cisek PL, Comerota AJ, Jr., Holland B, Eid IG, Comerota AJ. High-pressure, rapid-inflation pneumatic compression improves venous hemodynamics in healthy volunteers and patients who are post-thrombotic. *J. Vasc. Surg.* Apr 1999;29(4):593-599.

28. Comerota AJ, Chouhan V, Harada RN, et al. The fibrinolytic effects of intermittent pneumatic compression: mechanism of enhanced fibrinolysis. *Ann. Surg.* Sep 1997;226(3):306-313; discussion 313-304.

29. Kohro S, Yamakage M, Sato K, Sato JI, Namiki A. Intermittent pneumatic foot compression can activate blood fibrinolysis without changes in blood coagulability and platelet activation. *Acta Anaesthesiol. Scand.* May 2005;49(5):660-664.

30. Zhao JM, He ML, Xiao ZM, Li TS, Wu H, Jiang H. Different types of intermittent pneumatic compression devices for preventing venous thromboembolism in patients after total hip replacement. *Cochrane Database Syst Rev.* 2012;11:CD009543.

31. Westrich GH, Specht LM, Sharrock NE, et al. Pneumatic compression hemodynamics in total hip arthroplasty. *Clin. Orthop. Relat. Res.* Mar 2000(372):180-191.
32. Colwell CW, Jr., Froimson MI, Anseth SD, et al. A mobile compression device for thrombosis prevention in hip and knee arthroplasty. *J. Bone Joint Surg. Am.* Feb 5 2014;96(3):177-183.
33. Lefebvre C, Manheimer E, Glanville J. Chapter 6: Searching for studies. In: Higgins JPT, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. www.cochrane-handbook.org. Accessed July 22, 2014.
34. Agarwal R, Hecht TE, Lazo MC, Umscheid CA. Venous thromboembolism prophylaxis for patients undergoing bariatric surgery: a systematic review. *Surg. Obes. Relat. Dis.* Mar 4 2010;6(2):213-220.
35. Kakkos SK, Caprini JA, Geroulakos G, Nicolaides AN, Stansby GP, Reddy DJ. Combined intermittent pneumatic leg compression and pharmacological prophylaxis for prevention of venous thromboembolism in high-risk patients. *Cochrane Database Syst Rev.* 2008(4):CD005258.
36. Lederle FA, Zylla D, MacDonald R, Wilt TJ. Venous thromboembolism prophylaxis in hospitalized medical patients and those with stroke: a background review for an American College of Physicians Clinical Practice Guideline. *Ann. Intern. Med.* Nov 1 2011;155(9):602-615.
37. Morris RJ, Woodcock JP. Intermittent pneumatic compression or graduated compression stockings for deep vein thrombosis prophylaxis? A systematic review of direct clinical comparisons. *Ann. Surg.* Mar 2010;251(3):393-396.
38. Naccarato M, Chiodo Grandi F, Dennis M, Sandercock PA. Physical methods for preventing deep vein thrombosis in stroke. *Cochrane Database Syst Rev.* 2010(8):CD001922.
39. Pour AE, Keshavarzi NR, Purtill JJ, Sharkey PF, Parvizi J. Is venous foot pump effective in prevention of thromboembolic disease after joint arthroplasty: a meta-analysis. *J. Arthroplasty.* Mar 2013;28(3):410-417.
40. Rahn DD, Mamik MM, Sanses TV, et al. Venous thromboembolism prophylaxis in gynecologic surgery: a systematic review. *Obstet. Gynecol.* Nov 2011;118(5):1111-1125.
41. Agency for Healthcare Research and Quality. *Methods Guide for Effectiveness and Comparative Effectiveness Reviews*. Rockville, MD: Agency for Healthcare Research and Quality. Available at: http://www.effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=318. Accessed November 6, 2014.
42. Viechtbauer W. Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software.* 2010;36(3):1-48.
43. DerSimonian R, Laird N. Meta-analysis in clinical trials. *Control. Clin. Trials.* Sep 1986;7(3):177-188.
44. Knapp G, Hartung J. Improved tests for a random effects meta-regression with a single covariate. *Stat. Med.* Sep 15 2003;22(17):2693-2710.
45. Guyatt G, Oxman AD, Akl EA, et al. GRADE guidelines: 1. Introduction-GRADE evidence profiles and summary of findings tables. *J. Clin. Epidemiol.* Apr 2011;64(4):383-394.

46. Lachiewicz PF, Kelley SS, Haden LR. Two mechanical devices for prophylaxis of thromboembolism after total knee arthroplasty. A prospective, randomised study. *J. Bone Joint Surg. Br.* Nov 2004;86(8):1137-1141.
47. Pagella P, Cipolle M, Sacco E, Matula P, Karoly E, Bokovoy J. A randomized trial to evaluate compliance in terms of patient comfort and satisfaction of two pneumatic compression devices. *Orthop. Nurs.* May-Jun 2007;26(3):169-174.
48. Robertson KA, Bertot AJ, Wolfe MW, Barrack RL. Patient compliance and satisfaction with mechanical devices for preventing deep venous thrombosis after joint replacement. *J. South. Orthop. Assoc.* Fall 2000;9(3):182-186.
49. Rokito SE, Schwartz MC, Neuwirth MG. Deep vein thrombosis after major reconstructive spinal surgery. *Spine (Phila Pa 1976).* Apr 1 1996;21(7):853-858; discussion 859.
50. Stannard JP, Riley RS, McClenney MD, Lopez-Ben RR, Volgas DA, Alonso JE. Mechanical prophylaxis against deep-vein thrombosis after pelvic and acetabular fractures. *J. Bone Joint Surg. Am.* Jul 2001;83-a(7):1047-1051.
51. Wood KB, Kos PB, Abnet JK, Ista C. Prevention of deep-vein thrombosis after major spinal surgery: a comparison study of external devices. *J. Spinal Disord.* Jun 1997;10(3):209-214.
52. Blanchard J, Meuwly JY, Leyvraz PF, et al. Prevention of deep-vein thrombosis after total knee replacement. Randomised comparison between a low-molecular-weight heparin (nadroparin) and mechanical prophylaxis with a foot-pump system. *J. Bone Joint Surg. Br.* Jul 1999;81(4):654-659.
53. Warwick D, Harrison J, Glew D, Mitchelmore A, Peters TJ, Donovan J. Comparison of the use of a foot pump with the use of low-molecular-weight heparin for the prevention of deep-vein thrombosis after total hip replacement. A prospective, randomized trial. *J. Bone Joint Surg. Am.* Aug 1998;80(8):1158-1166.
54. Windisch C, Kolb W, Kolb K, Grutzner P, Venbrocks R, Anders J. Pneumatic compression with foot pumps facilitates early postoperative mobilisation in total knee arthroplasty. *Int. Orthop.* Jul 2011;35(7):995-1000.
55. Ginzburg E, Cohn SM, Lopez J, Jackowski J, Brown M, Hameed SM. Randomized clinical trial of intermittent pneumatic compression and low molecular weight heparin in trauma. *Br. J. Surg.* Nov 2003;90(11):1338-1344.
56. Stone MH, Limb D, Campbell P, Stead D, Culleton G. A comparison of intermittent calf compression and enoxaparin for thromboprophylaxis in total hip replacement. A pilot study. *Int. Orthop.* 1996;20(6):367-369.
57. Silbersack Y, Taute BM, Hein W, Podhaisky H. Prevention of deep-vein thrombosis after total hip and knee replacement. Low-molecular-weight heparin in combination with intermittent pneumatic compression. *J. Bone Joint Surg. Br.* Aug 2004;86(6):809-812.
58. Edwards JZ, Pulido PA, Ezzet KA, Copp SN, Walker RH, Colwell CW, Jr. Portable compression device and low-molecular-weight heparin compared with low-molecular-weight heparin for thromboprophylaxis after total joint arthroplasty. *J. Arthroplasty.* Dec 2008;23(8):1122-1127.
59. Pambianco G, Orchard T, Landau P. Deep vein thrombosis: prevention in stroke patients during rehabilitation. *Arch. Phys. Med. Rehabil.* Apr 1995;76(4):324-330.

60. Bockheim HM, McAllen KJ, Baker R, Barletta JF. Mechanical prophylaxis to prevent venous thromboembolism in surgical patients: a prospective trial evaluating compliance. *J. Crit. Care.* Jun 2009;24(2):192-196.
61. Greenfield LJ, Proctor MC, Rodriguez JL, Luchette FA, Cipolle MD, Cho J. Posttrauma thromboembolism prophylaxis. *J. Trauma.* Jan 1997;42(1):100-103.
62. Proctor MC, Greenfield LJ, Wakefield TW, Zajkowski PJ. A clinical comparison of pneumatic compression devices: the basis for selection. *J. Vasc. Surg.* Sep 2001;34(3):459-463; discussion 463-454.
63. Schulman S, Angeras U, Bergqvist D, Eriksson B, Lassen MR, Fisher W. Definition of major bleeding in clinical investigations of antihemostatic medicinal products in surgical patients. *J. Thromb. Haemost.* Jan 2010;8(1):202-204.
64. Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *J. Bone Joint Surg. Am.* Apr 2007;89(4):780-785.
65. Amin A, Stemkowski S, Lin J, Yang G. Thromboprophylaxis rates in US medical centers: success or failure? *J. Thromb. Haemost.* Aug 2007;5(8):1610-1616.
66. Tapson VF, Decousus H, Pini M, et al. Venous thromboembolism prophylaxis in acutely ill hospitalized medical patients: findings from the International Medical Prevention Registry on Venous Thromboembolism. *Chest.* Sep 2007;132(3):936-945.
67. Schleyer AM, Schreuder AB, Jarman KM, Logerfo JP, Goss JR. Adherence to guideline-directed venous thromboembolism prophylaxis among medical and surgical inpatients at 33 academic medical centers in the United States. *Am. J. Med. Qual.* May-Jun 2011;26(3):174-180.
68. Herbers J, Zarter S. Prevention of venous thromboembolism in Department of Veterans Affairs hospitals. *J. Hosp. Med.* 2010;5(1):E21-E25.
69. Agha Z, Lofgren RP, VanRuiswyk JV, Layde PM. Are patients at Veterans Affairs medical centers sicker? A comparative analysis of health status and medical resource use. *Arch. Intern. Med.* Nov 27 2000;160(21):3252-3257.
70. Anonymous. Intermittent pneumatic compression devices. *Health Devices.* Jun 2007;36(6):177-204.
71. Gelfer Y, Tavor H, Oron A, Peer A, Halperin N, Robinson D. Deep vein thrombosis prevention in joint arthroplasties: continuous enhanced circulation therapy vs low molecular weight heparin. *J. Arthroplasty.* Feb 2006;21(2):206-214.
72. Chin PL, Amin MS, Yang KY, Yeo SJ, Lo NN. Thromboembolic prophylaxis for total knee arthroplasty in Asian patients: a randomised controlled trial. *J. Orthop. Surg. (Hong Kong).* Apr 2009;17(1):1-5.
73. Robinson KA, Saldanha IJ, Mckoy NA. Frameworks for Determining Research Gaps During Systematic Reviews. Methods Future Research Needs Report No. 2. (Prepared by the Johns Hopkins University Evidence-based Practice Center under Contract No. HHSA 290-2007-10061-I.) AHRQ Publication No. 11-EHC043-EF. Rockville, MD: Agency for Healthcare Research and Quality. June 2011. www.effectivehealthcare.ahrq.gov/reports/final.cfm. .

APPENDIX E. TECHNICAL FEATURES OF NAMED DEVICES EVALUATED IN INCLUDED STUDIES

Manufacturer	Device Name	Sleeve Location	Single vs Multiple (Bladder Position)	Average Cycle Duration	Average Compression Duration	Pressure Pattern (Constant vs Sequential) and Amount	Inflation Rise Time (Rapid vs Slow)	Portable?	Hour Meter?
Aircast	VenaFlow®	Calf*	Multiple	60 sec	6 sec	Sequential; 52 mm Hg (distal), 45 mm Hg (proximal)	Rapid	No	Yes
Huntleigh	Flowtron®	Calf*	Single	60 sec	12 sec	Constant; 30-60 mm Hg	Slow	No†	No
Jobst	Anthrombic Pump (System 2500)‡	Calf§	Multiple	60 sec	7-8 sec	Sequential; 30-50 mm Hg	Slow	No	No
NuTech	PlexiPulse®	Foot, foot-calf‖	Multiple	Varies: 20-60 sec	2.5 sec	Constant; 160 mm Hg	Rapid	No	Yes (1 study) No (2 studies)
Kendall	Kendall SCD™	Calf, calf-thigh#	Multiple	Varies; 20-60 sec	11 sec	Sequential; 30-45 mm Hg	Slow	No†	No
Medical Compression Systems	ActiveCare DVT® or ActiveCare+S.F.T.® CECTs	Calf*	Multiple	Varies; 30-60 sec	10 sec	Sequential; Average maximum 50 mm Hg	Slow	Yes	Yes
	WizAir DVT™ CECT	Calf	Multiple	60 sec	8 sec	Sequential; average maximum 50 mm Hg	Slow	Yes	Yes
Novamedix	A-V Impulse System™	Foot	Single (sole of foot)	Varies: 20-50 sec	3 sec	Constant; 60-200 mm Hg	Rapid	No	Yes

*Sleeves also available for foot and calf-thigh locations.

†Device available in both portable and non-portable options; answer given here is for the specific devices evaluated in the included studies.

‡Specific information on this device was not provided in the published study included in our report, but rather by Huntleigh, the company that most recently bought out Jobst.

§Sleeve also available for calf-thigh location.

‖Sleeve also available for calf location.

#Sleeve also available for foot location.

Abbreviations: CECT(s)=continuous enhanced circulation therapy device(s); DVT=deep vein thrombosis; SCD=sequential compression device; S.F.T.=Synchronized Flow Technology