

European first aid guidelines

Resuscitation (2007) 72, 240–251

Bleeding

Findings

One guideline,⁴ 2 SRs on control of arterial puncture⁵⁶ and on femoral vessel injuries in warfare,⁵⁷ 2 RCTs on control of arterial puncture,^{58,59} 11 case reports or series,^{60–70} and 14 expert opinion scripts^{71–84} were selected.

The effectiveness of controlling external bleeding through applying direct pressure or a compression bandage to the site of bleeding is proven by high level of evidence (LOE 1+,^{4,56,58,59} LOE 3,^{61,62,65,67,68} LOE 44,^{71–78,80–83}). There is insufficient evidence about the effectiveness of indirect pressure on pressure points and elevation (LOE 44,^{72,74–76,80–82}). Because of the possible complications, the use of a tourniquet is contraindicated for laypersons (LOE 3^{60,63–66,68–70}, LOE 44,^{57,72,75,76,79,80,82,84}).

56. Koreny M, Riedmuller E, Nikfardjam M, Siostrzonek P, Mullner M. Arterial puncture closing devices compared with standard manual compression after cardiac catheterization: systematic review and meta-analysis. *JAMA* 2004;291:350–7.
57. Pearl JP, McNally MP, Perdue PW. Femoral vessel injuries in modern warfare since Vietnam. *Military Med* 2003;168:733–5.
58. Lehmann KG, Heath-Lange SJ, Ferris ST. Randomized comparison of hemostasis techniques after invasive cardiovascular procedures. *Am Heart J* 1999;138:1118–25.
59. Walker SB, Cleary S, Higgins M. Comparison of the FemoStop device and manual pressure in reducing groin puncture site complications following coronary angioplasty and coronary stent placement. *Int J Nurs Pract* 2001;7:366–75.

- 61 Naimer SA, Nash M, Niv A, Lapid O. Control of massive bleeding from facial gunshot wound with a compact elastic adhesive compression dressing. *Am J Emerg Med* 2004;22:586–8.
62. Gadzhiev NA, Kosenkov AN. Organization of treating patients with major vessel injuries at stages of evacuation. *Khirurgiiia* 2003;6:22–7.
63. Pilcher DB, Gettinger Jr CE, Seligson D. Recurrent themes in ambulance critique review sessions over eight years. *J Trauma* 1979;195:324–8.
64. Bouma S. First aid in hemorrhages, the use of tourniquets. *Ned Tijdschr Geneeskd* 1966;110:1255–7.
65. Dorlac WC, DeBakey ME, Holcomb JB, et al. Mortality from isolated civilian penetrating extremity injury. *J Trauma Injury Infect Crit Care* 2005;59:217–22.
66. Calkins D, Snow C, Costello M, Bentley TB. Evaluation of possible battlefield tourniquet systems for the far-forward setting. *Military Med* 2000;165:379–84.
67. Pohlemann T, Paul C, Gansslen A, Regel G, Tscherne H. Traumatic hemipelvectomy. Experiences with 11 cases. *Unfallchirurg* 1996;99:304–12.
68. Fasol R, Irvine S, Zilla P. Vascular injuries caused by antipersonnel mines. *J Cardiovasc Surg* 1989;30:467–72.

69. Kornbluth ID, Freedman MK, Sher L, Frederick RW. Femoral, saphenous nerve palsy after tourniquet use: a case report. *Arch Phys Med Rehabil* 2003;84:909—11.
70. Savvidis E, Parsch K. Prolonged transitory paralysis after pneumatic tourniquet use on the upper arm. *Unfallchirurg* 1999;102:141—4.
71. Beck A, Gebhard F, Kinzl L, Strecker W. Principles and techniques of accident surgery primary care at the accident site. *Unfallchirurg* 2001;104:1082—99.
72. Boericke PH, Boericke CH. Emergency! Part 2. First aid for open wounds, severe bleeding, shock, and closed wounds. *Nursing* 1975;5:40—6.
73. Broos PL, Willaert WI. Notorious pitfalls in the care of multitrauma patients. *Acta Chir Belg* 2003;103:346—54.
74. Clifford CC. Treating traumatic bleeding in a combat setting. *Mil Med* 2004;169(8—10):4.
75. Donelan S. Teaching wound care and bandaging: an historical perspective. *Wilderness Environ Med* 2003;14:47—56.
76. Dunant JH. Emergency treatment of hemorrhage. *Ther Umsch* 1979;36:1059—61.
77. Garner JP, Brown RFR. Recent advances in topical agents for prehospital haemostasis. *Trauma* 2002;4:203—9.
78. Holcomb JB. Methods for improved hemorrhage control. *Crit Care* 2004;8:S57—60.
79. Husum H, Gilbert M, Wisborg T, Pillgram-Larsen J. Prehospital tourniquets: there should be no controversy. *J Trauma Injury Infect Crit Care* 2004;56:214—5.
80. Jacobs LM. Initial management and evaluation of the multisystem injured patient, Part 1. *J Natl Med Assoc* 1987;79:361—70.
81. Kunin IJ. Principles of first aid. *Dent Clin North Am* 1965;7:89—801.
82. London PS. Treatment of soft tissue injuries at the roadside. *Br Med J* 1969;4:284—6.
83. Muhr G, Tscherne H. Rescue and first aid for the severely traumatized. *Chirurg* 1978;49:593—600.
84. Navein J, Coupland R, Dunn R. The tourniquet controversy. *J Trauma* 2003;54:S219—20.