Authors: Per Gundtoft, Andres Orlando Villanueva, Tommaso Bonanzinga, Hamidreza Yazdi, Carlos Arturo Romero, Mauricio Cordova

# QUESTION 7: When should sterile surgical dressings be removed and how frequently should subsequent dressings be changed following orthopaedic procedures?

RECOMMENDATION: The dressing placed over the surgical wound under sterile conditions in the operating room should be changed based on saturation of the dressing. Early removal and frequent changes of the surgical dressing are not needed if there is no significant bleeding or drainage on the original dressing. If the dressing remains dry, wound coverage for a minimum of 48 hours has been recommended.

LEVEL OF EVIDENCE: Limited

DELEGATE VOTE: Agree: 97%, Disagree: 3%, Abstain: 0% (Unanimous, Strongest Consensus)

## RATIONALE

Sterile dressings are applied to the skin following primary closure in most orthopaedic surgery. Dressing acts as a physical barrier, which protects the wound from contamination until the continuity of the skin is restored [1]. The first phase of the wound healing cycle is the hemostasis phase, during which the continuity of the skin is restored. In the clean wound, with regular edges following incisions, the wound is usually closed within 48 hours [2]. The general practice is to cover surgical incisions post procedure to control postoperative bleeding, to absorb exudates and to provide protection [3]. The ideal dressings produce a moist, warm and clean environment that promotes wound healing [4,5]. However, the moist environment created by a dressing left on the wound for a longer period could increase the risk of maceration, leading to weakening of the tissue and wound [6].

Concerning the prevention of surgical site infections (SSIs), the ideal timing of dressing removal is an unresolved issue. Some professionals prefer to leave wounds uncovered from the moment of closure, others uncover them after a certain time and still others keep them covered until suture removal [3]. Clinical guidelines from the Centers for Disease Control and Prevention (CDC) and the British National Collaborating Centre for Women's and Children's Health (the latter commissioned by the National Institute for Health and Clinical Excellence in 2008) mainly recommend covering surgical incisions with a dressing for a period of at least 48 hours postoperatively. Uncovered or early exposed wounds seem to be associated with an increased risk of contamination and SSIs, but some studies suggest that longer dressing periods have no benefits [3]. While an abundance of studies comparing different dressings was available, no meta-analyses or systematic reviews of randomized control trial (RCT) of early vs. late removal of sterile dressings in orthopaedic surgery exist. One RCT comparing removal of a bulky dressing after 2 weeks compared to after 48 to 72 hours following carpal tunnel decompression found no significant difference in wound complication, but the study consisted of a rather small cohort of 94 patients, none of whom developed a SSI [7].

One systematic review on early vs. late dressing removal including all surgical specialties was identified, in which 3 RCTs were included with a total of 280 patients [8]. Participants in the 3 studies were randomized to early dressing removal (< 48 hours following surgery) or delayed dressing removal (continued dressing for > 48 hours following surgery). The primary outcome was surgical site infection as defined by Horan [9]. There was no significant difference in the proportion of people who developed superficial SSI between the early and delayed dressing removal groups. No deep SSI or deep dehiscence was reported in the early or in the delayed dressing removal groups [8].

In addition to the systematic review, two randomized controlled trials were identified, which investigated the effect of early removal of wound dressing on the risk of infection. The primary outcome for both studies was SSI. Heal et al. compared removing the dressing within the first 12 hours with leaving the dressing on for the first 48 hours and found no statistically significant difference in the incidence of surgical site infection [10]. In a similar study, Chrintz et al. compared removal of dressing after 24 hours with keeping the wound dressed until removal of the sutures and found no statistically significant difference in the incidence of surgical site infection [11].

If the dressing is disturbed less often, the risk of infection is reduced and this aids the healing process [12]. Every time a dressing is changed, there is a potential risk for introducing pathogens into the wound, which can subsequently lead to SSI or PJI. Wound dressings keep the wound near core body temperature, which increases the rate of mitotic cell division and leukocyte activity that is necessary for wound healing. When a dressing is changed, it takes three to four hours for the cellular activity of the wound to resume. Hence, episodic cooling associated with dressing changes should be avoided as much as possible. Also, fewer dressing changes protects the wound from repeated exposure to pathogens in the surrounding air [13].

The costs associated with a wound dressing depends on two factors: the unit cost of the dressing and the number of dressing changes required [14]. Fewer dressing changes can decrease the costs.

Dressing changes can also be affected by dressing type. Modern dressings need less frequent changes and can decrease the rate of acute SSI and periprosthetic joint infection (PJI) [15]. Abuzakuk et al. demonstrated that there were less dressing changes for hydrofiber dressings within the first five postoperative days compared to the use of a central pad group. They theorized that leaving the hydro fiber dressing undisturbed for a longer period of time could help prevent wound infections [16]. Hopper et al. showed that, wear time for the traditional dressing (two days) was significantly shorter than for the modern dressing (seven days, $p < 0.001$), and required more changes . They also found that the modern dressing can create less need for dressing changes, thus decreasing burden on healthcare personnel, diminishing superficial wound problems and avoiding delays in hospital discharge due to wound healing issues [17].

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