

QUESTION 9: What is the definition of persistent wound drainage?

RECOMMENDATION: There is no validated definition of “persistent wound drainage.” In the absence of such data, we define persistent wound drainage as any continued fluid extrusion from the operative site occurring beyond 72 hours from index surgery.

LEVEL OF EVIDENCE: Consensus

DELEGATE VOTE: Agree: 78%, Disagree: 17%, Abstain: 5% (Super Majority, Strong Consensus)

RATIONALE

Early wound drainage is not uncommon in patients undergoing total joint arthroplasty (TJA), and can be observed in up to 10% of patients [1–3]. Serous or serosanguinous drainage shortly after the procedure is benign and can be explained by the surgical disruption of superficial capillaries. On the contrary, many publications have noted the severity of persistent drainage, which may potentially be a sign of an evolving infectious process [2,4–8]. The previous 2013 International Consensus Meeting on Periprosthetic Joint Infection (ICM) reached a strong consensus that continued drainage after 72 hours postoperatively should be closely monitored and that a wound persistently draining greater than 5 or 7 days after diagnosis should be re-operated on without delay [5]. It is also advisable to refrain from collecting culture samples of the drainage early on, since these will often yield normal skin flora [4].

In a study conducted by Patel et al. composed of 2,437 total hip and knee arthroplasty (THA and TKA) patients, they concluded that every additional day of wound drainage increased the probability of developing a wound complication following THA and TKA, by 42% and 29% respectively [9]. In addition, Galat et al. performed a study of 17,784 patients who underwent primary TKA and discovered that patients who require earlier surgical intervention for wound-healing complications are at a significantly increased risk for additional interventions, such as deep infection surgery, resection arthroplasty, muscle flap coverage or amputation [3].

The difficulty lies in accepting a definition for “persistent drainage” to allow for timely intervention, since literature is not consistent. For instance, in a recent study involving 127 orthopaedic surgeons who replied to wound drainage questionnaires, the highest portion of respondents (36.7%) defined persistent wound drainage as greater than 5 days postoperatively, while other respondents defined the duration as anywhere from greater than 1 day to greater than 14 days postoperatively [10]. Weiss and Krackow were among the first to attempt defining persistent drainage [1]. Several other authors afterward defined persistent wound drainage by time, type of exudate (serous, sanguineous, purulent, etc.), site (wound or from suction drains) and presence of microorganisms from culture. See Table 1 below for a list of predominant definitions that have developed.

TABLE 1. Literature with definitions of persistent wound drainage

Author	Year	Number of Procedures	Definition	Additional Notes/ Conclusions
Weiss [1]	1993	597	<ol style="list-style-type: none"> 1. Drainage for 4 consecutive days after POD 5 2. Drainage that significantly soaks a 2" x 2" gauze dressing 3. Drainage that emanated from the same specific site(s) along the wound 	Primary and revision TKA, 1.3% developed persistent drainage
Saleh [6]	2002	2,305	2 days PO for non-infected cases, 5.5 days PO for infected cases.	12.7-times greater risk of SSSI for wounds draining more than 5 days
Jaberi [2]	2008	11,785	Drainage greater than 48 hours post-op that soaks through post-op dressings	Primary and revision TJA, 2.9% developed persistent drainage
Butt [11]	2011	77	Continued drainage beyond POD 4	Primary TKA, periarticular local anesthesia, subvastus approach, and tourniquet time led to less wound drainage
Hansen [12]	2013	109	Continued drainage beyond POD 3 or 4	Primary and revision THA
Parvizi [5] (2013 ICM on PJI)	2013	n/a	Continued drainage from operative site greater than 72 hours post-op	Strong consensus among delegates. Persistent drainage more than 5 or 7 days after diagnosis should be re-operated on without delay.

POD, postoperative day; TKA, total knee arthroplasty; TJA, total joint arthroplasty; SSSI, superficial surgical site infection; ICM, international consensus meeting; PJI, periprosthetic joint infection

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