An Evidence Based Approach to Determining Hospital Suction Canister Change Protocols

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Abstract

Issue: Suction collection canisters are used in almost every patient area of a hospital. Once employed clinically, they become an environmental reservoir of contaminants and pathogens. In an attempt to remove this vector, hospital infection control bundles typically include recommendations for canister changes Q24hr (every 24 hours). There is, however, no evidence based standard that exists pertaining to this issue and ultimately the decision to change a canister is left up to the clinician. This study will examine if evidence exists to support the Q24hr protocol or if another protocol is more applicable.

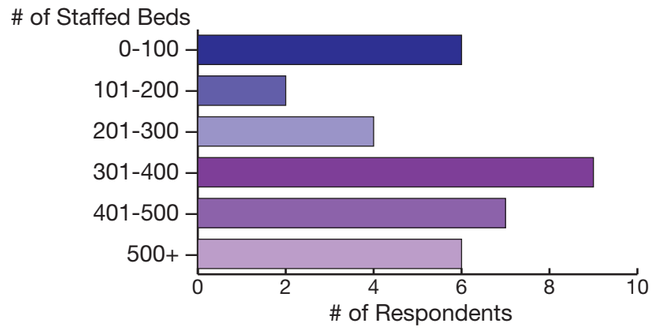
Project: A review of contemporary published research, looking for evidence based Q24hr canister change recommendations was conducted. In addition, a survey was created and distributed to 608 critical care nurses inquiring about facility specific canister change protocols and the justification for using them.

Results: The review of published, peer reviewed articles (PubMed 1965-2010) on suction collection systems indicates that there is a patient contamination risk associated with suction canisters (n=9). Applicable protocols and published research articles were identified as recommending a Q24hr or earlier canister change. None of the protocols cited evidence to support their chosen solution. Peer reviewed articles showed that exogenous pathogens existed in the suction circuit but no attempt was made to track the progression of bacterial growth, therefore, a time based recommendation to remove the risk was not stated. An *in vitro* study showed that pathogens from a suction regulator could contaminate a sterile suction collection canister at levels >$1x10^3$ cfu/ml in as little as 30 minutes. This same contamination was found in a patient analog in less than 24hrs.

Lessons Learned: The contemporary literature review does not substantiate the Q24hr recommendation. *In vitro* work performed shows that a significant risk to the patient exists at 24hrs. Results from the survey showed that although 93% of facilities have a canister change protocol, only 53% of them change the canister on a Q24hr basis. We suggest that more evidence needs to be obtained for generating canister change protocols. Also, facilities should study their own suction circuits in order to identify any associated risk.

Results

Average Number of Staffed Beds at Surveyed Hospitals = 389

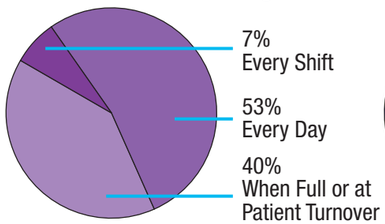


93% have a hospital protocol for suction canisters

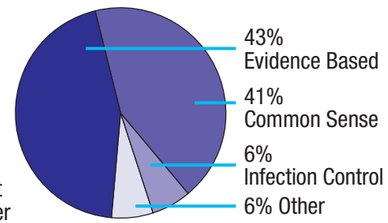
97% use a new collection canister for each patient change

36% feel there is an infection risk attributable to suction canisters

When Canisters are Changed



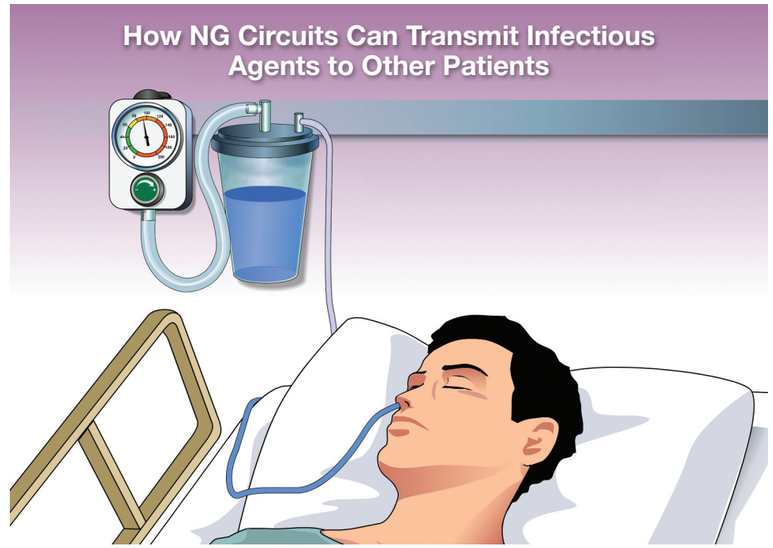
Reason for Canister Change Protocol

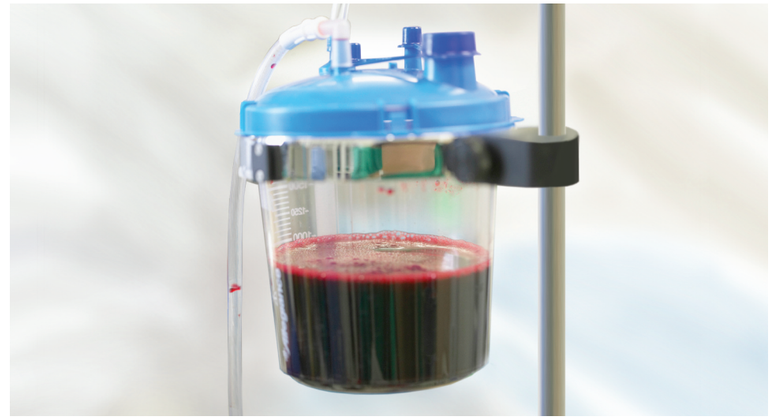


Issues

1. Surveyed respondents indicate there is no uniform standard for handling suction collection canisters in patient care areas.
2. Published hospital infection control bundles include recommendations to change suction canisters at Q24hrs.
3. A contemporary literature review did not reveal evidence based support for a 24hr change canister change protocol.
4. Two published peer reviewed articles (*in vitro* and *in vivo*) implicate suction collection circuits in possible patient cross contamination.

Canister Contaminants





Lessons Learned

1. Suction circuits are not exclusively one way, and suction collection canisters present large reservoirs of nosocomial pathogen contaminants in the patient care area.
2. Hospitals should consider careful examination of their suction collection circuit change protocol and the processing of reusable medical equipment that control these circuits.