Swabbing Vial Tops

Jaymin Patel, MD¹ and Clark C. Smith, MD, MPH² on behalf of the Spine Intervention Society's Patient Safety Committee

¹Emory University, Department of Orthopaedics, Atlanta, Georgia, U.S.A.;
²Columbia University Medical Center, Rehabilitation and Regenerative Medicine, New York, NY, U.S.A.

Myth: 60-70% alcohol, applied topically, kills all harmful pathogens.
Fact: Alcohol is effective against some, but not all, infectious agents.

At concentrations of 60-70% or greater, isopropyl alcohol has germicidal activity against both gram negative and gram positive bacteria, such as E. coli or MRSA, respectively. Alcohol is also effective against many viruses including HIV, influenza, RSV, and HSV. Hepatitis B and C are susceptible to alcohol, but only at concentrations of at least 60%. Alcohol is not effective against bacterial spores (such as those causing clostridium difficile) [1]. Bactericidal function is accomplished during the evaporation of the liquid alcohol and is not complete until dry.

Myth: Swabbing of vial tops is unnecessary.
Fact: Although there is limited evidence of efficacy, the CDC and WHO do recommend swabbing vial tops.

The 2010 American Society of Anesthesiology (ASA) guidelines support swabbing vial tops.

“Use aseptic technique, including use of an alcohol swab or appropriate disinfectant, to cleanse the vial's rubber septum before entering. Cleanse the neck of glass ampules with an alcohol swab and let dry before opening.” [2]

In 2010, the American Journal of Infection Control has supported disinfecting vial stoppers while using friction with sterile 70% isopropyl alcohol.

“Disinfect IV ports and vial stoppers by wiping and using friction with a sterile 70% isopropyl alcohol, ethyl/ethanol alcohol, iodophor or other approved antiseptic swab. Allow the port to dry before accessing.” [3]


The World Health Organization (WHO) suggested in 2003 that swabbing vial tops is unnecessary.

“Swabbing of clean vial tops or ampoules with an antiseptic or disinfectant is unnecessary. If swabbing with an antiseptic is selected for use, use a clean, single-use swab and maintain product-specific recommended contact time. Do not use cotton balls stored wet in a multi-use container.” [5]

The WHO points to several instances of spread of infection after vial swabbing, including an instance of pyogenic abscesses after alcohol swabbing of vaccine vials [6]. In these instances, spread of infection involved cotton swabs in a jar, not single-use sterile disposable alcohol swabs. In 2010, WHO recommended swabbing vial tops with 60-70% alcohol when preparing injections in its “Best Practices for Injection and Related Procedures Toolkit” [7].

Recent evidence shows that vial dust caps may not maintain sterility of vial tops. Access diaphragms were sampled after either “routine handling”, exposure to aerosolized E.Coli, or submersion into a bacterial medium. Two of twelve vials in the routine handling group were found to have microbial contaminants [8]. In regard to glass ampules, multiple studies have shown a decrease in bacterial growth on ampules swabbed with alcohol compared to those not swabbed. This would support the use of alcohol swabs to reduce the risk of bacterial transmission from a glass ampule [9,10].
Conclusions & Recommendations

- SIS recommends that physicians and health care providers swab vial tops and glass ampules with sterile isopropyl alcohol.
- There is limited evidence, which is mostly expert opinion, that swabbing vials after opening may help reduce the risk of infection.
- When vial tops or glass ampules are swabbed with alcohol, SIS recommends that physicians and health care providers:
  - allow alcohol to dry,
  - use at least 60-70% alcohol,
  - DO NOT use cotton swabs in a jar, and
  - use only single-use disposable alcohol swabs.

References

2. Recommendations for Infection Control for the Practice of Anesthesiology (3rd ed.) American Society of Anesthesiology. Developed by the ASA Committee on Occupational Health Task Force on Infection Control. 2010.