# Alcohol Based Hand Rub in the Clinical Assisted Reproductive Technologies (ART) Setting

Infection prevention and control (IPAC) is critical to the safety of all patients seeking reproductive care. It is incumbent on health care providers to protect patients and all clinical staff from health-care associated infections.

Recently, new infection control standards, Infection Prevention and Control for Clinical Office Practice from Public Health Ontario (1), have been introduced in Ontario and these have been adopted by the College of Physicians and Surgeons of Ontario and the Out of Hospital Premises Inspection Program (2). These standards are well described, evidence based, and comprehensive in nature. Compliance with these standards is required for all out of hospital health care facilities.

Hand hygiene is a pivotal step in infection control and prevention. The Infection Prevention and Control for Clinical Office Practice states "Hand hygiene is considered the most important and effective IPAC measure to prevent the spread of health -care associated infections".

As per the Best Practices for Hand Hygiene in All Health Care Settings published by Public Health Ontario (3), hand hygiene can be performed in two ways;

1. Hand sanitizing with a 70 to 90% alcohol-based hand rub (ABHR) is the preferred method for cleaning hands, when hands are not visibly soiled. Using easily-accessible ABHR in health care settings takes less time than traditional hand washing and has been shown to be more effective than washing with soap and water (even using an antimicrobial soap) when hands are not visibly soiled.

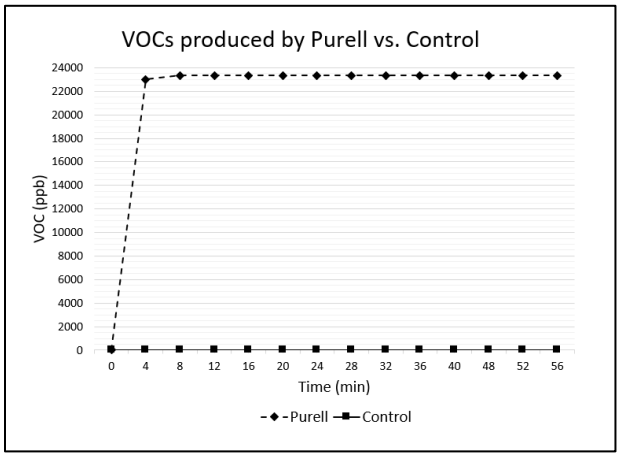
2. Hand washing with soap and running water must be performed when hands are visibly soiled. The effectiveness of alcohol is inhibited by the presence of organic material. The mechanical action of washing, rinsing and drying is the most important contributor to the removal of transient bacteria that might be present.

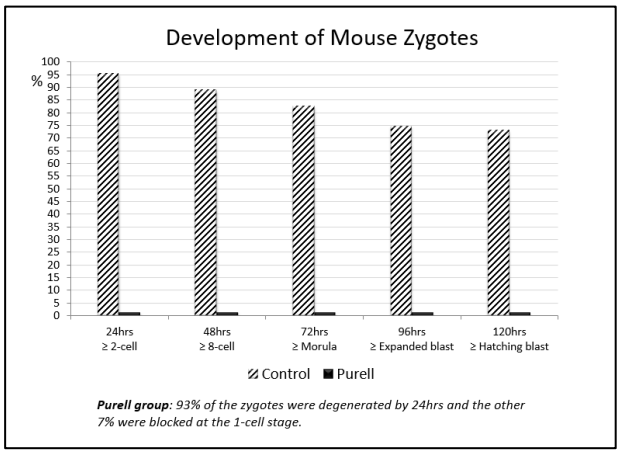
The Infection Prevention and Control for Clinical Office Practice reiterates "ABHR is the preferred method to routinely decontaminate hands in clinical situations when hands are not visibly soiled. ABHR provides for a rapid kill of most transient microorganisms, is less time-consuming than washing with soap and water and is easier on skin. While the action of hand rubbing for 15 seconds is equivalent to the time spent in hand washing, the busy health care provider can do other things while hand rubbing (e.g., converse with the patient)".

Aside from provincial guidelines, national IPAC standards also exist. Within the Accreditation Canada Standards, hand-hygiene is a required organization practice and viewed as "a critical component of an effective infection prevention and control program". This statement is directly quoted from the ART Standards for Clinical Services. The first major test of compliance specifically states ABHR stations are to be available at each point of care which is further defined by the World

Health Organization (WHO) as within three feet of where care is delivered. Accreditation Canada does not define suggested products for use or the concentration of ABHRs.

Hand hygiene in the clinical Assisted Reproductive Technologies (ART) setting is associated with some extra clinical challenges. Creating an optimal environment for embryo culture and ensuring stable pregnancy outcomes is required and expected of ART clinics. Volatile organic compounds (VOCs) are already known through evidence based literature to be harmful to embryos. ABHRs have high levels of VOCs. They are intended to kill microorganisms, but are also capable of killing mammalian embryos. VOCs from ABHRs were shown to be toxic to embryos using the well-established mouse embryo assay.




This observation poses a challenge for ART clinics where VOCs from ABHR can rapidly accumulated in proximity of gametes and embryos at time of egg collection, during laboratory procedures and at time of embryo transfer, if used by health care providers, as recommended by Public Health Ontario.

Although Public Health Ontario specifically identifies ABHR concentrations to be 70-90%, the WHO gives a lower range of 60-80% as 'most effective' (4). If operating within compliance of the WHO standards, ART clinics could consider alternative products such as chlorhexidine surgical scrubs which contains chlorhexidine gluconate and only 60% ethyl alcohol. This product has been used by some fertility centres after passing in-house mouse embryo bioassay (MEA) for embryo non-toxicity. Options to meet both the requirements for protecting against health-care associated infections as well as those which do not potentially harm embryos would be optimal.

This communication recommends that ABHR not be used in situations where the associated VOCs can come in contact with human gametes and embryos as this has detrimental effects on outcomes. The use of soap and water or other approved low VOC products would be recommended in laboratory settings when handling gametes and embryos in vitro, or clinical settings where the resulting VOC's may migrate to laboratory areas. It is also recommended that ART clinics know in detail and follow all the applicable IPAC Standards for their province.

References

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