

Risk Assessment for Use of Alcohol-Based Hand Rubs in Healthcare Facilities

Introduction

Improving hand hygiene among healthcare workers (HCW) is currently the single most effective intervention to reduce the risk of hospital-acquired infections in Australian hospitals. One way in which HCWs improve their hand hygiene practices is through the regular use of alcohol-based hand rubs at the point-of-care. There are a number of risks to patients and staff associated with the use of alcohol hand rub, **however the benefits in terms of its use far outweigh the risks.** Risk assessment should be undertaken and a management plan put in place. This particularly applies to clinical areas managing patients with alcohol use disorder and patients at risk of deliberate self harm.

The Risk Assessment below is provided as a generic guide and includes common issues that need to be addressed in all healthcare facilities. Use of this Risk Assessment may assist in addressing these issues to ensure appropriate use and placement of alcohol-based hand rubs at the point-of-care.

Risk Assessment Worksheet

Task	Storage & use of generic alcohol based hand rubs (ABHR)	Risk Assessment Completed by:	HHA Team
Date assessed	January 2009		

Potential Hazards	Likelihood (Rare/Almost Certain?)	Consequence (What can happen?)	Risk Rating (Inherent)	Risk Treatment	Risk Rating (Residual)
Splash	Unlikely Considered unlikely during normal use.	Minor/moderate Minor injury <ul style="list-style-type: none"> Irritation of eyes Moderate <ul style="list-style-type: none"> Corneal damage (refer to WHO Guidelines ¹)	Low	Elimination: N/A Substitution: N/A Engineering: Design and placement of hand dispensers minimises the risk of a splash incident. Consider: <ul style="list-style-type: none"> Metered dose dispenser Splash/drip tray Appropriate dispenser locations, (i.e. dispensers can be mounted on walls out of the reach of children or in supervised locations. Refer HHA manual Appendix 3). Avoid placing at eye level Do not place on head of bed Maximum bottle size of 500mL, no decanting of bottles is allowed 	Low

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				<p>Administrative: Education – educate staff on safe use and handling of ABHR.</p> <p>PPE: N/A</p> <p><u>Comments</u> If a splash occurs don't rub, flush eye and seek help ASAP.</p>	
Ingestion	<p>Unlikely</p> <p>Considered unlikely during normal use.</p>	<p>Minor/Moderate</p> <p><u>Alcohol Toxicity</u></p> <p>Minor - Intoxication Signs include: headache, dizziness, lack of coordination, hypoglycaemia, abdominal pain, nausea, vomiting and haematemesis</p> <p>Moderate – Severe toxicity Signs include: respiratory depression, hypotension, and coma.</p> <p>(refer to WHO Guidelines¹)</p>	Low	<p>Elimination: N/A</p> <p>Substitution:</p> <p>Engineering: Design of hand dispensers minimises the risk of accidental ingestion.</p> <p>Careful consideration for placement of ABHR in mental health facilities, and alcohol withdrawal units. Instead of ABHR being mounted in rooms, staff could be issued personal pocket bottles instead</p> <p>Also consider</p> <ul style="list-style-type: none"> • Lockable dispenser holders • Metered dose bottles • Labelling dispensers to make the alcohol content less clear at a casual glance • Adding a warning label against consumption • Inclusion of an additive in the product formula to make it unpalatable • Appropriate dispenser locations, (i.e. dispensers can be mounted on walls out of the reach of children or in supervised locations. Refer HHA manual Appendix 3). <p>Administrative: Educate staff on correct use/handling of ABHR.</p> <p>Ensure all ABHR containers are appropriately labelled.</p> <p>PPE: N/A</p>	Low

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<p>Fire</p>	<p>Possible</p> <p>Considered unlikely during normal use.</p>	<p>Moderate</p> <p>Burns to person</p> <p>Damage to property</p> <p>Incidents involving fire and ABHR have been reported, however the incidence is extremely low (refer to articles by Kramer² and Boyce³)</p>	<p>Medium</p>	<p>Elimination: N/A</p> <p>Substitution: N/A</p> <p>Engineering: Ensure appropriate safety (fire fighting) equipment is in use (i.e. smoke alarms, sprinkler systems, extinguishers etc.</p> <p>Ensure appropriate dispenser locations, (i.e. dispensers should be mounted on walls out of the reach of children, in supervised locations, and in areas fitted with working sprinklers) (Refer HHA manual Appendix 3).</p> <p>Administrative: Do not store or use hand rubs near open flames or ignition sources. No smoking should be permitted in these areas.</p> <p>Ensure appropriate emergency procedures are in place and communicated to all staff.</p> <p>Educate staff on correct use/handling ABHR – to rub hands together until alcohol has evaporated and hands are dry before moving on to another activity. (i.e. not to smoke immediately after decontaminating hands.)</p> <p>PPE: N/A</p> <p><u>Comments</u> The overall risk of fires associated with ABHR is extremely low Consult MSDS, local OH&S requirements & HHA guidelines for product placement. Consult local fire standards</p>	<p>Low</p>
<p>Spillage / Splash onto Floor</p>	<p>Possible/Likely</p> <p>Considered likely with solution</p> <p>Unlikely but possible with a gel</p>	<p>Insignificant / Minor</p> <p>Insignificant – discoloration of floor surfaces</p> <p>Minor – potential for a slip hazard</p>	<p>Low/ Medium</p>	<p>Elimination: N/A</p> <p>Substitution: N/A</p> <p>Engineering: Design of hand dispensers minimises the risk of spillage by having a drip tray underneath</p>	<p>Low</p>

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				<p>Administrative: Ensuring staff use both hands to dispense ABHR, and that spills are cleaned up immediately.</p> <p>Educate staff that 1-2 pumps from dispenser will release an appropriate amount of ABHR, and that excessive pumping is not required.</p> <p>PPE: N/A</p>	
<p>Deliberate or unintentional misuse</p>	<p>Possible Potential for deliberately or unintentional misuse of ABHR (i.e. children or the mentally ill).</p>	<p>Moderate (refer to splash, ingestion, flammability)</p>	<p>Medium</p>	<p>Elimination: N/A</p> <p>Substitution: N/A</p> <p>Engineering: Design of hand dispensers minimises the risk of a splash injury.</p> <p>Consider:</p> <ul style="list-style-type: none"> • Dispenser locations, (i.e. dispensers can be mounted on walls out of the reach of small children or in supervised locations) <p>Administrative: Do not store or use hand rubs near open flames or ignition sources.</p> <p>Consider:</p> <ul style="list-style-type: none"> • Education - Correct use of hand rub/potential hazards <p>PPE: N/A</p>	<p>Low</p>
<p>Alcohol Absorption</p> <p>Concern of skin absorption for religious or other reasons</p>	<p>Unlikely ABHR with isopropanol appears more predictable in its lack of cutaneous alcohol absorption when compared with an ethanol-based ABHR¹</p>	<p>Insignificant Local studies have demonstrated minimal rates of cutaneous alcohol absorption.</p>	<p>Low</p>	<p>Elimination: N/A</p> <p>Substitution: N/A</p> <p>Engineering: N/A</p> <p>Administrative: N/A</p>	<p>Low</p>

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	Intense use of an ethanol based ABHR has shown blood ethanol concentrations were far below levels that would result in noticeable symptoms (Kramer ref 787 in new WHO)	You cannot absorb enough through your skin to lose you drivers license (refer to article by Brown ⁴)		PPE: N/A	
Bulk Storage of ABHR (Dangerous Goods Class 3 - Flammable liquid)	Rare	Moderate (fire hazard) Burns to person Damage to property Incidents involving fire and ABHR have been reported, however the incidence is extremely low (refer to articles by Kramer ² and Boyce ³)	Low	Elimination: N/A Substitution: N/A Engineering: Ensure that bulk storage complies with state fire regulations and apply standard precautions for flammable liquids (DG class 3): <ul style="list-style-type: none"> • Store in a cool, well ventilated environment away from flammable gases, explosives, oxidising agents, halogens, aldehydes, foodstuff and sources of heat or ignition. • A designated flame proof cabinet will be required for situations where it is necessary to store more than 50L <p>The storage of ABHR in a ward or department should be kept to a minimum (as is reasonably practicable) for day-to-day purposes only.</p> Administrative: N/A PPE: N/A	
Disposal	Rare	Minor	Low	Elimination: N/A Substitution: N/A Engineering: used containers will contain residue and flammable vapours – rinsing out used containers with copious amounts of cold water will reduce the risk of fire and the containers may then be recycled (but not reused) or disposed of in general waste (ref new WHO)	Low

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				<p>Administrative: Ensure staff know the correct procedures for disposal of ABHR bottles</p> <p>PPE: N/A</p>	
Skin Irritation	Rare	Minor	Low	<p>Elimination: N/A</p> <p>Substitution: Trial alternative HH products.</p> <p>Engineering: Ensure a compatible skin moisturiser is readily available for all hospital staff in all areas</p> <p>Administrative: Ensure part of the HH education package includes advice on moisturising a minimum of 3 times a shift</p> <p>Ensure that there is procedure for staff to report skin irritations for assessment and treatment.</p> <p>PPE: N/A</p>	Low
Infection from poor compliance with HH product regimes	<p>Almost Certain On baseline HH compliance audits 7-20% compliance is "normal"</p>	<p>Major-Severe Low HH compliance is associated with higher HCAs (refer to WHO Guidelines¹)</p>	Extreme!	<p>Elimination: N/A</p> <p>Substitution: N/A</p> <p>Engineering: Ensure ABHR products are widely available with easy and unobstructed access and logical placement.</p> <p>Ensure appropriate logistics of regular procurement and replenishment of consumables</p> <p>Administrative: Ensure hospital wide education program on HH and correct use of HH products</p> <p>PPE: Appropriate use of ABHR when working with patients</p>	Medium

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References

1. World Alliance for Patient Safety. Who Guidelines on Hand Hygiene in Healthcare (Advanced Draft): Global patient safety challenge 2005-2006: Clean care is safer care. World Health Organisation; 2005.
2. Kramer A, Kampf G. Hand rub-associated fire incidents during 25,038 hospital years in Germany. *Infection control and epidemiology* 2007;28(6):745-746.
3. Boyce JM, Pearson ML. Low frequency of fires from alcohol hand rub dispensers in health care facilities. *Infection control and hospital epidemiology* 2003;24:618-619.
4. Brown TL, Gamon S, Tester P, Martin R, Hosking K, Bowkett GC, Gerostamoulos D, O'Brien M, Grayson ML. Can alcohol-based hand-rub solutions cause you to lose your driver's licence? Comparative cutaneous absorption of various alcohols. *Antimicrobial Agents Chemotherapy* 2007; 51:1107-8.

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5. Risk Consequence, Likelihood & Matrix Tables: Adapted from the Risk Management Standard AS/NZS 4360: 2004

Table 1 Consequence

Level	Descriptor	Examples of Description
1	Insignificant	Injuries not requiring first aid.
2	Minor	First aid required (only), minor property damage
3	Moderate	Medical treatment required, moderate damage to property
4	Major	Hospital admission required, major damage to property
5	Severe	Death or permanent disability to one or more persons, total loss of property.

Table 2 Likelihood

Level	Descriptor	Examples of Description
A	Almost certain	The event is expected to occur in most circumstances.
B	Likely	The event will probably occur in most circumstances.
C	Possible	The event could occur at some time.
D	Unlikely	The event is not likely to occur in normal circumstances.
E	Rare	The event may occur only in exceptional circumstances.

Table 3 Risk Rating Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost certain	Medium	High	Extreme	Extreme	Extreme
Likely	Low	Medium	High	Extreme	Extreme
Possible	Low	Low	Medium	High	Extreme
Unlikely	Low	Low	Low	Medium	High
Rare	Low	Low	Low	Low	Medium

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Hierarchy of Risk Controls

The risks must be minimised to the lowest reasonably practicable level by taking the following measures in the following order and as determined by the risk assessment.

Elimination	The job is redesigned so as to remove the hazard. However, the alternative method should not lead to a less acceptable product or less effective process.
Substitution	Replace the material or process with a less hazardous one. For example, replace mercury thermometers with spirit thermometers.
Engineering controls	Install or using additional machinery such as local exhaust ventilation to control the risk. Separating the hazard from operators by methods such as enclosing or guarding dangerous items of machinery.
Administrative controls	Reduce the time the worker is exposed to the hazard. Provide training. Perform risk assessments. Increase safety awareness signage.
Personal Protective Equipment	Only after all the previous measures have been tried and found to be ineffective in controlling the risks should Personal Protective Equipment be considered. If chosen, PPE should be selected and fitted to the person who uses it. Workers must be trained in the function and limitation of each item of PPE. For example, an operator should know how long the compressed supply in a self contained breathing apparatus will last. PPE may be used as a temporary control measure until other alternatives are installed. In most cases a combination of engineering controls, administrative controls and PPE are chosen to effectively control the risks.