

Brief on Indoor Climbing and Required Use of Liquid Chalk

Dear Romain,

As briefly discussed by phone, there may be some confusion within the climbing community in relation to the underpinning principle for the use of liquid chalk products during the COVID-19 Pandemic.

In May 2020, *Gym Climber* magazine published a well presented article by Dr Andrew Abeleira, a Ph.D chemist, on the possible advantages of liquid chalk in relation to COVID-19 ^[1]. This article appears to have initiated an international discussion on the use of liquid chalk during the COVID-19 crisis and formed the basis of international policy and standards. Of concern however, is the initial advice by Dr Abeleira, in many cases, appears to have been misunderstood or misinterpreted. There is evidence that even well-established international climbing information sources, providing referenced advice in this space, have fundamental scientific failings. For example apparently confusing antibacterial and antiviral efficacy^[2] and failing to identify that COVID-19, caused by a virus (SARS-CoV-2), other than causing disease, has almost nothing in common with pathogenic bacteria.

As you are aware, I am also a chemist and the director of a chemistry laboratory. I feel that there is value in providing a breakdown of the scientific basis for the use of liquid chalk to address some of the possible misconceptions on the issue.

Liquid Chalk as an alternative to commercial hand sanitiser:

The World Health Organisation (WHO) provides guidelines^[3] on the ethanol content of Alcohol Based Hand Sanitisers and state that concentrations of 60-80% are required for antiviral action. Of pertinence however, is a 2020 paper on Alcohol Sanitisers^[4] which reiterates the established sterilising principle that alcohol solutions above 95% have limited antimicrobial efficacy due to the absence of water. The WHO guideline additionally specifically excludes use of alcohol based sanitisers where hands are 'Visibly Soiled' (in other words, having any visible material on them).

The Australian Therapeutic Goods Administration (TGA) provides guidance on the manufacture, marketing and use of Alcohol Based Hand Sanitisers^[5] within Australia. The guidelines state that hand sanitisers are a therapeutic good and must meet specific content requirements to be considered as such. This includes strict concentrations of various alcohols, glycerol, hydrogen peroxide and water. Of note is the specific requirement that the sanitiser "*must not contain any other active or inactive ingredients, including colours, fragrances or emollients*".

While many liquid chalks contain levels of alcohol, which may appear to meet the WHO recommendation, they do not meet the other substantive requirements of a hand sanitiser under either the WHO guidance or Australian legislation due to the absence of all components other than alcohol. In addition, the presence of particulate matter (chalk), which spreads across a climber's hands during use, further breaches the TGA guidelines for additional inactive ingredients and can clearly be defined as 'Visibly Soiled' hands under the WHO guideline.

In addition; climbing chalk is specifically designed as a desiccating agent, while liquid chalks contain advertised alcohol concentrations of 60%-80%, the absence of water means that in practice the effective concentration of alcohol in liquid chalk products is approaching 100% purity. This can be directly related to the limited antimicrobial effectiveness of alcohol solutions exceeding 95%. This is consistent with the prior advice of Dr Abeleira who clearly articulated the absence of water in liquid chalk products and noted the presence of water as a key requirement of hand sanitisers.

Therefore; while the presence of alcohol at listed concentrations between 60% and 80% in liquid chalk may be seen to anecdotally provide some level of antimicrobial action, when reviewed against the specific criteria for alcohol based hand sanitisers, liquid chalk does not meet any of the requirements. **As a result, liquid climbing chalk cannot be relied upon to provide antimicrobial action.**

Of additional note, Sport Climbing Australia (SCA) should be aware that the TGA legally enforces restrictions on advertising and promotion of products which do not meet TGA guidelines. It is critical that climbing facilities be aware of explicit legislative restriction on any promotion of antiviral properties of unapproved sanitisers.

Presence of airborne chalk as a vector of viral transmission:

It is common for busy climbing facilities to contain visible concentrations of airborne chalk dust. Whilst a direct link between airborne chalk and increased risk of transmission of SARS-CoV-2 has not formally been identified, several scientific papers proposit to identify a linkage between airborne particulate matter and viral spread^{[6][7]}. A more recent study has further examined airborne pollution in cities heavily impacted by COVID-19, and has proposed a direct link between high COVID-19 case numbers and airborne particulate matter^[8].

The use of loose climbing chalk by climbers within a climbing facility is primarily responsible for excess airborne chalk. The proposed restriction of loose chalk in preference to liquid chalk by various bodies can be expected to significantly reduce the presence of excess airborne chalk in climbing facilities.

Whilst the link between airborne chalk particles within climbing facilities and risk of increased SARS-CoV-2 transmission is not established, it is clear that Health bodies feel that sufficient evidence exists, that an increased risk may be present if no control is applied. This evaluation of the scientific evidence is consistent with the article written by Dr Abeleira for *Gym Climber*.

Due to the risks to the reputation of the sport, the economic sustainability of businesses and the community, should an outbreak occur within a climbing facility, I feel it appropriate SCA continue its advice that climbing facilities apply a risk mitigating strategy, and continue to restrict the use of loose chalk for the reasons outlined above.

However, I believe there would be significant value in SCA contacting facilities and advise them not to promote the use of liquid chalk as an alternative to established hand hygiene practices. Further I feel there needs to be an effort by all involved to address the existing community misconceptions in relation to this.

I am not an epidemiologist nor virologist, and therefore cannot comment on the overall effectiveness of liquid chalk in mitigating COVID-19 risk. I feel however, that the misinformation surrounding liquid chalk could inadvertently lead to decreased vigilance of hand hygiene by patrons, and potentially constitute an unintended increased risk of outbreak within a climbing facility.

An outbreak linked to poor hygiene practice in a climbing facility would be devastating for the industry and for the climbing community.

[1] <https://www.gymclimber.com/can-liquid-chalk-protect-climbers-from-coronavirus-as-gyms-begin-to-reopen/>

[2] <https://www.climbernews.com/is-liquid-chalk-antibacterial-the-claims-tested/>

[3] https://apps.who.int/iris/bitstream/handle/10665/44102/9789241597906_eng.pdf;jsessionid=B4DE392C273209E5F3BB8C225AE5E6FF?sequence=1

[4] <https://www.ncbi.nlm.nih.gov/books/NBK513254/>

[5] <https://www.tga.gov.au/hand-sanitisers-information-manufacturers-suppliers-and-advertisers>

[6] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4986625/>

[7] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944079/>

[8] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7151372/>

Kind Regards

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