



Medical Bulletin



EXCEL Division of Blue Cross Laboratories

BREAK THE CYCLE (WITH USE OF MULTICIDAL HAND DISINFECTANT):

Hand hygiene is now regarded as one of the most important elements in infection control.

The significance of hand washing in patient care was conceptualized in the early 19th century where Labarraque provided the first evidence that hand decontamination can markedly reduce the incidence of puerperal fever & maternal mortality.

With the increasing burden of infectious disease globally, the emphasis on hand hygiene is not only restricted to medical personnel and health care workers but also to the general population, especially school going children.

Keeping this in mind, the WHO has declared 5th May as Global Hand Hygiene day and 15th October as Global Hand Washing day.

Given the current scenario, the emergence of the COVID-19 (Coronavirus Disease-2019) pandemic caused by the SARS CoV-2 virus and given its highly contagious nature, the primary concern worldwide is to curb the spread of the disease.

Studies on the SARS CoV-2 has revealed that its transmission is possible in the form of aerosol and fomites, and the virus can remain viable and infectious in aerosols for hours and on surfaces up to days, depending on the inoculum shed. Hence, it is crucial to interrupt the transmission chain of the virus through contact isolation and strict infection control tools.

Keeping this in mind, following face masks & social distancing, appropriate hand hygiene is also of utmost importance as hands may be contaminated from direct contact with patients' respiratory droplets from coughs and sneezes or indirect contact via surfaces, which may then facilitate the transmission and spreading of the disease.

Studies on SARS CoV-2 virus outbreak settings have shown that providing efficient handwashing facilities reduced transmission.

Hence, the success of the hand sanitization solely depends on the use of effective hand disinfecting agents formulated in various types and forms such as antimicrobial soaps, water-based or alcohol-based hand sanitizers.



SURGICAL DISINFECTION OF HANDS

Surgical hand disinfection reduces transient and sometimes permanent skin flora on the hands and thereby reduces the contamination of the surgical wound through small lesions, holes and damages to the gloves. A high bacterial load on the hands may cause residues of staphylococci, gram-negative bacteria and other bacteria, even after repeated washing with soap and water.



MULTICIDAL[®]

Each 100 g contains: 2-propanol 45.0 g + 1-propanol 30.0 g
+ Mecetronium Ethyl Sulphate 0.2 g

An
Instant & Effective
Hand Disinfectant



Up to 10,000 bacteria may pass through tiny holes in the surgical gloves during the period of operation. Well-performed surgical hand disinfection before wearing sterile gloves may significantly reduce this number of bacteria passing over from the skin to the wound during surgery. The quality of surgical hand hygiene is therefore important, including the use of effective disinfectants.

Centre for Disease Control and Prevention (CDC) recommends alcohol-based hand disinfectant with persistent activity. Disinfectants that satisfy both the short- and long-duration effects of disinfection are alcohol-based agents containing more than 70% concentration.

It is proved that surgical hand disinfectant contains alcohol, and has favorable properties such as strong and rapid antibacterial effect, ease of application, and suitable effect on skin. Therefore, nowadays use of them has been gradually replacing traditional surgical hand scrub with antibacterial soap.

WHAT IS THE BEST IN TERMS OF HAND HYGIENE?

Keeping hands clean is a fundamental and essential step to avoid illnesses while limiting the transmission of infectious pathogens to others.

Both the soaps and alcohol-based sanitizers work by dissolving the lipid membranes of microbes, thereby inactivating them.

Thus, the sanitizer serves as an alternative when the soap and water are not readily available.

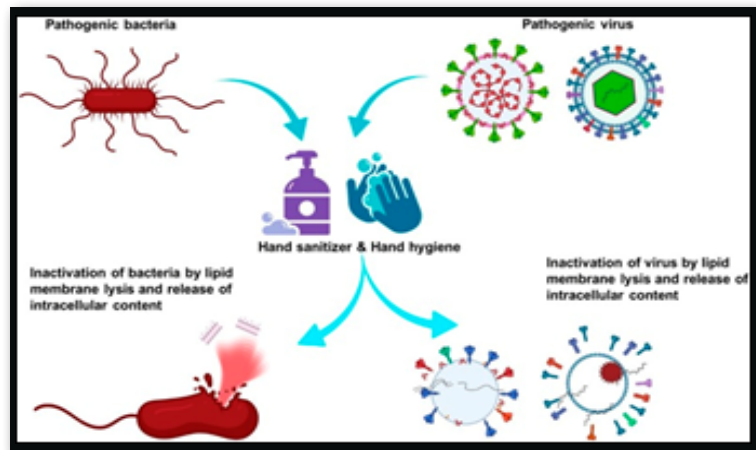
The World Health Organization (WHO) recommends alcohol-based hand sanitizer (ABHS) in line with the proven advantages of their rapid action and a broad

spectrum of microbicidal activity offering protection against bacteria and viruses.

The most effective ABHS are generally most effective when formulations contain 60-95% alcohol as it can denature the proteins of microbes and the ability to inactivate viruses.

PHARMACEUTICAL INGREDIENTS AND THEIR FUNCTION IN ABHS

ABHS contains either ethanol, isopropanol, or n-propanol. A concentration of 60-95% of alcohol by volume is said to exhibit optimum bactericidal activity. The antimicrobial effect of alcohols is attributed to their ability to dissolve the lipid membranes and denature the proteins of microbes. Alcohols have broad-spectrum antimicrobial activity against most vegetative forms of bacteria (including Mycobacterium tuberculosis), fungi, and enveloped viruses (human immunodeficiency virus [HIV] and herpes simplex virus).



ABHS AGAINST BACTERIA

The mechanism of action may be related to membrane damage, and inhibition or uncoupling of mRNA and protein synthesis through effects on ribosomes and RNA polymerase, or associated with protein denaturation.

However, alcohols exhibit bactericidal activity against vegetative bacteria, those undergoing metabolism and binary fission, but not against spores.



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ABHS AGAINST VIRUSES

The viral targets of alcohol-based hand sanitizers are predominantly the viral envelope, if present, which is derived from host lipid envelopes, the protein capsid, which contains and protects the genetic material, and the genetic material itself.

Given that all these components are necessary for the viral life cycle (attachment, penetration, biosynthesis, maturation, lysis), and thus critical for its ability to transmit to another host, it can be presumed that altering the structure or function of any of the aforementioned components will typically render the virus ineffective.

EFFICACY OF ABHS AGAINST SARS CoV-2

The virus SARS CoV-2 is termed due to of its genome sequence similarity to SARS Coronavirus (SARS CoV-2) which belong to the same genus beta coronavirus, sharing similar morphology in the form of enveloped, positive single-stranded RNA viruses.

Most alcohol-based hand sanitizers are effective at inactivating enveloped viruses, including coronaviruses.

LIQUID Vs GEL ABHS

The ABHS are available as gels or as liquids. Despite the higher acceptance of gel-based sanitizers, studies have shown that most liquid hand rubs present significantly better antimicrobial performance than gels. Also, liquid-based sanitizers act more rapidly

(~15 s) and leave less residual substance on hands, whereas, gels require about 30 seconds to act, and time loss can reduce compliance.

45% 2-propanol & 30% 1-propanol based hand disinfectant are more effective-

Based on the results of the study conducted by Mitra Zandiyeh et.al, Effectiveness of three surgical alcohol-based hand rubs on skin flora, Iran J Nurs Midwifery Res. 2015 Mar-Apr; 20(2): 221–225; although ethanol based disinfectants had significant effect on skin flora, considering the factors that influence the antibacterial efficacy of alcohol-based hand rub (type, concentration, applied volume, and duration of contact with antiseptic), Propanol based disinfectant containing (45% 2-propanol, 30% 1-propanol, 0.2% mecetronium ethylsulfate; was best as compared with 50% ethanol, 25% isopropanol, 0.5% CHG; and (44.7% 2-propanol, 21.9% 1-propanol, 0.1% benzalkonium chloride.

In a research conducted by Kampf G, Ostermeyer C. World Health Organization-recommended hand-rub formulations do not meet European efficacy requirements for surgical hand disinfection in five minutes. (J Hosp Infect. 2011;78:123–7), on 3 and 5 min hand disinfection with two hand rub products (ethanol- and isopropanol-based hand rubs), isopropanol hand rub caused better result in decreasing the skin flora.

Maintaining hand hygiene is not about being paranoid. It's like wearing seatbelts. It is impossible to not engage with the world at all. But, the best you do is to be cautious and practise good hand hygiene.

References:

- Jia Jing JL et al. *Int J Environ Res Public Health* 2020; 17(9): 3326.
- Golin AP et al. *Am J Infect Control* 2020; 48(9): 1062-1067.
- Maiwald M & Widmer A. *Crit Care* 2007; 11(4): 418.
- Anderson BM. *Prevention and Control of Infections in Hospitals* pp.439-452.



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STATINS (LIPONORM) AND COVID-19

Repurposing drugs is faster and more economical than starting development from scratch. One such candidate among existing drugs is the use of statins. Statins are inhibitors of a key cholesterol synthetic enzyme, HMGCoA reductase, and have been on the market since the late 1980s. Apart from its main function of cholesterol lowering and lipid metabolism, which has also been implicated in the pathogenesis of the SARS CoV-2 virus, statins are known to have anti-inflammatory and immunomodulatory properties.

HOW ARE STATINS BENEFICIAL IN COVID-19 INFECTION?

There are several plausible mechanisms through which statins may exert a beneficial effect in this disease. It has been observed to reduce the severity for disease progression in covid patients.

VIRAL ENTRY AND REPLICATION

The potential mechanism of action of statins in COVID-19 could be through inhibiting SARS CoV-2 entry into cells by binding the main protease.

Statins can interfere with viral infectivity through inhibition of glycoprotein processing. The main protease (Mpro) of corona virus, plays an important role in proteolytic maturation. Consequently, it has been examined as a potential protein target to prevent infection expansion by inhibiting the cleavage of the viral polyprotein.

IMMUNOMODULATION

In SARS CoV-2 infection, the host's immune system must mount an effective response to control the virus but avoid responding too aggressively and inducing a "cytokine storm," which likely poses the greatest risk of death. In vitro and in vivo experiments have shown that statins can suppress TLR/MYD 88/NF-kB signaling and modulate the NLRP3 inflammasome.

MYD 88 PATHWAY

Dysregulation of the myeloid differentiation primary response protein (MYD 88) pathway which results in overwhelming inflammation has been observed

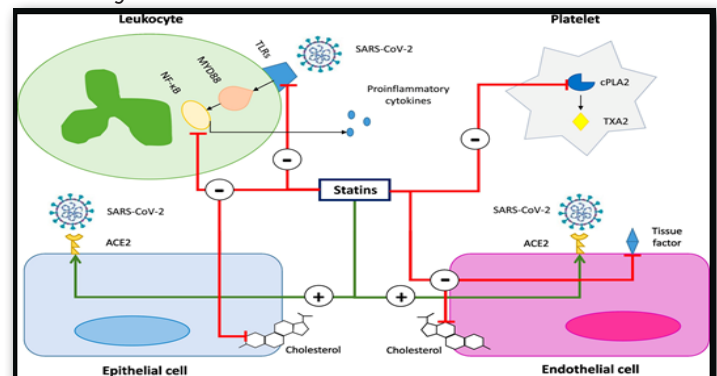
and associated with poor prognosis in other coronavirus infections; this could be the case for COVID-19. Statins/Atorvastatin are known inhibitors of MYD88 and could stabilize MYD88 levels in the presence of external stressors, which thus suggest their roles in protecting COVID-19 patients from the development of overwhelming inflammatory responses.

TLR

Toll-like receptors (TLR) on activation recruit the adapter proteins MYD 88 which in turn activates the transcription and induction of inflammatory cytokines. Atorvastatin has shown to inhibit the mRNA and protein expression of TLR and reduce downstream inflammation and oxidative stress.

NF-kB

Statins have been shown to directly inhibit nuclear factor kappa-light-chain-enhancer of activated B cells (NF-kB), which is a crucial mediator of inflammatory responses during infections, including those caused by coronaviruses.



Overall, the available data and hypotheses based on biological plausibility suggest that some clinical benefits in COVID-19 patients may derive from statin-mediated cholesterol-lowering and pleiotropic effects.

Evidence is emerging showing a possible benefit from statin therapy in reduction of COVID-19 severity and mortality.

References:

- Miao Liu et al; *Int J Clin Exp Med.* 2015; 8(3): 3371-3380.
- Fajgenbaum DC & Radar DJ. *Cell Metab.* 2020 Aug 4; 32(2): 145-147.
- Kow CS & Hasan SS. *The Am J of Cardiology* 2020; 134: 153-155.
- Karalis DG. *J of Clinical Lipidology* 2020; 14: 396-397.
- Reiner Z et al. *Arch Med sci* 2020; 16(3): 490-496.

In Dyslipidaemia

Liponorm[®]
Atorvastatin 5 mg. / 10 mg. / 20 mg. / 40 mg.
Tablets



ANTIVIRAL PROPERTIES OF ESSENTIAL OILS (KOL Q INHALANT CAPSULES)

Essential oils (EOs) have long been known to have anti-inflammatory, immunomodulatory, bronchodilatory, and antiviral properties.

EOs have shown promise as antiviral agents against several pathogenic viruses, including influenza and other respiratory viral infections.

EOs are comprised of a complex mixture of volatile phytochemicals from diverse classes including monoterpenes, sesquiterpenes, and phenyl propanoids. These EOs are found to be active against a wide variety of viruses, such as influenza virus (IFV), human herpesviruses (HSV), human immunodeficiency virus (HIV), yellow fever virus, and avian influenza.



Owing to the lipophilic nature of EOs, these have the potential to intercalate into the lipid double layer of the viral envelope. Subsequently, the fluidity of the membranes is changed and, at a higher concentration, the membranes are even ruptured.

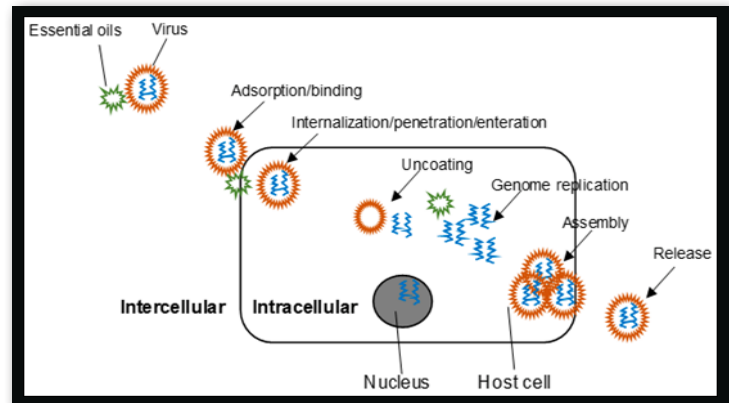
Major mechanisms through which EOs induce antiviral actions are, direct actions on free viruses, inhibition of steps involved in virus attachment, penetration, intracellular replication, and release from host cells and inhibition of vital viral enzymes.

COMMON ESSENTIAL OILS

CAMPHOR

Camphor exhibits a number of biological properties such as insecticidal, antimicrobial, antiviral, anticocidal, anti-nociceptive, anticancer and antitussive activities, in addition to its use as a skin penetration enhancer.

Studies have shown that certain herbs that are rich in camphor have shown high levels of virucidal activity.



EUCALYPTUS OIL (EO)

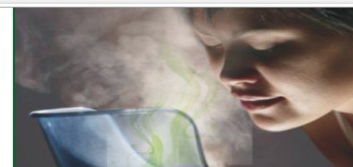
Eucalyptus oil is known to have antibacterial, antiviral and antifungal components and a long history of use against the effects of colds, influenza and other respiratory infections like rhinitis and sinusitis, including inhalation of the vapours which also absorbs into the tissues of the chest.

Studies have shown that eucalyptus oil and its active constituent, eucalyptol (1,8-cineole) reduces the viral count and viral replication against certain viruses by disrupting the envelope structures of virus.

Apart from this action, eucalyptus oil and eucalyptol also have demonstrated marked immunomodulatory properties by reducing the release of pro-inflammatory cytokines from monocytes and macrophages in response to lung inflammation and infections.

**Clear
Congestion
Quickly**

KOLQ[®] Inhalant Capsules
Camphor 25 mg + Chlorothymol 5 mg + Eucalyptol 125 mg
+ Menthol 65 mg, Terpineol 120 mg



Having established the antiviral activity of eucalyptus oil and eucalyptol against respiratory viruses, multiple researchers have attempted to explore the antiviral efficacy of eucalyptus oil and its active ingredients against SARS CoV-2.

CHLOROTHYMOL

Chlorothymol is a derivate of thymol which is a known antifungal agent and also a general antimicrobial agent. Thymol has been shown to have antiviral activity against certain viruses like influenza virus and herpes simplex virus (HSV). However, chlorothymol is a more potent germicide and its inhalation with other essential oils is known to have anti-infective and decongestive properties.

MENTHOL

The broad spectrum of biological activity of plants of the genus *Mentha* exhibited high levels of virucidal activity against HSV-1 and HSV-2 and affects the virus before adsorption, but not after penetration. Treatment with menthol was also found to significantly reduce the levels of pro-inflammatory cytokines, i.e. interleukin-1, interleukin-23, and tumour necrosis factor- α (TNF- α).

TERPINEOL

Tea tree oil (TTO) is an essential oil with anti-inflammatory properties and its components, terpinen-4-ol and alpha-terpineol exhibit immunomodulatory properties. Tea tree oil can help to get rid of the herpes simplex virus, which causes cold sores, as well as viruses that cause the common cold and the flu. Monoterpenes combination in TTO show synergetic anti-viral actions and its active components show strong anti-viral activity.

NEED FOR ESSENTIAL OILS DURING THE COVID-19 OUTBREAK

Covid-19 has become a concern worldwide, claiming thousands of lives on a daily basis. Yet no full-proof treatment is approved globally for this pandemic. All the treatments available are mainly supportive. However, some of the essential oils are reported to have anti-viral activity against SARS CoV-1. Based on the genetic resemblance between SARS CoV-1 and SARS CoV-2, these essential oils can be effective against Covid-19. Therefore, use of simple essential oils diffuser or nebulizer for inhalation of essential oils could help in the supportive therapy for Covid-19 infection. Moreover, keeping in view the multiple pharmacological attributes of essential oils, a combination approach whereby essential oils are administered with synthetic drugs is suggested to combat this viral disorder and its associated complications.

References:

- Asif, M et al. *Inflammopharmacol* 2020; 28: 1153-1161.
 Chen W et al. *Molecules* 2013; 18(5): 5434-5454.
 Sadlon AE et al. *Alternative Medicine Review* 2010; 15(1): 33-47.
 Winska K et al. *Molecules*. 2019 Jun; 24(11): 2130.
 Nogueira MNM et al. *Inflamm Res* 2014; 63(9): 769-78.
<https://ijpsr.com/bft-article/inhalation-of-essential-oils-could-be-adjuvant-therapeutic-strategy-for-covid-19/?view=fulltext>.

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