

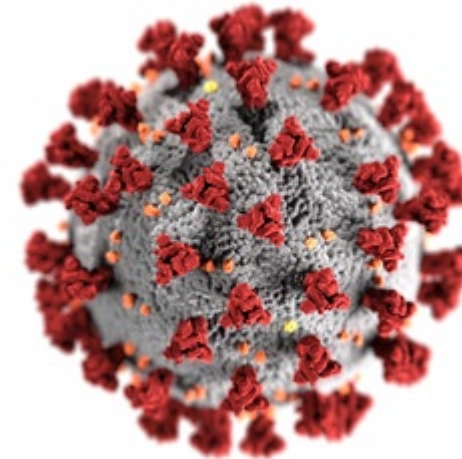
COVID-19 ORAL HEALTH PREVENTIVE MEASURES



Expertos en Salud Bucal

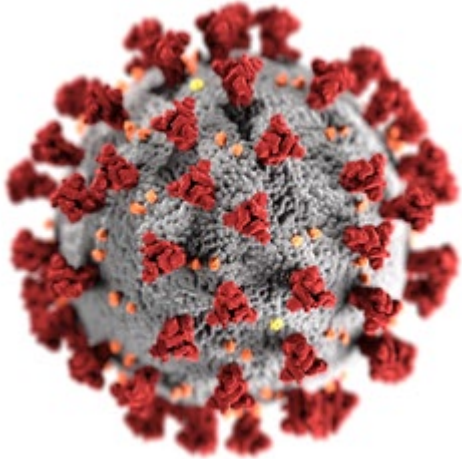
DATA COVID-19 PANDEMIC

- Number of cases: 2,094,897
- Number of deaths: 135,569
- Number of recoveries: 520,946
- Number of active cases:
1,438,382



SOURCE: <https://www.worldometers.info/coronavirus/> [consulted on 16/04/2020]

SARS-COV2 / COVID-19 INFORMATION

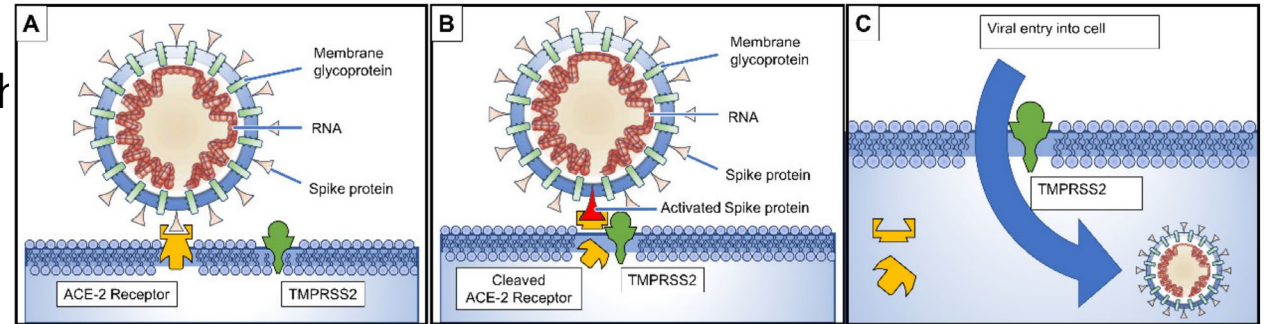


- **High rate of transmission**
- Incubation period: **5-6 days** (1-14)
- Disease duration: **2 weeks** (3-6 weeks severe cases)
- It is transmitted up to 15 days after illness
- **Viability** time varies depending on the **surface** (4-72 hours)

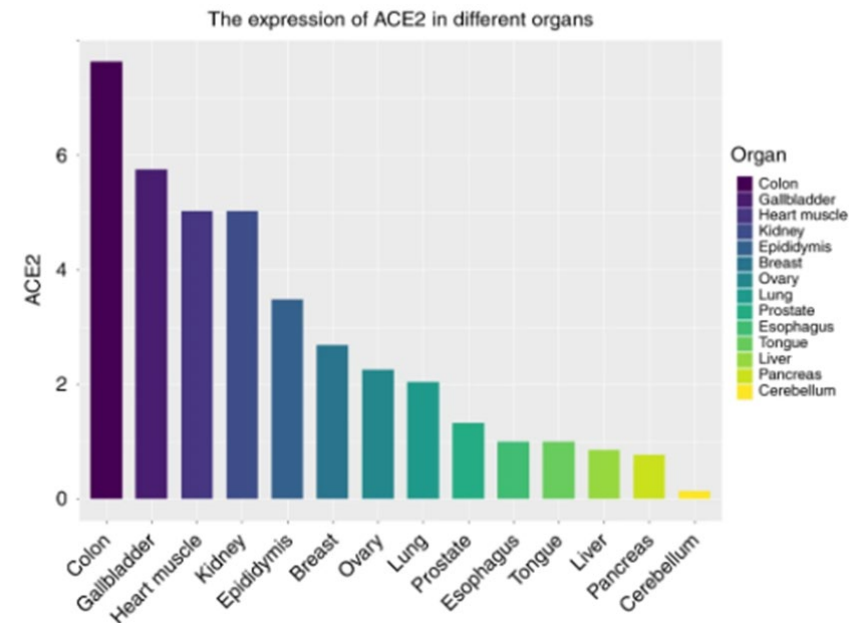
SOURCE: Technical-scientific information, disease from coronavirus, COVID-19 04.04.2020. Centre for Coordination of Health Alerts and Emergencies. Spanish Ministry of Health.

COVID-19 KEY POINTS – ORAL HEALTH

- SARS-CoV2 coronavirus infects cells through ACE2 receptors^{1,2}



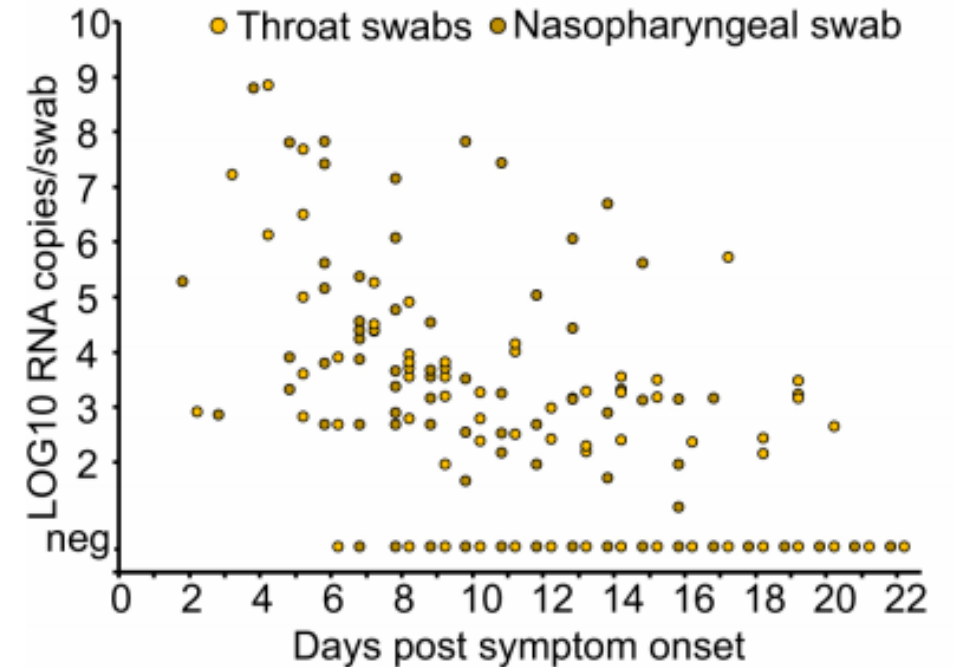
- High ACE2 receptor density in the oral cavity, particularly on the tongue¹



1. Xu H, Zhong L, Deng J, Peng J, Dan H, Zeng X, et al. High expression of ACE2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. *Int J Oral Sci.* 2020 Feb 24;12(1):8
2. Rabi FA, Al Zoubi MS, Kasasbeh GA, Salameh DM, Al-Nasser AD. SARS-CoV-2 and Coronavirus Disease 2019: What We Know So Far. *Pathogens.* 2020 Mar 20;9(3)

COVID-19 KEY POINTS – ORAL HEALTH

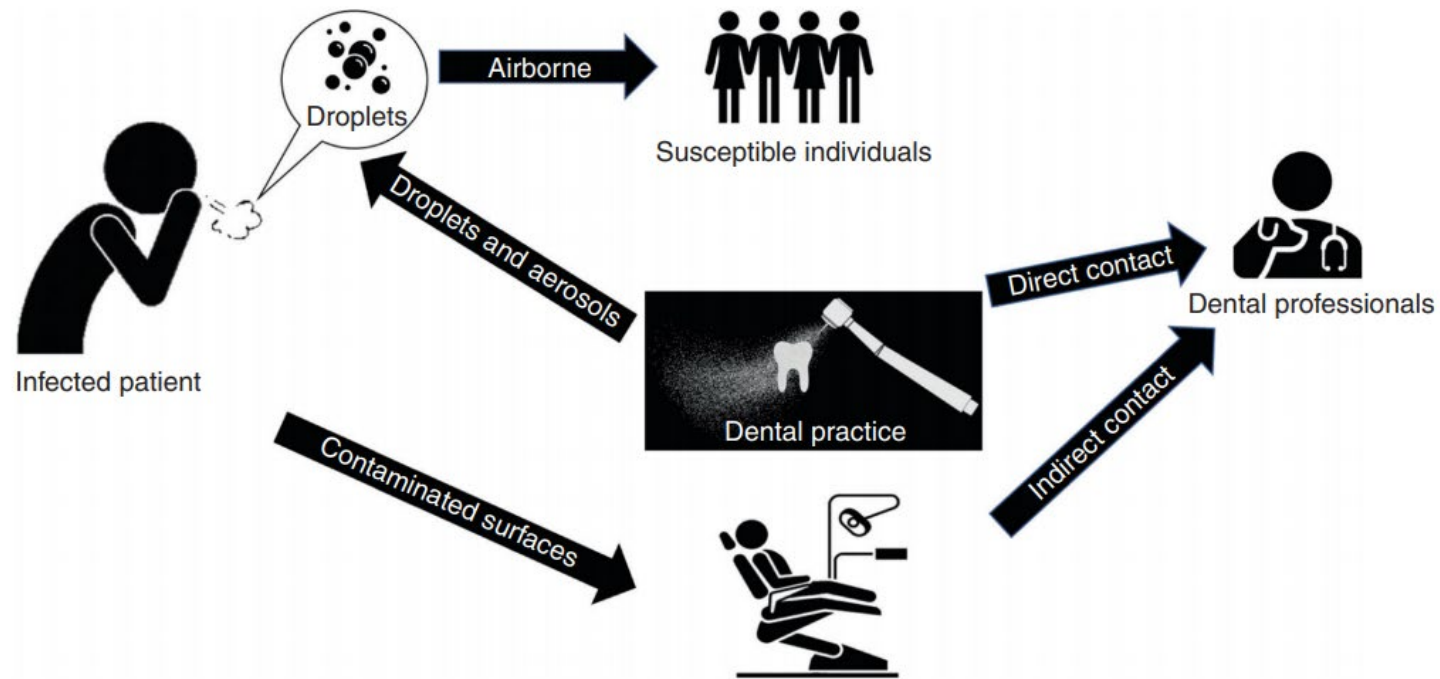
- During the first 10 days, in which patients are asymptomatic and highly contagious, the infection is located in the upper respiratory tract (mouth, nose, throat).
- Subsequently, as the disease progresses, the virus moves on to the lower respiratory tract (lungs)³



3. Wölfel R, Corman VM, Guggemos W, Seilmaier M, Zange S, Müller MA, et al. Virological assessment of hospitalized patients with COVID-2019. Nature <https://doi.org/10.1038/s41586-020-2196-x> (2020).

COVID-19 KEY POINTS – ORAL HEALTH

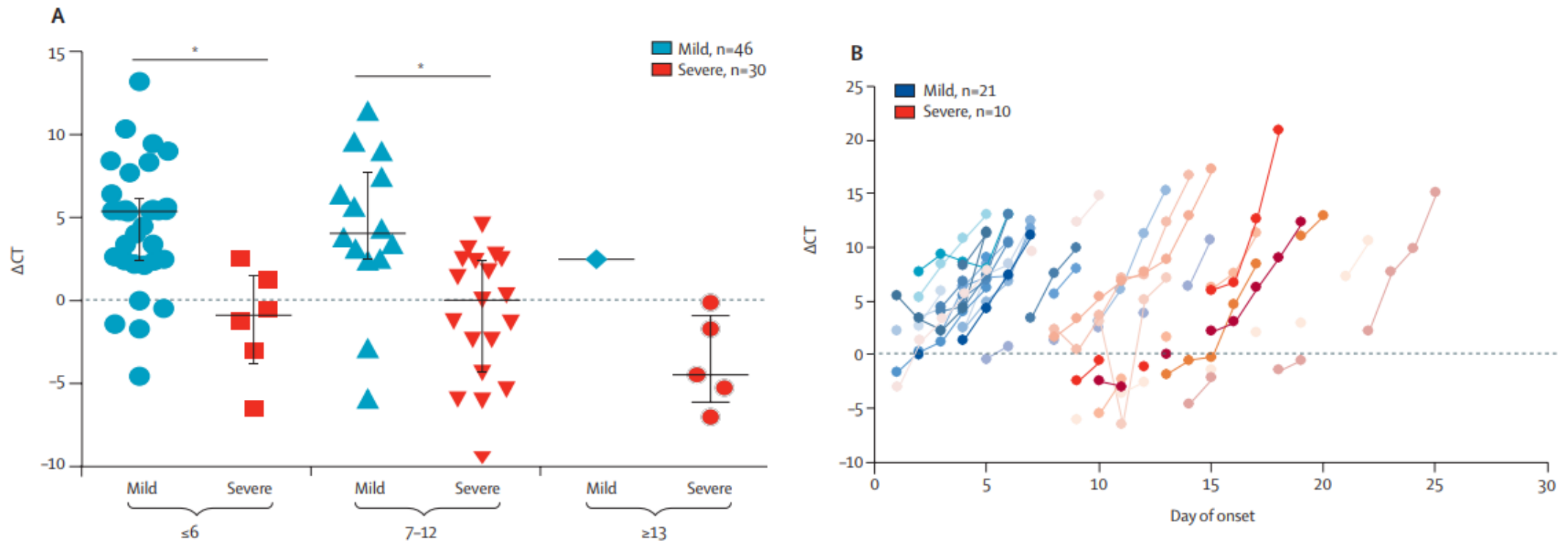
- Potential transmission route by saliva and aerolisation from infected patients, particularly relevant in the dental field⁴



4. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. Int J Oral Sci. 2020 Mar 3;12(1):9


COVID-19 KEY POINTS – ORAL HEALTH

- SARS-CoV-2 viral load is directly associated with the severity of COVID-19⁵



5. Liu Y, Yan LM, Wan L, Xiang TX, Le A, Liu JM, Peiris M, Poon LLM, Zhang W. Viral dynamics in mild and severe cases of COVID-19. *Lancet Infect Dis.* 2020 Mar 19. pii: S1473-3099(20)30232-2

COVID-19 KEY POINTS – ORAL HEALTH

- SARS-CoV2 coronavirus infects cells through ACE2 receptors^{1,2}
 - High ACE2 receptor density in the oral cavity, particularly on the tongue¹
 - During the first 10 days, the infection is located in the upper respiratory tract (mouth, nose, throat) and the patient is highly contagious³
 - Potential transmission route by saliva and aerolisation from infected patients, particularly relevant in the dental field⁴
 - SARS-CoV-2 viral load is directly associated with the severity of COVID-19⁵
- 
- **The oral cavity is a potentially high risk site for infection by SARS-COV2**
 - **The reduction of the pathogenic load in the oral cavity would help to reduce the severity of the COVID19 disease and to temporarily reduce the transmission of SARS-COV2 to healthy people**

ORAL HEALTH RECOMMENDATIONS

CPC (CETYLPYRIDINIUM CHLORIDE)



Highly safe antiseptic (=daily use)



Fights
plaque



Substantivity: from 3 to 5 hours



Broad spectrum of action:

- Different types of bacteria
- Fungi
- Some viruses

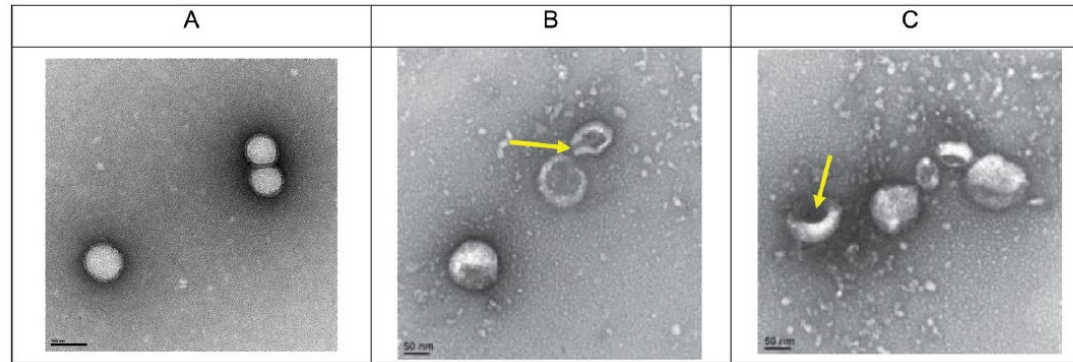
- There are *in vitro* and *in vivo* studies that show CPC to have a viricidal and preventive activity against some viruses, including some strains of coronavirus

ORAL HEALTH RECOMMENDATIONS: CPC

Popkin et al. 2017⁶

in vitro and *in vivo* study on *Influenza* virus (virus with lipid envelope)

Mechanism of action: CPC alters the lipid membrane of viruses with a lipid envelope through physicochemical interactions, causing their rupture, and in turn, the inactivation of the virus.



Arm A: control

Arms B and C: 0.005% CPC for 5 minutes

Mortality Arm A: 4.5%

Mortality Arm B: 86%

Conclusion: CPC is effective in the inactivation of viruses with a lipid envelope

6. Popkin DL, Zilka S, Dimaano M, Fujioka H, Rackley C, Salata R et al. Cetylpyridinium chloride (CPC) exhibits potent, rapid activity against influenza viruses *in vitro* and *in vivo*. *Pathogens and Immunity*. 2017;2(2):253-69.

ORAL HEALTH RECOMMENDATIONS: CPC

Mukherjee et al. 2017⁷

Clinical trial conducted on 94 healthy volunteers with the aim of ascertaining whether the use of CPC applied orally could prevent viral infections of the upper airways caused by influenza virus, respiratory syncytial virus, human metapneumovirus, rhinovirus and adenovirus

Table 2 Frequency and severity of diary-based symptoms in study participants with upper respiratory infections

Symptom	Frequency (%) [*]			Severity (mean ± SD)		
	Placebo	Active	P-value	Placebo	Active	P-value
Cough	29 (78.4%)	7 (25.9%)	< .001	1.73 ± 1.36	0.56 ± 1.01	< .001
Sore throat	30 (81.1%)	13 (48.1%)	.008	1.73 ± 1.19	0.74 ± 0.85	.001
Runny nose	25 (67.6%)	18 (66.7%)	1	0.95 ± 0.88	1.56 ± 1.28	.027
Stuffy nose	19 (51.4%)	26 (96.3%)	<.001	0.89 ± 1.05	2.07 ± 0.87	<.001
Malaise	22 (59.5%)	21 (77.8%)	.179	1.49 ± 1.38	1.67 ± 1.03	.572
Fever	4 (10.8%)	0	-	100 – 103 °F	-	

^{*}Percentage values are compared to the total number of events

Conclusion: CPC is effective in the prevention of upper respiratory infections by viruses with a lipid envelope

7. Mukherjee PK, Esper F, Buchheit K, Arters K, Adkins I, Ghannoum MA et al. Randomized, double-blind, placebo-controlled clinical trial to assess the safety and effectiveness of a novel dual-action oral topical formulation against upper respiratory infections. BMC Infect Dis. 2017 Jan 14;17(1):74



**COVID-19
ORAL HEALTH
PREVENTIVE
MEASURES**

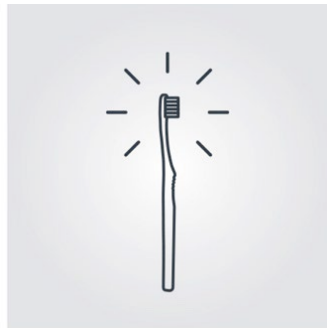
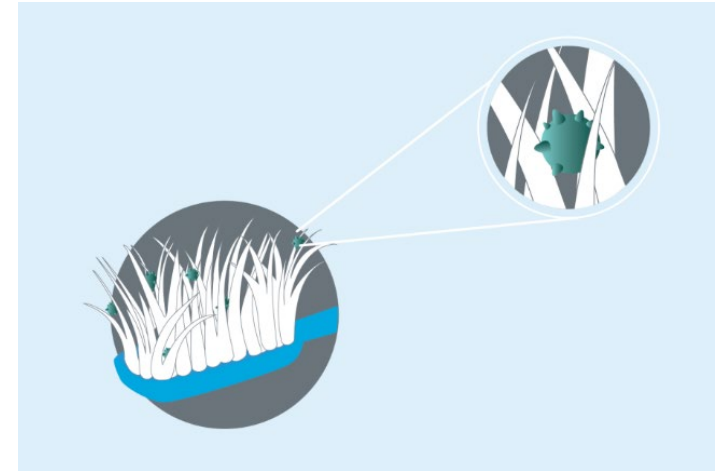
COVID-19 PREVENTION



ORAL HYGIENE RECOMMENDATIONS



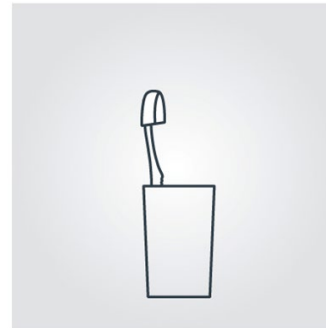
Filaments can be an ideal medium for the retention and growth of pathogens



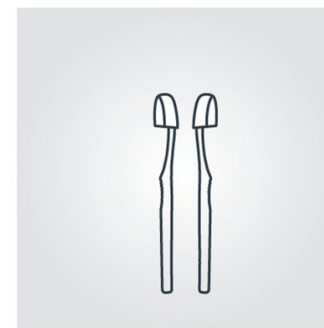
Rinse and shake brush (to eliminate excess water)



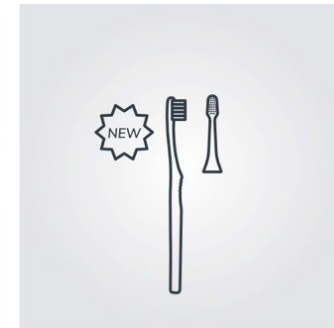
Use of cap with ventilation (protection from contamination)



Store in upright position



Keep brushes from touching each other



Replace brush after infectious process

ORAL HEALTH RECOMMENDATIONS: TONGUE CLEANER



- High density of ACE2 receptors (high SARS-CoV-2 affinity receptors) on tongue¹
- The tongue cleaner has proven to reduce tongue coating, epithelial cells and microorganisms⁸

1. Xu H, Zhong L, Deng J, Peng J, Dan H, Zeng X, Li T, Chen Q. High expression of ACE2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. *Int J Oral Sci.* 2020 Feb 24;12(1):8

8. Quirynen M, Avontroodt P, Soers C, Zhao H, Pauwels M, van Steenberghe D. Impact of tongue cleansers on microbial load and taste. *J Clin Periodontol* 2004; 31: 506–510.

ORAL HEALTH CONCLUSIONS

- The oral cavity is a potentially high risk site for infection by SARS-COV2:
 - High density of ACE2 receptors, especially on the tongue → **Importance of using a tongue cleaner**
 - First 10 days the virus infects the upper respiratory tract (mouth/nose/throat)
- CPC has a preventive and viricidal effect on viruses with a lipid envelope
- **CPC could reduce the viral load of SARS-CoV-2 in the mouth**
- The reduction of the viral load could reduce the severity of disease by COVID-19
- Oral hygiene with products containing CPC, and the use of a tongue cleaner, could help to prevent COVID-19 and its immediate contagion (importance in healthcare setting)

OFFICIAL BODIES

Several international organisms recommend the use of CPC in COVID-19 prevention protocols:

- Dental Council of Spain
- Regional Federation of Surgeons and Dentists from Lombardy (Italy)
- Wuhan University (China)

RECOMMENDATIONS COVID-19 PREVENTION



BIBLIOGRAPHY

1. Xu H, Zhong L, Deng J, Peng J, Dan H, Zeng X, et al. High expression of ACE2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. *Int J Oral Sci.* 2020 Feb 24;12(1):8.
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6. Popkin DL, Zilka S, Dimaano M, Fujioka H, Rackley C, Salata R et al. Cetylpyridinium chloride (CPC) exhibits potent, rapid activity against influenza viruses in vitro and in vivo. *Pathogens and Immunity.* 2017;2(2):253-69.
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