



## Covid-19: Surfing the second wave

Dear colleagues,

at the end of the summer vacation time and with the fall and winter approaching in the northern hemisphere the topic „Corona“ is ubiquitous again. Additionally, the vague and unclear statement of the WHO concerning the conduct of dentistry during the active COVID-19 pandemic published on the 3<sup>rd</sup> of August has puzzled clinicians and the public. Due to common interest in the topic we decided provide a summary of the available evidence and facts about COVID-19.

Our first survey can be found here:

[https://www.dr-troeltzsch.de/fileadmin/user\\_upload/dokumente/2020/2020\\_Troeltzschbrothers\\_Covid-19\\_Eng.pdf](https://www.dr-troeltzsch.de/fileadmin/user_upload/dokumente/2020/2020_Troeltzschbrothers_Covid-19_Eng.pdf)

At the present time, the statements we published on the March 26<sup>th</sup> are still in accordance with the evidence. Unfortunately, also the title is still true: **There is no time after COVID-19.**

The most important message to begin with is: We still have to take the virus SARS-CoV2 seriously. The most important methods to prevent SARS-CoV-2 are perpetual utilization of personal protective equipment, the avoidance of mass gatherings and the compliance with interpersonal distance recommendations. Additionally, the evidence about patient safety in dental offices has increased.

On September 10<sup>th</sup> a German guideline about COVID-19 in the dental office was published at <https://www.awmf.org/leitlinien/detail/II/083-046.html>. As in Germany dentistry was never shut down this is of special importance.

We hope this summary is useful for you and helps you surf the second wave. Stay safe and healthy!

For questions please contact us at [conference@dr-troeltzsch.de](mailto:conference@dr-troeltzsch.de)

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Ansbach, 13th of september 2020

### 1. What transmission routes are clear?

Very early in the pandemic it was clear that the mucosa of nose and pharynx is the primary port of entry for SARS-CoV-2 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7170333/>) and that droplets and contaminated surfaces are likely to be the vehicles (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7170333/>; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7293495/>).



An airborne transmission of SARS-CoV-2 was always discussed, especially as a lab setting showed this is theoretically possible ([https://www.nejm.org/doi/full/10.1056/NEJMc2004973?url\\_ver=Z39.88-2003&rfr\\_id=ori%25253Arid%25253Acrossref.org&rfr\\_dat=cr\\_pub%25253Dpubmed](https://www.nejm.org/doi/full/10.1056/NEJMc2004973?url_ver=Z39.88-2003&rfr_id=ori%25253Arid%25253Acrossref.org&rfr_dat=cr_pub%25253Dpubmed)). Whether this is possible in a real clinical setting is still unclear. (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7293495/>). Most publications did not find evidence for an airborne transmission (<https://pubmed.ncbi.nlm.nih.gov/32131908/>, <https://pubmed.ncbi.nlm.nih.gov/32129805/>), but a very recent publication of August 4<sup>th</sup> claimed to have identified viable SARS-CoV-2 in the air (<https://www.medrxiv.org/content/10.1101/2020.08.03.20167395v1>). This paper has not been peer reviewed yet and the methods, the selection of the primers and the very little amount of detected virus led to claims that the conclusions are not valid. Also, the authors themselves discuss this in the paper.

Although it is still unclear what the true results of this publication are, it seems wise to follow some advice deduced from this paper: ventilate the rooms regularly and wear masks in rooms even if social distancing is possible.

#### *Assessment for the dental office:*

The hygiene measurements still have to be held up, but the evidence of transmission routes show that these are effective.

Our hygiene guidelines, that are still unchanged and valid today, can be downloaded here: [https://www.dr-troeltzsch.de/fileadmin/user\\_upload/dokumente/2020/2020\\_Hygiene\\_protocol\\_SARS-CoV-2.pdf](https://www.dr-troeltzsch.de/fileadmin/user_upload/dokumente/2020/2020_Hygiene_protocol_SARS-CoV-2.pdf)

## **2. How dangerous is COVID-19 really?**

Currently we see the established media and governments around the world stressing the dangers of SARS-CoV-2 while in the meantime many opinions can be found - especially on social media - that this Virus is at the most comparable to the flu virus. At the beginning of the pandemic many things were still unclear but today we have some evidence.

#### ***How infectious is SARS-CoV-2?***

The inoculation dose of SARS-CoV-2, this means the amount of virus that has to enter the human body to cause the disease Covid-19, is unknown. (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7313959/>; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7393808/>; <https://www.awmf.org/leitlinien/detail/II/083-046.html>)

The current data shows that 97% of the patients show symptoms within the first 12 days while the median is at 5 days. (<https://pubmed.ncbi.nlm.nih.gov/32150748/>; <https://pubmed.ncbi.nlm.nih.gov/32255761/>; [https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/Steckbrief.html?nn=13490888](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html?nn=13490888)).



The reproductive number  $R_0$ , that describes how many others are infected by a single spreading patient, varies geographically and is between 2 to 6, for example Germany states this to be 2 to 3,3 (RKI: 7th of august 2020). ([https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/Steckbrief.html?nn=13490888](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html?nn=13490888); <https://pubmed.ncbi.nlm.nih.gov/32255761/>; <https://pubmed.ncbi.nlm.nih.gov/32498136/>).

*For a comparison:*

$R_0$  for measles is rated 9 to 18 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7120728/>; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6375639/#pcbi.1006806.e001>), SARS (year 2003) 0,86 to 1,83 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7120728/>) and for Influenza 1 to 2 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7120728/>; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4169819/>).

This illustrated that SARS- CoV-2 is a more infectious virus.

### ***What is all this about age, comorbidities and mortality?***

On July 28<sup>th</sup> the data of the treatment of more than 10.000 Covid-19 patients in Germany, that took place between the end of February and mid-April, was published ([https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30316-7/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30316-7/fulltext)): 17 % needed artificial ventilation, out of these 24 % were aged between 18 and 59 years. The number of males requiring ventilation was double the number of females. 22% of the hospitalised patients died (2.229 of 10.021).

For hospitalised patients the following co-morbidities were most commonly diagnosed: hypertension (56%), diabetes (28%) and cardiac arrhythmia (27%). Patients with co-morbidities more often suffered from severe courses of the disease compared to otherwise healthy patients. 22% of the ventilated patients were without co-morbidities. A total of 36% of the patients that were hospitalised (3.611 of 10.021) because of Covid-19 were without comorbidities.

In Germany the case mortality rate is calculated with 3.8% (12th of September 2020: [https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/Steckbrief.html?nn=13490888](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html?nn=13490888)). This demonstrated clearly that this disease features a relatively high mortality even in a system that is not overwhelmed. Although the comparison is difficult the data shows a higher mortality for COVID-19 when compared to influenza (<https://pubmed.ncbi.nlm.nih.gov/31203513/>; <https://pubmed.ncbi.nlm.nih.gov/26148709/>; <https://pubmed.ncbi.nlm.nih.gov/21396216/>).

### ***Are there longtime consequences resulting from the infection?***

As this disease has only been known for 9 months now this question cannot be answered terminally, however there are mounting clues that neurologic (<https://pubmed.ncbi.nlm.nih.gov/32498691/>; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7182030/>), pulmonary (<https://pubmed.ncbi.nlm.nih.gov/32404798/>) and other long lasting physical issues (<https://pubmed.ncbi.nlm.nih.gov/32515393/>) can be triggered.

***Are kids immune?***

No, sadly not. Kids can also sicken from Covid-19, depending on the source up to 12% of the patients are kids (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7334563/>; <https://pubmed.ncbi.nlm.nih.gov/32232980/>; <https://pubmed.ncbi.nlm.nih.gov/32310621/>). Furthermore, there is increasing data that SARS-CoV-2 can cause a Kawasaki-syndrome like disease (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7247462/>; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7387257/>; <https://pubmed.ncbi.nlm.nih.gov/32265235/>) especially in small infants and babies.

***Is the second wave less dangerous?***

There are some signs that the mild courses of Covid-19 are more frequent now that they were in March and April. If this is true or what might be the reason is unclear. Some discuss the public use of masks as a possible factor (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7393808/>). However, the average age of the affected patients is now lower than in the springtime which might also serve as an explanation for these clinical findings.

***Am I immune after a prior SARS-CoV-2 infection?***

Sadly, there is evidence that a new infection is possible (<https://pubmed.ncbi.nlm.nih.gov/32840608/>).

***Assessment for the dental office:***

The evidence is clear, being healthy and young does not mean that you're protected. This virus has to be taken seriously. However, the hygiene standards in dental offices offer efficient protection. The incoming fall and cold season will pose new challenges because the clinical distinction between a common cold and COVID-19 is difficult.

**3. Prevention and therapy of COVID-19**

Currently there is no vaccination available. There are also obstacles apart from the vaccination that have to be solved (<https://www.dpdhl.com/en/media-relations/press-releases/2020/delivery-covid-19-vaccine-dhl-study-shows-how-public-and-private-sector-can-partner-for-success.html>). As a timeframe is not clear we still have to plan without.

Multiple studies showed that surgical 3-layered masks might not be inferior to N95/N100 respirators in a real clinical setting (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4868605/>; <https://pubmed.ncbi.nlm.nih.gov/19797474/>), especially for corona virus (<https://pubmed.ncbi.nlm.nih.gov/31479137/>; <https://pubmed.ncbi.nlm.nih.gov/32371934/>). Furthermore



there is evidence that masks do reduce the probability for an infection (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7393808/>).

### ***Prevention in civil life***

A meta-analysis published on June 1<sup>st</sup> 2020 demonstrated the high efficacy of masks and eye protection ([https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)31142-9/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31142-9/fulltext)) against an infection with SARS-CoV-2. Although the only study that might show viable virus in the air can still not be assessed due to criticism against the applied methodology (<https://www.medrxiv.org/content/10.1101/2020.08.03.20167395v1>), it underlines the value of masks and distance.

Furthermore, there is recent evidence that even improvised (homemade) masks reduce the inoculated dose of SARS-CoV-2, (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7393808/>). This alone may be protective or lead to milder courses of the disease.

Reminder: the necessary inoculation dose to start the disease is not known yet.

Face shields do not replace masks and are markedly inferior to masks.

(6th of September: <https://www.rki.de/SharedDocs/FAQ/NCOV2019/gesamt.html?nn=13490888>)

### ***Prevention and infection risks in the dental office***

The guideline of September 10<sup>th</sup> (<https://www.awmf.org/leitlinien/detail/II/083-046.html>) has formulated clear advice from the available evidence, that is completely in accordance with our hygiene rules: [https://www.dr-troeltzsch.de/fileadmin/user\\_upload/dokumente/2020/2020\\_Hygiene\\_protocol\\_SARS-CoV-2.pdf](https://www.dr-troeltzsch.de/fileadmin/user_upload/dokumente/2020/2020_Hygiene_protocol_SARS-CoV-2.pdf)

Some examples:

- Always wear a mask in the office
- Ask the patient to irrigate with disinfecting mouth rinses prior to treatment
- High volume dental suction is necessary and sufficient
- Rooms should be well ventilated with fresh air
- **SARS-CoV-2-positive patients** require the use of N95/N100 respirators ([https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/nCoV\\_node.html](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/nCoV_node.html)).

Recently, evidence became available that dentists are well protected and that there is a very low risk for infection in the dental office (<https://pubmed.ncbi.nlm.nih.gov/32881190/>).

This is in accordance with a survey we currently conducted in Germany in which we could not identify a single case of COVID-19 transmission that occurred in dental offices using PPE. It has been reported that in office COVID-19 transduction can be effectively curbed by perpetual PPE use.



There is an international survey that we conduct together with Dr. Howard Gluckman (Capetown, South Africa) where you can still participate:

<https://www.surveymonkey.com/r/RXDDM6Y?fbclid=IwAR1tXCA95ahJTDSpv77ZHnQLZWL9Ue->

### ***Medical therapy and prevention***

Currently there is no good evidence about the efficacy of prophylactic drug administration to prevent COVID-19 infection and therefore this it is not recommended.

([https://www.rki.de/DE/Content/Kommissionen/Stakob/Stellungnahmen/Stellungnahme-Covid-19\\_Therapie\\_Diagnose.pdf?blob=publicationFile](https://www.rki.de/DE/Content/Kommissionen/Stakob/Stellungnahmen/Stellungnahme-Covid-19_Therapie_Diagnose.pdf?blob=publicationFile)). Guidelines are available.

(<https://www.awmf.org/leitlinien/detail/ll/113-001.html>);

([https://www.rki.de/DE/Content/Kommissionen/Stakob/Stellungnahmen/Stellungnahme-Covid-19\\_Therapie\\_Diagnose.pdf?blob=publicationFile](https://www.rki.de/DE/Content/Kommissionen/Stakob/Stellungnahmen/Stellungnahme-Covid-19_Therapie_Diagnose.pdf?blob=publicationFile)).

Anticoagulation, general medical support and surveillance are the current tools of the support of patients with mild COVID-19 diseases.

([https://www.rki.de/DE/Content/Kommissionen/Stakob/Stellungnahmen/Stellungnahme-Covid-19\\_Therapie\\_Diagnose.pdf?blob=publicationFile](https://www.rki.de/DE/Content/Kommissionen/Stakob/Stellungnahmen/Stellungnahme-Covid-19_Therapie_Diagnose.pdf?blob=publicationFile)). For a Covid-19 pneumonia Remdesivir proved to be

efficient (<https://www.ema.europa.eu/en/human-regulatory/overview/public-health-threats/coronavirus-disease-covid-19/treatments-vaccines-covid-19#remdesivir-section>).

Other medications such as Hydroxychloroquine did not prove to be efficient and shows a high risk potential (<https://www.ema.europa.eu/en/news/covid-19-reminder-risks-chloroquine-hydroxychloroquine>).

The same is valid for Lopinavir and Ritonavir (<https://www.recoverytrial.net/news/no-clinical-benefit-from-use-of-lopinavir-ritonavir-in-hospitalised-covid-19-patients-studied-in-recovery>).

Other approaches such as the use of convalescent patient plasma or Interleukin-6-receptor (IL-6) blockers are being researched but their efficacy has yet to be examined

([https://www.rki.de/DE/Content/Kommissionen/Stakob/Stellungnahmen/Stellungnahme-Covid-19\\_Therapie\\_Diagnose.pdf?blob=publicationFile](https://www.rki.de/DE/Content/Kommissionen/Stakob/Stellungnahmen/Stellungnahme-Covid-19_Therapie_Diagnose.pdf?blob=publicationFile)).

Also various psychoactive medications are under investigation (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7309834/>; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7187842/>) but there is no clinically valid clarity yet.

## **4. What is it with the WHO statement?**

The majority of the statement is in accordance with the evidence ([https://apps.who.int/iris/bitstream/handle/10665/333625/WHO-2019-nCoV-Oral\\_health-2020.1-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/333625/WHO-2019-nCoV-Oral_health-2020.1-eng.pdf)).

However, some parts are vague and definitely should have been formulated better as misunderstandings and problems are obvious.

*Some examples:*



- the advice to stop routine dental treatment and the labelling of preventive dentistry as non-essential

*„WHO advises that routine non-essential oral health care – which usually includes oral health check-ups, dental cleanings and preventive care – be delayed until there has been sufficient reduction in COVID-19 transmission rates from community transmission to cluster cases or according to official recommendations at national, sub-national or local level. The same applies to aesthetic dental treatments. However, urgent or emergency oral health care interventions that are vital for preserving a person's oral functioning, managing severe pain or securing quality of life should be provided.“*

([https://apps.who.int/iris/bitstream/handle/10665/333625/WHO-2019-nCoV-Oral\\_health-2020.1-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/333625/WHO-2019-nCoV-Oral_health-2020.1-eng.pdf))

- the omission of clear distinction between dental spray and infectious aerosols and the inadmissible risk attribution

*„Definition of aerosol generating procedures (AGPs) in oral health care: All clinical procedures that use spray-generating equipment such as three-way air/water spray, dental cleaning with ultrasonic scaler and polishing; periodontal treatment with ultrasonic scaler; any kind of dental preparation with high or low-speed hand-pieces; direct and indirect restoration and polishing; definitive cementation of crown or bridge; mechanical endodontic treatment; surgical tooth extraction and implant placement.“*

([https://apps.who.int/iris/bitstream/handle/10665/333625/WHO-2019-nCoV-Oral\\_health-2020.1-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/333625/WHO-2019-nCoV-Oral_health-2020.1-eng.pdf))

- the unfounded, actually refuted risk assessment in dental offices

*„Oral health care teams work in close proximity to patients' faces for prolonged periods. Their procedures involve face-to-face communication and frequent exposure to saliva, blood, and other body fluids and handling sharp instruments. Consequently, they are at high risk of being infected with SARS-CoV-2 or passing the infection to patients“.*

([https://apps.who.int/iris/bitstream/handle/10665/333625/WHO-2019-nCoV-Oral\\_health-2020.1-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/333625/WHO-2019-nCoV-Oral_health-2020.1-eng.pdf))

These false statements led to fierce replies from the various dental chambers

- Germany: [https://www.bzaek.de/fileadmin/PDFs/pm20/200812\\_WHO.pdf](https://www.bzaek.de/fileadmin/PDFs/pm20/200812_WHO.pdf)
- American Dental Association ADA: <https://www.cda.org/Home/News-and-Events/Newsroom/Article-Details/cda-and-ada-respond-to-who-recommendation-dentistry-is-essential-health-care>
- World Dental Federation FDI: <https://www.fdiworlddental.org/news/20200814/fdi-responds-to-whos-latest-guidance-on-the-provision-of-oral-health-services-in-the>

and many more such as the Hispanic Dental Association, the South African Dental Association, the Canadian Dental Association and the British Association of Private Dentistry.

All made clear that due to the medical importance of dentistry the WHO statement was wrong and misleading. We had summarized the medical importance of dentistry already in April: [https://www.dr-troeltzsch.de/fileadmin/user\\_upload/dokumente/2020/20200415\\_TroeltzschBrothers\\_Medical\\_side\\_of\\_dentistry.pdf](https://www.dr-troeltzsch.de/fileadmin/user_upload/dokumente/2020/20200415_TroeltzschBrothers_Medical_side_of_dentistry.pdf)

Furthermore, existing evidence was neglected, such as the proven safety of dental offices:

(<https://pubmed.ncbi.nlm.nih.gov/32881190/>).

*Assessment for the dental office:*

As all the associations stated: dentistry is important and safe.



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## 5. What happens if routine dental work is interrupted.

As stated in April, dentistry is important from a medical standpoint. In the meantime, this has sadly proven to be correct. Although dentistry was not limited in Germany many patients were discouraged from seeing their dentist due to negative media coverage. In our clinic we saw a massive surge in the numbers and extent of oncologic diseases in May and June (more than 4x the amount of 2019). The same is reported from various university clinics for orofacial and maxillofacial surgery such as Frankfurt (Prof. Dr. mult. Sader, source: Prof. Dr. med. Dr. med. dent. Shahram Ghanaati, FEBOMFS) and Kiel (source: Prof. Dr. med. Dr. med. dent. Jörg Wiltfang).

The same was observed in dentistry. Our survey demonstrated that many offices saw patients whose oral health had severely declined and that had refused to come in for recalls out of Covid-19 fear. Also, university clinics observed this such as Marburg (source: Prof. Dr. Roland Frankenberger) and the Tufts University School of Dental Medicine, Boston, Massachusetts, USA (source: Prof. Dr. med. dent Wael Att, Chair Department of Prosthodontics & Faculty Practice).

Also other medical specialties such as neurosurgeons observed this effect (<https://pubmed.ncbi.nlm.nih.gov/32555723/>).

### *Assessment for the dental office:*

Your daily work is relevant for the oral and general health of your patients. Interrupting routine dental work for prologued periods of time can affect the patient's wellbeing.

## 6. Summary

The evidence shows that dentistry is well prepared to safely manage the new menace SARS-CoV-2. There is no need for expensive extra equipment if the basic hygiene rules are observed. Masks proved to be more efficient in protecting the user than anticipated.

The medical importance of dentistry became especially obvious where patients refused to or could not see their dentist.

We hope this was helpful. Thanks to Luise Mortag for text-editing.

Stay healthy, stay alert but also take into account: our hygiene protocols work.

Markus & Matthias Tröltzsch