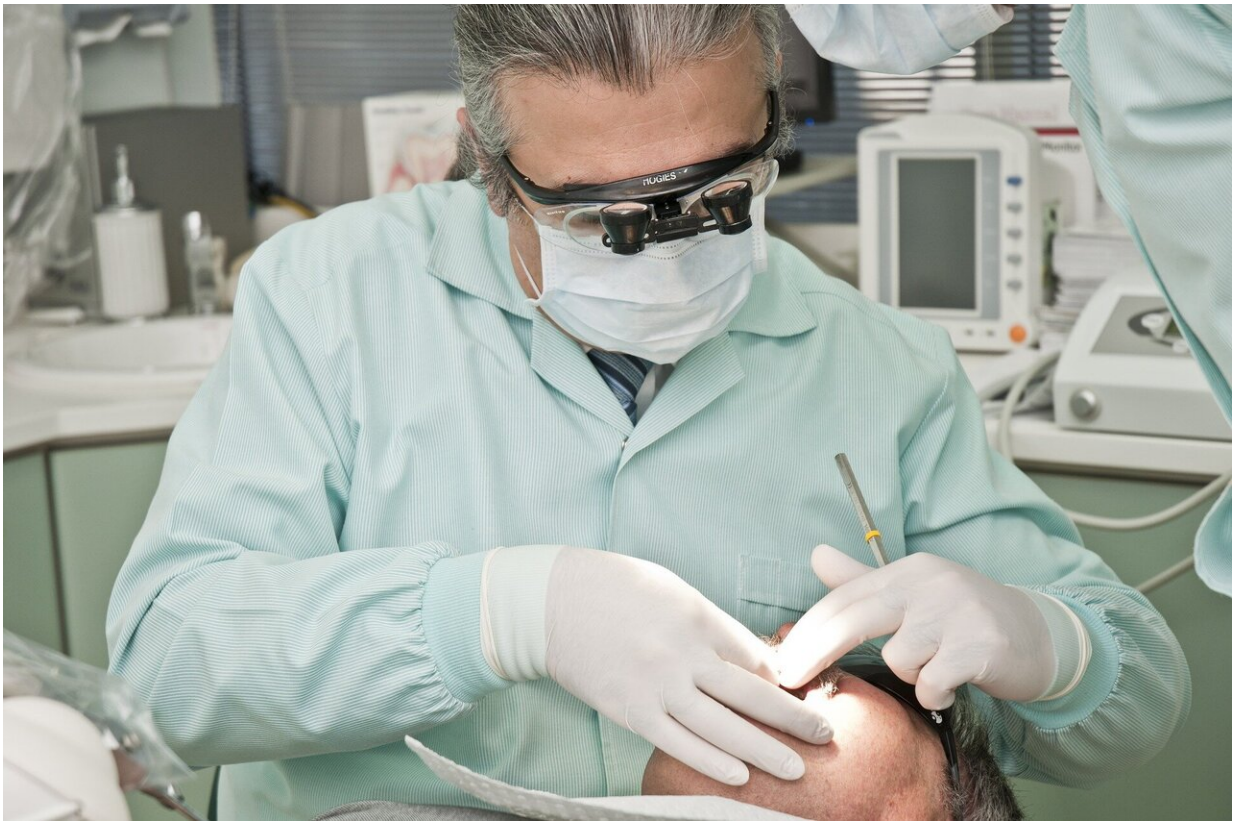


# Research shapes safe dentistry during COVID-19

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Leading research at Newcastle University has been used to shape how dentistry can be carried out safely during the COVID-19 pandemic by mitigating the risks of dental aerosols.

It is well known that coronavirus can spread in airborne particles, moving around rooms to infect people, and this has been a major consideration when looking into patient and clinician safety.

Research, published in the *Journal of Dentistry*, has led the way in helping shape national clinical guidance for the profession to work effectively under extremely challenging circumstances.

The findings have been used by the Dental Schools' Council, Association of Dental Hospitals and the Scottish Dental Clinical Effectiveness Programme to guide key COVID-19 policies for the profession.

## **Research findings**

Research revealed that [aerosol](#) generated procedures—such as fillings and root canal treatment—can spray aerosol and saliva particles from dental instruments large distances and contamination varied widely depending on the processes used.

In the open clinic settings, dental suction substantially decreased contamination at sites further away from the patient, such as bays five meters away. Often these distant sites had no contamination present or if contamination was detected it was at very low levels, diluted by 60,000—70,000 times.

It was also found that after 10 minutes, very little additional contaminated aerosol settled onto surfaces and therefore is a suitable time to clean a surgery after an aerosol-generating procedure.

Dr. Richard Holliday, NIHR Clinical Lecturer in Restorative Dentistry at Newcastle University, said: "Our research has improved our understanding of dental aerosol generated procedures and identified how cross-contamination could be a risk for spreading COVID-19.

"When the pandemic began, dental services were significantly reduced and there was an urgent need by the profession to focus on how dental clinics could work in a safe environment for patients and staff.

"We now have a much greater understanding of where the splatter of aerosols go and how far they travel during different procedures and settings, allowing clinical teams to make informed decisions to protect people.

"I am pleased that our research here at Newcastle has been used nationally by leading dental bodies to inform their policies on how the profession should carry out procedures during the pandemic."

## **Collaborative effort**

A research team from the School of Dental Sciences, including clinicians, dental nurses, microbiologists and scientists carried out the study.

The team used the tracer dye, fluorescein, while carrying out aerosol-generating procedures on a dental mannequin to analyze how far and where aerosol particles and saliva traveled from the patient's mouth.

A range of procedures were done and the effect of suction and ventilation analyzed. Experts looked at contamination close by and also in an open plan clinic.

Kimberley Pickering, a research dental nurse involved in the study, said: "For the safe re-opening of dental services, it was essential to understand the behavior of the aerosols that come out of a patient's mouth during dental work.

"We now better understand where the aerosols go and how far they

travel during different procedures and settings.

"We also understand how dental aerosols settle over time, which has helped inform cross-infection control procedures."

Further research will continue to focus on where aerosol and droplets from dental instruments travel and how far they go. Experts will also look at how long aerosols hang around in the air and examine a number of common dental procedures and methods of controlling aerosols.

A key part of the research will investigate if viruses can be carried in dental aerosols, and if viruses remain infective at a distance from the procedure. This will help experts to understand how to reduce the risk of microbes, like COVID-19, being spread by aerosols during dental treatment.

## **Student case study**

The research led the team to develop a new clinic configuration to allow the safe return of dental students and their patients.

Newcastle University's School of Dental Sciences is one the first universities in the country to recommence teaching aerosol-generating procedures to students in person during the pandemic.

Fourth year student Paddy Crawshaw said: "Being a dental student during the pandemic has been a big challenge, but dental students feel lucky to come into University every day and get in-person teaching as it's a privilege to treat our patients.

"The Dental School has been very supportive since the pandemic began. It is clear that senior clinicians and academics have worked hard behind the scenes to allow us to return to clinical teaching.

"The common goal of delivering first-class treatment for our patients has enhanced the Dental School's sense of community and this has really helped me through this term.

"I am proud of the way Newcastle Dental School and all of its staff and students have come together in the face of adversity through the COVID-19 pandemic. To know we are one of the first schools in the country offering a full range of student-led treatments for our patients makes me feel lucky to be studying here.

"Due to the extensive research undertaken by the School I have never felt unsafe, whether extracting a tooth or doing a simple examination I know the School's protocols are allowing me to work safely."

**More information:** Richard Holliday et al. Evaluating contaminated dental aerosol and splatter in an open plan clinic environment: Implications for the COVID-19 pandemic, *Journal of Dentistry* (2021). [DOI: 10.1016/j.jdent.2020.103565](https://doi.org/10.1016/j.jdent.2020.103565)

Provided by Newcastle University

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