ISSN: 2471-8726 Open Access

Cornucopia and Highlights of Internet Resources on the Web for COVID-19

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Abstract

Introduction: A new coronavirus COVID-19 has emerged as the cause of unusual cluster of viral pneumonia cases in China. The situation has rapidly evolved into a global health emergency as declared by the World Health Organization.

Aim: This paper aims to provide a brief and succinct guide to the current knowledge available in the internet regarding COVID-19 and the practice of dentistry. We tabulated the most useful websites available on the internet to the dental practitioner and the reader of our journal.

Methods: Current search engines Googles, Yahoo and Bing were used without time limit to trawl for websites with terms "COVID-19", "SARS-CoV-2", "Coronavirus" in conjunction with "Dentistry", "Infection control" and "Dental Practice".

Results: We found many yields of websites with good clinical information and current best practices to advert transmission of COVID-19 in the dental practice. There has been an unprecedented change in how dental patients are managed in this crisis. The current best practices are highlighted in the figures. The websites were classified and tabulated and listed as a table.

Conclusion: This paper provides a synopsis of the best available resource in Dentistry and guidance on the internet for COVID-19. The internet is a good source of dental information, resource and tools useful for the dissemination of information on COVID-19. It has been shown that in this pandemic that is happening world-wide, many researchers and scientists have shared their best information about this unknown disease and provided the best timely practices to other practitioners all over the world to avert transmission to healthcare workers in their institutions and to limit the spread of the infection to the local community.

Keywords: Coronavirus; COVID-19; Infection control; Dentistry; Oral Surgery; Internet

Introduction

Coronaviruses are enveloped non-segmented positive-sense RNA viruses belonging to the family Coronaviridae and the order Nidovirales and broadly distributed in humans and other mammals [1,2]. A new coronavirus COVID-19 has emerged as the cause of unusual cluster of viral pneumonia cases in China on Dec 16, 2019 [2,3]. The situation has rapidly evolved into a global health emergency as declared by the World Health Organization [4]. Seven coronaviruses are known to cause disease in humans. Two strains Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) have zoonotic origins and have been linked to outbreaks of severe respiratory illnesses in humans. Person to person transmission has been documented for COVID-19 [2,3,5,6]. For a review on Human coronaviruses, see Yin Y [7].

Most patients with COVID-19 infection present with fever (98%), cough (6%) and myalgia or fatigue (44%). Dyspnoea has been reported in 55% of the patients, developing in a median of eight days after the onset of the initial symptoms. Deaths have been reported [2,5]. At the time of writing, there were over 5.6 million confirmed cases and 348, 46 deaths around the world from

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Received 18 May 2020; Accepted 08 June 2020; Published 15 June 2020

the outbreak. It has spread to 213 countries outside China and 2 international conveyances (the Diamond Princess cruise and the MS Zaandam). United Kingdom recorded the first case on the 12 February this year. The Republic of Ireland reported its first case on the 29 February. Given the potential for rapid spread of the virus internationally, measures have been instituted to try to limit the spread [2,7-9]. On the 11 March, World Health Organization (WHO) declared the coronavirus outbreak a pandemic [10]. China has emerged from the crisis with a total of 84,536 confirmed cases and 4645 deaths. Currently China reports of zero to a single digit daily increase of COVID-19 cases [11] (Figure 1).

This paper provides a brief overview of all current recommendations worldwide to help the dental practitioners from being transmitted whilst caring for their patents. This is a first overview of internet resources on implications and measures for dentistry in a COVID-19 outbreak or pandemic.

Methods

The main search engines were used. These included Google, Yahoo and Bing. The search engines were used without time limit to trawl for websites with the search terms "COVID-19", "SARS-CoV-2", "Coronavirus" in conjunction with "Dentistry", "Infection control" and "Dental Practice". The difference in the surveys conducted with the three search engines was collected and duplications removed. The results were organized and tabulated over a 2-month period (1 Mar 2020 to 30 April 2020). The websites were assessed similarly for information and readability as in Hanna study [12]. The quality of information and readability was evaluated on a 5-pointed Likert-like scale and agreed by the three authors. Each item was scored on a scale ranging from 1 "very poor" to 5 "excellent" and grouped. Some of these websites found were highlighted in this article and represented as figures.

Results

There has been a big increase in the available literature on the internet and publication on the topic of coronavirus 2019. Just an observation, the number of published articles has increased each week since the week of January 13, 2020. Over five hundred journal articles were published electronically as February 24, 2020. This had swelled to 3883 by April 2, 2020. ByMay 16, the number was 12959 [13]. Table 1 depicts the tabulation of the websites found in this study. Most websites were ranked to have good to excellent information and readability. The table starts with basic information on COVID-19 and current updates, onto telemedicine and consultation prior to receiving the dental patient during the outbreak, to preparing requirements on receiving the patients especially personal protective equipment, to range of dental treatment to be rendered during this time, to post environment disinfection after dental treatments and finally ontoinformation regarding the resumption of dentistry after the outbreak.

Discussion

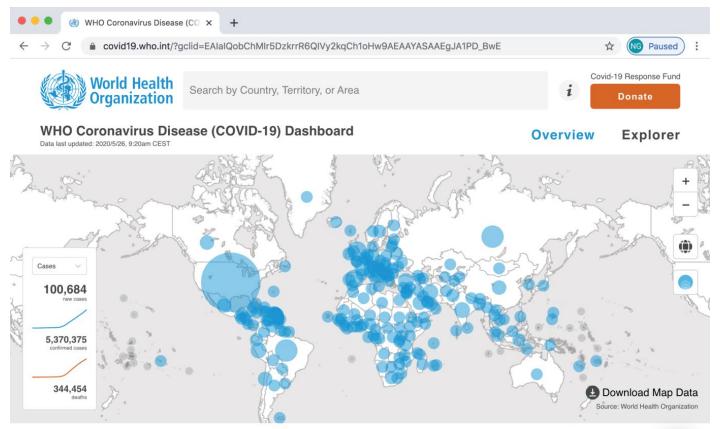
At press time, most dental practices worldwide remain on high alert to prevent COVID-19 transmission in their establishments. Most dental practitioners exercise Standard precautions. This was evolved from Universal precautions in 1996 by USA Center for Disease Control and Prevention (CDC) [14,15]. Figure 2 shows how Personal Protective Equipment (PPE) is worn from CDC website. Hand washing and the use of surgical masks are useful against some respiratory infections [16,17]. Coronavirus COVID-19 has been found in the saliva of infected persons [18]. Cleaning and disinfecting the environment surfaces are important as there has been reports of significant environmental contamination by COVID-19 patients through exhaled expiratory droplets [19,20]. When standard precautions alone cannot prevent transmission, a second tier of infection control known as transmission based protocol is used.

Not all dental settings are typically designed to carry out all of transmission based precautions. PPE is recommended for contact with critically ill patients with confirmed or suspected COVID-19. This includes fluid resistant gown, gloves, eye protection, full face shield and fit tested N95 respirators [21,22].

Most international guidances provide a flowchart for teledentistry and screening patient as well as patient risk assessment prior to the dental visit (Figure 3). The three most pertinent questions for initial screening should include any exposure to a person with known or suspected COVID-19 presentation, any recent travel history to an area with high incidence of COVID-19 or presence of any symptoms of febrile respiratory illnesses such as fever or cough [23].

Upon patient arrival at the dental practice, patients should complete a declaration and the patient's temperature measured using a non-contact forehead thermometer. In suspected or confirmed cases of COVID-19 infections requiring treatment, patients should be referred to a specialist dental care centre to prevent spread of infection (Figure 4). Most current guidelines advised essential treatments for dental patients during the outbreak and non-essential treatments deferred [24,25] (Figures 5 and 6). Emergency dental treatment should be considered. Dental treatment should be carried out as minimally invasive as possible. Aerosol generating procedures should be avoided where possible. After treatment, clinic staff should make sure to disinfect inanimate surfaces using chemicals. Current specific guidelines and recommendations for oral and maxillofacial surgery are evolving. The most current recommendation was provided by Zimmermann and Nkenke [26]. Most elective procedures are advised to be deferred and emergency treatments i.e., trauma, haemorrhage and deep head and neck infections should proceed to treatment without delay. The guidelines also advised the test for COVID-19 to be carried out before taking the patient to the operating room. Special requirements will be needed with infected patients [26].

With increasing transmission and local and community spread of the COVID-19, exposure of the healthcare professional to the virus may seemed



Globally, as of 9:20am CEST, 26 May 2020, there have been 5,370,375 confirmed cases of COVID-19, including 344,454 deaths, reported to WHO.



Figure 1. A screenshot depicting current infection worldwide (World Health Organization). https://covid19.who.int/. Site assessed 26 May 2020.

Table 1. Depicting results of study Resources on the web.

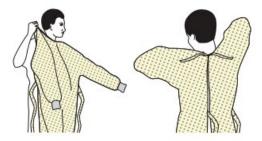
Table 1. Depicting results of study Resources on the w	/eb.		
Variables	Country/ Origin	Informational Content /Remarks	Information quality/ readability (Likert scale)
A. Latest update on coronavirus disease-2019			
WHO http://www.who.int/emergencies/diseases/novel-coronavirus-2019	Geneva, Switzerland	Daily update	Excellent
UK-NHS https://www.gov.uk/guidance/coronavirus-covid-19-information-for-the-public#number-of-cases-and- deaths	United Kingdom	Daily update	Excellent
Ireland https://www.hse.ie/eng/services/news/newsfeatures/covid19-updates/	Ireland	Daily update	Excellent
The Guardian https://www.theguardian.com/world/coronavirus-outbreak	United Kingdom	Daily update	Excellent
Worldometer https://www.worldometers.info/coronavirus/countries-where-coronavirus-has-spread/	Dadax Ltd, United Kingdom	Daily update	Excellent
B. Journal information for coronavirus disease-20	19		
NEJM https://www.nejm.org/coronavirus	United States	Content (Free download)	Excellent
JAMA https://jamanetwork.com/journals/jama/pages/coronavirus-alert	United States	Content (Free download)	Excellent
The Lancet https://www.thelancet.com/coronavirus	United Kingdom	Content (Free download)	Excellent
C. Risk assessment for Persons with potential COVID-19	exposure		
CDC https://www.cdc.gov/coronavirus/2019-ncov/healthcare-facilities/steps-to-prepare.html	Atlanta, Georgia, United States	Guidance	Good/ Excellent
D. Teledentistry and triage			
Dental Council New Zealand https://dcnz.org.nz/assets/Uploads/COVID/Guidelines-at-Alert-Level-4-updated-31Mar20.pdf	New Zealand	Guidance	Excellent
E. Recommendations for PPE			
CDC https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf	Atlanta, Georgia, United States	Guidance	Excellent
F. Dental settings and environment			
CDC Centers for Disease Control and Prevention https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html	Atlanta, Georgia, United States	Guidance	Excellent
G. Guidelines for Dental care			
GDC https://www.gdc-uk.org/information-standards-guidance/covid-19	United Kingdom	Guidance	Good/ Excellent
CDC https://www.cdc.gov/oralhealth/infectioncontrol/statement-COVID.html	Atlanta, Georgia, United States	Guidance	Good/ Excellent
IDA (Irish Dental Association) https://www.dentist.ie/news/covid-19-advice.8333.html	Ireland	Guidance	Good/ Excellent
Dental Council http://www.dentalcouncil.ie/covid.php	Ireland	Guidance	Good/ Excellent
HSE (Health Service Executive) https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/infectionpreventionandcontrolguidance/ dentalservices/Guidance-ManagingInfectionRisk-DentalServices-COVID19-MC-Agreed%20v1.0.pdf	Ireland	Guidance	Good/ Excellent
H. Guidelines for oral maxillofacial surgery			
AO CMF https://aocmf3.aofoundation.org/about-ao-cmf/news/2020_04-challenge-of-covid-19	Biel, Switzerland	Guidance	Good/ Excellent
Royal College Surgeons of England https://www.rcseng.ac.uk/-/media/files/rcs/fds/guidelines/oral-surgery-COVID19.pdf	United Kingdom	Guidance	Good/ Excellent
I. Guidelines for orthodontics Royal College Surgeons of England https://www.rcseng.ac.uk/-/media/files/rcs/fds/guidelines/orthodontics-covid19.	Haita d Kingadana	Ouidamaa	Good/
pdf J. Reopening of dental services	United Kingdom	Guidance	Excellent
ADA https://www.ada.org/en/publications/ada-news/2020-archive/april/ada-offers-interim-guidance-as-dentists-consider- reopening-practices	United States	Guidance	Good/ Excellent
Cochrane https://oralhealth.cochrane.org/sites/oralhealth.cochrane.org/files/public/uploads/covid19_dental_reopening_rapid_ review_13052020.pdf	United Kingdom	Guidance	Good/ Excellent
K. Website Resource centre			
American Dental Association coronavirus Centre https://success.ada.org/en/practice-management/patients/infectious-diseases-2019-novel-coronavirus	United States	Content	Excellent
Scottish Dental Clinical Effectiveness Programme http://www.sdcep.org.uk/published-guidance/	Dundee, United Kingdom	Content/ Guidance	Excellent
isted website addresses and information last accessed 26 May 2020.			

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- · Fasten in back of neck and waist



2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- · Fit flexible band to nose bridge
- · Fit snug to face and below chin
- · Fit-check respirator



3. GOGGLES OR FACE SHIELD

· Place over face and eyes and adjust to fit



4. GLOVES

· Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- · Keep hands away from face
- · Limit surfaces touched
- · Change gloves when torn or heavily contaminated
- · Perform hand hygiene



Figure 2. A screenshot depicting wearing of personal protective equipment (Source Centers for Disease Control and Prevention). https://www.cdc.gov/hai/pdfs/ppe/PPE-Sequence.pdf. Site assessed 26 May 2020.



Steps in assessing patients for urgent care or emergencies

- Triage all patients by phone first and decide whether they can be deferred. If over the counter or
 prescription medication is required, please note:
 - prescriptions can be sent to pharmacy for collection without the patient presenting at the dental surgery
 - where prescriptions are issued to suspected or COVID-positive patients, please ask the
 patient not to attend the pharmacy themselves to pick it up they should send a family
 member or arrange delivery by the pharmacy (delivery may incur a cost).
- If the patient needs a face-to-face assessment, ask the following questions over the telephone first:
 - Do you have a confirmed diagnosis of COVID-19?
 - Have you or anyone coming in contact with you, had contact with someone with a confirmed diagnosis of COVID-19?
 - · Have you travelled internationally in the last 14 days?
 - · Are you aged 70 or over?
 - Do have any of the following symptoms?
 - o sore throat
 - o cough
 - o shortness of breath
 - o high temperature (>38C).

Steps to limit transmission

Figure 3. A screenshot depicting triage and teledentistry (Dental Council New Zealand). https://dcnz.org.nz/assets/Uploads/COVID/Guidelines-at-Alert-Level-4-updated-31Mar20.pdf. Site assessed 26 May 2020.

Triage of Commonly Presenting Dental Problems

The following diagram illustrates a simple method for managing care for patients by telephone triage. Note that this is not comprehensive but deals with the most common presenting symptoms.

It is essential to establish the patient's COVID-19 status and then record this using your health board or local health system protocol.

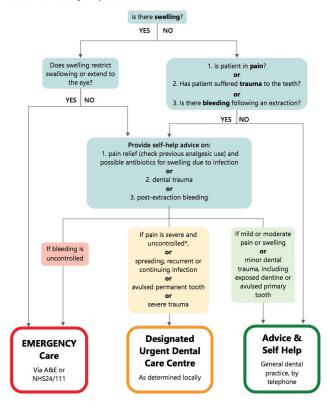


Figure 4. A screenshot depicting patient workflow management (Source Scottish Dental Clinical Effectiveness Programme). http://www.sdcep.org.uk/published-guidance/acute-dental-problems-covid-19/.Site assessed 26 May 2020.

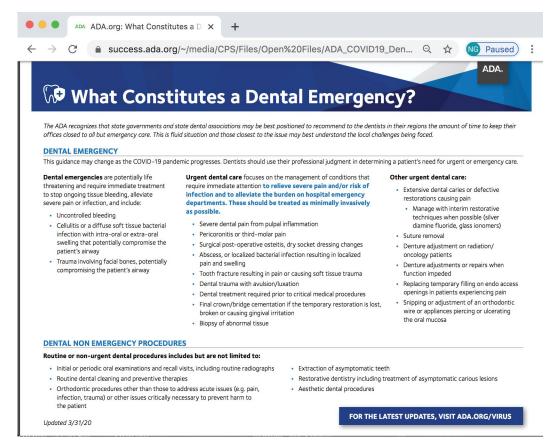


Figure 5. A screenshot depicting essential and urgent dental care during outbreak (AmericanDentalAssociation).https://success.ada.org/~/media/CPS/Files/Open%20 Files/ADA_COVID19_Dental_Emergency_DDS.pdf. Site assessed 26 May 2020.

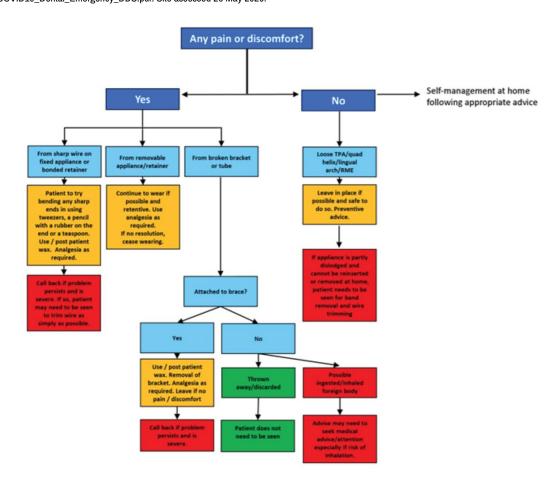


Figure 6. A screenshot depicting management of patients under orthodontic care during the outbreak (Source Royal College Surgeons of England). https://www.rcseng.ac.uk/-/media/files/rcs/fds/guidelines/orthodontics-covid19.pdf. Site assessed 26 May 2020.

likely. Indeed, there were anecdotal accounts of a COVID-19 patients who underwent dental procedures when they were not confirmed of infection at the time of presentation during the outbreak. The COVID-19 pandemic puts pressure on the healthcare system. It is hoped that with information sharing with researchers and dental professionals on the disease COVID-19 can help in the management of dental care around the world amid the pandemic and provide further development in the guidelines [27-31].

Conclusion

We presented the highlights of the dentistry relevant internet resources on COVID-19 in this article. Many aspects are still unknown about this disease. The internet is a good source of up-to-date dental information, resource and tools. It is useful for the dissemination of information. The information available is vast. There has been unprecedented change in how dental patients are managed in a crisis. This paper provides a synopsis of the best available resource in Dentistry and guidance on the internet for COVID-19.

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How to cite this article: Ng Chee-Hon, Tan Cornelius and Stassen Leo FA. "Cornucopia and Hightlights of Internet Resources on the Web for COVID-19", Oral health case Rep 6 (2020):1-7.