SELECTED ABSTRACTS FROM PUBMED

1. ***de Leeuw RA, Burger NB, Ceccaroni M, Zhang J, Tuynman J, Mabrouk M, et al. COVID-19 and Laparoscopic Surgery: Scoping Review of Current Literature and Local Expertise. JMIR Public Health Surveill. 2020 Jun 23;6(2):e18928.***

ABSTRACT

Background: The current coronavirus disease (COVID-19) pandemic is holding the world in its grip. Epidemiologists have shown that the mortality risks are higher when the health care system is subjected to pressure from COVID-19. It is therefore of great importance to maintain the health of health care providers and prevent contamination. An important group who will be required to treat patients with COVID-19 are health care providers during semiacute surgery. There are concerns that laparoscopic surgery increases the risk of contamination more than open surgery; therefore, balancing the safety of health care providers with the benefit of laparoscopic surgery for the patient is vital.

Objective: We aimed to provide an overview of potential contamination routes and possible risks for health care providers; we also aimed to propose research questions based on current literature and expert opinions about performing laparoscopic surgery on patients with COVID-19.

Methods: We performed a scoping review, adding five additional questions concerning possible contaminating routes. A systematic search was performed on the PubMed, CINAHL, and Embase databases, adding results from gray literature as well. The search not only included COVID-19 but was extended to virus contamination in general. We excluded society and professional association statements about COVID-19 if they did not add new insights to the available literature.

Results: The initial search provided 2007 records, after which 267 full-text papers were considered. Finally, we used 84 papers, of which 14 discussed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Eight papers discussed the added value of performing intubation in a low-pressure operating room, mainly based on the SARS outbreak experience in 2003. Thirteen papers elaborated on the risks of intubation for health care providers and SARS-CoV-2, and 19 papers discussed this situation with other viruses. They conclude that there is significant evidence that intubation and extubation is a high-risk aerosol-producing procedure. No papers were found on the risk of SARS-CoV-2 and surgical smoke, although 25 papers did provide conflicting evidence on the infection risk of human papillomavirus, hepatitis B, polio, and rabies. No papers were found discussing tissue extraction or the deflation risk of the pneumoperitoneum after laparoscopic surgery.

Conclusions: There seems to be consensus in the literature that intubation and extubation are high-risk procedures for health care providers and that maximum protective equipment is needed. On the other hand, minimal evidence is available of the actual risk of contamination of health care providers during laparoscopy itself, nor of operating room pressure, surgical smoke, tissue extraction, or CO2 deflation. However, new studies are being published daily from current experiences, and society statements are continuously updated. There seems to be no reason to abandon laparoscopic surgery in favor of open surgery. However, the risks should not be underestimated, surgery should be performed on patients with COVID-19 only when necessary, and health care providers should use logic and common sense to protect themselves and others by performing surgery in a safe and protected environment.

Keywords: COVID-19; corona 2019; health care provider; infectious disease; laparoscopy; outbreak; pandemic; physician; surgery; surgical procedures, operative.

2. ***Sommer DD, Engels PT, Weitzel EK, Khalili S, Corsten M, Tewfik MA, et al. Recommendations from the CSO-HNS taskforce on performance of tracheotomy during the COVID-19 pandemic. J Otolaryngol Head Neck Surg. 2020 Apr 27;49(1):23.***

ABSTRACT

Introduction: The performance of tracheotomy is a common procedural request by critical care departments to the surgical services of general surgery, thoracic surgery and otolaryngology - head & neck surgery. A Canadian Society of Otolaryngology - Head & Neck Surgery (CSO-HNS) task force was convened with multi-specialty involvement from otolaryngology-head & neck surgery, general surgery, critical care and anesthesiology to develop a set of recommendations for the performance of tracheotomies during the COVID-19 pandemic.

Main body: The tracheotomy procedure is highly aerosol generating and directly exposes the entire surgical team to the viral aerosol plume and secretions, thereby increasing the risk of transmission to healthcare providers. As such, we believe extended endotracheal intubation should be the standard of care for the entire duration of ventilation in the vast majority of patients. Pre-operative COVID-19 testing is highly recommended for any non-emergent procedure.

Conclusion: The set of recommendations in this document highlight the importance of avoiding tracheotomy procedures in patients who are COVID-19 positive if at all possible. Recommendations for appropriate PPE and environment are made for COVID-19 positive, negative and unknown patients requiring consideration of tracheotomy. The safety of healthcare professionals who care for ill patients and who keep critical infrastructure operating is paramount.

Keywords: AGMP; Aerosol; Aerosol generating medical procedure; Airway; Coronavirus; Covid-19; Global pandemic; ICU; Personal protective equipment; Recommendations; SARS-CoV-2; Tracheostomy; Tracheotomy; Ventilator.

3. ***Garas G, Cingolani I, Patel V, Panzarasa P, Alderson D, Darzi A, et al. Surgical Innovation in the Era of Global Surgery: A Network Analysis. Ann Surg. 2020 May;271(5):868-874.***

ABSTRACT

Objective: To present a novel network-based framework for the study of collaboration in surgery and demonstrate how this can be used in practice to help build and nurture collaborations that foster innovation.

Background: Surgical innovation is a social process that originates from complex interactions among diverse participants. This has led to the emergence of numerous surgical collaboration networks. What is still needed is a rigorous investigation of these networks and of the relative benefits of various collaboration structures for research and innovation.

Methods: Network analysis of the real-world innovation network in robotic surgery. Hierarchical mixed-effect models were estimated to assess associations between network measures, research impact and innovation, controlling for the geographical diversity of collaborators, institutional categories, and whether collaborators belonged to industry or academia.

Results: The network comprised of 1700 organizations and 6000 links. The ability to reach many others along few steps in the network (closeness centrality), forging a geographically diverse international profile (network entropy), and collaboration with industry were all shown to be positively associated with research impact and innovation. Closed structures (clustering coefficient), in which collaborators also collaborate with each other, were found to have a negative association with innovation ($P < 0.05$ for all associations).

Conclusions: In the era of global surgery and increasing complexity of surgical innovation, this study highlights the importance of establishing open networks spanning geographical boundaries. Network analysis offers a valuable framework for assisting surgeons in their efforts to forge and sustain collaborations with the highest potential of maximizing innovation and patient care.

4. ***Aghagoli G, Marin BG, Soliman LB, Sellke FW. Cardiac involvement in COVID-19 patients: Risk factors, predictors, and complications: A review. J Card Surg. 2020 Jun;35(6):1302-1305.***

ABSTRACT

Background: Respiratory complications have been well remarked in the novel coronavirus disease (SARS-CoV-2/COVID-19), yet an emerging body of research indicates that cardiac involvement may be implicated in poor outcomes for these patients.

Aims: This review seeks to gather and distill the existing body of literature that describes the cardiac implications of COVID-19.

Materials and methods: The English literature was reviewed for papers dealing with the cardiac effects of COVID-19.

Results: Notably, COVID-19 patients with pre-existing cardiovascular disease are counted in greater frequency in intensive care unit settings, and ultimately suffer greater rates of mortality. Other studies have noted cardiac presentations for COVID-19, rather than respiratory, such as acute pericarditis and left ventricular dysfunction. In some patients there has been evidence of acute myocardial injury, with correspondingly increased serum troponin I levels. With regard to surgical interventions, there is a dearth of data describing myocardial protection during cardiac surgery for COVID-19 patients. Although some insights have been garnered in the study of cardiovascular diseases for these patients, these insights remain fragmented and have yet to cement clear guidelines for actionable clinical practice.

Conclusion: While some information is available, further studies are imperative for a more cohesive understanding of the cardiac pathophysiology in COVID-19 patients to promote more informed treatment and, ultimately, better clinical outcomes.

Keywords: COVID-19; cardiac surgery; heart; respiratory failure; virus.

5. ***Di Mascio D, Khalil A, Saccone G, Rizzo G, Danilo Buca D, Marco Liberati M, et al. Outcome of coronavirus spectrum infections (SARS, MERS, COVID-19) during pregnancy: a systematic review and meta-analysis. Am J Obstet Gynecol MFM. 2020 May;2(2):100107***.

ABSTRACT

Objective: The aim of this systematic review was to report pregnancy and perinatal outcomes of coronavirus spectrum infections, and particularly coronavirus 2019 (COVID-19) disease because of severe acute respiratory syndrome-coronavirus-2 infection during pregnancy.

Data sources: Medline, Embase, Cinahl, and Clinicaltrials.gov databases were searched electronically utilizing combinations of word variants for coronavirus or severe acute respiratory syndrome or SARS or Middle East respiratory syndrome or MERS or COVID-19 and pregnancy. The search and selection criteria were restricted to English language.

Study eligibility criteria: Inclusion criteria were hospitalized pregnant women with a confirmed coronavirus related-illness, defined as severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), or COVID-19.

Study appraisal and synthesis methods: We used meta-analyses of proportions to combine data and reported pooled proportions, so that a pooled proportion may not coincide with the actual raw proportion in the results. The pregnancy outcomes observed included miscarriage, preterm birth, preeclampsia, preterm prelabor rupture of membranes, fetal growth restriction, and mode of delivery. The perinatal outcomes observed were fetal distress, Apgar score <7 at 5 minutes, neonatal asphyxia, admission to a neonatal intensive care unit, perinatal death, and evidence of vertical transmission.

Results: Nineteen studies including 79 hospitalized women were eligible for this systematic review: 41 pregnancies (51.9%) affected by COVID-19, 12 (15.2%) by MERS, and 26 (32.9%) by SARS. An overt diagnosis of pneumonia was made in 91.8%, and the most common symptoms were fever (82.6%), cough (57.1%), and dyspnea (27.0%). For all coronavirus infections, the pooled proportion of miscarriage was 64.7% (8/12; 95% confidence interval, 37.9-87.3), although reported only for women affected by SARS in two studies with no control group; the pooled proportion of preterm birth <37 weeks was 24.3% (14/56; 95% confidence interval, 12.5-38.6); premature prelabor rupture of membranes occurred in 20.7% (6/34; 95% confidence interval, 9.5-34.9), preeclampsia in 16.2% (2/19; 95% confidence interval, 4.2-34.1), and fetal growth restriction in 11.7% (2/29; 95% confidence interval, 3.2-24.4), although reported only for women affected by SARS; 84% (50/58) were delivered by cesarean; the pooled proportion of perinatal death was 11.1% (5/60; 95% confidence interval, 84.8-19.6), and 57.2% of newborns (3/12; 95% confidence interval, 3.6-99.8) were admitted to the neonatal intensive care unit. When focusing on COVID-19, the most common adverse pregnancy outcome was preterm birth <37 weeks, occurring in 41.1% of cases (14/32; 95% confidence interval, 25.6-57.6), while the pooled proportion of perinatal death was 7.0% (2/41; 95% confidence interval, 1.4-16.3). None of the 41 newborns assessed showed clinical signs of vertical transmission.

Conclusion: In hospitalized mothers infected with coronavirus infections, including COVID-19, >90% of whom also had pneumonia, preterm birth is the most common adverse pregnancy outcome. COVID-19 infection was associated with higher rate (and pooled proportions) of preterm birth, preeclampsia, cesarean, and perinatal death. There have been no published cases of clinical evidence of vertical transmission. Evidence is accumulating rapidly, so these data may need to be updated soon. The findings from this study can guide and enhance prenatal counseling of women with COVID-19 infection occurring during pregnancy, although they should be interpreted with caution in view of the very small number of included cases.

Keywords: Middle East respiratory syndrome; coronavirus; coronavirus 2019; infection; pregnancy; severe acute respiratory syndrome; severe acute respiratory syndrome–coronavirus-2.

6. ***Linden K, Mailey J, Kearney A, Menown IBA. Advances in Clinical Cardiology 2019: A Summary of Key Clinical Trials. Adv Ther. 2020 Jun;37(6):2620-2645.***

ABSTRACT

Introduction: A large number of important clinical trials in cardiology were published or presented at major international conferences during 2019. This paper aims to offer a concise overview of these significant advances and to put them into clinical context.

Methods: Trials presented at the major international cardiology meetings during 2019 were reviewed including The American College of Cardiology (ACC), Euro PCR, The European Society of Cardiology (ESC), Transcatheter Cardiovascular Therapeutics (TCT), and the American Heart Association (AHA). In addition to this a literature search identified several other publications eligible for inclusion based on their relevance to clinical cardiology, their potential impact on clinical practice and on future guidelines.

Results: A total of 70 trials met the inclusion criteria. New interventional and structural data include trials examining use of drug-coated balloons in patients with acute myocardial infarction (MI), interventions following shockable cardiac arrest, mechanical circulatory support in cardiogenic shock complicating MI, intervention in stable coronary artery disease, surgical or percutaneous revascularisation strategies in left main coronary artery disease, revascularisation strategy in ST elevation MI, transcatheter aortic valve replacement in low-risk patients, and percutaneous mitral or tricuspid valve interventions. Preventative cardiology data included the use of sodium-glucose cotransporter 2 (SGLT2) inhibitors (dapagliflozin), proprotein convertase subtilisin-kexin type 9 (PCSK9) inhibitors (evolocumab), bempedoic acid, and novel approaches to the management of hypertension. Antiplatelet data included trials evaluating both the optimal length of course and combination of antiplatelet agents and regimes including combination antithrombotic therapies for patients with atrial fibrillation. Heart failure data included trials of sacubitril-valsartan in heart failure with preserved ejection fraction and the use of SGLT2 inhibitors in patients with heart failure but without diabetes. Electrophysiology data included trials examining alcohol in atrial fibrillation and the use of wearable fitness devices for identifying atrial fibrillation.

Conclusion: This article presents key clinical trials completed during 2019 and should be valuable to clinicians and researchers working in cardiology.

Keywords: Acute coronary syndrome; Anticoagulation; Atrial fibrillation; Cardiology; Coronary revascularisation; Heart failure; Lipids; Mitral clip; Myocardial infarction; Transcatheter aortic valve implantation.

7. ***Choi B, Jegatheeswaran L, Minocha A, Alhilani M, Nakhoul M, Mutengesa E. The impact of the COVID-19 pandemic on final year medical students in the United***

Kingdom: a national survey. BMC Med Educ. 2020 Jun 29;20(1):206.

ABSTRACT

Background: The coronavirus disease (COVID-19) global pandemic has resulted in unprecedented public health measures. This has impacted the UK education sector with many universities halting campus-based teaching and examinations. The aim of this study is to identify the impact of COVID-19 on final year medical students' examinations and placements in the United Kingdom (UK) and how it might impact their confidence and preparedness going into their first year of foundation training.

Methods: A 10-item online survey was distributed to final year medical students across 33 UK medical schools. The survey was designed by combining dichotomous, multiple choice and likert response scale questions. Participants were asked about the effect that the COVID-19 global pandemic had on final year medical written exams, electives, assistantships and objective structured clinical examinations (OSCEs). The survey also explored the student's confidence and preparedness going into their first year of training under these new unprecedented circumstances.

Results: Four hundred forty students from 32 UK medical schools responded. 38.4% (n = 169) of respondents had their final OSCEs cancelled while 43.0% (n = 189) had already completed their final OSCEs before restrictions. 43.0% (n = 189) of assistantship placements were postponed while 77.3% (n = 340) had electives cancelled. The impact of COVID-19 on OSCEs, written examinations and student assistantships significantly affected students' preparedness (respectively p = 0.025, 0.008, 0.0005). In contrast, when measuring confidence, only changes to student assistantships had a significant effect (p = 0.0005). The majority of students feel that measures taken during this pandemic to amend their curricula was necessary. Respondents also agree that assisting in hospitals during the outbreak would be a valuable learning opportunity.

Conclusions: The impact on medical student education has been significant, particularly affecting the transition from student to doctor. This study showed the disruptions to student assistantships had the biggest effect on students' confidence and preparedness. For those willing to assist in hospitals to join the front-line workforce, it is crucial to maintain their wellbeing with safeguards such as proper inductions, support and supervision.

Keywords: Assistantship; COVID-19; Medical education; Students.

8. Rao R, Hawkins M, Ulrich T, Gatlin G, Mabry G, Mishra C. The Evolving Role of Public Health in Medical Education. Front Public Health. 2020 Jun 26;8:251.

ABSTRACT

Medical education in the twentieth century was largely influenced by the Flexner Report, with significant proportions of instruction dedicated to the molecular underpinnings of the pathologic pathways and minimal mention of the socio-ecological determinants of health. When examining the predominant diseases of the twenty first century landscape, widening health disparities, and significant changes in the United States healthcare system, it is imperative to view wellness and sickness in a broader public health context rather than a singular focus of the biomedical model. While undergraduate opportunities to study public health are on the rise in the United States, there is a parallel urgency for medical curricula to recognize the importance of the complex interrelated socio-ecological root causes of health, well-being, and illness. In order to reduce the risk of non-communicable diseases and increase health equity, it is necessary for medical education to integrate core public health knowledge and competencies. Contemporary health challenges require a public health approach, in addition to clinical skills, for physicians to provide equitable care. The COVID-19 pandemic further underscores the necessity to mitigate the effects of socio-ecological determinants of health. Seven key recommendations are presented from a training to practice timeline emphasizing the important linkages between medical education, socio-ecological influences on health, and public health. As the health challenges in society and communities shift, so too must training of future physicians. There is a need and an opportunity for medicine and public health to address the shared health challenges of our global society.

Keywords: education; health equity; premedical; public health; socio-ecological.

9. De Mattos-Arruda L, Blanco-Heredia J, Aguilar-Gurrieri C, Carrillo J, Blanco J. New emerging targets in cancer immunotherapy: the role of neoantigens. ESMO Open. 2020 Apr;4(Suppl 3):e000684.

ABSTRACT

The success of cancer therapies with immune checkpoint inhibitors is transforming the treatment of patients with cancer and fostering cancer research. Therapies that target immune checkpoint inhibitors have shown unprecedented rates of durable long-lasting responses in patients with various cancer types, but only in a fraction of patients. Thus, novel approaches are needed to make immunotherapy more precise and also less toxic. The advances of next-generation sequencing technologies have allowed fast detection of somatic mutations in genes present in the exome of an individual tumour. Targeting neoantigens, the mutated peptides expressed only by tumour cells, may enable antitumour T-cell responses and tumour destruction without causing harm to healthy tissues. Currently, neoantigens can be identified in tumour clinical samples by using genomic-based computational tools. The two main treatment modalities targeting neoantigens that have been investigated in clinical trials are personalised vaccines and tumour infiltrating lymphocytes-based adoptive T-cell therapy. In this mini review, we

discuss the promises and challenges for using neoantigens as emergent targets to personalise and guide cancer immunotherapy in a broader set of cancers.

Keywords: adoptive T cell; checkpoint inhibitors; immunotherapy; neoantigens; next generation sequencing; vaccines.

10. Shimizu H, Nakayama KI. Artificial intelligence in oncology. Cancer Sci. 2020 May;111(5):1452-1460.

ABSTRACT

Artificial intelligence (AI) has contributed substantially to the resolution of a variety of biomedical problems, including cancer, over the past decade. Deep learning, a subfield of AI that is highly flexible and supports automatic feature extraction, is increasingly being applied in various areas of both basic and clinical cancer research. In this review, we describe numerous recent examples of the application of AI in oncology, including cases in which deep learning has efficiently solved problems that were previously thought to be unsolvable, and we address obstacles that must be overcome before such application can become more widespread. We also highlight resources and datasets that can help harness the power of AI for cancer research. The development of innovative approaches to and applications of AI will yield important insights in oncology in the coming decade.

Keywords: artificial intelligence; deep learning; machine learning; oncology; personalized medicine.

11. Cha H-R, Hyoung Lee JH, Ponnazhagan S. Revisiting Immunotherapy: A Focus on Prostate Cancer. Cancer Res. 2020 Apr 15;80(8):1615-1623.

ABSTRACT

Therapeutic interventions to harness the immune system against tumor cells have provided mixed results in the past for several solid tumors and hematologic malignancies. However, immunotherapy has advanced considerably over the last decade and is becoming an integral combination for treating patients with advanced solid tumors. In particular, prostate cancer immunotherapy has shown modest efficacy for patients in the past. With several key discoveries on immune mechanisms and advanced molecular diagnostic platforms recently, immunotherapy is re-emerging as a viable option for prostate cancer, especially castration-resistant prostate cancer (CRPC), to stimulate antitumor immunity. Combination of patient-tailored immunotherapy and immune checkpoint blockers with conventional cytotoxic agents and androgen receptor-targeted therapies should move the field forward. With a recent adaptation that the application of immune checkpoint inhibitors has been successful in the treatment of more than a dozen solid tumors, including melanoma, lymphoma, liver, cervical, gastrointestinal, and breast cancers, it is a timely endeavor to harness immunotherapy for prostate cancer. Here, we provide an account on the progression of immunotherapy with new discoveries and precision approaches for tumors, in particular CRPC, from mechanistic standpoint to emerging limitations and future directions.

12. Hankey W, Chen Z, Wang Q. Shaping Chromatin States in Prostate Cancer by Pioneer Transcription Factors. Cancer Res. 2020 Jun 15;80(12):2427-2436.

ABSTRACT

The androgen receptor (AR) is a critical therapeutic target in prostate cancer that responds to antagonists in primary disease, but inevitably becomes reactivated, signaling onset of the lethal castration-resistant prostate cancer (CRPC) stage. Epigenomic investigation of the chromatin environment and interacting partners required for AR transcriptional activity has uncovered three pioneer factors that open up chromatin and facilitate AR-driven transcriptional programs. FOXA1, HOXB13, and GATA2 are required for normal AR transcription in prostate epithelial development and for oncogenic AR transcription during prostate carcinogenesis. AR signaling is dependent upon these three pioneer factors both before and after the clinical transition from treatable androgen-dependent disease to untreatable CRPC. Agents targeting their respective DNA binding or downstream chromatin-remodeling events have shown promise in preclinical studies of CRPC. AR-independent functions of FOXA1, HOXB13, and GATA2 are emerging as well. While all three pioneer factors exert effects that promote carcinogenesis, some of their functions may inhibit certain stages of prostate cancer progression. In all, these pioneer factors represent some of the most promising potential therapeutic targets to emerge thus far from the study of the prostate cancer epigenome.