### Contents

**Volume 7 Issue 2 | BMJ Innovations April 2021**

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>247</td>
<td>Editorial</td>
<td>A McKimm</td>
</tr>
<tr>
<td>249</td>
<td>One nudge for hand hygiene</td>
<td>D A Redelmeier, R H Thaler</td>
</tr>
<tr>
<td>271</td>
<td>Rapid implementation of Inpatient eConsult Programme addresses new challenges for patient care during COVID-19 pandemic</td>
<td>S Rikin, E J Epstein, J Gendina</td>
</tr>
<tr>
<td>278</td>
<td>Population eye health education using augmented reality and virtual reality: scalable tools during and beyond COVID-19</td>
<td>D V Ganasekeren, R Loe, R Gunasekeren, B Chan, H Y Ong, D Raje, H Mi, C Pavesio, Q D Nguyen, R Agrawal</td>
</tr>
<tr>
<td>284</td>
<td>Virtual hackathon to tackle COVID-19 unmet needs</td>
<td>W S Bolton, S Ng, A Lam, J Kinch, V Parchment, W P Foster, M R Zimmermann, J Q Teh, A Simpson, K Sharma, R Kerstein, J Burke, S J Chapman, P R Culmer, D G Jayne, on behalf of the MedTech Foundation</td>
</tr>
<tr>
<td>292</td>
<td>Negative pressure patient isolation device to enable non-invasive respiratory support for COVID-19 and beyond</td>
<td>A August, M Bolthouse, B Rice, J K Wall</td>
</tr>
<tr>
<td>297</td>
<td>Feasibility of manual ventilation replacing mechanical ventilation</td>
<td>M F Brady, I K Wefer, R Walker, J J, E Holley, S A Ni, S Young, E D Monhollen, R S Carpenter, J W Tsao</td>
</tr>
<tr>
<td>308</td>
<td>Modified full-face snorkel mask: answer to the PPE crisis?</td>
<td>H D Measuria, Y V Verma, R Kerstein, S Tucker</td>
</tr>
</tbody>
</table>

---

**Guidelines for Authors**

Full instructions are available online at http://innovations.bmj.com/fora. Articles must be submitted electronically to mc.manuscriptcentral.com/bmjinnov. Authors retain copyright but are required to grant BMJ Innovations an exclusive licence to publish http://journals.bmj.com/site/authors/editorial-policies.xhtml#copyright

**Copyright:**

BMJ Innovations is published by BMJ Publishing Group Limited and its content is for information only. The Journal is published without any guarantee as to its accuracy or completeness and any representations or warranties are expressly excluded to the fullest extent permitted by law. Readers are advised to independently verify any information on which they choose to rely. Acceptance of advertising by BMJ Innovations does not imply endorsement. BMJ Publishing Group Limited shall not be liable for any loss, injury or damage however arising from BMJ Innovations (except for liability which cannot be legally excluded).

**Disclaimer:**

The Editor of BMJ Innovations has been granted editorial freedom and BMJ Innovations is published in accordance with editorial guidelines issued by the World Association of Medical Editors and the Committee on Publication Ethics. BMJ Innovations is primarily intended for healthcare professionals and its content is for information only. The Journal is published without any guarantee as to its accuracy or completeness and any representations or warranties are expressly excluded to the fullest extent permitted by law. Readers are advised to independently verify any information on which they choose to rely. Acceptance of advertising by BMJ Innovations does not imply endorsement. BMJ Publishing Group Limited shall not be liable for any loss, injury or damage however arising from BMJ Innovations (except for liability which cannot be legally excluded). Copyright: © 2021 BMJ Publishing Group Ltd. All rights reserved; no part of this publication may be reproduced in any form without permission. BMJ Innovations is published by BMJ Publishing Group Ltd, typeset byEdeTer Premedia Services Private Limited, Chennai, India.

---

**Strategic Partner**

![WIS]
Exploring the challenges and hidden opportunities of hosting a virtual innovation competition in the time of COVID-19
M El Akoum, M El Achi

Epidemiological impact of prioritising SARS-CoV-2 vaccination by antibody status: mathematical modelling analyses

The way forward after COVID-19 vaccination: vaccine passports with blockchain to protect personal privacy
K K F Tsok, J J Y Sung, H W Y Lee, K K L Yu, H Fung, S Y S Wong

Telemonitoring programme on COVID-19 for a low-income community in Brazil: case study
T U d S Graça, A L Santos, G Yamamoto, R W de Souza, M P P Srougê, R L Pacheco, C Lima, R Riera

C L Ochu, O W Akende, O Oyetaban, O Ademola, O Ogunbode, R Attah, T Obwor, E Ogwuao, T Ojumu, C Ofegbenuam, B Erhodaghe, G Joseph, P Ikewue, C Ikewwezu

End-to-end convolutional neural network enables COVID-19 detection from breath and cough audio: a pilot study
H Coppock, A Gaskell, P Tzirakis, A Baird, L Jones, B Schuller

MyCOVIDRisk app: development and utilisation of a COVID-19 risk assessment and mitigation application
E M Goldberg, C S Bingaman, S Perera, M L Ranney

Contact-tracing applications: a review of technologies
M Nazayer, S Madanian, F Mirza

Extending tubing to place intravenous smart pumps outside of patient rooms during COVID-19: an innovation that increases medication dead volume and risk to patients
J W C Blake, K K Giuliano, R D Butterfield, T Vanderveen, N M Sims

Applications and challenges of AI-based algorithms in the COVID-19 pandemic
D Khemasiwatan, H G Colt

Medical devices

Using human-centred design to develop an innovative female condom
P S Coffey, M Kilbourne-Brook

Driving medtech innovation and start-up company formation through successful joint academic/commercial fellowship
F Sharif, I Quinn

Health technology assessment

Machine-learning-based hospital discharge predictions can support multidisciplinary rounds and decrease hospital length-of-stay
S Levin, S Barnes, M Toepfer, A Delbrae, A Deangelico, E Hamrock, J Hineson, E Hoyer, T Dungarani, E Howell

Assistive technologies

Google translate in healthcare: preliminary evaluation of transcription, translation and speech synthesis accuracy
J Birkenbeuel, H Joyce, R Sahyouni, D Cheung, M Madacoc, N Mostagmi, S Sahyouni, H Djallilian, J Chen, H Lin

Early-stage innovation reports

Design and user experience of Noxeno: a novel nasal foreign body removal device
A Chandran, K Sileka, B Jat, P Kadambi, R D Souza, R Kumar, A Thakar, S Sharma

Single-unit, wireless device for salivary stimulation
Rajkumar K, Ramya R, Swarna Lakshmi R

Development of a practical training method for a healthcare artificial intelligence (AI) chatbot

Use of a smart lip holder for minimally invasive minor salivary gland biopsy
A Dumusc, B Bannen, F Kollen, J Alvarez-Trompoco, T Hugle
448  Pain alleviation during cryotherapy of plantar viral warts using a non-invasive vibratory device: a randomised individually controlled trial
Y P Koh, M M Chan, X Zhao, L Tan, H L Tey

452  Evaluating simple, affordable technology for ophthalmic diagnoses in rural Malawi: a potential tool to address skill shortage
A Noar, H Jeffery, J Hoffman

456  Assessing baseline practice and the implementation and efficacy of a novel device for medication security
H Young, M Z A Mariyaselvam, V Patel, J Gibson, E Hodges, N English, R Heij, G Wijewardena, D Pearson, M Blunt, P Yeung

463  Purpose-built, head-mounted 3D display for ophthalmic microsurgery: surgical skill performance and evaluation: a pilot study
E Korot, M M Rolain, A Evans, A Thanos, C Bergeles, E H Wood, M A Rolain

470  New technique and device for controlled and continuous drug delivery into the brain: a proof-of-concept study
Anoop U R, K Verma

478  Simple working sheath for lumbar and lumbosacral spine: technical note
D K Jha, J S Gosal, J Ruparelia, N Kumar, T Sharma, P K Bhattia, P Kheria

Reviews
482  Double standards in healthcare innovations: the case of mosquito net mesh for hernia repair
M Skopec, A Grillo, A Kureshi, Y Bhattia, M Harris

491  Design thinking as an approach for innovation in healthcare: systematic review and research avenues
M Oliveira, E Zancul, A L Fleury

499  Agile Innovation to transform healthcare: innovating in complex adaptive systems is an everyday process, not a light bulb event
R J Holden, M A Boustani, J Azar

506  Blockchain, health disparities and global health
D Vervoort, C R Guetter, A W Peters

Letter
515  Novel disinfecting spittoons during COVID-19
M M Khan, S R Parab