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Grass-roots junior doctor communication network in response to the COVID-19 pandemic: a service evaluation

Arun Sivananthan [1,2] Matthew Machin,[3] Geiske Zijlstra,[4] Alexander Harris,[5] Shiva T Radhakrishnan [2,6] Peter Crook,[2] Georgina Phillips,[7] Max Christopher Denning [8,9] Nisha Patel,[1,2] Georgina Russell,[10] Ara Darzi,[1] James Kinross,[5] Ruth Brown[11]

Check for updates

For numbered affiliations see end of article.

Correspondence to
Dr Arun Sivananthan;
arun.sivananthan@nhs.net

ABSTRACT

Background COVID-19 was declared a worldwide pandemic on 11 March 2020. Imperial College Healthcare NHS Trust provides 1412 inpatient beds staffed by 1200 junior doctors and faced a large burden of COVID-19 admissions.

Local problem A survey of doctors revealed only 20% felt confident that they would know to whom they could raise concerns and that most were getting information from a combination of informal work discussions, trust emails, social media and medical literature.

Methods This quality improvement project was undertaken aligning with Standards for Quality Improvement Reporting Excellence 2.0 guidelines. Through an iterative process, a digital network (Imperial Covid cOmmunications Network; ICON) using existing smartphone technologies was developed. Concerns were collated from the junior body and conveyed to the leadership team (vertical—bottom-up using Google Form) and responses were conveyed from leadership to the junior body (vertical—top-down using WhatsApp and Zoom). Quantitative analysis on engagement with the network (members of the group and number of issues raised) and qualitative assessment (thematic analysis on issues) were undertaken.

Results Membership of the ICON WhatsApp group peaked at 780 on 17 May 2020. 197 concerns were recorded via the Google Form system between 20 March and 14 June 2020. There were five overarching themes: organisational and logistics; clinical strategy concerns; staff safety and well-being; clinical (COVID-19) and patient care; and facilities. 94.4% of members agreed ICON was helpful in receiving updates and 88.9% agreed ICON improved collaboration.

Conclusions This work demonstrates that a coordinated network using existing smartphone technologies and a novel communications structure can improve collaboration between senior leadership and junior doctors. Such a network could play an important role during times of pressure in a healthcare system.

BACKGROUND

The SARS-CoV-2 virus was declared a world-wide pandemic on 11 March 2020.[1] By 21 March 2020, there were over 1000 confirmed cases in the UK with 71 reported deaths.[2 3] This placed significant strain on the National Health Service (NHS), and its capacity to cope was exacerbated by limited testing strategies and personal protective equipment (PPE) shortages.[4] The NHS was forced to rapidly retrain and redeploy clinicians into front-line roles and restructure to deliver high-volume critical care services. These staff members were often trainees or junior doctors, who were exposed to high rates of anxiety and stress. Imperial College Healthcare NHS Trust (ICHNT) had admitted 241 cases by 11 March and the trust has experienced a rapid rise in acute cases in alignment with national trends. ICHNT is a complex organisation spread over three acute hospitals, two specialist hospitals and seven renal centres providing 1412 inpatient beds, staffed by over 1200 junior doctors.[5]

The management of any health crisis requires the rapid writing and dissemination of clinical practice guidelines, and the maintenance of open and secure communication networks. An initial survey of the preparedness and use of information channels by 25 doctors was conducted at ICHNT in March 2020.

Participants reported their main information streams were 'informal discussions at work' (68%), 'daily Trust email briefing' (64%), 'medical literature' (56%) and 'social media' (52%). Only 20% felt confident that they would know to whom they could raise concerns and that they would get a consistent reply. Ninety-two per cent of respondents felt that it would be useful to have a 'forum or communication channel to ask questions and raise concerns regarding COVID-19'.

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There are innovative solutions to communication in healthcare being developed such as the mobile application 'pando', an NHS digital mobile application providing a secure communications platform specific to healthcare. At the time of the pandemic none of these innovations however had broad usership and, as demonstrated by the initial survey, did not serve a role in communication during the pandemic. Electronic mobile applications such as WhatsApp are already used in healthcare settings to facilitate information sharing and improve direct communication between colleagues.[6–9] Such apps have been approved in the UK by the NHS body, NHSX, who are responsible for setting national policy and developing best practice for data sharing and transparency.[10]

In response to the pandemic, a grass-roots junior doctor network was established to improve collaboration between senior leadership and junior doctors. The Imperial Covid cOmmunications Network (ICON) engaged clinicians across ICHNT and was key in the communication between service providers and divisional management in addition to the dissemination of rapidly evolving clinical guidelines. This was undertaken following social distancing guidelines and therefore was organised without a physical infrastructure. ICON is a junior doctor communication network aiming to improve information sharing and collaboration between clinicians and senior leadership during the COVID-19 pandemic.

The aims of this service evaluation were to:
1. Identify if ICON is effective at improving the collaboration between senior leadership and junior doctors.
2. Identify themes of concern during the COVID-19 pandemic.
3. Assess if ICON is able to streamline information dissemination.
4. Establish if ICON is able to facilitate responses to concerns raised by junior doctors.

METHODS
ICON is a grass-roots trainee-led network that used existing digital technologies to organise a communication system among clinical staff at ICHNT during the pandemic. Through an iterative process, a network was developed to improve communications from leadership to the junior body (vertical—top-down), collate concerns and queries from the junior body and convey them to the leadership (vertical—bottom-up), and aid in peer-to-peer communication (horizontal).

Vertical (bottom up)
Junior doctors were invited to anonymously submit concerns via a prepopulated electronic Google Form. Drop-down options included grade of trainee, specialty and site of work. Free text inputs were categorised into concerns about patient management, training, welfare, communications, safety, rota and redeployment. The ICON committee collated issues from the Google Form system into themes and presented them to the relevant senior managers and clinicians in order to gather formal response on a weekly basis.

Vertical (top-down)
A weekly digitally forum via Zoom was hosted by a senior management lead who would respond to the issues raised in the previous week collated by the Google Form system. There was also an opportunity to ask live questions via the chat function of Zoom. Initially, junior doctors could attend in person, but the forum was fully digitalised as social distancing guidance was implemented.

A WhatsApp group was established at the three major sites, one dedicated to each main centre, at ICHNT equalling 748 members in total. The WhatsApp groups were configured to only allow 'administrators' to post messages to reduce information overload. Messages were ratified by the ICON committee.

These were then posted by the ICON communications lead to either all groups or single-site groups if the information was site specific (eg, local referral information). Postings included clinical COVID-19 guideline updates, information on COVID-19-related webinars, updates on PPE protocols, staff testing advice and minutes of the weekly forums.

Horizontal
Representatives across sites, specialties and grades were identified as peer links to the ICON committee. Issues could be raised with ICON representatives and raised to the committee to feed into the other prior mentioned channels.

ICON committee
The committee served to facilitate the network and met virtually, initially every 2 days, using the online platform Zoom. The development of the committee structure evolved in parallel to the network. Roles were divided into administrative (chair, vice-chair and secretary) and specialist roles. A guidelines team made up of a senior respiratory and infectious diseases registrar approved any guideline-related messages to be disseminated. Administrative messages were approved by the chair and deputy chair. A communications lead was responsible for both posting on the WhatsApp groups and collating the Google Form responses weekly.

An iterative and adaptive committee
As issues were flagged, ICON was well positioned to facilitate responses to some of the concerns from the junior body. Five additional domains were added to the remit of the committee: welfare, education, research, rotas and partnerships.

Well-being issues were prevalent and a welfare team worked to collate and share well-being resources.

Education was understandably paused at the start of the pandemic but was identified as a key concern among juniors. An ICON education team worked to facilitate cross-site digital non-COVID-19-related teaching.
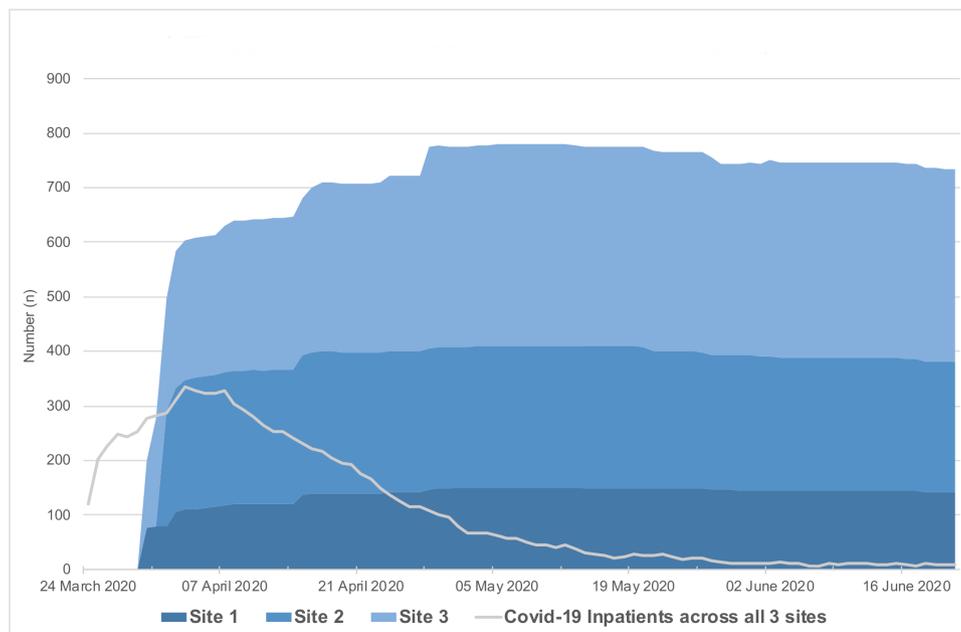
Figure 1 Number of members of the Imperial Covid cOmmunications Network (ICON) WhatsApp groups (shaded areas) compared with number of COVID-19 inpatients (grey line) over time.

Furthermore, there were several key trials running across the trust necessitating rapid recruitment to deliver meaningful and swift results. An ICON research team facilitated recruitment to COVID-19-related trials through development of single sheet reminders which were distributed via the network. An ICON rota team helped arrange specific webinars for rota concerns with those involved in rota design, contracts and compensation.

The iterative process in retrospect

The iterative process leading to the network, as detailed above, was a dynamic and fluid process. In brief summary, the initial step was deployment of the Google Form system to identify and collate concerns. To disseminate this system, a committee of volunteer representatives across sites, specialties and grades was rapidly established. The committee was then able to set up and maintain the WhatsApp group across three sites to disseminate responses to the raised queries (top-down). With substantial and rapid engagement with the WhatsApp groups and Google Form system, the ICON committee were able to work closely with the senior staff to arrange regular digital forums.

These steps occurred with a significant degree of overlap and not as neatly as suggested above. Once these key facets of the network were established the committee were able to respond to raised concerns in a more organised way through the twice weekly committee meetings, such as delivering the digital foundation teaching programme.

Study of the intervention and measures

In order to assess the impact of ICON, both quantitative and qualitative measures were implemented. Quantitative measures included the number of responses gathered per week on the Google Form system, the number of members in the WhatsApp groups over time and an evaluation survey distributed 12 weeks after intervention.

The numerical values for membership of the WhatsApp groups and engagement with the Google Form system reflect the value that users place on the network. Although an indirect measure of value, it is generally assumed that individuals will only continue to use a voluntary service if they find it to be worthwhile.

The evaluation survey included free text answers and Likert scales and directly sought to evaluate the merit of ICON. The Likert scales offered an objective numerical value to help guide this assessment.

Additionally, a voluntary postintervention survey was distributed. This again included both Likert scale and a free text entry.

Qualitative measures included thematic analysis of two information sources. Entries from the Google Form system and the free text entries from a national study assessing the impact of COVID-19 on healthcare workers, the 'Staff and SAfety eFfects of Epidemic' (SSAFE) study, offered longitudinal qualitative data. These data sources were used as they were used by ICHNT staff who also used the ICON network. The key themes identified were coded, the frequency of themes over time was plotted to establish evolution of the issues raised. Thematic analysis of these data sources was considered as a valid metric as this was the tool used to collect the concerns of the junior doctors and would accurately reflect the changing issues they faced. Additionally, minutes from the weekly ICON meeting and daily trust-wide emails were inspected for evidence of interventions and outcomes.

Accuracy of data collection was ensured by the undertaking of quality control measures. The distribution of

the invitation to provide information on the Google Form was circulated using the ICON group, this ensured that contributions were valid from current Imperial College Healthcare NHS Trust staff. Duplicate entries to the Google Form were removed. Accuracy of the thematic analysis was ensured by duplicate blind assessment with independent verification.

ANALYSIS

Engagement of the network was assessed quantitatively through analysis of membership of the WhatsApp group over time through exported anonymised data. This was then plotted against inpatient COVID-19 admission over time to offer a graphical representation of group membership versus burden of COVID-19 at our trust.

An online evaluation survey containing Likert scales provided quantitative assessment on the value of each aspect of the ICON network. Responses were presented as percentage agreed; equivalent to those selecting 'agree' or 'strongly agree' divided by the total number of respondents.

The number of responses inputted on the Google Form system over time was recorded. All entries were anonymous. Qualitative analysis in the form of a thematic analysis was performed on the free text entries from the Google Form system and the data gathered from the SSAFE study. Thematic analysis was initially undertaken independently by two authors (MM, AH), with mediation and discussion occurring in union to align themes.

The analysis was undertaken following an inductive approach as previously described by Frith and Gleeson.[11 12] Temporal relationships were identified by plotting the coded themes longitudinally based on their electronic timestamp.

RESULTS
Engagement

One hundred and ninety-seven concerns and questions were recorded via the Google Form system between 20 March and 14 June 2020.

Membership of the ICON WhatsApp group peaked at 780 on 17 May and stands at 734 at the time of analysis, 21 June. Variation in membership over time is shown in figure 1.

Thematic analysis

A total of 179 free text entries (via the Google Form system) from 20 March until 9 June 2020 equating 368 qualitative data points were coded. Representation ranged from interim foundation doctor to consultant level but was predominantly spread between Foundation Year 1 (22.6%), Foundation Year 2 (23.3%), core trainees (25.3%) and specialty registrars (27.4%).

Table 1 shows the key themes and subthemes identified. Inputs were grouped into five overarching themes: organisational and logistics; clinical strategy concerns; staff safety and well-being; clinical (COVID-19)/patient

**Table 1** Key themes and associated subthemes identified

Key themes	Theme description	Subthemes
Organisational and logistics	Reported trainee concerns on non-clinical macrolevel approach to COVID 19.	Communication Teaching Training (impact of COVID-19) Meetings Clinical guidelines Pay Redeployment Annual leave Discharge pathways Compassionate leave Staff roles Contract
Clinical strategy concerns	Macrolevel approach to non-clinical patient facing and staff deployment COVID-19 concerns.	Staffing Rota Patient safety Out-of-hours escalation
Staff safety and well-being	Trainee concerns reported concerning staff facing COVID-19-related issues.	PPE Staff testing Well-being/mood/ morale/burn-out Home/living arrangements Self-isolation Senior support Staff support/anxiety
Clinical (COVID-19)/ patient care	Issues raised by trainees on clinical COVID-19-specific concerns.	End of life Clinical equipment Emergencies Prescribing Allied healthcare input COVID-19 response team Patient investigations
Facilities	Issues identified on access and use of facilities in context of restrictions related to COVID-19.	Changing rooms Accommodation Rest Health and fitness Parking Internet
Miscellaneous		Positive feedback

PPE, personal protective equipment.

care; and facilities. Positive feedback was placed into an additional miscellaneous category. Figure 2 shows the frequency of these themes over time. Concerns with the structural approach to non-clinical issues were grouped under the theme 'organisational and logistics'. This comprised a number of subthemes including redeployment, annual leave and pay:

> I am a surgical SpR currently doing a PhD and have been re-deployed to ITU… where I am supernumerary [and am] feeling very anxious and guilty about my academic work.

Clinical management including investigating, prescribing and end-of-life management in COVID-19 was grouped under the theme 'Clinical (COVID-19)/patient care'.
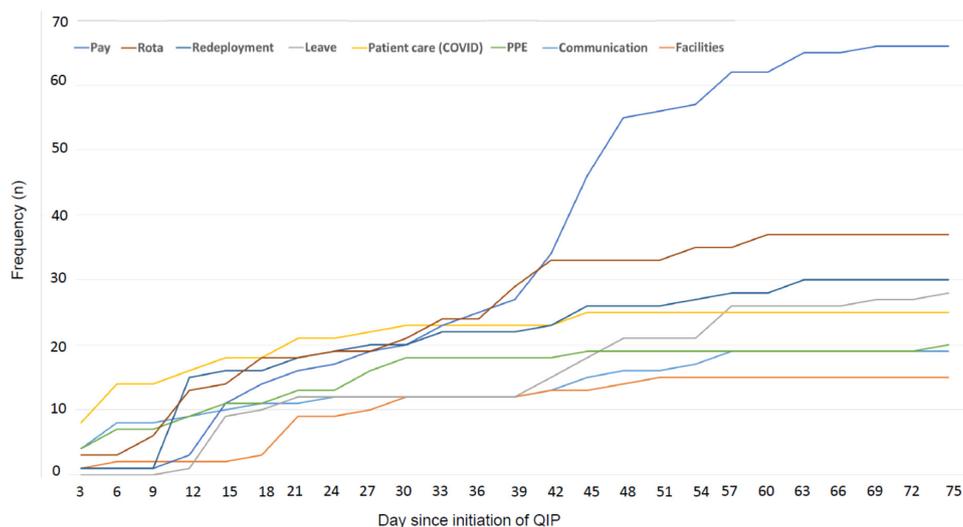
Figure 2 Frequency over time of key themes identified from thematic analysis of the Google Form system. PPE, personal protective equipment. QIP, quality improvement project

Issues identified on access and use of facilities in context of restrictions related to COVID-19 were grouped under the theme 'Facilities'.

The theme 'Clinical strategy concerns' referred to the macrolevel approach to patient safety, staffing, rota and out-of-hours escalation.

Staff levels have been maintained with academics and community trainees… it feels a much safer working environment.

'Staff safety and well-being' as a theme encompassed subthemes including PPE, testing and morale.

[I] fear passing infection on to loved ones or patients. [It is difficult] being isolated away from home and dealing with other people's mental health, not just my own.

Evidence of intervention

As the network evolved it became apparent that issues could be managed by the ICON committee with creation of new domains (welfare, education, research, rotas and partnerships). Examples of issues identified and resolved via the ICON network are shown in table 2.

Postintervention survey

Twenty-eight clinicians across the three major sites and from a variety of different clinical stages responded to a survey assessing the impact of ICON.

83.4% agreed that the ICON Google Form system helped them to raise questions and concerns. 88.9% agreed that the ICON weekly forums were a useful way to receive updates.

It was reassuring to see a member of the leadership team read out my comment… and then answer it directly.

77.8% agreed the WhatsApp group made accessing updated COVID-19 guidelines easier with 94.4% agreeing it was helpful in receiving updates on upcoming events.

In a confusing and stressful time, it was incredibly useful to have information clarified through clear pathways.

Table 2 Examples of issues identified by theme and solutions provided

Theme	Issue	Solution
Staff safety and well-being	Walking to cars after late shifts unsafe.	Security escort to four designated car parks at set times.
Clinical strategy concerns	Confusion about medical rota changes; pay and annual leave.	Dedicated ICON webinar to address rota concerns with relevant stakeholders including rota coordinators and service leads.
Facilities	Inadequate facilities to wash scrubs.	Dedicated new service to wash and launder scrubs on site and return within 24 hours.
Organisational and logistics	Suspension of non-COVID-19 foundation teaching.	80.4% of foundation doctors felt their teaching needs were being met. ICON delivered a cross-site 6-week foundation digital teaching course after which xx% reported teaching needs were met.
Clinical (COVID-19)/patient care	Clarification of updated VTE prophylaxis guidelines.	Single-sheet ICON summary produced and disseminated via WhatsApp groups.

All issues identified via Google Form system and disseminated by weekly digital forum and ICON WhatsApp group.
ICON, Imperial Covid cOmmunications Network; VTE, venous thromboembolism.

88.9% agreed ICON improved collaboration between junior doctors and senior leadership.

> ICON has been really effective in providing me with a platform to interact with the big decision makers. As a junior doctor working for the NHS it's often difficult to know who and how to escalate issues or concerns, and easy to feel like a cog in a machine. Through ICON's communication network, I know that I can flag up a problem or question and know how and when to expect an answer.

DISCUSSION

We identified early in the pandemic that the junior doctor body at a busy London NHS trust were receiving information about COVID-19 from an array of information streams. The vast majority of clinicians reported that they would not know to whom they could raise concerns nor felt they would get a consistent reply.

Harnessing simple technologies (Google Form and WhatsApp) on clinicians' smartphones facilitated the simplification of horizontal and vertical communication streams. This was aided by both the rapid assembly of a committee to help structure the network and direct access to senior leadership. Through an iterative and dynamic process, a grass-roots trainee-led communication network was shown to improve the interface between the junior doctors and senior leadership and deliver a responsive communication network.

Interpretation

The simple Google Form system was used beyond what the group had anticipated with almost 200 issues registered through the system. A structured process to collate these issues and present them to the senior leadership via the ICON committee and to disseminate the information top-down through the WhatsApp group was similarly well engaged with 750 members joining the group with good retention over time. This suggests that ICON was indeed effective in improving collaboration between senior leadership and junior doctors.

Thematic analysis gave insight into the core themes of concern ranging from macro to micro and clinical to non-clinical issues. As the pandemic evolved, the focus of raised concern shifted from predominantly clinical to non-clinical issues potentially due to the vast amount of COVID-19-specific training delivered early on as shown in figure 2. Through the network, many issues ranging from COVID-19-related clinical management queries to non-clinical administrative concerns were efficiently identified, resolved and relevant updates disseminated using the top-down streams.

Initially, ICON planned to address communications alone; however, the group found itself in a unique position to exploit its communications platform to tackle some of the identified issues. The network effectively evolved to deliver the broadened remit evidenced by a number of successful ancillary ICON projects and suggests that ICON was able to facilitate responses to concerns raised.

The vast majority of users agreed that ICON helped users raise concerns and receive key updates including clinical guidelines, that is, successfully streamlining information. There was similar agreement that the network improved collaboration between junior doctors and senior leadership.

Due to the novel approach to an unprecedented situation there is little directly comparable literature. The findings of this quality improvement project highlight the importance of communications during emergent situations and the effective harnessing of commonly used smartphone technologies for information exchange in healthcare.[7 8]

Limitations

Limitations to the evaluation of this intervention are the lack of direct evidence of outcomes. Deploying this network rapidly to meet the emergent department of the pandemic compromised a more comprehensive analysis of the impact of the network, for example, ethics were not sought to interview participants at the start of the pandemic and after the deployment of the network.

Engagement and survey data were used as surrogate markers of effectiveness. The network was created in the unusual landscape of a pandemic and it is difficult to know how much engagement can be ascribed to the emergent situation of COVID-19 rather than the structure of the network itself. Furthermore, this was a service evaluation rather than a research project limiting its generalisability.

The intervention provided by this network was in the context of a unique and unprecedented circumstance. In a time of high stress, several unknowns and lockdown, the engagement with ICON may over-represent the value of such a network in more precedented times.

Future

Although this work was specific to our trust during a unique public health crisis, we feel that protocolising and spreading this approach to other contexts could prove valuable. Other potential periods of strain on healthcare communications, where such a network could add value, include the winter season-associated increase in pressure on healthcare services.[13 14] This protocol could also be implemented at other healthcare trusts using similar principles, as the fundamental issues of communication in healthcare are not singular to our centre. This group has already been approached by other trusts both in the UK and internationally for support implementing a similar communication network.

Ongoing use of the network and further data collection will allow us to evaluate whether doctors will gain use from a trainee-led communication network outside the confines of the pandemic.

The second wave

Since the initial service evaluation and authorship of this report there has been a second wave with a new nationally implemented lockdown. The network has been formally incorporated into the junior doctor pathway. Inductions to new staff were used to publicise ICON, and the network at the time of writing continues to be active to help disseminate information and raise concerns during this new stage of the pandemic. The same vertical and horizontal communication streams remain in place.

CONCLUSION

Healthcare systems are complex organisations which possess inherent challenges in communication management, and established networks were placed under severe strain by COVID-19.[15] This quality improvement project has shown that a well-organised digital network using existing smartphone technologies and a novel communications structure can improve collaboration between senior leadership and junior doctors, streamline vertical. We hope this service evaluation will help inform the approach to communication in a healthcare setting.

Author affiliations
[1]Institute of Global Health Innovation, Imperial College London, London, UK
[2]Department of Gastroenterology and Hepatology, Imperial College Healthcare NHS Trust, London, UK
[3]Academic Section of Vascular Surgery, Department of Surgery and Cancer, Imperial College London, London, UK
[4]Department of Primary Care and Public Health, Imperial College London, London, UK
[5]Academic Section of General Surgery, Department of Surgery and Cancer, Imperial College London, London, UK
[6]Department of Metabolism, Digestion and Reproduction, Faculty of Medicine, Imperial College London, London, UK
[7]Department of Endocrinology and Metabolic Medicine, Imperial College Healthcare NHS Trust, London, UK
[8]Department of Surgery and Cancer, Imperial College Healthcare NHS Trust, London, UK
[9]Department of Surgery and Cancer, Imperial College London, London, UK
[10]Department of Respiratory Medicine, Imperial College Healthcare NHS Trust, London, UK
[11]Department of Emergency Medicine, Imperial College London, London, UK

ORCID iDs
Arun Sivananthan http://orcid.org/0000-0002-1649-0150
Shiva T Radhakrishnan http://orcid.org/0000-0002-8311-9714
Max Christopher Denning http://orcid.org/0000-0001-6215-6885

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