The global pandemic of the novel coronavirus SARS-CoV-2 has resulted in over 7 million infected cases across 188 countries at the time of writing. While the resulting illness, Covid-19, poses a variety of challenges to many specialties in acute medicine, respiratory medicine has been a driving force for the care and management in our trust of patients who are infected.

Although Covid-19 can affect a number of organs, the respiratory tract is the primary target of the virus and can lead to a wide range of presenting symptoms from mild coryzal symptoms (inflammation of the nasal mucous membranes with discharge of mucus) to the extremes of significant respiratory failure (Yuki et al, 2020). Angiotensin-converting enzyme 2 (ACE2) is highly prevalent in lung epithelial cells and is an integral receptor to which SARS-CoV-2 binds (Mason, 2020); this is believed to be why respiratory symptoms are the main presenting complaint. A large majority (about 80%) of patients who are infected manage symptoms at home, which is likely due to the virus staying in the upper respiratory tract. However, in the remaining 20%, the virus migrates to the lower respiratory tract and can lead to pulmonary infiltrates, which can be seen radiologically in the lungs and are defined as viral pneumonia.

The respiratory clinical nurse specialist (CNS) team at East and North Hertfordshire NHS Trust has rapidly adapted its ways of working to meet the challenges posed by Covid-19. The team responded to the pandemic by increasing the support provided to the wards that had more patients requiring additional oxygen than usual. Our bed capacity for the patients with suspected or confirmed Covid-19 is limited. This highlights the positive impact a virtual clinic can have and indicates that such a clinic is a novel concept for the future management of patients.

Key points

A virtual Covid-19 clinic using telephone consultations can provide a safety net for patients discharged from hospital with suspected or confirmed Covid-19.

Multidisciplinary team working and clear care pathways are essential for service development as well as patient safety.

Regular patient contact provides patients with reassurance and opportunities for education.

Clear pathways, standard operating procedures and telephone consultation guides enable other clinical staff to support the clinic in times of high demand and staffing restraints.

A virtual respiratory clinic to support patients with Covid-19 after discharge

Keywords Covid-19/Respiratory/Virtual clinic/Recovery

This article has been double-blind peer reviewed

In this article...

○ Post-discharge support that is needed by patients with suspected or confirmed Covid-19
○ Development of a service offering telephone support from clinical nurse specialists
○ The value of virtual clinics in supporting patients who are recovering from Covid-19

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This cohort of patients are at increased risk of developing acute respiratory distress syndrome (ARDS) and requiring critical care (Mason, 2020). The respiratory clinical nurse specialist (CNS) team at East and North Hertfordshire NHS Trust has rapidly adapted its ways of working to meet the challenges posed by Covid-19. The team responded to the pandemic by increasing the support provided to the wards that had more patients requiring additional oxygen than usual. Our bed capacity for the patients with suspected or confirmed Covid-19 is limited. This highlights the positive impact a virtual clinic can have and indicates that such a clinic is a novel concept for the future management of patients.

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How the virtual clinic evolved
Alongside oxygen review and teaching, the respiratory CNS team provided ad hoc telephone consultations for patients who had been discharged from hospital with suspected or confirmed Covid-19. One of the first consultations identified a patient who was still extremely symptomatic and was asked to attend the accident and emergency department (A&E). On arrival at A&E, the patient was immediately intubated and admitted to critical care; the patient made a full recovery and was successfully discharged. This patient story was the driving force behind the development of a robust virtual Covid-19 clinic.

The overall aims of the virtual Covid-19 clinic were to:
- Provide a safety net for patients with suspected or confirmed Covid-19 who were discharged from hospital;
- Identify patients who have deteriorated at home and ensure clinical review through the community respiratory team, attendance in the rapid-access respiratory ‘hot’ clinic or the assessment unit to prevent or arrange readmission as appropriate;
- Educate and reassure patients;
- Ensure patients were offered aftercare in line with current guidance (Bit.ly/BSCTCovid19Info).

The virtual clinic in action
In response to the pandemic and to support decision making, the trust implemented a risk-stratification score to categorise patients’ risk of having Covid-19 infection on admission. This score follows an extended ‘red, amber, green’ (RAG) rating system:
- Green – for patients in whom there was no suspicion of Covid-19;
- Amber – for those suspected of Covid-19 infection;
- Red – for patients in whom infection was highly suspected;
- Black – for patients in whom Covid-19 infection had been confirmed.

There are two pathways for patients identified as needing support: one for those rated Amber, and one for those rated Red or Black. Patients rated Green are not accepted into the service. The risk-stratification system was incorporated into the Covid-19 virtual clinic to facilitate decisions regarding which of the two pathways patients should be placed on.

Eligible patients are referred to the clinic after discharge from hospital and receive the following:
- Amber pathway – a telephone consultation by a respiratory CNS on day 1 post discharge and a further follow-up telephone consultation between days 3 and 5;
- Red/black pathway – a telephone consultation on day 1 post discharge with a doctor, with a further telephone consultation on days 3 and 7 by a respiratory CNS.

The number of calls can be increased or decreased depending on clinical judgement. The service was initially set up in March; a review after three months revealed that many patients classified as Amber were negative of Covid-19 and unlikely to deteriorate within the first two days of discharge. We, therefore, removed the day-1 call from the Amber pathway and these patients now receive their first consultation between days 3 and 5 post discharge.

Telephone consultations include asking about the patient’s physiological status, with specific questions on:
- Breathing;
- Chest pain;
- Fever.

Patients are also given the results of a nasopharyngeal swab for Covid-19, if available. The consultations enable the team to reassure patients about any persistent symptoms they may be experiencing, and allow for inpatient or outpatient review, if appropriate.

Offering reassurance about recovery timescales and reaffirming isolation guidance were fundamental aspects of the telephone consultation and led to the creation of a Covid-19 patient information leaflet, which is now given to patients when they are discharged from hospital. This leaflet provides reassurance and guidance from day 1 to reduce any anxiety patients might experience while waiting for their telephone consultation.

Challenges to developing the virtual clinic
The main challenges we had in developing the service were:
- The infection risk patients posed when discharged from hospital;
- Staffing.

To minimise infection risk, patients are advised to self-isolate for one week after leaving hospital, in line with public health guidance (Public Health England, 2020). To comply with government guidelines, patients receive a telephone consultation as described above. Environmental changes

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**Table 1: Patient discharge from the virtual clinic, n = 733**

<table>
<thead>
<tr>
<th>Patient rating</th>
<th>Percentage of patients discharged after</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 telephone call</td>
</tr>
<tr>
<td>Amber</td>
<td>35.4</td>
</tr>
<tr>
<td>Red/Black</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Amber = suspected Covid-19 infection; Red/Black = highly suspected/confirmed Covid-19 infection.
Clinical Practice

Innovation

have also been implemented for the respiratory CNS team, with two separate clinic rooms being used to make sure social distancing can be achieved.

Staffing can be a particular challenge for the respiratory CNS team, which consists of seven respiratory nurses and two administration support staff. It affected the development of the service, as 40% of the team were self-isolating when the virtual clinic was launched. Although staffing levels were problematic, members of the team were not only fully engaged in setting up the service, but also quick to adapt to this new way of working. When capacity is challenging, they support each other by sharing the workload or seeking support from other colleagues such as junior doctors.

To enable multiple clinicians to support the clinician alongside the respiratory CNS team a standard operating procedure (SOP) was developed. Other documents developed to support the clinic include a:

- Clear pathway;
- Telephone guide to aid practitioners;
- Discharge template letter to be completed and sent to the patient’s GP.

The gratitude expressed by patients to respiratory CNS team members has been extremely humbling, and the positive impact of the service makes the challenges we have experienced feel worthwhile.

Linking with other services

The respiratory CNS team also works closely with the trust’s integrated community respiratory service: we can refer patients who may need reassessment to this service so a community practitioner can visit them at home, thereby reducing the need for them to travel to be reassessed.

Challenges faced by services and the workforce across the trust meant that not all patients with confirmed or suspected Covid-19 were referred to the clinic. Not all patients with suspected or confirmed Covid-19 who had chest X-rays that revealed changes associated with inflammation were being referred to respiratory services for repeat imaging; referral to the Covid-19 virtual clinic, therefore, was the only respiratory follow-up some patients were due to receive. The clinic team was able to identify this particular cohort of patients and refer them into an already established virtual pneumonia clinic, enabling them to receive repeat imaging in line with national guidance (Bit.ly/BTSCovid19Info).

Similarly, inpatients were not always stepped down from intensive care to the respiratory ward, which meant that follow-up chest X-rays were not always requested and these patients were not always referred to the Covid-19 clinic. Increased collaboration between the respiratory and intensive-care teams ensured that referrals to the Covid-19 virtual clinic for this at-risk group were made, regardless of the ward from which they were discharged. Follow-up imaging is extremely important to confirm improvement of infection, ensure that consolidation is not obscuring abnormalities and to observe for any long-term changes such as interstitial lung disease (Bit.ly/BTSCovid19Info).

Findings and evaluation

By the end of June, 733 patients had been contacted by the virtual clinic and staff had conducted over 1,500 calls. The number of telephone consultations patients received before being discharged from the service are outlined in Table 1.

The majority of patients on the amber (64.6) and black (92.9%) pathways required more than one telephone consultation; this suggests these calls were clinically relevant and would have prevented readmission of patients who were symptomatic but stable. Of patients referred to the clinic, 33 were readmitted; seven of these were identified for readmission by the virtual clinic team. The readmissions identified by the clinic confirm the need for patients discharged from hospital with suspected or confirmed Covid-19 to have close follow-up post discharge.

By the end of June, approximately 170 patients were identified via the virtual Covid-19 clinic for referral to the virtual pneumonia clinic to ensure adherence with follow-up guidelines; 130 patients in HDUs and intensive care were identified by the respiratory or intensive care team for potential follow-up. Box 1 outlines the findings.

Staff feedback

Eighteen staff members in A&E completed feedback forms: 62% reported that access to the virtual Covid-19 clinic enabled them to avoid referring at least one of their patients to the medical team. Responses from 18 medical colleagues via an online feedback form has been extremely positive: many want the virtual clinic service to continue, as it supports frontline teams in discharging patients and improves staff confidence in managing and reviewing patients in an outpatient setting.

Patient feedback

The first 100 patients referred to the clinic were posted formal feedback forms asking for their views on their experience. Questions asked about time saved, whether they were reassured by the virtual clinic and whether they felt a video conference would have been better. They could also feed back on any problems encountered or improvements for the clinic.

To date, 23 patients have responded. Feedback has included the following: “Amazing”, “I felt listened to”, “I was readmitted by the virtual clinic; it saved my life”. Two patients stated they preferred face-to-face appointments due to other underlying health conditions, which made telephone consultations difficult to follow.

Future of the clinic

Current data and experience from the virtual clinic highlight the need for the service to continue, but to be modified to improve its efficiency and optimise patient care. Patients rated Amber can be safely managed with appropriate advice from the medical team and a Covid-19 patient information leaflet without being referred to the virtual clinic; not referring them will enable the team to focus on those at highest risk of developing long-term problems and enduring changes to their lungs.

References


