COVID Oximetry @home (virtual ward) Guideline

Background

Covid-19 infection has affected millions of people worldwide over the last few months. Over this period, the medical community has also improved their knowledge and skills on how best to manage patients with Covid-19 infection. In addition to improved measures to reduce transmission, development of new drug treatments and better understanding of critical care management, early recognition of hypoxia has been instrumental in saving lives. As significant proportions of patients have ‘silent’ hypoxia and tend to present later in their illness, active monitoring of their symptoms and oxygen saturation can be crucial. Using this principle, remote monitoring of people at their home through provision of hand held pulse oximeters and remote consultation with a clinician, called the Covid virtual ward a.k.a. Covid oximetry @home (CO@h) has been used as pilot programmes in many NHS trusts throughout England during the first wave of the pandemic. As the data from these earlier centres have shown encouraging results, it is felt nationally that this pathway should be adopted by more centres during the second wave. Bucks Healthcare NHS Trust currently does not have such a pathway. As we expect Covid-19 cases to increase this coming winter, it is crucial to establish a similar pathway in Bucks.

The Bucks Way

Bucks CCG including primary care and community care, Bucks Healthcare NHS Trust, NHS England/Improvement and Oxford AHSN have collaborated to formulate a programme tailored to the needs of the Bucks people. In the first phase of this programme called the Bucks CO@h, the program will commence in Secondary care. We anticipate that a similar programme for patients in the community will start in the subsequent phase. The programme will run from the main acute hospital in the area which is Stoke Mandeville Hospital. The patients are selected from the emergency medicine department, acute assessment area and from Covid-19 wards (with a view to have an early supported discharge). Patient inclusion and exclusion criteria, process of monitoring and governance process are discussed below.

The inclusion and exclusion criteria for the Covid oximetry @home programme are as follows

**Inclusion criteria:** Diagnosis of Covid-19 infection (clinical diagnosis or positive swab test) AND symptomatic AND EITHER

a. Aged 65 years or older  
b. Under 65 years of age and clinically extremely vulnerable to Covid-19  
OR any of the following  
c. BAME background, BMI >35, significant comorbidities, learning disability, severe mental health illness

NB: Clinically vulnerable groups and extremely vulnerable group are usually over 65yrs and are already included in the group. Clinical discretion can be used to enter other people into the group.

**Exclusion criteria:**

- Anyone under 18 years of age - to be managed by paediatric services  
- Pregnant and postpartum up to 6 weeks – to be managed by maternity services  
- Patients with an emergency health care plan that indicates that escalation of care to hospital would not be required or would be inappropriately burdensome.
Assessment

In the acute assessment area and emergency department routine comprehensive assessment of patients should take place. Some of the parameters obtained during the assessment may be used to aid the decision making as to whether the patient is suitable for Covid oximetry @home (virtual ward). The following flow chart is a guide only and clinical judgement should be exercised alongside this.

Figure 1

On assessment in ED or acute assessment area, patients may have the following outcomes:

1. Admission to hospital
2. Discharge back to community (GP)
3. Enrolment into CO@h (virtual ward).

If the decision is to enrol the patient into Covid oximetry @home, please follow the instructions below for referral.

Referral pathway from ED/AMU/Covid ward for enrolment into Covid oximetry @home (virtual ward)

1. Provide patient with pack containing
   - Pulse oximeter
   - Covid diary (Appendix 6)
   - Patient information leaflet (Appendix 3)
   - Patient experience survey (Appendix 4)
2. Note down the patient’s preferred contact details and explain about the remote monitoring
3. Remind the patient that the phone call may be from a ‘private number’ or withheld number
4. Provide any drug prescription for patients e.g. antibiotics, analgesia
5. Add patient to the Covid-19 virtual ward list on PMS for follow up contact
6. Please complete the referral form and email to BIRS team @ buc-tr.birs@nhs.net. To note: enrolment will not take place without this.

From 8 am to 4.30 pm Monday to Sunday, please contact BIRS team before the patient leaves the hospital. They will come and introduce themselves and explain process. Outside of these hours, there will not be any BIRS support, but the patient should be referred following the instructions above. Please note that the BIRS nurses are unable to make the initial assessment and/or decision to enrol to Covid oximetry @home. The decision lies with the Consultant in charge of the patient.

The referral form can be seen below. Full version can be found in Appendix 1.
Once the patient is enrolled onto the Covid oximetry @home (virtual ward) they will be followed up as per Figure 2. Patients in the Covid oximetry @home group will have been given a pulse oximeter and symptom diary which they will use to record their symptoms and oxygen saturations. They will then receive scheduled phone calls on day 2, 5, 7, 10, 12 and 14 (from the onset of their symptoms) or as per clinical discretion by the BIRS team. At Day 14, a clinical decision is made to either continue follow up or discharge the patient back to community (GP). During the scheduled phone calls, patients will be asked about their symptoms, resting saturations and saturations on exertion. The full data that will be collected is available as Appendix 2. Based on symptoms or oxygen saturations, if there are concerns that a patient needs further assessment, the BIRS team must contact the acute care coordinator or ED team to bring the patient in for review. In unclear cases, BIRS team will have access to the respiratory in-reach Consultant for advice (Telephone: 07931531022). If the patient feels they need medical advice, they may contact as below.

8am to 6pm – BIRS nurses – Telephone: 01296 566113

Outside of these times – Standard contact – 111, Out of Hours (OOH) GP or 999.

Figure 2

Role of BIRS nurses

- Day 0 - During 8 to 4.30pm, contact Covid oximetry @home (virtual ward) patients in ED or AMU to introduce self and explain process. Ensure patient has got the pack with pulse oximeter. Explain how to use the pulse oximeter.
- Day 1 – Check PMS virtual ward list for new patients enrolled. Complete baseline data by completing the data fields as per the data sheet (appendix 2).
- Day 2 and subsequent contact - ask patient about symptoms, saturations at rest (COVID diary) and on exertion and decide on either continued follow up, referral for assessment or admission. Seek advice from respiratory in-reach Consultant if needed
- Day 14 or last contact – Ensure patient understands the end of monitoring process. Explain procedure for return of the pulse oximeter and the patient experience questionnaire
• Ad hoc – Twice weekly meeting with respiratory in-reach Consultants about the patients on Covid oximetry @home (virtual ward) programme.

At the time of discharge from the Covid oximetry @home (virtual ward), the patient will be given instructions to return the pulse oximeters. They will be invited to complete a patient experience questionnaire.

**Governance Process**

The Covid Oximetry @home (virtual ward) programme will be subject to clinical governance process like other acute clinical services in the trust and it sits with the Trust Executive team. A nominated administrative staff will be required for prospective data collection and administration to ensure the programme adheres to Trust and CCG standards. Main components of clinical governance will be as follows:

• Assigning designated clinical, managerial and executive lead for the programme
  - Clinical Lead – Dr Raghu Raju, Respiratory Physician
  - Managerial Lead – Usha Balasubramaniam
  - Executive Lead – Dr Tina Kenny, Medical Director

• For the purpose of governance, the Consultant in charge of the patient at the time of enrolment into COVID Oximetry @ Home (virtual ward) is deemed to be the patient’s Consultant for the duration of monitoring

• New data in the literature and new national guidance to be appraised and incorporated into the pathway as necessary - Oxford AHSN will collaborate with the Trust staff on this

• Periodic data review to monitor the effectiveness of the pathway

• Gathering DATIX incidents, complaints and patient experience surveys related to the process

• Adherence to data sharing and information governance standards.
Appendix one - Enrolment into COVID Oximetry @home referral form

Referral pathway from ED/AMU/COVID ward for enrolment into Covid Oximetry @home

1. Provide patient with pack containing
   a. Saturation monitor
   b. Symptom diary
   c. Patient information leaflet
   d. Patient experience survey
2. Note down patient preferred contact details and explain about the remote monitoring. Remind people that phone call may be from a ‘private number’ or withheld number.
3. Provide any drug prescription for patients e.g. Antibiotics, analgesia
4. Add patient to the COVID virtual ward list on PMS for follow up contact
5. Please complete the referral form and email to BIRS team @ buc-tr.birs@nhs.net
6. From 8 am to 4.30 pm Monday to Sunday, please contact BIRS team before the patient leaves the hospital (01296 566113)

Addressograph: ____________________________  Date of referral: ____________________________

Time of referral: ____________________________  Consultant in charge: ____________________________

Area of assessment: ED: [ ]  AMU: [ ]  COVID ward: [ ]  Other: ____________________________

Preferred Contact number: Landline: ____________________________  Mobile: ____________________________

Contact Name (if not patient e.g. NOK): ____________________________

Provided Saturation probe: Yes [ ]  No [ ]  Serial No: ____________________________

Provided COVID symptom diary: Yes [ ]  No [ ]

Provided Patient information leaflet: Yes [ ]  No [ ]

Prescribed any antibiotics: Yes [ ]  No [ ]  NA [ ]

If yes, details of the antibiotic: ____________________________

Have the patient details been added to the PMS Virtual ward list? Yes [ ]  No [ ]

Name of the person completing the form (PRINT): ____________________________  Signature: ____________________________

Please scan and send this form to BIRS team (buc-tr.birs@nhs.net) to complete enrolment.
Appendix Two- COVID Datasheet

Name: ____________________________ Date of presentation: ____________________________

Date of birth: __________ Time of presentation: __________

Hospital number: ____________________________ NHS number: ____________________________

Address: ____________________________ Or Affix label ____________________________

Age: ____________________________ Gender: ____________________________

Swab done: Yes [ ] No [ ] Result: Positive [ ] Negative [ ] Pending [ ]

CXR: ____________________________ CT: ____________________________

Bloods: FBC [ ] Neut [ ] Lymph [ ] D-dimer [ ] Procalcitonin [ ] LDH [ ] CRP [ ]

NEWS2 score: ____________________________ Resting saturations: ____________________________

Saturations post 1 min sit to stand test/rapid walking test: ____________________________

Impression: Choose scenario 1, 2 or 3. If scenario 1 or 2 they are suitable for continued follow up in Covid oximetry @home (virtual ward. If scenario 3, follow instructions or seek advice from respiratory in-reach Consultant.
Appendix Three - COVID Oximetry @home (virtual ward) patient information leaflet.

What is COVID Oximetry @ Home (Virtual ward)?

This information leaflet is being provided to you as you have been enrolled into the COVID19 oximetry @home (COVID virtual ward). You have been identified as someone with suspected (or confirmed) COVID-19 who does not require inpatient treatment but would benefit from close follow up by specialist healthcare professionals.

What will it involve?

You will be provided with a pulse oximeter (a small device which you clip onto your finger to measure your heart rate and the amount of oxygen in your blood) with which you can check your heart rate and oxygen saturations regularly and a diary to record your symptoms (how are feeling). Please read the guidance on how to use the pulse oximeter or alternatively you may watch video instructions by clicking on the links available on the next page. A nurse or a doctor from the hospital will then call you on your telephone at regular intervals (usually on day 2, 5, 7, 10, 12 and 14 after the onset of your symptoms) to perform a remote assessment of your condition. If your condition is stable, they will continue remote monitoring. If they are concerned about your health, they will arrange for you to be seen by a hospital doctor.

What should I do?

You must use the pulse oximeter as directed to check the oxygen levels in your blood and heart rate. You must record these along with your symptoms on the COVID diary twice a day. When the nurse or doctor phones you, please provide them the information in your diary and answer their questions as best as you can. You can have a family member to speak on your behalf if you do not feel up to it. You will have opportunity for questions or comments on anything else related to your COVID19 infection which is not already covered in the conversation.

What will happen next?

The information gained will be used by the nurse to decide if continued follow up at home is acceptable or more closer monitoring is required which may involve hospital assessment or admission. The nurse will let you know the date of the next contact. Once you have recovered or the nurse feels you have reached the end of monitoring period usually on or before day 14, you are must return the instrument either to the Main Reception, Stoke Mandeville Hospital or to your GP surgery in the provided padded envelope for onward post. It is very important that the pulse oximeters are returned so they can they be used for monitoring someone in similar position.

Please also ensure you complete the patient experience questionnaire provided in your original pack and return it in the same envelope as your monitor.

Who should I contact for further advice?

From 8.30am to 6pm, you may contact the BIRS nurses (telephone no: 01296 566113.). Outside of these hours, please contact the out of hours GP or 111 or alternatively, 999 if it is an emergency.
To watch a video on how to use the pulse oximeter please click on one of the links below:

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Appendix Four - Patient Experience Survey – COVID oximetry @home (virtual ward)

We would like to invite you to answer a few questions regarding your experience of the remote monitoring of your Covid-19 illness. Please tick the most appropriate option.

1. How would you rate your experiences of attending the Stoke Mandeville Hospital for your initial assessment?
   - Very poor ☐
   - Poor ☐
   - Fair ☐
   - Good ☐
   - Excellent ☐

2. How would you rate the manner of the clinician interaction on the telephone?
   - Very poor ☐
   - Poor ☐
   - Fair ☐
   - Good ☐
   - Excellent ☐

3. How would you rate the treatment or advice you were given today?
   - Very poor ☐
   - Poor ☐
   - Fair ☐
   - Good ☐
   - Excellent ☐

4. Did you find the monitoring helpful?
   - Yes ☐
   - No ☐

5. Is there anything else you would like to comment on?

Thank you for your time in completing this form. Your thoughts are important to us and will help us improve our service.

Please return this form in the same envelope as the pulse oximetry monitor.
Appendix Five - Sit to Stand Test (STST) to detect desaturation

- A STST is performed using a standard height chair without armrests positioned against a wall.
- The patient needs to be seated upright on the chair with knees and hips flexed at 90° feet placed flat on the floor and hip width apart.
- Ask patients to put hands on hips (or folded across their chest) or arms are kept stationary.
- Record Heart Rate and O2 Saturation from pulse oximeter.
- O2 saturation should be 94% or above to proceed.
- Patients need to stand straight upright and then sit down again and repeat this for 1 minute. Their bottom must contact the chair on each repetition.
- Record the number of times they can do this in 1 minute. There must be a minimum of 5 cycles for the test to be diagnostic.
- This test is self-paced and patients can stop, and rest should they need to.
- Explain to patients “The purpose of the test is to assess your exercise capacity and leg muscle strength. The movement required is to get up from this chair with the legs straight and sit back continuing the repetitions as fast as possible within one minute. I will give you the countdown 3-2-1 Go as an indication to start and, I will tell you when there are 15 seconds remaining. If required, you can take a break and resume the test as soon as possible.”
- There is typically a learning effect and if the first test is not positive the test may be repeated after an interval of 15 minutes and the result of the second test used.
- Desaturation of ≥3% would be considered significant and the patient should be referred to hospital for further assessment.

40 Step Test to detect desaturation

If the patient is unable to undertake the STST, then a 40 Step walk may be undertaken as an alternative.

- O2 saturation should be 94% or above.
- The patient is asked to take 40 steps either in the corridor if infection control measures permit or alternatively 40 steps on the spot.
- This should be done at the patient’s own pace.
- Desaturation of ≥3% would be considered significant and the patient should be referred to hospital for further assessment.

Recording

<table>
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<tr>
<th></th>
<th>Test One</th>
<th>Test Two</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>At Rest</td>
<td>Post Exercise</td>
</tr>
<tr>
<td>Heart rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturation Rate</td>
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</tbody>
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Appendix Six – Covid oximetry @home diary

Remote monitoring COVID-19 diary

First name ___________________________ Surname ___________________________
Date of birth ____________ Age ________ NHS number ______________
Live alone ☐ Carer at home ☐

Please record these three times a day:

<table>
<thead>
<tr>
<th>Days since first symptoms *</th>
<th>Date</th>
<th>Pulse</th>
<th>Oxygen level (%)</th>
<th>Temperature*</th>
<th>Feeling: better/same/worse</th>
<th>Breathing: better/same/worse</th>
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</thead>
<tbody>
<tr>
<td>Day</td>
<td>Time</td>
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* That is, if you start recording pulse oximetry five days after your first symptoms started, record ‘5’ under Day.

* Record and fill in temperature if you have a thermometer.