**COVID-19 Follow up pathway for Gloucestershire Hospitals NHS Trust**

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9. **Introduction**

Patients who recover from COVID-19 pneumonia are at risk of early, medium and long-term respiratory and systemic complications. Appropriate follow up is required to ensure that complications are identified, investigated and managed appropriately and expediently. A general algorithm for follow up of patients following a diagnosis of COVID-19 pneumonia was published by the British Thoracic Society1. However, a local policy is needed to both define pathways for investigations and onward referral and to consider situations not covered explicitly in the BTS guidelines.

1. **Aims**

This guidance covers the clinical follow up of all patients with a positive diagnosis of COVID-19 infection made in an acute hospital setting in Gloucestershire Hospitals NHS trust. It outlines follow up pathways, investigation and management of the respiratory and systemic complications of COVID-19 infection.

Separate guidance is being developed for follow-up of patients with suspected or confirmed COVID-19 infection who were managed in the community.

As a rapidly evolving field, we will continue to update this guidance as further information becomes available.

1. **Follow up algorithm**

An electronic list of all patients admitted with a positive COVID-19 swab is automatically generated by Business Intelligence. Patient details are taken from this to populate the Follow up Log Excel spreadsheet (Saved in Thoracic Drive -> Covid19 -> Follow Up). This list is used to triage patients to follow up group required. **Table 1** summarises the triage groups and follow-up pathways for patients with a positive Covid-19 diagnosis while admitted at Gloucestershire Hospitals NHS Trust. **Figure 1** outlines the follow up algorithm.

**Table 1: Follow-up triage groups – patient criteria and follow up required**

|  |  |  |  |
| --- | --- | --- | --- |
| **Group** | **Criteria** | | **Follow up** |
| **Group 1** | * No consolidation on CXR * Mild disease only * D-dimer <1000 at discharge   *Or*   * Nursing home resident or advanced frailty where further respiratory input is unlikely to change management | | * Standard advice letter to GP only |
| **Group 2a** | * Not admitted to ITU/HDU * Consolidation on CXR * **D-dimer <1000** at discharge, *or* CTPA done as inpatient and PE excluded | | * CXR at 12 weeks * If clear – standard discharge letter * If persisting changes – as per BTS policy |
| **Group 2b** | * Not admitted to ITU/HDU * **D-dimer > 1000** at discharge, with no CTPA done as inpatient * With or without consolidation on CXR | | * Telephone clinic consultation at 6 weeks.   -> If persisting breathlessness:  -> D-dimer  -> D-dimer >500 -> CTPA   * CXR at 12 weeks (if consolidation) |
| **Group 3** | * ITU or HDU level care * Consolidation on CXR | | * Telephone clinic consultation at 6 weeks * CXR at 12 weeks (CXR at 6 weeks if potential malignancy) * If persisting symptoms, face to face review at 12 weeks |
| **Confirmed/**  **suspected PE during admission** | | * PE diagnosed during admission   *Or*   * High index of suspicion for VTE and discharged on therapeutic anticoagulation | * Discharged on anticoagulation * Review duration of anticoagulation at 12 weeks, alongside repeat CXR |
| **Discharged on prophylactic anticoagulation** | | * Any patient discharged on prophylactic anticoagulation(will likely be in **group 3**) | * Assess appropriateness of continued prophylactic anticoagulation as part of 6 week telephone review |

**Group 1 (Not covered by BTS guidelines)**

**Criteria:** Patients with mild coronavirus infection with no radiological evidence of pneumonia and either a negative D-Dimer (or D-Dimer not checked). Or patients with advanced frailty where further intervention or investigation would be unlikely to change management.

**Action:** Patients with mild or incidental diagnosis of COVID-19, normal CXR at initial presentation and negative D-dimer (or not checked due to mild disease) do not require any further follow up. A standard letter to be sent to the GP and patient explaining the confirmed coronavirus infection, but that disease was mild with no evidence of lung involvement.

**Group 2A (Corresponding to Figure 2 in BTS guidelines)**

**Criteria:** Patients with confirmed covid-19 infection with evidence of pulmonary infiltrates on chest x-ray. These patients have mild or moderate disease; they may have been discharged the same day, or may have been admitted and given supportive care including oxygen, but did not require HDU or ITU level support.

**Action:** A chest x-ray will be performed at 12 weeks post discharge, and reviewed remotely. If this is normal, a standard letter will be sent. If there are persisting abnormalities, a telephone consultation will be arranged. HRCT will be requested and lung function testing as indicated by symptoms.

**Group 2B (Not covered by BTS guidelines)**

**Criteria:** Patients with confirmed covid-19 infection with a persistently elevated D-dimer, with or without evidence of pulmonary infiltrates on CXR, who did not receive HDU/ITU level care. These patients are at risk of undiagnosed pulmonary vascular disease, and hence require more prompt and in-depth review. If a CTPA has been performed and pulmonary embolism (PE) excluded, to follow group 2A pathway.

**Action:** Telephone review at 6 weeks. If no symptoms, for repeat D-dimer. If persisting symptoms or high clinical suspicion, for CTPA.

**Group 3 (corresponding to Figure 1 in BTS guidelines)**

**Criteria:** Any patient receiving HDU or ITU level care for COVID-19 pneumonia (where further investigation is appropriate and likely to benefit the patient).

**Action:** Telephone review at 6 weeks (see section 2).

**Figure 1: Flow chart for COVID-19 follow up**

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**4. Procedure, structure and content of 6-week telephone review**

The Follow-up Log is used to identify which COVID-19 patients require a 6-week telephone review, and when this should be completed by. Triaging of patients to follow up groups should be recorded on the Follow-up Log and completed 1-2 weeks in advance. 12-week CXRs for patients in group 2A should be requested at this time.

Follow up telephone reviews should occur between 5 to 7 weeks post discharge. If there have been subsequent re-admissions, telephone review should occur at 5-7 weeks after the most recent discharge.

Patients identified as needing a 6-week telephone review will be populated into Trakcare clinic lists (TBA). Telephone clinics will be primarily registrar-led, with the *(Cheltenham HOT)* consultant providing support as required.

When a telephone review is completed, a letter summarising the outcome and any further actions required should be sent to the patient and GP. A 12-week CXR (if required) should be requested at this point.

If there are persisting symptoms beyond those reasonably attributable to the usual recovery process, the patient should be brought to the ambulatory care unit for blood tests (Including D-dimer), ECG and clinical review. CTPA should be performed in cases of a positive D-dimer (>500).

Psychological symptoms should be specifically enquired about. In situations where more detailed screening or assessment of severity is required, a standardised tool (GAD-7 or Brewin Trauma Screening Questionnaire) should be used, but this may not be necessary in all cases. If there are distressing psychological symptoms and follow up with DCC is not already in place, a referral to the psychological support pathway should be arranged (TBC).

If there is persisting fatigue or breathlessness, a referral to the post-Covid rehabilitation pathway should be arranged (TBC).

The content the telephone review should cover is outlined in **table 2**:

**Table 2: Template for 6 week telephone reviews**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Points for assessment** | **Actions/onward referral** |
| **1** | **Symptoms** | Assessment and management of physical symptoms breathlessness, cough, fatigue  If discharged on oxygen, assessment and management of requirements | Consider PE, post-infectious asthma, fibrosis  If persisting symptoms, bring to ambulatory care unit for assessment within 48 hours,  for blood tests including D-Dimer.   * Referral to PR *(once pathway confirmed).* |
| **2** | **Psychosocial and anxiety** | Assessment and management of anxiety  Consider using validated tools to screen and assess – GAD-7 and Brewin Trauma Screening Questionnaire | *To be confirmed* |
| **3** | **Anticoagulation** | Discharged on prophylactic anticoagulation  Discharged on treatment dose anticoagulation for confirmed/suspected PE  If elevated D-dimer during admission, consider  Consideration of a new diagnosis of venous thromboembolic disease (VTE) | Review whether can be discontinued  Review compliance (decision on continuation to be made at 3 months)  Consider D-Dimer +/- CTPA as appropriate |
| **4** | **Rehabilitation** | If symptoms which may benefit from rehabilitation, refer to post-Covid rehab pathway. | *To be confirmed* |

1. **Procedure, structure and content of 12-week review**

All patients with parenchymal changes on CXR attributable to COVID-19 infection should have a repeat CXR performed at 12 weeks, apart from in situations where this would not alter management (e.g. in advanced frailty or with life-limiting co-morbidities).

, a standard letter will be sent to the patient, explaining that the X-ray has returned to normal and that no routine follow up is planned, but giving direct contact details for the respiratory team at GHNHSFT to contact if there are persisting symptoms or other concerns. If contacted, initial assessment should be made over the telephone with a face to face clinic review arranged.

Where there are persisting CXR changes, a telephone review should be arranged. If there are persisting symptoms, initial investigations should be requested and a face to face clinic review should be arranged. We suggest that in situations where there are persistent CXR changes, HRCT should be the initial investigation, while if the CXR changes for resolved, gas transfer and D-dimer should be requested.

1. **Referrals to Post-Covid Rehabilitation and psychological services**

TBC

1. **Audit and Data Collection**

It is essential that the performance and outcomes of the follow-up service is audited regularly. This is both to ensure quality of the process and to optimise clinical efficacy of the follow-up pathway. As a new disease, the recovery course, prevalence and severity of sequela remains to be fully ascertained, and the follow up pathway will need to be dynamic and responsive to emerging evidence, which may be generated from preliminary findings from the GHNHSFT cohort or externally.

Clinical outcomes of patients reviewed by the follow up service should be recorded to help improve our understanding of the short, medium and long-term complications of COVID-19 infection. This will help refine the follow up pathway and guide discussions with patients during the initial admission regarding likely future course. The minimum data set of clinical outcomes that should be recorded for each patient with COVID-19 infection are summarised in **table 3**.

|  |  |
| --- | --- |
|  | Clinical outcome |
| 1 | Patient demographics |
| 2 | Length of stay |
| 3 | ITU or HDU admission (during initial admission) |
| 4 | Subsequent readmission |
| 3 | Post-discharge mortality |
| 4 | Complications identified at 6-week review |
| 5 | Persistence of abnormalities on CXR at 12 weeks |
| 6 | Complications identified at 12-week review |
| 7 | Referral to psychological services |
| 8 | Duration of supplementary oxygen therapy (when discharged on supplementary oxygen) |

**Table 3: Core clinical outcomes data set**

Performance outcomes of the follow up pathway should also be audited, to ensure adherence to standards and identify areas of deviation. Performance outcomes to be collected and audited are outlined in **Table 4.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Audit Criteria | Target |
| 1 | All patients in groups 2B and 3 should have a telephone review within 7 weeks post discharge | | 80% |
| 2 | All patients with CXR changes attributable to COVID-19 pneumonia should have a CXR performed at 12 weeks post discharge | | 90% |
| 3 | All patients should have psychological needs assessed and documented, with onward referral where required | | 80% |
| 4 | Patients discharged on anticoagulation for COVID-19 associated PE should have this reviewed at 12 weeks | | 100% |
| 5 | Patients discharged on prophylactic anticoagulation should have this reviewed within 6 weeks of discharge | | 100% |
| 6 | Patients discharged on supplementary oxygen should have this reviewed within 6 weeks of discharge | | 100% |

**Table 4: Performance outcomes for auditing**

1. **References**
2. British Thoracic Society Guidance on Respiratory Follow Up of Patients with a Clinico-Radiological Diagnosis of COVID-19 Pneumonia V1.2 11 May 2020
3. British Thoracic Society Guidance on Venous Thromboembolic Disease in patients with COVID-19 May 2020
4. ARTP COVID-19 Infection Control Issues for Lung Function, Association for Respiratory Technology and Physiology, 2020