Royal Berkshire NHS Foundation Trust

Virtual Acute Care Unit: Pneumonia Pathway

Approval

Approval		Date
AMU Clinical Governance		Sept 2021

Authors

Version	Date	Author, job title	Reason
1.0	July 2022	Dr Tran Nguyen Dr Joseph Nunan Dr Emily Law (Middle grade doctors for VACU) Dr Andrew Walden (Lead Consultant for VACU) Dr Dionne Tannetta (Lead Physician Associate for VACU)	New guidance

Change History

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Introduction

The COVID-19 pandemic has demonstrated the need to extend the use of telemedicine to keep patients out of hospital and reduce the risk of nosocomial infections. Every year between 0.5% and 1% of adults in the UK develop community-acquired pneumonia which equals almost 700,000 cases in absolute numbers.[1]

At Royal Berkshire Hospital, community-acquired pneumonia (CAP) was noted to be the most common reason for hospital admission. It included 745 hospital admissions in 2019 with the median length of stay of 5 days. Virtual pathways to reduce hospital admission and expedite early discharges would reduce hospital pressures and improve patient experience.

Little research has been done to date on managing bacterial pneumonia remotely utilising telemedicine. One study conducted in Hawaii enrolled 16 patients with CAP using a combination of the Pneumonia Severity Index (PSI), the Karnofsky performance score, and the Charlson comorbidity index to risk stratify patients for home management.[2] Home televisits included video call along with evaluation of temperature, respiratory rate, pulse oximetry, and auscultation for crackles (using a dedicated machine). With this set-up, a median of 5.4 bed days per patient were saved. Patients monitored remotely using a telemedicine device were found to return to activities of daily living 13 days earlier; other outcomes were similar for the telemedicine and control group. However, a survey of telemedicine patients revealed that they would have felt safer in hospital. Given that this study was conducted in 2004 in the absence of the acute threat of hospital-acquired infections at the forefront of patients' minds, this perception may differ now. Due to the paucity of the literature on this subject, any approach taken would have to be under extreme caution and subject to constant review.

The infrastructure and experience from remote management of patients with COVID-19 pneumonia can be used to widen the use of telemedicine to patients with bacterial pneumonia. We propose a triage pathway and a virtual management protocol for these patients.

About the triage pathway

The CURB-65 score is a widely used tool to assess clinical stability. Screening with this score and using the Halm's criteria along with CRP values prior to discharge adds another layer of safety to the triage process. The combination of Halm's criteria and CRP has been shown to predict risk of complications most reliably.[3] Final decision to discharge should always be made by a senior physician taking into consideration patient and NOK preferences.

About virtual assessments

Virtual assessments will include at least a once-daily assessment via telephone or video call with monitoring of blood pressure, oxygen saturations, pulse rate, and temperature. Patients will also be asked about their general condition and symptoms to determine any new features and the overall trajectory of their illness. Any changes required to medications e.g., adjustment of antimicrobials according to culture results can also be carried out and the patient can be informed about this.

1

2

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Risk assessment scores:

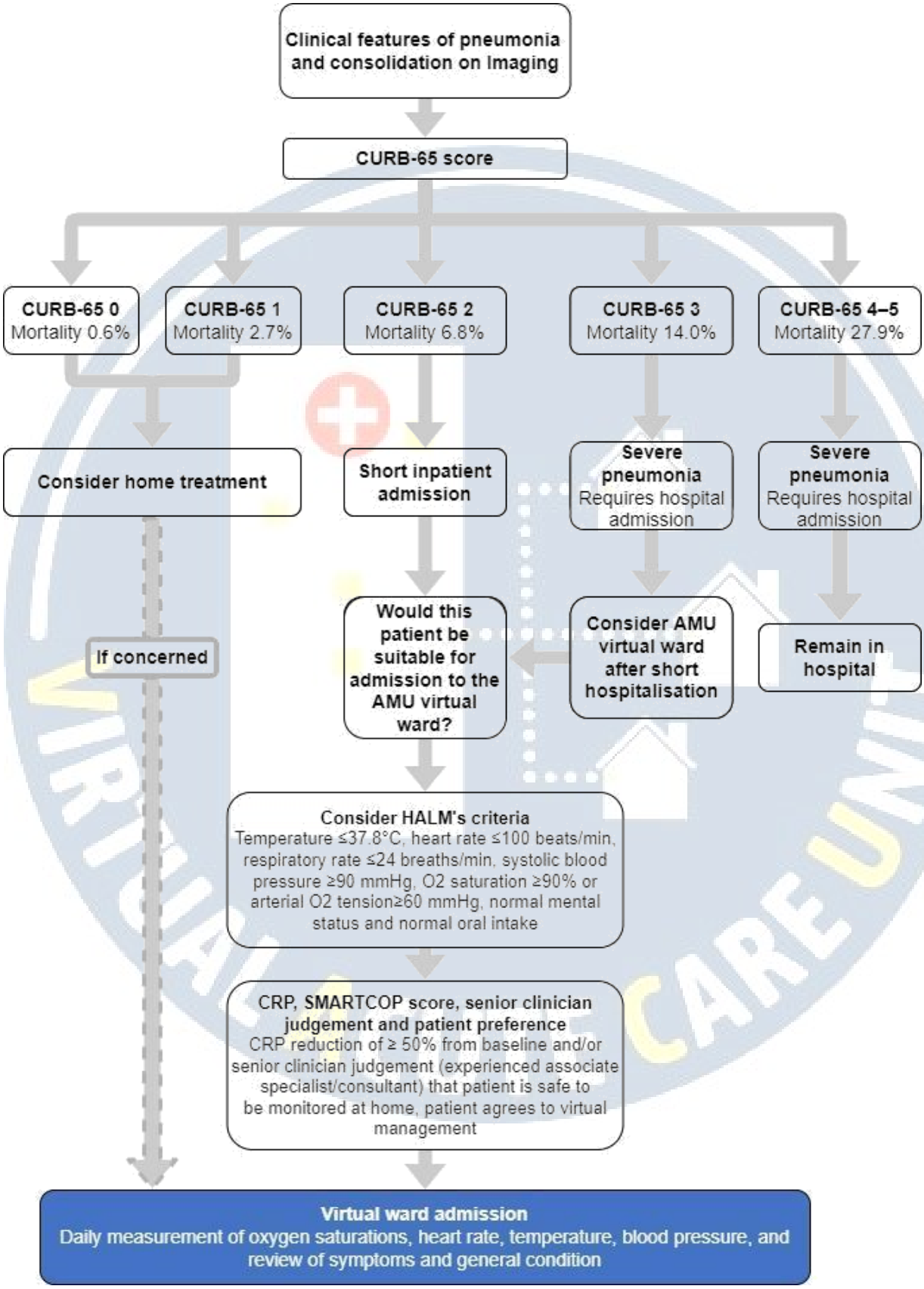
CURB-65	
Clinical feature	**Points**
Confusion	+1
Urea > 7 mmol/L	+ 1
Respiratory rate ≥ 30/min	+ 1
Systolic BP < 90 mmHg or diastolic BP < 60 mmHg	+ 1
Age ≥ 65	+ 1

CURB-65 score interpretation	
0–1	Low risk, consider home treatment
2	Short inpatient hospitalization or closely supervised outpatient treatment
3 (mortality 14%)	Severe pneumonia, hospital treatment
4–5 (mortality 27.8%)	Severe pneumonia, hospital treatment

Halm's criteria

- Temperature ≤37.8°C
- Heart rate ≤100 beats/min
- Respiratory rate ≤24 breaths/min
- Systolic blood pressure ≥90 mmHg
- O2 saturation ≥90% or arterial O2 tension≥60 mmHg
- Normal mental status
- Normal oral intake

Pneumonia Pathway: To be used by senior clinician or consultant



Exclusion criteria:

- Oxygen requirement
- Haemodynamic instability
- Unresolved new confusion
- Social reasons including inability to hold calls
- Concerns over compliance
- Other unrelated clinical concerns

Checklist prior to discharge:

- Documented resting target sats
- Documented phone number
- Patient has cognitive and physical ability to use pulse oximeter (BP monitor, temp probe) at home and take phone calls.
- Provide patient with a leaflet, a sats probe and a blood pressure monitor.

Virtual ward follow-up for patients

Once daily phone calls to assess:

- Temperature
- Oxygen saturations
- Blood pressure
- Heart rate
- General condition (oral intake, mobility,…)
- Symptoms present and trajectory

Readmission criteria

- Saturations < 95% (for COPD 88–92%) or below agreed baseline
- Persistent fever
- Hypotension
- New confusion
- Inability to tolerate oral intake and/or oral medication
- Any other clinical concern (e.g., abnormal blood glucose in diabetes patients, worsening of other comorbid conditions)

References

[1] NICE Pneumonia (community-acquired): antimicrobial prescribing guideline. Evidence review. September 2019. ISBN: 9781473135291.URL: https://www.nice.org.uk/guidance/ng138/evidence

[2] Lawrence Eron, Paula King, Michelle Marineau, Cyndee Yonehara, Treating Acute Infections by Telemedicine in the Home, Clinical Infectious Diseases, Volume 39, Issue 8, 15 October 2004, Pages 1175–1181, https://doi.org/10.1086/424671

[3] Akram AR, Chalmers JD, Taylor JK, Rutherford J, Singanayagam A, Hill AT. An evaluation of clinical stability criteria to predict hospital course in community-acquired pneumonia. Clin Microbiol Infect. 2013 Dec;19(12):1174-80. doi: 10.1111/1469-0691.12173. Epub 2013 Feb 26. PMID: 23438068.