# Virtual Wards: role of clinical risk stratification

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The Academic Health Science Network continue to support implementation of clinical risk-stratification in patients presenting to hospital with COPD exacerbations. Prognostic tools enhance clinical judgement by providing an objective and accurate estimate of clinical risk. This provides a sound basis for truly informed shared decisions with patients and their families.

Virtual wards (VW) were established during the COVID-19 pandemic to monitor patients in their own homes, facilitating early discharge from hospital and potentially avoiding admission. Their role is now expanding into other conditions, including COPD. We have proposed a three-tier model for VW, using clinical risk stratification to inform patient selection.

In patients presenting with COPD exacerbation and triaged for admission, DECAF is best predictor of risk of in-hospital death; of importance, approximately ½ patients have a low risk score. In this group, we have shown that hospital at home is safe, clinically and cost-effective (saving £1,016 per patient over 90 days), and preferred by 90% of patients. Patients with an intermediate score (DECAF 2), can also be considered for inclusion once stable/ improving. Hospital at home may also be considered for patients with pneumonia (using CURB65, or if co-existent COPD, DECAF) and bronchiectasis, among other conditions. This approach could be implemented from the emergency department, including out of hours, with admission directly to a VW hospital at home bed, supported by completion of a structured initial assessment (freely available from Prof Bourke). Patients requiring temporary oxygen therapy or other interventions may need to an initial overnight stay until seen by the specialist respiratory team to ensure all resources are in place before return home. Units unable to provide full hospital at home can instead focus on early discharge; length of stay in the usual care arm of the RCT was 2 days shorter compared to low risk patients admitted prior to the study, whilst implementation of a QI initiative including DECAF across 18 hospitals in Ireland was associated with a median reduction of 1.75 bed days.
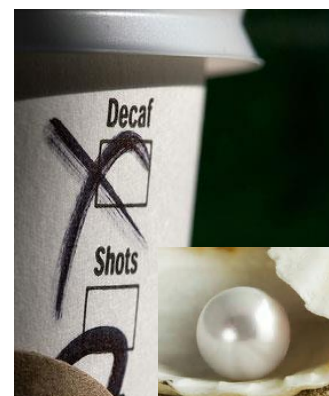
DECAF Score		Circle
D	eMRC**D** 5a (Too breathless to leave the house unassisted but independent in washing and/ or dressing)	1
	eMRC**D** 5b (Too breathless to leave the house unassisted and requires help with washing and dressing)	2
E	**E**osinopenia (eosinophils $< 0.05 \times 10^9$/L)	1
C	**C**onsolidation	1
A	Moderate or severe **A**cidaemia (pH < 7.3)	1
F	Atrial **F**ibrillation (including history of paroxysmal AF)	1
	Total:	

In patients admitted for COPD exacerbation, in-hospital mortality has fallen substantially over the last 15 years (2008 = 7.7%; 2019/20 = 3.9%). However 90-day readmission rates have increased from 33% to over 43%. PEARL is the best predictor of risk of readmission, and selection for readmission avoidance. Those in the intermediate and high-risk groups combined are more likely to experience readmission than not. Close surveillance within VW provides a novel approach to readmission avoidance, notably for the first 30 days (highest risk). This should include completion of Structured COPD Review, optimising COPD management, and identifying and treating key co-morbidities – "LUNGS, HEARTS, MINDS and BONES".

PEARL Score	Prediction of 90-day readmission or death risk	Circle
P	**P**revious admissions (≥2) *Admission to inpatient hospital ward. Do not count attendance at A&E, Ambulatory Care or day-case units.*	3
E	**e**MRCD 4 (Stops for breath after about 100m or after a few minutes on the level) **e**MRCD 5a (Too breathless to heave the house unassisted but independent in washing and/or dressing) **a**MRCD 5b (Too breathless to leave the house but requires help with washing AND dressing)	1 2 3
A	**A**ge (≥80)	1
R	**R**ight sided heart failure *Clinical diagnosis of Cor Pulmonale (with or without imaging)*	1
L	**L**eft sided heart failure *Confirmed by cardiac imaging*	1
	Total PEARL Score	

90-day risk of readmission or death:
PEARL 0-1 (low risk) = 20.7%; PEARL 2-4 (intermediate risk) = 42.1%; PEARL ≥5 (high risk) = 66.4%

Respiratory virtual ward three tier model

Tier 1: Hospital at Home

Small proportion of VW population – short duration, high intensity support.

24/7 service with daily visits, and respiratory specialist nurse and consultant on call. If the patient deteriorates out of hours they contact the specialist team. Only patients triaged for admission enter the service. Includes most treatments normally provided during a hospital admission with the exception of acute NIV: e.g. temporary controlled oxygen, intravenous and nebulised therapies. Ideally should have access to all inpatient clinical systems (to share documentation of this clinical episode across home and hospital, new prescriptions, ICE and PACS). Average length of stay = 5 days

1. Exacerbation of COPD DECAF 0-1 (+ DECAF 2 if stable/ improving after 24+ hours in hospital)
2. Community acquired pneumonia (use DECAF is co-existent COPD) CURB65 0-1 (+ CURB65 2 stable/ improving after 24+ hours in hospital)
3. Exacerbation of bronchiectasis

This is the current Northumbria H@H service. Extension to include direct admission to VW H@H bed from ED under consideration.

RSN delivering H@H need to be ring fenced in this role (not pulled to cover the acute ward etc)

Northumbria Healthcare NHS Foundation Trust   NHS   Academic Health Science Network North East and North Cumbria   Newcastle University

Tier 2: Standard Virtual Ward

Patients at high risk of deterioration and (re)admission. 7-day service (remote/ telephone support at weekends).

1. Supported Pulmonary Discharge (SPUDS – proposal to extend to 30 days within VW): predominantly post discharge following COPD exacerbation selected by PEARL score for readmission risk: intermediate = 42%; high = 66%.
2. Home IV antibiotics in patients not requiring full H@H (typically when the need for IV antibiotics is driven by antibiotic resistance to oral alternatives). Remain in service for 7 – 14 days depending on condition and clinical need.
3. Patients who have an ongoing oxygen requirement following an acute respiratory illness (including viral pneumonia, and exacerbation of a pre-existing condition), but who are on an improving trajectory. If oxygen cannot be weaned, referred for a formal LTOT assessment in 6 weeks (it would be helpful if these patients were separately identified to be picked up by the oxygen team).
4. Admission avoidance, including step-up from tier 3 below. Includes patients requiring assessment, treatment escalation and close monitoring following deterioration despite primary therapy (e.g. usual rescue pack).

Tier 3: Enhanced self-monitoring

<u>Not included</u> within VW numbers, but may step up to VW during exacerbations
Outreach service: patients with chronic respiratory disease at risk of deterioration. Able to directly contact the respiratory specialist nurses Mon – Fri, 09:00 – 17:00. Input may range from telephone advice (which may include contact GP) to a home visit.

Contact details:

Prof Stephen Bourke: Stephen.bourke@nhct.nhs.uk
Stephen is the educational lead for this programme and can be contacted for copies of supporting assessment sheets and other materials in use in Northumbria (to adapt to your own service).

Carlos Echevarria: carlos.echevarria@nhs.net
Carlos is supporting individual centres with their implementation plans.

Claire Adams: claire.adams6@nhs.net
Claire is facilitating all activities through her role within the AHSN.