East of England

West Hertfordshire
Hospitals NHS Trust

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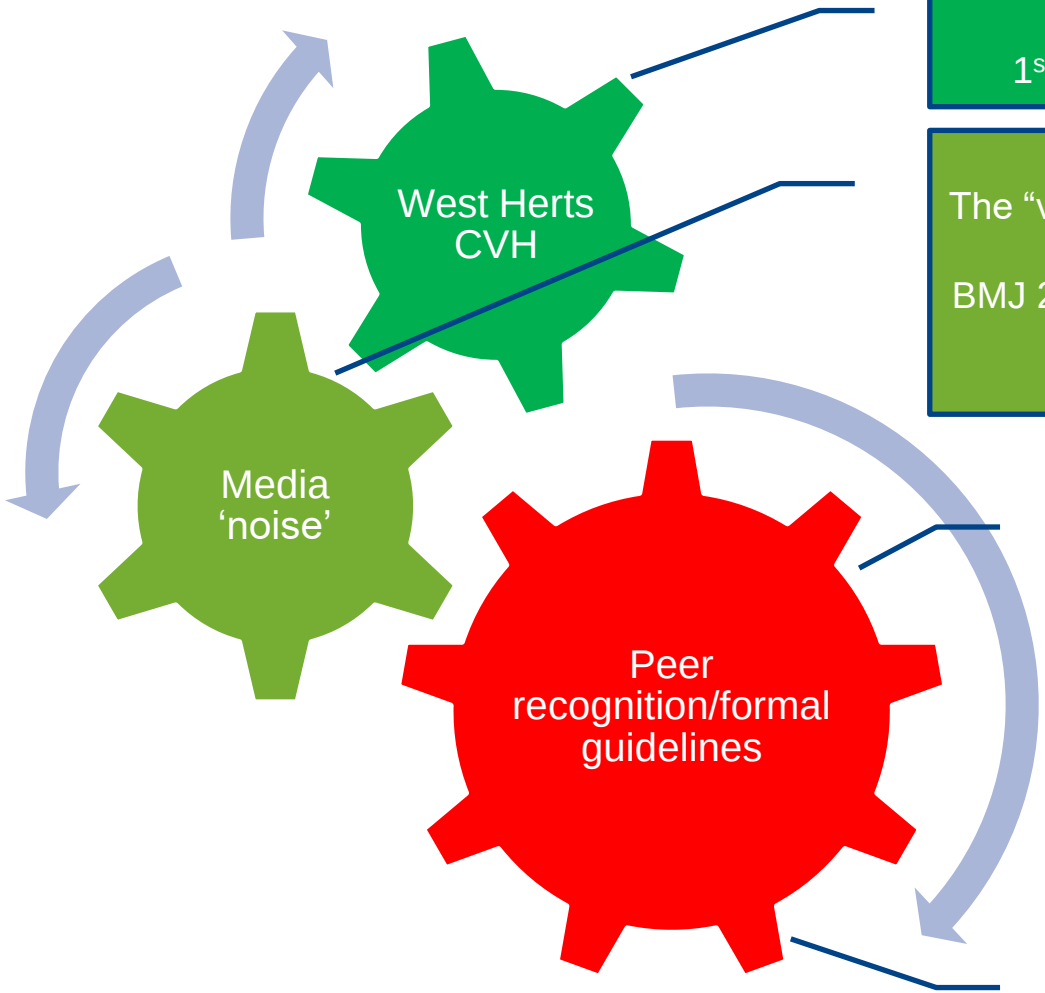
NHS E/I Clinical Lead (East of England) for Covid Virtual Hospitals and oximetry@home

Revolution in the COVID era

- Shared vision/effective leadership
- Supportive culture
- Appetite for change
- Handling conservatism
- Deliver
- QI principles



'Conceived': 9/3/20
1st patient on-boarded 14/3/20

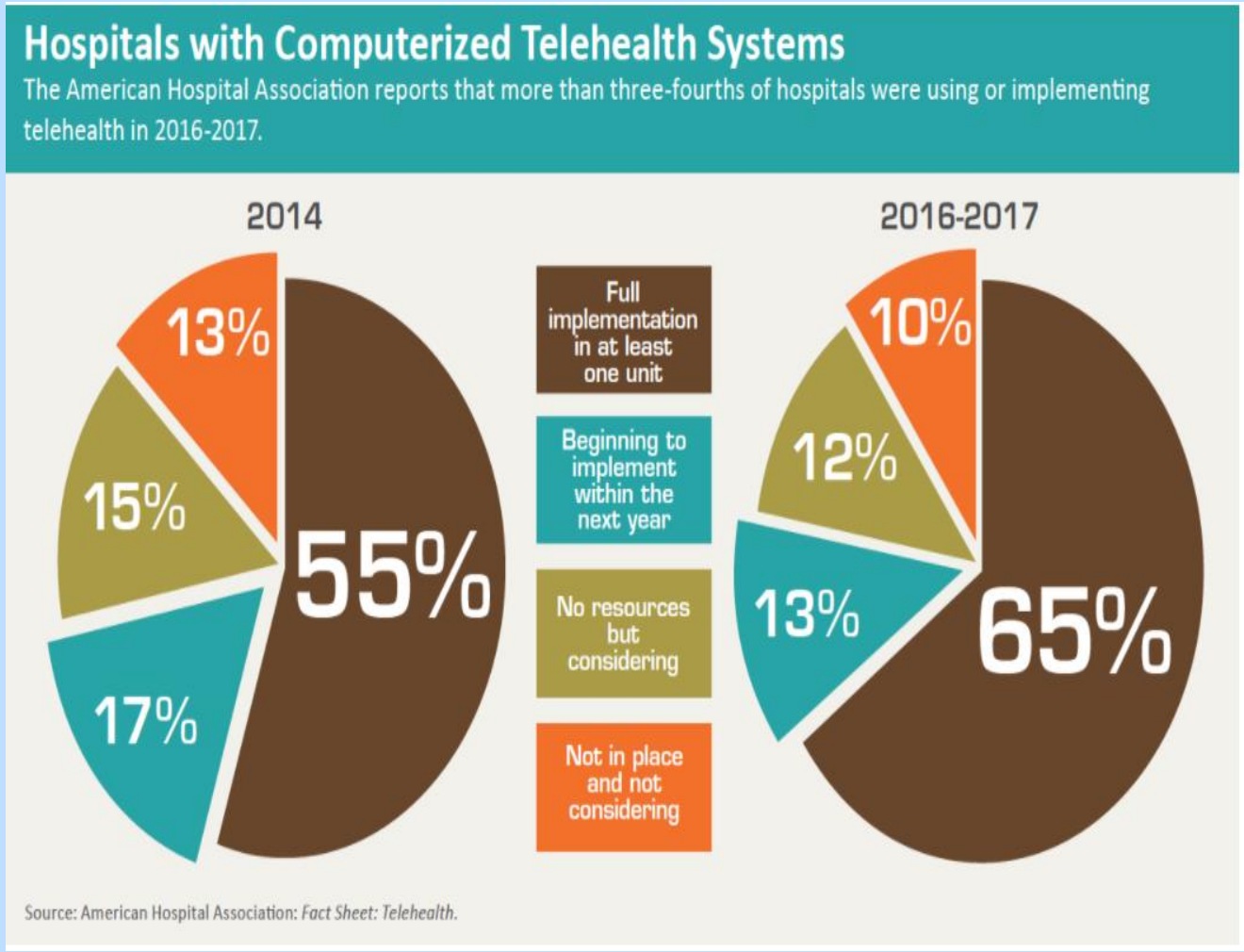
The "virtual wards" supporting patients with covid-19 in the community
BMJ 2020; 369 doi: https://doi.org/10.1136/bmj.m2119: June 2020

Remote home monitoring (virtual wards) during the COVID-19 pandemic: a systematic review
Cecilia Vindrola-Padros…Naomi J Fulop
https://doi.org/10.1101/2020.10.07.2020858 7: October 2020

NICE position statement: Nov 2020
NHSE/I: January 2021

The evolution of Virtual Wards

- Mercy Virtual Care Centre, Masachusetts 2015
- St. Lukes Health System, Idaho [2018, Ambulatory, acute post-acute
- Intermountain: Connect Care Pro [2019]- consolidation of 35 telehealth programs



NHS@home

	COVID Oximetry@home	COVID virtual ward
WHERE	Primary care supervised	Hospital supervised
WHO	Lower acuity/complexity	Higher acuity/complexity
WHEN	Community diagnosed patients	Emergency hospital patients
AIMS	**Safe admission avoidance and self escalation**	**Early supported hospital discharge safe admission avoidance**
HOW	Patient self monitoring/escalation **Earlier deterioration presentation**	Monitored service Reliable deterioration recognition
WHAT	Supportive treatments	+/- Dexamethasone, LMWH, O2

This isn't an exhaustive list, but we're currently focussed on:

- Blood Pressure @home: working alongside the Clinical Policy Unit at NHS England and NHS Improvement, as well as NHSX to embed better home management of blood pressure across primary care.
- **Proactive Care @home**: the Proactive care frameworks developed by UCL Partners form the basis of this work, working with primary care colleagues to better support people with a range of long-term conditions.
- **Managing Heart Failure @home**: currently working with five ICSs to support people with heart failure to better self-manage their condition.
- **Pulmonary Rehab @home**: aligned to Long Term Plan ambitions, this work is supporting more people to be referred to and complete a good quality pulmonary rehabilitation programme.
- Extension of **virtual wards:** working alongside partners to expand virtual wards to non-Covid patients, as safe alternatives to admission and supporting earlier discharge.

Definition of ‘VIRTUAL WARD/HOSPITAL’

- Drivers – what do you hope to achieve?
- Target groups ie @home, RH/NH, age groups
- Available staff and skill sets
- Available resources (tech, monitoring, space)
- Agree a pathway
  - Referrers
  - Patients
  - Clinicians
  - Management
- Plan escalation route – things do not always go to plan
- Technology does not replace common sense

Governance & monitoring

- Clinical accountability rests with the hospital clinical team
- SOP/pathways/KPI sit within the corporate structure of the acute trust

Configuration

- Adheres to RCP guidelines on ‘ideal ward rounds’
- Patients are monitored
- Treatment/interventions
- Tests can be performed (POCT)

DEFINITION

Virtual Ward/Hospital

Referral
Patient type
Care model
Monitoring
Treatment
Multi-disciplinary
Clinical accountability
Clear escalation routes
Corporate governance
KPI
System integration

West Herts Covid Virtual Admission prevention

Referral

SOARS score mortality								
0	1	2	3	4	5	6	7	8
1.4%	5.3%	5.9%	23.4%	35.4%	53.9%	72.5%	78.6%	>78.6%

0-1

GREEN

SOARS SCORE 0-1

1) Discharge to Virtual Hospital**

2) Give patient Advice Pack (with oximeter)

**Make referral via Infloflex Web COVID 19 or email westherts.respcovid19@nhs.net if Infoflex unavailable

Chua F, et al. Thorax 2021;**0**:1–8. doi:10.1136/thoraxjnl-2020-216425

Original research

Early prognostication of COVID-19 to guide hospitalisation versus outpatient monitoring using a point-of-test risk prediction score

Felix Chua [1,2] Rama Vancheeswaran,[3] Adrian Draper,[4] Tejal Vaghela,[5] Matthew Knight,[3] Rahul Mogal,[3] Jaswinder Singh,[6] Lisa G Spencer [7] Erica Thwaite,[8] Harry Mitchell,[3] Sam Calmonson,[3] Noor Mahdi,[3] Shershah Assadullah,[3] Matthew Leung,[3] Aisling O'Neill,[3] Chhaya Popat,[3] Radhika Kumar,[3] Thomas Humphries,[7] Rebecca Talbutt,[7] Sarika Raghunath,[7] Philip L Molyneaux [1,2] Miriam Schechter,[5] Jeremy Lowe,[5] Andrew Barlow[3]

ABSTRACT

Introduction Risk factors of adverse outcomes in COVID-19 are defined but stratification of mortality using non-laboratory measured scores, particularly at the time of prehospital SARS-CoV-2 testing, is lacking.

Methods Multivariate regression with bootstrapping was used to identify independent mortality predictors in patients admitted to an acute hospital with a confirmed diagnosis of COVID-19. Predictions were externally validated in a large random sample of the ISARIC cohort (N=14 231) and a smaller cohort from Aintree (N=290).

Results 983 patients (median age 70, IQR 53–83; in-hospital mortality 29.9%) were recruited over an 11-week study period. Through sequential modelling, a five-predictor score termed SOARS (SpO2, Obesity, Age, Respiratory rate, Stroke history) was developed to correlate COVID-19 severity across low, moderate and high strata of mortality risk. The score discriminated well for in-hospital death, with area under the receiver operating characteristic values of 0.82, 0.80 and 0.74 in the derivation, Aintree and ISARIC validation cohorts,

Key messages

What is the key question?

- Can patients with COVID-19 be risk stratified in the prehospital setting without laboratory-measured data?

What is the bottom line?

- A five-predictor risk prediction score (SOARS) based on demographic and clinical characteristics can quickly and reliably identify COVID-19-positive patients who have a low probability of mortality for outpatient monitoring and management.

Why read on?

- Information from the prognostication of SARS-CoV-2-infected individuals early in their illness can be used to guide clinical decision-making with respect to the level of subsequent care.

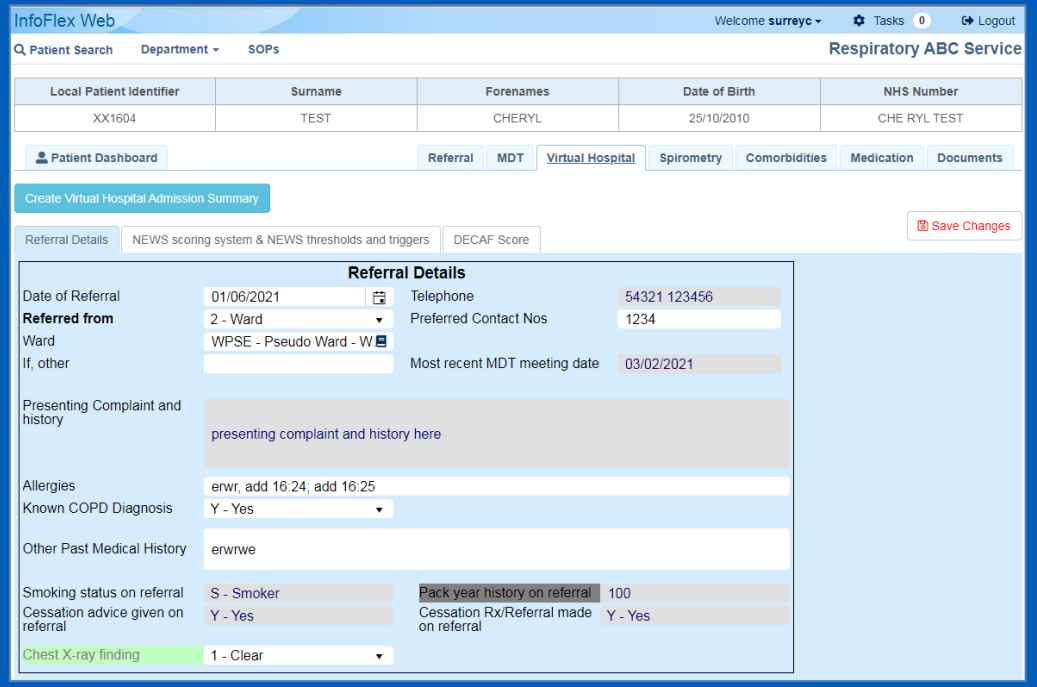
West Herts Covid Virtual Hospital Referral

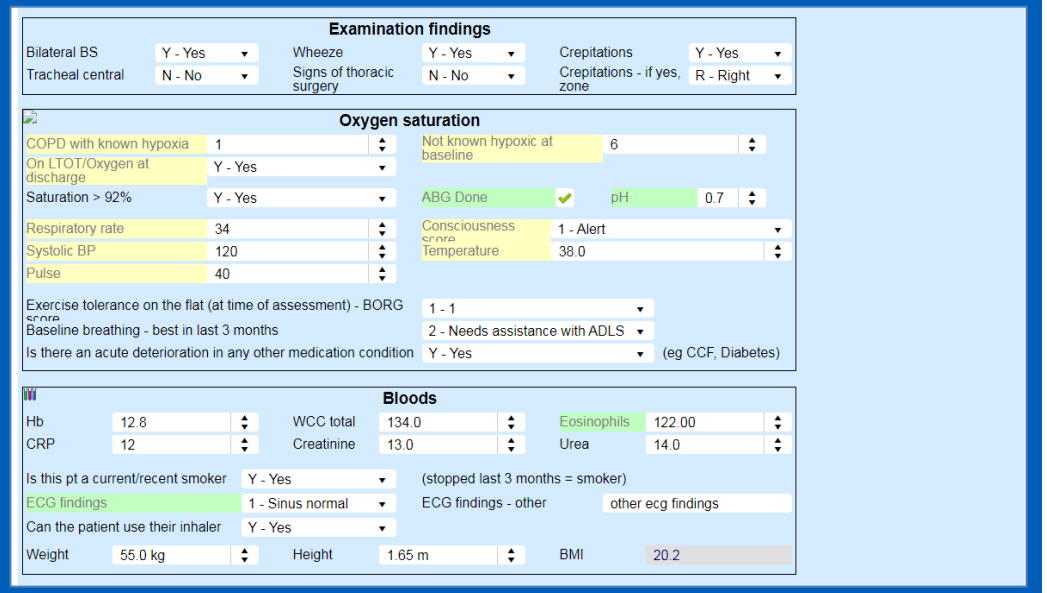
The COPD VH Pathway: decision-making

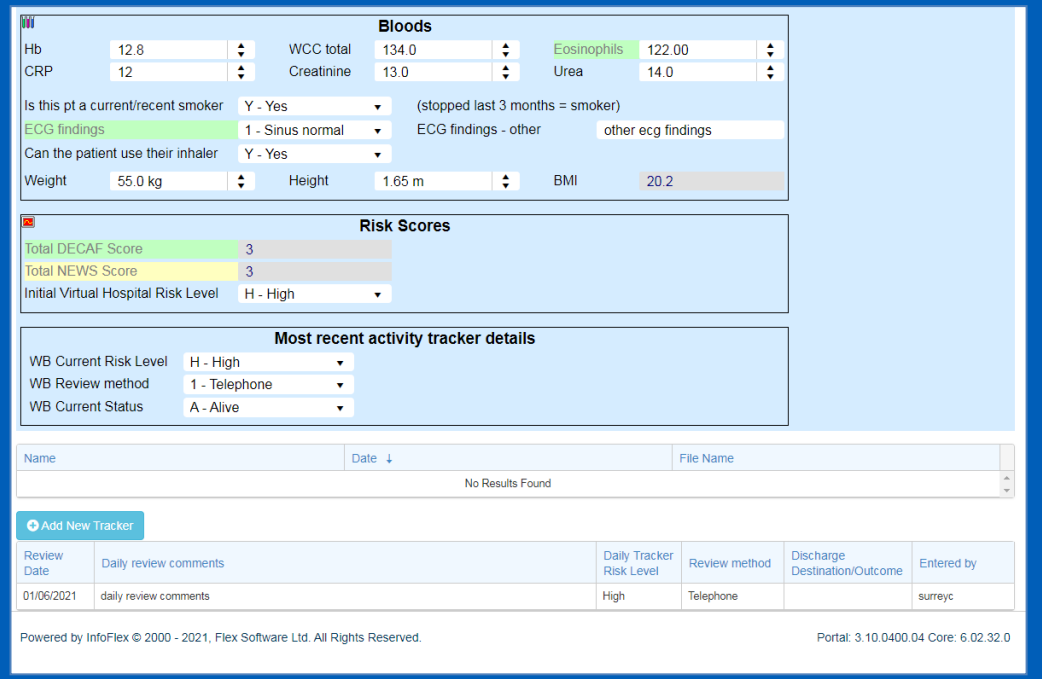
DECAF SCORE	In-hospital mortality risk	Hospital	Pathway	Comments
0	0%	VH	Low	Admission prevention
1	1.5%	VH	Low	Admission prevention
2	5.4%	VH	High	Admission prevention
3	15.3%	VH/WGH	High	Admission prevention
4	31%	WGH	High/palliative	Early discharge
5	40.5%	WGH	High/palliative	Early discharge
6	50%	WGH	High/palliative	Early discharge

West Herts COPD Virtual Hospital

Referral

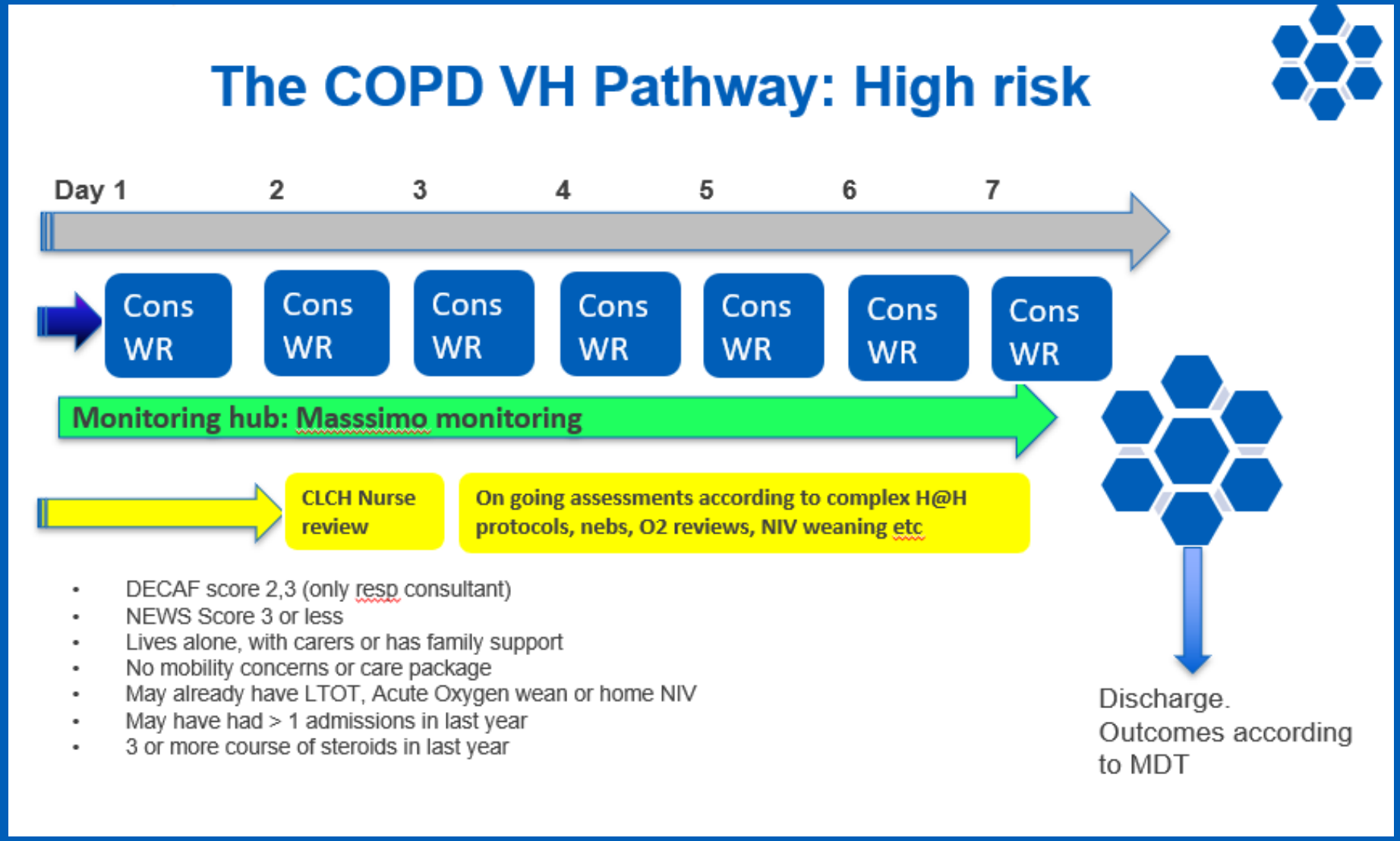






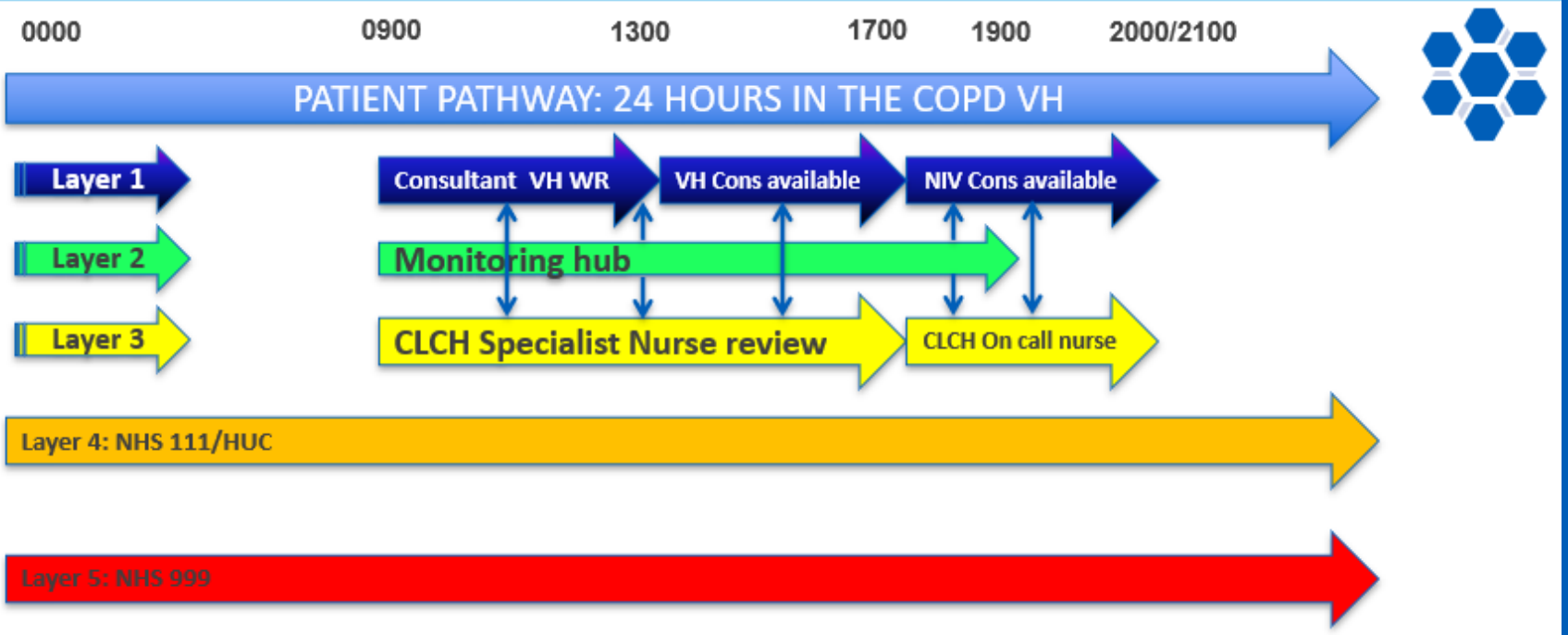
West Herts COPD VH

Care model



West Herts COPD VH

Escalation/clinical accountability



- Escalation routes will vary dependent on the time of day
- The monitoring hub will review all patients observations according to risk status and also provide 0900-1900 telephone advice to patients
- Nurses can escalate to available consultant and vice versa
- Patients can contact monitoring hub 0900-1900
- At 'risk patients' need agreed escalation plans in place by 1700 every day available to emergency teams

Week day escalation routes

Local exemplar, national recognition, research

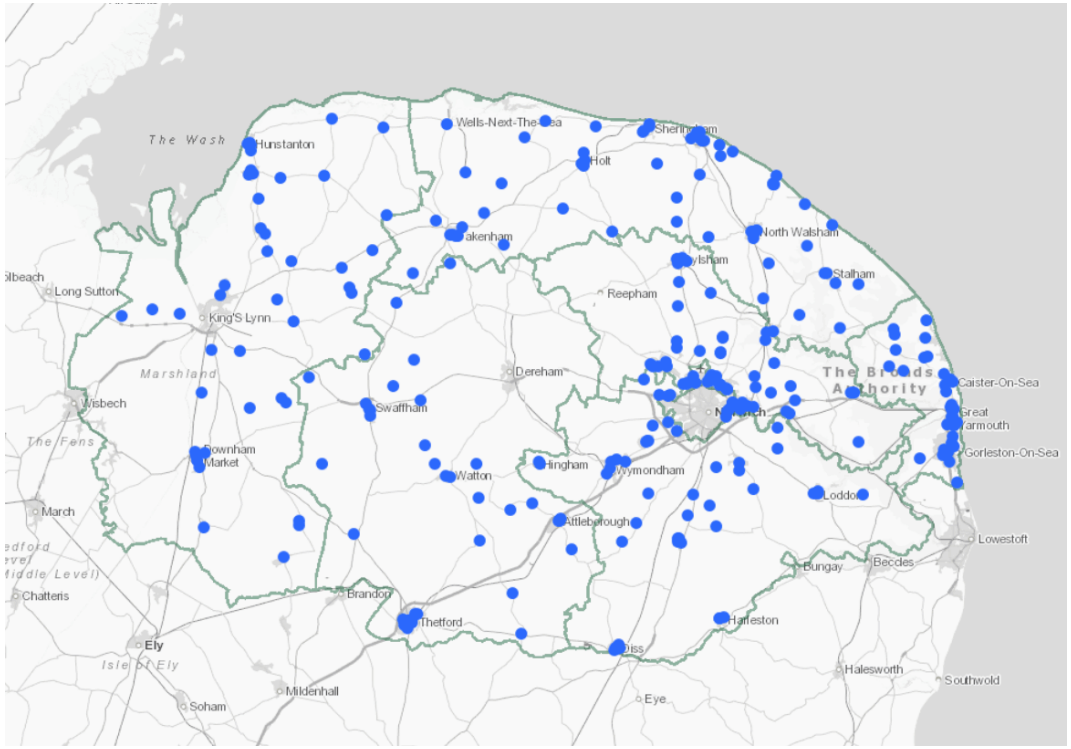
- WHHT was the first site in the UK to establish a formal Covid Virtual ward (https://www.bmj.com/content/369/bmj.m2119

- The work from the CVH contributed to the safety analysis project undertaken by NHSE&I and NHSD/NHSX – contributing to the national pathway released by NHSE advising all CCG areas to run oximetry at home services https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/11/C0817-sop-covid-oximetry-@home-november-2020.pdf (November 12th 2020).

- WHHT was one of two sites in the UK to pilot the use of an ambulatory phone based app developed in collaboration with NHSX and Huma/Medopad (https://preprints.jmir.org/preprint/23190, https://www.thehtn.co.uk/2020/06/12/huma-supports-nhsx-remote-monitoring-trials/), which contributed to a 50% reduction in the amount of clinician time spent per patient.
- COVPRO- prognostic factors in Covid in a virtual hospital group: http://dx.doi.org/10.1136/bmjopen-2020-045356
- SOARS score-prognostication at the front door: http://dx.doi.org/10.1136/thoraxjnl-2020-216425
- Rapid Antibody tests https://www.medrxiv.org/content/10.1101/2020.11.17.20233296v1

- PREDICTCOVIDUK: COFUP in draft form

NNUH Virtual Ward



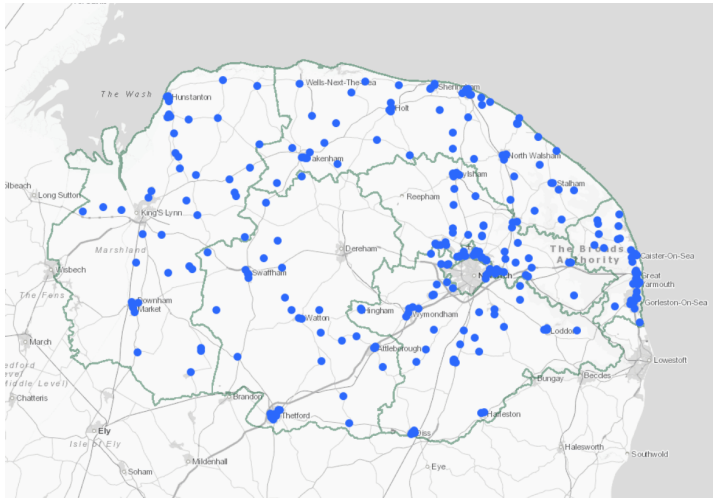
Emily Wells CNIO, Mr Ed Prosser-Snelling CCIO & Sheila Glenn Operation Director

NNUH

Virtual Ward

Vision → Plan → Process → Benefits

The Vision: A virtual hospital, made up of 40 virtual beds, virtual outpatients, virtual discussions with patients, clinician to clinician dialogue with primary care colleagues and virtual research trials and education. All without increasing the physical bed capacity of the NNUH.



STEP ONE = The Virtual Ward

Patient Feedback over the Past Week

Marked 1-5 1 being lowest to 5 being highe

5
I'm extremely happy to be at home, being part of the virtual ward gave me confidence. When my oxygen went down I used oximeter on my finger to check and if it was low I used more oxygen, always knowing that the nursing team where there if I needed them.

5
I have spent many weeks in and out of the N and N, and I think the virtual ward is a great way to be cared for at home.

5
Being in hospital was bringing my husband down, so going home really helped. Absolutely Brilliant cannot fault it.

4
I felt happy and secure when I went to the virtual ward. My breathing was very laboured but knowing I was being monitored made all the difference

5
Very happy . I felt depressed in hospital and over the moon when the virtual ward was suggested, I felt much happier being monitored at home by the nurses who called and introduced themselves before each shift which was great.

NNUH Virtual Ward

The journey so far:

Norfolk and Norwich University Hospitals NHS Foundation Trust

- 13th January 2021 asked by NHSE/I to set up a virtual ward for Covid inpatients
- 3rd February 2021 admitted our first patients
- Established a clinical team to mirror a normal ward
- Initially engaged shielding staff
- Created a governance process to fit into the corporate process, sitting within digital health.
- *"Our primary goal is to provide a safe and effective monitoring and follow service for all patients in the virtual ward, and to facilitate early discharge admission avoidance, and physical bed occupancy reduction where poss*

Our initial focus was COVID, but we knew we wanted to use the VW to support recovery and beyond

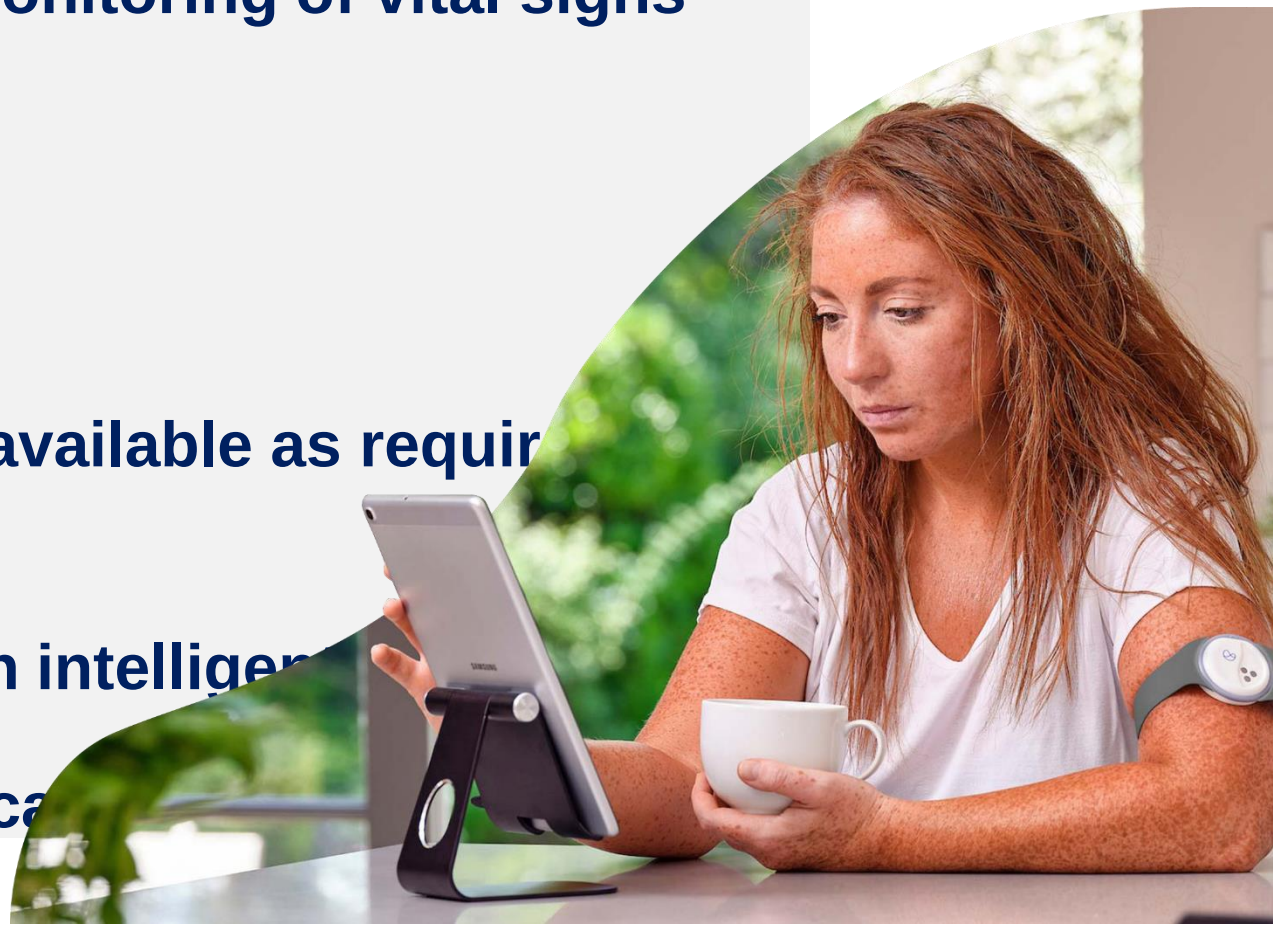
NNUH Digital Health

NNUH Virtual Ward

The Kit:

NHS Norfolk and Norwich University Hospitals NHS Foundation Trust

- Continuous, passive monitoring of vital signs
  - Respiration rate
  - Oxygen Saturations
  - Movement
  - Pulse Rate
  - Body Temperature
- Additional monitoring available as requir
  - Blood pressure
  - Scales
- Clinical dashboard with intelligen
alerts (app/Desktop)
- Tablet to enable video ca



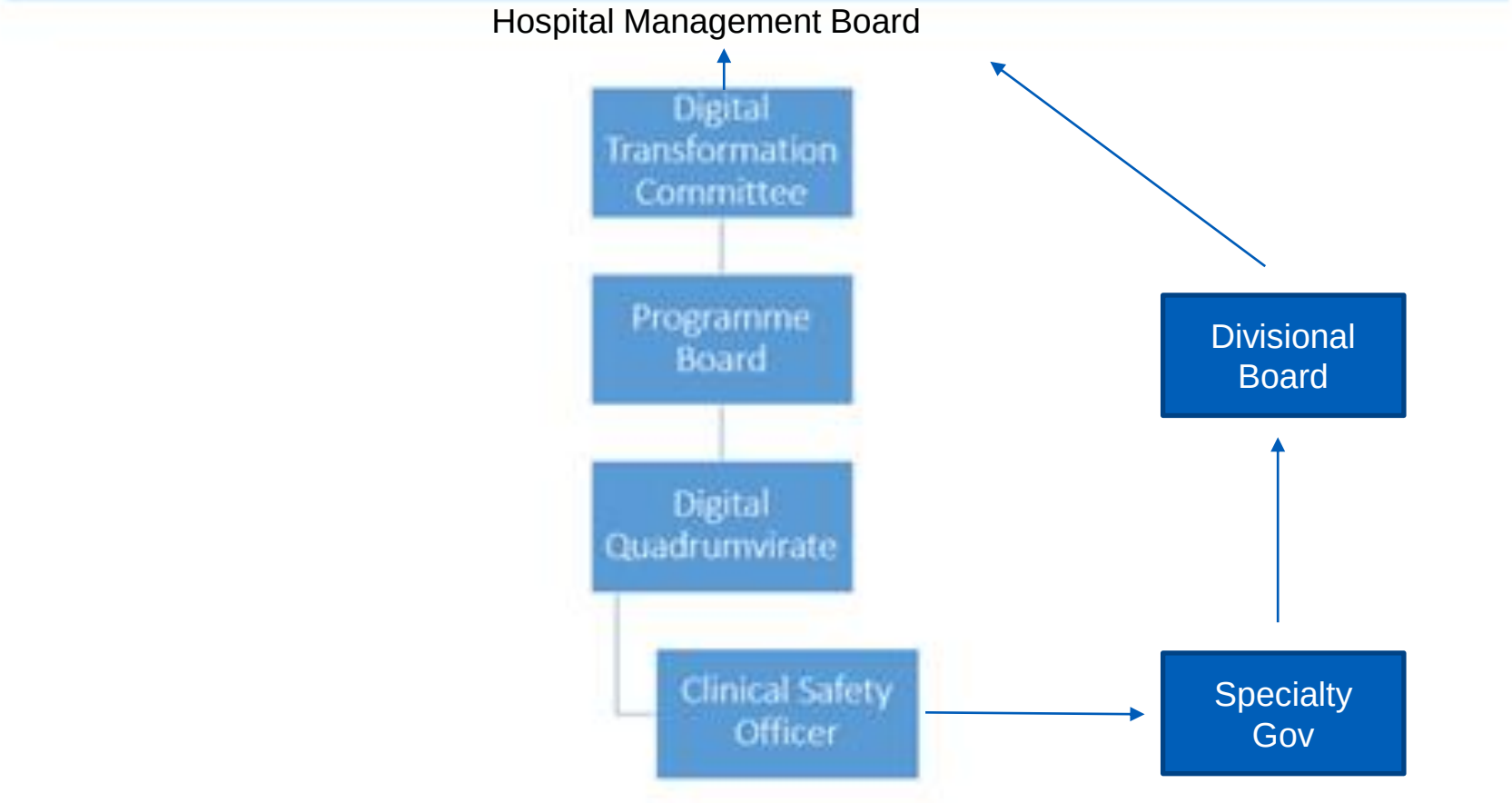
NNUH Digital Health

Governance

Clinical Governance

NHS
Norfolk and Norwich University Hospitals
NHS Foundation Trust

Reporting and Risk Management



Pathway Design

In order to "On Board" patients for the virtual ward a department or service must undertake the following:

1. Nominate a *lead consultant* to take clinical oversight & responsibility of patient/pathway (named consultant)
2. The speciality lead consultant is then asked to approve the creation of a on-boarding pathway document

Which includes:

- Admission inclusion and exclusion criteria
- Instruction for care whilst on the ward, and thresholds for intervention
- Instructions and routes for escalation
- *The support model including arrangements for ward rounds to comply with the NHS Seven Day Services model.*
- *Escalation and on-call arrangements*

3. The speciality lead consultant takes responsibility for ensuring that necessary clinical governance leads are informed of their service's participation in the virtual ward and that their pathway is approved
4. The specialties divisional triumvirate will have general oversight and have approved of this pathway
5. The specialty lead consultant should read, review and understand the clinical safety case, the standard VW operating procedure and other relevant documents.
6. The steps above should be confirmed in writing to the CCIO and CNIO and Operational Lead
7. The Virtual Ward programme board will then approve the request and ensure the technical process for on-boarding is completed.

In case of dispute the addition of a service, the CCIO will arbitrate and provide a final decision, based on the clinical safety case, with the right to appeal after this arbitration to the medical director.

NNUH Virtual Ward

NHS Norfolk and Norwich University Hospitals NHS Foundation Trust

Current Pathways

Live Pathways –

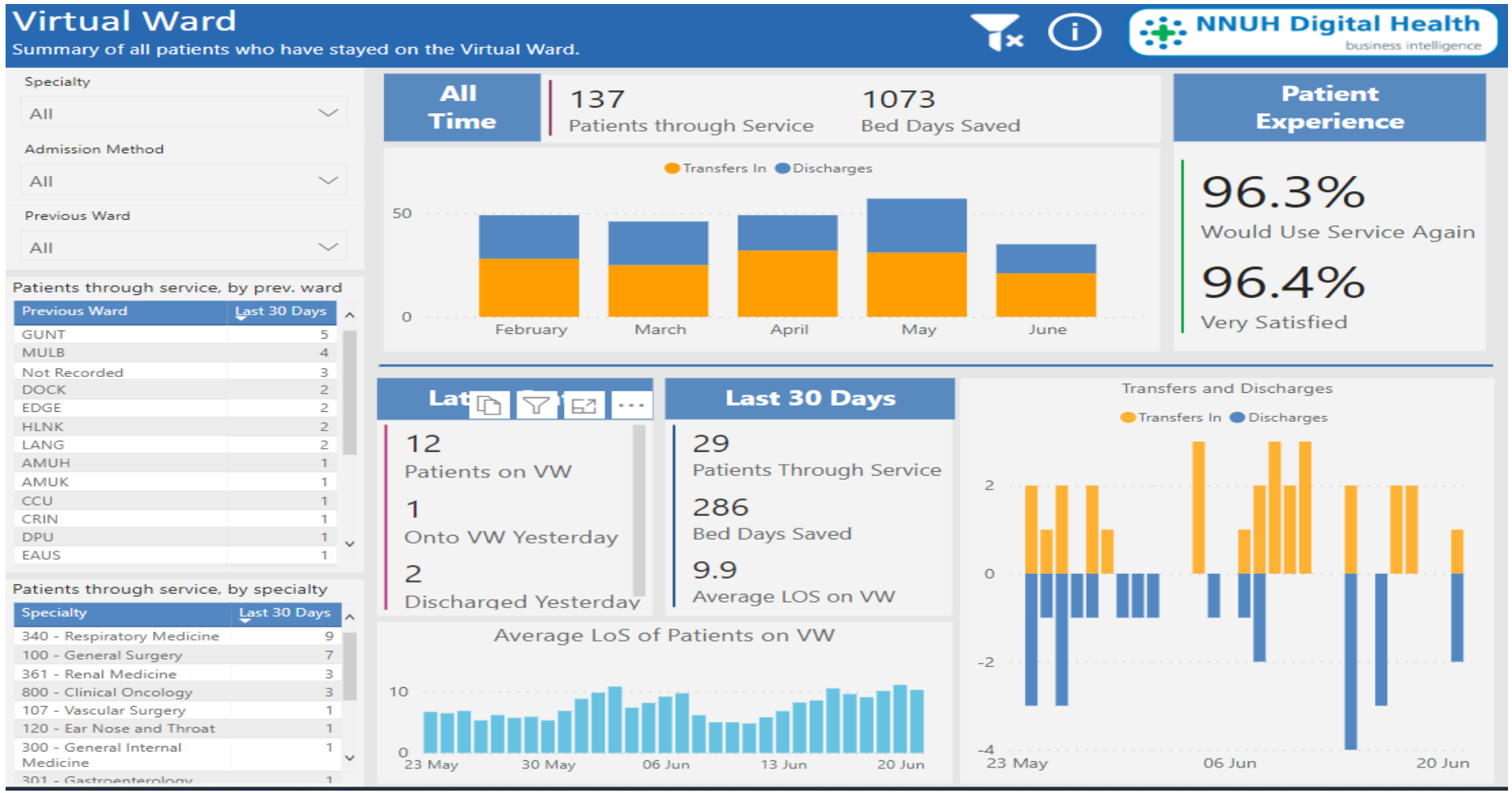
- Covid
- Palliative Care
- Respiratory
- Stroke
- Awaiting Diagnostics
- Awaiting Treatment
- Awaiting Cardiology
- Stroke
- Gastro
- Pregnant patients with Covid

Being Developed

- Diabetes
- Oncology
- Bespoke
- Heart Failure
- DPU

NNUH

Virtual Ward



NNUH
Virtual Ward

NHS
Norfolk and Norwich
University Hospitals
NHS Foundation Trust

Current Pathways Example

Microsoft Word
Document