



Royal College of  
General Practitioners

*The***AHSN***Network*

# **COVID-19: Patient Assessment the role of physiology and oximetry**

Dr Alison Tavaré, West of England AHSN

Dr Simon Stockley, RCGP Lead for Acute Deterioration and Sepsis

Dr Jonathan Leach OBE, RCGP Hon Sec and COVID lead

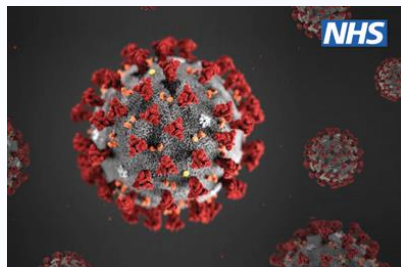
# Overview of webinar

- Clinical features of COVID-19
- Clinical judgement and physiology in patient assessment
- Importance of oximetry in COVID-19
- The role of NEWS2 in general practice and care homes
- Remote oximetry in the assessment and management of COVID-19 disease in the community
- This will be followed by a Q&A session

# Clinical features COVID-19

- COVID-19 became a clinical entity just four months ago
- The clinical features have been largely described from hospital experiences
- Data on the presentation of mild illness in the community is hard to come by

# Clinical course of patients admitted to hospital



## Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study

*Fei Zhou\*, Ting Yu\*, Ronghui Du\*, Guohui Fan\*, Ying Liu\*, Zhibo Liu\*, Jie Xiang\*, Yeming Wang, Bin Song, Xiaoying Gu, Lulu Guan, Yuan Wei, Hui Li, Xudong Wu, Jiuyang Xu, Shengjin Tu, Yi Zhang, Hua Chen, Bin Cao*

- Review of 191 people admitted to hospital in Wuhan with confirmed COVID-19 and clinical outcome of discharge or death by Jan 31 2020
- Patients presented first with fever and persistent cough. Shortness of breath developed on about day 6
- 59% met criteria for sepsis and 54% had respiratory failure
- SOFA (Sequential Organ Failure Assessment) an ITU tool with many variables was used to assess them: the higher the SOFA, the greater the odds of death

# Symptom tracker analysis

These were the common features in order of by severity predictiveness in those being admitted to hospital

Temperature does not appear to have a predictive value which aligns with what we find with sepsis. A normal temperature does not exclude serious disease

**BREATHLESSNESS**

**Myalgia**

**Chill**

**Severe Fatigue**

Sputum

Dizziness

Cough

Nausea/vomiting

Diarrhoea

Headache

Sore throat

Nasal Congestion

# UK data: Bristol, April 2020

Intervention	
Ward only	23%
Ward and oxygen only	42%
Non-invasive ventilation (NIV)	16%
Ventilated with intubation	19%

- 69 completed COVID-19 +ve admissions
- Median age 67 years, 63% male
- Most common comorbidities hypertension, COPD, diabetes and CKD
- Median hospital admission NEWS of 8. Median lowest pre-hospital pO<sub>2</sub> 86%
- 60% discharged, 33% died and 7% transferred

# RCGP position on NEWS2 during COVID-19

- There is no validated scoring system for COVID-19
- Clinical judgement is paramount
- Recording physiological measures may be helpful in supporting decision-making
- It can assist to track changes over time and assist partner agencies to spot deterioration
- If used it should be used alongside wider clinical assessment and should not replace clinical judgement

# NEWS2 and COVID-19

## Should we use NEWS2 to assess unwell COVID-19 patients in primary care?



NEWS2 is an early warning score developed for monitoring hospital patients. There is no data on its value in COVID-19 in a primary care setting. If using NEWS2, do so alongside a full clinical assessment. Further research on early warning scores for COVID-19 is needed.

#EvidenceCOVID

Trisha Greenhalgh, Julian Treadwell,  
Rebekah Burrow and others 8.4.20

- ‘NEWS2 includes measurements (blood pressure and oxygen saturations) that are difficult or impossible to take remotely.’
- ‘Key to the detection of deterioration is comparing the current NEWS/NEWS2 against the previous sets of vital signs for the same patient.’
- Urgent research is needed on the use of prognostic scores in the context of COVID-19
- It should also be remembered that not every sick patient has COVID-19



# What is NEWS2?

National Early Warning Score (NEWS2)

Physiological parameter	Score						
	3	2	1	0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO <sub>2</sub> Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO <sub>2</sub> Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

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- NEWS was developed in conjunction with the Royal College of Physicians (RCP) based on over 200,000 patient data sets
- Each physiological parameter is given a value and added to calculate a total score. It provides a structure as to how patient physiology is used in patient assessment
- NEWS values in hospital and elsewhere predict outcomes the higher the score the worse chance of a poor outcome
- NEWS is used in all ambulance services, ED, and hospitals as such it can be used to aid communication and concern as 'a common language'

# Physiological measurement and a common language



# Using NEWS2 to communicate



- Some ambulance and hospital services in the UK have been requesting NEWS when a GP arranges admission. It can provide a shared language and understanding of clinical concern about deterioration
- Clinical judgement remains paramount
- Aim is for patient to be seen right time, right place by the right person
  - NEWS 3 usually on acute medical unit but alternatives discussed e.g. hot clinic
  - NEWS 5 usually seen in Acute Assessment.
  - NEWS 7 consider blue light admission to ED
- Not always practical, and partial NEWS score or sharing the physiology available particularly at times of COVID-19 is acceptable
- Balance of priorities; benefits of admission compared to remaining in the community

# Physiology in COVID-19: case study



- GP working in out of hours became unwell. Cough, temperature and headache - presumed to be COVID-19, NEWS 3-4 but seemed to be improving after isolating first week
- D11-12 after the infection started noticed by family to have increased RR
  - RR 25; O<sub>2</sub> sat. 90% on air; BP 126/78, P105 and
  - temperature 37.9°C. Not confused
  - NEWS of 7
- Admitted and told respiratory decompensation with tachycardia but inflammatory markers satisfactory. Raised d-dimer
  - Bilateral pneumonia with classic changes of COVID and superadded lobar consolidation right base
- Treated with IV antibiotics, LMWH and nasal oxygen 4 days
- COVID-19 confirmed on PCR
- Discharged when maintaining sats >95% on room air
- Good recovery and back at work

# Baseline: what's normal for your patient?

While many of the general population may have a NEWS of 0, young fit healthy people may have a normal NEWS of 3

Consider the young sportsman with a systolic BP of 92 and a resting pulse of 45

Ironically, if he were to become unwell his pulse might rise to 88 which would be high for him but would mean his aggregate NEWS would fall to 2

Physiological parameter		
Resp rate	12	0
Oxygen sats on air	98%	0
Temperature	36.3	0
Systolic BP	92	2
Heart rate	48	1
Level of alertness	Alert	0



**Another reason actions cannot be ascribed to scores and clinical judgement is needed**

# Role of physiology in care homes

**RESPECT**

Recommended  
Summary Plan for  
Emergency Care  
and Treatment

	Value	NEWS
Resp Rate	20	0
O <sub>2</sub> Sats in air	90%	3
Systolic BP	70	3
Pulse	123	2
Conscious-ness	No record	0
Temperature	36.3	0
<b>NEWS2</b>		<b>8</b>

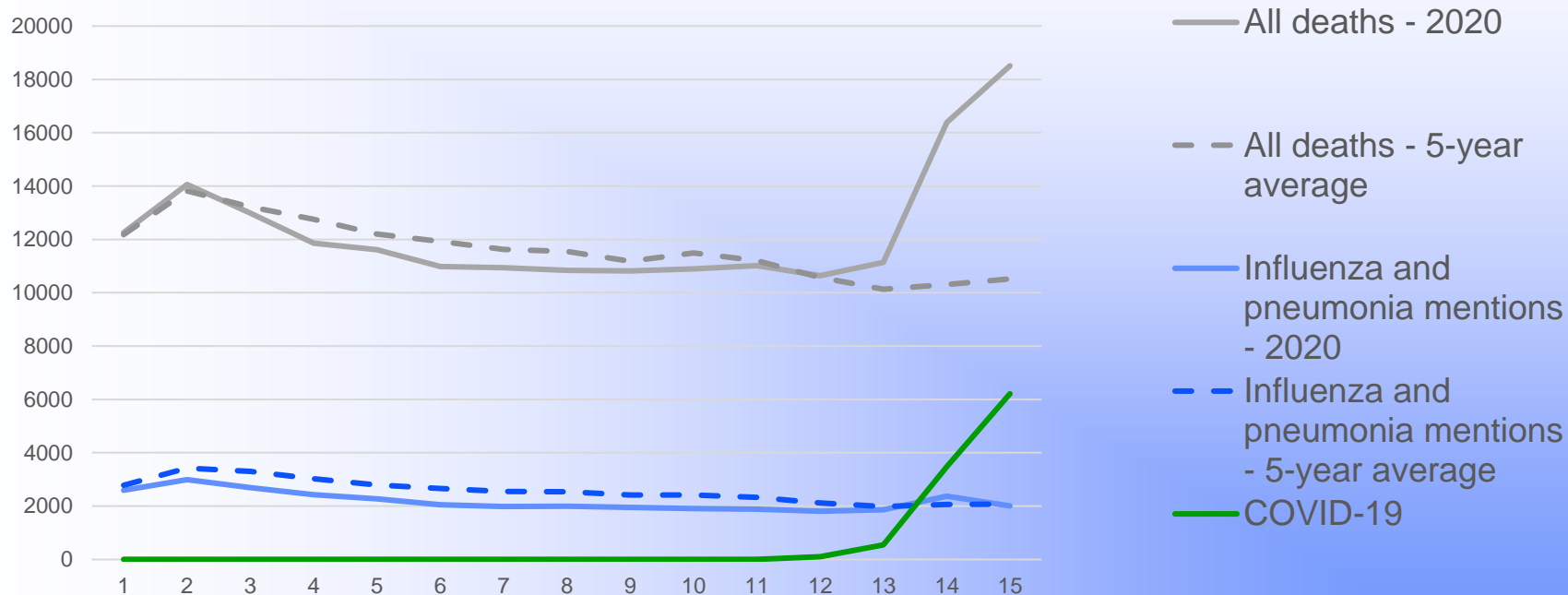
- A 93-year-old man in a residential home was visited by his GP and diagnosed with a cough. His NEWS2 was 3
- The following day he had deteriorated and was seen by a nurse practitioner who had not met him before
- His NEWS2 was now 8 and probably more as his level of alertness was not noted. A DNACPR was in place
- Clinically she felt he was dying, but the NEWS2 of 8 was objective evidence and supported discussions with the family.

It was agreed that escalation of care to hospital was inappropriate this was facilitated by clinical judgement and clear, objective evidence of deterioration

**Can we support staff taking observations to support communication? What about measuring pulse oximetry?**

# All-cause and COVID-19 deaths

Office of National Statistics 21 April 2020



# Clinical judgement remains paramount



## **April 2020, midst of COVID-19 lockdown:**

- 84-year-old woman with known paroxysmal AF on bisoprolol
- Felt unwell and dizzy and measured pulse using oximeter had purchased for monitoring in case developed COVID-19
- Pulse 29, usually 65. Called NHS 111
- Paramedics arrived pulse 140 and in AF

## **On arrival at ED:**

- RR18, SATS on air 95%, BP 150/83 HR 114, temp 36.7°C and alert
- NEWS2 score of 3

## **Admitted on basis of clinical judgement:**

- Responded to bisoprolol but arrested 6 hours later.
- Tachy-brady syndrome diagnosed
- Pacemaker inserted and home within 72h



# The role of physiology and oximetry

**‘I just know sick when I see it.’**

I don't really want to see a sick patient just so that I can measure observations that tell me what I already know



# NICE COVID-19 guidelines

## Bacterial pneumonia

- Becomes rapidly unwell after only a few days of symptoms
- Does not have a history of typical COVID-19 symptoms
- Has pleuritic pain
- Has purulent sputum

## COVID-19 pneumonia

- Presents with a history of typical COVID-19 symptoms for about a week
- Has severe muscle pain (myalgia)
- Has loss of sense of smell (anosmia)
- Is breathless but has no pleuritic pain
- Has a history of exposure to known or suspected COVID-19, such as a household or workplace contact

# NICE: COVID-19 rapid guidelines:

## Managing suspected or confirmed pneumonia in adults in the community

- Oximetry below 92% (or 88% in patients with COPD) identify seriously ill patients
- The Roth Score is not a reliable proxy for oximetry
- Use of NEWS2 to predict deterioration may be useful
- Face-to-face consultation should not be undertaken simply for the purposes of calculating NEWS2

# The importance of oximetry in COVID-19

- A measure of the effectiveness of respiration
- ‘Silent hypoxia’ is being seen in COVID, at hospital presentation
- Symptomatic patients with low oximetry but not outwardly appearing unwell



# Oximetry remotely



Roth Score is unreliable and no longer recommended

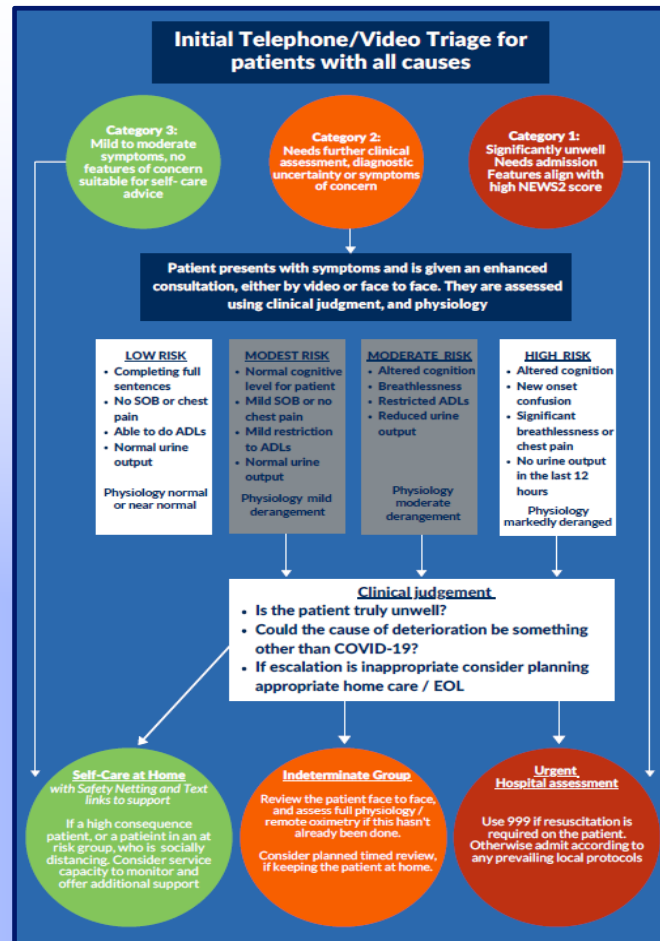
App-based oximetry currently viewed as unreliable for medial use

Home delivery oximetry is being trialled and explored by some areas

Post-exercise desaturation is discussed as a marker for deterioration in COVID-19

# RCGP COVID-19 flow chart

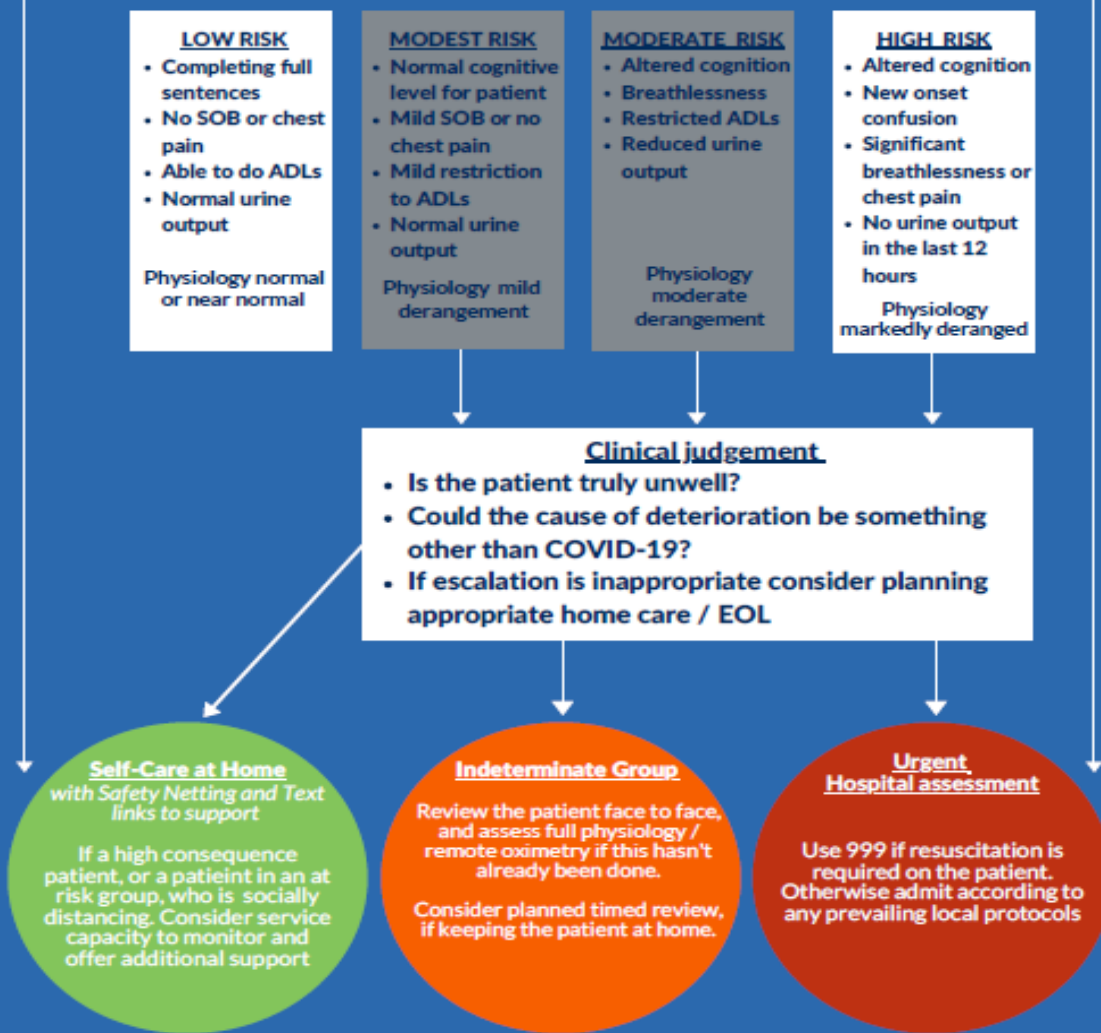
RCGP produced a flow chart to help clinical judgement and assessment after initial telephone contact



# RCGP COVID-19 flow chart

GPs are used to working in the grey areas of decision making and this is where we add value to patients and the system

Does not have to be face-to-face to follow, but where it is f2f physiology should be recorded



# The role of physiology in general practice and care homes

- We strongly recommend the measurement of physiology alongside clinical judgement
- GPs may wish to calculate a NEWS2 but face-to-face appointments should not be arranged unnecessarily
- It has value in communication between services and tracking deterioration
- Provides structure and objectivity to the patient assessment at the point of time it is undertaken
- Used in some nursing and care homes to aid staff in spotting change in residents and escalating concern



# NICE/RCP and incomplete physiology

- Remote consultations may limit our ability to record vital signs
- No consultation face to face should take place just to achieve this
- Incomplete NEWS2 is recognised by NICE as necessary in certain circumstances
- Where a NEWS2 is incomplete then this must be made clear to the receiving ambulance and hospital teams

# Key messages

- Respiratory rate particularly in the context of COVID-19 isn't the same as respiratory effort.
  - Not broncho-constricted but in resp. failure so tachypnoea with no use of accessory muscles
- Oximetry is important where there is concern as may have silent hypoxia
- New changes in cognitive function and ADLs are significant
- Soft signs, e.g. new falling/incontinence, are indicators of systemic unwellness