Covid 19: Remote Oxygen Monitoring in Maternity Services

Clinical Guidance for Professionals

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NOTE
This guideline is not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at following discussion of the options with the patient, covering the diagnostic and treatment choices available. It is advised, however, that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient's case notes at the time the relevant decision is taken.

COVID-19: Remote Oxygen Monitoring in Maternity Services

Clinical Guidance for Professionals

1.0 Background

Maternity services in all health boards are facing significant capacity challenges as a result of the impact of the COVID-19 Delta variant on younger, including pregnant, populations. While Royal College of Obstetricians (RCOG) and Royal College of Midwives (RCM) produced updated guidance on 20th August 2021 to recommend vaccination against COVID-19 in pregnancy, slow uptake of the vaccine amongst pregnant women in Scotland remains concerning[1].

2.0 Target Group

Pregnant women affected by COVID-19 can sometimes become very unwell. There is opportunity for wider implementation of the adult remote monitoring pathway to support pregnant women, to enable early detection of deterioration and offer timely intervention for those who need it[2] [3].

Insights from a recent pilot within a medium-sized NHS Board into home oxygen monitoring in pregnant women, suggest some symptomatic COVID-19 positive women have felt reassured by the opportunity to choose to monitor at home. However, a degree of ambivalence towards home oximetry is common amongst asymptomatic Covid-positive pregnant women, leading to poor engagement and effectiveness.

Therefore, asymptomatic women should not be offered home pulse oximeters and remote monitoring.

The target population includes:

1. Day care/Community maternity assessment discharges: All COVID-19 positive, symptomatic pregnant women who are assessed as well enough to be discharged with remote monitoring.

2. Hospital admission discharges (from a medical or maternity unit): COVID-19 positive symptomatic pregnant women who have been admitted for monitoring and are well enough to be discharged with remote monitoring.

3.0 Clinical Assessment

Face to face clinical assessment of symptomatic COVID-19 positive patients should take place in accordance to local policies. A flow chart, for use with clinical judgement, is included at **Appendix 1**.

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[1] https://www.ed.ac.uk/usher/research/projects/COVID-19-pregnancy-scotland
[2]Green LJ, et. al, Gestation-Specific Vital Sign Reference Ranges in Pregnancy. [accessed online at https://www.bmj.com/content/bmj/372/bmj.n677.full.pdf]
[3] Van Hook JW, Harvey CJ, Anderson GD. Effect of pregnancy on maternal oxygen saturation values: use of reflectance pulse oximetry during pregnancy. South Med J. 1996. [accessed online at https://pubmed.ncbi.nlm.nih.gov/8969354/]

As a guide, assessment may include:

1. History taking – Nature, severity and duration of symptoms (fever/ chest pain/SOB/ D&V/ exertional breathlessness)
2. Ask about fetal movements.
3. Complete evaluation assessing for other causes including COVID-19
4. Be vigilant for problems like dehydration/ poor fluid intake, reduced urine output, confusion, sepsis
5. Evaluate for other comorbidities and take into account in care planning other issues, such as language barriers, mental health or social care factors.
6. Risk assessment – BMI >30, BAME, Lung disease/ Immunosuppression/ Diabetes/ hypertension/cardiac disease
7. Risk assess for thromboprophylaxis – Low threshold for prophylaxis for venous thromboembolism – consider possible immobility as risk factor.
8. Baseline oximetry and exertional oximetry (such as 40 steps around the room / 1 minute sit to stand test)
9. Include routine assessment of pregnancy

3.1 Assessing suitability for remote monitoring

Evaluate clinical risk factors while assessing women and reduce threshold to initiate home monitoring if risk factors are present. For example:

- High BMI>30
- BAME
- Hypertension
- Diabetes
- Lung disease
- Immunosuppression
- Possible deterioration day 5-14;
- Third trimester (at highest risk of deterioration)

Evaluate environmental factors. For example:

- Ascertain who else is at home and give advice on infection control, masks for the patient and others when in contact
- Confirm that a care package is in place, such as a friend or relative able to help with shopping, collection of medications or other supplies.
- Confirm that the patient is not a carer for someone else or is well enough to continue to provide the care required.

At 8 – 10 days post-infection, symptoms may increase rapidly. Women being discharged sooner than 8 days into infection should be particularly encouraged to monitor at home.

Please also see SIGN guidance: COVID-19 Clinical Advice - Maternity Care

4.0 Implementation Pathway

1. Discuss and agree with the woman/carer their preferred communication channel: online/app, SMS text-message or automated telephone call

2. Advise the women /carer Advise the woman / carer that the Inhealthcare app is free to download; however, using the app may incur data charges unless connected to wi-fi. SMS text messages are provided free.
3. If the woman / carer prefers to use a paper diary, or if your board does not use the Inhealthcare system, offer a paper diary instead. Advise women using paper diaries it will be up to them to remember when to take readings. **(See Appendix 2)**
4. Teach the woman / carer to check oxygen levels, pulse and temperature two times a day and record results on the Inhealthcare app.
5. Give patient information leaflet which explains how to use pulse oximetry
6. Give safety netting advice – Be clear what the normal parameters are, when and how they should contact their maternity triage service
7. Women being discharged earlier than 8 days into infection should be encouraged to monitor at home, as there is some evidence that symptoms may increase at day 8 – 10 of infection.
8. Provide advice not to wait to contact their maternity unit if oxygen levels reduce within the parameters provided, even if they feel well.

4.1 Follow-up

Pulse oximeters used at home can be used to detect hypoxia associated with acute COVID-19. Home oximeters can be provided in a clinical setting or delivered to women in the community. This approach may require a follow up phone or NHS NearMe call with the woman on the day, or next day, to use teach-back to explain how to use the monitor and report readings.

Each board will need to consider how to provide this, depending on local processes and digital platforms available. Boards may wish to consider the role of staff who are working from home or self-isolating.

However, this is a home monitoring initiative which gives women additional tools to inform their decisions about when and how to seek medical care and guidance. There is no expectation that staff will routinely provide additional follow-up.

A flow chart for colleagues receiving an escalation call from a symptomatic Covid-19 positive woman monitoring oxygen at home is included at **Appendix 3**

4.2 Rules of Thumb For Care And Onward Referral

- Consider trajectory over time: “the trend is your friend”.
- Deterioration of clinical parameters like pulse, oxygen saturations or symptoms will help identify deteriorating patients early.
- Remember patients can appear comfortable or feel well despite being hypoxic
- Share decisions about next steps.

4.3 Guidance for Women Who Become More Unwell At Home

People with COVID-19 can occasionally become unwell very quickly. If this happens to you, do not wait to seek help.

- Check your oxygen level, temperature and pulse rate.
- Rest for 10 minutes.

- Check your oxygen level, temperature and pulse rate again.

Call **999** if:

- ➢ You are so breathless you are having difficulty speaking
- ➢ Your oxygen level is 93 or less[4]
- ➢ You have severe central chest pain
- ➢ You have heart rate of over 120 bpm

Remember to tell the 999 call-handler:

- ➢ **That you have COVID-19 and are monitoring your oxygen levels at home**
- ➢ **That you are pregnant**
- ➢ **If you think you might be in labour**

Call **your Local Maternity Unit if:**

- ✓ Your oxygen level is lower than it was before and has dropped to 95% or 94%
- ✓ Your oxygen level falls by 3% or more with mild exertion, such as walking
- ✓ You have palpitations (very fast heart rate) or a pulse rate higher than 100 bpm
- ✓ Your temperature is 38.5 degrees or higher OR your temperature has been 38 degrees or more for more than 5 days
- ✓ You don't have a thermometer and you are very hot with chills /shakes
- ✓ You, or someone who looks after you, has noticed you are more confused
- ✓ You have very pale or clammy or mottled skin
- ✓ You have persistent and problematic coughing
- ✓ you notice your baby hasn't moved as much as usual or their pattern of movement has changed

Low blood oxygen levels or a very fast heart rate can be dangerous for you and your baby, even if you feel well.

Remember to tell your Local Maternity Unit

- ➢ **That you have COVID-19 and are monitoring your oxygen levels at home**

5.0 Suite of Home Oxygen Monitoring in Pregnancy Resources

In addition to this Clinical Guidance, the pathway is supported by:

- Implementation Guidance for Professionals
- Patient Information Leaflet
- Remote Health Monitoring COVID-19 Learning (on Turas)
- Videos about how to use a Pulse Oximeter in:
  English, Polish, Hindi, Punjab, Urdu

For further information or queries please contact the National programme at NSS.TEC@nhs.scot

[4]Pacheco, Luis, Covid-19 in Pregnancy: Supplement oxygen if saturation drops below 94% [accessed online at mdedge.com/haematology-oncology/article/221959]

APPENDIX 1: Flowchart for home oximetry for symptomatic COVID-positive pregnant women following maternity triage.

The parameters and criteria are a guide to be used with clinical judgement

Pre-hospital Model

Led by: Triaging midwife or doctor
Aim: Safe avoidance of admission
How: Patient self-monitoring and escalation
Early deterioration presentation

Post-discharge Model

Led by: Ward midwife or doctor
Aim: Early supported discharge
Safe avoidance of admission
How: More intensive self-monitoring
Reliable recognition of deterioration

Exclusion Criteria: Do not consider home oximetry for

- COVID-19 positive asymptomatic women
- Women meeting admission criteria
- Women with comorbidities, alternative diagnosis or not fully assessed

Inclusion criteria: Consider home oximetry if diagnosis of COVID-19 and symptomatic with risk-factors:

High BMI>30 / BAME / Hypertension / Diabetes / Immunosuppression / Pre-8th day of infection / third trimester
Also evaluate home environment

Preparation for home oximetry

1. Discuss and agree preferred communication channel
2. Explain cost implications of communication channels
3. Teach: check oxygen levels, pulse and temperature two times a day and record results
4. Offer paper diary if preferred; however, explain they will not get a reminder to take readings.
5. Give patient information leaflet which explains how to use pulse oximetry
6. Give safety netting advice – Be clear about normal parameters / how to contact maternity triage
7. Particularly encourage women pre-8th day of infection to monitor at home
8. Advise not to wait to contact if oxygen levels reduce within the parameters, even if they feel well

Guidance for women who become more unwell at home:

People with COVID-19 can occasionally become unwell very quickly. If this happens, do not wait to seek help:

- Check oxygen / temperature / pulse rate. Rest for 10 minutes. Check again.

Call **Local Maternity Unit if:**

- ✓ Oxygen level is lower and has dropped to 95% or 94%
- ✓ Oxygen level falls by 3% or more with mild exertion
- ✓ Palpitations or a pulse rate higher than 100 bpm
- ✓ Temperature => 38.5 degrees OR => 38 degrees > 5 days
- ✓ No thermometer; very hot with chills /shakes
- ✓ Noticeably more confused
- ✓ Very pale or clammy or mottled skin
- ✓ Persistent and problematic coughing
- ✓ Baby hasn't moved as much as usual or their pattern of movement has changed

Tell them: you have COVID-19 / are monitoring oxygen at home

Call **999** if:

- ✓ So breathless you are having difficulty speaking
- ✓ Oxygen level <= 93 %
- ✓ Severe central chest pain
- ✓ Heart rate over 120 bpm

Tell them**:** You have COVID-19, are monitoring oxygen at home, are pregnant, if labbour is suspected.

Low oxygen levels or a very fast heart rate can be dangerous for you and your baby, even if you feel well.

APPENDIX 2: Remote monitoring COVID-19 diary
(Per local pathway or for women who prefer paper diary)

First name: Surname:

Date of birth: Age:

NHS CHI number:

Patient addressograph

Live alone ☐ Carer at home ☐

Date first symptoms began:

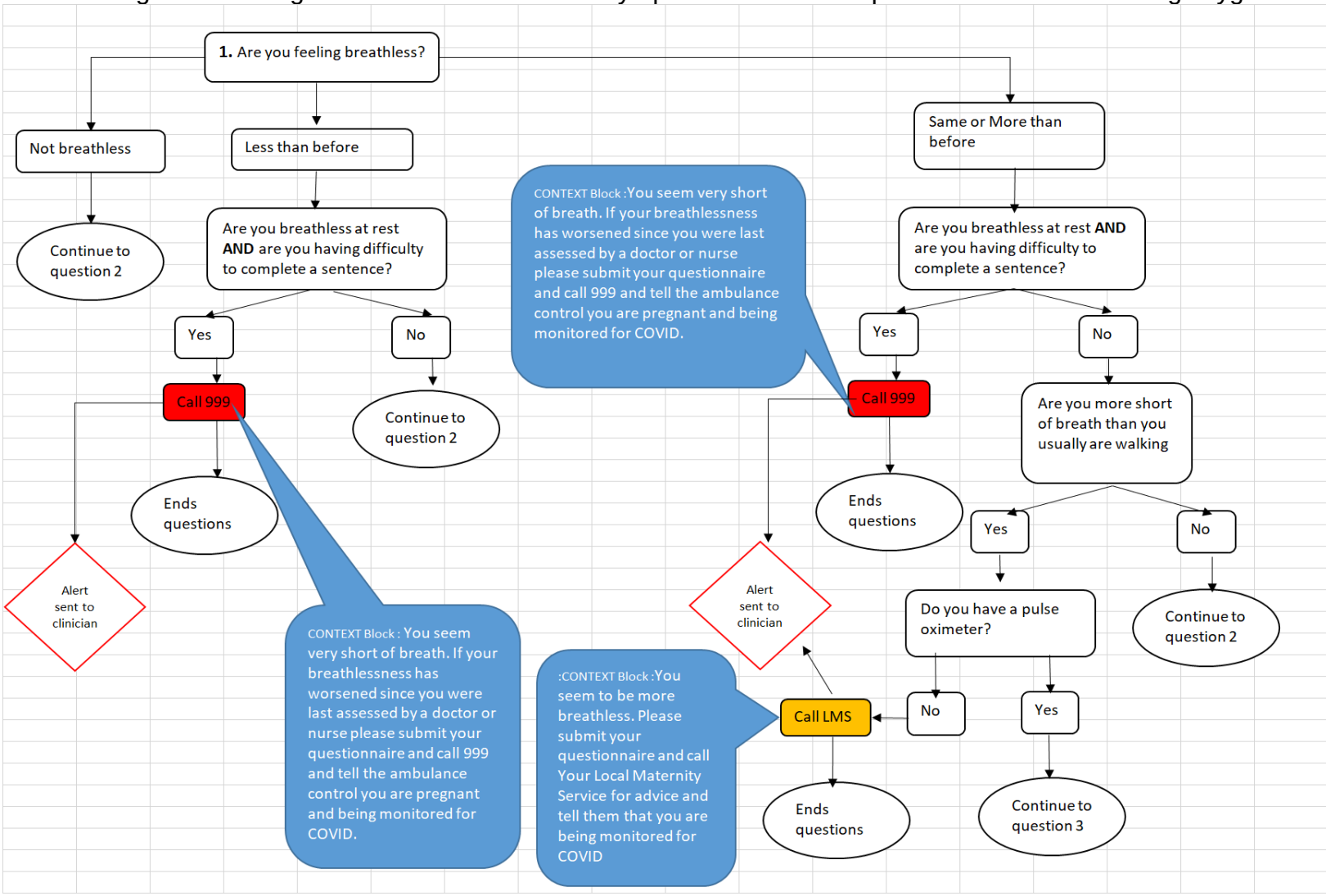
Date of positive test:

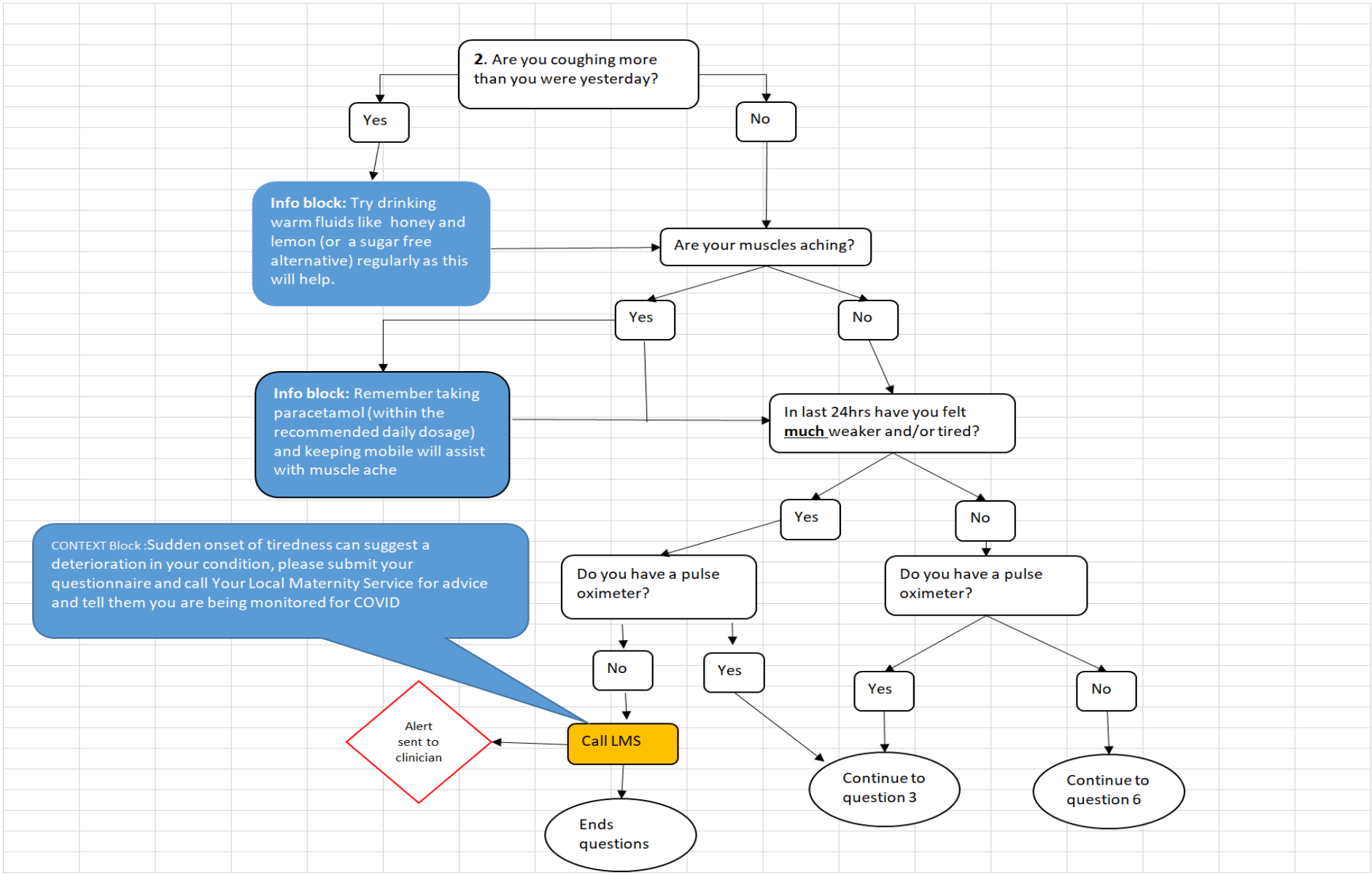
Please record 2 times a day:

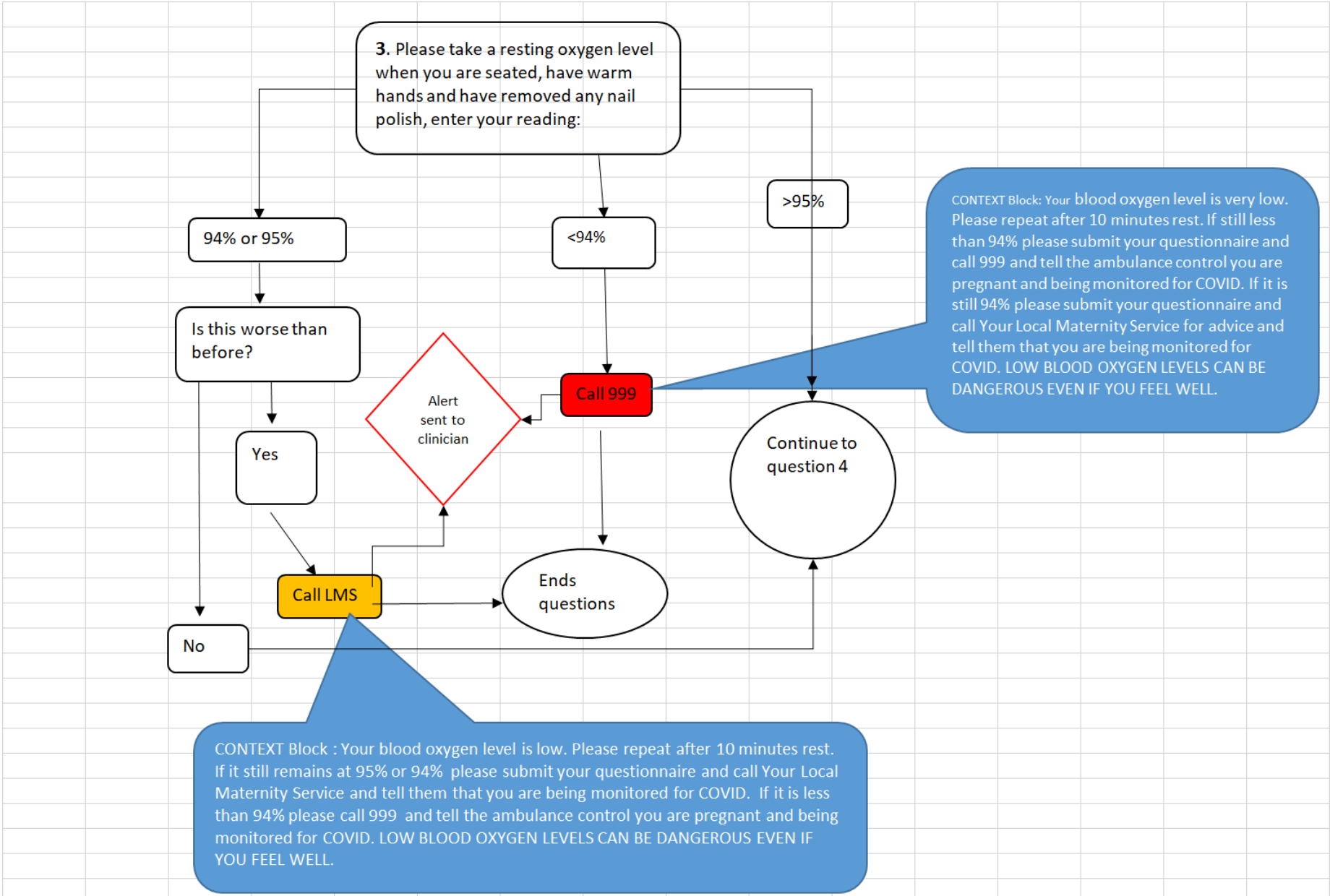
Date and time	Pulse rate	Oxygen level%	Temperature If you have thermometer	Feeling better worse or same

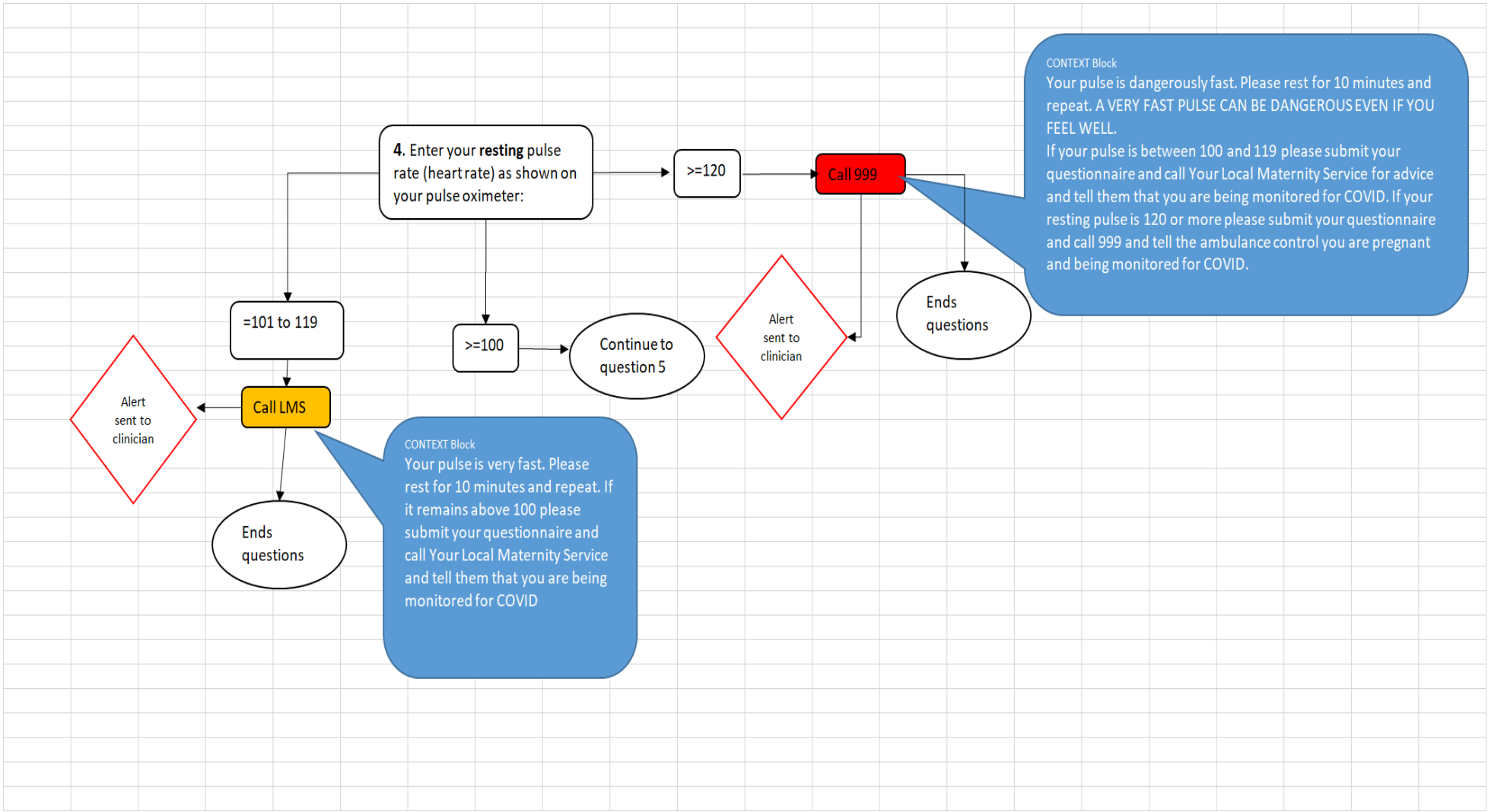
Appendix 3: Covid-19 Remote Health Pathway Adapted for Maternity Services

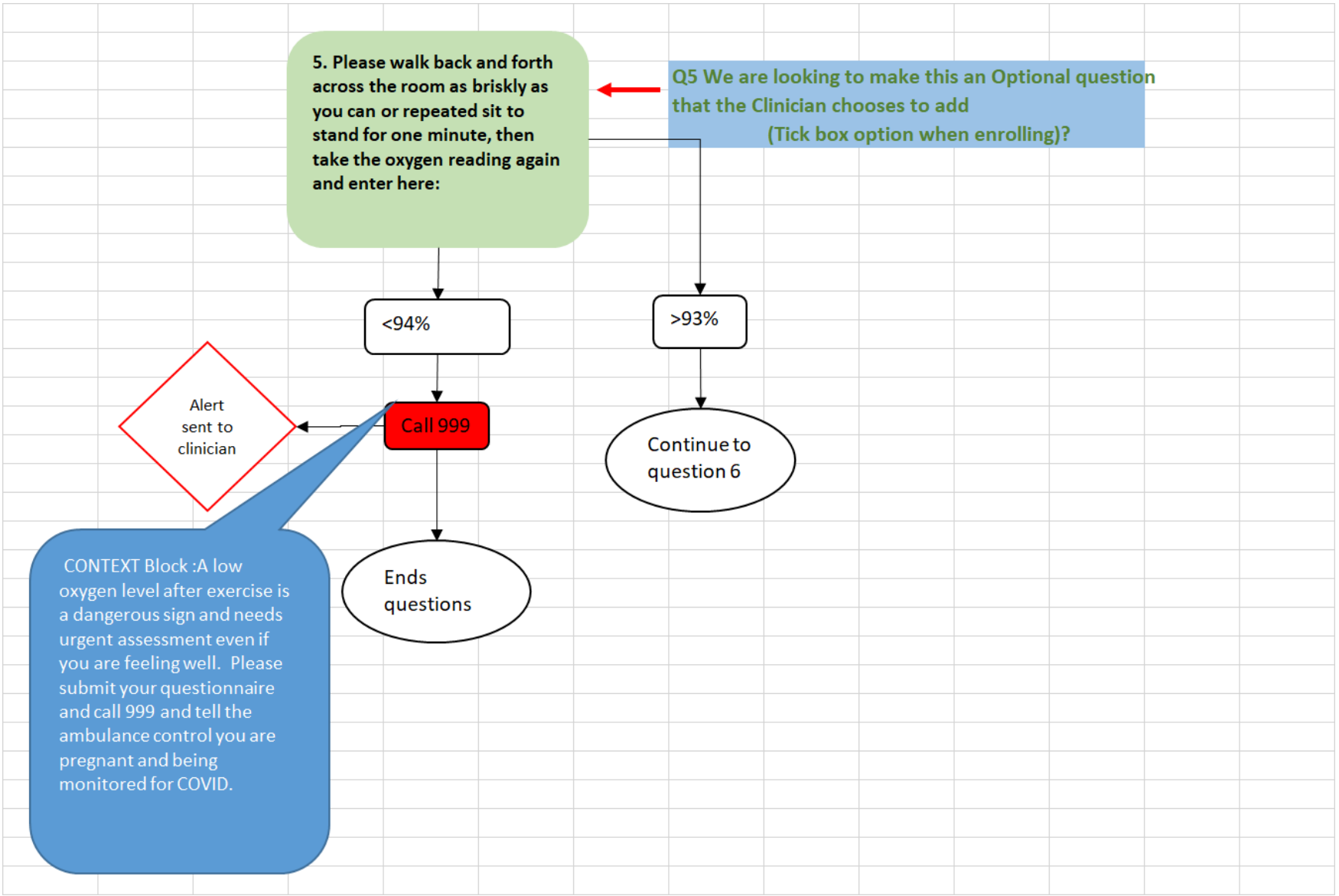
Flow Chart for colleagues receiving an Escalation call from a symptomatic Covid-19 positive woman monitoring oxygen at home

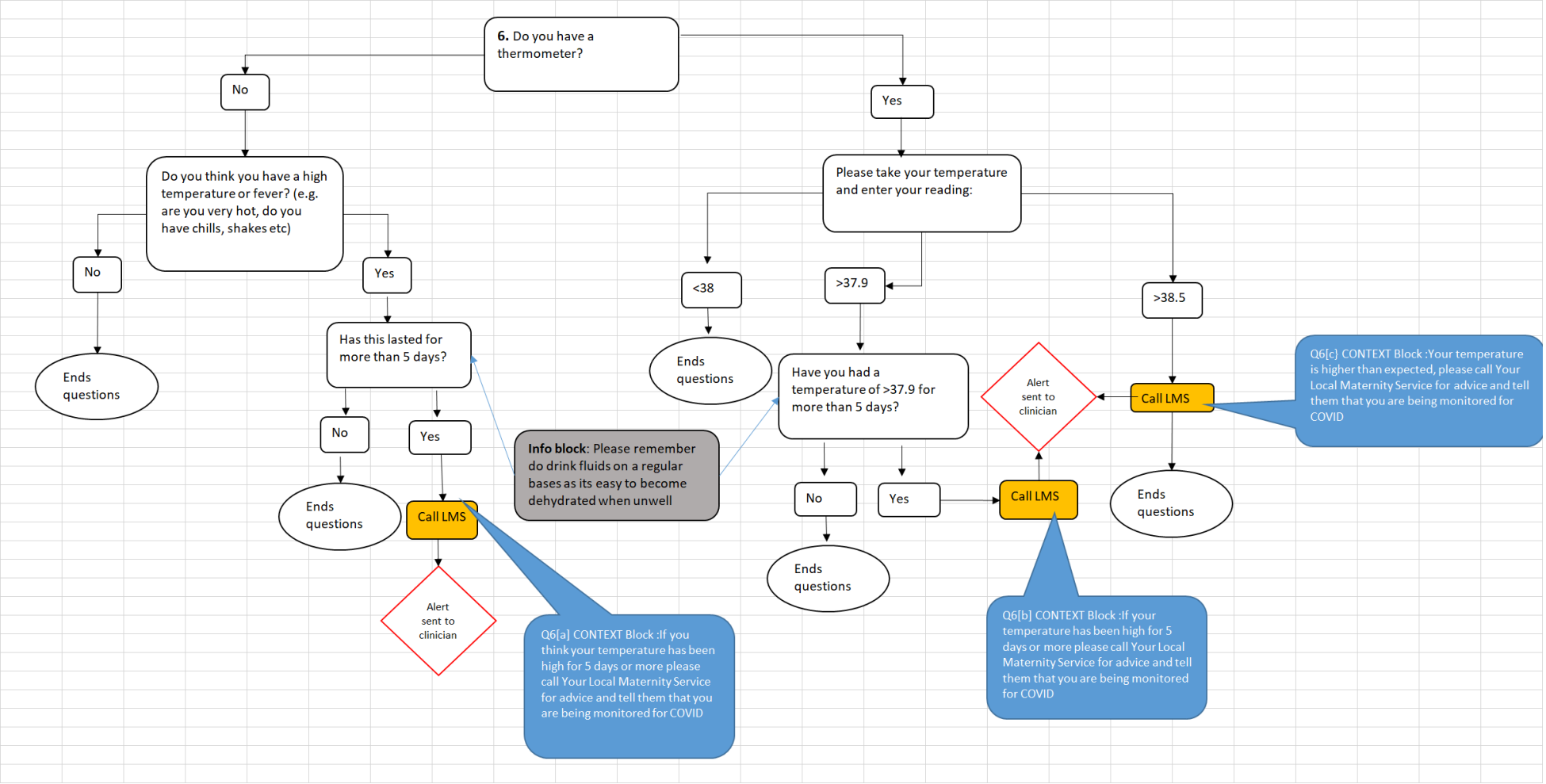



2. Are you coughing more than you were yesterday?
Yes
No
Info block: Try drinking warm fluids like honey and lemon (or a sugar free alternative) regularly as this will help.
Are your muscles aching?
Yes
No
Info block: Remember taking paracetamol (within the recommended daily dosage) and keeping mobile will assist with muscle ache
In last 24hrs have you felt much weaker and/or tired?
Yes
No
CONTEXT Block :Sudden onset of tiredness can suggest a deterioration in your condition, please submit your questionnaire and call Your Local Maternity Service for advice and tell them you are being monitored for COVID
Do you have a pulse oximeter?
Do you have a pulse oximeter?
No
Yes
Yes
No
Alert sent to clinician
Call LMS
Continue to question 3
Continue to question 6
Ends questions


3. Please take a resting oxygen level when you are seated, have warm hands and have removed any nail polish, enter your reading:
94% or 95%
<94%
>95%
Is this worse than before?
Alert sent to clinician
Call 999
Yes
Continue to question 4
Call LMS
Ends questions
No
CONTEXT Block: Your blood oxygen level is very low. Please repeat after 10 minutes rest. If still less than 94% please submit your questionnaire and call 999 and tell the ambulance control you are pregnant and being monitored for COVID. If it is still 94% please submit your questionnaire and call Your Local Maternity Service for advice and tell them that you are being monitored for COVID. LOW BLOOD OXYGEN LEVELS CAN BE DANGEROUS EVEN IF YOU FEEL WELL.
CONTEXT Block : Your blood oxygen level is low. Please repeat after 10 minutes rest. If it still remains at 95% or 94% please submit your questionnaire and call Your Local Maternity Service and tell them that you are being monitored for COVID. If it is less than 94% please call 999 and tell the ambulance control you are pregnant and being monitored for COVID. LOW BLOOD OXYGEN LEVELS CAN BE DANGEROUS EVEN IF YOU FEEL WELL.


4. Enter your resting pulse rate (heart rate) as shown on your pulse oximeter:
>=120
Call 999
CONTEXT Block
Your pulse is dangerously fast. Please rest for 10 minutes and repeat. A VERY FAST PULSE CAN BE DANGEROUS EVEN IF YOU FEEL WELL.
If your pulse is between 100 and 119 please submit your questionnaire and call Your Local Maternity Service for advice and tell them that you are being monitored for COVID. If your resting pulse is 120 or more please submit your questionnaire and call 999 and tell the ambulance control you are pregnant and being monitored for COVID.
Ends questions
Alert sent to clinician
=101 to 119
>=100
Continue to question 5
Alert sent to clinician
Call LMS
Ends questions
CONTEXT Block
Your pulse is very fast. Please rest for 10 minutes and repeat. If it remains above 100 please submit your questionnaire and call Your Local Maternity Service and tell them that you are being monitored for COVID


5. Please walk back and forth across the room as briskly as you can or repeated sit to stand for one minute, then take the oxygen reading again and enter here:
Q5 We are looking to make this an Optional question that the Clinician chooses to add
(Tick box option when enrolling)?
<94%
>93%
Alert sent to clinician
Call 999
Continue to question 6
Ends questions
CONTEXT Block :A low oxygen level after exercise is a dangerous sign and needs urgent assessment even if you are feeling well. Please submit your questionnaire and call 999 and tell the ambulance control you are pregnant and being monitored for COVID.


6. Do you have a thermometer?
No
Yes
Do you think you have a high temperature or fever? (e.g. are you very hot, do you have chills, shakes etc)
No
Yes
Ends questions
Has this lasted for more than 5 days?
No
Yes
Ends questions
Call LMS
Alert sent to clinician
Info block: Please remember do drink fluids on a regular bases as its easy to become dehydrated when unwell
Q6[a] CONTEXT Block :If you think your temperature has been high for 5 days or more please call Your Local Maternity Service for advice and tell them that you are being monitored for COVID
Please take your temperature and enter your reading:
<38
>37.9
>38.5
Ends questions
Have you had a temperature of >37.9 for more than 5 days?
No
Yes
Ends questions
Call LMS
Alert sent to clinician
Q6[b] CONTEXT Block :If your temperature has been high for 5 days or more please call Your Local Maternity Service for advice and tell them that you are being monitored for COVID
Call LMS
Ends questions
Q6[c] CONTEXT Block :Your temperature is higher than expected, please call Your Local Maternity Service for advice and tell them that you are being monitored for COVID