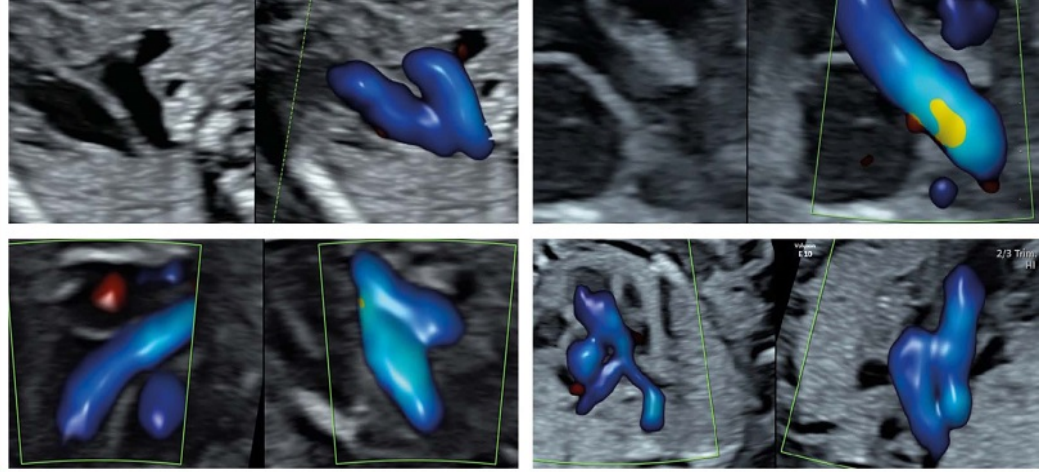


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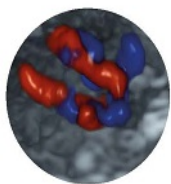
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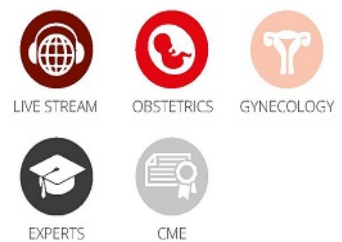


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ISUOG Consensus Statement on rationalization of early-pregnancy care and provision of ultrasonography in context of SARS-CoV-2

INTRODUCTION

In view of the challenges of the current coronavirus (SARS-CoV-2) pandemic and to protect both patients and healthcare providers (physicians, sonographers, allied healthcare professionals), the International Society of Ultrasound of Obstetrics and Gynecology (ISUOG) has compiled the following evidence and expert-opinion-based guidance for the management of early-pregnancy complications. This statement provides proposals and options for managing patients referred for assessment by early-pregnancy healthcare practitioners during the coronavirus disease 2019 (COVID-19) pandemic.

Transvaginal ultrasonography is a crucial part of clinical decision-making in early pregnancy. However, appropriate triage is now essential to allow prioritization of use of this resource by pregnancies at high risk of complications, mainly ectopic pregnancy, in which hospital visits will be safer than remote consultation. Temporarily reducing physical patient throughput will reduce the risk of SARS-CoV-2 transmission between patients and between patients and healthcare professionals. Clinicians carrying out ultrasound scans are in close proximity to patients for a significant period of time and have been shown to be at high risk of being infected by SARS-CoV-2¹.

Rationalizing patient visits and the provision of pregnancy care is vital to allow mobilization of staff and resources in response to this unprecedented pandemic whilst ensuring that women at risk of early-pregnancy complications continue to be safely cared for. Considering the inevitable reduction in resources and capacity, which limits the number of scan appointments available, we recommend that early-pregnancy appointments should be triaged to one of the following three options:

- Scans and/or visits that need to be **undertaken without delay**;
- Scans and/or visits that can be **delayed without affecting clinical care**;
- Scans and/or visits that can be **avoided for the duration of the pandemic**.

This consensus statement focuses on women contacting their local early-pregnancy support services

(e.g. early-pregnancy unit, emergency rooms with ultrasound, ultrasound clinic) with common complaints. Our proposed recommendations can be adapted to individual sites based on their resource availability and infrastructure, in order to continue to use ultrasound when indicated whilst reducing its use to the essential minimum. Guidance on rationalization of gynecological ultrasound services in the context of the COVID-19 pandemic has been provided in a separate document².

Recommendations on triage of early-pregnancy scans based on onset of symptoms and on findings during previous ultrasound assessments are outlined in Tables 1 and 2, respectively. Justification for these is provided within this document.

GENERAL GUIDANCE

Screening for SARS-CoV-2

All women in need of care should be triaged based on their symptoms and infection status. Ideally, this should be carried out over the phone by a senior healthcare practitioner prior to an appointment. However, in the event that the patient is first seen in the clinic, the healthcare professional undertaking triage should wear appropriate personal protective equipment (PPE). Triage for common symptoms, such as cough and fever³, is critical before a patient gains access to a clinical area for an ultrasound scan or consultation. Screening for travel, occupation, contact and cluster (TOCC) risk factors should also be implemented (Appendix S1). If the local prevalence of SARS-CoV-2 increases, a policy of managing all patients as high risk may need to be implemented at some point. We also recommend that senior healthcare practitioners acquire and consider the details of the clinical history of the women to determine whether they need to attend the hospital or clinic.

Policy for patients with probable or confirmed COVID-19

Any woman with probable or confirmed COVID-19 should be asked not to attend the unit. If assessment is

Table 1 Recommended rationalization of early-pregnancy management including ultrasound scans, based on symptoms, in context of COVID-19 pandemic

Symptom	Details	Recommended action
<i>Scans that need to be undertaken without delay</i>		
Abdominal or pelvic pain (no previous scan)	Referrals from urgent-care centers, emergency rooms, primary care Quantify pain using visual analog score (1–10)	Offer scan within 24 h†
Heavy bleeding for more than 24 h and systemic symptoms of blood loss	Referrals from urgent-care centers, emergency rooms, primary care Bleeding score 3–4	Offer scan within 24 h†
Presence of risk factors for ectopic pregnancy* with pain and/or bleeding	Referrals from urgent-care centers, emergency rooms, primary care	Offer scan within 24 h†
<i>Scans that can be delayed without affecting clinical care</i>		
Moderate bleeding	Referrals from urgent-care centers, emergency rooms, primary care Bleeding score 2	Telephone consultation with experienced clinician Ask patient to take UPT in 1 week - Negative result: no follow-up - Positive result: offer scan
Heavy bleeding that has resolved	Referrals from urgent-care centers, emergency rooms, primary care Bleeding score 3–4, now resolved	Telephone consultation with experienced clinician Ask patient to take UPT in 1 week - Negative result: no follow-up - Positive result: offer scan
<i>Scans that can be avoided for duration of pandemic</i>		
Reassurance	Referrals from urgent-care centers, emergency rooms, primary care	Telephone consultation with experienced clinician No routine scan
Previous miscarriage(s)	Referral because of previous miscarriage(s)	Telephone consultation with experienced clinician No routine scan
Light bleeding with or without pain, not troublesome to patient	Referrals from urgent-care centers, emergency rooms, primary care Bleeding score 1 Quantify pain using visual analog score (1–10)	Telephone consultation with experienced clinician No routine scan

*Risk factors: previous ectopic pregnancy; previous fallopian-tube surgery; previous pelvic or abdominal surgery; sexually transmitted infections; pelvic inflammatory disease; use of intrauterine contraceptive device or intrauterine system; use of assisted reproductive technology. †When carrying out triage over telephone, clinical judgment must always be used, and if there are concerns about the patient's clinical condition, provision should be made for immediate review. UPT, urine pregnancy test.

required, they should be seen in a designated COVID-19 area. Only screen-negative patients or patients with probable COVID-19 who need to be reviewed without delay should be asked to attend the unit. If an ultrasound scan is required, we recommend that one ultrasound machine and room is designated for patients with probable or confirmed COVID-19, if possible. It is important to clean the equipment according to safety guidelines⁴.

Patients with suspicion of COVID-19 requiring admission

If a patient with suspicion of COVID-19 is stable, they should be sent home to self-isolate for 7 days, if clinically appropriate. Ideally, any patient who is cohabiting with someone who shows possible symptoms of COVID-19 should self-isolate for 14 days; however, in the context of early-pregnancy care, this is unlikely to be practical. Any rooms or areas in the department in which the patient was present will require deep cleaning. If the patient requires admission to the hospital, the location will depend on the

reason for admission and availability of a side room until SARS-CoV-2 testing confirms their status.

Any patient with a suspicion of possible SARS-CoV-2 infection must be highlighted immediately to all healthcare team members.

APPOINTMENTS AND TRIAGE

New appointments during normal working hours

Referrals from urgent-care centers, emergency rooms, midwives and primary-care practitioners to early-pregnancy support services should be made via a dedicated phone number, if available, in order to allow telephone-based triage of both early-pregnancy symptoms and risk of COVID-19 by an experienced member of the team. If this is not possible due to logistic limitations or legal requirements, then the clinician on call to cover emergency gynecology should be contacted directly for discussion and advice. A standardized proforma should be completed to screen the patient for TOCC risk factors and symptoms. The form includes three patient-specific

Table 2 Recommended rationalization of early-pregnancy follow-up based on initial ultrasound scan findings, in context of COVID-19 pandemic

Scan finding	Details	Recommended action
Live normally sited pregnancy	Scan shows embryo with heartbeat (even if it does not correspond to menstrual dates)	<ul style="list-style-type: none"> • No follow-up • Re-date pregnancy accordingly
Normally sited pregnancy of unknown viability	Scan shows early normally sited pregnancy without embryo with heartbeat	<ul style="list-style-type: none"> • Findings consistent with menstrual dates: no follow-up • Findings not consistent with menstrual dates: explain risk of miscarriage and consider urine pregnancy test and telephone follow-up in 2 weeks
Pregnancy of unknown location	Scan unable to identify intrauterine or extrauterine pregnancy	<ul style="list-style-type: none"> • Blood test to be taken as per local protocol; measure β-hCG with or without progesterone • M6 model can be used (http://earlypregnancycare.co.uk/) • Triage according to M6 model or local policy
Ectopic pregnancy	Extrauterine or uterine ectopic pregnancy	<ul style="list-style-type: none"> • Emphasis on conservative management, if possible • Use methotrexate with caution and following MDT discussion • Do not perform surgery unless scan is reviewed by senior clinician and no other management option is available • If laparoscopy is performed, ensure strict precautions are taken to filter CO₂ and use appropriate PPE; alternatively, consider mini-laparotomy
Miscarriage	Normally sited pregnancy meeting miscarriage criteria	<ul style="list-style-type: none"> • Perform medical or manual vacuum aspiration if possible • Regional anesthesia should be considered
Molar pregnancy	Ultrasound suggesting features of, or complete or partial, molar pregnancy	<ul style="list-style-type: none"> • Review by senior clinician regarding management
<i>Conditions that will require treatment</i>		
Hyperemesis gravidarum	Nausea and vomiting in pregnancy requiring antiemetic management	<ul style="list-style-type: none"> • Use PUQE screening tool • Follow protocol regarding medications to be prescribed • Ambulatory care if required

β -hCG, β -human chorionic gonadotropin; MDT, multidisciplinary team; PPE, personal protective equipment; PUQE, pregnancy unique quantification of emesis.

details (name, date of birth, unique patient identifier); if a unique patient identifier is not available, then recording the patient's address is advised (Appendix S1). This proforma can also be used to record the discussion accurately and in detail, and will determine if the patient requires urgent review or if advice can be provided remotely. This proforma is a medical record of the consultation and can be kept with the patient's records.

A basic requirement in all cases is that the woman should have a positive urine pregnancy test (UPT) in order for them to be considered for referral to early-pregnancy services. Cases of gynecological emergency, such as suspected ovarian torsion, should be discussed with the senior clinician on call.

New appointments out of normal working hours (evenings, nights and weekends)

Referrals should be made to the clinician on call covering emergency gynecology (if possible via telephone). This applies to out-of-hours primary-care practitioners as well as healthcare personnel working in the emergency room.

Phone triage of patients should be applied as follows:

- Acutely unwell patients should be advised to attend the emergency room. If they are already in the emergency room, they should be reviewed there by the responsible clinician on call for gynecology;
- If 'semi-acute' assessment is required, the patient should be directed to a gynecology assessment unit or emergency room for review;
- If the patient is stable, patient details should be collected. If possible, an experienced clinician should contact the patient by telephone for further triage assessment.

Triage

Ideally, triage should be performed remotely via telephone. Triage should collect the following information (Appendix S1), although this can be adapted based on available resources and infrastructure:

- Unique patient identifier;
- Symptoms related to COVID-19;
- TOCC risk factors;
- Details of presenting complaint (and advice given).

Presenting complaint/request

The most common presenting complaints are vaginal bleeding with or without pelvic pain. Objective measures of vaginal bleeding include a pictorial blood-loss assessment chart (Figure 1)⁵. A visual analog score ranging from 0 to 10 (0 indicating no pain and 10 severe pain) can be used to document the level of pelvic pain.

It is important to note that, if a woman presenting with vaginal bleeding and/or pelvic pain has had a previous ultrasound scan showing a normally sited pregnancy (ongoing or failed), they should first have a telephone consultation with an experienced clinician as soon as is practical, before being considered for ultrasound assessment.

SYMPTOM-BASED ASSESSMENT AND FOLLOW-UP

Early-pregnancy scans that need to be undertaken without delay (Appendix S2)

- If a pregnant woman has pelvic pain and has not had a previous pelvic scan documenting a normally sited pregnancy in the uterus, she should be invited to attend for an ultrasound scan within 24 h.
- If a patient in early pregnancy has heavy vaginal bleeding (bleeding score of 3 or higher) for more than 24 h and develops symptoms due to blood loss, they should be invited to attend for an ultrasound scan within 24 h.
- If a patient with risk factors for ectopic pregnancy develops symptoms (i.e. pelvic pain and/or vaginal bleeding), they should be invited to attend for an ultrasound scan within 24 h. Risk factors for ectopic pregnancy include⁶:
 - a) Previous ectopic pregnancy;
 - b) Previous fallopian-tube surgery;
 - c) Previous pelvic or abdominal surgery;
 - d) Sexually transmitted infection;
 - e) Pelvic inflammatory disease;
 - f) Presence of an intrauterine contraceptive device or intrauterine system;
 - g) Use of assisted reproductive technology.

When carrying out telephone triage, clinical judgment must always be used, and if there are concerns about the patient's clinical condition, provision should be made for immediate review.

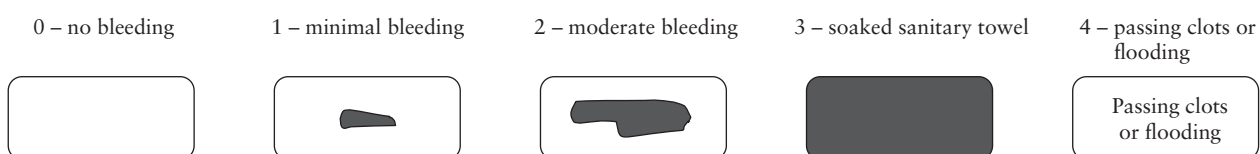


Figure 1 Pictorial bleeding chart.

Early-pregnancy scans that can be delayed without affecting clinical care (Appendix S2)

- If a patient in early pregnancy has moderate vaginal bleeding (bleeding score of 2), she can be asked to wait and repeat a UPT in 1 week:
 - a) If the UPT is negative, no follow-up needs to be arranged;
 - b) If the UPT is positive, an ultrasound assessment should be offered. The timing of this scan will depend on the patient's clinical symptoms.
- If a patient in early pregnancy has had heavy vaginal bleeding (bleeding score of 3 or higher) which has now resolved, she can be asked to repeat a UPT in 1 week:
 - a) If the UPT is negative, no follow-up needs to be arranged;
 - b) If the UPT is positive, an ultrasound assessment should be offered. The timing of this scan will depend on the patient's clinical symptoms.

Early-pregnancy scans that can be avoided for duration of COVID-19 pandemic (Appendix S2)

- Asymptomatic women in early pregnancy who request an ultrasound scan for reassurance, irrespective of risk factors.
- Asymptomatic women in early pregnancy with a history of previous miscarriage(s).
- Patients in early pregnancy who have minimal symptoms, such as light vaginal bleeding (bleeding score of 1) with or without mild pelvic discomfort (quantified using the visual analog scale for pelvic pain) that resolves spontaneously.

Follow-up after ultrasound scan has been carried out (Appendix S3)

Live intrauterine pregnancy or intrauterine pregnancy of unknown viability

The patient should not be offered further ultrasound scans, unless it is deemed necessary clinically. Patients with a pregnancy of unknown viability can be asked to perform a UPT in 2 weeks' time.

Pregnancy of unknown location

A blood test should be taken as per local protocol, measuring β -human chorionic gonadotropin (β -hCG) with or without progesterone. The most sensitive validated

method of interpreting these results is via a two-step protocol (Figure 2) comprising initial serum progesterone level and the M6 risk-prediction model, which utilizes initial β -hCG, initial progesterone and 48-h β -hCG levels^{7,8}. In units in which measurement of progesterone is not part of the standard protocol, the version of the model using β -hCG alone can be used. Patients can then be managed in accordance with the model outcome and local policy. The M6 model is available to use for free online (<http://earlypregnancycare.co.uk/>).

The model triages women with a pregnancy of unknown location as being at high or low risk of complications as follows:

- a) Low risk, probable failed pregnancy of unknown location: the patient should be advised to take UPT after 2 weeks; if the test is positive, they should contact the early-pregnancy unit;
- b) Low risk, probable intrauterine pregnancy: the patient should undergo a transvaginal scan after 1 week to confirm the location and viability of the pregnancy;
- c) High risk for ectopic pregnancy: the patient should be advised to return to the clinical unit for a repeat β -hCG measurement and ultrasound assessment after 48 h.

Nausea and vomiting in pregnancy (hyperemesis gravidarum)

The patient should be assessed over the phone and advised regarding antiemetics. A validated screening tool for pregnant patients with nausea and vomiting is provided in Appendix S4 and a list of recommended antiemetic medications is provided in Appendix S5, as derived from UK guidance (and may be amended according to country

or practice), for discussion over the phone⁹. Prescriptions can be sent to primary-care practitioners or directly to the patient, if possible. If intravenous hydration is required, ambulatory departments would be an ideal location¹⁰. The rare possibility of a molar pregnancy should be considered in patients with hyperemesis gravidarum and other symptoms, such as vaginal bleeding. In the event of routine dating ultrasound assessments being delayed as the clinical burden of the pandemic heightens, women should be offered assessment in early-pregnancy support services if gestational trophoblastic disease is suspected.

Ectopic pregnancy

Patients should be managed in accordance with local protocols, with an emphasis on conservative management, if possible. Accurate diagnosis of an ectopic pregnancy is critical for guiding management; thus, ultrasound scans should be reviewed by the most senior clinician available. In the event that a senior clinician is at home self-isolating or not in the hospital, consideration should be given to allow review of ultrasound images online, with appropriate security.

Suggestions and important good-practice points relating to management of patients with an ectopic pregnancy include:

- a) Expectant management: ensure appropriate follow-up, reduce contact with the patient as much as possible, limit the number of ultrasound scans and perform β -hCG monitoring if possible.
- b) Medical management: the commonly used medication is the antimetabolite methotrexate¹¹. Body surface area is used to calculate dosing. There is a known low risk of immunosuppression with

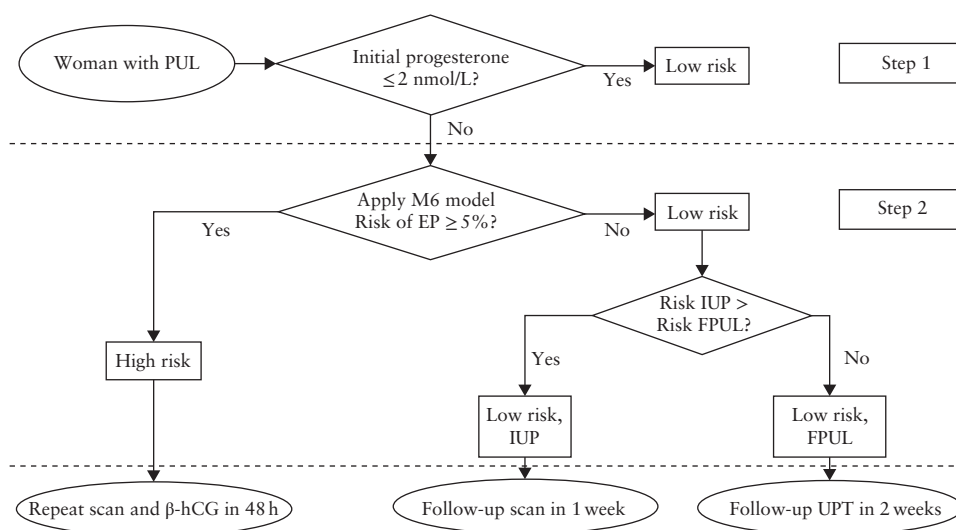


Figure 2 Proposed clinical management using M6 model for characterization of pregnancies of unknown location (PUL). β -hCG, β -human chorionic gonadotropin; EP, ectopic pregnancy; FPUL, failed pregnancy of unknown location; IUP, intrauterine pregnancy; UPT, urine pregnancy test.

use of methotrexate¹². It is currently unknown whether immunosuppression increases the effect of SARS-CoV-2 infection and whether administering such medication in SARS-CoV-2-positive patients exacerbates pneumonia-related complications. It is likely that the detrimental effects of methotrexate in patients with COVID-19 are minimal, but this possibility must be considered and medical treatment should be discussed with a senior clinician and reviewed in a multidisciplinary team (MDT) meeting. Screening of women prior to administration of methotrexate can be considered depending on local hospital policy.

- c) A joint statement by the UK Royal Colleges of Surgeons has stated that laparoscopy should be carried out **only** in selected situations during the COVID-19 pandemic^{13,14}. Other national bodies, such as the British Society of Gynaecological Endoscopy and the Royal College of Obstetricians and Gynaecologists, permit the use of laparoscopy but with necessary precautions. There is limited evidence on the risk of SARS-CoV-2 infection during laparoscopy; therefore, during laparoscopic surgery, strict precautions should be taken to filter CO₂ escaping into the operating theatre and the theatre staff should wear appropriate PPE¹⁵. Laparotomy should be considered as an alternative to laparoscopy if these strict precautions cannot be met confidently.

Miscarriage

Patients should be managed in accordance with local protocols. Counseling should be offered and performed over the phone, if possible. However, there should be an effort to reduce inpatient admissions; ideal options are medical management and use of manual vacuum aspiration if available in the local unit¹¹:

- Women undergoing expectant or medical management do not need to be offered further ultrasound scans, but should be asked to carry out a UPT in 3 weeks. If the diagnosis is made in hospital, patients should be provided with adequate analgesia, such as combined paracetamol and codeine preparations. Units should aim to provide telephone consultation to women 3 weeks following their miscarriage to assess physical and emotional wellbeing, if resources are available.
- The availability of surgery will need to be reviewed locally on a daily basis, and if surgical management is indicated, appropriate precautions related to surgery and PPE must be taken. If appropriate and available, manual vacuum aspiration should be performed to reduce the risk and required resources associated with general anesthesia.

SCHEDULING AND ORGANIZING APPOINTMENTS

Pre-existing appointments

- A review of the clinical urgency of all existing appointments should be made by the medical team on a weekly basis.
- All non-urgent scans should be postponed for (at least) 14 days and organized according to the recommended schemes of essential care.
- For routine or non-urgent appointments, women should be advised by phone that their pregnancy care will not be compromised but will be modified to keep her and her baby safe during the SARS-CoV-2 outbreak. Women should be advised not to attend the hospital, and to self-isolate for 14 days if appropriate, based on local and national guidelines.

Precautions that should be taken in waiting areas and examination rooms

- Considering the recommendation for social distancing, it is important to respect the time of scheduled visits, to space out the appointment intervals in order to prevent crowding in the waiting room and to space the seats in the waiting areas to at least 2 m apart.
- Hand sanitizer should be made available at the entrance to and within the waiting rooms. Pregnant patients and their partners (if present) should be advised to use it immediately upon arrival, at frequent intervals during their stay in the department and prior to the ultrasound scan. If hand sanitizer is not available due to shortage, women should be advised to wash their hands with soap for a minimum of 20 s prior to the scan.
- Facemasks must be made available and used according to previously published guidance¹. Specifically, patients with symptoms or judged to have suspected or probable COVID-19 should wear a surgical mask. Sonographers should wear a surgical facemask or respirator (N95, FFP2, FFP3) depending on the risk profile of the patient.
- Patients should be asked, when arranging their appointment, to either attend on their own or with only one other adult. No children or adult over the age of 60 years should attend the appointment. Women with symptoms suggestive of possible SARS-CoV-2 infection should avoid visiting the unit, unless there is a strong clinical indication for a visit. In such circumstances, the woman should be seen and assessed in a designated 'contaminated' area or SARS-CoV-2 assessment area.

Guidance for staff undertaking routine or specialist ultrasound scans

- Guidance on cleaning and disinfection of ultrasound transducers and equipment, and how to protect the

- patients and ultrasound providers during obstetric and gynecological scans, has been provided in a separate document⁴.
- All recommendations from local infection-control departments should be followed, including:
 - The sonographer's arms should be bare below the elbows;
 - The sonographer should not wear a watch or any jewelry.
 - Practitioners should wash their hands or use hand sanitizer both before and after direct patient contact.
 - Practitioners should use latex-free disposable gloves during the ultrasound examination and change them after each patient.
 - We recommend the use of a three-ply surgical mask as a minimum when performing ultrasound scans, as sonographers spend a significant amount of time during an examination in close proximity to the patient. When managing patients with suspected/probable/confirmed COVID-19, an appropriate respirator should be used (N95, FFP2, FFP3)¹.
 - The use of single-use gel packs is recommended, instead of gel containers, even for transabdominal scans.
 - Non-clinical staff (e.g. receptionists and clerks) are advised to follow local infection-control procedures. If they are able to perform their tasks without being in close proximity to patients, use of a three-ply surgical mask should not be necessary.
 - All personnel working in ultrasound units should be aware of the potential symptoms of SARS-CoV-2 infection, such as new onset of cough, fever and shortness of breath. If they develop any of these symptoms, they should immediately seek medical advice and arrange testing, if allowed by local protocols.

Coordinating your local unit during COVID-19 pandemic

In addition to the usual day-to-day requirements for running your local unit, we recommend the following:

- All PPE¹ must be checked daily to ensure your unit is stocked and prepared.
- All staff must be fit tested for FFP3 masks and records must be kept.
- Managers should anticipate that staff (or members of their family) may become unwell during the pandemic, and therefore, careful planning of staff and contingency planning should be carried out in accordance with local availability.
- If patients are tested for SARS-CoV-2, ensure that records of the tests sent are kept and that these results are checked daily. Ensure that the patient is informed of the result, and if they were admitted, the ward staff and team in the hospital are also informed as soon as possible.

- If MDT meetings are relevant to practice, we highly encourage units to conduct weekly MDT meetings, which can be arranged using an online meeting platform (e.g. Zoom), to discuss cases.
- Considering that there is a high risk of SARS-CoV-2 transmission between staff, social distancing with colleagues should be observed when possible and meetings should be kept to the minimum necessary. Meal breaks should be taken in isolation and not as a group.

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SUPPORTING INFORMATION ON THE INTERNET

The following supporting information may be found in the online version of this article:



Appendix S1 Checklist for COVID-19 symptoms and TOCC

Appendix S2 Flowchart summarizing recommended rationalization of early-pregnancy management including ultrasound scans (USS), based on symptoms, in context of COVID-19 pandemic

Appendix S3 Flowchart summarizing recommended rationalization of early-pregnancy follow-up based on initial ultrasound scan (USS) findings, in context of COVID-19 pandemic

Appendix S4 Early pregnancy hyperemesis rapid-assessment tool

Appendix S5 Recommended medication for management of nausea and vomiting in early pregnancy