**Tocilizumab doesn’t lower covid-19 mortality**

Tocilizumab joins a growing list of drugs that don’t seem to reduce mortality in covid-19. In this small randomised trial embedded in the CORUMINO-19 cohort—which hospitalised patients with moderate to severe pneumonia and covid-19 who needed oxygen but not intensive care—tocilizumab, an interleukin-6 receptor antibody, did not reduce mortality by day 28. There was possibly a small reduction in the need for ventilation and mortality at day 14 compared with normal care (24% vs 36%).

It is too soon to write off tocilizumab entirely; larger trials are needed to tease out subgroups that may benefit and to find out whether combining tocilizumab with corticosteroids and antiviral drugs gives better results. Even if 28 day mortality doesn’t fall, tocilizumab may prevent deterioration, keep some patients out of intensive care, and improve their long term health and quality of life as a result.

---

**Lopinavir-ritonavir in hospitalised covid patients**

The UK Recovery trial has found that a combination of the antiviral drugs lopinavir and ritonavir did not reduce 28 day mortality, length of hospital stay, risk of progressing to invasive mechanical ventilation, or death among patients admitted to hospital with covid-19 compared with those who received usual care. The results held true across several subgroups including age, sex, and ethnicity, but the drug combination couldn’t be tested in intubated patients so we can’t be sure that they wouldn’t benefit.

The dexamethasone and hydroxychloroquine groups in this trial have now been stopped, but azithromycin, tocilizumab, convalescent plasma, and REGN-CoV2 (a combination of two monoclonal antibodies against SARS-CoV-2 spike protein) are still being studied and others can be added, which is the beauty of this trial. The WHO Solidarity trial reported last week that none of the four repurposed drugs studied (remdesivir, interferon, hydroxychloroquine, and lopinavir-ritonavir) showed any significant impact on mortality or disease course, so there’s an urgent need for fresh candidates.

---

**Steroids in prematurity are effective and safe in low income countries too**

Antenatal corticosteroids have been shown to reduce mortality and complications of prematurity in high income countries, but they seem to have the opposite effect in low income countries. This well designed WHO study found fewer neonatal deaths among liveborn infants of women given antenatal intramuscular dexamethasone compared with placebo (19.5% vs 23.5%), less severe respiratory distress and need for neonatal resuscitation, and lower stillbirth or neonatal death (25.7% vs 29.2%).

The researchers estimated that 1 in 25 women would need to be treated to prevent one neonatal death. Dexamethasone was safe for mothers and their babies. The study covered a range of sites with different approaches to maternal and neonatal care which muddies the waters. Further study is needed into the best dosing regimens and safety profile of dexamethasone, and the role of tocolytic drugs that postpone delivery for long enough to allow the dexamethasone to be given.

---

**Intravenous iron for preoperative anaemia**

Preoperative anaemia (haemoglobin <130g/L for men or <120g/L for women) is common and is associated with worse outcomes after surgery. Oral iron is often ineffective in surgical patients because iron transport and metabolism are disrupted by the presence of inflammation or chronic disease. Does intravenous iron work any better? A single 1000 mg dose of ferric carboxymaltose given 10-42 days before major elective abdominal surgery didn’t reduce mortality rates or the need for blood transfusions compared with placebo (29% vs 28%) according to this well conducted UK study. These robust findings mean guidelines recommending preoperative iron therapy need to be revisited and probably revised.

---

**Consigning cervical cancer to history**

WHO is trying to eliminate cervical cancer across the world. Human papillomavirus (HPV) vaccination rates are currently low in low and middle income countries, so effective screening and early stage treatment remain essential if the goal is to be achieved. This cross sectional study based on self-reported data in 55 low and middle income countries between 2005 and 2018 found a median level of 43.6% of women aged 30-49 years had ever had a cervical cancer screening test. This ranged massively from 0.3% in sub-Saharan Africa to 97.4% in Latin America and the Caribbean. Women in the highly populated countries of Indonesia, China, and India, and those living in poverty and in rural areas were least likely to have had any cervical cancer screening tests. Relying on self-reporting is always a limitation, but this study is a useful step in the long march towards wiping out cervical cancer globally.

---

**Education**

FROM THE JOURNALS  Edited highlights of weekly research reviews on https://bit.ly/2PLtii8

---

**Intravenous iron for preoperative anaemia**

Preoperative anaemia (haemoglobin <130g/L for men or <120g/L for women) is common and is associated with worse outcomes after surgery. Oral iron is often ineffective in surgical patients because iron transport and metabolism are disrupted by the presence of inflammation or chronic disease. Does intravenous iron work any better? A single 1000 mg dose of ferric carboxymaltose given 10-42 days before major elective abdominal surgery didn’t reduce mortality rates or the need for blood transfusions compared with placebo (29% vs 28%) according to this well conducted UK study. These robust findings mean guidelines recommending preoperative iron therapy need to be revisited and probably revised.

---

**Consigning cervical cancer to history**

WHO is trying to eliminate cervical cancer across the world. Human papillomavirus (HPV) vaccination rates are currently low in low and middle income countries, so effective screening and early stage treatment remain essential if the goal is to be achieved. This cross sectional study based on self-reported data in 55 low and middle income countries between 2005 and 2018 found a median level of 43.6% of women aged 30-49 years had ever had a cervical cancer screening test. This ranged massively from 0.3% in sub-Saharan Africa to 97.4% in Latin America and the Caribbean. Women in the highly populated countries of Indonesia, China, and India, and those living in poverty and in rural areas were least likely to have had any cervical cancer screening tests. Relying on self-reporting is always a limitation, but this study is a useful step in the long march towards wiping out cervical cancer globally.

---

**Lopinavir-ritonavir in hospitalised covid patients**

The UK Recovery trial has found that a combination of the antiviral drugs lopinavir and ritonavir did not reduce 28 day mortality, length of hospital stay, risk of progressing to invasive mechanical ventilation, or death among patients admitted to hospital with covid-19 compared with those who received usual care. The results held true across several subgroups including age, sex, and ethnicity, but the drug combination couldn’t be tested in intubated patients so we can’t be sure that they wouldn’t benefit.

The dexamethasone and hydroxychloroquine groups in this trial have now been stopped, but azithromycin, tocilizumab, convalescent plasma, and REGN-CoV2 (a combination of two monoclonal antibodies against SARS-CoV-2 spike protein) are still being studied and others can be added, which is the beauty of this trial. The WHO Solidarity trial reported last week that none of the four repurposed drugs studied (remdesivir, interferon, hydroxychloroquine, and lopinavir-ritonavir) showed any significant impact on mortality or disease course, so there’s an urgent need for fresh candidates.

---

**Steroids in prematurity are effective and safe in low income countries too**

Antenatal corticosteroids have been shown to reduce mortality and complications of prematurity in high income countries, but they seem to have the opposite effect in low income countries. This well designed WHO study found fewer neonatal deaths among liveborn infants of women given antenatal intramuscular dexamethasone compared with placebo (19.5% vs 23.5%), less severe respiratory distress and need for neonatal resuscitation, and lower stillbirth or neonatal death (25.7% vs 29.2%).

The researchers estimated that 1 in 25 women would need to be treated to prevent one neonatal death. Dexamethasone was safe for mothers and their babies. The study covered a range of sites with different approaches to maternal and neonatal care which muddies the waters. Further study is needed into the best dosing regimens and safety profile of dexamethasone, and the role of tocolytic drugs that postpone delivery for long enough to allow the dexamethasone to be given.

---

**Intravenous iron for preoperative anaemia**

Preoperative anaemia (haemoglobin <130g/L for men or <120g/L for women) is common and is associated with worse outcomes after surgery. Oral iron is often ineffective in surgical patients because iron transport and metabolism are disrupted by the presence of inflammation or chronic disease. Does intravenous iron work any better? A single 1000 mg dose of ferric carboxymaltose given 10-42 days before major elective abdominal surgery didn’t reduce mortality rates or the need for blood transfusions compared with placebo (29% vs 28%) according to this well conducted UK study. These robust findings mean guidelines recommending preoperative iron therapy need to be revisited and probably revised.
Video consultations in primary and specialist care

Josip Car, Gerald Choon-Huat Koh, Pin Sym Foong, C Jason Wang

1 Centre for Population Health Sciences, Lee Kong Chian School of Medicine, Nanyang Technological University Singapore
2 Department of Primary Care & Public Health, School of Public Health, Imperial College London
3 Saw Swee Hock School of Public Health, National University of Singapore
4 Departments of Pediatrics, Medicine, and Health Research and Policy, Stanford University School of Medicine, California
5 The New School for Leadership in Health Care, Koo Foundation Sun Yat-Sen Cancer Center, Taipei, Taiwan

Correspondence to: J Car josip.car@ntu.edu.sg

Even before the covid-19 pandemic, virtual consultations (also called telemedicine consultations) were on the rise, with many healthcare systems advocating a digital-first approach. At the start of the pandemic, many GPs and specialists turned to video consultations to reduce patient flow through healthcare facilities and limit infectious exposures. Video consultations can be used for triage and management of a wide range of acute conditions, including, for example, emergency eye care triage. This practice pointer summarises the evidence on the use of video consultations in healthcare and offers practical recommendations for video consulting in primary care and outpatient settings.

Evidence for video consultations

Evidence about patient outcomes, cost effectiveness, safety, technical issues, impact of video consultations on healthcare delivery, and quality of consultations is mixed and mainly from small studies. The few randomised trials that have been conducted focus on the use of video consultations in hospital outpatient clinics for patients with chronic conditions. They generally report that video consultations led to high satisfaction among patients and clinicians; no difference was seen in disease progression or service use; and no long term or reliable evidence was available on harms and lower transaction costs compared with face-to-face consultations. In general practice and acute care, no randomised trial evaluations of video consultations have been recorded.

This article offers a pragmatic approach (based on the best available evidence and the opinion of the authors). Patients and doctors should carefully consider the appropriateness and safety of video consultation, and have a low threshold for changing the mode of consultation, should the need arise.

HOW PATIENTS WERE INVOLVED IN THE CREATION OF THIS ARTICLE

We discussed video consultations and shared a draft of this paper with eight patients or carers aged 8 to 67 who had a wide range of health conditions. They highlighted importance of video to avoid face-to-face consultations with doctors citing risk from infection during the covid-19 pandemic. Some suggested they would postpone visiting GPs for minor illness. Several sections, especially those relating to examination and guidance for patients on how to prepare for a video consultation, were improved in the article at their suggestion. Several technical considerations were identified as critical by patients.

WHAT YOU NEED TO KNOW

- Video consultations in healthcare present an approximation of face-to-face interaction and are a “visual upgrade” of widely used telephone consultations
- Evidence for the effectiveness of video consultations is scarce, but points towards effectiveness, safety, and high satisfaction in patients and healthcare providers
- Be prepared to switch from a video to a telephone or in-person consultation, depending on technical, patient, or clinical factors
Practical use of video consultations with patients and carers

Implementing video consultations

All digital communication with patients must be compliant with the country’s and organisation’s data protection and telehealth regulations. Note that these are rapidly evolving and subject to change. Healthcare video consultation apps or platforms will state their compliance level to pertinent data security and privacy requirements (e.g., the US Health Insurance Portability and Accountability Act or the European Union’s General Data Protection Regulation guidelines). Administrative and physical security considerations are matters of organisational implementation, and a growing number of countries have developed protocols and guidelines for adopting video consultations.

In the UK and US (among others), clinicians are now permitted by regulators to use non-medical, popular video call applications (apps) such as Skype, WhatsApp, and FaceTime in addition to medical ones. Technical considerations are described in box 1 (bmj.com). Box 2 gives guidance for patients.

How to conduct a video consultation

Getting started

Conduct video consultations in a quiet room on a device that supports high quality video calls. We recommend using two screens: one for the video consultation, and one for the electronic health record. If using one screen, avoid using a “floating image” of a video consultation on top of electronic health record as this could cover critical information. Instead, before the consultation, split the screen into two parts. Most platforms display a smaller video of the user, which enables you to view how the patient sees you.

In contrast to telephone, video consultations closely resemble face-to-face consultations and can therefore be structured as such. However, video consultations require more attention to pick up non-verbal and visual cues such as facial expressions, because the visual field is smaller and sometimes there is a lag in communication. Aim to establish eye contact by aligning your point of focus close to where the camera is on your device. If your head is turned away, it may look as though you are disengaged or distracted.

Building rapport and establishing mutual trust—relevant for all types of consultation—are even more important over video because of remoteness, potential disruption, latency, and loss of video or audio. Regularly check whether the patient hears and understands you, offer short intermittent summaries of the information shared, and check their understanding. Use safety netting as you would for a telephone or face-to-face consultation.

A low threshold for seeing patients in person is needed (as with telephone consultations), especially for children under 2 with signs and symptoms of high fever, nausea, vomiting, diarrhoea, low playfulness/physical activity, hydration status, respiratory status (too high or low), and neurological cues such as seizures.

Box 2  Guidance for patients on how to prepare for a video consultation

Before the video consultation

- **Test the device**—such as smartphone, tablet (e.g., iPad), laptop, or desktop computer, and check
  - **Internet connectivity**—use broadband internet connection >1 Mbs or confirm the availability of a strong Wi-Fi/4G signal. If possible, use a wired connection
  - **Power**—check the device battery is fully charged or it is plugged in
  - **Camera**—adjust the position or angle so that you can be clearly seen by the doctor
  - **Microphone and speakers**—test them before the consultation.
- **Room**—find a private quiet space where the sound from the video consultation will not be overheard by others.
- **Lighting**—ensure the room is well lit. Cameras need more light than the human eye to produce a quality image. Use a broad light source with daylight, as this lessens shadows and reduces contrast. Position yourself towards the source of light—e.g., if the window is the source of light, look towards it when looking into the camera. Avoid a high intensity light behind you as this darkens the image and the doctor may not be able to see you clearly.
- **Appearance**—check your appearance on the screen. Is the camera at the right distance from you so that the doctor can see you or the relevant body part for examination, and not just your face?
- **Assistance**—consider asking a family member or a carer to join you. They could help by taking notes of key actions or hold the smartphone during the examination. If the doctor will not be able to see the person who may be with you, let the doctor know they are present so that they could be involved in the consultation, if appropriate.
- **Examination**—Depending on the reason for the consultation (e.g., a rash or swelling), consider wearing clothing that would enable the doctor to examine you by video.
- **Measurements**—if you have home devices such as a thermometer, blood pressure or blood glucose measurement monitor, do the measurements as needed before the consultation.
- **Questions and notes**—consider making a written list of concerns and queries before the consultation and record any important information about medical history such as allergies.
- **Medication(s)**—prepare the list of current medication(s) you are taking.
- **Smartphone functions and features**—familiarise yourself with the settings, functions, and features of your phone video consultation app, including the mute button or the video on/off button.

During the video consultation

- **Introduction**—introduce yourself, and inform the doctor at the start of the consultation of who else is with you if they are out of view.
- **Audio and video**—check the doctor can see and hear you clearly; otherwise a telephone consultation may be more appropriate.
- **Notes**—make notes of key points and actions.
- **Questions**—do ask questions and share any concerns you may have as you would in a face-to-face consultation.
Sometimes, video consultations offer a window into a patient’s home or work environment akin to that of a home visit. This can enable functional assessment and assist in clinical decision making. For example, the patient could be invited to show where they keep their medication.

At the end of the video consultation invite the patient to disconnect first or say, for example, “What questions do you have?” and if the patient says none, then say “I’ll let you disconnect first, bye now, wishing you well!” to ensure that she or he has no further issues to raise. This imitates the patient leaving the consulting room in a face-to-face consultation, or a home visit if that is planned, and removes concern about whether the consultation was interrupted by a technical issue.

**How can I examine the patient?**

Indirect examination or doctor guided self-examination by the patient or a carer (or parent, when assessing children) may be conducted during video consultations. You can make physical observations of a patient as you take the history, or combine your history taking and physical observations. This can enable functional assessment and follow key principles for remote intimate clinical assessments. These are listed in the document “Key principles for intimate clinical assessments undertaken remotely in response to COVID-19” published by Royal College of Paediatrics and Child Health (https://bit.ly/3juPdKT). The principles apply to all age groups.

- A parent or carer can often help with video examinations. With a parent of a crying child with high fever you might ask: “Does the child have neck stiffness? Can she turn and move her head around and touch chin to her chest?” “Could you gently press on your child’s ear—first left, then right? Does the child react as if they are in pain?” “Could you use your mobile phone’s light to look into the child’s mouth and tell me what you see?” “Could you take a photo of their throat and share it?”

- For visible complaints such as rashes, ask the patient to bring the area closer to the camera (if they use a smartphone, tablet, or computer’s camera that can be moved). Examine a rash as you normally would but note that colours may look different, depending on the camera and lighting. If you can’t see the rash clearly, consider arranging a face-to-face appointment instead.

- It may be helpful to examine for swollen legs, a skin lesion, or any other changes in visual appearance. Bear in mind possible practical challenges, particularly if the patient is using a fixed camera on a desk computer.

- Examples of other aspects of examination may include assessment of vision, mobility, muscle strength, changes to appearance, and listening to the patient’s cough. A patient may also be taught how to measure their oxygen saturation (if in possession of an oximeter), pulse rate, and respiratory rate, or asked to share an image of an affected body part (which typically has a higher resolution than a video consultation motion image).

For long term conditions where video consultation is planned, discuss aspects of self-examination and how to use devices such as a thermometer, blood pressure monitor, glucose, peak flow, or international normalised ratio (INR) meter for self-examination or testing at home. Some patients may benefit from a face-to-face appointment (eg, with the practice nurse or healthcare assistant) to run through how to use these correctly.

### Box 3 | Suggestions for remote physical examination

These suggestions for remote physical examinations in the absence of in-person examination are based on our clinical experience and patient feedback, and are adapted from those for telephone consultations.

- The dynamic of remote physical examination will depend on the clinical problem and may resemble a face-to-face one, intertwined with history taking.
- The patient may need to partially undress. Carefully consider whether a remote intimate assessment is clinically necessary to provide care or reach a diagnosis in circumstances where it is not reasonable or appropriate to examine the patient in person, taking into account patient choice.
- The sense of privacy in relation to undressing will differ between people, so sensitively explore what the patient is comfortable to do in a video consultation and follow key principles for remote intimate clinical assessments. These are listed in the document “Key principles for intimate clinical assessments undertaken remotely in response to COVID-19” published by Royal College of Paediatrics and Child Health (https://bit.ly/3juPdKT). The principles apply to all age groups.
- A parent or carer can often help with video examinations. With a parent of a crying child with high fever you might ask: “Does the child have neck stiffness? Can she turn and move her head around and touch chin to her chest?” “Could you gently press on your child’s ear—first left, then right? Does the child react as if they are in pain?” “Could you use your mobile phone’s light to look into the child’s mouth and tell me what you see?” “Could you take a photo of their throat and share it?”

- For visible complaints such as rashes, ask the patient to bring the area closer to the camera (if they use a smartphone, tablet, or computer’s camera that can be moved). Examine a rash as you normally would but note that colours may look different, depending on the camera and lighting. If you can’t see the rash clearly, consider arranging a face-to-face appointment instead.

- It may be helpful to examine for swollen legs, a skin lesion, or any other changes in visual appearance. Bear in mind possible practical challenges, particularly if the patient is using a fixed camera on a desk computer.

- Examples of other aspects of examination may include assessment of vision, mobility, muscle strength, changes to appearance, and listening to the patient’s cough. A patient may also be taught how to measure their oxygen saturation (if in possession of an oximeter), pulse rate, and respiratory rate, or asked to share an image of an affected body part (which typically has a higher resolution than a video consultation motion image).

For long term conditions where video consultation is planned, discuss aspects of self-examination and how to use devices such as a thermometer, blood pressure monitor, glucose, peak flow, or international normalised ratio (INR) meter for self-examination or testing at home. Some patients may benefit from a face-to-face appointment (eg, with the practice nurse or healthcare assistant) to run through how to use these correctly.

### When to change the consultation mode?

Consider switching to a telephone, face-to-face consultation, or a home visit if

- A telephone call will suffice, for example, for a brief follow-up call or for a patient you know well and is used to speaking with you on the phone
- Technology is not acceptable to the patient or they do not have sufficient digital literacy
- The patient does not have a smartphone or another video calling device and high speed affordable internet connectivity (or data if using 4G). Both parties could experience technical difficulties with audio and video quality
- Communication is difficult because the patient is not able to hear or understand owing to hearing, linguistic, or cognitive problems
- You or the patient or carer become uncertain whether a video consultation is safe, such as when the patient reveals red flag symptoms or an important diagnosis or acute severe illness needs to be excluded with an examination
- You need to discuss very serious issues or deliver difficult or bad news.

Competing interests: None declared.

Cite this as: **BMJ** 2020;371:m3945

Find the full version with references at http://dx.doi.org/10.1136/bmj.m3945.
Recognising and explaining functional neurological disorder

Jon Stone,1 Chris Burton,2 Alan Carson1

1 Centre for Clinical Brain Sciences, University of Edinburgh
2 Academic Unit of Primary Medical Care, University of Sheffield
Correspondence to: J Stone Jon.Stone@ed.ac.uk

Functional disorders are conditions whose origin arises primarily from a disorder of nervous system functioning rather than clearly identifiable pathophysiological disease—such as irritable bowel syndrome, fibromyalgia, and functional neurological disorder (FND)—they are the second commonest reason for new neurology consultations.1

Our recommendation is to refer all patients with a suspected diagnosis of FND to secondary care. However, the diagnosis may be raised as a possibility with the patient in primary care, and knowledge of how the diagnosis is confirmed greatly aids subsequent management. In this article we offer advice to generalists on how to recognise FND, based on clinical diagnostic and prognostic studies.

What is functional neurological disorder?

FND describes a disorder of the voluntary motor or sensory system with genuine symptoms including paralysis, tremor, dystonia, sensory disturbance (including visual loss), speech symptoms, and seizures. The hallmark is that such symptoms can be positively identified as internally inconsistent or incongruent with recognised pathophysiological disease.

It is not a diagnosis of exclusion

Commonly used synonyms are dissociative neurological symptoms, psychogenic neurological symptoms, and conversion disorder. The DSM-5 definition of FND requires the presence of positive diagnostic features and not just the exclusion of other conditions. In DSM-IV, one of the diagnostic requirements for FND was a recent psychological stressor; however, this was removed in recognition that many patients do not have identifiable stressors. FND often coexists with other persistent physical symptoms such as dizziness, pain, and fatigue. Patients may also have other functional disorders such as irritable bowel syndrome, fibromyalgia, or chronic pelvic pain.

WHAT YOU NEED TO KNOW

- Functional neurological disorder (FND) is associated with considerable distress and disability. The symptoms are not faked
- Diagnose FND positively on the basis of typical clinical features. It is not a diagnosis of exclusion
- FND can be diagnosed and treated in the presence of comorbid, pathophysiological defined disease
- Psychological stressors are important risk factors but are neither necessary nor sufficient for the diagnosis

SHOULD YOU ASK ABOUT ADVERSE LIFE EVENTS?

A systematic review of functional neurological disorder (FND) found that adverse events are more common in FND than in the general population but are certainly not always present, and their presence is not useful diagnostically.10

Exploring past traumatic life events may help with individual formulation of aetiology and future treatment, but doing so may also cause distress. Patients with FND who have not had these events may have been sensitised by previous encounters to consider this line of questioning an intrusion into their privacy and an inappropriate search for a psychological cause. Patients with FND who have had adverse experiences may feel they are being blamed for their symptoms by an authority figure, which can recapitulate the traumatising event. If necessary, or if encouraged by the patient, inquire about adverse life events with sensitivity at a pace that is suitable to the patient. It can often wait until follow-up visits.
How is a positive diagnosis of functional neurological disorder made?

Diagnosis is based on positive clinical features which typically demonstrate impaired voluntary movement or sensation in the presence of intact automatic movement or sensation, or in some cases, incongruency with pathophysiological disease.

Patient history

List the symptoms—Patients with FND often have multiple symptoms. As well as asking about motor and sensory symptoms, ask about fatigue, pain, sleep disturbance, and memory, and offer patients time to list their physical symptoms.

Describe a typical day—This helps build a picture of how disabled the person is and can help determine whether there may be comorbid depression or anxiety. Asking about good days and bad days can help assess variability.

Ask about onset and course, looking particularly for physical triggering such as injury, migraine, or syncope that may help explain why a particular symptom developed. For example, migraine aura can trigger functional limb weakness, or an unexpected syncope can trigger subsequent dissociative attacks.

Ask about dissociative symptoms such as depersonalisation (a feeling of being disconnected from your own body) and derealisation (a feeling of being disconnected from the world around you). These are common symptoms and can occur at the onset or as part of a dissociative attack. It may be a relief to a patient to discover that their strange experiences have a medical name and are shared by many other people.

Use of home video—For episodic symptoms such as seizures or paroxysmal movement, mobile phone videos (with patient consent) can be helpful for diagnosis.

Ideas, concerns, and expectations—Ask the patient what they and their family or carers think might be wrong, about the experiences they have had with healthcare professionals, and what they think it would be helpful for doctors to do at this point.

Asking about stress and adverse life events—See box.

Clinical features

The diagnosis of FND rests on the demonstration of one or more (usually a combination) positive physical clinical features, with examples listed below:

**Functional limb weakness**

*Hoover’s sign* describes weakness of hip extension which returns transiently to normal during contralateral hip flexion against resistance (see infographic). It can be done sitting or lying.

*The hip abductor sign* describes a similar sign in relation to weakness of hip abduction that returns to normal with contralateral movement (infographic).

**Functional movement disorders**

Functional tremor is diagnosed by looking for evidence of distractibility with the “entrainment test.” Ask the patient to copy rhythmic movements of varying frequency made by the examiner between thumb and forefinger using one hand and then observe the response in the other hand. Cessation of the tremor, “entrainment” to the same rhythm, or inability to copy the movement suggest functional tremor. See figure and infographic.

Functional dystonia typically presents with a fixed position, usually a clenched fist or inverted ankle (see infographic). This is different from other types of dystonia which are usually mobile.

Functional facial dystonia usually presents with episodic contraction of platysma or orbicularis, resulting in a typical appearance (see infographic).

Functional or dissociative seizures

These are diagnosed on the basis of characteristic features in the subjective account and observed description of the attacks.

Subjective descriptions often include symptoms of autonomic arousal such as palpitations, warmth, and sweating, as well as dissociative experiences (with or without fear). These often only last seconds and are often not recalled; they are not diagnostic of functional seizures, but knowledge of them can help guide management. For example, a person might be dissociating as a conditioned response to unpleasant autonomic arousal, and learning distraction techniques to gain control (in a similar way to panic attacks) can be helpful.

Objective features—demonstrated in a systematic review of the specificity and sensitivity of various clinical signs of functional seizures versus epilepsy in 34 studies—include the eyes being tightly closed, tearfulness, duration more than 5 minutes, hyperventilation during a seizure, and side to side head shaking (see table on bmj.com and infographic). Around 30% of patients have events that look like syncope. The combination of sudden motionless unresponsiveness with eyes closed for more than 2 minutes is rarely due to another cause. Making a clinical diagnosis requires experience of the range of presentation of epileptic seizures and syncope which may co-exist.

**Functional visual loss.**

Characteristic features include tubular (rather than conical) vision, so visual field at 150 cm distance is the same width as at 50 cm. The laws of physics mean that the diameter of a field should increase conically with distance (see infographic). Patients may also demonstrate visual field “spiralling” on Goldmann perimetry (infographic)—the longer the test goes on, the more constricted the person’s visual field becomes.
Recognising functional neurological disorder

**Looking for positive diagnostic signs in primary care**

Functional neurological disorder (FND) describes a disorder of the voluntary motor or sensory system, which has been linked to corruption of pre-conscious phases of motor planning. It should usually be diagnosed by someone with specific expertise in the diagnosis of neurological disease, but it can be useful to recognise the signs and symptoms in primary care for appropriate and timely specialist referral.

### Patient history

**Symptoms**

Patients with FND often have multiple symptoms. Ask about motor and sensory symptoms, fatigue, pain, sleep disturbance, memory, and dissociative symptoms.

**Ability**

Ask patients to describe a typical day, to build a picture of how disabled they are. This can also help determine whether there may be comorbid depression or anxiety.

**Onset**

Look particularly for physical triggering such as injury, migraine, or syncope. Previous adverse experiences are a risk factor, but may not be present.

### Positive diagnostic signs

**Functional limb weakness**

- **Hoover’s sign:** Hip extension weakness that improves with contralateral hip flexion against resistance.
- **Hip abductor sign:** Abduction weakness that improves with contralateral hip abduction against resistance.

**Functional movement disorders**

- Functional dystonia typically presents with a fixed position, usually a clenched fist or inverted ankle.
- Functional facial dystonia presents with episodic contraction of platysma or orbicularis oculi.
- Left wrist tremor stops or entrains when copying examiner’s movements with right hand.

**Functional or dissociative seizures**

Should be diagnosed on the basis of finding characteristic features in the subjective account and observed description of the attacks, such as:

- Eyes tightly closed
- Tearfulness
- Longer than 5 minutes
- Side to side head shaking
- Hyperventilating
- Ask patient if they would be willing to have their attacks video recorded by a family member.

**Functional visual signs**

A tubular visual field defect at 50 cm which is the same width as at 150 cm

### Common pitfalls

Common reasons for missing the diagnosis of FND include:

- An absence of psychological comorbidity
- No prior functional disorders
- Patients that don’t fit a false stereotypical profile—such as male, older, working.

**Common reasons for making a wrong diagnosis of FND include:**

- Placing too much emphasis on psychological comorbidity
- Relying on single signs rather than combinations
- Relying on normal tests
- Unusual or unexpected symptoms, but no positive diagnostic signs of FND.

### Investigation and referral

While it may be reasonable for the diagnosis to be raised as a possibility with the patient in primary care, it is recommended to refer patients with a suspected diagnosis of FND to secondary care for specialist assessment.

**Disclaimer:** This infographic is not a validated clinical decision aid. This information is provided without any representations, conditions, or warranties that it is accurate or up to date. BMJ and its licensors assume no responsibility for any aspect of treatment administered with the aid of this information. Any reliance placed on this information is strictly at the user’s own risk. For the full disclaimer wording see BMJ’s terms and conditions: http://www.bmj.com/company/legal-information/
W\When are investigations for pathophysiological disease comorbidity necessary?

Always consider whether patients with signs and symptoms of FND could also have pathophysiological disease, and be willing to make two diagnoses if appropriate. For example, someone may have multiple sclerosis, but their disability may be coming predominantly from FND.\textsuperscript{20} Other contributing neurological and medical problems such as vitamin B\textsubscript{12} or thyroid deficiency, migraine, hypermobility spectrum disorders, or carpal tunnel syndrome are also common, and around 20% of patients with functional seizures as part of FND also have epilepsy.\textsuperscript{21} Therefore, routine blood tests and assessment for some of these common disorders may be helpful when waiting for a neurological review.

FND can be a relapsing remitting condition, but other new conditions can occur at any stage. If new neurological symptoms develop in someone with diagnosed FND, consider whether they are likely to be related to the FND diagnosis or if they are unrelated. Offer an unbiased assessment and ask for a neurological review when there is doubt.

Arrange appropriate laboratory, radiological, or neuropsychological investigations even when there is clear evidence of FND; however, remain aware that, in asymptomatic individuals undergoing cranial neuroimaging, one in six individuals has incidental changes.\textsuperscript{22} Incidental findings on spinal imaging, such as disc prolapse, in asymptomatic individuals occur at a percentage similar to a patient’s age.\textsuperscript{21} Therefore, to reduce patient concern, when FND is clinically the most likely diagnosis, consider informing patients in advance that tests for pathophysiological disease are likely to be negative or might show these incidental changes.

Video electroencephalography, especially with induction protocol, allows a video recording of typical features and helps to exclude epilepsy occurring in addition to functional seizures.

Avoid diagnosing FND on the basis that investigations for other conditions are negative and consider that FND may still be present even when investigations for other conditions are positive.

What are the diagnostic pitfalls

Common reasons for making a wrong diagnosis of FND include placing emphasis on psychological comorbidity; making judgments that symptoms, especially gait and “episodes” are “bizarre” without considering whether they are typical of FND; relying on single signs rather than combinations of features; and placing reliance on normal laboratory or radiological investigations for recognised pathophysiological disease.

Conversely, common reasons for missing the diagnosis of FND include assuming that it cannot be the diagnosis in a patient with no psychological comorbidity or no prior functional disorders, or in a patient who goes against false stereotypes about functional disorders—for example, a patient who is male, older, and working.

Which functional disorder and psychological comorbidities may be present?

Other functional symptoms and disorders, especially those involving chronic pain, fatigue, and memory symptoms are common in patients with FND of all types, and in many patients these symptoms determine quality of life more than motor or sensory symptoms.\textsuperscript{26}

Psychological comorbidities—especially anxiety, panic, and depression—are common, affecting over 50% of patients,\textsuperscript{27} and are often worsened by the disability of the condition. Some patients will have had adverse experiences, but importantly, these are neither necessary nor sufficient for the diagnosis.

Falsification of symptoms, as seen in factitious disorder or malingering, may lead to similar clinical features to FND but is acknowledged to be rare. Specifically excluding it is no longer part of the diagnosis of FND in DSM-5.\textsuperscript{28} Consider wilful exaggeration if there is repeated evidence of lying or a major discrepancy between reported and observed function, but not if there is self reported variability in function as this is typical of FND.

How can the diagnosis be explained?

A successful conversation about the diagnosis of the FND leaves the patient with a reasonable degree of confidence and understanding and is an essential platform for further treatment.

As with the delivery of the diagnosis of any disorder, include sufficient time, take the problem seriously, give the name of the condition, provide further reading information and offer sources of support such as patient support groups (see bmj.com for details).\textsuperscript{29}

Demonstrating positive clinical signs of FND can be especially helpful provided it is done as a way of helping the patient gain insight into the mechanism of their symptoms, as opposed to an approach that suggest a diagnosis of exclusion or that there is “no problem.” It may also lead naturally to therapies. For example, if someone can be helped to see that their weak leg does return transiently to normal during testing for Hoover’s sign, or that their tremor transiently stops during an entrainment test, this offers a window on what may be possible with physiotherapy to “retrain the brain.” The use of analogy—for example, that this a “software rather than hardware problem” or, for FND seizures, that there is a “red alert state which the brain has learnt to switch off automatically by going into a trance-like state” can help translate neuroscience to the bedside.

FND is not an easy diagnosis for a patient or their family and friends to understand, and some patients may not agree that it’s correct. Explanation may need to be repeated by the neurologist, members of a multidisciplinary team, and in primary care, ensuring that everyone understands the correct rationale for it.

Competing interests: See bmj.com.
Cite this as: BMJ 2020;371:m3745
Find the full version with references at http://dx.doi.org/10.1136/bmj.m3745
A woman in her 70s presented to the dermatology clinic with a two year history of blue-grey hyperpigmentation on her face, which symmetrically involved her forehead, eyelids, cheeks, nose, and perioral skin (fig 1). Similar blue-grey discoloration was noted on her gingiva (fig 2).

The patient had had rosacea since her late teens, for which she had been taking oral minocycline intermittently for more than 20 years. Three months before this presentation she was advised to stop the minocycline because it was the suspected cause of her facial pigmentation.

Other history included breast cancer 16 years earlier, for which she completed adjuvant radiochemotherapy and a course of anastrozole, and had a risk reducing mastectomy.

She was otherwise in good health, had no other symptoms, and took no other drugs regularly.

What is the most likely diagnosis?

Type 3 minocycline induced cutaneous hyperpigmentation of the facial skin and gingiva. This is a benign condition and can be diagnosed clinically; however, consider skin biopsy if the diagnosis is uncertain.

Reported rates of pigmentation secondary to long term minocycline use range from 2.4-14.8%.

Three types of minocycline induced hyperpigmentation occur. In type 1, well circumscribed blue-grey macules appear in areas affected by acne scarring. In type 2, blue-grey pigmentation appears in sites distant from the previous inflammation, normally the shins and forearms. Types 1 and 2 hyperpigmentation typically improve when minocycline is withdrawn. Type 3 hyperpigmentation shows as diffuse symmetrical blue-grey discoloration, particularly in photo-exposed sites, is seen less often than types 1 and 2, and can be permanent despite discontinuation of minocycline. Types 1, 2, and 3 hyperpigmentation often result from melanin deposition in basal keratinocytes and dermal melanophages. It has also been described affecting the nails, oral cavity, sclera, conjunctiva, bone, cartilage, thyroid, heart valves, and atherosclerotic plaques.

Other causes of drug induced pigmentation include amiodarone, cytotoxic drugs (eg, bleomycin, cyclophosphamide), anticonvulsants (eg, phenytoin), and hydroxychloroquine. Paradoxically, prolonged use of topical hydroquinone, a skin bleaching agent, can also result in pigmentation, known as exogenous ochronosis.

Other causes of facial hyperpigmentation include melasma and post-inflammatory pigmentation secondary to eczema, acne, lichen planus, cutaneous lupus erythematosus, or Riehl melanosis (a form of contact dermatitis).

What is the most likely diagnosis?

An unusual case of acquired facial pigmentation.

As cutaneous and non-cutaneous hyperpigmentation associated with minocycline use is common, a detailed drug history is important in its evaluation. The patient was recommended to consult with a dermatologist, and permanent discontinuation of minocycline was recommended. The patient was also advised about photoprotection using high factor sunscreens and physical methods and the use of cosmetic camouflage on the affected areas of the face.

Permanent discontinuation of minocycline is thought to result in full resolution of hyperpigmentation in basal keratinocytes and dermal melanophages. Other causes of drug induced pigmentation include amiodarone, cytotoxic drugs (eg, bleomycin, cyclophosphamide), anticonvulsants (eg, phenytoin), and hydroxychloroquine. Paradoxically, prolonged use of topical hydroquinone, a skin bleaching agent, can also result in pigmentation, known as exogenous ochronosis.

Other causes of facial hyperpigmentation include melasma and post-inflammatory pigmentation secondary to eczema, acne, lichen planus, cutaneous lupus erythematosus, or Riehl melanosis (a form of contact dermatitis).
Thigh pain after a stroke

This axial view of an abdominal and pelvic computed tomogram shows warfarin induced left psoas (black arrow) and retroperitoneal (white arrow) haematomas.

The patient—a man in his 50s with no previous trauma—had worsening left posterior thigh pain, increasing left limb weakness, and numbness in the region of the second and third lumbar vertebrae. Two days earlier he had started warfarin for a left middle cerebral artery infarct (having first received tissue plasminogen activator). His haemoglobin level was 70 g/L (100 g/L previously; normal range 130-170 g/L) and international normalised ratio was 2.3 (target international normalised ratio 2.0-3.0)

Retroperitoneal haematomas and psoas haematomas arise in 0.5-0.6% and 0.1-0.6% of patients who are using anticoagulant drugs, respectively. Retroperitoneal haematomas can present as ipsilateral limb weakness or acute compressive neuropathy. Psoas haematomas can present as vague, insidious, referred thigh pain. It is unusual for these haematomas to arise simultaneously.

Large haematomas can cause a rapid decrease in haemoglobin levels. They can be assessed with computed tomography of the abdomen and pelvis before magnetic resonance imaging of the spine.

If you would like to write a Minerva picture case, please see our author guidelines at http://bit.ly/29HCBAL and submit online at http://bit.ly/29yyGSx

Sudden cardiac death

Decisions about the timing of surgery for people with asymptomatic aortic stenosis must balance the risks of intervention against the possible harms of watchful waiting. Among the latter is the possibility of sudden cardiac death which, according to a recent longitudinal study, is small but not negligible. Among 1849 asymptomatic people, 27 sudden cardiac deaths occurred over four years of follow-up (Heart doi: 10.1136/heartjnl-2019-316493). The strongest predictors were age and left ventricular hypertrophy.

Ageing lungs

Pulmonary function peaks at the age of 25 to 30 and then gradually declines. The reasons include enlargement of the alveolar air spaces, reduced elastic lung recoil, and lower alveolar pressures during forced expiration. High resolution computed tomography of 32 lungs obtained from organ donors, but never actually transplanted, suggests that age related loss of terminal bronchioles may be more important than all these (Lancet Respir Med doi: 10.1016/S2213-2600(20)30224-6). Between the ages of 30 and 80, the total number of terminal bronchioles declines by nearly a half.

Tranexamic acid

The antifibrinolytic drug tranexamic acid reduces mortality when given in hospital to people with traumatic bleeding. A trial from the US explored whether earlier administration of the drug carried additional benefit. The answer is probably not. Among nearly 1000 people randomised either to tranexamic acid or to placebo, given during transfer to a trauma centre, there was no difference in 30 day mortality between treatments (JAMA Surg doi:10.1001/jamasurg.2020.4350).

Restless legs

Restless legs syndrome, characterised by discomfort in the legs and an irresistible urge to move them, affects around 5% of the adult population. The symptoms tend to be worst at night and often interfere with sleep. Neither the cause nor the pathology is understood, although some evidence links the condition to iron deficiency, pregnancy, and renal disease. A study from Spain that followed 96 cases for 10 years found no excess mortality associated with the condition (Neuroepidemiology doi:10.1159/000508855).

Recurrent sudden unexpected death in infancy

The “Care of Next Infant” programme was established in the UK in 1988. The aim was to help families who had experienced a sudden unexpected death in infancy. Analysis of its database finds that the risk of sudden unexpected death in infants born subsequently is 10 times higher than the rate in the UK population generally (Arch Dis Child doi:10.1136/archdischild-2019-318379). Data were available only for families who had experienced a second unexpected death, so it wasn’t possible to evaluate how effective the programme had been in modifying risk factors.

Methotrexate and malignant melanoma

People with psoriasis whose condition does not respond to topical treatment and phototherapy are often given methotrexate. Although frequently effective, the drug has immunosuppressant effects that have prompted concern about an increased risk of malignancy, in particular of cutaneous malignant melanoma. A case-control study nested within a large Swedish cohort of patients with psoriasis offers reassurance (Br J Dermatol doi:10.1111/bjd.18887). The study found no evidence of an enhanced risk of melanoma, even at the highest cumulative dose of methotrexate.

If you would like to write a Minerva picture case, please see our author guidelines at http://bit.ly/29HCBAL and submit online at http://bit.ly/29yyGSx

Sudden cardiac death

Decisions about the timing of surgery for people with asymptomatic aortic stenosis must balance the risks of intervention against the possible harms of watchful waiting. Among the latter is the possibility of sudden cardiac death which, according to a recent longitudinal study, is small but not negligible. Among 1849 asymptomatic people, 27 sudden cardiac deaths occurred over four years of follow-up (Heart doi: 10.1136/heartjnl-2019-316493). The strongest predictors were age and left ventricular hypertrophy.

Ageing lungs

Pulmonary function peaks at the age of 25 to 30 and then gradually declines. The reasons include enlargement of the alveolar air spaces, reduced elastic lung recoil, and lower alveolar pressures during forced expiration. High resolution computed tomography of 32 lungs obtained from organ donors, but never actually transplanted, suggests that age related loss of terminal bronchioles may be more important than all these (Lancet Respir Med doi: 10.1016/S2213-2600(20)30224-6). Between the ages of 30 and 80, the total number of terminal bronchioles declines by nearly a half.

Tranexamic acid

The antifibrinolytic drug tranexamic acid reduces mortality when given in hospital to people with traumatic bleeding. A trial from the US explored whether earlier administration of the drug carried additional benefit. The answer is probably not. Among nearly 1000 people randomised either to tranexamic acid or to placebo, given during transfer to a trauma centre, there was no difference in 30 day mortality between treatments (JAMA Surg doi:10.1001/jamasurg.2020.4350).

Restless legs

Restless legs syndrome, characterised by discomfort in the legs and an irresistible urge to move them, affects around 5% of the adult population. The symptoms tend to be worst at night and often interfere with sleep. Neither the cause nor the pathology is understood, although some evidence links the condition to iron deficiency, pregnancy, and renal disease. A study from Spain that followed 96 cases for 10 years found no excess mortality associated with the condition (Neuroepidemiology doi:10.1159/000508855).

Recurrent sudden unexpected death in infancy

The “Care of Next Infant” programme was established in the UK in 1988. The aim was to help families who had experienced a sudden unexpected death in infancy. Analysis of its database finds that the risk of sudden unexpected death in infants born subsequently is 10 times higher than the rate in the UK population generally (Arch Dis Child doi:10.1136/archdischild-2019-318379). Data were available only for families who had experienced a second unexpected death, so it wasn’t possible to evaluate how effective the programme had been in modifying risk factors.

Methotrexate and malignant melanoma

People with psoriasis whose condition does not respond to topical treatment and phototherapy are often given methotrexate. Although frequently effective, the drug has immunosuppressant effects that have prompted concern about an increased risk of malignancy, in particular of cutaneous malignant melanoma. A case-control study nested within a large Swedish cohort of patients with psoriasis offers reassurance (Br J Dermatol doi:10.1111/bjd.18887). The study found no evidence of an enhanced risk of melanoma, even at the highest cumulative dose of methotrexate.