Swiss Re

Life & Health Underwriting Insights

COVID-19 clinical presentations: what you need to know from our Medical Officer's time on the front lines

I took some time away from my role as the EMEA Chief Medical Officer at Swiss Re to work in a COVID-19 unit in the NHS. My time on the front lines gave me first-hand experience seeing patients presenting with the viral illness. There are similarities from the clinical data emerging in other countries where they too confront challenging and continually evolving clinical presentations. The way COVID-19 patients are diagnosed and their path to recovery has direct relevance to the insurance industry.

I hope my personal experience provides useful insights.

Q – Is it straightforward to diagnose COVID-19?

A – Not always. As with any atypical pneumonia the onset is insidious, so it's hard for the patient to know exactly when they started feeling unwell and the symptoms can be vague and diverse. Although a fever and cough were helpful markers, equally the virus could present as nasal congestion, a sore throat, aching joints or muscles, diarrhoea or a headache. For me, the onset of feeling short of breath on minimal exertion was the most relevant part of their history. Diagnosis is always a mixture of clinical history, blood results and imaging.

Insurance relevance: when asking underwriting questions to capture COVID-19 infections (past or present), it is very difficult to find a true differentiator, i.e. one that will pick up the disclosures you want. Timeline is also important as the course from onset to critical deterioration is short, in the order of 5–8 days. Once past day 14, mortality risk is low in the absence of end organ damage.

Q – What investigations were done in the hospital, and what will we see when we get GPRs/APSs/medical reports back?

A – There will be variations between what different hospitals do and in the UK there was no national guidance issued on the panel of tests to perform for suspected COVID-19 patients. Most hospitals separated their admissions into "hot" and "cold" areas with patients suspected of having the virus routing through the "hot" area. Over time, however, it became clear that many patients running through the "cold" areas had dual pathology, i.e. they had a disease which COVID-19 had caused to deteriorate, or just both diseases. This was also likely to be a factor of the susceptibility to the virus that existed in individuals with underlying co-morbidities.

In terms of blood tests, you will see the usual Full Blood Count (FBC or CBC), liver function tests, renal function tests (urea, creatinine), C-reactive protein (CRP), troponin and D-Dimer.

Insurance relevance: You won't be able to make the same assumptions that blood test results indicate the same pathology as you did prior to COVID-19.

Q – How can we interpret the blood results that we will see on reports?

A – During COVID-19, expect to see raised troponin levels. Some will be positive but small rises, and some will show high or serial elevation. What's relevant is the context in which rises occur, and what treatment is given. The main takeaway is that a raised troponin does not always equal a heart attack. What it does signify is cardiac involvement by the virus, and studies are exploring whether this is a cardiomyopathy type picture (some of which recover, and some don't). Some of these might be heart rate related rises (if you're tachycardic then your troponin will show a small rise) or related to

kidney injury when you're unwell. It is vital that you consider the Electrocardiogram (ECG) changes in context with the troponin. Take CMO advice where necessary. For instance, you may see territorial changes on the ECG that suggest ischaemia. Add in typical sounding ischaemic chest pain and you may have a Myocardial Infarction (MI) picture, with or without coronavirus. Many of these patients will not have been routed to angiography (and ambulances will not have routed directly there as they did before COVID-19) so the course of treatment will look very different to what you are used to. Patients with ST elevation myocardial infarction (STEMI) may be thrombolysed if their angiography lab is closed. This may also mean that you do not have an angiogram to confirm degree of stenosis in the coronary vessels, and maybe not even a computed tomography (CT) coronary angiogram or calcium score if there was no access to this. Clinicians are still waiting on national guidance for how to follow up raised troponins, and the National Institute for Health and Care Excellence in the United Kingdom is currently at the data collection stage in developing a standardised approach.

Insurance relevance: be careful to underwrite based on the final diagnosis and results from the hospital. On some papers, a working diagnosis might exist that is overruled once all the investigations are back. It's important not to be misled. Remember that not all troponin rises indicate a MI or Acute Coronary Syndrome. Equally the ability to confirm or deny underlying ischaemic heart disease may be delayed until elective (i.e. outpatient) imaging or angiography is back online. From a claims perspective it is clear that attendances in hospital with NSTEMI during the pandemic are lower than the pre-COVID-19 era. The ECG is likely to be the best arbitrator of whether a MI may have occurred. Chest pain and a rise in troponin aren't specific enough to confirm a claim. It is also unlikely that the patient will have been advised that they have had a MI unless it was a STEMI or there were territorial and dynamic ECG changes alongside serial changes in troponin. Use your CMO's – they will help you decipher the details. Our CMO team at Swiss Re can support you and your Medical Officers.

Q – Other than troponin, are there other unusual blood results we should be aware of?

A – Very much so. I'll tackle them one by one.

C-reactive protein (CRP) – All of the patients presenting to hospital showed significant rises in their CRP. The higher the CRP, the more worrying the prognosis as it predicted end organ damage. You should expect this was reducing prior to discharge, but hospitals will usually consider it safe to discharge patients with an abnormal CRP as long as it is lower than approximately 80–100 and trending down.

Liver function tests – high bilirubin is common in coronavirus patients and wouldn't indicate the need for further investigations if it was returning to normal or near normal by the time of discharge. A rise in the ALT or AST in the hundreds was not uncommon and was usually not indicative of alternative disease.

Renal function tests – these were normally at a patient's baseline unless they had become dehydrated (then expect a small rise in urea and creatinine). In severe coronavirus cases or with superadded bacterial sepsis, some cases needed filtration (like dialysis) on ITU/ICU, but these were usually confined to patients with underlying chronic kidney disease.

FBC differential – clinicians looked for the neutrophil to lymphocyte ratio. Probably more helpful for underwriters was the absolute lymphocyte count. Very low counts i.e. <0.5–0.8 had a worse prognosis. As we know, this is not confined to COVID-19, and Life Guide already confirms that this is a poor prognostic factor.

D-Dimer – this would usually be used clinically to risk stratify patients suspected of a deep vein thrombosis or pulmonary embolism. In many coronavirus patients, there was a significant rise in D-Dimer. There are likely to be multiple mechanisms at play here. These might include secondary infection, myocardial infarction, renal failure or a hypercoagulable state related to COVID-19. Differentiating what might be a pulmonary embolus or might be COVID-19 or heart failure became quite difficult. Of course, quite often there was dual pathology. In many cases you may see a very high D-Dimer being ignored. The mainstay of diagnosis therefore would fall back to imaging. CT pulmonary angiogram can be performed when there is a high index of suspicion. This can also give a reasonable view of the lung fields to help confirm coronavirus-like changes.

Insurance relevance: in any hospital discharge letter, you may see many abnormalities in blood panels. No two hospitals may have the same panel. Cause and effect may be very different from pre-coronavirus days. Interpretation of the results should be done with care and with CMO input where necessary. Where you have CT chest results then in the presence of severe changes, it should be considered to what extent these will resolve. There is potential for the viral pneumonitis to result in lung fibrosis that will persist. There is little information currently available on follow up plans for patients with these kind of CT changes.

Q – What happened to individuals needing to go to Intensive Care?

A – The statistics vary widely (depending on admission criteria largely, i.e. if you don't admit over a certain age then outcomes will obviously be improved). Anywhere from 40–80% will die, depending on admission criteria. Not all admissions are the same. Some will route to a High Dependency Unit and will be given non-invasive ventilation (NIV), and some will go to an Intensive Treatment Unit and require full ventilator support. The duration on a ventilator is not short. Anecdotally, durations for patients with COVID-19 are always in excess of 10 days and in some cases extend to 20 days and beyond. You may see reports where there is no improvement following ventilation and they will be weaned off to pass away. The ventilation is there to take over their breathing whilst they recover. If there are no signs of recovery, then the patient is unable to breathe on their own and continuation is futile.

Insurance relevance: any stay on HDU/ITU/ICU comes with a complex recovery picture. Be careful when underwriting any disability benefits. It can take months or years to recover fully, not just in terms of organ systems but also cognition, sleep, anxiety and fatigue. Also bear in mind the possibility for there to be PTSD-like presentations. Breathlessness at rest or on exertion that extends for several months may indicate a long term inability to return to full occupational duties.

The underwriting of applicants who have needed hospital admission will be complex, and there is a need to consider what will pose significant mortality or morbidity risks going forward. The clinical follow up protocol is currently unclear, and it is important to involve your CMOs to guide detection of applicants likely to have post coronavirus complications. Complications are far reaching and include, to name but a few, post infection lung fibrosis, cardiomyopathy, renal impairment and mental health considerations. A blood panel before consideration of terms may be helpful once any postponement period has elapsed.

At Swiss Re, we are working hard on your behalf to provide regular guidance as we learn more. Clinical research across the globe is focusing on prognosis and outcomes with various treatment modalities, and this will ensure follow up in these patients. Our Global R&D and CMO teams collaborate to ensure we have access to the widest range of research data possible.

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