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USING BEHAVIOURAL SCIENCE

TO IMPROVE COVID-19 CARE IN
HIGH-RISK POPULATIONS



Preface

The COVID-19 pandemic highlighted both the strengths and vulnerabilities of healthcare systems around the world. While most people now recover from COVID-19 without severe consequences, certain groups remain at increased risk of hospitalisation, long-term complications, and poorer health outcomes. These include older adults, people living with chronic conditions, pregnant women, people with disabilities, and individuals facing barriers to healthcare access.

Supporting healthcare practitioners to recognise and respond to these risks remains critically important. Clinical knowledge alone, however, is often not enough. Effective care also depends on communication, decision-making, patient engagement, timely action, and an understanding of the behavioural, social, and cultural factors that influence health outcomes.

This resource was developed to support healthcare practitioners in identifying, diagnosing, treating, and managing COVID-19 among high-risk populations. Drawing on behavioural science principles, the modules provide practical, evidence-informed strategies that can be applied in everyday clinical practice. The content focuses on common challenges faced by healthcare professionals, including identifying patients who may be overlooked, encouraging timely treatment, supporting behaviour change, managing the longer-term impacts of COVID-19, and communicating effectively across diverse cultural contexts.

The five modules were co-developed by an international team of behavioural scientists, clinicians, researchers, and educators from across Europe, Asia, Australia, and North America. Each module combines current evidence with practical recommendations designed to be relevant across a range of healthcare settings and resource contexts. Accompanying infographics provide concise visual summaries to support learning and implementation.

This training program forms part of a broader initiative to improve equitable access to evidence-based COVID-19 care through culturally appropriate and multilingual education. The materials have been developed for translation and adaptation across multiple languages and settings, recognising that healthcare practitioners serve diverse communities with varying needs, experiences, and health literacy levels.

Although focused on COVID-19, many of the behavioural science principles presented in these modules extend beyond a single disease. The approaches described here can support communication, engagement, adherence, and person-centred care across a wide range of health conditions.

We hope these modules increase confidence, strengthen clinical practice, and support healthcare practitioners in delivering timely, compassionate, and effective care for those most at risk.



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On behalf of the international module authors, translators, and contributors.

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01

MODULE

Are high-risk COVID-19 patients being missed? Improving early identification in practice



By **Astin Sokang**, Universitas Kristen Krida Wacana, Indonesia; **Triana Kesuma Dewi**, Universitas Airlangga, Indonesia; **Yuhang Zhu**, Shandong Second Medical University, China; **Gill ten Hoor**, Maastricht University, The Netherlands

For many adults, COVID-19 causes only mild illness, such as **fatigue, cough, or a slight fever**. However, for people with certain health conditions, infection can lead to hospitalisation or severe complications. Early identification of these patients is therefore critical, because treatments are most effective when given soon after symptoms begin.

Recent numbers consistently show that the risk of severe COVID-19 increases with age and with underlying health conditions such as cardiovascular disease,

diabetes, obesity, chronic lung disease, cancer, and immunosuppression. Older adults and people living with multiple health conditions are particularly vulnerable to severe outcomes.

While antiviral therapies are most effective at preventing severe outcomes when started within five days of symptom onset, rapid identification of high-risk patients remains essential, as delayed treatment may still benefit vulnerable groups with prolonged viral replication.

Why high-risk patients are sometimes overlooked

Despite clear clinical guidance, eligible patients are not always identified in time to receive early treatment. Clinicians often focus on symptom severity rather than underlying risk. Patients who present with mild symptoms may not immediately trigger further evaluation, even if they have risk factors that increase the likelihood of complications.

Additionally, risk often arises from multiple moderate factors rather than a single high-risk condition. **Guidance** emphasises that the number of underlying conditions significantly increases the risk of severe illness, highlighting the importance of assessing overall risk profiles, for example, old age, hypertension, and overweight, rather than individual conditions in isolation.

Time pressure in busy clinical environments can also play a role. Clinicians often need to make decisions based on limited information, such as incomplete patient histories or medical records that do not clearly flag relevant risk factors. As a result, important cues may be missed when risk factors are not immediately obvious.

Structural and behavioural barriers also affect who receives timely care. **Research throughout the pandemic** has shown that racial and ethnic minority groups, as well as socioeconomically disadvantaged populations, experienced higher rates of COVID-19 infection, hospitalisation, and death. These disparities are partly linked to differences in access to healthcare and treatment.

Patients themselves may also delay seeking care. Many people assume that mild symptoms mean low risk, or they may be unaware that treatments are most effective when started early. Without clear guidance from clinicians, these patients may present too late for treatment to be effective.

In addition, changes in risk perception over time may also play a role. Earlier in the pandemic, higher risk awareness led to more cautious practice. As the situation has improved, mild cases may seem less urgent, which can reduce motivation to assess risk systematically, among both patients and healthcare professionals.

How behavioural science can support better identification

At first glance, the challenge may appear purely clinical. However, behavioural science provides practical tools that can help clinicians consistently identify high-risk patients. Clinicians frequently work under high cognitive loads. Simplifying decision-making through prompts and checklists may help reduce reliance on memory and intuition by guiding clinicians through structured review of key risk factors. Electronic medical records (where available) can also support early identification. Automated alerts that flag patients with known risk factors, such as age, chronic disease, or immunosuppression, can prompt clinicians to assess treatment eligibility quickly.

Clear communication about risk and the importance of early treatment can support early identification. When patients understand their risk, they may be more likely to contact healthcare providers sooner after testing positive, rather than delaying care until symptoms become worse.

Additionally, asking targeted questions (e.g., "What might make it difficult for you to get treatment quickly?") or expressing concern about access to care may help uncover hidden barriers. For example, a general prompt such as "You should consider seeing a doctor" is often less effective than actionable guidance like "You could book an appointment with your local clinic this week, and I can help you find one nearby if needed", when encouraging health-seeking behaviour.

Reflective practice can also help address implicit bias. Simple prompts, such as asking whether the same advice would be given or treatment decisions would be made for a different patient with the same clinical profile, can reduce unintended discrepancies in care.

Practical Recommendations

1



Use a brief risk-screening checklist during COVID-19 consultations

During every (pre-)consultation with a patient who tests positive or shows symptoms, quickly assess common high-risk factors such as older age, cardiovascular disease, diabetes, obesity, chronic lung disease, cancer, or immunosuppression. This might reduce the risk of missing vulnerable patients, especially during busy clinical appointments.

2



Consider cumulative risk rather than single conditions

Patients often have several moderate risk factors rather than one obvious high-risk condition. When assessing antiviral treatment eligibility, consider the overall risk profile, including age, comorbidities, and clinical context, rather than focusing on a single diagnosis.

3



Prioritise rapid assessment within the treatment window

Early COVID-19 treatments are most effective when started soon after symptom onset. Establish clear workflows so that high-risk patients who test positive can be assessed quickly for treatment eligibility. This might include same-day clinical review, dedicated triage pathways, or automated alerts within electronic health records where available.

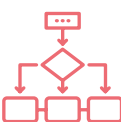
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Communicate risk clearly and proactively to patients

Patients with chronic conditions may not know that they are at increased risk of severe COVID-19. Explain how specific health conditions influence risk and encourage patients to contact healthcare providers promptly if they test positive or develop symptoms.

5



5. Standardise treatment decisions

Standardise treatment decisions through algorithmic triage pathways and clinical scoring systems to remove subjective intuition and reliance on heuristics. Before deciding that a patient does not need further assessment or treatment, pause and reflect: "Would I make the same decision for another patient with the same medical profile?". Structured reflection can help reduce unintended disparities in care and ensure that decisions are based on clinical need rather than assumptions.



Key takeaways

Improving the identification of high-risk COVID-19 patients does not necessarily require major system changes. Often, small adjustments to clinical workflows, screening procedures, and communication practices can make a meaningful difference. By combining clinical guidance with behavioural insights, healthcare practitioners can ensure that high-risk patients are recognised promptly and receive timely assessment for treatment. In the context of COVID-19 and future infectious disease outbreaks, these small improvements in clinical practice can help to prevent severe illness and potentially save lives.

The Hidden **High-Risk Patient**

Patient A

Severe Symptoms



Patient B

Mild Symptoms



HEART
DISEASE



LUNG
DISEASE



DIABETES



OBESITY



AGE 65+

**Mild symptoms do not
mean low risk.**

Look beyond symptoms. Check the risk profile.

Spot the Hidden High-Risk COVID-19 Patient

Mild symptoms do not always mean low risk. Early identification saves lives.

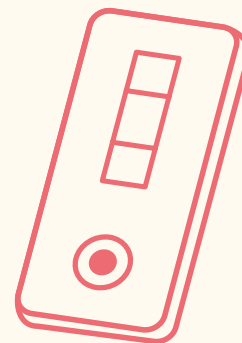
1

Confirm COVID-19

Does the patient have COVID-19?

- ✓ Positive test
- ✓ Symptoms consistent with COVID-19

→ **IF YES:** Check risk factors immediately



2

Look for High-Risk Indicators



Age

• Age ≥ 60 years

Chronic Conditions



• Cardiovascular disease



• Diabetes



• Obesity



• Chronic lung disease



• Cancer



• Chronic kidney disease

Immune System



• Immunosuppression



• Immunosuppressive medication



• Chemotherapy

Other Risk



• Pregnancy

3

Remember: Risk Adds Up

Even if symptoms are mild, multiple moderate risks increase danger.

Example:



Age 62

+



Hypertension

+



Overweight

30-Second Rule for Clinicians

Small decisions made early can prevent severe illness and save lives.



1

Confirm COVID-19



2

Check risk factors



3

Look for cumulative risk



4

Assess treatment eligibility early

MODULE

02

Early action, better outcomes: The importance of early COVID-19 intervention in high-risk patients



By **İrem Berna Güvenç Erdoğan**, Middle East Technical University, Turkey; **Iga Palacz-Poborczyk**, SWPS University, Poland; **Olga Perski**, Stockholm University, Sweden; **Sheson Tiwari**, Psyfolks Education, India; **Belgin Ünal**, University of Michigan, USA

For many adults, COVID-19 causes only mild illness, such as fatigue, cough, or a slight fever. However, for people with certain health conditions, infection can lead to hospitalisation or severe complications. Early identification of these patients is therefore critical, because treatments are most effective when given soon after symptoms begin.

Recent numbers consistently show that the risk of severe COVID-19 increases with age and with underlying health conditions such as cardiovascular disease, diabetes,

obesity, chronic lung disease, cancer, and immunosuppression. Older adults and people living with multiple health conditions are particularly vulnerable to severe outcomes.

While antiviral therapies are most effective at preventing severe outcomes when started within five days of symptom onset, rapid identification of high-risk patients remains essential, as delayed treatment may still benefit vulnerable groups with prolonged viral replication.

COVID-19 progression and importance of early treatment provision.

Most people recover from COVID-19 without needing intensive medical treatment. Supportive care and symptomatic treatment are usually sufficient. However, a subset of the population, particularly older adults, unvaccinated individuals and those with existing chronic conditions, are at a higher risk of severe illness. Therefore, **the World Health Organization** emphasizes the importance of early treatment in such high-risk groups to prevent hospitalisation, intensive care, or death.

For certain patients, antiviral treatment is recommended to substantially reduce the risk of critical illness, which is most effective within the first 5 days of symptom onset. Delays in testing, diagnosis, or treatment can substantially reduce the effectiveness of available therapies. Ensuring rapid healthcare access, particularly in community settings, is therefore essential for maximising treatment benefits and improving patient outcomes.

Context-specific evidence supporting early treatment to reduce hospitalisation and death.

Early treatment substantially reduces the risk of hospitalisation and death, particularly among patients at high-risk of severe disease. To understand the clinical urgency, we must interpret the evidence within its specific clinical and population context. In a large randomized clinical trial conducted across multiple countries, including sites in the US, Brazil, South Africa, India, and Mexico, non-hospitalised high-risk, unvaccinated adults who received antiviral treatment within the first 3 days of symptoms were nearly 89% less likely to be hospitalised or die compared to placebo.

Similarly, early treatment with Sotrovimab, a targeted antibody therapy, reduced the risk of disease progression by 85% (during early circulating variants; effectiveness varied with later variants), reinforcing the importance of early intervention for high-risk individuals, including the elderly and those with underlying conditions like obesity or diabetes. Notably, over 60% of the sample were from Hispanic and Latinx communities, groups disproportionately affected by the pandemic, suggesting the effectiveness of early treatment across socio-demographic contexts.

Likewise, a systematic review of 18 real-world studies across multiple countries found that early treatment significantly reduced hospitalisation and mortality, and that the benefit was greatest when treatment was started within five days of symptoms. A large study from Hong Kong tracking over 87,000 patients found that starting treatment within the first 1-2 days of symptoms significantly reduced hospitalisation and mortality compared to starting it later. Moreover, this pattern was generally consistent across demographic and clinical subgroups, including age, sex, and vaccination status.

Taken together, the evidence supports a simple but critical conclusion: early treatment works, and delays reduce its effectiveness.

Overview of recommended therapies aligned with local clinical recommendations.

Knowing that the treatment timing is critical, which treatments are actually available, and who should receive them?

For non-hospitalised adults with mild to moderate COVID-19, antiviral therapy is most effective. **There are currently three main antiviral agents** commonly used in the treatment of COVID-19: Remdesivir, Nirmatrelvir/Ritonavir, and Molnupiravir. The right choice depends on the individual patient's risk profile, current medications, routes of administration, and local availability.

Remdesivir is administered as a three-day intravenous infusion and is preferred when oral therapy is not appropriate. **In a randomized control trial**, a three-day outpatient course of Remdesivir significantly reduced hospitalisation and death compared to placebo. Remdesivir is **recommended** for hospitalised COVID-19 patients, alongside immunomodulators when oxygen support is needed, and as a second treatment option for high-risk outpatients when Nirmatrelvir/Ritonavir is not suitable.

Nirmatrelvir/Ritonavir (Paxlovid) is taken orally for typically five days, and **has been shown** to significantly reduce the risk of hospitalisations and death in high-risk, unvaccinated individuals. **WHO recommends** Nirmatrelvir/Ritonavir as first-line treatment for high-risk, non-hospitalised patients.

Finally, Molnupiravir is also taken orally and considered a third-line option, **recommended** for patients who cannot access or tolerate either of the above. **A randomized control trial** showed benefits with significant reduction in hospitalisation and death in unvaccinated adults, though the evidence in vaccinated populations was **less consistent**, suggesting more modest effects.

Availability of therapies may vary across healthcare systems and resource setting. Across all three agents, the timing is critical, as all have been shown to be more effective earlier in the disease. Delaying testing, diagnosis, or the prescribing decision directly reduces the chance of seeing a benefit.

Patient communication strategies to overcome treatment hesitancy.

Why does treatment hesitancy persist, even when the clinical case and benefits of treatment are clear?

Several factors contribute to delayed decision-making. A common barrier is the **"watch and wait"** approach, where patients underestimate the severity of COVID-19 and postpone treatment. Concerns about side effects and potential drug interactions are also frequent, parti-

cularly among patients managing multiple medications. In addition, limited awareness and difficulty accessing clear information can further delay timely action, with studies suggesting that **only 54% of adults having heard of treatments like Paxlovid** (Nirmatrelvir/Ritonavir) prior to diagnosis. Together, these factors create uncertainty, leading patients to hesitate or defer treatment.

What can be done differently in practice?

First, emphasise that COVID-19 treatments are time-sensitive preventive interventions, not just symptom relief.

Frame antivirals as a strategy to prevent severe disease, rather than just a treatment, so patients understand that early treatment reduces the risk of severe illness and hospitalisation.

Second, a direct recommendation from a trusted healthcare provider is critical. Patients are far more likely to accept treatment when it is clearly advised by a familiar clinician, with reassurance about safety and compatibility with existing medications. Data shows the proportion of

people willing to take antivirals **increases by more than 20% if recommended by their doctor, reaching up to 93% acceptance among adults aged 65 and older.**

Finally, proactive outreach and standardised education are essential. Patients rarely request treatment independently, as studies indicate that **fewer than 20% of eligible patients are both sufficiently informed and possess the initiative to ask for treatment unprompted.** Healthcare teams should **contact eligible patients promptly** after diagnosis and provide concise, structured information on benefits, risks, and next steps.



Practical Recommendations

1

Prioritise early intervention.

Antivirals are most effective within the first 5 days of symptoms. Do not wait for a patient to get worse before acting. Ensure high-risk patients have tests at home and know to get in touch on Day 1 of a positive result to start the treatment immediately.

2

Focus on the vulnerable.

Focus on adults with diabetes, heart disease, chronic kidney disease, or a BMI over 30. These patients often feel "fine" initially, but they face the highest risk of sudden decline. Early treatment is their best insurance against a hospital admission.

3



Identify and screen early.

Proactively screen your patient lists to identify those at highest risk and establish a clear "fast-track" protocol for early diagnosis as soon as symptoms appear. Early identification of the right candidates is the foundation of preventing clinical deterioration.

4



Reframe as prevention.

If a patient feels okay today, they may see medicine as unnecessary. Explain that the goal is not just to treat a cough; it is to prevent a hospital stay next week. Keeping them in their own bed is a powerful motivator.

5



Minimise delays in prescribing.

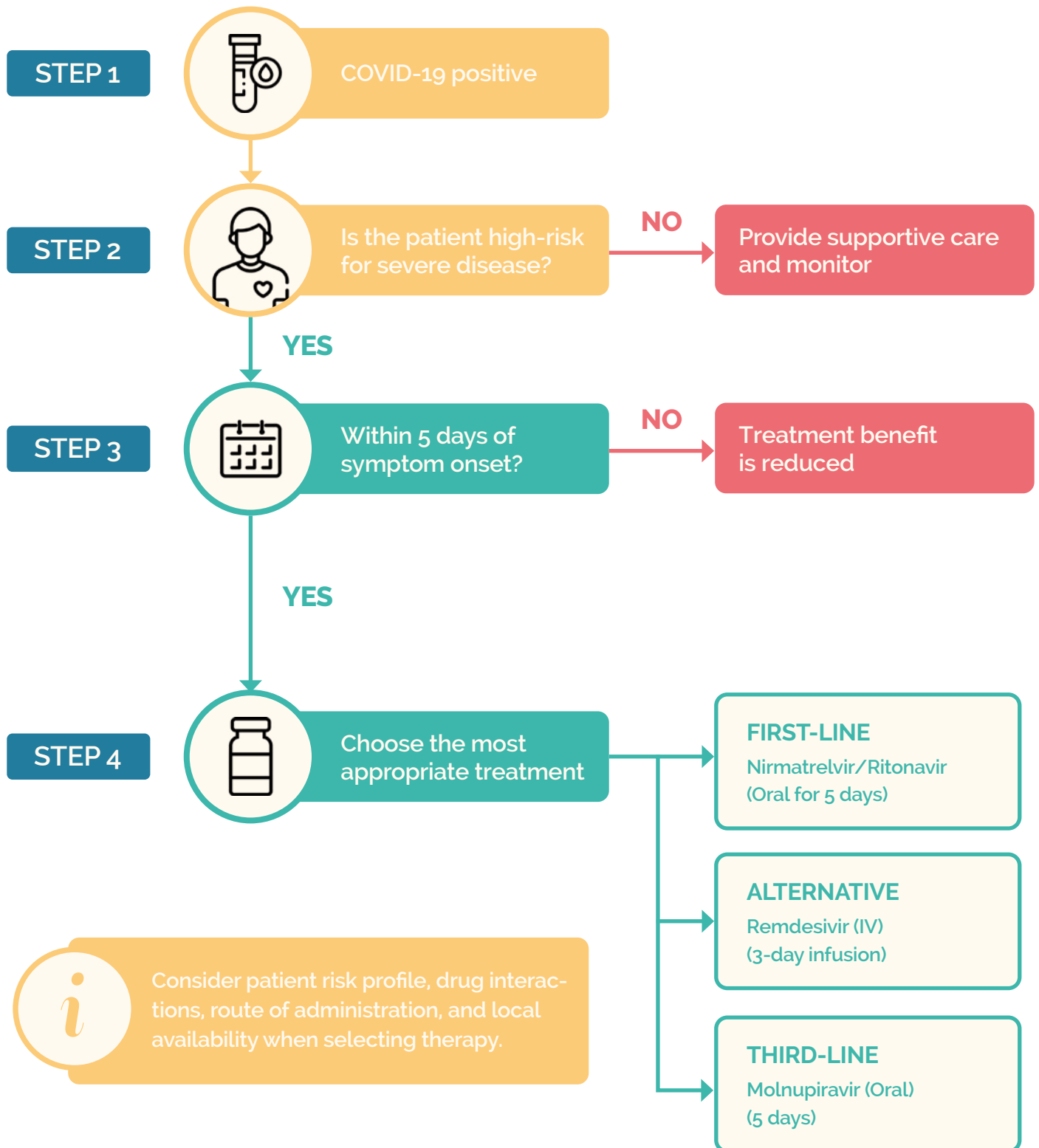
Review current medications, contraindications, and treatment eligibility as early as possible. Simple prescribing pathways and rapid medication reconciliation can help high-risk patients start antiviral treatment within the critical early treatment window.

Key takeaways

Early treatment of COVID-19 within the first 5 days of symptoms is critical for high-risk individuals, as it can dramatically reduce the risk of hospitalisation and death, with strong evidence from trials and real-world studies supporting its effectiveness. Antiviral therapies such as Nirmatrelvir/Ritonavir, Remdesivir, and Molnupiravir are most beneficial when given early, with treatment choice depending on patient characteristics and access. Despite clear benefits, treatment delays persist due to low awareness and hesitancy. Timely provider recommendations, proactive outreach, and framing antivirals as preventive interventions are key to improving uptake and health outcomes.

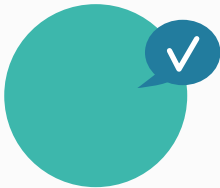
WHAT TO DO AFTER A **POSITIVE** COVID-19 TEST

Early identification. Timely treatment.

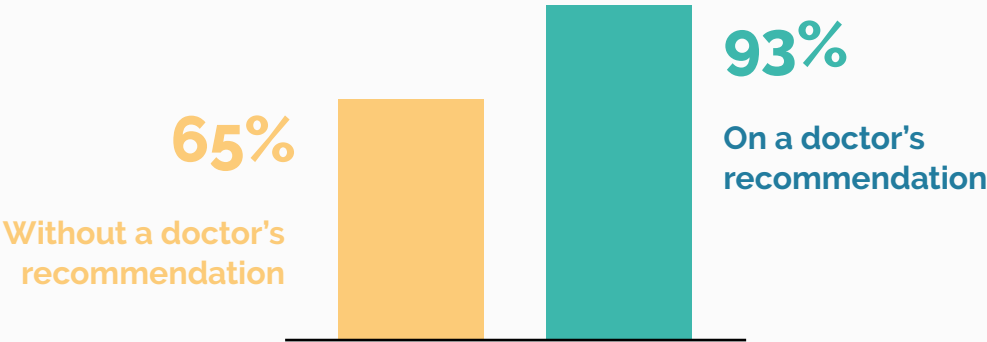


Why Treatment Delays Happen —and What Helps

Common Barriers	What Helps
"Watch and wait" approach	Frame antivirals as prevention
 Concerns about side effects	Direct recommendation from a trusted clinician
 Concerns about drug interactions	Reassurance about safety and compatibility with other medications
Limited awareness	Proactive outreach to eligible patients
 Difficulty accessing clear information	Concise, structured education on benefits, risks and next steps



A doctor's recommendation increased willingness to take antivirals by more than 20%, reaching up to 93% acceptance among adults aged 65 and older.



MODULE

03

Preventing COVID-19 complications in high-risk patients through behaviour change.



By **David Simons**, Pennsylvania State University; **Ayşegül Bakır**, Hacettepe University, Türkiye; **Johanna Nurmi**, University of Helsinki, Finland

Typically, COVID-19 is described in the past tense and solely as a respiratory infection. But COVID-19 remains an acute systemic stressor of health, particularly for high-risk patients with pre-existing cardiovascular, metabolic, immune or respiratory comorbidities. It is not just the virus that poses a threat; it is the cascade of physiological decompensation it may trigger.

As healthcare professionals, we know the clinical trajectory. A patient with chronic obstructive pulmonary disease (COPD) or interstitial lung disease faces a dra-

stically heightened risk of Acute Respiratory Distress Syndrome (ARDS). **This vulnerability is compounded by metabolic conditions**; in patients with poorly controlled diabetes or severe obesity, chronic low-grade inflammation and baseline endothelial dysfunction prime the body for a hyperinflammatory response. Consequently, the systemic inflammation induced by COVID-19 can easily precipitate decompensated heart failure, widespread microvascular thrombosis, or acute kidney injury.

In immunocompromised individuals, the dysregulated immune response and prolonged viral shedding create a high-risk environment for superadded bacterial infections, rapidly compounding the clinical severity. Furthermore, we see increased rates of neurological complications, including **acute encephalopathy** and **delirium**. These are particularly devastating in older adults, as they frequently cause a sudden, severe decline in Activities of Daily Living (ADLs), impacting patient independence and triggering the need for urgent hospitalisation and prolonged intensive care.

The burden of these complications extends far beyond the individual patient. When an older adult loses their functional baseline due to delirium, or an immunocompromised patient develops a secondary bacterial pneumonia, they do not just require a brief admission. They require complex, intensive emergency interventions, multidisciplinary management, and often extended rehabilitation. This creates a ripple effect across the

healthcare system. Intensive care units and care-of-the-elderly wards reach capacity, elective procedures are cancelled, and care continuity for other chronic diseases is fractured.

Furthermore, the sustained pressure of managing these preventable exacerbations and navigating the complex discharge pathways for patients who have abruptly lost their independence may contribute to staff burnout and moral injury among healthcare workers. **Moral injury** refers to the profound sense of entrapment that arises when people act in ways that conflict with their ethical or professional values. **Burnout**, on the other hand, is the convergence of work-related stressors with emotional exhaustion, doubts about our competence and productivity, and interpersonal distancing behaviours. Both moral injury and burnout may increase the **anxiety, depression, and somatic symptom levels**, and exert a direct impact on patient safety, intention to leave the profession, and the **overall quality of healthcare**.

The behavioural bridge

The gap between a mild initial infection and a hospital admission is often behavioural. Why do high-risk patients delay seeking care, or decline early antiviral and immunomodulatory treatments when they are most effective?

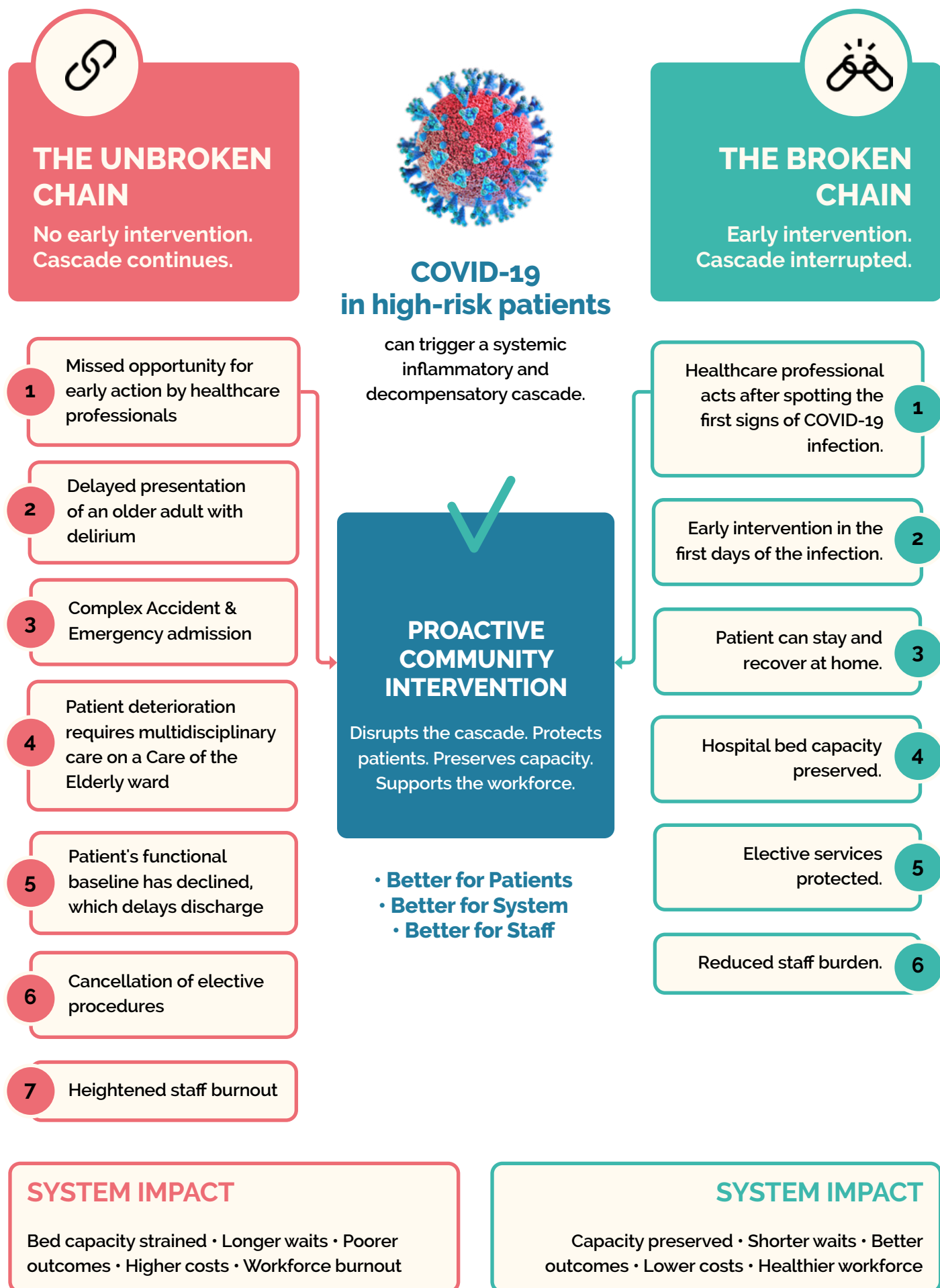
Psychological research indicates that patients frequently misjudge their risk during the early phases of illness. An immunosuppressed patient might experience a mild cough and assume they have a standard upper respiratory tract infection, failing to recognise the rapidly narrowing window to prevent further complications. Similarly, an older adult in the early stages of delirium cannot accurately assess their own clinical decline or advocate for their care.

Besides, cognitive and emotional biases in risk perception can also lead to delay. For example, a patient with congestive heart failure may normalise pain caused by COVID-19 because they are accustomed to their existing chronic chest pain. They may **deny** the risk because they are overwhelmed to cope with a new threat, or they may display an **optimism bias**, particularly when symptoms are mild in the early stages, and fail to recognise that they are in a high-risk group.

Treatment hesitancy remains common, patients may distrust new medications, minimise their symptoms to avoid being a "burden," or feel overwhelmed by the prospect of navigating complex healthcare pathways.

Clinical knowledge alone cannot bridge this gap. If we are to reduce avoidable hospital admissions and protect both our patients and maintain the capacity of healthcare services, we must seamlessly integrate behavioural science into our routine consultations. We need to shift our focus from passively providing medical information to actively facilitating patient and caregiver behaviour change.

By employing specific Behaviour Change Techniques (**BCTs**), high-risk patients and their support networks can be empowered to act before complications become severe. This proactive approach transforms the patient and their carers from passive recipients of care into active participants in their own health surveillance, ultimately protecting systemic capacity.



Practical Recommendations

To reduce the burden of COVID-19 complications, integrate these three evidence-based Behaviour Change Techniques into your consultations with high-risk patients and their caregivers:

1



Co-create tailored "Sick Day" action plans

Avoid generic advice such as "Call us if you feel worse". High-risk patients, and particularly the caregivers of older adults at risk of delirium, need precise, objective clinical triggers.

How to apply it: Write down a concrete plan. For respiratory and cognitive risks, define triggers: "If your oxygen saturation drops below 92%, OR if you notice sudden confusion and difficulty with daily tasks, call this specific clinic number immediately". For diabetic patients, explicitly activate established "sick day rules": define the required frequency of glucose monitoring (e.g., testing every four hours) and instruct the patient to contact their general practitioner or prescriber immediately to review pausing specific oral hypoglycaemics (such as SGLT2 inhibitors to prevent euglycaemic ketoacidosis). Ensure patients and their carers are trained to use any required home monitoring equipment.

2



Personalise the threat to overcome hesitancy

When patients hesitate to take early antivirals because their symptoms feel "mild," reframe the risk directly around their specific comorbidity to increase salience.

How to apply it: Instead of stating "COVID-19 is dangerous," personalise the consequence: "Because your immune system is suppressed, this virus can easily allow a severe bacterial pneumonia to take hold, even if you only have a sore throat right now. This medication helps clear the virus before those bacteria can cause lasting damage".

3



Activate the social support system

Vulnerable patients often delay care because navigating the health system whilst sick is exhausting, or because acute cognitive decline prevents them from acting.

How to apply it: During a routine outpatient visit, ask: "If you test positive tomorrow, who will drive you to the pharmacy or clinic?" Identify a "care champion" (family member, neighbour) and integrate them into the Action Plan. This is vital for older adults; ensuring a designated caregiver knows the signs of delirium can help ensure that early clinical deterioration is noticed and acted upon, bypassing systemic delays.

04

MODULE

Living beyond COVID-19: Managing long-term health impacts



By **Dominika Kwasnicka**, University of Melbourne, Australia and **Rizmina Rilwan**, Independent Researcher from Sri Lanka

COVID-19 after the acute phase: what we're still learning

While the acute phase of COVID-19 has been the focus of global attention, its long-term consequences are increasingly recognised in clinical practice. **WHO identifies** certain populations as being at higher risk of developing post-COVID-19 conditions following SARS-CoV-2 infection. This includes women, older adults,

smokers, people who are overweight or obese, those with pre-existing chronic health conditions, and people with disabilities.

Many individuals continue to experience symptoms weeks or months after infection, while others develop new or worsening chronic conditions. Understanding these longer-term effects is essential for providing effective, patient-centred care, particularly for older adults and those already at risk of chronic disease. For healthcare professionals, this requires a shift from acute management to ongoing monitoring, prevention, and coordinated care planning.

What is Long COVID?

Understanding a complex, evolving condition.

Long COVID, also known as post-COVID-19 condition, is defined as the continuation or development of new symptoms 3 months after the initial SARS-CoV-2 infection, with these symptoms lasting for at least 2 months with no other explanation (this is a WHO definition; definitions vary slightly across organisations). Common symptoms include fatigue, shortness of breath, cognitive difficulties ("brain fog"), chest pain, and sleep disturbances. These symptoms can fluctuate and often affect multiple organs. Clinicians should be aware that symptom presentation is often non-specific and may require a broad, systems-based assessment.

Prevalence estimates vary, but Long COVID appears to be more common **among older adults**, individuals with **pre-existing conditions**, and those who experienced **more severe initial illness**. However, it can also affect people who had mild or even asymptomatic infections, making it a broad and unpredictable condition.

How COVID-19 is reshaping chronic disease risk

Emerging evidence shows that COVID-19 has been associated with the development or worsening of **chronic diseases**. For example, some patients develop **new-onset diabetes** following infection, possibly due to viral effects on pancreatic function or **inflammation-related** metabolic changes. Similarly, cardiovascular complications such as myocardial injury, arrhythmias, and increased risk of heart failure have been observed even after recovery from the acute illness. Ongoing monitoring of cardiometabolic risk factors is therefore an important component of post-COVID care.

These associations highlight the need to view COVID-19 not only as an acute respiratory infection but also as a condition with systemic and long-lasting health implications. For patients already living with chronic diseases, COVID-19 may accelerate disease progression or complicate disease management.

Older adults after COVID-19: Navigating recovery, decline, and resilience.

Older adults have been disproportionately affected by both the acute and long-term impacts of COVID-19. **People aged 65** and older are more likely to experience long COVID-19 symptoms and complications than younger adults. Additionally, COVID-19 can both trigger and worsen existing chronic conditions, such as cardiovascular and respiratory diseases, and neurodegenerative disorders.

Beyond medical complications, many experience functional decline, including reduced mobility, muscle weakness, and loss of independence. **Social isolation** during and after illness can further contribute to cognitive dec-

line and mental health challenges such as depression and anxiety. **Quality of life** is often significantly affected. Even after apparent recovery, older patients may struggle to return to their previous level of functioning, requiring additional support from healthcare providers, caregivers, and community services. Routine assessment of functional status, mental health, and social support is particularly important in this population.

Why Long COVID demands a team-based, long-term care approach

Given the wide range of post-COVID complications, a multidisciplinary approach to care is essential. This may include input from general practitioners, specialists (cardiologists or endocrinologists), physiotherapists, psychologists, and social workers. Regular follow-up allows for early identification of new or worsening conditions and supports timely intervention. Establishing clear referral pathways and communication channels between services can improve continuity of care.

Importantly, care should be individualised. Patients with long COVID often present with diverse and overlapping symptoms, and their recovery trajectories can vary widely. Integrating Long COVID considerations into existing chronic disease management plans can improve outcomes and reduce the risk of further complications. Shared decision-making and goal setting can help align care with patient priorities and capacities.

Moving forward: Building awareness, confidence, and continuity in practice

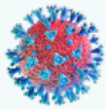
Healthcare professionals play a key role in recognising and addressing the long-term impacts of COVID-19. Raising awareness among patients, validating their symptoms, and providing clear guidance can help reduce uncertainty and improve engagement with care. Building confidence in discussing Long COVID with patients is an important component of clinical practice.

As research continues to evolve, it is important to remain informed and adaptable. The long-term burden of COVID-19 is likely to persist, making it a critical component of chronic disease management for years to come. Ongoing professional education (including this training) and integration of emerging evidence into practice will be essential to optimise patient outcomes.



LIVING BEYOND COVID-19

Recognising and managing the long-term health impacts of COVID-19



COVID-19 infection



Some patients recover completely



Others experience ongoing health impact

LONG COVID

- ✓ Symptoms start or continue ≥ 3 months after infection
- ✓ Last ≥ 2 months
- ✓ Cannot be explained by another diagnosis

WHO IS AT HIGHER RISK



Women



Older adults (≥ 65)



Smokers



People living with overweight or obesity



People with chronic health conditions



People with disabilities

WHAT DOES LONG COVID LOOK LIKE?



Brain fog (cognitive difficulties)



Sleep problems



Chest pain



Shortness of breath



Symptoms fluctuate



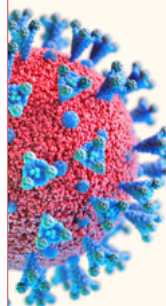
Can affect multiple organ systems



Fatigue



BEYOND LONG COVID: CHRONIC DISEASE CONSEQUENCES



NEW-ONSET DIABETES

- Metabolic changes
- Blood glucose abnormalities



CARDIOVASCULAR DISEASE

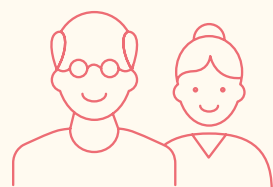
- Myocardial injury
- Arrhythmias
- Heart failure risk



WORSENING EXISTING CONDITIONS

- Cardiovascular disease
- Respiratory disease
- Other chronic illnesses

WHY OLDER ADULTS NEED SPECIAL ATTENTION



- Reduced mobility
- Muscle weakness
- Loss of independence
- Cognitive decline
- Anxiety and depression
- Increased need for caregiver and community support



Recovery may be slower and less complete.



Assess function, mental health and social support routinely

5 ACTIONS FOR HEALTHCARE PROFESSIONALS

1

ASK PROACTIVELY

Screen for persistent symptoms

Fatigue, breathlessness, cognitive changes, sleep problems, chest pain

2

MONITOR CHRONIC DISEASE RISK

- Blood glucose
- Blood pressure
- Cardiac symptoms

Detect new or worsening conditions early

3

SUPPORT RECOVERY

- Gradual return to activity
- Tailored rehabilitation

Consider cognitive and mental health screening

4

WORK AS A TEAM

- GP / Primary care
- Specialists
- Physiotherapists
- Psychologists
- Social workers

Coordinate and communicate clearly

5

REASSURE AND EDUCATE

- Validate symptoms
- Set realistic expectations
- Encourage self-management

Build trust and empower patients

REMEMBER



RECOGNISE
Long COVID



MONITOR
Chronic disease risk



COORDINATE
Multidisciplinary care



SUPPORT
Recovery and quality of life



COVID-19 RECOVERY MAY LAST MONTHS – NOT DAYS



EARLY RECOGNITION + CONTINUOUS CARE = BETTER OUTCOMES

Practical Recommendations

1 Ask proactively about persistent symptoms



During routine consultations, ask patients about ongoing symptoms following COVID-19, even if the initial infection was mild. Fatigue, breathlessness, and cognitive changes are commonly underreported. Targeted questions allow early recognition, timely assessment, and referral where needed.

2 Screen for new or worsening chronic conditions



Monitor for signs of new-onset diabetes, cardiovascular complications, or deterioration in existing conditions. This may include checking blood glucose levels, blood pressure, and cardiac symptoms. Integrating this screening into post-COVID follow-up can help detect complications early.

3 Support functional recovery in older adults



Encourage gradual return to physical activity, tailored to the patient's capacity. Rehabilitation and activity planning should be individualised, as some patients experience symptom exacerbation following overexertion. Referral to physiotherapy or rehabilitation services can support mobility, strength, and independence. Also consider cognitive and mental health screening, particularly in patients who experienced prolonged isolation.

4 Adopt a multidisciplinary approach



Coordinate care across disciplines where possible. Patients with complex or persistent symptoms may benefit from combined input from medical, allied health, and psychosocial services. Clear communication between providers is key to avoiding fragmented care.

5 Provide reassurance and set realistic expectations



Recovery from Long COVID can be slow and variable. Acknowledge patient concerns, validate their experiences, and provide clear information about what to expect. Supporting self-management strategies and regular follow-up can help patients feel more in control of their recovery.

05

MODULE

Using behavioural science to support COVID-19 diagnosis and treatment in high-risk groups.

By Tracy Epton, University of Manchester, UK, Lisa Marie Warner, MSB Medical School Berlin, Germany, and Aleksandra Lazic, an independent researcher from Belgrade, Serbia

Working with high-risk patients around COVID-19 can feel like navigating several conversations at once. There's the clinical information we need to share, of course, but there's also everything patients bring with them – beliefs shaped by culture, experiences of healthcare, fears about stigma, mixed messages from social networks, and the pressures of everyday life. Behavioural science can help us untangle these threads and make the whole process smoother, more compassionate, and more effective.

One of the challenges begins right at the moment of diagnosis. Many clinicians worry about delivering sensitive

information, especially if they feel pressed for time or unsure how the patient will react. Meanwhile, patients may carry misinformation ("the tests aren't accurate", "COVID isn't serious anymore"), or they may be wary of the healthcare system based on past experiences. Some are afraid of what a diagnosis means for their job, their family, or their community.

When we step into this conversation, we're walking into a very human space, not just a medical one. People might find conversations about their health difficult – they might feel judged, embarrassed or worried they are making

poor health choices. If they feel this way, they may act defensively; for example, they might deny the need for treatment, downplay the severity of COVID-19, or believe that the treatment is ineffective. See Step 1 in the recommendations on how to create a safe space for diagnosis, correct misinformation and decrease the tendency to defensiveness.

Once the diagnosis has landed, the next challenge is motivation. Motivation rarely comes from risk information alone. Many patients with heightened risk, especially those who feel only mildly unwell or have no symptoms at all, may struggle to see why urgent treatment is necessary. Others doubt that antiviral treatments will help, or they worry about side effects. Some do not see themselves as "high-risk", or they may hold religious or cultural beliefs about medication that make the decision more complex. However, these concerns can often be addressed using behaviour change techniques (see Step 2).

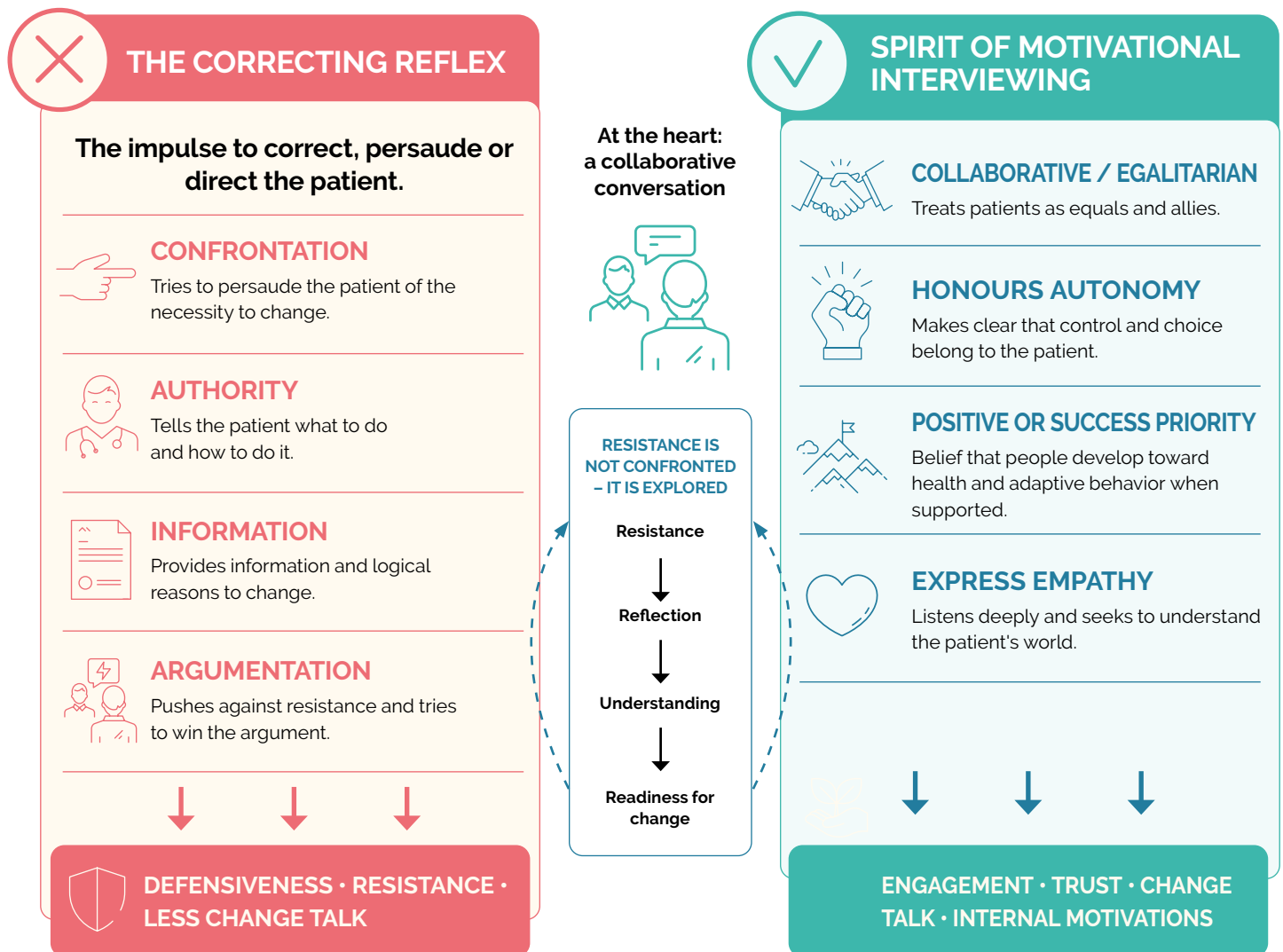
Even when a patient is fully motivated, they can face hurdles once treatment begins. They might forget to take medication, be confused about the instructions, or have competing responsibilities such as family or work. Simply feeling better after a day or two can also lead to early discontinuation. Adherence is not only about willingness – it's about how treatment fits into everyday routines. This can be supported through proactive planning (see Step 3). Supporting high-risk patients through COVID-19 diagnosis and treatment works best when behavioural science is combined with cultural sensitivity; the following recommendations should be grounded in both.



MOTIVATIONAL INTERVIEWING (MI)

Helping patients find their own motivation for change

Guiding instead of persuading



PRACTICAL TOOLS: OARS



PRINCIPLES OF MOTIVATIONAL INTERVIEWING

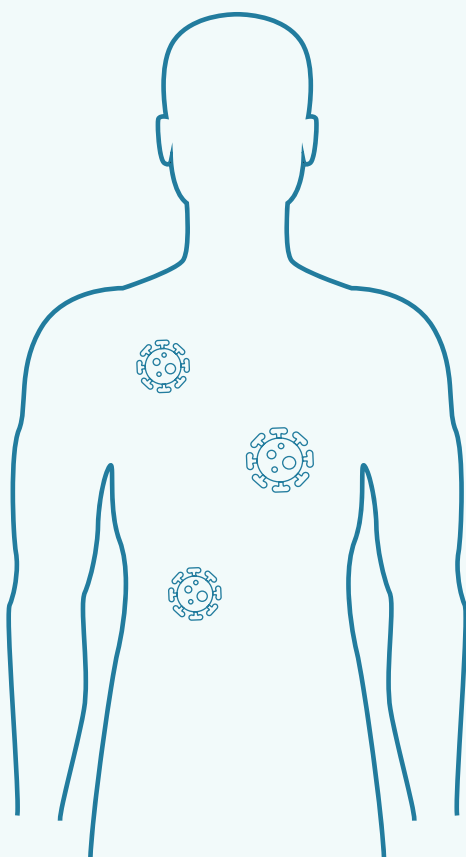


MI is a partnership. Our goal is not to change the patient, but to help them discover their own reasons and their own way forward.

VIRAL LOAD ON DAY 7 AFTER COVID-19 INFECTION

With the same risk profile in older adults

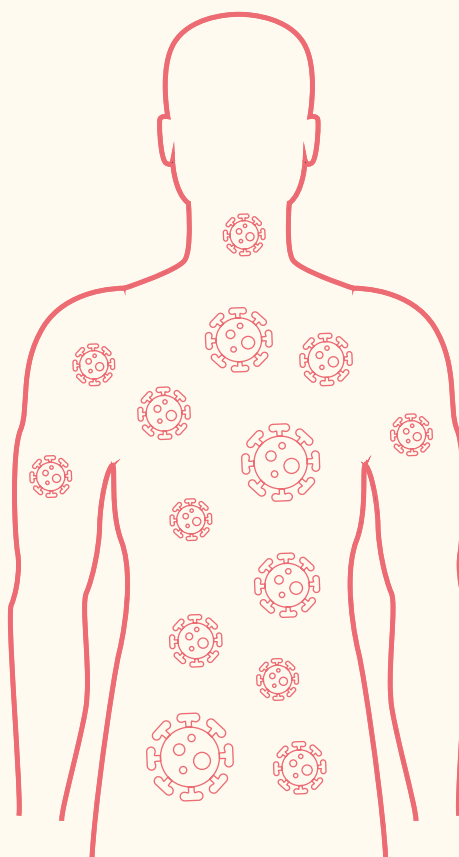
ANTIVIRAL TREATMENT



LOW VIRAL LOAD

Day 7 with treatment

NO TREATMENT



HIGH VIRAL LOAD

Day 7 without treatment



Faster decrease in viral load



Lower risk of complications and severe symptoms



Lower risk of hospitalisation, faster recovery

MAKE IT EASIER TO STAY ON TRACK

Action planning and barrier anticipation for taking medication

1

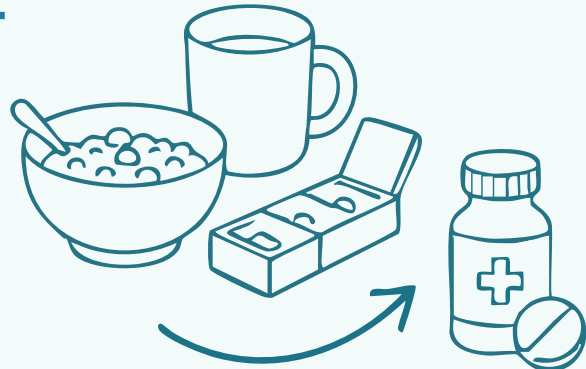
TRANSLATE TREATMENT INTO DAILY ROUTINES



Anchor medication to an existing habit



Use clear "if-then" structures



EXAMPLE LOGIC (NOT PATIENT-SPECIFIC)

If it is time for breakfast, then I take my COVID medication together with my regular tablets.



KEY PRINCIPLE: Familiar routines reduce effort and forgetting.

2

ANTICIPATE BARRIERS BEFORE THEY OCCUR



Time pressure



Competing medications



Forgetting



Fatigue or stress



KEY PRINCIPLE: Planning for barriers prevents disengagement.

3

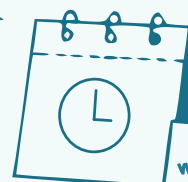
BUILD IN SUPPORT AND CUES



Social reminders
(family, calls, messages)



Environmental cues
(routine times, visible placement)



KEY PRINCIPLE: Support system strengthens follow-through



Plan ahead. Anticipate challenges.

USE ROUTINES AND SUPPORT TO STAY ON TRACK.

Practical Recommendations

step
1



Create a safe, respectful atmosphere when delivering the diagnosis.

Begin by affirming the patient's strengths or values – this helps reduce defensiveness and builds rapport. One method to decrease the risk of such defensive reactions is the so-called **"affirmation" approach**, in which patients are briefly encouraged to reflect on their personal strength and valued roles in life, such as being an important person to others – a caring partner, parent, or colleague – instead of focusing on the setback of infection. This may support self-esteem and increase the likelihood of accepting the diagnosis and next steps of treatment. When misinformation arises, correct it calmly by using a "fact sandwich": **share the fact, acknowledge the myth briefly, explain why it's inaccurate, and return to the fact**. Keeping explanations simple and culturally relevant is crucial, especially for patients with limited health literacy or limited language proficiency.

step
2



Use clear and engaging communication tools to support motivation.

Motivational interviewing techniques – open questions, reflective listening, and affirmations – can support patients in identifying their own reasons for considering treatment, which is far more effective than persuasion alone. **Narratives** – for example, a short story about another patient's experience – or **visual aids** in the form of infographics or illustrations – for example, a simple graphic showing viral load with and without treatment – can help explain why early treatment matters and make the risk of deterioration more tangible and easier to understand. Patients can also be encouraged to weigh their own pros and cons for treatment, **considering not only their personal health but how recovery may impact their social environment** (e.g., being there for family or maintaining close relationships). Particularly for older adults, the **emotionally meaningful and short-term benefits of a treatment** (e.g., recovering quickly to see the grandchild) can be more convincing than long term health goals (e.g., avoiding the risks associated with illness accumulation).

step
3



Support adherence through practical planning.

Work with the patient to build a concrete action plan – where medication will be kept, when doses will fit into daily routines, and what cues will prompt them. This makes adherence more manageable and less reliant on memory. **Implementation-intention strategies** ("If I'm at work when it's time for a dose, then I will...") help maintain treatment even when routines change. Pill organisers, alarms, and visual cues support consistent follow-through.



You can also help patients problem-solve by identifying potential barriers to taking their medication and potential solutions in advance. Encourage them to seek support from their social network, which may even welcome the opportunity to help.

Above all, culturally responsive care matters at every stage. Asking about beliefs, family roles, or preferred languages helps ensure the plan feels respectful and realistic. By combining rapport-building, motivational support, and practical planning, healthcare professionals can improve outcomes and reduce disparities for the patients who need it most.

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USING BEHAVIOURAL SCIENCE

TO IMPROVE COVID-19 CARE IN
HIGH-RISK POPULATIONS