



The following information resources have been selected by the National Health Library and Knowledge Service Evidence Virtual Team in response to your question. The resources are listed in our estimated order of relevance to practicing healthcare professionals confronted with this scenario in an Irish context. In respect of the evolving global situation and rapidly changing evidence base, it is advised to use hyperlinked sources in this document to ensure that the information you are disseminating to the public or applying in clinical practice is the most current, valid and accurate.

## YOUR QUESTION

What is the best evidence on care pathways for patients with COVID-19?  
What care pathways or models of care have been implemented internationally for COVID-19 suspected or confirmed positive patients?

Key themes emerging from the literature:

- The importance of optimising community delivered care
- Increased utilisation of telehealth/telemedicine

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## EVIDENCE SUMMARY

### What does the World Health Organization say?

#### [Operational considerations for case management of COVID-19 in health facility and community](#)<sup>1</sup>

Key action steps to be taken are presented by transmission scenario to enable timely surge of clinical operations. Strategic priorities are outlined by scenario, including the 7 recommended steps to deal with community transmission. Referral pathway overviews are provided for:

- Screening and Triage
- Hub and Spoke Model [community transmission]



## What does the international literature say?

### Europe

#### Health Protection Surveillance Centre and HSE

##### [Assessment and Testing Pathways for COVID-19<sup>2</sup>](#)

The HPSC has made available specific pathways such as: [COVID-19 Assessment and testing pathway for use in a hospital setting](#). The current HSE Operational Pathway of Care is also available [HERE](#).

#### The European Centre for Disease Prevention and Control

##### [Guidance for Health System contingency planning during widespread transmission of SARS-CoV-2 with high impact on healthcare services<sup>3</sup>](#)

ECDC provide guiding principles for contingency planning in primary care, hospital and long-term care settings. This features modifications to community care, inpatient and outpatient care which may be useful to consider when developing care pathways.

### Scotland

##### [COVID-19 CMO clinical advice 3 April 2020<sup>4</sup>](#)

This report provides a detailed outline of how care should be planned, organised and delivered:

- Community Assessment and Referral to Secondary Care [Section 4] and includes a 2-page clinical assessment tool for assessment at hospital or community management
- Anticipatory Care Plans in COVID-19 [Section 5]
- Hospital Admission and Management [Section 6]
- Critical Care [Section 7]
- Management of Special Populations [including flowcharts for Paediatric and Obstetric patients in Section 8]
- End-of-Life Care [Section 9]

The importance of Scotland's community hubs and assessment centres is emphasised. They will triage patients presenting with suspected COVID-19 to ensure that the best possible location of care is identified. It is vital they are adequately resourced and supported. **New pathways of care for patients are clearly described.**

The report also describes how care should be delivered in surge conditions:

- Prioritisation of active treatment for those acutely ill from all conditions
- Redeployment of staff and resources to deliver maximum level of care service, potentially in non-standard acute settings;
- Curtailment and suspension of non-emergency work such as elective surgery
- Utilisation of primary and community care to reduce demand on acute care settings and support patients discharged to home or to the community

It recommends a focus on best practice in alignment with the principles of realistic medicine:

- Identification of those who will benefit from medical interventions
- Provision of supportive or end-of-life care for all acutely ill patients in whom extensive medical interventions are futile
- Discussions with patients about their preferences in the event of becoming acutely unwell with COVID-19 or other illnesses
- Ensuring cohesive working across health and social care in Scotland to reduce unwarranted variation in care

## England

Much has been written about the evolving pathways of care in England for COVID-19 patients, with changes to primary care and the establishment of a dedicated temporary hospital, the NHS Nightingale London Hospital.

### **[COVID-19 and the rapid reorganisation of general practice: triage, hubs and pathways to care in hospital and the community: a discussion paper<sup>5</sup>](#)**

This discussion paper describes the reorganisation of general practice into 'cold' and 'hot' sites to reduce the rate of spread, optimise use of critical care beds and ensure high quality care for those choosing not to be admitted. It outlines the practical considerations, such as:

- Site location and configuration
- Electronic health record systems and digital solutions
- Preventing staff illness and PPE
- Practicalities of each potential point of assessment/pathway



- Professional education and learning
- Patient education

The discussion paper features a COVID-19 Hub Generic Model (5).

### **Greenhalgh et al. (2020). COVID-19: a remote assessment in primary care<sup>6</sup>**

Greenhalgh and colleagues determined that:

- Most patients with COVID-19 can be managed remotely with advice on symptomatic management and self-isolation
- Although such consultations can be done by telephone, in many cases video provides additional visual cues and therapeutic presence
- Breathlessness is a concerning symptom, though there is currently no validated tool for assessing it remotely
- Safety-netting advice is crucial because some patients deteriorate in week 2, most commonly with pneumonia

### **Razai et al. (2020). Coronavirus disease 2019 (COVID-19): a guide for UK GPs<sup>7</sup>**

This practical guide for GPs describes when to suspect COVID-19 and how to respond. Regarding care pathways it suggests that: "GP surgeries should develop protocols for managing patients with possible infection, including triaging remotely, postponing non-urgent services, isolation procedures, PPE provision, seeking specialist advice, decontamination, and collaborating with community services."

The BMJ also provides [INFOGRAPHICS](#) for GPs:

- [Assessment of people with COVID-19](#)
- [Remote consultation of COVID-19](#)



Twitter posts from Irish and British GPs:

Dr Trisha Greenhalgh:

- [Quick survey on hothubs](#)
- [Sharing her concerns about hothubs](#)

Dr Craig Seymour:

- [Islington General Practice patient pathway during COVID-19 pandemic:](#)

Dr Mark Murphy:

- [Ireland's plan to set up 40 "community assessment hubs"](#)

### **[NHS Nightingale London Hospital<sup>8</sup>](#)**

NHS Nightingale London, opened on April 3<sup>rd</sup> 2020, is a specially built hospital to care for patients who have already been intubated and ventilated at a London hospital and require further intensive care treatment for COVID-19. It provides up to 4,000 beds, fully equipped with ventilators and oxygen. These are a mixture of intensive care and recovery beds and it will use a multidisciplinary team approach.

According to the [BBC](#) three more temporary hospitals are to be built, in Birmingham, Manchester and Glasgow, and NHS England said other sites were being considered.

### **Italy**

#### **[White Paper: Patient Safety Recommendations for Covid19 Epidemic Outbreak: Lessons from the Italian Experience<sup>9</sup>](#)**

The Italian Network for Safety in Healthcare (INSH) has compiled key lessons on the optimal environment, team, equipment and staffing for COVID-19 patient care. It outlines 'reliable' pathways of care that they recommend for: diagnosis; hospital treatment; surgery; pregnant women; paediatric patients; hospital discharge; home isolation; quarantine; oncology and immunosuppressed patients; mortuary procedures; mental wellbeing of staff and patients.

It includes sample outcome measures which can support healthcare providers in monitoring their response to the pandemic and capacity to treat other commonly presenting conditions.

## **Nacoti et al. (2020). At the Epicenter of the COVID-19 Pandemic and Humanitarian Crises in Italy: Changing Perspectives on Preparation and Mitigation<sup>10</sup>**

Italian clinicians suggest that:

- Western health care systems have been built around the concept of patient-centred care but they recommend a move to epidemic community-centred care.
- Hospitals may be the main COVID-19 carriers, facilitating transmission from infected to uninfected patients.
- Massive deployment of outreach services is required. Home care and mobile clinics avoid unnecessary movements and release pressure from hospitals. Early oxygen therapy, pulse oximeters, and nutrition can be delivered to the homes of mildly ill and convalescent patients, setting up a broad surveillance system with adequate isolation and leveraging innovative telemedicine instruments.
- Hospitalisation should be limited by disease severity.
- Measures to prevent infection must be widely implemented, in all locations and including vehicles. Dedicated COVID-19 hospital pavilions and operators are required, separated from virus-free areas.
- This outbreak is a public health and humanitarian crisis and requires a broad response such as social scientists, epidemiologists, experts in logistics, psychologists, and social workers.
- A long-term plan for the next pandemic is required.

## **Pisano et al. (2020). Lessons from Italy's Response to Coronavirus<sup>11</sup>**

This article highlights the importance of a shift from patient-centred models of care to a community-system approach that offers pandemic solutions for the entire population with a specific emphasis on home care. A comparison of Lombardy and Veneto's approaches to COVID-19 is outlined. Veneto's strategy was multi-pronged and more effective:

- Extensive testing of symptomatic and asymptomatic cases early on.
- Proactive tracing of potential positives: families and neighbours.
- A strong emphasis on home diagnosis and care. Whenever possible, samples were collected directly from a patient's home and then processed in regional and local university labs.
- Specific efforts to monitor and protect health care and other essential workers.

The authors highlight the importance of learning from strategies and policies in Italy and elsewhere and of collecting and disseminating accurate data.

## Asia

### China

#### **Handbook of COVID-19 Prevention and Treatment**<sup>12</sup>

This handbook which outlines experience from Chinese clinicians emphasises the importance of personalised, collaborative and multidisciplinary patient care (18-19): “A comprehensive multidisciplinary diagnosis and treatment mechanism has been established in which doctors both inside and outside the isolation wards can discuss patients’ conditions every day via video conference ... The goal of MDT discussion is to achieve personalized treatment. The treatment plan should be adjusted to each person when considering the differences among individuals, courses of disease, and patient types. Our experience is that MDT collaboration can greatly improve the effectiveness of the diagnosis and treatment of COVID-19.”

#### **Xihong (2020) [Presentation]. Learning from 26,000 cases in Wuhan**<sup>13</sup>

Suggested lessons using Chinese data with a view to directing the US approach:

- Centralised quarantine is effective, reducing household and community transmission
- Provision of accommodation for healthcare workers will help protect their families
- Undiagnosed community cases, some of which are asymptomatic, will infect others which underscores the importance of widespread testing
- A multi-pronged approach is necessary: screening; mitigation and suppression
- Protect vulnerable groups: healthcare workers; elderly people; family members and close contacts; children [as their risk may increase with time periods]
- Early diagnosis and early medical care are essential

## South Korea

### **[Park et al. \(2020\). Out-of-Hospital Cohort Treatment of Coronavirus Disease 2019 Patients with Mild Symptoms in Korea: an Experience from a Single Community Treatment Center<sup>14</sup>](#)**

To allocate medical resources efficiently, Korea implemented the Community Treatment Center (CTC) to treat patients with cohort isolation out of hospital. The CTC is an independent building outside a hospital based on the concept that patients with mild symptoms do not require advanced medical resources, although they require isolation to prevent transmission and active surveillance. Utilising CTCs has several advantages compared to isolating patients at home: strict isolation with active surveillance of patients is possible; it also lowers the risk associated with collecting viral specimens and the possibility of cross-infections. The article outlines the CTC's: staffing, organisation, diagnostic and protective equipment used including the use of apps to reduce the need for clinician patient physical contact, patient monitoring and the exclusion criteria for patients.

### **[Kwon et al. \(2020\). Drive-Through Screening Center for COVID-19: a Safe and Efficient Screening System against Massive Community Outbreak<sup>15</sup>](#)**

This article outlines the drive-through (DT) screening centre concept which has been adapted in Ireland and elsewhere. It describes the concept, advantages, and limitations of the COVID-19 DT screening centres. The steps of the DT centres include registration, examination, specimen collection, and instructions. The entire service takes about 10 minutes for one testee without leaving his or her cars. Increased testing capacity over 100 tests per day and prevention of cross-infection between testees in the waiting space are the major advantages, while protection of staff from the outdoor atmosphere is challenging.

### **[McCarthy \(2020\) \[News article\] What South Korea can teach Ireland about fighting COVID-19<sup>16</sup>](#)**

This article describes the strategies being successfully utilised by South Korea to ensure early patient identification, widespread and expedited testing, patient isolation and communication.

## Australia

### [Australia. Department of Health \(2020\). Australian Health Sector Emergency Response Plan for Novel Coronavirus \(COVID-19\)<sup>17</sup>](#)

This high-level document provides an overview of the Australian national approach (Part 1) and their operational plan (Part 2). It outlines key activities in each stage of the COVID-19 Plan and outlines scenarios depending on disease severity and escalation plans. The need for a flexible and proportionate response is emphasised throughout.

Part 2, the operational plan, includes resource issues, infection prevention and control and strategies to support and maintain quality care. Specific patient care measures listed included consideration to use different strategies to treat mild cases where resources are overwhelmed. New models of care may be instituted to manage novel coronavirus patients, for example:

- innovative methods for contact tracing and diagnostic testing: call centres, at-home specimen collection etc.
- home based care, which may require contingency community services support [potentially telephone support]
- fever clinics staffed predominantly by nurses via management protocols, with onsite or telephone medical support
- adjustment of ICU staffing ratios and opening of new ICU beds or negative pressure rooms, where available (43)

### [National COVID-19 Clinical Evidence Taskforce \(Australia\). Evidence-based clinical guidelines<sup>18</sup>](#)

Living guidelines and decision flowcharts are in development. The currently available decision flowcharts are:

- [Management of patients with moderate to severe COVID-19](#)
- [Management of patients with severe to critical COVID-19](#)



## United States

### What do the Centers for Disease Control and Prevention (United States) say?

#### [Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease \(COVID-19\)<sup>19</sup>](#)

The CDC provides general advice regarding the clinical management and treatment of COVID-19: mild to moderate disease; severe disease; investigational therapeutics; and discontinuation of transmission-based precautions or home isolation.

Many academic papers from the US advocate the use of telehealth/telemedicine:

#### [Khairat et al. Interpreting COVID-19 and Virtual Care Trends: A Call for Action<sup>20</sup>](#)

“The use of virtual care presents promising potential in the fight against COVID-19. Virtual care is capable to reduce ER visits, conserve healthcare resources and avoid the spread of COVID-19 by treating patient remotely. We call on more adoption of virtual care by health systems across the US and the world during the COVID-19 pandemic.”

#### [Turner et al. \(2020\). Electronic Personal Protective Equipment: A Strategy to Protect Emergency Department Providers in the Age of COVID-19<sup>21</sup>](#)

This article looks at technology-based clinical evaluation, which serves to conserve personal protective equipment (PPE) and protect emergency providers.

#### [Mehrotra et al. \(2020\). Rapidly Converting to “Virtual Practices”: Outpatient Care in the Era of COVID-19<sup>22</sup>](#)

This article shares the experience of four centres in rapidly adopting telehealth to reduce patients attending and the number of nurses and physicians who physically staff the office. They are increasing telehealth modalities, including electronic messaging, within the patient portal, telephone calls, and video visits.



### **COVID-19: Experiences from Seattle Children's Hospital<sup>23</sup>**

This webinar recording outlines changes made to paediatric inpatient care in light of COVID-19:

- Heavy utilisation of Telemedicine to facilitate virtual rounding and to allow patients to communicate with family at home
- Revising their visiting policies
- Implementing mitigation strategies and measures to protect the workforce.
- Quality and safety considerations

Produced by the members of the National Health Library and Knowledge Service Evidence Team<sup>†</sup>. Current as at 8 April 2020. This evidence summary collates the best available evidence at the time of writing and **does not replace clinical judgement or guidance**. Emerging literature or subsequent developments in respect of COVID-19 may require amendment to the information or sources listed in the document. Although all reasonable care has been taken in the compilation of content, the National Health Library and Knowledge Service Evidence Team makes no representations or warranties expressed or implied as to the accuracy or suitability of the information or sources listed in the document. This evidence summary is the property of the National Health Library and Knowledge Service and subsequent re-use or distribution in whole or in part should include acknowledgement of the service.

The following PICO(T) was used as a basis for the evidence summary:

<b>P</b> Population person location condition/patient characteristic	COVID-19 PATIENTS
<b>I</b> Intervention length location type	CARE PATHWAYS
<b>C</b> Comparison another intervention no intervention location of the intervention	
<b>O</b> Outcome	

The following search strategy was used:

KEYWORD SEARCH FOR COVID-19 AND  
 PROTOCOL OR ALGORITHM OR CARE PLAN OR PATHWAY OR CHECKLIST OR MODEL OF CARE OR DECISION AID OR  
 FLOWCHART

<sup>†</sup> Maura Flynn, Librarian, Midland Regional Hospital, Tullamore, Offaly [Author]; Brendan Leen, Regional Librarian, HSE South, St. Luke's General Hospital, Kilkenny [Editor].

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- <sup>5</sup> National Institute for Health Research (6 April 2020). COVID-19 and the rapid reorganisation of general practice: Triage, hubs and pathways to care in hospital and the community: a discussion paper. Version 2. 6/4/20 <https://www.arc-swp.nihr.ac.uk/general-practice-hubs> [Accessed 7 April 2020].
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- <sup>10</sup> Nacoti et al. 21 March 202. At the Epicenter of the COVID-19 Pandemic and Humanitarian Crises in Italy: Changing Perspectives on Preparation and Mitigation. <https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0080> [Accessed 7 April 2020].
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