

# CLINICAL PATHWAY FOR INFLUENZA IN THE ELDERLY: A COMPREHENSIVE MANAGEMENT PROTOCOL OF MALAYSIA

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## ABSTRACT

### INTRODUCTION:

The clinical pathway (CP) is one of the most recommended tools for ensuring the best quality of care and has been proven to reduce the cost and time spent in hospital. The development of a CP for influenza is crucial, especially for the elderly, as they are vulnerable to influenza-related complications. The main aim of this study was to provide a comprehensive protocol for each component of influenza management among the elderly in Malaysia.

### METHOD:

An expert group meeting was conducted involving family medicine specialists, public health specialists, geriatricians, respiratory physicians and infectious disease physicians. The CP was designed following a 6-step protocol: 1) Selection of expert panel, 2) discussion and information gathering, 3) development of CP draft, 4) refinement of CP draft, 5) implementation of CP, and 6) finalisation of CP. The CP for influenza was designed based on service type and disease severity.

### RESULTS:

The panel described both outpatient and inpatient CPs for managing elderly patients with influenza. The outpatient CP covered mild and moderate influenza cases, while the inpatient CP addressed the management of moderate and severe

influenza. The estimated length of hospital stay for moderate and severe influenza cases with pneumonia was 6 and 14 days, respectively.

## CONCLUSION:

The CP for influenza supports existing treatment according to illness severity leveraged on current clinical practice guidelines and the best-care practices in primary and tertiary care settings. Continuous use of the CP is required to assess its effectiveness, thereby enabling optimisation of the healthcare process in influenza treatment.

## KEYWORDS

Clinical Pathway, Influenza, Elderly, Malaysia

## INTRODUCTION

Influenza is a febrile illness mainly affecting the respiratory tract; it is highly infectious and is associated with excess hospitalisation [1]. Worldwide, influenza results in an estimated 3–5 million severe cases and about 290,000–650,000 respiratory deaths annually, with an estimated 90% of the deaths occurring among senior citizens [1,2]. Influenza is characterised by symptoms that include the sudden onset of fever (38–40°C), cough (usually dry), headaches, myalgia, sore throat and respiratory tract inflammation. Most patients recover from fever and other symptoms within a week without requiring medical attention. However, people at high risk, particularly the elderly, are susceptible to more serious life-threatening complications such as pneumonia, chronic heart and lung diseases [3]. Furthermore, the cell-mediated immune response needed to clear the influenza virus from the lungs declines with age, causing influenza to last longer in elderly patients [4]. In general, such patients are more likely to experience hospitalisation, intensive care admission or death compared to other age groups [5]. As influenza-related hospitalisations are more frequent and prolonged among the elderly, influenza is likely to contribute to significant costs to healthcare providers and patients.

Malaysia is expected to become an ageing nation by 2030, with the elderly population estimated to comprise 15% of the total population [6]. The majority of older people in this country are retired, have no established income and are entirely dependent on the public healthcare system. Hence, this population group is vulnerable to the clinical and economic burden of influenza due to the costly treatment of influenza, especially those with comorbid diseases. Apart from improving patient care efficiency to an optimum and more comprehensive level, the

development of evidence-based treatment guidelines is crucial for reducing treatment costs.

Clinical pathways (CPs) are one of the most recommended tools for minimising the variations in each clinical process for improving medical treatment. The main aim of a CP is to enhance the quality of care across the continuum by improving risk-adjusted patient outcomes, promoting patient safety, increasing patient satisfaction and optimising the use of resources [7]. The European Pathway Association defines a CP as a complex intervention that involves a mutual decision-making process for a group of patients based on the principles of evidence, best practice and patient expectations [8]. It also involves coordinating the activities between physicians, case managers, nurses, pharmacists, physiotherapists and other health professionals [7,9]. Following that, CPs ensure that the best quality of care is delivered and have reduced the cost and time spent in hospital [10–14]. Historically, CPs were designed mainly for inpatient care to assist health care providers in delivering more effective and efficient care, which subsequently contributes to a shorter length of hospital stay. In recent years, CPs have also been developed for outpatients to support disease management in the primary care setting, such as periodontitis and primary care-based longer-term stroke care [15,16]. CPs have been widely established and used in hospitals mainly in the developed countries such as the United Kingdom, Australia, New Zealand, the United States, Canada, Japan, Germany and Belgium [7,17]. In Southeast Asia, the use of CPs in Indonesia and Singapore has been rising rapidly in the last decade [12,18].

Health expenditure in Malaysia has shown an upward trend throughout the years. Moreover, it is difficult to acquire information on the estimated cost of treatment of

particular diseases, as most of the existing studies were not performed in detail. The procedures and activities used for treatment CPs will help healthcare managers estimate the cost of each illness, thereby aiding their prevention of financial mismanagement. When minimising healthcare finances, healthcare policymakers face considerable challenges in controlling costs without compromising quality. In addition, this concern has become the rationale for the need for CP usage to provide cost-effective healthcare. To date, there are limited evidence on available guideline use in the clinical management of influenza in Malaysia healthcare system. Furthermore, there are considerable variations in the management of influenza patients, especially patients with severe influenza with pneumonia [19]. The main aim of the present study was to identify a comprehensive CP for each component of influenza management specifically among the elderly in Malaysia. The development of a CP for influenza in Malaysia will support existing treatments and be consistent with the available influenza management guidelines for both outpatient and inpatient care.

## METHODS

We developed a CP for influenza with cooperation and collaboration between various disciplines (interdisciplinary and multidisciplinary) involved in treating the disease. Active involvement is needed to construct a comprehensive and reliable CP. Developing the CP for influenza among the elderly involved six steps: 1) formation of the team, 2) discussion and information gathering, 3) development of the CP draft, 4) refinement of the CP draft, 5) implementation and evaluation of the CP, and 6) finalisation of the CP [7,20].

### 1. Formation of the Team

The team was selected based on their direct involvement in influenza treatment and management. The research team identified family medicine specialists, public health specialists, geriatricians, respiratory physicians and infectious disease physicians as the core discipline experts actively involved in managing influenza patients at primary care clinics and hospitals. The experts were selected based on their clinical expertise, experience and knowledge on the latest clinical practice guidelines and evidence-based recommendations. These experts were also able to share the best practice recommendations for conditions where healthcare services were lacking or inadequate.

### 2. Information Gathering

The healthcare procedures required in influenza treatment of elderly patients were discussed in several meetings. During the brainstorming session, each expert had the opportunity to describe the appropriate goals for meeting the patients' multidimensional needs, and all of the information to be documented was agreed upon. The activities were listed from the point of the patient attending primary care for mild to moderate influenza to their admission for inpatient treatment for moderate to severe influenza until discharge. The key objectives were to specify the criteria and symptoms differentiating each severity level and to outline all activities involved in relation to managing influenza patients at the hospital and clinic.

### 3. Development of the CP Draft

The assessment outcomes were interpreted into the basics of care, which were detailed in local protocols, including the sequence of procedures and expected patient progress over the period, by implementing the general format of the CP template [21]. Based on the discussion, the CP for influenza was divided into outpatient and inpatient care based on severity (mild, moderate or severe). The main CP components were time, activities or intervention and final treatment outcome. The care activities included the assessment by the consultant, medical officer or other health personnel, and the type of investigation or treatment arranged for the patient. The medications, diet plans, education or medical advice, referral and discharge plans provided to the patient each day were also obtained.

### 4. Refinement of the CP Draft

The developed CP draft was disseminated to all team members for review. Feedback from each discipline was obtained to ensure that each activity in the pathway depicted current and comprehensive practice and were agreed upon by all disciplines. The experts' response and additional information on the activities in the CP draft were evaluated for improvement of the final draft. The initial draft was presented to the team to obtain consensus on the completed draft before the CP for influenza among elderly patients was implemented in clinical practice.

### 5. Implementation and Evaluation of the CP

The implementation of a CP is the most crucial and challenging phase. Cooperation and teamwork from the healthcare managers and supporting staff handling the CP are indispensable. During the pilot phase, the case manager was required to document any variances that

had occurred in the CP. The researchers and experts involved in the CP reviewed the details and variance gathered to continue evaluating and improving the activities in the CP for influenza.

## 6. Finalisation of the CP

The final CP draft, outlined in Gantt chart format, was accomplished by translating the detailed protocol involved in managing influenza treatment from the collected feedback and evaluation from the pilot implementation. Finally, the complete CP could be utilised continuously and its effectiveness in controlling the medical cost could be assessed and to improve the quality of care.

## RESULTS

We established a CP for influenza via multidisciplinary clinician specialists, including family medicine specialists, public health specialists, geriatricians, respiratory physicians and infectious disease physicians. The development of the CP began with segregating the clinical characteristics and criteria for each influenza severity (mild, moderate, severe) and by the type of service care (inpatient and outpatient). The outpatient care CP was separated into mild and moderate cases whilst that for inpatient care was separated into moderate and severe influenza with pneumonia cases.

For mild cases, one visit is necessary for outpatient care services and the patient receives symptomatic treatment (Table 1). However, the infection may progress if the symptoms persist or worsen. In that circumstance, the patient requires further treatment and investigation following the CP for moderate cases (Table 2). Generally, elderly patients with moderate influenza require two visits at outpatient primary care services. They typically present with complicated illness and atypical signs, including diarrhoea, myalgia and fatigue with respiratory symptoms. Additional investigation and the use of antibiotics or antiviral agents, particularly Tamiflu®, or Oseltamivir, are recommended if the indications for use are fulfilled. Investigations and laboratory tests performed during the first visit have to be repeated in one week, especially if the initial results are abnormal. Also, as a safety net, the patient or their caregiver should be educated on the warning signs of deterioration or requiring admission. Home assessment tools are advised, apart from advocating soft diet and adequate fluid intake to prevent dehydration.

In this study, we developed a CP for hospitalised elderly patients with moderate influenza, considering the high risk of developing serious flu-related complications if they were infected with the virus (Table 3). The inpatient care CP begins with an assessment by the consultant or medical officer, where the patient undergoes a Comprehensive Geriatric Assessment (CGA). Subsequently, a thorough physical examination, including that for mental status, is performed, and medical history is taken before the patient is offered any treatment. Furthermore, monitoring investigations during admission such as full blood count, renal profile, liver function test, chest x-ray and C-Reactive Protein (CRP) test are repeated on day 2 and 5. Diagnostic tests, involving sputum culture and sensitivity testing, and blood cultures, are conducted twice during the entire hospitalisation duration. At the same time, antiviral agents and antibiotics Azithromycin and Augmentin® (Amoxicillin-Clavulanic Acid) are to be administered intravenously initially, then orally for total of six days. The patient will also have to be referred to the clinical pharmacist for medication reconciliation and review and to the physiotherapist for chest and mobility physiotherapy.

The experts in the team concurred that the average length of hospital stay for severe influenza with pneumonia was 14 days (Table 4). Above all, the daily consultant and medical officer assessments for examining the patient's oxygen saturation, blood pressure, pulse rate and mental status are maintained. Following that, procedural investigations are conducted based on the patient's clinical progress and requirements. Progress review and assessment carried out by nurses to monitor the patient's illness during the entire care episode. They also play an important role in increasing patient knowledge about preventing and managing medical conditions. Further, health education and the role of clinical pharmacists, physiotherapists, occupational therapists, dietitians and speech therapists in managing elderly patients with severe influenza are crucial for these health care providers to understand the disease and educate the patient on the various aspects of their condition to avoid other complications and reduce mortality. In the course of discharge, the patient is assigned a summary note to undergo rehabilitation to review their health status. Moreover, a 1-month influenza vaccination plan is recommended after discharge or as suggested by the clinician to provide better protection against the influenza virus.

TABLE 1: CLINICAL PATHWAY OF INFLUENZA FOR OUTPATIENT (MILD)

Activities	Visit 1 Date:
<b>Assessment</b>	5 to 10 minutes by Medical Assistant/Medical Officer
<b>Investigations</b>	Assess clinically
<b>Medications</b>	Symptomatic treatment: antihistamine antitussive antipyretic antiemetic
<b>Diet</b>	Lots of fluids/food Soft diet
<b>Teaching</b>	Warning sign Patient education
<b>Referral</b>	-
<b>Outcome</b>	May progress or get well
<b>Discharge Plan</b>	No follow up unless symptoms persist or worsen

TABLE 2: CLINICAL PATHWAY OF INFLUENZA FOR OUTPATIENT (MODERATE)

Activities	Visit 1 Date:	Visit 2 Date: After 1 week from Visit 1
<b>Assessment</b>	15-30 minutes (SOB & Respiratory distress) (MA/MO/FMS)	15 - 60 minutes (MA/MO/FMS)
<b>Investigations</b>	FBC Chest x ray Urine Creatinine (BUSE) Renal Profile (RP) Urine Ketone/Blood Ketone if RP not available Random blood sugar test (Dextrostix)	FBC Chest x ray Urine Creatinine (BUSE) Renal Profile (RP) Urine Ketone/Blood Ketone if RP not available Random blood sugar test (Dextrostix)
<b>Medications</b>	TamiFlu® (high risk/comorbid) Antibiotic	TamiFlu® (high risk/comorbid) Antibiotic
<b>Diet</b>	Lots of fluids/food Soft diet	Lots of fluids/food Soft diet
<b>Teaching</b>	Warning sign Patient education	Warning sign Patient education Home assessment tools
<b>Referral</b>	EM Specialist: 30 minutes	EM Specialist: 30 minutes
<b>Outcome</b>	-	Admission to hospital
<b>Discharge Plan</b>	Follow-up after 1 week	Discharge. Admission to hospital if conditions become severe.

Abbreviations: SOB, shortness of breath; MA, Medical Assistant; MO, Medical Officer; FMS, Family Medicine Specialist; BUSE, blood urea and serum electrolyte; EM, Emergency Medicine

## DISCUSSION

In the present study, we created a CP that could be used for guiding the management of influenza in elderly patients. CPs are a common component in the healthcare setting for sustaining and supporting quality improvement aimed at organizing and standardising care processes [22]. The team members involved in developing the CP were mainly responsible for supervising influenza patients. They were expected to comprehend their responsibilities and roles to successfully produce an effective CP. The lack of involvement of physicians in patient management has been identified as the main obstacle to the success of a CP [23]. The expert panel agreed on separating the CP into four pathways mainly for outpatient and inpatient influenza cases according to severity. The influenza-related symptoms in each classification of the CP were discussed. This is a shift from the majority of available guidelines on the management of influenza patients, which focus more on severe or progressive clinical illness [24,25]. Our study provides more information on treatment procedures according to severity to aid decision-making by health managers beginning at the early stage of the disease. Additionally, early initiation of influenza treatment and timely medical treatment reduce the length of hospital stay, especially among those with severe influenza [26].

The design of the CP covers a full course of influenza management from screening, disease investigation, treatment and supportive care to discharge plans and preventive measures. These procedures can be planned and executed such that they are most advantageous for the organisation and its patients. Furthermore, desirable outcomes can be established and monitored, and capacity and resources can be provided to help improve both quality and efficiency. Elderly patients with influenza require careful attention and immediate treatment, as they are vulnerable to developing influenza-related complications. In the present study, we suggest that antivirals or antibiotics be started for elderly patients with moderate and severe influenza with pneumonia. Moreover, it is also recommended that this high-risk group be treated with Oseltamivir or Zanamivir as soon as possible whenever they have uncomplicated illness due to confirmed or strongly suspected with virus infection [27]. Furthermore, there is evidence that antiviral therapy successfully reduces the burden in an influenza pandemics in high risk group aged 5 to 65 years and healthcare workers [28].

In hospitals, patients with influenza-related pneumonia and severe influenza-related complications are at high risk of death and should be managed as having severe pneumonia [24]. Needless to say, the elderly population are at increased risk for contracting pneumonia, especially those with comorbid risk factors such as hypertension, heart disease, other cardiovascular diseases and diabetes [29]. The other serious complications triggered by influenza include myocarditis, encephalitis, multiorgan failure, severe dehydration and exacerbation of underlying chronic disease (such as asthma, chronic obstructive pulmonary disease (COPD), renal insufficiency). It can also lead to the development of the life-threatening illness known as sepsis [30]. For these reasons, elderly patients are likely to stay longer in hospital due to complications and comorbid conditions-related problems. Primarily in the geriatric ward, most patients exhibit a slow recovery rate and also experience mobility difficulty. Further investigation and repeated testing are important and should be conducted to obtain useful diagnostic and prognostic information on other related complications. Therefore, investigations such as chest radiography and laboratory tests, i.e. full blood count, serum creatinine, blood urea nitrogen, glucose, electrolytes and liver function testing, should be determined for influenza patients thought to have pneumonia.

Globally, many CP treatments have been implemented to evaluate the impact of a CP on the average length of hospital stay associated with the illness. The majority of the outcomes has shown a positive impact, with decreases in days with using CP treatment [10,12,14]. A comprehensive action plan would allow better continuity of the implementation process. Certainly, further studies should be conducted to determine the impact of influenza CP treatment on the length of hospital stay to strengthen the evidence on the effectiveness and sustainability of healthcare quality. In addition, CP implementation would facilitate healthcare processes across different clinical departments by presenting best practice principles and a safety culture in healthcare settings [31]. Besides, the application of a CP would aid standardisation in healthcare services management. Health care standardisation is greatly beneficial because it not only promotes services implementation, but also aids assessment of the disease course and treatment results [32]. As the elderly are a vaccine priority group, first-line prevention measures are strongly recommended. In Malaysia, influenza vaccines are currently only subsidised for healthcare workers, but vaccination is strongly

recommended for pilgrims and the elderly with  $\geq 1$  chronic illnesses who are travelling to Saudi Arabia [33]. Therefore, economic evaluation of influenza vaccines is crucial for providing evidence-based information to policymakers and stakeholders on the cost–benefits of implementing a national influenza immunisation program for the elderly. Using this CP would enable estimation of the cost of influenza treatment, and further research can be conducted to determine the economic impact of the illness and strengthen the evidence on the economic evaluation of influenza, especially among the elderly.

The CP management usage scope is not universal, and the various patient and physician needs as well as resources availability in healthcare facilities, be it the public or private sector, will affect compliance. In addition, continuous use of the CP in healthcare settings should be implemented to provide feedback based on the issues and challenges encountered. Further, analysis of the variances in practice will yield further recommendations and improvements to the existing CPs in each healthcare setting, allowing for long-term sustainability of the CPs and simultaneously enhancing the healthcare system.

## CONCLUSION

The CP for influenza is a detailed protocol for managing influenza in elderly patients in Malaysia, spanning primary care to tertiary care and being based on illness severity and presentation at the healthcare facility. Early detection of influenza may help lessen the symptoms of the flu by initiate necessary treatment and avoid unhelpful medications. Furthermore, influenza screening in elderly may help inform decisions on infection prevention and control practices such as vaccination program among the elderly. The CP also provides a basis for further economic evaluation of the effectiveness of influenza management and prevention. Further study on the implementation of influenza CP is recommended to evaluate the impact in length of stays and resource use in healthcare setting.

## ETHICS STATEMENT

This research was approved by the Universiti Kebangsaan Malaysia (UKM) Research Committee (UKM PPI/111/8/JEP-2021-603) and the Medical Research Committee, Faculty of Medicine, UKM (FF-2021-353).

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## CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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**TABLE 3: CLINICAL PATHWAY OF INFLUENZA FOR INPATIENT (MODERATE)**

Activities	Day 1 Date:	Day 2 Date:	Day 3 Date:	Day 4 Date:	Day 5 Date:	Day 6 Date:
<b>Assessment</b>	Consultants: 5 -10 minutes. MO/HO: 20-30 minutes Comprehensive Geriatric Assessment (CGA) in Geriatric facility. MO/HO: 60 minutes. History taking and full physical examinations. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Daily ward rounds by HO and MO: 5-10 minutes. Nurse:Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Consultants: 3-5 minutes. Daily ward rounds by HO and MO: 5-10 minutes. Nurse : Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Daily ward rounds by HO and MO: 5-10 minutes. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Consultants: 3-5 minutes Daily ward rounds by HO and MO: 5-10 minutes Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Daily ward rounds by HO and MO: 5-10 minutes Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).
<b>Investigations</b>	FBC Renal Profile Liver Function Test Chest X-ray CRP Sputum culture & sensitivity Blood culture Arterial blood gas	FBC Renal Profile Liver Function Test Chest X-ray CRP Arterial blood gas	-	-	FBC Renal Profile Liver Function Test Chest X-ray CRP Sputum culture & sensitivity Blood culture Arterial blood gas	-
<b>Treatment &amp; Medications</b>	TamiFlu® 75 mg (bd) Antibiotic Azithromycin 500 mg (od) (oral) Augmentin 1.2 gram (tds) (IV) IV Drip	TamiFlu® 75 mg (bd) Antibiotic Azithromycin 500 mg (od) (oral)	TamiFlu® 75 mg (bd) Antibiotic Azithromycin 500 mg (od) (oral)	TamiFlu® 75 mg (bd) Antibiotic Augmentin 1.2 gram (tds) (IV) IV Drip	TamiFlu® 75 mg (bd) Antibiotic Augmentin 1.2 gram (tds) (IV)	Antibiotic (oral) Augmentin 1.2 gram (tds) (Oral)

	Paracetamol Oxygen	Augmentin 1.2 gram (tds) (IV) IV Drip Paracetamol Oxygen	Augmentin 1.2 gram (tds) (IV) IV Drip Paracetamol Oxygen	Oxygen		
<b>Diet</b>	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding
<b>Teaching</b>	Health Education	-	-	-	-	-
<b>Referral</b>	Clinical Pharmacist Physiotherapist Chest and mobility physio	-	-	-	-	-
<b>Discharge Plan</b>	-	-	-	-	-	Rehabilitation (Outpatient visit) Review at Health Clinic if required e.g.: for blood pressure control and medication continuation or follow up for comorbidities. (Discharge summary notes will be given to patient upon discharge). Plan for vaccination (after 1 month from discharged)

Abbreviations: MO, Medical Officer; HO, House Officer; IV, intravenous; FBC, full blood count; CRP, C-Reactive Protein

**TABLE 4: CLINICAL PATHWAY OF INFLUENZA FOR INPATIENT (SEVERE WITH PNEUMONIA)**

Activities	Day 1 Date:	Day 2 Date:	Day 3 Date:	Day 4 Date:	Day 5 Date:	Day 6 – 8 Date:	Day 9 – 11 Date:	Day 12 – 14 Date:
<b>Assessment</b>	Consultants: 10 -20 minutes. MO/HO: 20-30 minutes. Comprehensive Geriatric Assessment (CGA) (Geriatric facility). MO/HO: 60 minutes. History taking and full physical examinations (additional information may be added up during the hospital stay). Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	MO/HO: 20-30 minutes. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Consultants: 3-5 minutes. MO/HO: 20-30 minutes. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	MO/HO: 20-30 minutes. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Consultants: 3-5 minutes. MO/HO: 20-30 minutes. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	MO/HO: 20-30 minutes. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Consultants: 3-5 minutes. MO/HO: 20-30 minutes. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).	Consultants: 3-5 minutes. MO/HO: 20-30 minutes. Nurse: Oxygen saturations/ blood pressure/pulse rate every 4 hourly. Mental status: orientation to time/place/person (if Glasgow Coma Scale <15, to start GCS charting 4 hourly).
<b>Investigations</b>	FBC Renal Profile Liver Function Test (LFT) Chest X-ray CRP Sputum culture & sensitivity Blood culture Arterial blood gas (ABG) Rapid antigen test (Influenza A&B)	FBC Renal Profile Liver Function Test (LFT) Chest X-ray CRP Arterial blood gas (ABG)	FBC Renal Profile Sputum culture & sensitivity Chest X-ray CRP Arterial blood gas (ABG)	FBC Renal Profile Chest X-ray CRP Arterial blood gas (ABG)	FBC Renal Profile Chest X-ray CRP Arterial blood gas (ABG)	FBC Renal Profile Chest X-ray CRP Arterial blood gas (ABG) Liver Function Test (LFT) Blood culture	FBC Renal Profile Chest X-ray CRP Arterial blood gas (ABG)	FBC Renal Profile Chest X-ray CRP Arterial blood gas (ABG)

ESR  
Urine FEME  
Blood Glucose  
ECG

<b>Medications</b>	TamiFlu® 75 mg (bd) Antibiotic Ceftriaxone 2gm (od) Azithromycin 500 mg (od) (oral) Augmentin 1.2 gram (tds) (IV) IV Drip Paracetamol Oxygen	TamiFlu® 75 mg (bd) Antibiotic Ceftriaxone 2gm (od) Azithromycin 500 mg (od) (oral) Augmentin 1.2 gram (tds) (IV) IV Drip Paracetamol Oxygen	TamiFlu® 75 mg (bd) Antibiotic Ceftriaxone 2gm (od) Azithromycin 500 mg (od) (oral) Augmentin 1.2 gram (tds) (IV) IV Drip Paracetamol Oxygen	TamiFlu® 75 mg (bd) Antibiotic Ceftriaxone 2gm (od) Augmentin 1.2 gram (tds) (IV) IV Drip Paracetamol Oxygen	TamiFlu® 75 mg (bd) Antibiotic Ceftriaxone 2gm (od) Augmentin 1.2 gram (tds) (IV) IV Drip Paracetamol Oxygen	Antibiotic Ceftriaxone 2gm (od) Augmentin 1.2 gram (tds) (IV) IV Drip Paracetamol Oxygen	Paracetamol Oxygen KIV Antibiotic	Paracetamol Oxygen KIV Antibiotic	
<b>Diet</b>	Soft diet / parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	Soft diet/parenteral feeding	
<b>Teaching Referral</b>	Health Education Clinical Pharmacist Physiotherapist Chest and mobility physio Dietitian Speech therapist OT	- Physiotherapist Chest and mobility physio	- Physiotherapist Chest and mobility physio	- Physiotherapist Chest and mobility physio	- Physiotherapist Chest and mobility physio Dietitian Speech therapist	- Physiotherapist Chest and mobility physio Dietitian Speech therapist	- Physiotherapist Chest and mobility physio Dietitian Speech therapist	- Physiotherapist Chest and mobility physio Dietitian Speech therapist	- Physiotherapist Chest and mobility physio Dietitian Speech therapist
<b>Discharge Plan</b>	-	-	-	-	-	-	-	Rehabilitation (Outpatient visit). Review at Health Clinic if required e.g.:	

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for blood pressure control and medication continuation or follow up for comorbidities. (Discharge summary notes will be given to patient upon discharge). Plan for vaccination (after 1 month from discharged).

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Abbreviations: MO, Medical Officer; HO, House Officer; IV, intravenous; FBC, full blood count; FEME, full examination microscopic examination; OT, occupational therapist; CRP, C-Reactive Protein