



Clinical Communiqué >



Next Edition: September 2019

Editorial

Dr Nicola Cunningham

Welcome to the second edition of the Clinical Communiqué for 2019, a landmark edition for this publication coinciding with the launch of our new design and revamped website – we hope you enjoy the new look. Five years on from the return of the Communiqué, we continue to strive to provide a publication that engages and educates using the lessons learned from healthcare-related deaths – for many more years to come.

We saw a fantastic response to our recent edition on human factors (Clinical Communiqué Volume 6. Issue 1. March 2019 Edition). It is very encouraging to hear that clinicians want to look deeper and understand more about their work, and the environment in which they perform. The study of human factors is helping us to understand that humans are not the root of the problem, but they are certainly part of the solution. Individuals can invoke changes that affect entire systems. We do not have to look too far to see people who are working hard to improve things in our workplaces, often against the odds. Stop and say to them – well done for trying, and ask if there is anything you can do to support them to make our healthcare systems safer.

That edition made us reflect on how much industries are learning from each other. Medicine has been learning from aviation. Aviation is learning from the gaming industry, the gaming industry learns from marketing, and on it goes. So, what does medicine have to offer to other industries? Sometimes it can feel like our industry sits far behind, constantly having to look outwards to understand how things can be done better. That is not the case however. As commentators in one article noted* - *“One of the most important lessons that other industries can learn from healthcare is the importance of focusing on the customer, or in the case of healthcare, the patient. The patient is clearly at the center of today’s healthcare models.”* (Susan A. Cantrell, RPh, CAE, CEO, AMCP). *“Healthcare presents some unique problems that most other industries do not experience to the same degree - intense all pervasive regulation being the most notable. Other industries can learn how healthcare companies cope with and manage with the heavy compliance oversight but still improve outcomes for their patients and shareholders/stakeholders.”* (David Schmidt, president of the TPG International Health Academy, Managed Healthcare Executive editorial advisor). As much as we can learn from other industries, we should also learn from our own and recognise our strengths and improvements, even when they arise from tragic circumstances.

In this edition, we turn to the issue of communicable diseases and the virus that is currently receiving plenty of attention in healthcare and in the media. We present one coroner’s finding into the deaths of two patients from Influenza A.

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Editorial (Continued)

Both patients died ten years ago, and although the subtype of influenza viruses change seasonally, ten years later, in 2019 we are facing another Influenza A epidemic and need to be alert to the presenting features and complications of the disease.

To accompany our case summary, we are very fortunate to have two expert commentaries that serve as a timely reminder of what to think about as we experience yet another 'flu season'. What is the same, what is different now, and what do we need to do to keep patients safe? Professor Allen Cheng from Monash University and The Alfred Hospital provides an overview of the recognition and management of Influenza A illnesses. Dr Michelle van den Driesen from the Royal Melbourne Hospital offers an overview of pandemic influenza preparedness and outbreak management, and discusses some of the key considerations for healthcare organisations in dealing with the next influenza epidemic.

* Westgate A. Six things other industries can learn from healthcare. Managed Healthcare Executive. April 11, 2017. Accessed 21/06/2019. Available at: <https://www.managedhealthcareexecutive.com/business-strategy/six-things-other-industries-can-learn-healthcare>.



Case Report A swine of a diagnosis

Case Number 7/2012
(1303/2009 & 1554/2009)

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The following cases were heard as concurrent inquests into the deaths of two patients in 2009. The two patients were not known to each other, but they had both died in rural hospitals from complications associated with Influenza A H1N1 2009, pandemic swine flu.

Ms CF

i. Clinical Summary

Ms CF was a 41 year old female who did not have any significant past medical history. She presented in the early evening to a medical clinic with a four day history of flu-like symptoms, loss of appetite, and lethargy.

The night before she presented, she had developed diarrhoea,

nausea and dry-retching. At the clinic, Ms CF was seen by a general practitioner (GP) registrar (Dr V) who noted that she looked pale and dehydrated. On examination, she was febrile (temperature was 38.9 degrees Celsius) and tachycardic (heart rate was 121 beats per minute). She had a red throat but did not report any respiratory symptoms. Dr V diagnosed her with viral gastroenteritis and made arrangements for her to be admitted under his care at the local hospital for intravenous rehydration.

On admission, Ms CF's blood pressure (BP) was 108/66 mmHg. Over the course of the evening she received over two litres of intravenous fluids but was progressively more hypotensive with a BP reading at 10pm of 81/53 mmHg. Her tachycardia and temperature settled and she told the nurses she was feeling better.

At midnight, her BP was 75/54 and at 2am, the nurse on duty called

Dr V to report that Ms CF's BP had dropped to 72/46 mmHg. Dr V instructed the nurse to administer a 500ml bolus of saline over two hours and call him back if there were any concerns or changes.

Dr V reviewed Ms CF at 8:25am that morning and noted that her BP at 4am had been 75/46 mmHg and at 6am was 87/53 mmHg. She looked flat, and complained that she felt worse and was still experiencing diarrhoea. Dr V maintained a working diagnosis of gastroenteritis and made a plan for the nurses to continue with intravenous fluids and administer fluid boluses as needed. He then left the hospital to attend to his clinic patients.

Ms CF's blood pressure remained low throughout that day despite fluid therapy. At 4:45pm, nursing staff became concerned that she had deteriorated and was looking pale and clammy, and was grunting. Her BP had suddenly increased to 150/128 mmHg. The nursing staff

contacted Dr V who advised he would review Ms CF as soon as his clinic was finished.

In the meantime, he indicated that they should slow the rate of the intravenous fluids. Dr V then spoke to Dr A, a GP anaesthetist at the same clinic, who went to the hospital to see Ms CF.

Dr A arrived at the hospital just over an hour later, and found Ms CF cold and shutdown with a systolic BP of 70 mmHg. She was alert but agitated and in obvious respiratory distress. Dr A called for immediate assistance and began administering adrenaline with little improvement. Dr A proceeded to intubate Ms CF and make arrangements to transfer her to a metropolitan intensive care unit, however she arrested and did not respond to cardiopulmonary resuscitation. She was pronounced deceased at 8pm.

ii. Pathology

A forensic pathologist conducted a post-mortem examination of Ms CF and reported her cause of death as being due to Influenza A (H1N1 2009, pandemic swine flu) after detecting the virus on a specimen of lung tissue. The forensic pathologist also found evidence of viral myocarditis and pulmonary oedema.

iii. Investigation

The coroner held an inquest to consider whether different clinical management and support would have led to an accurate diagnosis for Ms CF and her condition being treated effectively. A senior emergency physician provided written and oral expert evidence in relation to Ms CF. The expert

stated that at the time, it was reasonable for Dr V to not have considered H1N1 as a differential diagnosis for Ms CF's illness. The expert qualified however, that irrespective of the diagnosis, the persistent hypotension exhibited by Ms CF should have triggered close observation with continuous monitoring, and aggressive investigation of the potential underlying causes with

in the event of a change rather than if there had been no change to Ms CF's condition, and the lack of explicit instructions regarding the monitoring and management of Ms CF's blood pressure. Dr V's misguided sense of comfort at the elevated BP failed to take into account her progress in the hours since he had seen her, or to recognise the severity of her condition.

The coroner also found that Ms CF's persistent hypotension was reflective of myocarditis, a process that was not recognised by the clinicians.

reconsideration of the provisional diagnosis. It was the expert's opinion that inotropic therapy, escalation of care, and retrieval to a tertiary hospital ought to have been considered much earlier.

The expert also offered an opinion on the view taken by the nurses that the unexplained low blood pressure readings in the context of an improved clinical picture was not cause for alarm. The expert submitted that deriving reassurance on the basis of conscious state was a flawed approach.

The expert considered that Ms CF was exhibiting a shock state, which is an uncommon finding in viral gastroenteritis.

The coroner drew attention to the fallacy of the fluid bolus order, pointing out that the infused amount would have equated to only 250mls by the end of the first hour. The coroner expressed concern about Dr V's directions to the nursing staff to be contacted

iv. Coroner's Findings

The coroner found that at the time of Ms CF's admission to hospital, she was suffering from the effects of swine flu. The coroner also found that Ms CF's persistent hypotension was reflective of myocarditis, a process that was not recognised by the clinicians.

The coroner was not critical of the failure to diagnose myocarditis, but indicated that regardless of the perceived reason for the low blood pressure, it should have been cause for much greater concern. The coroner stated that Ms CF's management in hospital was sub-optimal and her chances of survival would have been much greater, had she been provided with optimal support or retrieved to a tertiary hospital.

Mr JT

i. Clinical Summary

Mr JT was a 26 year old male with a past medical history of asthma who was admitted to a regional

hospital with fever, shortness of breath, chest pain, and a productive cough. In the five weeks prior to his admission, he had presented on six separate occasions to the emergency department (ED).

He had also visited a GP four days prior to his hospital admission, complaining of flu-like symptoms. The GP made a presumptive diagnosis of influenza but did not perform any tests to confirm his suspicion. He prescribed Tamiflu (oseltamivir), gave Mr JT the script and explained the pros and cons of treatment.

Three of Mr JT's hospital presentations took place several hours, two, and three days after his visit to the GP.

On the first of those presentations, he told the ED staff that he had been given a script for Tamiflu but had been unable to obtain it. The

was negative, and while the PCR test for H1N1 was also conducted, the results were not available at the time.

ii. Pathology

A post-mortem examination was not conducted on Mr JT. The coroner accepted the cause of death for Mr JT as that listed on the Medical Practitioner's Deposition - hypoxic respiratory failure, H1N1 pneumonitis and acute respiratory distress syndrome.

iii. Investigation

The focus of the inquest in Mr JT's case was on the care provided and whether earlier intensive care treatment would have prevented his death.

The senior emergency physician who provided an expert opinion on the care management of Ms CF

script for Tamiflu had been filled.

Dr K gave evidence that he had not offered Mr JT a course of Tamiflu from the hospital stock as he did not consider him at high-risk of complications and was following the hospital's instructions on supplying the medication only in the case of high-risk patients. He expected Mr JT to fill his script the following morning.

The court heard that the ED staff should have written in the discharge letter that Mr JT had not filled his script, and had the GP seen the discharge letters, he would have contacted Mr JT to follow up his reasons for not obtaining Tamiflu.

Although there was some discussion at inquest about a possible shortage of Tamiflu being the reason for Mr JT failing to obtain the medication, the coroner heard that police inquiries did not reveal information that supported the notion that Mr JT had attempted to purchase Tamiflu, nor any clear evidence of non-availability of Tamiflu at his local pharmacies. It remained unclear as to why Mr JT never filled the script.

The expert explained to the court that although there is a high mortality rate associated with pneumonia and ARDS, earlier intubation and mechanical ventilation may have improved Mr JT's chances of survival. Once again, the expert pointed out that the initiation of an intervention (CPAP) was flawed in that it did not include a plan for what to do in the event that there was no change or improvement in condition.

The expert offered the view that there was nothing to suggest Mr JT required hospital admission on any of his earlier reviews.

ED doctor (Dr K) explained to Mr JT that he was not in a high-risk category and could decide whether he wanted to take the medication or not. Dr K treated him for an acute viral illness and asthma and discharged him shortly afterwards. Mr JT never filled the script for Tamiflu.

The next two hospital presentations resulted in discharge from the emergency department, with working diagnoses of influenza or glandular fever, and tonsillitis respectively. A rapid antigen test for Influenza A and B

also provided expert evidence at inquest into Mr JT's case.

The expert offered the view that there was nothing to suggest Mr JT required hospital admission on any of his earlier reviews. While he appeared to be experiencing an exacerbation of asthma, and was appropriately managed on each presentation to hospital and to his GP, his serious condition did not manifest itself till the day of admission.

She did indicate that his death might have been avoided if the

iv. Coroner's Findings

The coroner found that Mr JT's management during his admission to the regional hospital was sub-optimal, as earlier consideration should have been given to intubation, ventilation and transfer to a tertiary facility.

The coroner made a number of recommendations about drawing the attention of relevant ministers and organisational leaders to the inquest findings.

The coroner's recommendations included the development of systems and protocols to

The abnormal vital signs were ignored and clinical cues that could have heralded the worsening state were missed.

While the coroner could not determine whether death would have been avoided with more aggressive management, he found that Mr JT's chances of survival would have been enhanced.

Ms CF and Mr JT

v. Author's Comments

Ms CF and Mr JT both died of complications from swine flu. While Ms CF was never diagnosed with the infection prior to her death, H1N1 infection was considered early on in Mr JT's case. Yet both patients died of complications of their illness and the lessons drawn from the inquests were one and the same. The abnormal vital signs were ignored and clinical cues that could have heralded the worsening state were missed.

These lessons are applicable to any patient suffering from any pathological condition, and it is incumbent upon medical and nursing staff to always be vigilant to not only a change in condition from normal to abnormal, but also to an unchanging abnormal condition despite intervention.

1) ensure regional hospitals are staffed with appropriate medical expertise so that patients are regularly reviewed by practitioners with relevant experience; and 2) medical practitioners and nurses are enabled to recognise and appropriately respond to the deteriorating patient.

vi. Keywords

Regional hospital, Influenza A (H1N1), swine flu, general practitioner, Tamiflu.

Influenza, 10 years on from the “Swine Flu” pandemic

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Ten years after the swine flu pandemic, it is timely to reflect on these two tragic cases of severe influenza in young adults. While the common perception of the pandemic was that it was a relatively mild season, it is important to note that critical care services came under considerable stress in 2009. Influenza continues to cause many thousands of hospital admissions each year in Australia, with a particularly high number of cases in 2017.

Although most infections are relatively mild, influenza can cause rare but serious complications.

In children, influenza is a well described cause of severe neurological complications including encephalitis and status epilepticus, which can occur in children with no previous medical history (1). The incidence of severe influenza is highest at the extremes of age (2). The NSW Coroner found that influenza caused more deaths in children than any other vaccine preventable disease, including meningococcal disease.

The association between cardiac events and influenza is more complex; apart from infective myocarditis, studies have found an excess of other cardiac admissions, such as acute myocardial infarction at the time of increased influenza activity (3), and this is supported by case control studies showing an association

between myocardial infarction and influenza (4).

Influenza diagnostics are useful to help confirm the diagnosis of influenza to target treatment and infection control interventions, but empiric treatment may be required, particularly in severely unwell patients. Many other respiratory infections can cause an influenza-like illness. Even in the peak of the influenza season, the proportion of influenza tests that are positive for influenza is usually less than 50% (5).

Balanced against the need to confirm a diagnosis is the need to start influenza antivirals quickly for the patient to receive the maximal benefit. Over the last 10 years, rapid and sensitive influenza diagnostic assays have become more widely available in hospitals, and to a lesser degree in primary care settings.

Despite good test performance, it is important to note that the sensitivity of the test also relies on the adequacy of specimen collection.

In a small proportion of patients with lower respiratory tract infection, upper tract sampling may be negative (6).

Influenza antivirals may be considered in outpatients presenting within 48 hours of the onset of symptoms to reduce the duration of illness. The

use of influenza antivirals is a controversial topic. A number of neuraminidase inhibitors antivirals are available in Australia, including

Antivirals are not subsidised by the Pharmaceutical Benefits Scheme, but are widely available in community pharmacies and hospitals.

Influenza antivirals should be given in hospitalised patients with severe influenza. There are few studies of antivirals in patients with severe influenza. In the absence of better evidence, it is reasonable to examine observational studies, while being conscious of potential confounders. Confounders, or factors that are related to both antiviral use and outcomes (such as death) are likely to underestimate any potential protective effect of antivirals, as antivirals are likely

Targeted actions include administration of supplemental oxygen, blood cultures and serum lactate, administration of antibiotics and intravenous fluids, and close clinical monitoring and referral as appropriate. Persisting hypotension despite adequate fluid challenge, respiratory failure and other organ dysfunction and an elevated lactate should trigger an escalation of care. Quality improvement projects have been associated with improved processes of care, and have also suggested a reduction in the risk of mortality (12, 13).

Ideally, these should be integrated into other procedures to facilitate timely treatment for deteriorating patients.

Influenza antivirals should be given in hospitalised patients with severe influenza.

oseltamivir, zanamivir and more recently peramivir. Clinical trials have demonstrated that antivirals reduce the duration of illness in patients with uncomplicated influenza by around 17 hours, and are also effective in preventing influenza (7, 8).

However, there is much less data on whether antivirals prevent clinically relevant complications of influenza, such as pneumonia, hospitalisation and death. Additionally, almost all studies were performed in outpatients, and evidence is scant on the use of antivirals in hospital inpatients with severe influenza. Systematic reviews of the available studies suggest that antivirals reduce lower respiratory tract infections, but are less conclusive on whether they reduce the risk of hospitalisation (7, 8).

to be given those who are more severely unwell.

These studies suggest a substantial mortality benefit in patients given antivirals (9).

The timely management of patients with severe infection, including pneumonia, should be evaluated and improved where necessary. Secondary bacterial pneumonia is a known complication of influenza; previous studies have suggested that *Streptococcus pneumoniae* and *Staphylococcus aureus* are common causes (10). Recent interest has focused on early recognition, resuscitation and referral to improve outcomes from severe infections, including pneumonia (11).

Processes should exist at all levels of the health system to facilitate immunisation to all patients who want an influenza vaccination, particularly those at higher risk of severe infection. Influenza vaccination is an effective measure to reduce influenza and its complications, and is provided under the National Immunisation Program to elderly Australians, those with medical comorbidities, Indigenous Australians and pregnant women.

Although a vaccine for H1N1pdm influenza did not become available until September 2009, available data suggest that seasonal vaccine coverage is incomplete – in older Australians, around 70-80% are vaccinated, but in children and younger adults, coverage is much lower (14).

Clinical trials have demonstrated a reduction in the risk of confirmed influenza (15), and some

studies have also demonstrated a reduction in respiratory hospitalisations (16). As the effectiveness of the influenza vaccine is expected to vary from year to year due to differences in “match” between vaccine and circulating strains, surveillance systems are required to monitor effectiveness. These studies have consistently demonstrated that influenza vaccination reduces the risk of medical presentation and hospitalisation with confirmed influenza (17).

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Planning for both seasonal and pandemic influenza

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The preparedness stage of the Australian Health Management plan for pandemic influenza outlines national logistical and research responsibilities. The response stage outlines the national coordination and communication responsibilities that will support and maintain quality health care. Although the health risks associated with a new pandemic are difficult to quantify, the plan aims to be responsive to the health risks being communicated, and flexible so that available resources are efficiently utilised.

State and territory governments have their own pandemic influenza plans.

All provide a framework within which the health sector can operate to minimise transmission, reduce morbidity and mortality, and to manage the impact on the community and the health care system. All rely on existing arrangements for the command and control of state and territory-based emergency incidents. This system is supported in Victoria, by the State Emergency response plan, 4th edition 2017 and by the Public health control plan, 2012.

Pandemic influenza planning involves prevention, preparedness, response and recovery stages with all plans concentrating on the preparedness and response phases. Infection prevention and control measures are an essential component of the preparedness phase of pandemic influenza, but they are also integral to the management of seasonal influenza and the management of all infectious diseases.

At a local level, support of and strengthening of these skill sets along with the development of clinical and laboratory guidelines for the management of influenza is the most effective way of preparing for an outbreak of influenza. Each health care service should customise their plan to best fit their resources, their patients and their role in the health care system. Local plans should be tested, reviewed and updated after each influenza season. Annual review should consider the threshold for establishing local flu clinics, as well as their location, staffing and resourcing.

Infection prevention includes quarantine, vaccination and medication if appropriate. Quarantine and the use of antivirals will be dictated at a national and state/territory level. At the health services level, health care workers should be vaccinated against all vaccine preventable diseases.

A robust governance system should be in place to ensure that all staff are assessed and immunised. Seasonal influenza is a vaccine preventable disease. Mandatory vaccination occurs in specialised units such as haematology, transplant and neonatal intensive care units. In other areas of health care, mandatory opt out systems are increasingly being instituted.

Infection control practices, as outlined in the Australian guidelines for the prevention of infection in healthcare (NHMRC

the waiting room prior to early medical review.

Guidelines should consider the lack of sensitivity and specificity associated with a clinical diagnosis of influenza, as well as the occurrence of disease outside the recognised 'flu season.'

Laboratory testing for influenza should be validated for each health care service, along with the type of viral swab, the transport media, and the site and method of sampling. Accepted turn-around

whether antiviral agents are used. General guidelines on their use continue to be updated depending on research developments and the results of antiviral resistance studies. Health care services should keep abreast of these updates.

Health care workers should be aware of high risk procedures that are associated with aerosolization of influenza and an increased risk of nosocomial transmission.

These procedures, such as the use of nebulisers, should warrant senior medical involvement and if used, mandate an increased level of patient isolation and staff PPE.

Local planning for seasonal and pandemic influenza is essential because state and territory and national plans lever off local systems. This means that we need to focus on efficient, proven means of minimising transmission of disease and on evidence-based disease management. Our response to and review of our seasonal influenza epidemic is a valuable way of educating and preparing staff and systems for the inevitable outbreak of pandemic influenza.

“Clinical guidelines detailing the management of patients with an ‘influenza like syndrome,’ should be readily available”.

2010), should be implemented by all health care services. Hand hygiene, aseptic non-touch techniques, isolation and transmission-based infection control practices, and the use of personal protective equipment (PPE) are essential knowledge and skill sets to minimise the risk of nosocomial infection. Support for these practices needs to include continuing education, accessible hand hygiene stations, adequate PPE stores and the appointment of local champions at all levels of the clinical hierarchy.

Clinical guidelines detailing the management of patients with an ‘influenza like syndrome,’ should be readily available. These should outline the management of groups at high risk of disease transmission, such as those with cough and fever, who should be masked at triage, directed to hand hygiene stations, and quarantined within

times for the availability of results should also be specified and resourced.

The management of groups at high risk for influenza related complications should receive an early laboratory diagnosis and offered antiviral medication according to accepted treatment guidelines. Disposition will depend on their medical condition.



Patients with influenza admitted to hospital should receive antiviral medication. This is supported by state and territory health departments and by the World Health Organisation (WHO) and the Centre for disease control and prevention (CDC). The duration of inpatient isolation is dependent on the presence of fever and on

Resources

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