Submission No 26

INQUIRY INTO IMPACT OF AMBULANCE RAMPING AND ACCESS BLOCK ON THE OPERATION OF HOSPITAL EMERGENCY DEPARTMENTS IN NEW SOUTH WALES

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To: The Hon. Greg Donnelly, MLC

Please accept this submission to the New South Wales government enquiry regarding the impact of ambulance ramping and access block on the operation of hospital emergency departments in New South Wales.

To introduce myself, I am emergency physician practising at Nepean Hospital since 2003. I have held various roles, including Director of Emergency Medicine Training, Director of Trauma, Deputy Director of the ED, and am currently the Director of Emergency Medicine Research. I am also Clinical Associate Professor in Emergency Medicine with the Sydney University Nepean Clinical School. External to my clinical role, I am a member of the Scientific Advisory Committee of the Nepean Hospital Human Research and Ethics Committee, and am section editor for Emergency Medicine Australasia journal for original research. My research portfolio includes studies into ED performance and patient flow, a couple of which I have attached with this submission.

I apologise for the quality of submission. Due to the short timeframe, I was unable to give it significant justice and at times it may sound like it rambles a bit. However, I did take the approach that most of the members of the enquiry would be laypersons with respect to medicine in general, and emergency medicine specifically, and so have tried to explain various concepts as simply as possible.

Accompanying this submission are a number of publications from peer-reviewed journals regarding aspects of ED performance, patient flow, ED overcrowding and access block. I refer to some of them specifically in the submission, but have included others for completeness: to paint a picture of what some of the aspects of ED overcrowding, access block and ED performance look like; the factors that affect them; and to support the main points I am making in my submission.

Yours sincerely

James Mallows

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We have done this enquiry before

The starting point for this enquiry should be the report on ambulance ramping in Queensland metropolitan hospitals authored by the Metropolitan Emergency Department Access Initiative published in July 2012, a full 10 years ago. I attach this report to my submission.

This report is comprehensive and the methodology sound. It was driven largely by senior emergency physicians and senior ambulance personnel, and survey a wide number of EDs and other areas. It came up with 15 major recommendations.

New South Wales health, whether formally or not, have adopted most if not all of these recommendations. My only comment is with regards to recommendation 14: most hospitals will have the time limits on interhospital transfers direct to the ward. For example, at Nepean Hospital, it is policy for the wards only to accept interhospital transfers to 9 PM, after which interhospital transfers transit through the ED for the initial workup. Also, I do not know whether a version of recommendation 15 has been adopted by New South Wales health.

The significance behind this is that these recommendations, from a report from another state, have largely been adopted by New South Wales as standard practice, whether because of this report or for some other reason. However, 10 years after the report was published, we are still suffering significant problems with ambulance ramping. Therefore, the solutions to ambulance ramping are contained outside of this report. I implore the members of the enquiry to read this report as the first item of business. From outside of the ED looking in, a number of these recommendations seem quite sensible. However, from the inside looking out, and based on the fact that none of these recommendations have had any effect on ED performance and ambulance ramping, enquiry needs to come up with new recommendations which will actually make a difference to ED performance.

A summary of patient flow

For one to understand where ambulance ramping sits within the emergency department, one must be familiar with the emergency department patient flow.

1. First the patient presents to the ED. New South Wales health mandates that the first patient contact be with a clinician, and this is usually the triage nurse. For ambulances presenting to the ED, the paramedics will transfer the patient into the ambulance bay where there is a triage point, and the patient will be triaged at the next available opportunity.
2. Patient triage is a particularly complex task and involves a short history of the presenting symptom and the assigning of a triage category signifying the degree of urgency. At Nepean, we require the triage process to be undertaken in less than two minutes. This is because we could have more than 20 to 30 patients presenting in an hour: if triage takes five

minutes and there are two triage nurses, patients could wait more than an hour after arrival just be triaged. However, this does not include the clerking of the patient prior to triage nor all of the administrative tasks that occur after triage, for example printing out paperwork and placing the patient in the appropriate area of the department, which could be anywhere within the ED or the waiting room.

3. Patients presenting by ambulance are triaged at the next appropriate opportunity. Once triaged, a decision is made regarding whether that patient could be offloaded to the waiting room. There are many factors that go into this decision. Firstly, the patient needs to be mobile and ambulant. Secondly the patient needs to be stable and not require significant monitoring, such as ECG or saturations monitoring. Thirdly, the patient may need treatment at that moment, for example oxygen or intravenous fluids. For these reasons, many patients cannot be offloaded from ambulance stretchers and must wait for an emergency department bed space to become available, usually in acute care.
4. There are multiple assessment areas in most EDs in metropolitan Sydney. There is the resuscitation bay where patients requiring urgent resuscitation are placed, ideally on arrival but not necessarily so. There will be an acute care area where the patients spend their ED stay in a bed. There will be some kind of subacute area where patients are ambulatory, and are assessed in examination areas that generally do not have a bed but more of an examination couch, and spend the majority of their ED stay in some kind of waiting room, either the external waiting room or in a specially designed internal waiting room. Lastly most EDs will have a fast track area where minor injuries and conditions will be seen and discharged, again in an assessment space rather than an acute care style bed.
5. At triage, regardless of the mode of arrival of the patients, once a triage category is assigned, the patient is then assigned to a specific area of the ED based on the presenting problem, their urgency and their complexity (which is different to both urgency). However, if an assessment space is not available in their assigned area, the patient will wait in the waiting room. For patients arriving by ambulance, they will wait in the waiting room unless they are unable to be offloaded: in this situation they will stay on the ambulance stretcher.
6. Patients who are unable to be offloaded from ambulance stretchers will require an acute care bed. Therefore, the degree of ramping will depend on the degree of patient flow through acute care. To repeat, acute care patients require a bed. They require a bed because they are immobile, require significant monitoring or require significant treatment interventions. These are patients that by definition cannot be looked after in the waiting room or in other subacute areas of the department.

7. The majority of patients that require an acute care bed for the assessment and treatment within the ED usually require admission to the hospital. Those that are not admitted, and at discharge from the ED, often require hospital or ambulance transfer to go home or to their usual place of residence. Therefore, the major impedance to ambulance offloads is the ability to admit patients to a ward in the hospital.

Looking at figures from Nepean Hospital for ED presentations for the month of May 2021. There were 6726 presentations, of which 1904 (28.3%) presented by ambulance. All of these 1904, 963 (50.6%) were admitted, compared to the other 4822, of which 1418 (29.4%) were admitted. You can see from these numbers the high demand that patients presenting by ambulance have on both ED acute care beds and on hospital ward beds. It also puts to bed any notion that these patients can be diverted to any other nonhospital medical service, for example community health or GP services. Patients presenting to EDs by ambulance are highly complex and the majority are admitted, with some of the remainder requiring some kind of ambulance transport to be discharged from hospital.

Some commonly used ED definitions

Access block: This refers to the percentage of patients who were admitted or planned for admission but discharged from the emergency department (ED) without reaching an inpatient bed, transferred to another hospital for admission, or died in the ED whose total ED time exceeded 8 hours, and is a definition formulated by the Australian College for Emergency Medicine.

ED overcrowding: the situation where Emergency Department function is impeded primarily because the number of patients waiting to be seen, undergoing assessment and treatment, or waiting for departure exceeds either the physical or staffing capacity of the Emergency Department, and is again a definition formulated by the ACEM.

Ambulance ramping: there is no formally accepted definition of ambulance ramping and it simply refers to the situation where an ambulance cannot offload a patient off the ambulance stretcher. New South Wales has an ambulance offload KPI that states that 90% of ambulances need to be offloaded within 30 minutes of arrival. Beyond this, no performance measure has been defined for ambulance ramping, for example length of time a patient has been waiting to be offloaded nor a baseline percentage for the ambulance offload KPI within 30 minutes. At present, one ambulance unable to be offloaded within 31 minutes is defined as being ramped.

Ambulance ramping as a symptom

Ambulance ramping is a symptom and ED overcrowding is the disease, mostly caused by significant access block for patients waiting in the ED for a ward bed.

Overcrowding is largely a function of how many patients present and how long they stay in the emergency department. Access block is a cause of the disease: if we cannot move admitted patients from the ED to the ward then the ED will become overcrowded and ED function impeded. Ambulance ramping is a symptom of the disease. A patient turns up to the ED by ambulance, they are not able to be offloaded because of ED overcrowding, just as a patient coming to ED via private transport must sit in the waiting room because of ED overcrowding.

So when we look for the causes of ambulance ramping, we are ultimately looking for the causes of ED overcrowding. The predominant cause of ED overcrowding is indeed access block. It is routine for EDs in New South Wales have a large number of admitted patients waiting for a bed at 8 AM. Often this number exceeds the total number of ED acute care bed spaces, not counting ambulatory care assessment zones. For example, if you have an ED with 21 acute care bed spaces and you have 18 admitted patients at 8 AM waiting for a ward bed, you are functionally working with a three bed ED as the 18 patients are actually ward patients. There are hospitals in the Sydney metropolitan area where ward patients boarding in the ED exceeds the total number of ED acute care bed spaces. In this situation the ED is operating with a negative bed base.

In this situation, when an ambulance turns up there is no bed for them to be offloaded to. As mentioned above, many EDs have ambulance offload strategies, such as offloading ambulant stable patients to the waiting room or to ambulatory areas of the ED. However, often patients are offloaded to a wheelchair in the ambulance or triage bay as they are not safe enough to be in the general waiting room. This is usually when there are significant pressures to offload the ambulance stretchers, such as excessive ambulance ramping to the point where ambulances can't fit in the ambulance bay or in the situation where there are next to no available road crews for the next 000 call. However, patients that require intensive monitoring, such as cardiac or oxygen saturations monitoring, or who are immobile and can only be offloaded to bed, will stay on the ambulance stretcher until an appropriate bed space becomes available.

To further illustrate this point, I used data from 2019 that I used in a paper published last year looking at various factors and their effect on ED performance - I discuss this paper further below. I did not specifically examine ambulance transfer of care in the paper. However, I was able to do a correlation analysis comparing ambulance TOC with all of the other ED performance KPIs and, on the whole, they correlate fairly well. If ambulance ramping is present, then it is likely that other ED performance KPIs will also be suffering.

Variable	Pearson's r
Total ETP	0.51
Ward ETP	0.24
EMSS ETP	0.38
Discharge ETP	0.42
%LOR	-0.28
Median Dr wait time	-0.23
Cat 2	0.49
Cat 3	0.45
Cat 4	0.35
Cat 5	0.09

Correlations between each of the dependent variables and ambulance TOC. Note kappa 0.4 – 0.6 indicates moderate correlation (highlighted) and kappa 0.6 – 0.8 indicates high correlation. Note negative correlation means there is an inverse relationship, ie as one variable increases the other decreases.

Based on this data, ambulance ramping is one of a significant number of ED performance indicators that suffer because of ED overcrowding and access block, and it is access block that needs to be fixed.

Causes of ED overcrowding and access block

There is a lot of very good research regarding the causes of ED overcrowding. The first article to discuss is "Myths Versus Facts in Emergency Department Overcrowding and Hospital Access Block", which I have attached to this submission. This article states that the single most important factor affecting ED overcrowding is the availability of sufficient inpatient beds. It then goes on to discuss many of the myths that persist despite evidence to the contrary, myths that continue to get discussed even now. The paper is well worth reading considering ED overcrowding and access block is the major cause of ambulance ramping and I summarise the myths below.

4 Summary of the myths and facts about emergency department (ED) overcrowding

The myths	The facts
• "Inappropriate" or "general-practice-type" patients cause overcrowding	• Overcrowding is largely the result of patients being admitted but remaining in the ED awaiting suitable inpatient beds
• Overcrowding is the result of an excess number of patients arriving and waiting to be seen by a doctor	• Patient attendances at EDs have increased, but the number of patients waiting to see a doctor in Australasian EDs remains smaller than the number waiting for an inpatient bed
• The time patients spend in the ED is now excessive because staff take too long in investigating and treating them	• There has been little change in the time taken to assess and treat ED patients, but some increase in waiting time because ED staff and resources are being used to care for inpatients, and a large increase in waiting time for inpatient beds
• Telephone advice lines and collocated general practitioner services reduce ED attendances	• Telephone advice lines and collocated GP services have little or no effect on ED attendances
• Overcrowding can be reduced by building larger EDs	• Increasing ED size is associated with increased overcrowding
• The causes of overcrowding lie within the ED	• The causes and the solutions to overcrowding lie outside the ED
• Overcrowding does not influence patient outcomes	• Overcrowding has serious adverse effects on hospital processes, quality of care, and patient outcomes, including mortality ◆

The ultimate cause of ED overcrowding and access block is an inadequate inpatient hospital bed base. All emergency department literature on the subject suggests that hospital capacity needs to run around 85 to 90% to avoid significant access block and the resultant ED overcrowding (see the "Emergency Department Overcrowding, Mortality and the Four Hour Rule in WA" paper attached). Hospitals are routinely run at greater than 100% capacity.

Firstly, the concept of ED available beds accounts for the fact that a bed must be open 24 hours per day to be able to put a patient admission from the ED in it. Therefore, areas such as the day only ward, delivery suite, outpatient clinics, recovery and day only surgical units do not count to the ED available bed base but often count towards the headline hospital bed number.

Nepean Hospital currently has 267 ED available beds. These will routinely be 100% occupied. Then consider the 20 inpatients in the ED waiting a ward bed. This means that hospital occupancy is almost 110%. It also means the next patient that gets admitted in the ED will not have a ward bed. It also means that 20 patients need to be discharged just to empty out the ED of all of the admissions from the previous day, and that you then need to discharge enough patients to account for all of the admissions that happen today, something that invariably does not happen and we play the same game the following day.

Consider this thought experiment. What would happen to ED performance and ambulance ramping if the hospital was completely empty. Answer: there would be no access block and no ambulance ramping. Admitted patients would go to the ward the instant they were admitted and safe to be transferred to the ward. There would be almost no impediment to offloading ambulances to acute

care beds and ambulance ramping virtually eliminated. ED function will be highly efficient as we would be able to place all patients into an appropriate bed space the moment they present to ED and that ED nurses would be able to focus all of the care on patients presenting to ED rather than inpatients waiting for ward bed, which is the majority of their work at the moment.

Effects of ED overcrowding and access block

As pointed out earlier, ED overcrowding and access block are significant causes of ambulance ramping: ambulance ramping is the symptom and access block is the disease. The effects of the disease are well-known, and largely leads to increase morbidity and mortality of all patients presenting to the ED. In fact, some of the papers I attach to this submission are greater than 15 years old. We know what the problem is, and we know what the solution is: there is simply a cognitive (and likely financial) bias against giving a hospital more inpatient beds to empty out the ED.

It is routine for EDs in New South Wales have a large number of admitted patients waiting for a bed at 8 AM. Often this number exceeds the total number of ED bed spaces, not counting ambulatory care assessment zones. At Nepean Hospital, the ED has 21 acute care bed spaces. In a paper that I published last year, and that I will discuss below, I document that in 2019 we have an average of 20 admitted patients at 8 AM in the ED waiting for ward bed. In this situation we are functionally working with a single acute care bed in the ED as the 20 patients are actually ward patients. Indeed, in the study period, the number of admitted patients waiting for ward bed could be anything up to 40 at 8 AM. In this situation, the number of admitted patients exceeded number of acute care beds in the ED. Therefore, when an ambulance turns up with a patient that is unable to be offloaded from an ambulance stretcher, they stay on the ambulance stretcher as there is no acute care bed for them to be offloaded into.

There was a seminal paper published last year from New Zealand, "Emergency Department Crowding and Mortality for Patients Presenting to Emergency Departments in New Zealand", again attached to this submission. This looked at a number of measures of overcrowding to see which ones were significantly associated with mortality across 25 metropolitan New Zealand hospitals. This study found that access block had the strongest association with seven-day mortality across New Zealand hospitals. Not meeting ED length of stay targets was also associated with an increase seven-day mortality but, interestingly, ED occupancy and the number of ED presentations were not significantly associated with mortality.

I also published a paper this year examining the effects of staff grade, as well as the effect of ED overcrowding, measured by the number of presentations and the number of admitted patients in the ED at 8 AM, on various ED performance KPIs. I attach this paper, as well as a summary of the tables and results for easy reading. Again, the mean number of admitted patients waiting for a ward

bed at 8 AM was 20. The study found that increasing numbers of ward patients waiting for a bed at 8 AM led to worsening performance for all ED KPIs, except for ETP for patients admitted to the ward. In fact, none of the variables in the model had any effect on ETP for patients admitted to the ward. This has quite a simple explanation: even a single admitted patient in the ED waiting for a bed at 8 AM is a signal the hospital inpatient service is full and nothing we can do in the ED will get that patient, nor any of the other patients that admitted that day, to the ward any quicker. I make the comment that the poor ETP for patients waiting for ward bed is not an ED problem nor a whole of hospital problem, it is a rest of hospital problem.

I did not incorporate ambulance transfer of care data into this regression model and there are very good statistical reasons why I did not do this and mainly relate to the fact that that data is non-normal. However, in the "regression tables for ED performance" document attached, I did add an extra column for a regression analysis that I did on that data. The model is quite robust with an R^2 value of 0.413, and shows that there is a significant negative effect of the number of admitted patients in the ED waiting for ward bed on ambulance TOC performance. Looking at the number, for every additional admitted patient in the ED waiting for ward bed at 8 AM, there is a -0.57% effect on ambulance TOC, remembering that the mean number of patients waiting for ward bed at 8 AM is 20. This means that on average, there is a worsening effect of 11.4% on ambulance TOC simply due to the number of admitted patients in the ED at 8 AM waiting for ward bed.

Patients who are unable to be offloaded off ambulance stretches have their care severely compromised. At the start of the patient journey, an appropriate history and examination is difficult if not impossible. The ambulance bay is not private nor is it quiet. Therefore, histories are difficult at the best of times, and there are often sensitive questions that you can't ask in the first instance. Examination is essentially impossible as the ambulance stretcher is narrow and does not allow adequate access to the patient. Also, the patient cannot be appropriately examined in a public area where often intimate examinations may be required, for example simple procedures such as auscultation of the heart in a female or examining the abdomen or lower limbs. Very few investigations can be performed in the ambulance bay. Although basic pathology is often performed, ECGs are problematic due to the requirement of exposure of the anterior chest, x-rays and complex imaging is virtually impossible and forget about doing a urinalysis.

However, care is compromised for all patients that cannot access an appropriate examination space. The patient with renal colic that arrives by private transport, may get a decent dose of analgesia triage but if they cannot access an appropriate examination space then they will sit in the waiting room with their assessment and management being delayed despite having originally presented in severe pain.

The solution to ED overcrowding and access block

The solution is fairly straightforward: hospitals need to run at 85 – 90% capacity to ensure adequate flow of admitted patients from the ED to the wards. There are obviously many barriers to this and I discuss them in a separate section below.

EDs are as efficient as they can be within the limitations of their staffing and resources. First of all, you need to staff EDs based on the number, acuity and complexity of the presentations. Most EDs are staffed based on outdated funding models and the number of ED beds available. However, it is routine for the number of patients in an ED to outnumber, often significantly so, the number of beds and treatment spaces within an ED. The greatest example of this is the single clinical initiatives nurse looking after 40 patients in the external waiting room. As I point out in my paper, ED staffing should not even be aimed at mean patient presentations as this will not be enough half of the time.

Also, it is clear from my paper that you cannot just pour any doctor into the mix - increased staffing levels must be aimed at specialist staff and senior decision-makers such as emergency medicine trainees and senior career medical officers. There was clearly no benefit seen with increasing numbers of junior medical officers, ie junior doctors in their first or second postgraduate year.

Hospitals are also as efficient as they can be within the limitations of their staffing and resources. The care of complex elderly patients, the main source of extended hospital length of stay, require not just doctors and nurses, but allied health such as physiotherapists and occupational therapists. At Nepean Hospital, there is a significant shortage of allied health staff and patients are often delayed because they are waiting for physiotherapy or occupational therapy assessments as part of their discharge planning.

These patients also require significance amounts of discharge planning and, unfortunately, they maybe in the situation where they can only be safely discharged to a residential care facility such as a nursing home or hostel. They may also need the input of the NDIS and may be in the situation where they cannot be safely discharged until an adequate plan and funding has been instituted.

State-wide, and at Nepean Hospital specifically, there are a large number of patients waiting nursing home placement and NDIS plan and funding finalisation. This is largely a federal issue and there are significant blocks in this process, especially with NDIS planning.

Availability and access of aged care and disability services has a significant effect on hospital function and therefore ED overcrowding as part of increasing access block. A stable patient who in all intents and purposes is ready for discharge, but requires significant aged care or disability services, will stay unnecessarily in hospital until those services are organised and available. This

leads to a patient inappropriately occupying a hospital inpatient, therefore increasing hospital occupancy, increasing access block and therefore ED overcrowding.

To further highlight the limitations of staffing and resources, Nepean Hospital recently opened a new 14 story redevelopment with the plan to significantly increase the hospital bed base, in part to alleviate the access block and overcrowding in the ED. However with a bed base of 267, we got a total uplift of eight elective surgical beds and eight medical beds, woefully inadequate considering we routinely have 20+ admitted patients in the ED waiting for ward bed at 8 AM.

When talking about hospital occupancy, the elephant in the room is the elective surgical waiting list. Most admissions through the emergency department are medical admissions, in that they usually require admission under a medical rather than a surgical team. Obviously, most elective surgical admissions are admitted under surgical teams. At present the balance between the bed base for medical and surgical patients is skewed too far towards surgical patients.

At Nepean Hospital, there is a set medical bed base yet there are always 20+ admissions waiting for a bed in the ED at 8 AM. There is also a set surgical bed base capacity for the planned elective surgical patients. However, we routinely achieve “000” for our elective surgical targets. On the other hand, the ED almost never meets routine performance KPIs, largely due to the excessive numbers of medical patients being boarded in the ED. If the surgical division is meeting all of their KPI targets while the medical division performs so poorly, then surely the mix of medical versus surgical beds is wrong and there needs to be a rebalancing of the number of medical versus surgical beds in the bed base. At Nepean Hospital, with a new redevelopment having been opened, an easy solution would be simply to fund another 20 inpatient medical beds but this funding is not forthcoming. Considering most other hospitals in the Sydney metropolitan area would be running at greater than 100% occupancy in the ED available bed base, this is a discussion that needs to happen if we are serious about tackling ED performance, access block and the symptom of ambulance ramping.

This is an example of significant cognitive bias. State elections have been won and lost on the size of surgical waiting lists. Therefore all governments will tend to prioritise elective surgical waiting lists. It is also an easy number to count and makes it easy an KPI that the government can point to as part of a list of achievements. Conversely, ED performance tends to reflect the institution rather than the government. Poor ED KPIs are used to beat doctors over the head with and numbers such as the number of admitted patients waiting for a bed at 8 AM are not publicly available. The squeaky wheel gets the oil, thus the surgical waitlist is prioritised over the 20+ patients admitted in the ED waiting for a bed at 8 AM.

A key change would be the markers we are measuring and reporting. There is much debate in the emergency medicine literature regarding ETP and time-based performance targets. They are useful as a quality measure that should not be used as a target per se as this introduces the potential for gaming the system. Another paper I discuss is the "Review Article: Emergency Department Crowding Measures' Associations with Quality of Care: A Systematic Review". This paper found that the two metrics with the highest certainty evidence for associations with worse quality of care in most settings and for most conditions were total EDLOS and total ED occupancy. Along with the number of admitted patients waiting for ward bed at 8 AM that I examined in my paper, these markers should be measured and routinely reported to the ministry and be available to the public as the current ED KPIs and other performance metrics are.

Hospitals also need to be funded for the work that they do. If there are routinely 20 inpatients admitted in the ED waiting for ward bed, and that hospital needs 20 more inpatient beds. Funding to hospitals should also be quarantined into two major funding streams: elective surgical capacity and emergency medical capacity (please note there are multiple other activities of the hospital but I only focus on elective surgery and emergency medical admissions for the clarity of this submission).

There is no talk at the hospital executive level about how many more medical beds or surgical beds are needed. Hospital gets more money and we open more beds, without any robust thinking about what the split between surgical and medical bed should be. As highlighted above, hospitals are often skewed towards attacking the elective surgical list but there is no talk of attacking the emergency medical patients waiting in the ED for a ward bed.

The ambulance ramping paper from the MJA

This paper was published online in June of this year. The paper involved a database linkage study and showed an association between prolonged ambulance offload times, 30-day mortality and ambulance reattendance rates for patients with chest pain. However, there are some points I would like to make regarding this article. Firstly, association is not causation. Secondly ambulance ramping is the symptom and access block and ED overcrowding is the disease. Thirdly, the study contains some significant limitations and biases in the data which have not been alluded to.

First of all, a discussion about association versus causation. There is an association between shark attacks and ice cream sales. This is a classic example used in statistics to illustrate the difference between association and causation. There is no way the two could be linked, unless there was some perverse celebration of a shark attacks with the mass purchase of ice cream. The short story is they both occur in increasing numbers in summer. Therefore, the association is spurious.

The paper demonstrated an association between delayed ambulance offloads and increased 30 day mortality and re-presentation rates of patients presenting by ambulance with the presenting problem with chest pain. However, a simple argument is that both of these things are caused by third factor, namely access block and ED overcrowding. ED overcrowding and access block will clearly delay ambulance offloads. There is a large amount of literature showing an association between ED overcrowding, access block and increasing mortality of patients presenting to the ED, whether they are admitted or discharged from the hospital. Therefore, any overcrowding in the ED that leads to the delay to ambulance offloads will also have an effect on mortality and representation rate of patients presenting during that time. Ergo, ambulance ramping is symptom and ED overcrowding and access block is the disease.

Unfortunately, the paper does not make this distinction. In the conclusion, the paper states "we found that offload time influenced 30-day mortality and ambulance re-attendance rates for patients with chest pain". Considering how the study was designed and the actual findings of the paper, this statement is scientifically incorrect and if I was reviewing the paper for the MJA I would ask the authors to change it. A more correct statement would be: "we found that offload time was associated with 30-day mortality and ambulance re-attendance rates for patients with chest pain". To the lay reader, this seems pedantic but from a scientific point of view is extremely necessary.

As with all database linkage studies, there are significant limitations and biases in the data. The paper did acknowledge some of these. However, there are a number of limitations that they did not discuss and that I will detail below.

The paper splits the patients up into 3 tertiles, and I will focus most of the discussion on tertile 1 (offloaded between zero and 17 minutes) and tertile 3 (offloaded at more than 28 minutes). The points I want to make, and that the paper does not, is that the patients in tertile 1 and tertile 3 were significantly different.

Firstly, discussing tertile 1. Referring back to the Queensland ambulance ramping report, recommendation 8 states that: "Appropriate ambulance patients should be transferred to the waiting room under the observation of the Clinical Initiative Nurse." At Nepean Hospital, and I suspect in most EDs in New South Wales, this practice is largely followed. Patients that are well enough to be offloaded into the waiting room do not require significant monitoring such as real-time ECG and saturations monitoring. They are also offloaded at the time of triage, which is usually very soon after the ambulance arrives. Therefore, you could potentially expect these patients to do reasonably well as we are not suspecting significant cardiovascular or respiratory disease, having offloaded them to a full waiting room to be looked after by single nurse. These are the decisions that are made

at triage and on the whole triage nurses are very good at making them. Tertile 1 would have had many more of these types of patients than tertile 3.

Looking at tertile 3, you have a group of patients with significant delays to ambulance offload. An obvious cause of this is that they were unable to be offloaded safely into the waiting room. Therefore, compared to tertile 1, they would have significant problems with mobility and likely have been assessed by the triage nurse is requiring significant monitoring as they were at higher risk of significant pathology. Therefore, at the start of the study, you are already identifying patients who are going to do worse in terms of mortality and representation rates than patients who you could safely offloaded into the waiting room. Therefore, again, the lines between association causation are blurred: tertile 3 will have worse outcomes because they are sicker and need more intensive ED resources in their initial assessment, independent to however long they stayed on the ambulance stretcher.

The paper attempts to adjust their risk ratios via a logistic regression model that adjusts for potential confounders and comorbidities that may affect patient outcomes. They adjust for 8 chronic conditions a patient may have as well as the clinical status of the patient close to ED arrival based on the patient observations. However, there are significant problems and biases in this data that the authors have not discussed. Firstly, they adjust for the presence of a chronic condition but there is no measure of the severity of the condition. For example, they adjust for the patient having a previous stroke. However, there are different severities of stroke. A patient who has had a previous TIA (or “mini stroke”) with no residual deficit will be vastly different to a patient who has had a major stroke with significant hemiplegia. Only one of these patients would be offloaded into the waiting room to be looked after by single nurse. Looking at these chronic conditions, without adjusting for severity, the regression analysis is incomplete and potentially flawed.

Two significant comorbidities that the paper does not adjust for other degree of mobility and the presence of dementia. These are both well-known predictors of poor outcome including increased mortality and representation rate of any time period. Getting back to my earlier point about the patients in tertile 3, these patients would have a much higher incidence of poor mobility and dementia and patients in tertile 1, and therefore would be expected to have worse outcomes independent of however long they stayed on the ambulance stretcher. Another significant patient factor is whether they came from a nursing home or not. Again we are not going to offload a nursing home resident into the waiting room to be looked after by a single nurse, but these patients have worse outcomes than patients who live independently at home.

When analysing the incidence of the chronic conditions, it is clear that, overall, the frequency of these conditions is increased in tertile 3 compared to tertile 1. Therefore, patients in tertile 3

compared to tertile 1, will tend to have multiple comorbidities and again they are expected to have worse outcomes independent of ambulance of the times.

The Charlson index they quote looks very similar between the three groups. However, the Charlson index is a very intricate scoring system which uses a lot more data points than are analysed in the study, and also incorporates an element of severity with some of the chronic conditions. For example, the Charlson index looks at diabetes but score 0, 2 or 3 depending on the severity of the diabetes, something the paper does not do. It also gives a score for hemiplegia, in addition to a score for previous stroke, something the study does not incorporate into the results but would clearly affect whether a patient is able to be offloaded or not. Secondly, reinforcing my previous point, it gives a score for dementia, which again the study does not incorporate into the results but would clearly affect whether the patient is able to be offloaded.

Lastly, study is incomplete as it only analyses patients presenting with chest pain by ambulance. At Nepean Hospital, I examined the figures for patients presenting with chest pain for the month of May 2021. There were 719, of which only 281, or 39%, presented by ambulance. I would argue that if you examined the other 61% of patients who self-presented with chest pain, they would also have increased mortality and representation rates if they presented during times of ED overcrowding. In fact, there is literature that does show this association. I would also argue that patients self-presenting to ED with chest pain could potentially do worse than patients presenting via ambulance, in times of excessive ED overcrowding and access block. We have a bizarre cognitive bias where we feel it is okay to put patients in the waiting room if they self-present but we will not offload the same patient if they present by ambulance, for example if it is decided at triage that they need extensive ECG or saturations monitoring. Again, ambulance ramping is the symptom and ED overcrowding and access block is the disease.

To conclude, there was an article in MJA insight commenting on this paper and had some significant quotes from the past president of the ACEM Simon Judkins. In fact, the title of the article said it all: “Ambulance ramping: offloading faster ‘won’t fix a thing’”, and I attach that article to give further commentary on the ambulance ramping paper.

GPs and emergency department flow

There are a great many myths regarding “GP type patients” and emergency department function. GP type patients do not clog up EDs and they do not cause excessive ambulance ramping. As I have alluded to earlier, the majority of patients presenting by ambulance require admission to hospital, and therefore require to be offloaded to acute care beds rather than the waiting room. However, there is a common perception, ordering obsession, by both the media and health administration in government, that GP type patients presenting to the ED is a significant problem.

All of the emergency medicine literature suggests that 5 to 10% of patients presenting to the ED could be managed by a GP. The first point I want to make is that good GPs keep people out of hospital. However, they do this by managing all of the complex chronic health conditions in the community and avoiding decompensation to the point that the patient cannot manage at home and therefore requires hospital admission. They do not do this by managing semi acute presentations that are best managed by emergency departments, such as lacerations, broken bones, acutely painful conditions such as abdominal pain, unwell kids requiring prolonged observation; the list goes on.

The old days where GPs could manage minor trauma, significant acute medical conditions and spend significant amounts of time with patients as required are long gone. 20% of patient practices are made up of psychiatric and psychological problems. Most of the patients will have chronic illnesses requiring a number of medications that require a significant amount of fine tuning. They are not suturing wounds, plastering fractures or doing other minor procedures that have become the purview of emergency departments. They also do not have the capacity to observe patients for several hours in a safe place waiting for them to either get better or declare themselves as sick. This is what EDs are designed to do and it is unsafe to expect GP practices to take over this workload.

The obsession stems from the Australian Institute for Health and Welfare report that comes out every three months that clearly states that one third of patients presenting to EDs are low urgency and may be able to be managed by their GP. Unfortunately, the methodology of who they decide is a GP type patient is seriously flawed and mainly relies on triage category and disposition without any measure of complexity or the treatment that they received. This is a major flaw for any database linkage study, for example the ambulance ramping study as discussed above, as it does not look at any data from an individual patient level. There are multiple other papers in the ED literature that look at this and there are several decision algorithms to decide more accurately what the GP type patient load is on an ED.

I looked at this specific issue as part of a medical student research project which I plan to refine into a submission to the MJA. I attach that for your benefit, please note it does require a significant amount of refinement before being submitted.

This paper specifically looked at the patients that the AIHW would have defined as GP type patients for the month of June 2021. Out of a total of 6483 patients, 1929 (29.8%) patients were defined as GP type patients as per the AIHW methodology. Of these, we determined that only 449 of these patients (or about 6.9% of total presentations for the month) could have been suitable for GP care. Also, only 194 of these (3.0% of total presentations) presented within the hours of 8 AM to 6 PM. The key difference of this paper is that we examined patients at a patient level rather than at a database level.

On top of this, any GP type patients that present to the ED will not require a lot of resources, and they will almost definitely not require an acute care bed affecting ambulance ramping. The majority of these are managed within ambulatory settings in the ED and most emergency department literature suggests that these patients require at most 3% of the total ED resources.

The key point no one discusses is the fact patients do not know whether they are a GP patient or not. The second point no one discusses is the fact that GPs send patients to EDs that could be GP type patients! To illustrate this point, I attach several articles. The first was a comparison of children presenting to EDs that were either referred by their GP or self-presented with their parents. In this study, children brought to ED directly by their parents or carers did not differ substantially from GP referred children in their characteristics or outcomes, the conclusion being that diverting these children to GP practices will not alter outcome nor will it potentially reduce the number of children presenting to the ED: a GP would refer that child to the ED anyway.

The second explores the reasons behind why parents present to the ED with their child. This had 2 interesting findings. First of all, fewer than half the parents had tried to make an appointment for their GP before presenting to the ED. However, in contrast to this, of parents who had taken their child to their GP for review, two thirds of them were told by their GP to present to ED. Simply diverting these patients to their GPs to avoid ED presentations will not work. What should also be noted, is that paediatric patients often do not require an acute care bed and can be managed in ambulatory settings, and therefore do not contribute ambulance ramping.

The third explores an interesting concept in patients presenting with lower back pain. The title is the most informing: “I’m not in GP pain, I’m in hospital pain…”. There are a lot of reasons why patient may decide to present to hospital, one of which is their belief system around what a GP can actually offer. The ED is indeed a one-stop shop for multiple health services, including imaging, pathology and allied health services and has the ability to give analgesia beyond what is capable in a GP practice. EDs must be resourced for what the community expects their role is, rather than health administration telling the patients with health expectations should be.

For example, a child falls out of a tree and presents with a broken arm. It is a minor green stick fracture so the pain is not too bad and the child is given a triage category 4, having been driven to hospital by their parents. Analgesia is prescribed, x-rays performed, orthopaedic review occurs and plaster is applied. The patient is discharged. The AIHW defines this encounter is a GP type patient. In the scheme of things, this patient did not require a lot of ED resources and would have potentially had their ED treatments completed in a couple of hours. In the community, managed by a GP, this could have potentially taken a few days.

Co-located GP clinics close to EDs do not work. There is a large amount of evidence behind this and the reasons are many and, when discussed, are actually quite sensible. Evidence where GP clinics have reduced ED presentations usually involve GP clinics in areas where there are significant deficits in GP coverage, especially access to out of hours GPs. In these situations, there are patients presenting to EDs that could be managed by a GP if there were suitable out of hours GP services available. However, these studies also show that the effect is very small and again only 3 to 5% reductions in ED presentations are seen, recognising that these patients do not occupy large amounts of ED resources in the first place.

At Nepean Hospital, we had a co-located GP clinic next to the ED, the aim of which was to open out of hours to service patients who were not able to see the GP due to the time of day. The first problem was one of funding. By definition, the GP clinic had to bulk bill is otherwise the patient would simply present to the ED for free. Second of all, because of this, it was very difficult to recruit GPs to a practice that ran on weekday evenings and on weekends for the Medicare rebate only, especially when these patients were not known to the practice and often had complex problems that could not be sorted out in six minutes. Therefore, GPs were employed on a GP VMO award at great cost to the hospital and that largely caused clinic to lose money. Also, the GP practice had no access to out of hours pathology or radiology, so if these tests were required the patients presented to the ED to have them. Also, as the GPs had variable skill in interpreting x-rays and there was no out of hours radiology reporting service, senior ED staff were often required to interpret these x-rays for them.

What also happened is that presentations to the ED actually increased. This is never discussed when talking about co-located GP clinics. However, patients turned up to the service knowing that they could join two queue, one for the GP and one for the ED. They were hedging their bets: if they were unable to be seen by the GP clinic then they could simply be seen in the ED. They also knew that if the GP thought they needed to go to hospital, then the ED was right next door and they could simply walk across. Again, this gets back to the fundamental expectation of what a patient has for what their care requires when deciding whether to present to either a GP or an ED; in this situation they could arguably present to both and therefore justify they were doing the right thing by seeing a GP but knowing that the ED was their if required.

It would have been much simpler and cheaper to give some of this funding to the ED to boost the roster to resource the care of these patients presenting to ED. EDs are very efficient at looking after these patients and you have already spent the capital costs; a little bit more money to fill a couple more roster holes should not be a big deal, that as alluded to below, is often a function of funding sources, especially the state funding of EDs and the federal funding of GPs.

In fact, one solution outside the square is to staff the ED with a small number of GP registrar trainees. The college of GPs insists that they can look after patients that present to emergency departments. However, the training of GP registrars does not involve any emergency medicine training, apart from a minimum of 10 weeks as an intern. This would kill two birds with one stone: EDs would have a source of extra doctors to see minor medical conditions present to the ED; and GP trainees would be up-skilled in these patients so that they would not refer these patients to the ED if they saw them in their future practice.

Emergency hotlines and the ED

Emergency hotlines, largely staffed by trained nurses, also do not work in reducing ED presentations. Patient assessment is complex. A large part of patient assessment is the clinical examination which cannot be performed over the phone. A nurse asks a patient or parent of a child about various symptoms, as well as some physical signs, and tries to make some kind of informed assessment based on what is largely an incomplete picture. Unfortunately, this leads to the advice from the emergency hotline recommending the patient present to the ED as the number one concern is patient safety, and appropriately so.

I have been in the situation at Nepean when I have reviewed a patient and sent them home after a very short assessment. However, a number of those patients have told me that they didn't want to come to the ED but the emergency hotline told them that they should. Whenever you are using a non-doctor staffed emergency hotline, this phenomenon is going to be real. You might think you have a chance reducing the number of ED presentations all, but there will always be a group of patients who may not have presented to ED and only did so because they wanted to phone emergency hotline to be reassured but the emergency hotline played it safe and sent them to the ED.

Cost shifting and ED resourcing

There are many aspects to the debate on ED overcrowding and access block. However, fundamentally they come down to a concept of state versus federal funding. A number of these aspects are true, for example the number of hospital inpatients waiting for nursing home beds, or NDIS plans and funding. However, some of them are spurious, for example the concept that more GPs, and diverting patients to GPs, will solve the problem.

These debates invariably raise their head toward the end of the four year term of government and can cynically be ascribed to the election strategy that governments have running up to the next election. This cynical emergency physician would argue that the ambulance ramping enquiry is designed to hang some of the problems of ambulance ramping onto the federal government in the

run-up to the next election, and the terms of reference for the enquiry ensure that federally funded health services are examined.

However, as alluded to in this submission, the majority of ED overcrowding and access block is a function of hospital inpatient resourcing and a lack of inpatient beds, as well as a commitment by the government to run hospitals and above 100% occupancy in a misguided attempt to improve efficiency.

Why don't we talk about hospital inpatient capacity?

This is unfortunately where my submission becomes self-serving. Having been a practising emergency physician for 20 years, and having undertaken significant research in the field of ED patient flow, the number one constant when discussing and debating issues such as ED overcrowding, access block, ambulance ramping, ED performance overall, whether it be in the media or in government committees, is that no one ever talks to an emergency physician. It is very rare that articles in the lay media quote emergency physicians, for example the current president of the ACEM Dr Claire Skinner who works at Hornsby Hospital, or the current chair of the New South Wales Emergency Medicine faculty, Dr Trevor Chan, ex-director of the St George Emergency Department and current Clinical Director of the Emergency Care Institute at the ACI.

There are multiple stakeholders that seem to have a piece of the debate in the media. First of all, the standard go to for any media quote is the Australian Medical Association. However, the AMA do not have significant emergency medicine membership nor do they have a specific body (or class according to the AMA New South Wales website) representing emergency medicine: https://www.amansw.com.au/about-governance/. They do however have significant surgical, anaesthetic and GP membership, which can influence the content of their opinions regarding emergency department performance.

Another often quoted craft group is the college of GPs. First of all, the college of GPs will always think of a problem can be solved by more GPs. This is especially relevant to the debate around ED performance considering all of the persistent myths regarding GP type patients clogging up the EDs and the effect on performance. Second of all, how can a specialty with no access or experience with public hospital medicine be expected to have any kind of expert opinion regarding emergency department flow.

This is perpetuated by the continual reporting of the AIHW reports regarding the "excessive" number of GP type patients presenting to EDs. Again, as alluded to above, this is a myth and the methodology the AIHW uses is flawed.

The usual go to body for emergency apartments overcrowding and ambulance ramping is the ambulance service itself. However, ambulance will always see the problem as not having enough ambulance paramedics. New South Wales have trialled various strategies to improve ambulance offload times, such as having a dedicated paramedic teams they can look after multiple ramped patients and allow paramedic cars back on the road to service the community. However, without fixing access block, this simply means that more ambulance patients will present and will have significant delays to being offloaded.

To give them some credit, the ambulance ramping paper made a significant comment in the discussion regarding that "As offload times are primarily determined by ED and hospital overcrowding, effective solutions will require increased investment in hospital resources, staffing, and infrastructure".

Lastly, no one actually understands emergency department performance and patient flow. My greatest personal example was a meeting in which a VMO surgeon turned to me and said, "Discharge ETP. It's all ED's fault, how are you going to fix it?" That was one of the motivations for me to do the paper regarding the effects of staff grade, overcrowding and ED presentations on ED performance. The response to this question is simply that if you give me an empty ED at 8 AM in the morning, then I can take responsibility for any poor performance that day in the ED. Otherwise, like everything else, discharge ETP is affected by the number of patients boarded in the ED waiting for ward bed and until you fix that, my hands are tied. So too it is with ambulance ramping.

You can see from this submission that there is much data to support the concept that ED overcrowding and access block is a major contributor to poor performance and ambulance ramping. However, this data is not widely available nor reported. This is because emergency physicians are not part of the debate regarding ED performance and access block. It is also because that when elective surgery lists blow out, it is clear that we need more theatres, more surgeons, more anaesthetists and more hospital beds to empty the waiting list. However, any ED performance KPI that is reported in the media is used to beat doctors and hospitals over the head with, rather than using these KPIs is a marker of hospital performance and understanding when a hospital performs poorly, they need more resources, not more efficiency savings. Unfortunately, these resources involve spending money on more beds, something the government is never keen to do. However, it is clear part of the strategy to manage hospital costs is to use the ED as an overflow ward rather than spending money on opening actual wards where a patient needs to be. They then have their cake and eat it too by blaming the ED, and by corollary the hospital, for poor performance.

So what is the solution

Unfortunately, the solution may simply be a matter of more money and more hospital inpatient beds. However, I have some suggestions on some of the things we could do differently.

First of all, the reporting of ED KPIs. It is clear that there are a small number of KPIs that signal a significant drop in ED performance and therefore the potential to increase ambulance ramping. The first measure has to be the number of admitted patients waiting for a ward bed in the ED at 8 AM. This is routinely captured as part of the daily report at Nepean Hospital, and I suspect at most Sydney Metropolitan hospitals. It is easy to measure and clearly quantifies both the deficit in the hospital inpatient bed base and the lack of capacity in the ED for new patients. It is the job of the ED to see the 200 patients that present today, not to continue to look after any of the 200 patients that presented yesterday.

In addition to this, the number of patients per day that wait longer than 8, 12 and 24 hours for ward bed need to be reported. The formal definition of access block is the proportion of admitted patients that are unable to access an inpatient ward bed within eight hours of the presentation to the ED. 24 hours is massively unacceptable to the community. It also routine that when a patient waits more than 12 hours for ward bed, they will wait more than 24 hours for ward bed, and collecting this data would allow us to decide which particular KPI is most important.

Another KPI that needs to be measured and recorded, is the median length of stay for all patients presenting to the ED, as well as reporting the length of stay for admitted patients and discharged patients separately. This will allow hospitals to be compared to their peers. Median ED length of stay for admitted patients will again reflect on elements of access block and median ED length of stay for discharged patients will be a marker for ED performance and efficiency. However, by also examining the number of patients waiting for ward bed at 8 AM, and the number of patients each day that wait longer than eight, 12 and 24 hours for ward bed, we will be able to see whether ED performance is a function of access block or whether there is some other factors inherent in ED performance that need to be fixed.

There is no reporting of ambulance activity available to the general public. When talking about ambulance ramping, you must do this in the context of how many ambulances present to an ED, both as an absolute number and as a proportion of total presentations. Reporting the median offload time, as well as the 30 minute transfer of care KPI will again give context to ED performance and potentially reflect access block.

All this data needs to be reported with respect to both the total number of ED available inpatient hospital beds and the total number of bed spaces within an ED. These numbers are relatively constant, with only small variations depending on staff availability from day-to-day. Also, the ED spaces should be reported based on be different geographical areas and capacities, for example the

number of acute care beds versus the number of ambulatory care beds. This will give context to all of the KPIs above, and especially to the number of admitted patients in the ED waiting for ward bed at 8 AM, the number of ambulances presenting and the number of ED beds that are then available for these ambulances.

Hospitals must be funded, resourced and staffed to be able to supply a proper seven day a week service. The ED runs a 24 hour, seven day a week service, but needs to rely on a hospital that runs an eight hour per day five day a week service. What changes relative to the day the week are the number of inpatient patient discharges, with significantly lower numbers of discharges on a Saturday and Sunday compared to later in the week. Not only that, hospital discharges tend to increase through the week starting Monday to peak on Thursday and Friday in preparation for the predictable low numbers of discharges on the Saturday and the Sunday. Unfortunately, I made this point in a letter to the MJA in 2010, which I also attach this submission.

This is why Mondays are so horrendous. Presentations are not much higher compared to other days of the week, perhaps a couple of percent higher in the long-term. My paper examining ED performance with respect to presentations, overcrowding and staff grade demonstrated that day of the week was not an independent predictor of ED performance. Poor performance on Mondays was simply due to an excessive number of admitted patients in the ED waiting for ward bed at 8 AM along with a small increase of patient presentations compared to other days in the week.

There will be benefit increasing staff within the emergency department. However, this should only be an increase in senior emergency staff, such as emergency physicians and emergency medicine trainees. The key here is the concept of Senior Decision-Makers. I make this point in my ED performance paper, and I include the ACEM policy guidelines for the construction of a senior emergency medicine workforce. In my paper, I demonstrate there is almost no benefit for increasing numbers of junior medical staff within the ED. Staffing should also not be aimed at the geographical number of beds in the department, nor should they be aimed at the average number of presentations per day: they should be staffed to at least the 85th centile of patient presentations for the day to account for a reasonable amount of surge planning.

What will not work

- increasing GP numbers
- ambulance diversion strategies
- more paramedics
- nurse based emergency hotlines
- co-located GP clinics close to EDs

- community-based patient education strategies focused on ED avoidance
- micromanagement of patient flow at a ward level - hospitals are about as efficient as a can be within the levels of their funding and resourcing
- micromanagement a patient flow at the ED level - ED inefficiencies are driven by ED overcrowding and access block, magnified by the number of admitted patients in the ED waiting for ward bed
- building bigger emergency departments - when your toilet is blocked you call a plumber to unblock the sewage line, building a bigger emergency department when the blockage to patient flow is upstream getting admitted patients to the ward, is akin to building a bigger toilet when your toilet is blocked
- thinking that nursing home bed numbers and NDIS planning will miraculously improve and offload significant numbers of these patients from the hospital inpatient beds. This is simply blame shifting and is not a viable short-term solution to the current problem.