

Pain Management in Patient Transport: Research Report

What are the typical characteristics of WNSWLHD patients who experience pain before, during or after a non-ambulance, hospital transport episode, and does their perceived pain level change during transport?



Author

Richard Williams

CNS Patient Transport - Bathurst

Western New South Wales Local Health District

richard.williams@health.nsw.gov.au



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ABBREVIATIONS:

LHD	Local Health District
NSAID	Non-Steroidal Anti-Inflammatory Drug
PTV	Patient Transport Van
PTU	Patient Transport Unit
SAGO	Standard Adult General Observation
VNPS	Verbal Numerical Pain Scoring
WNSWLHD	Western New South Wales Local Health District

ABSTRACT

AIM:

To determine if patients being transported between two rural hospitals by non-ambulance transport travelling along two predetermined routes experienced pain during their journey. This study was also used to identify if any patient characteristics could be associated with an increase or decrease in the level of pain.

METHODS:

This retrospective comparative study examined the medical records of patient transport patients whom travelled from Cowra and Molong Hospitals to Orange Hospital. The study compared the pain assessment and pain management within the specified dates: July 1st 2014, to 31st December 2015. This study looked at the transport episode in three phases being pre-transport, during transport and post transport.

RESULTS:

Data were examined for a total of 256 trips taken by 150 patients. Of the total trips: 92 travelled from Cowra to Orange and 164 travelled from Molong to Orange.

Fifty-six percent (n = 144/256) of patients in the four hours pre-departure and 71% (n = 181/256) of patients during the two hours post arrival did not have a pain score recorded. Pain scores both pre-trip and post-trip were significantly associated with whether pain was recorded on the PTU nurse's handover sheet (pre: p = 0.006; post: p = 0.025).

Of the pre-transport group analgesia was given 56% of the time (n = 143/256) and of the post-transport group it was given 24% (n = 61/256). The type of analgesia administered before departing (pre-transport pain medication group) was significantly associated with the patient's pain scores post-transport (p = 0.013) but not in the pre-transport phase (p = 0.846).

CONCLUSIONS:

This study found the small numbers of patients with pain scores pre and post-transport made it difficult to identify characteristics of patients experiencing pain. It has laid the ground work for a follow-on study of a larger proportion of the 19,000 patients the PTU transports each year. Additional recording of pain scores throughout the transport episode (pre-transport, during transport and post-transport phases) would enhance the scope of the pain assessment for PTU patients.

KEYWORDS:

Patient transport, pain scores, pain management, analgesia.

EXECUTIVE SUMMARY

BACKGROUND:

The area of Patient Transport is relatively new when compared to the other specialty health care services within the hospital environment. It is a well-established practice that patients within WNSWLHD on occasion are transported from smaller rural hospitals to larger regional centres for further investigation or treatment of their medical condition. While as many as 70% of patients in hospital experience pain (Manias, 2015) this proportion of patients may potentially increase while factoring in being transported in a Patient Transport Van (PTV), on a stretcher travelling at 100km/hr on rural roads. The potential numbers of patients experiencing pain is further signified when considering there are in excess of 19,000 transport episodes undertaken by the WNSWLHD each year.

THE STUDY:

This retrospective comparative study which studied the medical records of patient transport patients whom travelled from Cowra and Molong Hospitals to Orange Hospital. The study compared the pain assessment at three phases of the transport episode (pre, during and post-transport) and pain management within the specified dates: July 1st 2014 to 31st December 2015.

RESULTS:

Data for the pre-transport, transport and post transport phases were analysed for a total of 256 trips taken by 150 patients. Of the total trips: 92 travelled from Cowra to Orange and 164 travelled from Molong to Orange. Fifty-six percent (n=144/256) of patients in the four hours pre-departure and 71% (n=181/256) of patients during the two hours post arrival did not have a pain score recorded. The number of patients who did have a pain score recorded during the pre-transport phase was 44% (n=112/256) and the number of patients did have a pain score recorded during the post-transport phase was 29% (n=75/256). There were only 15% (n=38/256) patients who had a pain score recorded during both phases.

Paired comparisons of pain scores for the pre-transport to post-transport phases did not indicate a statistically significant difference over time ($p = 0.241$). There was a statistical association between acuity level and pre-transport phase pain scores ($p = 0.027$) but not with post-transport pain scores ($p = 0.532$). Pain scores both pre-trip and post-trip were significantly associated with whether or not pain was recorded on the PTU nurse's handover sheet (pre: $p = 0.006$; post: $p = 0.025$).

The type of analgesia administered before departing (pre-transport pain medication group) was predominantly opioid based (opioid alone or non-opioid + opioid) in 76% (n=109/143) of cases and was significantly associated with the patient's pain scores post-transport and

therefore comfort level, in the post-transport phase ($p = 0.013$) but not in the pre-transport phase ($p = 0.846$). The type of analgesic administered post-transport was opioid based (opioid alone or non-opioid + opioid) in 67% of cases ($n = 41/61$) but not related to the pain score either pre-transport ($p = 0.429$) or post-transport ($p = 0.050$). If the analgesia given did not relate to a pain score this may suggest that it was a standing order for analgesia given upon returning to the ward at the completion of the transport episode.

CONCLUSIONS AND RECOMMENDATIONS:

This study represents the starting point for the WNSWLHD Patient Transport Unit (PTU) to further investigate its patient's experience of pain and its management for its 19,000 episodes of patient transport each year. This study leads the way for additional research to be undertaken to further expand upon this work and its findings. PTU nurses do not routinely record pain scores as part of their standard practice, as they currently record a yes/no response as to whether the patient is pain free. It would be beneficial for patient care and for future research if this practice was changed and a series of pain scores were recorded by the PTU nurses.

Recommendation: It is recommended that the PTU nurse's handover checklist be reviewed and for the assessment of pain question to be changed from "Are you pain free?" to asking the patient for a pain score (recorded on a 0 to 10 scale) at three separate intervals per trip.

This will provide a better measure of the patients' pain and enable the PTU nurse to compare this pain score with the previous pain score to see if it is trending up or down. It will also give the nurse a better indication of the extent of the patients' pain and therefore help the PTU nurse determine the best course of action to treat the patients' pain. The PTU would not be reliant on the ward nurses to have recorded this pre and post transportation in any future research.

The PTU nurses record three pain scores at the following intervals: Upon arrival on the ward to collect patient (with completion of the modified PTU nurse's handover sheet), en-route while travelling in the PTV and upon arrival at the destination. These additional pain scores will enable a more comprehensive profile of the patient's pain experience and the additional information provides the PTU nurses with opportunities to treat pain as necessary and before it becomes well established en-route.

Recommendation: Investigating systems that could improve PTU nurses' recognition and documentation of pain. A coordinated system such as an integrated booking, dispatch and patient record system that integrates seamlessly with the existing electronic patient record would decrease the likelihood of miscommunication or missed opportunities to measure and manage a patient's pain.

The LOGIS CAD™ PTU digital booking and dispatch system could form part of the review of current systems to check for the possible expansion of its use.

The PTU nurses could in-put pain scores, analgesia given and nurses comments on patient's journey and their pain management. This could potentially provide a comprehensive patient profile with-in the PTU data base to help identify cases where pain treatment may be necessary pre-departure. To improve patient care by being able to allocate the appropriate resources to specific cases where the pre-emptive patient dosing with analgesia has not been adequate or does not last long enough on a longer journey for example.

Recommendation: Additional research be undertaken by the PTU to expand further upon this preliminary study.

This will enable a more detailed and expanded research to look further at the patients experience of pain during transportation. This research could make use of the three pain scores recorded by the PTU nurses which form part of this studies recommendations.

INTRODUCTION:

Internal transport services of the NSW health districts have been in use for approximately thirty-five years with St Vincent's Hospital in Sydney thought to be the first when they implemented their service in 1982. Prior to its introduction patients requiring transportation to other hospitals or for diagnostic tests that required a stretcher were carried out by the NSW Ambulance Service. The Western New South Wales Local Health District (WNSWLHD) Patient Transport Service was implemented in December 1999 by the Mid-Western Area Health Service as a cost saving strategy with two patient transport vans (PTV's) and has since grown to a staff of 70 and currently has fifteen PTV's in its fleet.

As a relatively 'new' ancillary hospital service, there has been little documented research in the Patient Transport arena. In the absence of previous research to influence the decision of what aspect of patient transport to research a joint decision was made between the principal researcher and Manager of the WNSWLHD Patient Flow and Transport Unit, that pain management was the area most needing investigation.

During the 2014/2015 financial year the PTU completed 19,032 transport episodes, which is an average of 1,586 trips per month. The patients experience was an area of priority within the NSW Health Departments strategic plan as the plan mentions the experience of pain and its focus on NSW Health is increasing access to pain management services in rural and regional NSW (Rural Health Plan Progress Report p7 2015).

BACKGROUND:

It is a well-established practice within the model of healthcare in rural health that many patients require transportation to further investigate their diagnosis, for ongoing treatment or to visit a specialist doctor for them to have input into their care. This is achieved via the "Patient Flow Portal" which is co-ordinated by the Patient Flow and Transport department one of which is located within the WNSWLHD. An assumption underpinning this study is that while in hospital receiving medical care, a proportion of these patients will be experiencing pain. This study explores if transportation of the patient makes any change to the patient's experience of pain.

Western NSW Local Health District is the largest local health district in NSW; it covers around 250,000 square kilometres, which is equivalent in geographical size to Germany. WNSWLHD services a population of 276,000 people and provides healthcare services to 5,400 patients annually (NSW Health Dept WNSWLHD website 2017). The rural population it services is diverse; it encompasses regional cities, regional towns, as well as remote communities. The entire WNSWLHD encompasses more than 40 geographical locations so this study is a small sample of the overall WNSWLHD patient population.

As many as one in three patients in hospital experience pain (Manias, E. 2015). Patients in smaller regional hospitals or multi-purpose centres often need to be transported long distances for assessment or treatment at a larger base hospital. The road surfaces are well worn and uneven from potholes and the deterioration of the roads often result in a bumpy journey for the patient. Distances travelled and road conditions combined with the patient's condition which requires them to be in hospital, it is a likely outcome that the patient will experience pain from the movements associated with lying on a stretcher which is travelling at 100km/h along rural roads.

Pain is unpleasant and potentially associated with tissue damage. Patients in hospital are most likely experiencing acute pain. At the present time, the patient's pain experience during transport is not known.

An important component of pain management is pain assessment (Fast & Newton, 2008). The ward or PTU nurse can quickly and easily measure the patient's pain using the Verbal Numerical Pain Scoring scale (NSW Agency for Clinical Innovation, 2017). The nurse asks the patient to score their own pain using a 0 – 10 scale, where zero equals no pain and ten represents severe pain and the patient can choose any number on the scale to represent their pain (NSW Agency for Clinical Innovation, 2017). The numeric pain scale is currently not routinely used by the PTU staff however the patient is routinely asked by the PTU nurses if they are "pain free" and their answer is documented on the PTU patient handover form.

The optimal trip for a patient being transported in a PTV is they are positioned comfortably either on the stretcher or in a sitting position with no or minimal pain or nausea. A comfortable patient who has received good analgesia is more likely to be compliant with the PTU nurses' treatment regime while travelling between hospitals (Chambers & Guly, 1993). Current analgesia regimes consist of a dose of prescribed strong analgesia usually an opioid, administered pre-departure or nurse initiated simple analgesics (for example paracetamol) administered during transport for mild pain if the nurse escort is a registered nurse.

As strong analgesics such as opioids are not currently stocked inside a PTV, an assessment of the patients' pain pre-departure is required to administer analgesia in accordance with the doctor's prescription of analgesic medications pre-departure. Patient transport nurses working with nurse researchers are well placed to make advancements in the management of pain for their patients (Fast & Newton, 2008).

An international literature search revealed only one published paper on pain management in the patient transport environment. The published paper is a review of the literature in patient transport in the context at the time being an ambulance based service which differs from the PTU's hospital based service and its authors concluded that there was little literature published on pain assessment in the transport environment (Fast & Newton,

2008). The paper reviewing pain management in ambulance based transport services was not useful for this study as the ambulance service and the PTU services are quite different in their working environments and procedures around the administration of analgesia.

Pain management is an important aspect of patient care and in the patient transport setting forms the focus of this study. This study looks to address the existing gap in the knowledge base related to pain management in the hospital based patient transport environment.

Patient transport within WNSWLHD involves very large patient numbers with 19,000 episodes of transport annually so when considering that a third of those patients are likely to experience pain (Manias, E. 2015) that correlates to an estimate of 6000 patients per year or 500 per month that may be experiencing pain..

In rural areas, the PTU transports patients between facilities and often this is over longer distances than the patients in metropolitan regions. For example in a metropolitan hospital a CT scanner is a standard diagnostic tool, so may only require a porter to take the patient to the CT Department within that facility. However in rural regions a patient may require transportation from a smaller district hospital or multi-purpose centre to a larger regional base hospital that has a CT scanner on site or transportation to a town that has a private diagnostic facility.

The NSW Ministry of Health's Pain Management Task Force in 2012 published a Pain Management Report. This report states in its research priorities "Pain management services in NSW need a defined minimum dataset to support consistent service delivery systems." (NSW Ministry of Health, 2012).

To summarise, patients in rural hospitals need to be transferred between facilities. While it is known that patients in hospital experience pain, the pain experience of patients being transported is not known. Therefore, this study was conducted to answer the following research question:

What are the typical characteristics of WNSWLHD patients who experience pain before, during or after a non-ambulance, hospital transport episode, and does their perceived pain level change during transport?

RESEARCH AIMS:

The project aims to achieve the following:

1. To establish a patient profile of patients who utilise the patient transport service,
2. To identify the degree of pain that is occurring in the transport episode

3. Identify trends of increasing or decreasing pain from the pre-transport phase to the post-transport phase,
4. Examine which pain medications were implemented and at which phase of the transport episode and to measure their effectiveness,
5. Identification if journey length impacts upon the pain experience,
6. Identification of any patient characteristics which impact upon the pain experience.

METHODS:

A retrospective comparative study which studied the medical records of patient transport patients whom travelled in a PTV along preselected routes. The study compared the pain assessment and pain management of adult patients who travelled from two pre-selected hospitals (Molong and Cowra) and whom travelled one-way to a pre-selected destination (Orange hospital).

Research Population:

The research population consisted of the patient transport records located at the Patient Transport Unit's head office in Dubbo. Records were located on the database located at the Dubbo patient transport office. The data-base support person accessed the data-base to determine which patient records fitted within the inclusion criteria.

Within the specified dates of July 1st 2014 and 31st December 2015, an audit was completed of the medical records of the patients whom travelled via a PTV from Cowra Hospital to Orange hospital, as well as patients whom travelled from Molong Hospital to Orange hospital. The Orange hospital records were accessed online via the Electronic Medical Records (EMR) system and the Cowra and Molong medical records were accessed by the principal researcher in person at the respective medical records department at the hospitals.

The reason for choosing these routes was that the two routes from Orange to Cowra are approximately 1 hour 15 min in duration and the one from Molong to Orange is shorter being approximately a half hour duration, so was to compare the patient's pain experience of the long journeys with that of the short journey.

The timeline for this study focused on the "transport episode", which is a combination of three time intervals: the four hours prior to transport crews arriving to collect the patient (Pre-Transport), the period from when the transport crew arrived on the ward up until they dropped off the patient at their destination (Transport) and the two hours after transportation, commencing when the patient was dropped off at their destination (Post-Transport).

Inclusion Criteria:

Adult patient ≥ 18 years old whom were transported from Cowra Hospital to Orange Hospital or from Molong Hospital to Orange Hospital in a PTV as either a sitting patient or stretcher patient.

Exclusion Criteria:

- Patients ≤ 17 years old.
- Patients whom travelled these routes within the selected time frame but who were not transported in a PTV (e.g. in a fleet car or a NSW Ambulance).
- Patients whose destination was not Orange Base Hospital
- Any duplicate records that the database generated

Sample Size:

The PTU data-base once checked against the exclusion criteria revealed there were 150 patients who travelled a total of 256 trips. Of the total trips; 92 were completed from Cowra to Orange and 164 were completed from Molong to Orange.

Instruments:

The data extracted out of the PTU database was exported into an Excel Spread Sheet™ as listed below in table 1.

The following data was collected:

Table 1. Data collected from the PTU Data Base

Event date	Event ID number
MRN	Surname
First name	Date of birth
Presenting problem	Acuity level (A, B, C, D)
From location	To location
Transport mode (NSW Ambulance/PTV)	Event cost

Additional fields were added and propagated with data as per table 2. Any identifiable data was password protected and stored on the principal researcher's hard drive. Table 2. Data collected from Medical Records and PTU Job Sheet audit

Patient number	Gender
Age	Age categories
Weight	Infectious (yes/no)
Coding of presenting problem	Stretcher/sitter
Confusion (yes/no)	Distance
Trip duration	Patient flow sheet analgesia
Patient flow sheet pain score	Triage pain score
SAGO pain score pre and post-transport	PTU job sheet pain score
Combined pain scores pre-transport	Progress notes documentation of pain management pre and post-transport
Analgesia pre and post transport	Analgesia groups pre-transport and post

Pain-free on PTU handover sheet
Analgesia en-route

transport
PTU handover sheet comment on pain
Pain score categories pre and post transport

Acuity Level:

A letter (A, B, C or D) was allocated by a Patient Flow Nurse Manager to represent the associated level of care the patient may require (See Appendix.2), based on policy “Interfacility Adult Patient Transfer” policy - Western NSW LHD Intranet (WN_PD2014_013).

The pain scores included in this study were taken from all three intervals where they were recorded. The patient’s medical records were also reviewed by the principal researcher at the hospital where they were completed and the PTU documents were examined at the PTU head office in Dubbo.

Patients in the study whom experienced any level of pain as measured using the Verbal Numerical Pain Scoring (VNPS) (NSW Agency for Clinical Innovation, (2017.)), had their pain scores (0-10) included in this study.

The pain scores were assigned according to the numerical value out of ten. These pain scores were then placed into 4 pain categories: no pain (score = 0), mild pain (1-3), moderate pain (4-6) and severe pain (7-10).

If a pain score was indicated as being a pain category as either: no pain, mild pain, moderate pain or severe pain then the pain scores for that category were averaged. If necessary a pain score that were averaged that gave a result to one decimal point and it was greater than or equal to point five, then it was rounded up.

The PTU nurses assess the patients pain pre-departure as part of the PTU nurse’s handover check sheet (see Appendix. 4) which asks the question “Is the patient pain free?” which requires a “yes” or “no” response from the patient which the PTU nurse documents onto the sheet. Pain scores are not routinely recorded on this form or en-route by the Patient Transport nurse however some pain scores were recorded in the comments column on the PTU nurse’s handover sheet from the pre-departure assessment of the patient.

The Patient Flow sheet (see Appendix. 3) was completed by one of the patient flow managers on duty while on the phone with the hospital nursing staff booking a patient’s inter-facility transfer but it was not used for patients having appointments.

The PTU job sheet (See Appendix. 5) was partially completed by the ward staff booking the transport and then completed by the PTU nurse allocated to undertake the patient transport.

Ethics:

A Low/Negligible Risk ethics application was approved by the WNSWLHD Human Ethics Committee (HREC) on 10/3/2016, GWAHS Reference No. 2016-007, HREC No. LNR/16/GWAHS/8

Data Analysis:

The data collected was analysed to quantitatively summarise and analyse the participant's data. Data analysis was conducted by a statistician using IBM's SPSS software™ which generated both descriptive and inferential statistics.

- A Kruskal-Wallis test was done to examine the association between the post-transport pain medication group and pain scores of both pre-transport and post-transport phases.
- A Kruskal-Wallis test was done to examine at the association between the pre-transport pain medication group and pain scores of both pre and post transport phases and the type of analgesic administered post-transport.
- A Wilcoxon Signed Ranks test was used for paired comparisons of pain scores.
- A Spearman's Rho test was used to compare trip times and post-transport pain scores.
- A Kruskal-Wallis test was done to examine association between acuity level and pre-transport phase pain scores.

The patients included in this study were allocated into three groups. The patients that travelled the shorter journey from Molong to Orange were allocated to Group A. The patients travelling the longer journey from Cowra to Orange were allocated to Group B and those patients that didn't experience any pain throughout their journey on either journey were allocated into group C. Group C was determined by the patient having a documented zero out of ten pain score recorded at any point in their journey.

The patients who were found to have the absence of a pain score during the three time intervals of this study are assumed to have not verbalised their pain and such were placed into the third group of having experienced no pain. This assumption is based on the understanding that patients in a local health district facility that complain of pain would have their pain assessed, treated (if applicable) and documented in the progress notes and on the SAGO chart (see Appendix. 1a, 1b, 1c, 1d).

The documentation of pain management included the recording in the patient's progress notes any mention of the patient: having complained of pain, their pain score, having received analgesic medications, or the documented outcome of having had analgesia.

Pain medications were put into the following Analgesic groupings:

- opioids only (46%),
- non-opioids and opioid (21%),
- non-opioids only (25%) and
- other (8%).

Patients' presenting problems were captured on the PTU data-base and were included in this study. The presenting problems were categorised by the principal researcher using the same disease coding system used nationally in Australia by medical record coders (Australian Consortium for Classification Development (2015)). As not all of the seventeen classifications were utilised and some only had small numbers so they were further condensed into 6 categories: Cancer, Musculoskeletal, Genito-urinary, Digestive, Circulatory and Other.

Patient acuity levels are determined by PTU Nurse Coordinators from the information provided by the ward nurse in accordance with the "Interfacility Adult Patient Transfer" policy - Western NSW LHD Intranet (WN_PD2014_013). The data had 4 patients who were allocated as level "B" acuity which meant they would possibly have been cases which had a high potential to deteriorate, were unstable and time critical. The four cases were reviewed by the principal researcher and it appeared based on the criteria three of these cases were all mistakenly categorised as level "B" instead of level "C" which includes cases which are hemodynamically stable, unlikely to deteriorate suddenly and that have a provisional diagnosis. (See Appendix. 2).

A patient's identified gender was noted as either male or female and there were no omissions from this data field.

A patient's age was also recorded as a numeric value and there were no omissions from this data field. The results were then broken down into age brackets as follows:

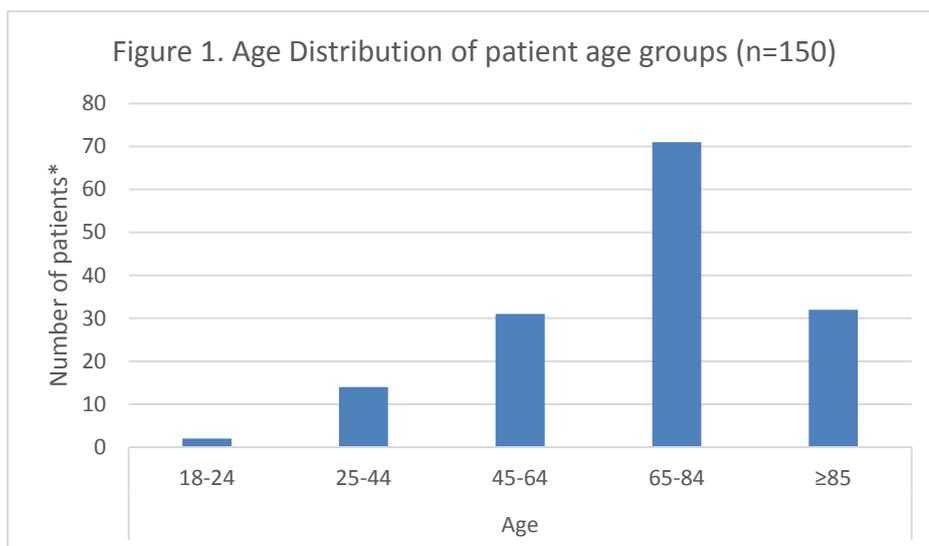
18 – 24, 25 – 44, 45 – 64, 65 – 84, ≥85

Each patient undertaking a transport episode is supposed to have their weight recorded in accordance with the PTU's Safe Operating Procedure that relates to safe manual handling procedures. There were thirty-two occasions of omissions of weight being recorded this represents a 13% omission rate. This is higher than expected as the PTU relies on receiving this information at the time of a patient being booked in to ensure the patient can be moved safely and in accordance with manual handling procedures.

RESULTS:

Participant Characteristics:

Of the original 375 Molong and 734 Cowra records that were selected from the PTU database after cleaning the data and eliminating the patients' records that did not qualify, there were a total of 256 records remaining. Of the 256 trips that did qualify, 164 travelled from Molong to Orange and 92 travelled from Cowra to Orange. The 256 trips were undertaken by a total of 150 individual patients, with a median age of 73 years (IQR 22 years). There was a considerable proportion of elderly patients in this study with 69% of the participants being 65 years or older (see figure 1). Of the 150 patients, there were 67 males (45%) and 83 females (55%).



The number of patients who did have a pain score recorded during the pre-transport phase was 112 (44%) and the number of patients whom did have a pain score recorded during the post-transport phase was 75 (29%). There were only 38 (15%) patients who had a pain score recorded during both the pre and post transport phases.

So, considering the inverse percentages, 56% of patients in the four hours pre-departure and 71% of patients during the two hours post arrival did not have a pain score recorded.

The PTU nurse's handover question: "Is the patient pain free?" had a compliance rate of 203 (79%) yes or no responses recorded, 33 (13%) not recorded and 20 (8%) occurrences where the PTU sheet was lost.

Pain Scores: Pre vs. Post Transport Phase:

The pain categories were cross tabulated for those 38 with both pre-transport and post-transport ratings. The pain categories show the trending down of pain scores. Increasing pain is represented by going from pink to red and diminishing pain going from dark blue to light blue (see Table 3). Unchanged pain categories are shown as white. There were 31% of patients whose pain remained unchanged throughout and 38% of patients whose pain diminished and 31% whose pain increased. Of those whose pain increased for two patients

the pain moved two categories (e.g. no pain to moderate). For those whose pain diminished there were four patients who pain dropped down by two categories and three who dropped down by three categories (severe to no pain).

Table 3. Pain Categories Pre-Transport and Post-Transport

		Pre-Transport				Total
		No pain	Mild pain	Moderate pain	Severe pain	
Post-Transport	No pain	9	4	2	3	18
	Mild pain	7	0	1	2	10
	Moderate pain	2	2	2	2	8
	Severe pain	0	0	1	1	2
	Total	18	6	6	8	38

Despite these shifts in pain score categories, paired comparisons of pain scores for the n=38 pre-transport to post-transport did not indicate a statistically significant difference over time (Wilcoxon Signed Ranks $z = -1.17$, $p = 0.241$).

Journey Length:

Trip times were also recorded with a minimum being 30 minutes and the maximum being 555 minutes (9 hours 25 minutes); with a median of 192.5, ([IQR 150]). A Spearman’s Rho test showed that there was no correlation between trip time and post-transport pain scores ($r_s = -0.22$, $p = 0.854$, $n = 75$). The longer job time included the return journey.

Presenting Problem:

The six categories that were used for analysis were: Cancer, Musculoskeletal, Genito-urinary, Digestive, Circulatory and Other.

Table 4. Frequency of Disease Categories

	Total sample		Trips with pre- and post-transport pain scores	
	n	%	n	%
Cancer	78	30	1	3
Musculoskeletal	65	25	13	34
Genitourinary	44	17	7	18
Digestive	22	9	7	18
Circulatory	15	6	2	5
Other	32	13	8	21
Total	256	100.0	38	100.0

Table 4 shows the frequency of the presenting problems into each of the categories for all 256 trips. When cross tabulated against the pain scores, the cell values became too small for

a valid chi-square test so no determination if a correlation existed could be made. As table 4 also indicates there were only 38 patient trips where both the pre and post-transport pain scores were recorded. When the 38 trips with a pre and post-transport pain scores were examined by disease category and change in pain score, the numbers did get too small for meaningful analysis. For example: only one of the trips with a patient with cancer had a pre- and post-transport score and this is out of 78 potential trips - or only 1.3% of the trips.

Patient Acuity:

Looking at all the trips (n=256), there was 4 (2%) category B, 73 (28%) category C and 179 (70%) category D patients. There was a statistical association between acuity level and pre-transport phase pain scores (Kruskal-Wallis $\chi^2 = 7.2$, df = 2, p = 0.027) but not with post-transport pain scores (Kruskal-Wallis $\chi^2 = 1.3$, df = 2, p = 0.532).

Rate of Analgesia:

There were 141 (55%) patients who received analgesia in the pre-transport phase, 102 (41%) whom received none and 11 where it was not recorded (4%). The analgesia given during the pre-transport phase was put into four main groups: opioids only (45%), non-opioid and opioid (32%), non-opioid only (18%) and other (5%). Opioids consisted of morphine, codeine, fentanyl or oxycodone. Non-opioid analgesia consisted of paracetamol, acetaminophen and paracetamol (Panadol-Osteo™). The other analgesic group was made up of nerve block, nerve block and opioid, non-steroidal anti-inflammatory drugs(NSAID)and combined with an NSAID's and opioid. No patients in the study received pregabalin (Lyrica™) and butylscopolamine (Buscopan™) is not listed as an analgesic drug so was excluded.

There were 61 (24%) patients who received analgesia in the post period, 186 (73%) whom received none and 9 (3%) where it was not recorded. The analgesia given during the post-period was also put into four main groups: opioids only (46%), non-opioid and opioid (21%), opioid only (25%) and other (8%).

Analgesia Type:

The type of analgesia administered before departing (pre-transport pain medication group) was significantly associated with the patient's pain scores post-transport and therefore comfort level, in the post-transport phase (Kruskal-Wallis $\chi^2 = 10.77$, df = 3, p = 0.013) but not in the pre-transport phase (Kruskal-Wallis $\chi^2 = 0.82$, df = 3, p = 0.846).

The type of analgesic administered post-transport was not related to the pain score either pre-transport (Kruskal-Wallis $\chi^2 = 2.77$, df = 3, p = 0.429) or post-transport (Kruskal-Wallis $\chi^2 = 7.83$, df = 3, p = 0.050).

Table 5. Median Pain Scores by Pain Medication Groups

	Opioid only	Non-opioid + opioid	Non-opioid only	Other analgesic
Pre-transport medication group (n*)	64	45	25	7
Pre-transport pain score, median (IQR)	2.0 (5)	2.0 (6)	0 (5)	2.0 (7)
Post-transport pain score, median (IQR)	3.0 (6)	3.0 (7)	0 (-)	4.5 (-)
Post-transport medication group (n*)	28	13	15	5
Pre-transport pain score, median (IQR)	2.5 (7)	2.0 (5)	0 (4)	7.0 (-)
Post-transport pain score, median (IQR)	5.0 (4)	6.0 (-)	2.0 (3)	2.0 (5)

PTU Nurses Handover Sheet:

There were 63 patients recorded as having pain on the PTU nurse’s handover sheet. Of the 63 with pain, 25 had a pre-transport pain score (median 2.0, [IQR 6]) Of the 25 (with pain on the handover sheet and with a pain score), nine (36%) had a pain score of 0, eight (32%) had a mild pain score, four (16%) moderate pain and four (16%) severe pain.

Of the 64 (pain free on the handover sheet and with a recorded pain score), 44 (69%) had a pain score of 0, nine (14%) had a mild pain score, 10 (16%) had moderate pain and one (1%) had severe pain.

Table 6. Nurses Handover Sheet Pre-Trip Pain Scores

	Number of patients	Pain level recorded pre - transport	IQR	Median
In pain on PTU Nurses Handover Sheet n=25	9	No pain	6	2.0
	8	Mild pain		
	4	Moderate pain		
	4	Severe pain		
Not in pain on PTU Nurses Handover Sheet n=64	44	No pain	2	0
	9	Mild pain		
	10	Moderate pain		
	1	Severe pain		

There was a statistically significant association found between whether or not the patient was recorded as being pain-free on the PTU nurse’s handover sheet and the patient’s category of pain score pre-transport (linear-by-linear association $\chi^2 = 7.84$, $df = 1$, $p = 0.005$). The same significant association held for post-trip pain score categorisation (linear-by-linear association $\chi^2 = 5.51$, $df = 1$, $p = 0.019$), with 70% ($n = 21/30$) of those recorded as pain-free on the handover sheet having a post-transport pain score of 0, compared with 44% (11/25) of those recorded as having pain on the PTU nurse’s handover sheet.

Pain scores both pre-transport and post-transport were significantly associated with whether or not pain was recorded on the handover sheet (pre: Mann-Whitney U $z = -2.72$, $p = 0.006$; post: Mann-Whitney U $z = -2.25$, $p = 0.025$). These comparisons related to the median scores: see table 7.

Table 7. Pre vs. Post Transport Nurses Handover Sheet Median Pain Scores

	Number of patients	Possible responses	Median pain scores
Pre-transport	21	No pain	0.0
		Has pain	2.0
		No record found	2.5
		No response recorded	0.0
Post-transport	11	No pain	0.0
		Has pain	1.0
		No record found	4.0
		No response recorded	0.0

Trip Length:

We wanted to also see if a longer journey increased the incidence of pain being experienced by the patients travelling in a PTV. The data revealed that there was no statistically significant difference between the two trip destination groups (Mann-Whitney U $z = -0.42$, $p = 0.676$).

Analgesia Effectiveness:

Of the patients with a pre-transport pain score ≥ 1 , there was no statistical difference by destination in terms of the proportion of patients receiving an analgesic medication; Cowra 90%, Molong 73%; Fisher’s Exact Test $p = 0.26$.

As table 8 indicates the analgesia that was administered was effective at reducing the pain scores. The results with a negative value indicates that the pain improved or lessened.

Table 8. Effect of Analgesia Type on Pain Scores

		Count	Median	Mean
Cowra- Orange	opioid only	10	-2.00	-3.00
	non opioid + opioid	4	1.00	1.00
	non opioid only	2	.	.
	other analgesic	2	.	.
Molong- Orange	opioid only	9	-2.50	-1.75
	non opioid + opioid	6	-3.00	-3.00
	non opioid only	3	-8.00	-8.00
	other analgesic	1	-2.00	-2.00

Table 9. P value comparison between the different analgesic medications

Analgesia Type	p Value
Opioid only vs Simple + opioid:	p = 0.954
Opioid only vs Simple only:	p = 0.002*
Opioid only vs Other:	p = 0.596
Simple + opioid vs Simple only:	p = 0.011*
Simple + opioid vs Other:	p = 0.711
Simple only vs Other:	p = 0.003*

*Significant as $p < 0.05$

As table 9 above indicates the type of analgesic medication used in certain combinations did have an impact on how effective they were at treating the patient's pain and therefore also affected the p value.

Pain Categories:

As table 10. below indicates for each category of pain (mild, moderate and severe) there was more analgesia given then not given and interestingly 26 (42%) of the patients who reported having no pain still received analgesia. There were patients who were on routine analgesics for chronic pain conditions but this study did not identify those participants. There were three patients with moderate to severe pain who received no analgesia. The one patient with severe pain was flagged by the principal investigator as requested by the ETHICs Committee to be reported to the Patient Transport Manager for further investigation by the relevant department head and resulted in a review of staff interaction and further instructions provided to staff.

Table 10. Incidence of Analgesia by Pain Category

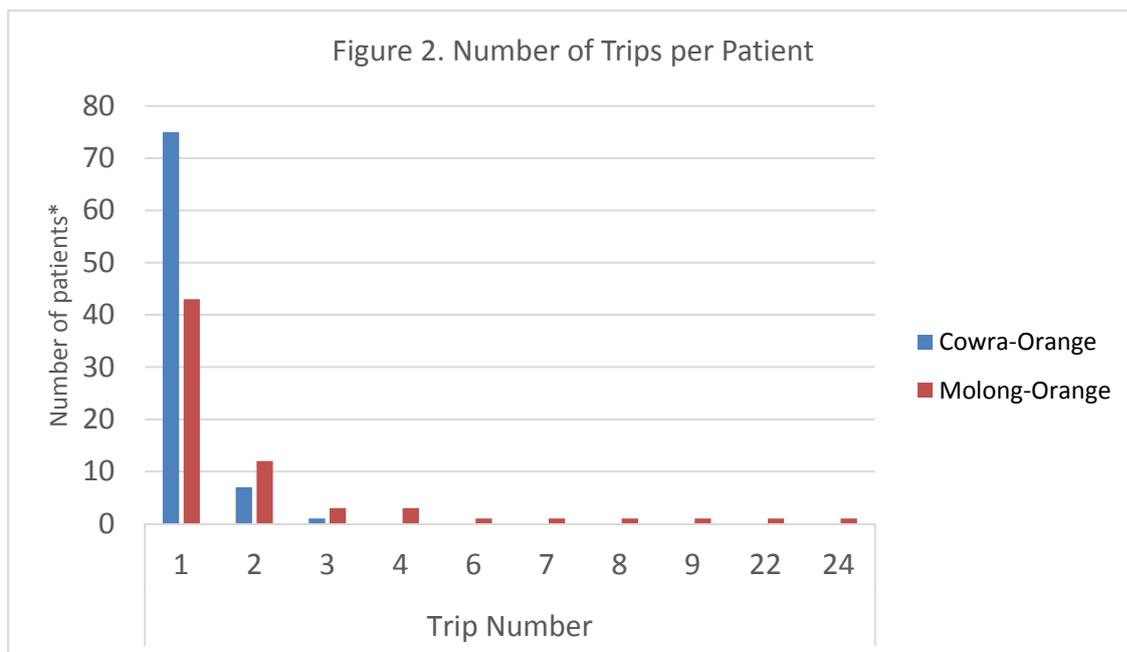
		No pain	Mild pain	Moderate pain	Severe pain	Total
nil (no analgesia given)	n	36	6	2	1	45
	%	58.1%	27.3%	12.5%	12.5%	41.7%
analgesia given	n	26	16	14	7	63
	%	41.9%	72.7%	87.5%	87.5%	58.3%
	n	62	22	16	8	108
	%	100.0%	100.0%	100.0%	100.0%	100.0%

When a Chi-Square test was used looking at the Linear-by-Linear Association between the two groups of analgesia given and no analgesia given, this revealed that there was a statistical significance between the two groups as $p = 0.001$.

Trip Numbers:

Most of the Cowra-Orange trips were single trips (90.4%) and the maximum was three trips, whereas only approximately two-thirds of Molong-Orange trips were single trips (64.2%) and the maximum was 24 trips as can be seen in Figure 2. Below.

There was a statistically significant difference between the Cowra and Molong groups, (Mann-Whitney Test: $U_z = -4.06$, $p = 0.001$), however when considering the whole sample, there was no correlation between the number of trips and pain at either the pre-transport phase ($r_s = -0.17$, $p = 0.074$) or post-transport phase ($r_s = -0.17$, $p = 0.155$). When split by trip destination, there were non-significant trends towards negative correlations between trip number and the pre-transport pain score (Cowra $p = 0.053$, Molong $p = 0.062$).



*n = 150

Stretcher vs. Sitting:

There was no statistical significance in the pain scores between the patients who travelled lying down on the stretcher or in a sitting position. Of the 256 trips, there was 144 (56%) stretcher trips and 60 (24%) sitting patients, 47 (18%) were not recorded and 5 (2%) indicated both options were utilised. Using a Chi-Square Linear by Linear association test the pre-transport ($p = 0.514$) and post-transport ($p = 0.681$) pain score results when compared revealed no statistical significance between the sitting and stretcher trips.

Confused patients:

The incidence of confused patients in this study found that there were 24 patients documented as being confused. Of these 14 (15%) were on the Cowra to Orange trip and 8 (5%) on the Molong to Orange trip.

Two confused patients overall had significant pain scores and they were both on the Cowra trip. One had a pain score given by triage of 9/10 in the pre-transport phase and they then received an opioid and then no further pain scores or documentation relating to pain was recorded. The second patient had no recorded pre-transport phase pain scores but did have documentation of their pain in the progress notes and was given a simple analgesic during the pre-transport phase but recorded a pain score of 10/10 post arrival but were not given any further analgesia, however they did have documentation in the progress notes relating to pain management during the post-transport phase.

DISCUSSION:

This study is the first of its kind to explore the pain experienced by patients during non-ambulance inter-hospital transport in a rural area. To summarise, patients in rural hospitals need to be transferred between facilities. While it is known that patients in hospital experience pain, the pain experience of patients being transported is not known. Therefore this study was conducted to answer the following research question:

What are the typical characteristics of WNSWLHD patients who experience pain before, during or after a non-ambulance transport episode, and does their perceived pain level change during transport?

The demographics of this sample indicate that the majority (69%) of patients transported along the two routes included in this study were over 65 years of age, with nearly a quarter of the 150 patients being over 85 years old.

The PTU nurses are well placed to make advancements in the management of pain for their patients.

Pain Scoring:

A large number of patients in this study did not have a pain score recorded. The low incidence of pain scores being recorded in either the pre-transport or post-transport phases meant that there were only 38 patients who had a pain score recorded in both the pre-transport and post-transport phases.

The PTU Nurses handover form had the question for the PTU nurses to provide a response to “Is the patient pain free?” This question did not ask for a pain score and it is not current practise to record a pain score during the trip. As this question was not a measure of pain but rather to determine the presence or absence of pain, it is therefore not a useful tool to determine the extent of the patient’s pain.

It is pleasing to see a trending down overall of the pain scores from the pre to post-transport phases meaning the patients pain was less evident at the end the journey rather than before it started, however the sample of trips with pain scores recorded in both phases were so small this was not a statistically significant finding. This small sample indicates the current practises of pain management seems to be effective for the majority of patients in managing their pain. This finding warrants a larger sample study to further explore the relationship between pain scores and pain relief given to the patients.

Pain Medications:

When looking at the same subgroup of 38 patients whom received a pain score at both the pre-transport and post-transport phases their primary analgesia was opioid or opioid in

combination with a non-opioid analgesic for 29 of the patients and for 25 of them their mean pain scores was a negative value indicating their pain was diminishing over time.

As there were many patients where pain scores were not recorded which for Cowra was surprising as unlike Molong hospital it doesn't have any residential aged care beds where pain scores are not routinely recorded. This study did not identify if any of the patients were from the residential aged care beds at Molong hospital. There would be benefits for the patient in recording pain scores for all patients booked for transportation having their pain scores recorded: immediately pre-transport, during the transportation and post transportation.

As such large numbers of patients are being transported each year by the numerous patient transport services which all Local Health Districts (LHD's) in both rural and metropolitan areas now have available, it is likely that the findings of this research project will have relevance and value to not only the WNSWLHD's PTU but also to all other patient transport units in NSW and interstate. This research project can form the foundation for subsequent research to be built upon.

Patient Flow sheet and PTU job sheets have as of the 1st of May 2017 become obsolete as WNSWLHD implemented the "LOGIS CAD™" system as part of the NSW Health Departments planned state-wide rollout of the new transport system. This is a computer based system which enables the nursing staff on the wards to book in the required transport and then it is received electronically by the dispatch office in Dubbo and then scheduled to be allocated to a PTU crew via a Smartphone app on the PTU nurses mobile phone. The PTU nurses hand-over job sheet is still in use but is about to undergo a review.

The PTU nurse's handover form has the PTU nurse asking the patient if they are pain free or not. Compliance with the recording of an answer among the PTU nurses was high at 79%, however the yes/no response this question looks to illicit from the patient doesn't automatically result in a pain score being recorded. The question itself is a little ambiguous, if the patient responds that they are not pain free which in fact means they do have pain. It is better practice to replace the question with "Pain score (0 to 10)." This would enable a direct comparison with the previous pain score (if recorded) and identify if the pain score values are trending up or down.

If pain is being recorded it is better practice to measure the pain using a VNPS rather than eliciting a generalised yes or no response with a closed question, which only confirms if the patient has the presence or absence of pain.

To provide a comparison for the pain experienced throughout the transport episode it would be optimal to record a pain score using a VNPS at four set intervals. Firstly, a pain

score entered by the ward nurse making the booking onto the new patient transport booking system (LOGIS CAD™), then three pain scores recorded onto the PTU nurse's handover sheet for pre-departure, one en-route and one upon arrival at the destination. This would then provide more information on how the patients experience of pain related to their journey progression facilitate further studies into if treatment of pain en-route was required. These pain scores recorded by the PTU nurse would replace the question on the PTU nurse's handover sheet asking the patient if they are pain-free.

The new LOGIS CAD™ system now logs the trip times more accurately than the earlier system which was in use during the time interval studied by this research. The new digital system requires the PTU nurse to push a button on the smart phone app: when the job is received by the PTU nurse, time of arrival to collect patient, time departing ward, time of arrival at destination and time of job completion. The LOGIS CAD™ system is an improvement on the previous paper based system as it captures more time intervals.

This research relied upon ward nursing staff to capture pain scores in the time frames either side of the transportation of the patient. This also involved the principle researcher having to travel to the sites to gather information from the paper based medical records. The implementation of electronic medical records since the date frame of this research would help facilitate easier data collection for future research but would still involve hours of manually collecting pain scores from the electronic records. By utilising the LOGIS CAD™ system to have the PTU staff in-put three pain scores at separate set intervals, then data collection could occur at the push of a button as it would all be downloaded from the PTU's own internal data base. With 19,000 patients per year on average being transported by the WNSWLHD PTU there could potentially be more robust research undertaken with such a large sample. LOGIS CAD™ is a state-wide system so that could facilitate a potential state-wide research sample and for rural and metropolitan comparisons.

Limitations:

The variable recording methods of the PTU drivers meant it was not possible to determine which of the two available routes from Cowra to Orange the crews travelled along so the distinction could not be made as to which route the crews travelled along. The reliance on non PTU staff to have recorded pain scores to be included in this study was also a limitation.

Strengths:

This research project provides a basic data set for the patients in the study. As an initial study, it will form a baseline for subsequent studies to build upon and will look at one aspect of the patient journey from the aspect of them being transported inter facility for either diagnostic tests or for the management of their medical condition. This research project looks to address the existing gap in the literature on pain management in patient

transport by publishing its findings in the project's final report. This research has identified where a gap exists in the recording of pain scores surrounding a transport episode. This gap can now be addressed within the PTU prior to further research being undertaken on pain management in patient transport in the WNSWLHD.

CONCLUSION:

This research has found that it was not able to establish a patient profile so to identify which patients are more likely to experience pain. This was due to the data analysis being reliant on a small sample where some data values were too small for analysis. The small final sample size used for comparative analysis was the result of the absence of pain scores having been recorded by non PTU nursing staff. This study was reliant on non PTU nursing staff having recorded pain scores as the PTU nurses did not record their own pain scores.

This research forms a baseline onto which subsequent research can be built. As it was the first study of its type following an international literature search its significance should not be under minded by its sample size. Considering there are 19,000 transport episodes occurring each year within the WNSWLHD there is the need to expand upon this initial research to further investigate to what extent pain is being experienced by the majority of patients and how well their pain is being managed.

RECOMMENDATIONS:

- Additional research be undertaken to expand upon this research. The next study would incorporate three pain scores each trip recorded by the PTU nurses. This would potentially identify which patients and in what locations throughout the LHD are experiencing pain and to what extent and also identify in more detail the effectiveness or lack thereof for the current pain management treatment regimes. This research could be undertaken by a team consisting of a PTU nurse, Patient Flow Nurse Co-Ordinator and Patient Flow doctor.
- PTU nurses record three sets of pain scores per trip: Pre-departure, en-route and post arrival.
- Modify the existing PTU nurse handover sheet to accommodate the documentation of three sets of pain scores (Pre-departure, en-route and post arrival) and removal of the existing question about the patient's pain.
- Investigate if it is feasible to also record the patients three pain scores in the digital dispatch system (Logis Cad [™]). This application is currently uploaded onto the PTU nurses smart phones and is used by dispatch staff to issue jobs to PTU crews. Having

the scores recorded electronically by the PTU nurses may facilitate any future researcher's ability to quickly and easily retrieve pain scores.

Develop a PTU Pain Management Protocol formulated under the directive of the PT and FU Manager with input from the PTU nurses, PFU doctors and nurse managers. The protocol provides an avenue for PTU nurses to treat a patient's pain under the directive of either the ward doctor or the PFU doctors while either in the ward environment or while on the road travelling between hospitals.

REFERENCES:

Australian Consortium for Classification Development (2015), ICD -10-AM The International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (9 th edition) Independent Hospital Pricing Authority, Darlinghurst.
Chambers, J., Guly, H. (1993). The need for better pre-hospital analgesia. <i>Archives of Emergency Medicine</i> Vol. 10, 187-192.
Clinical Excellence Commission, e-chart book portal, Safety and quality of healthcare in NSW (2015), NSW Ambulance Indicators, Pain Management. Retrieved from http://www.cec.health.nsw.gov.au/echartbook/acute-and-other-services-indicators/pain-management
Fast, M., & Newton, S. (2008). Assessment of pain in the transport environment: A review of the literature. <i>Journal of Emergency Nursing: Research</i> , 301-304.
Macintyre PE, Schug SA, Scott DA, Visser EJ, Walker SM; APM: SE Working Group of the Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine (2010), <i>Acute Pain Management: Scientific Evidence</i> (3rd edition), ANZCA & FPM, Melbourne.
Manias, E. (2015) Evidence Based Nursing 2015 Oct; 18(4):121. doi: 10.1136/eb-2014-101937. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/25854956
Merskey, H. (1986). International Association for the Study of Pain Subcommittee on Taxonomy. Classification of chronic pain syndromes and definitions of pain terms. <i>Pain</i> , Vol Suppl. 3, 1986, 226.
NSW Agency for Clinical Innovation (2017), Pain Management Network, Verbal Numerical Pain Scoring. Retrieved from http://www.aci.health.nsw.gov.au/_data/assets/pdf_file/0017/212912/Verbal_Numerical_Rating_Scale.pdf
NSW Ministry of Health. (2012). Pain Management Report: Report of the NSW Pain Management Taskforce [pdf report]. Retrieved from http://www.health.nsw.gov.au/PainManagement/Publications/NSW-Pain-Management-Report.pdf
Greater Western New South Wales Local Health District website: Western NSW LHD demographics http://www.health.nsw.gov.au/lhd/pages/wnswlhd.aspx
NSW Health Rural Health Plan, progress Report 2015 http://www.health.nsw.gov.au/rural/Publications/rural-health-progress-2015.pdf

APPENDENDICES:





Holes punched as per AS2828. 1:2012
BINDING MARGIN - NO WRITING

NH606512 221113

		FAMILY NAME		MRN	
		GIVEN NAME		<input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	
STANDARD ADULT GENERAL OBSERVATION CHART		D.O.B. ____/____/____		M.O.	
		ADDRESS			
<input type="checkbox"/> Altered Calling Criteria		LOCATION			
ALL OBSERVATIONS MUST BE GRAPHED			COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE		
OTHER CHARTS IN USE					
<input type="checkbox"/> Neurological Observation		<input type="checkbox"/> Insulin Infusion		<input type="checkbox"/> Alcohol Withdrawal	
<input type="checkbox"/> Fluid Balance		<input type="checkbox"/> Pain / Epidural / Patient Control Analgesia		<input type="checkbox"/> Resuscitation Plan	
<input type="checkbox"/> Anticoagulant		<input type="checkbox"/> Neurovascular		<input type="checkbox"/> Other _____	
PRESCRIBED FREQUENCY OF OBSERVATIONS					
<i>Observations must be performed routinely at least 8th hourly, unless advised below</i>					
DATE:		dd/MM/yy			
Time:		hh:mm			
Frequency Required		Twice daily			
Medical Officer Name (BLOCK letters)		P. SMITH			
Medical Officer Signature		P. SMITH			
Attending Medical Officer Signature		<i>R. Blagge</i>			
ALTERATIONS TO CALLING CRITERIA					
MUST BE REVIEWED WITHIN 72 HOURS OR EARLIER IF CLINICALLY INDICATED					
Any alterations MUST be signed by a Medical Officer and confirmed by Attending Medical Officer Document rationale for altering CALLING CRITERIA in the patient's health care record					
DATE:		dd/MM/yy			
TIME:		hh:mm			
Next review due Date & Time		dd/MM/yy hh:mm			
Respiratory Rate	Yellow Zone	30-34			
	Red Zone	≥ 35			
SpO ₂	Yellow Zone				
	Red Zone				
Heart Rate	Yellow Zone				
	Red Zone				
Blood Pressure	Yellow Zone				
	Red Zone				
Other	Yellow Zone				
	Red Zone				
Medical Officer Name (BLOCK letters)		P. SMITH			
Medical Officer Signature		P. SMITH			
Attending Medical Officer Signature		<i>R. Blagge</i>			
INTERVENTIONS / COMMENTS / ACTIONS					
	Date	Time			
1.					
2.					
3.					
4.					

STANDARD ADULT GENERAL OBSERVATION CHART SMR110.010

Appendix 1a.





Holes punched as per AS2828.1:2012
BINDING MARGIN - NO WRITING

NHR006512_221113

		FAMILY NAME		MRN	
		GIVEN NAME		<input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	
STANDARD ADULT GENERAL OBSERVATION CHART		D.O.B. ____/____/____		M.O.	
		ADDRESS			
		LOCATION			
<input type="checkbox"/> Altered Calling Criteria		COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE →			
ALL OBSERVATIONS MUST BE GRAPHED					
AIRWAY/BREATHING	Date Time			Date Time	
	Respiratory Rate	35		35	
		30		30	
		25		25	
	20		20		
	15		15		
	10		10		
	5		5		
	SpO ₂ %	100		100	
		95		95	
		90		90	
		85		85	
	O ₂ Lpm			O ₂ Lpm	
	Device / mode			Device / mode	
Key: RA = Room Air, NP = Nasal Prongs, FM = Simple facemask, NRB = Non Re-breather, VM = Venturi Mask					
CIRCULATION	Blood Pressure (mmHg) SBP is trigger	230		230	
		220		220	
		210		210	
		200		200	
		190		190	
		180		180	
		170		170	
		160		160	
		150		150	
		140		140	
		130		130	
		120		120	
		110		110	
		100		100	
		90		90	
		80		80	
		70		70	
		60		60	
		50		50	
		40		40	
	Rhythm			Rhythm	
	Heart Rate	160		160	
		150		150	
		140		140	
		130		130	
		120		120	
		110		110	
		100		100	
		90		90	
		80		80	
		70		70	
		60		60	
		50		50	
		40		40	
DISABILITY	Neurological	A		A	
		V		V	
		P		P	
		U		U	
Enter appropriate letter. A= Alert, V= Rousable by voice (conduct GCS). P= Rousable only by pain (conduct GCS). U= Unresponsive					
Initials				Initials	

Appendix 1b.

REFER TO YOUR LOCAL CLINICAL EMERGENCY RESPONSE SYSTEM (CERS) PROTOCOL FOR INSTRUCTIONS ON HOW TO MAKE A CALL TO ESCALATE CARE FOR YOUR PATIENT

CHECK THE HEALTH CARE RECORD FOR AN END OF LIFE CARE PLAN WHICH MAY ALTER THE MANAGEMENT OF YOUR PATIENT

Yellow Zone Response

IF YOUR PATIENT HAS ANY YELLOW ZONE OBSERVATIONS OR ADDITIONAL CRITERIA* YOU **MUST**

1. Initiate appropriate clinical care
2. Repeat and increase the frequency of observations, as indicated by your patient's condition
3. Consult promptly with the **NURSE IN CHARGE** to decide whether a **CLINICAL REVIEW** (or other CERS) call should be made

Consider the following:

- What is usual for your patient and are there documented 'ALTERATIONS TO CALLING CRITERIA'?
- Does the trend in observations suggest deterioration?
- Is there more than one Yellow Zone observation or additional criterion?
- Are you concerned about your patient?

IF A CLINICAL REVIEW IS CALLED:

1. Reassess your patient and escalate according to your local CERS if the call is not attended within 30 minutes or you are becoming more concerned
2. Document an A-G assessment, reason for escalation, treatment and outcome in your patient's health care record
3. Inform the Attending Medical Officer that a call was made as soon as it is practicable

*Additional YELLOW ZONE Criteria

- Increasing oxygen requirement
- Poor peripheral circulation
- Excess or increasing blood loss
- Decrease in Level of Consciousness or new onset of confusion
- Low urine output persistent for 4 hours (< 100mLs over 4 hours or < 0.5mL/kg/hr via an IDC)
- Polyuria, in the absence of diuretics (urine output > 200mL/hr for 2 hours)
- Greater than expected fluid loss from a drain
- New, increasing or uncontrolled pain (including chest pain)
- Blood Glucose Level < 4mmol/L or > 20mmol/L with no decrease in Level of Consciousness
- Ketonaemia > 1.5mmol/L or Ketonuria 2+ or more
- **Concern by patient or family member**
- **Concern by you or any staff member**

CONSIDER IF YOUR PATIENT'S DETERIORATION COULD BE DUE TO SEPSIS, A NEW ARRHYTHMIA, HYPOVOLAEMIA/HAEMORRHAGE, PULMONARY EMBOLUS/DVT, PNEUMONIA/ATELECTASIS, AN AMI, STROKE, OR AN OVERDOSE/OVER SEDATION

Red Zone Response

IF YOUR PATIENT HAS ANY RED ZONE OBSERVATIONS OR ADDITIONAL CRITERIA# YOU **MUST CALL FOR A RAPID RESPONSE** (as per local CERS) **AND**

1. Initiate appropriate clinical care
2. Inform the **NURSE IN CHARGE** that you have called for a **RAPID RESPONSE**
3. Repeat and increase the frequency of observations, as indicated by your patient's condition
4. Document an A-G assessment, reason for escalation, treatment and outcome in your patient's health care record
5. Inform the Attending Medical Officer that a call was made as soon as it is practicable

#Additional RED ZONE Criteria

- **Cardiac or respiratory arrest**
- **Airway obstruction or stridor**
- **Patient unresponsive**
- Deterioration not reversed within 1 hour of Clinical Review
- Increasing oxygen requirements to maintain oxygen saturation > 90%
- Arterial Blood Gas: PaO₂ < 60 or PaCO₂ > 60 or pH < 7.2 or BE < -5
- Venous Blood Gas: PvCO₂ > 65 or pH < 7.2
- Only responds to Pain (P) on the AVPU scale
- Sudden decrease in Level of Consciousness (a drop of 2 or more points on the GCS)
- Seizures
- Low urine output persistent for 8 hours (< 200mLs over 8 hours or < 0.5mL/kg/hr via an IDC)
- Blood Glucose Level < 4mmol/L or > 20mmol/L with a decreased Level of Consciousness
- Lactate ≥ 4mmol/L
- **Serious concern by any patient or family member**
- **Serious concern by you or any staff member**

Holes punched as per AS2828.1:2012
BINDING MARGIN - NO WRITING



Levels of Transport

Level:	Clinical Activity:	Transport Methods:
A	Life threatening	<ul style="list-style-type: none"> • NETS • Aeromedical Control Centre • Lights & Sirens Road Ambulance • Road Ambulance requiring Medical Escort
B	High potential to deteriorate. Unstable. Time Critical.	<ul style="list-style-type: none"> • Road Ambulance (May require RN escort) • Air Ambulance • NEPT contractor
C	Hemodynamically stable. Unlikely to deteriorate suddenly. Provisional Diagnosis.	<ul style="list-style-type: none"> • NEPT • Cardiac PTV • Ambulance booked as NEPT unavailable • Stable tertiary referrals
D	Non urgent transfer requiring nurse escort.	<ul style="list-style-type: none"> • NEPT for appointments that require escort • NEPT requiring escort • Non urgent waiting in peripheral site for bed in base facility
E	Transfer of patients not requiring clinical management.	<ul style="list-style-type: none"> • Private Vehicle • Taxi • NEPT not requiring escort • NEPT to home residence

Appendix. 2

PFTU INTER-FACILITY TRANSFER CLINICAL INFORMATION

NUMBER:

Database Portal Whiteboard First Net

Date:		Call Start:	NEPT: Yes / No
Referring Facility:		Caller:	
Patient's Name:			AUID:
DOB:	Age:	M / F	Conf Call: Y / N / N/A
<u>Situation / Background</u>		Time:	Time:
		T: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	T: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		HR: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	HR: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<u>Situation / Background / Assessment</u>		RR: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	RR: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		BP: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	BP: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		SaO2: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	SaO2: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		GCS: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	GCS: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		BGL:	Pain Score:
		Inside the Flags Yes / No	Altered Criteria Yes / No
		Infectious Yes / No	
		Monitored Yes / No	02 L/min
		IV Access Yes / No	
		IV Infusion Yes / No	
		Confusion Yes/No	Incontinent Yes/No
		Drains Yes/No	
		Diabetic Type1/Type 2	NFR Yes/No
		Mental Health Yes/No	
		Transport discussed with:	
		Referring Dr Yes/No	Receiving Dr Yes/No
		Medicare Number:	
		Private Health:	
		Wt: kgs. Bariatric assessment Y / N	
Receiving Facility:	Receiving Clinician:		
Receiving Clinicians Recommendations:			
Ambulant / Sitter / Stretcher / Capsule			
Transport Level: A / B / C / D / E			
MRU	NETS	Air Amb	
Amb	PTV	W/Way	
RFDS	Private/Taxi	Cardiac PTV	
PTV Suitable Yes / No			
Reason not used:			
Timeframe:		Ref No.:	
Notified: BM:	Referring Facility:	ED:	Booked:
Co-Ordinator:		Signature:	Date:
			Booked with:

Western NSW Local Health District - Patient Flow Transport Unit
Form No. 011 V1

Date Created: 20/10/2016
Review Date: 20/10/2018

Appendix. 3



 Health Western NSW Local Health District Western NSW LHD Patient Safety Handover Checklist		AUID	
		SURNAME	
		OTHER NAMES	
		DOB	
		MALE/FEMALE	
		DATE	
REFERRING FACILITY and WARD:			
CLINICAL HANDOVER INCLUDES THE FOLLOWING BUT NOT LIMITED TO: <i>(This form is to be completed prior to loading patient for transfer)</i>		YES/NO/NA	COMMENT/ACTION
INTRODUCTION	Correct ID band on patient		
	Allergy band on patient		
SITUATION BACKGROUND	Significant clinical history and information discussed		
ASSESSMENT	<i>The patient is pain free</i>		
	<i>Heart rate between 50 and 120 bpm</i>		
	<i>Systolic BP between 100mmHg and 180mmHg</i>		
	<i>Respiratory rate between 10 and 25 per minute</i>		
	<i>SaO₂ between 95% and 100%</i>	SaO ₂ =	
	<i>Level of Consciousness of AVPU score unchanged</i>		
	Medication administered as prescribed		
	Patent IV access		
	IV fluids administered according to IV orders and documented accordingly		
	Fluid Balance Chart reviewed		
	<i>Weight recorded</i>		
	Oxygen required		_____ L/min via
	Infection risk?		
	Pressure Injury Prevention Score		PIP Score <10 (Low) PIP Score >10 (High)
	Fall Risk		Fall risk score _____
Skin inspection (bony points) blanches			
All documentation available collected			
Acute changes in patient status 1. Need to contact PF Nurse Coordinator 2. Need for medical review			
CLINICAL COMMENTS:			
Name of Person transferring care:		Name of Person Receiving care:	
Date:		Time:	

Appendix. 4

INTERNAL TRANSPORT REQUEST

FROM: _____ TO: _____

Has private transport been investigated (if appropriate) Yes No

*** Indicates a MANDATORY field**

* Trip Date:		M.R.N No:	
* Name:		* D.O.B:	Age:
Ward:	Medicare No:	* Home Address:	
* Admission Diagnosis:		* Authorising Doctor:	
		* Accepting Doctor:	
* Reason for transport:		* Appointment Time:	
* Patient Information:			
* Contact at Referring Hospital:			* Ph No:
* Requesting Nurse Signature:			* Name:
* Type of Vehicle	<input type="checkbox"/> Hosp Car	<input type="checkbox"/> Road Amb	<input type="checkbox"/> Van
			<input type="checkbox"/> Taxi
			<input type="checkbox"/> Mental Health Car
			<input type="checkbox"/> Private Car
* <input type="checkbox"/> Walker	* <input type="checkbox"/> Wheelchair	* <input type="checkbox"/> Sitter	* <input type="checkbox"/> Stretcher
			* <input type="checkbox"/> Capsule
Is Patient Confused?	<input type="checkbox"/> Yes <input type="checkbox"/> No	* Comment:	
* Ambulation Assistance Required	<input type="checkbox"/> Yes <input type="checkbox"/> No	Aid:	* Cardiac Monitoring Required? <input type="checkbox"/> No <input type="checkbox"/> Yes
* IV Therapy / Cannula:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Type of IV Fluid:	
* Incontinent:	<input type="checkbox"/> Yes <input type="checkbox"/> No	* Oxygen:	<input type="checkbox"/> Yes <input type="checkbox"/> No
* Known Infections:	<input type="checkbox"/> Yes <input type="checkbox"/> No	* Drains:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type of Infection:	Type of Drain:		
* Patient's Weight:	* NFR Documented:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<i>If yes, photocopy documentation to send with patient</i>			
Observations during Transport:		* Escort Required:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Vehicle Driver:		Mental Health Client:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Escort Name:		Scheduled? Appendix E completed and faxed:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
Drivers Report: <input type="checkbox"/> Transferred Satisfactorily		<input type="checkbox"/> Other: Please give reason:	
Departure Time:	Time Returned:	KLM's Travelled:	

PLEASE FAX COMPLETED FORM TO PATIENT TRANSPORT ON 6841 5518
Non-clinical Transport issues ring Transport Unit PH. 6841 5517 or 6841 5516

Appendix. 5