Injury and Trauma Health Network

WA Non-Major Trauma Framework

Non-major Trauma Working Group

March 2010

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Government of **Western Australia**
Department of **Health**

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Acknowledgements

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1.   Glossary of Terms

Injury: physical harm or damage to the body. It may be intentionally or unintentionally caused. An injury may be minor or require little or no care, or may be more serious, requiring treatment or hospitalization and may result in permanent scarring, disability or death.[1]

Trauma: an injury or wound resulting from an external force.[2]

Framework: aims to provide a broad foundation from which strategies can be developed. It outlines future directions for action to develop better coordination and partnerships.

Objectives: identify WHAT needs to be achieved (i.e. goals) in order to provide optimal trauma care to the non-trauma patients.

Priorities: identify the most important issues that need to be addressed in order to achieve the identified objectives.

Strategies: provide HOW the objectives identified will be met.

Principles: A general truth or settled rule of action, a prime source or element from which anything proceeds.[3]

Causation: A relationship between one phenomenon or event (A) and another (B) in which a proceeds and causes B and the direction of influence and the nature of the effect are predictable and reproducible and may be empirically observed.[3]

Risk factors: A factor that causes a person or a group of people to be particularly vulnerable to an unwanted, unpleasant, or unhealthful event.[3]

2. Executive Summary

2.1 Background

In the literature, injury and trauma is used interchangeably. An injury is defined as "a bodily lesion at the organic level, resulting from acute exposure to energy (mechanical, thermal, electrical, chemical or radiant) in amounts that exceed the threshold of physiological tolerance. In some cases; drowning, strangulation, freezing, the injury results from an insufficiency of a vital element."[4] It may be argued that trauma broadens this concept to include the psychological harm experienced by an injured person.

Injury or trauma is an increasingly significant health problem throughout the world. Every day, 16 000 people die from injuries, and for every person who dies, several thousands more are injured.[5] Injury accounts for 16% of the global burden of disease.

Injury and trauma is potentially preventable. The majority of injuries are predictable, controllable events that can be anticipated and avoided. With specific strategies, the occurrence and severity of trauma can be reduced.[6] Through research, evaluation and development of effective programs, logical interventions can be applied to prevent the vast majority of injuries, reduce trauma and improve treatment.[6,7]

To date the main focus of trauma reform in Western Australia (WA) has been on major trauma. The current reform environment and local stakeholder commentary would suggest that it is now time to consider non-major trauma specifically but within the context of the whole trauma system.

2.2 Scope

The Trauma Working Group (TWG), worked collaboratively with the Injury and Trauma Health Network to develop the *Trauma system and services report (2007)[8]*. The Trauma Working Group has now been stood down and the Injury & Trauma Network Health Network, in collaboration with the State Director for Trauma will provide leadership for phasing in the different elements that will constitute the WA Trauma System as specified in the report. *The trauma system and services report of the Trauma Working Group (2007)* focused primarily on providing a coordinated integrated trauma system for prevention and treatment of trauma, with the main focus being major trauma.

In contrast the WA Non-major Trauma Framework whilst incorporating specific initiatives recommended for major trauma will provide additional comment on issues specific to non-major trauma management.

The Non-major trauma framework will provide a working definition of non-major trauma, describe the guiding principles for non-major trauma management, and identify key objectives, priorities and strategies for each of the following key elements in the spectrum of injury control: surveillance and research, prevention, community care, pre-hospital care, acute care and rehabilitation.

2.3 Audience

It is envisioned that this framework will be used as a guide in developing models of care, guidelines and protocols for non-major trauma prevention, treatment and management in WA.

The *Framework* is also intended to guide the development of locally relevant strategies to address health service delivery for injury prevention and harm minimisation. It aims to provide sufficient information to enable the reader to understand the context and basis of key objectives and recommended strategies.

The *Framework* recognises the benefits of appropriately formulated population health and early intervention and prevention actions, and attempts to offer strategies that enhance current and earlier efforts in WA in these areas as well as within the acute care setting.

The *Framework* is designed to guide stakeholder efforts to achieve improvements in injury prevention and harm minimisation in WA across the domains within the continuum of care that apply to non-major trauma.

Stakeholders of injury and trauma health in WA include:

- Clinicians
- Planners and designers
- Policy makers, funders and providers
- Professionals and managers
- Other government agencies and non-government health service providers
- Consumers

In view of this broad range of stakeholders, the framework must include an engagement and communication strategy, a component on training and education of health care providers and highlight opportunities for the use of technologies. It will focus on strategic outcomes, not operational process. This framework will align with the vision of 'providing the right care, at the right time, by the right team and in the right place'.

2.4 Governance

The Injury and Trauma Health Network was established in 2006 under the auspices of the Chief Medical Officer WA. The role of the health network is to assist in improving the coordination of clinical services and provide direction on where and how services should be delivered.

The *Framework* has been developed by the WA Framework for Non-major Trauma Working Group under the auspices of the Western Australian Injury and Trauma Health Network (I&THN) Advisory Group, to provide a new strategic agenda for improving injury prevention and harm minimisation for West Australians.

2.5 Why a framework?

A framework outlines essential elements and presents a coordinated, comprehensive set of concepts (as opposed to facts or details) which reflect a consensus among parties involved in its development. Frameworks are flexible and can be applied to a variety of real-life situations.

3   Introduction

Prior to identifying the essential elements and comprehensive concepts that define non-major trauma care in WA, it is necessary to gain a fundamental understanding of the extent of the problem. This includes clearly defining what aspects of the problem of trauma and injury may be defined as minor or moderate and what proportion of the whole problem sits within the minor and moderate categories.

3.1   Data and Statistics

3.1.1   International trends

Injury is one of the leading causes of death and disability world-wide. It affects all populations, regardless of age, sex, income, or geographic region. Road traffic accidents are the second leading cause of death in young adults, second only to HIV/AIDS.[9] Among people aged 15-29 years, road traffic injuries, self-inflicted injuries, interpersonal violence, war, drowning, poisoning, and injuries due to fire are all among the top ten leading causes of death, according to World Health Organisation (WHO) figures.[10]

3.1.2   Australia – national trends

Injury prevention and control has been identified as one of the seven National Health Priority Areas.[11] According to the Australian Institute of Health and Welfare (AIHW), there were approximately 323,500 hospital admissions nationwide in 2001-2002, due to injury (excluding poisoning and complications of medical and surgical care).[12] A more recent report from AIHW found an estimate of 344,849 incident injury cases in 2003-04.[13] Injury and poisoning due to external causes accounted for 5.4% of a total of 6,841,192 hospital separations from public, private and psychiatric hospitals in Australia.[12] Injury and poisoning due to external causes accounted for 1.40 million patient days, at an average of 4.1 days per episode. [12]

The six most commonly reported identifiable causes of injury were falls (36%); transportation (14%); intentional self-harm (7%); assault (6%); poisoning; pharmaceuticals (2%); and fire, burns and scalds (2%).[12] Males are 1.5 times more likely than females to be hospitalized for injury and poisoning from external causes. Demographic data collected by the National Trauma Registry Consortium of Australasia showed that in Australia and New Zealand, those aged between 15 to 24 years were more frequently injured than other groups.[14]

Mechanism of injury in Australia is predominantly blunt; most hospital- and state-based trauma registries report rates between 96% and 98% for blunt mechanism, and between 2% and 4% for penetrating mechanism.[15]

3.1.3 Western Australia

A ten-year trend analysis of hospital inpatient admissions for injury from 1994 to 2003 concluded that the burden of injury on WA hospitals is growing at the rate of 3% per year for hospitalizations and bed-days, with cost increasing at the rate of 7% per year. A major contributor to this increase is the 10% per year increase in the number of hospital admissions due to falls in older people.[7]

Injury and trauma were the primary reason for presentation to metropolitan emergency departments for all age groups apart from 0-4 years in 2004-2005.[31] Injury and trauma accounted for approximately 30% of all presentations in 2004-2005. Figure 1 below shows the proportions of presentations to emergency departments by injury area and type. Of these presentations, over 50% were from injuries to upper and lower limbs and would in most instances be classified as minor trauma.

Figure 1.   Proportion of presentations to emergency departments by injury area 2004-2005

Legend:
- Upper limb
- Lower limb
- Head
- Facial
- Assault
- Multiple injuries
- Back/spine
- Eye/orbit
- Chest
- Neck/cervical/spine
- Other

Values shown: 9%, 2%, 1%, 2%, 4%, 3%, 5%, 8%, 10%, 23%, 33%
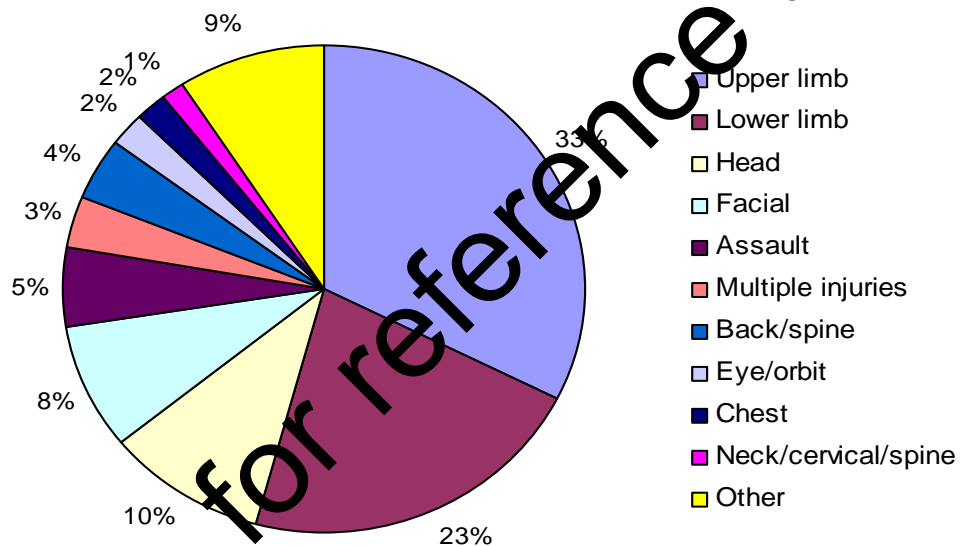
Source: WA Emergency Department Information System

3.2   Risk Factors for Injury

The Australian Institute of Health and Welfare identified the risk factors for injury: as age, gender, region of residence, cultural identity, socioeconomic status, body mass, exercise levels, and alcohol, tobacco and drug use.[16]

Younger children and older adults are more likely to have higher rates of injury than the rest of the population. Males have higher rates of injuries than females in most age groups. Individuals in rural and remote areas are also at a higher risk of injury. Aboriginals and Torres Strait Islanders have elevated risk of injury compared to non-indigenous people. Hospitalisations due to injury among the Indigenous population increase with remoteness. Socioeconomic status is also considered to be a factor in rates of injury incidence.

For both males and females in WA in 2005, those living in metro areas had the lowest hospitalisation rates for accidents and injuries, followed by those living in rural areas. Those living in remote areas experienced the highest rates of hospitalisations due to accidents and injuries.

For both Aboriginal males and females the mortality rate due to injury and poisoning was more than double that of the corresponding genders in the Non-Aboriginal population.

3.3   Trauma systems

The development of a coordinated integrated system of trauma care recognises that all trauma patients require optimal care.[17] It integrates all care providers and serves to meet the needs of all injured patients regardless of severity of injury. An effective trauma system must also be responsive to local needs. Types and numbers of presentations to emergency departments and identification of risk factors are reliable indicators of need. Indentifying the proportion of injury and trauma that occurs within each of the classifications – minor, moderate or major also helps to plan services and determine workforce requirements. Figure 2 indicates that the majority of injuries are classified as minor and moderate.

Figure 2.   Scope of a Trauma Care System[16]

To gain a further appreciation of proportion of injury by severity it is also useful to note Table 1 which provides a breakdown of the different injury classifications, definition by Injury Severity Score and the presentation rate for a major tertiary teaching hospital. [18]

Table 1.   Example of WA Tertiary Teaching Hospital Rate of Trauma by ISS Classification

Injury Classification	2006	2007*	2008
Minor (ISS <16)	3564	4099	4512
Moderate (ISS 16 – 24)	250	186	249
Severe (ISS 25 – 40)	218	179	178
Critical (ISS 41 – 75)	49	26	19

*Revised scoring system from AIS 98 to AIS 2005 from 2007 significantly downplayed the scoring of some injuries.

As previously stated; 'The trauma system and services report of the Trauma Working Group' (2007).[8] clearly describes an overarching trauma system for WA. It also articulates the definition of major trauma in addition to key elements and concepts related to major trauma service delivery. Given that the greater proportion of injury falls within the minor and moderate categories. The WA Framework for Non-major Trauma seeks to enhance the information provided in the trauma working group document by providing a definition of non-major trauma, describing the key elements and concepts related to non-major trauma service delivery in alignment with the guiding principles and objectives for care in a manner that is responsive to local need but transferable to other environments.

4.   Defining Non-Major Trauma

There are more than 50 scoring systems published for classification of trauma patients in the field of emergency or intensive care.[6] This indicates not only the need for such instruments but also their limitation to meet all requirements. [6]

The majority of all injuries do no require hospitalisation. Given the limited available resources in the health system and the need for urgent care of the seriously injured, it is critical to utilise a method of differentiating the injured patient who needs the specialised expertise and resources available in trauma centres from those who can be adequately cared for locally.[6] Estimates suggest that General Practitioners treat 20 to 30 times more patients than are admitted to hospital.[19]

A simple, accurate, reproducible and rapidly performed triage tool that can identify patients at risk of significant morbidity and mortality from those at a lesser risk is needed for the WA trauma system to deliver 'the right care, at the right time, by the right team and in the right place'.

Some examples of models for distinguishing major trauma from other categories of trauma are outlined below.

4.1   Injury Severity Score (ISS)

The Injury Severity Score is the generally recognised standard for anatomic injury severity assessment. [6] This method is used to describe patients with multiple injuries and is applied retrospectively when diagnosis is complete. It is calculated by the sum of the squares of the highest Abbreviated Injury Severity (AIS) code in three of the following locations: head or neck; face; chest, abdominal or pelvic contents; extremities or pelvic girdle; and external lacerations, burns). For example, the face, chest and external injuries might score 4, 3, and 2 respectively, hence giving an ISS of $4^2 + 3^2 + 2^2 = 29$. The ISS is then grouped by severity into the following categories: Minor (1 to 15); Moderate (16 to 24); Severe (25 to 40); and Critical (41 to 75).

According to the Western Australian Trauma Registry, major trauma is defined as patients with an ISS greater than 15.[20] This includes the categories of moderate, severe and critical trauma. Thus, by default, non-major trauma is defined as patients with an ISS of less than or equal to 15. However, there are limitations with using ISS in defining trauma. It does not take into account co morbidities and does not consider multiple injuries. For example, patients with low ISS still die often due to complications from pre-existing disease. A patient can undergo an amputation and still be categorised as a minor trauma patient. This suggests that using ISS less than or equal to 15 to define non-major trauma is not discriminatory and alternative or additional tools for definition should be considered.

A literature search also revealed other mechanisms by which trauma cases are defined. A study on the State Trauma System in Victoria identified the following pre-hospital major trauma criteria based on physiological, anatomical and mechanistic indicators.[21] By default, injured patients not meeting the criteria would be considered non-major trauma patients. Figure 4 is provided as an example of an alternative tool but further discussion will focus on an alternative definition for the Western Australian Trauma System.

Figure 4.   Pre-hospital Major Trauma Criteria*

VITAL SIGNS (major trauma if any one of the following present)

	ADULT	CHILD (<16 yrs)
RESPIRATORY RATE	<10 OR > 30 /min	< 15 or > 40 / min
CYANOSIS	Present	Present
HYPOTENSION	< 90 mmHg	< (75 + age of child in years)
CONSCIOUS STATE	GCS < 13	GCS <15

OR

INJURIES (major trauma if any one of the following presents)
ALL PENETRATING INJURIES: head/neck/chest/abdo/pelvis/axilla/groin

BLUNT INJURIES
- patients with a significant injury to a single region: head/neck/chest/abdo/axilla/groin
- patients with lesser injuries involving two or more of the above body regions

SPECIFIC INJURIES
- limb amputations/limb threatening injuries
- suspected spinal injury
- burns >20%(adults or children) or suspected respiratory tract
- serious crush injury
- major compound fracture
- fracture to two or more of the following: femur/tibia/humerus
- fractured pelvis

IF ANY OF THE ABOVE ARE PRESENT

IF NONE OF THE ABOVE ARE PRESENT

THESE PATIENTS ARE AT HIGH RISK OF HAVING MAJOR TRAUMA
Ejection from vehicle
Motor/cyclist impact (>30 kmh)
Fall from height (>5m)
High speed MVA (>60 kmh)
Vehicle rollover
Fatality in the same vehicle
Explosion
Pedestrian impact (>30 kmh)
Prolonged extrication (> 30 min)

CONSIDER CO-MORBIDITY
Age <10 or >55
Pregnancy
Significant underlying medical condition

MAJOR TRAUMA

AT RISK OF HAVING MAJOR TRAUMA

* **sourced from** Review of Trauma and Emergency Services – Victoria 1999. Final report of the Ministerial Taskforce on Trauma and Emergency Services and the Department Working Party on Emergency and Trauma Services. Department of Human Services; 1999.
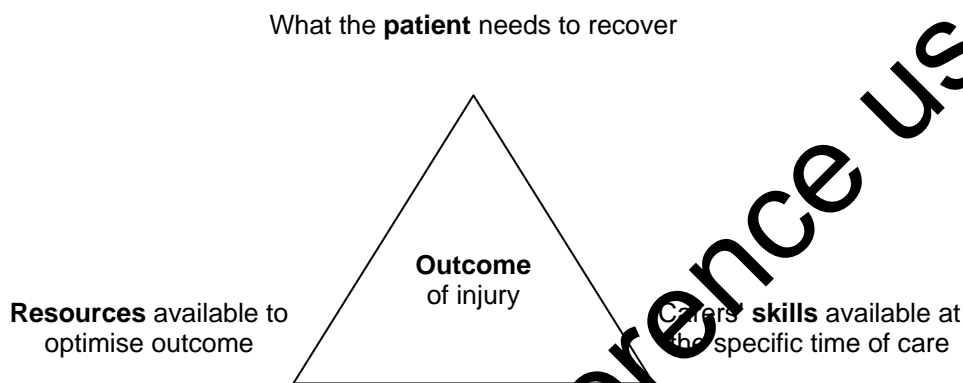
4.2   Proposed alternative definition process

Injured patients can be categorised into minor, moderate or major trauma categories based on the *triangle of care* (Figure 5). This triangle will assess whether the injured patient requires hospitalisation or not and if so should treatment be at a primary, secondary or tertiary centre.

The triangle of care shown below will guide the care pathway for each individual patient. The triangle of care is applied to assist in determining if in fact the time, place and team present are right for the patient at the point of contact.

Figure 5.   Triangle of Care

What the **patient** needs to recover

Outcome
of injury

Resources available to
optimise outcome

Carers' **skills** available at
the specific time of care

When the injured patient first enters the health system for treatment, the clinician present will conduct initial environment scanning. Using the triangle of care methodology patient outcomes are optimised by assessing whether the resources and skills available at the existing site is adequate for treating the injury.

The Figure 6: Flowchart of the three-tier system (p16) will be used to further guide the assessment of the injury. First, the urgency of the required treatment for the injury needs to be determined. Then, the extent to which the injury is life threatening in the given context will be assessed. The next step will be to determine pre-existing conditions of the injured patient which will affect the outcome of the injury. Finally, the clinician on site will assess whether the injury requires treatment from multiple disciplines. If the answer to **all** of the four key questions is affirmative (yes), the injury will be considered major trauma. The patient will be triaged to relevant health care centres based on this decision-making tool (p17). By default, any alternative response to the questions provided in the triangle will result in categorising the injury as minor or moderate. If the resources and skills set available on site at the time of care are inadequate, the injured patient will be transferred to the most appropriate health services for treatment as described by the role delineation and hospital designation outlined on page 18 in the 'The trauma system and services report of the Trauma Working Group' (2007).[8]

Figure 6.   Flowchart of the four-tier system – major, moderate, minor trauma
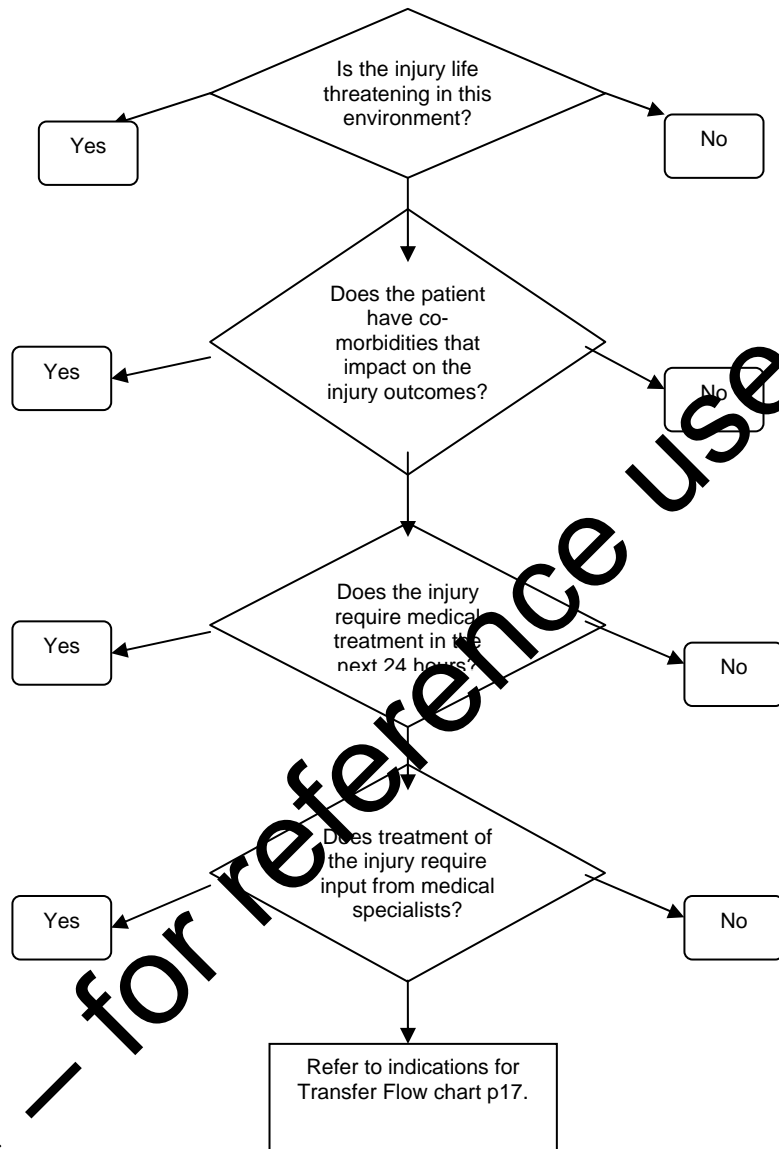
The questions will be answered in the context of the three key factors in the triangle of care. Trauma can be categorised according to three levels of acuity; minor, moderate, major:

- Major trauma: Yes to all the questions
- Minor trauma: No to all the questions
- Moderate trauma: Yes/No to the questions

Figure 7. Flowchart of the indications for transfer
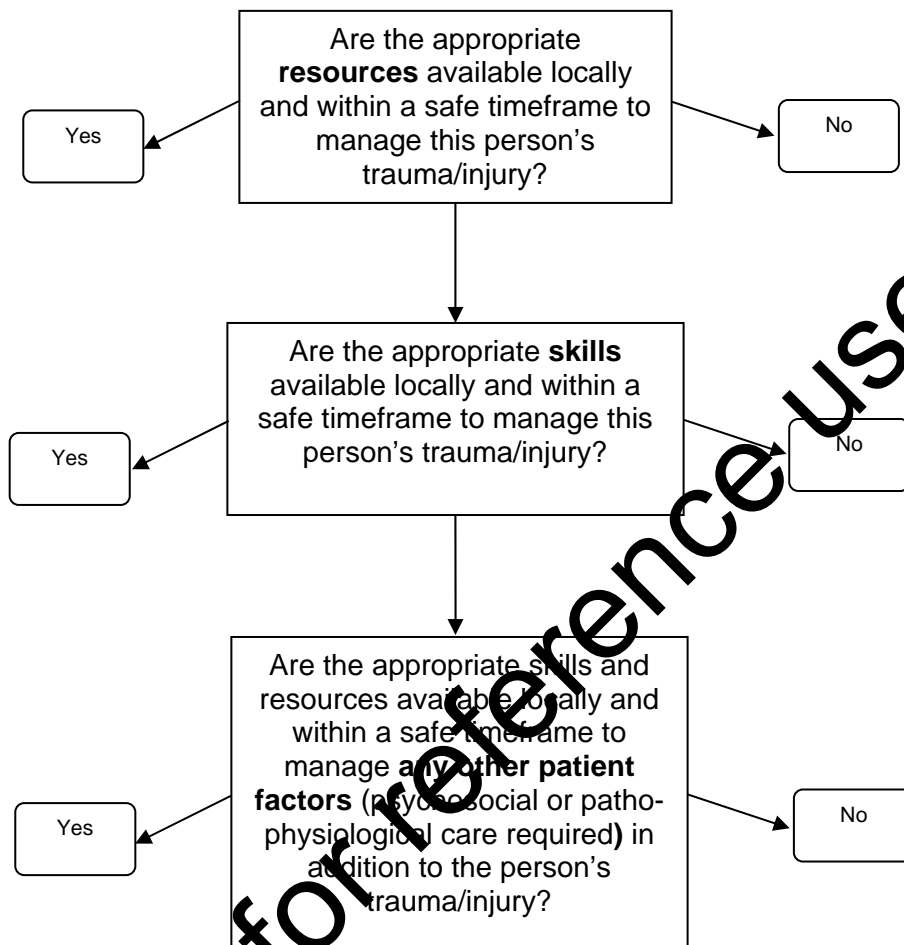
The questions will be answered in the context of the three factors within the triangle of care (patient's needs, resources, and health staff skill sets).

- Yes to ALL of the questions – keep the person on-site
- No to ANY of the questions – transfer person to a more suitable health service.

5.   Guiding Principles

The following guiding principles form the basis of the WA Non-major Trauma Framework. These principles in turn will guide the development of locally relevant strategies to address key objectives in the management of non-major trauma in WA.

- Access and Equity.
- Population Health Approach.
- Early Intervention and Prevention.
- Major Trauma and Non-Major Trauma Services Integration
- Improved Emergency and Disaster Management.
- Risk Management
- Workforce Education and Professional Development

6. Key Elements of the Non-Major Trauma Framework

The system wide response to non-major trauma management needs to involve a spectrum of injury control activities, including surveillance and research, prevention, and strengthened trauma care, including community, pre-hospital and hospital-based care (Figure 7 below).

Figure 7. Spectrum of injury control (Source: Mock et al 2007)
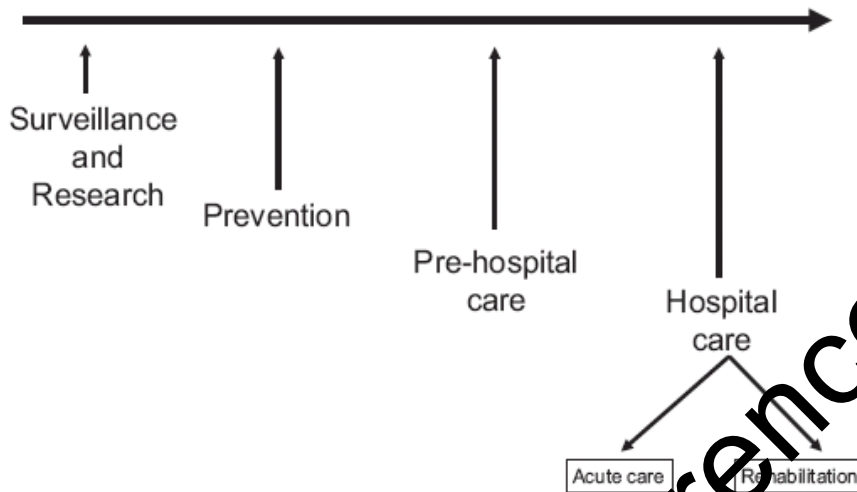
The management of non-major trauma within Western Australia needs to include the spectrum of injury control activities recommended by Mock et al 2007, but in the current WA healthcare environment which focuses on patient centric, decentralised community based care it is recommended that the domains within the spectrum be modified to reflect the WA strategic intent (Figure 8).

Figure 8. Spectrum of Injury Control[22] (adapted from Mock et al 2007)
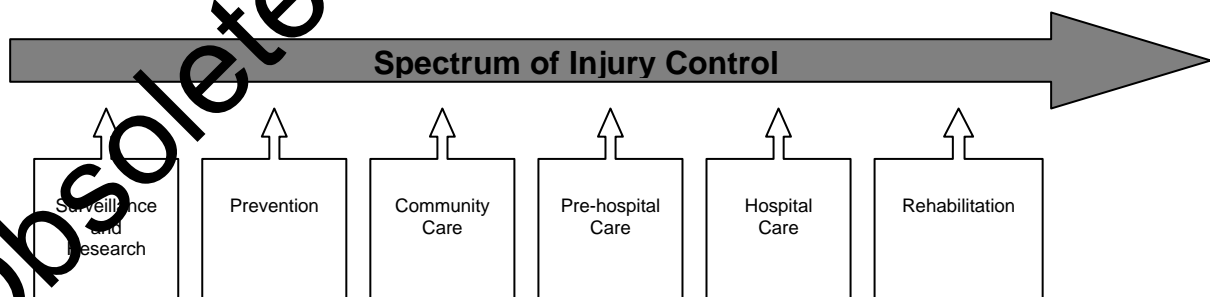
6.1 Surveillance and Research

Trauma registries are an important tool for improving the quality of care and outcomes for trauma patients.[18] Data collected from the registries provide evidence for the development of best practice indicators for trauma care, planning and managing trauma services, describing the size and nature of injury severity, and evaluating trauma prevention and treatment programs.

A Western Australian Trauma Registry has been established.[18] It comprises of four separate metropolitan trauma registries: the Royal Perth Hospital Trauma Registry, the Sir Charles Gairdner Hospital Trauma Registry, the Fremantle Hospital Trauma Registry and the Princess Margaret Hospital for Children Trauma Registry. The data collected by these registries are used to audit all trauma-related deaths, to develop and change existing clinical protocols, and increase stakeholder awareness via various publication and presentations.[23]

All of these registries contribute de-identified data to the National Trauma Registry consortium either individually or via the state-based registry.[14]

In Western Australia opportunities to capture non-major trauma data are yet to be developed. Not all sites collect non-major trauma data and the various hospital based registries report findings in a variety of ways making it difficult to compare one with another. Under the auspices of the Injury and Trauma Health Network the State Trauma Registry Working Group will address these issues.

Currently research on injury and trauma is supported on an ad hoc basis in response to individual researchers or institutional successful submissions for non-recurrent funding opportunities. More work needs to be done to provide a forum for co-ordinating these efforts, dissemination of the information gathered and provision of a sustainable platform for funding.

6.2 Prevention

The vision for the National Injury Prevention and Safety Promotion Plan 2004-2014 is:[24]

Governments, private sector and, communities working together to ensure that people in Australia have the greatest opportunity to live in a safe environment free, from the impact of injuries.

In the introduction to the plan it states:

Whether intended or accidental, most physical injuries can be prevented by identifying their causes and removing these, or reducing people's exposure to them.......Prevention of events likely to result in injury is usually the best approach. The likelihood and severity of injury can also be reduced by safety devices ...When serious injury occurs, the availability of good retrieval, acute care and rehabilitation services can increase chances of survival, and the speed and completeness of recovery.

The plan identifies ten principles for effective injury prevention and safety promotion.

1. Appropriate resource levels for injury prevention and safety promotion.
2. Leadership in injury prevention and safety promotion.
3. Coordination and integration of effort.
4. Informed and capable injury prevention and safety promotion workforce.
5. Access to quality data and its analysis.
6. Commitment to equity of access.
7. Evidence-based planning.
8. Supportive legislation and policy.
9. Monitoring, research and evaluation of initiatives.
10. Sustainability of injury prevention and safety promotion initiatives.

Key elements within the plan include identification of current gaps in injury prevention and principles to guide effective injury prevention strategies. There are a number of deficiencies in Australia's current injury prevention and safety promotion efforts. These include:

- Insufficient resourcing of injury prevention and safety promotion.
- Fragmentation of effort.
- Gaps in injury prevention and safety promotion activity.
- Injury prevention workforce and safety promotion capability issues.
- Quality of, access to, and dissemination of injury prevention information.
- Limited understanding of effective injury prevention and safety promotion activities.

Many of these gaps are applicable to the WA environment. Under the auspices of the Injury and Trauma Health Network the Injury Prevention Working Group has been tasked with the development of a state-wide injury prevention framework (p28) that will support the WA Non-Major Trauma Framework.

6.3 Community Care

6.3.1 Community education and awareness

The general community needs to be educated about responding in an efficient and effective manner in emergency situations. The concept of the majority of individuals within the community gaining the skills of a *first responder* and providing first aid at the scene of injury should be widely promoted across WA. Several non-government agencies in WA raise public awareness by producing educational resources and first aid training courses that are easily accessible. These courses tend to focus on first responder major trauma management.[25] Better access to education on basic first aid for minor and moderate injuries is required.

6.3.2 E-health initiatives

The Poison Information Centre provides telephone consultation to medical professionals and the general public in cases of acute and chronic poisonings. Toxicological advice on the management of exposures to prescription and non-prescription pharmaceuticals, household and industrial chemicals, plants, animal envenomations, pesticides and other agricultural products is also provided.

Similarly, Healthdirect and private health insurance companies such as the Health Benefit Fund - HBF provide telephone consultation healthcare advice to the general public.

These types of services need to be extended to be able to provide first aid/ first responder type advice that may minimise harm to the injured until more formal care is provided. In addition advice on which health care facility to attend if required may promote appropriate use of General Practice Clinics and various other types of community based minor trauma care facilities. These services also need to be supported to collect activity and patient outcomes data that are not currently available to inform service planning.

Ongoing social marketing campaigns are required to continue the education of the public about the full range of services available to them and how to access education on injury prevention or harm minimisation if injury has occurred.

6.4 Pre-Hospital Care

Pre-hospital care at the scene of injury and during transportation to a medical care facility is often provided by emergency medical services systems.[26] It is often the first step in managing the injured patient. Pre-hospital trauma care could influence the survival rate and appropriateness of care of the trauma patient by reducing the transfer time to the hospital, improving skills available at the scene, and by making the optimal choice as to which hospital or healthcare facility the patient is taken.[27]

In WA a broad range of health care facilities and health care workers are emerging and influencing pre-hospital injury and trauma care. Options currently available to those suffering minor and moderate trauma include attendance to emergency departments, specialist injury and trauma general practice clinics including private clinics staffed by a range of health professionals, such as, general practitioners, allied health and nurse practitioners; ambulance services and dedicated large crowd events first aid services. Appropriate use of these services is dependant on public awareness, healthcare worker awareness and the development of effective triage tools.

6.4.1 Triage tools and guidelines

It is well documented that the majority of injuries are of only minor or moderate severity and thus can be well managed at local community hospitals or even primary care facilities.[6] Alternatively, a significant minority of injured patients will require extensive acute care to survive or minimise their morbidity.

Triage tools, care guidelines and referral processes can be used to separate those patients who require the resources of a trauma centre from those who do not.[6] There are a range of tools available that incorporate physiologic parameters, scoring systems, anatomic considerations and mechanism of injury. Many aspects of injury and trauma care are currently governed by guidelines and protocols, particularly the care provided by ambulance staff and nurse practitioners.

Communication systems and professional relationships with an appropriate tertiary service are also recommended to provide a point of contact if the pre-hospital service provider is not confident about the assessment and associated plan of care or if complications occur. This will ensure access to expert advice and optimum patient treatment.

To create an equitable, accessible, effective and efficient pre-hospital environment in WA requires the development of comprehensive triage tools and guidelines that are acceptable to all stakeholders. It is recognised that this is a challenging task given the variety of funding arrangements and stakeholder groups that exist within the current system.

6.5   Hospital Care

Minor and moderate injury and trauma may be treated outside of a specialist Injury and Trauma Unit. Resuscitation is often limited to uncomplicated airway management and fluid replacement and or wound care. In most instances the non-specialist facilities such as, general and district hospitals are the most appropriate setting for minor and moderate injury and trauma care. However, as for the pre-hospital setting, communication with the most appropriate specialist Injury and Trauma Unit is also recommended. Specialist advice may be required for paediatrics, obstetrics, surgical intervention, co-morbid medical conditions, wound management, infection control, and pharmaceutical therapies - particularly for pain management and anti-depressants, nutrition, psycho-social, mental health and rehabilitation.

Most in-hospital settings are able to provide multi-disciplinary services and care planning. The need for, and intensity of, multi-disciplinary care required should be considered when determining the most appropriate care setting for the injured person.

6.6   Rehabilitation

Assessment of the need for rehabilitation and planning for rehabilitation should commence from the moment the patient presents. This ensures trauma patients requiring rehabilitation are referred from the [point of initial care] - community, pre-hospital or acute setting to the rehabilitation setting with minimal delay.[13]

Rehabilitative assistance should not be limited to a person's physical injury. Substance abuse and psycho-social factors are major precursors to injury and trauma so the need for detoxification and or social assistance should also be determined.

Options such as rehabilitation at home and return-to-work programs[13] are largely dependent on family members for their assistance and are not always a viable option in rural settings. However, for those who have access, these services do provide many rehabilitation opportunities for people who may not have easy access to in-hospital or centralised outpatient clinic services. Ambulatory care options also have the ability to increase throughput and relieve pressure on inpatient services.

6.7   Special Considerations for Rural and Remote Areas

The predominant issue for patients living in rural and remote areas is access to expert advice and care. E-health technologies can alleviate distance, transport, accommodation and cost issues for families having to travel to Perth from rural and remote areas for expert care. The transfer of information via e-health provides support to all staff involved in care regarding diagnosis, education and treatment. E-health is also used as a teaching tool to build on current knowledge in rural and remote areas. The main concerns with e-health are cost effectiveness, confidentiality and security of information/patient records, patient consent, and professional indemnity as well as litigation.[28] E-health can influence community based care, tertiary referral and hospital admission rates. An E-health system encompassing visual communication would enable injuries to be reviewed on a regular basis by experts in trauma care. To be effective and safe the process must achieve high accuracy and reliability. Studies have found the quality of digital imagery does enable accurate wound assessment and decision making.[29,30] Experience in other state jurisdictions has demonstrated benefits [31]. In WA the Burn Injury Service utilises digital technology on a regular basis for wound assessment and routine outpatient review.

Disparity between pre-hospital services available in the metropolitan area and those in the rural/remote areas needs to be recognised and addressed via well co-ordinated referral guidelines and processes [32].

6.8   Whole of System Approach

Creation of opportunities for inter-service communication, knowledge sharing, referral and discharge planning will enhance the quality and safety of care provided across the system. Whole of system efforts to improve on all aspects of the spectrum of injury control from prevention to rehabilitation, supported by robust monitoring and evaluation systems will provide better outcomes for at risk populations and people who suffer a minor injury.

7. Key Objectives for Non-Major Trauma

The objectives of the WA Non-major Trauma Framework support improving patient care outcomes, safety, quality and timeliness of care via:

1. Reduced burden of disease via injury prevention and safety promotion
2. Best utilisation of available workforce
3. A coordinated and integrated approach
4. Decentralisation of minor and moderate injury and trauma services

7.1 Key Objective 1: Reduce Burden of Disease

7.1.1 Priorities

- Primary Prevention
- First Responder training
- Reduced Substance Abuse in the workplace

7.1.2 Strategies

Targeted approach for *high risk population groups* and high volume injury types via:

- Development of a state-wide injury prevention framework.
- Social marketing campaigns for injury prevention for injuries related to drowning, road trauma, substance abuse, self harm.
- Partner with other government agencies such as Workcover and the Drug & Alcohol Office to develop new or enhance current strategies to address the issue of substance abuse in the workplace. For example, mandatory drug testing policy, opportunities for 'Brief Intervention' training for managers.
- Increase and promote uptake of 'first responder training' by creating training opportunities in non-traditional settings such as child care centres, during sporting events and educational institutions.
- Development of a model of care for burn injury which includes non-major burn injury.
- Development of protocols and care guidelines for burn injury, soft tissue injury, ophthalmic injury, ear nose & throat injury and, brief intervention care for substance abuse as it is a well documented related co-morbidity.
- Identify opportunities for legislative reform.

7.2 Key Objective 2: Best Utilisation of Available Workforce

7.2.1 Priorities

Development of:

- First responder training
- Nurse Practitioner services.
- Non-tertiary hospital and community based services.
- Ambulatory care services such as Hospital-In-The-Home (HITH), Rehabilitation-In-The-Nursing-Home (RITNH) and Twenty-three Hour Wards.
- Create opportunities for Inter-professional learning

7.2.2 Strategies

Development of:

- Social marketing campaigns and training courses to support first responder concepts.
- Common triage tools and care guidelines.
- Common referral and discharge processes
- E-health initiatives to support remote assessment and review, workforce education and training, community first responder training.
- In-service training in injury and trauma specific skills such as:
  - Suturing
  - Cannulation
  - Plastering
  - Wound assessment
  - Basic x-ray reading
  - Basic first aid
  - Advanced acute care skills incorporated into post basic medical Rural Generalist Practitioner training curriculum.

7.3   Key Objective 3: Coordinated Integrated Approach

7.3.1 Priorities

- Clinically coordinated patient transfer
- Primary care and acute care service partnerships for pre and post hospital care
- Disaster preparedness.
- Surveillance tools and research opportunities

7.3.2 Strategies

- Helpline – Consumers and care providers need help to negotiate the hierarchy of Generic 'Info health' type services and high level senior clinician advisory services need to be supported by robust data collection tools to measure effectiveness of these types of services in terms of activity coordination and patient outcomes.
- Working groups to develop triage tool.
- Provide a forum for education.
- Create a forum for collegial exchange between health service providers enhanced by a robust communication strategy and communication process.
- Improve and expand data sets within the current surveillance tools – trauma registry and hospital morbidity system.
- Provide a forum for dissemination of information and co-ordinating research efforts.

8.   Engagement and Communication Strategy

Within WA Health there are a number of key groups, key professional bodies and hence forums for consultation, collaboration, engagement, education and advocacy. Most notably the Health Networks Branch has developed robust engagement processes and, inter-sectorial/jurisdictional relationships. Therefore WA Health Networks Branch processes will be adopted for engagement of and communication with stakeholders of the WA Non-Major Trauma Framework. These processes create and promote opportunities for engagement and discussion about concepts, objectives and strategies presented.

8.1   Cultural Considerations

8.1.1   Aboriginal and Torres Strait Islander People

Engagement with Indigenous Australians will require multidisciplinary teams with Aboriginal Health Workers; the Aboriginal Medical Service and/or liaison groups to ensure services involve communities and are culturally appropriate (Refer to Appendix 2 for Aboriginal Health Impact Statement).

8.1.2   Culturally and linguistically diverse groups

Similarly injury and trauma care information needs to be consistent with all ethnic/CALD requirements.

Appendices

Appendix 1 WA Injury Prevention Framework

Outcome: to create a safe and supportive environment that prevents and reduces the risk of an injury occurring.
Target Groups: [specific to injury type]

The Injury Prevention Framework is a modified version of the model produced by Professor David Sanders [33].This framework can be applied across all types of injury and to any specific target group or population.

The key components of this framework are
- Promotive
- Preventive
- Curative
- Rehabilitative

The **Promotive** component identifies strategies that can be targeted at the general 'well' population. In contrast, the **Preventive** component focuses on specific strategies targeted at those who are most 'at risk'. The targeted 'at risk' population would vary depending on the type of injury. The selection of the targeted population will be supported by relevant statistical data such as prevalence rates. The **Curative** component specifically focuses on the acute care of the injured individual while the **Rehabilitative** component identifies strategies specific to the rehabilitation aspect in the treatment of injury.

A holistic multidisciplinary approach is taken in developing this framework. It outlines key priority areas that need to be examined for prevention and management of injury and trauma.

It is important to note that this framework allows for preventative measures to be identified across all components and therefore across the continuum of care.

WA Injury Prevention Framework

Universal		Selective	
Promotive	**Preventive**	**Curative**	**Rehabilitative**
Well	**At risk**	**Acute**	**Chronic**

Education
Policy
 	
Legislation
 	
Advocacy
 	
Partnerships (ie linking or collaborating with NGOs, state and local organisations)
 	
Media
 	
Community Engagement/Support/Action
 	
Workforce development
 	
Resources
 	
  *human resources
  *Physical resources (infrastructure)
	Assess and identify 'at risk' population according to
	  *geographical location
	  *age
	  *gender
	  *environment (SES?)
	  *ethnicity
	
	Identify specific actions within each of the following strategic areas:
	  *Education
	  *Policy
	  *Legislation
	  *Workforce development
	  *Resources (human and physical)
		Education
		
		Inform
		
		Brief intervention
		
		Home assessment
		
		Discharge planning
		
		Discharge packs
		
		Workforce development
		
		Resources
		  *human resources
		  *Physical resources (infrastructure)
			Education
			
			Inform
			
			Community support
			
			Client/carer support
			
			Care plan
			
			Partnerships
			
			Referral processes
			
			Workforce development
			
			Resources
			  *human resources
			  *Physical resources (infrastructure)

Appendix 2 Aboriginal Health Impact Statement

Non-major Trauma Framework

1. Will this policy, program or strategy significantly affect the health of Aboriginal people? Yes
If so, how: The proposed recommendations will reduce the risk of culturally inappropriate care of Aboriginal people, and support improved management of specific injury and trauma most commonly experienced by Aboriginal people.

2. Is this policy, program or strategy likely to lead to a change in the nature or level of resources of health services available for Aboriginal Health? Yes
If so, specify: The Non-Major Trauma Framework recommends a multidisciplinary team approach to the management of minor and moderate injury and trauma. This includes integration of services and clinics in community, pre-hospital, secondary metropolitan hospitals, regional hospitals and/or tertiary hospital settings. The creation of opportunities for rural and remote services to link with the multidisciplinary teams in the tertiary environment is a strategy that has been identified to ensure care is culturally appropriate for Aboriginal people closer to home.

3. Have all items of the checklist been reviewed and answered? Yes

Statement

The health needs and interests of Aboriginal and Torres Strait Islander people have been considered, and where relevant, incorporated and appropriately addressed in the development of this health policy, program or strategy.

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Unit name: Chief Medical Officer

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