****

**Generic business plan template**

**Participation in the Australian and New Zealand Hip Fracture Registry by implementation/development of an/the Orthogeriatrics Service for [Insert name of hospital]**

Please note that the citations in this document have active EndNote links that have been created with the Thomson Reuters EndNote version X7.7 software. If you have this software, Reference Manager or other bibliographic software, you can export the Travelling Library into your software package. The output style has been set to Archives of Internal Medicine format.

Contents

[Executive Summary 1](#_Toc468444969)

[The impact of hip fracture in New Zealand 2](#_Toc468444970)

[Best practice in hip fracture care: International experience 3](#_Toc468444971)

[Development of the combined orthogeriatric model of care 3](#_Toc468444972)

[Benchmarking of hip fracture care against national clinical standards 4](#_Toc468444973)

[A systematic approach to hip fracture care and prevention for New Zealand 5](#_Toc468444974)

[Australian and New Zealand Hip Fracture Care Clinical Care Standard 5](#_Toc468444975)

[Preparedness to participate in the ANZ Hip Fracture Registry at [Insert name of hospital] 7](#_Toc468444976)

[Orthogeriatric service provision at [Insert name of hospital] 2](#_Toc468444977)

[Other useful resources 5](#_Toc468444978)

[Summary and recommendation 5](#_Toc468444979)

[Appendix 1: Orthogeriatrics Services in New Zealand 7](#_Toc468444980)

[Auckland City Hospital 7](#_Toc468444981)

[Middlemore Hospital, Otahuhu 8](#_Toc468444982)

[North Shore Hospital, Takapuna 9](#_Toc468444983)

[Princess Margaret Hospital, Christchurch 9](#_Toc468444984)

[Appendix 2: All About ANZ HFR Ethics 10](#_Toc468444985)

[Appendix 3: ANZ HFR - How to get started 13](#_Toc468444986)

[References 16](#_Toc468444987)

# Executive Summary

**The combination of national clinical care standards, participation in a national hip fracture registry, feedback and sharing of best practice has resulted in significant improvements in the care of hip fracture patients and a significant reduction in 30-day mortality in other countries.**

* **XXX** people served by [**Insert District Health Board**] present with a hip fracture to [**Insert name of hospital**] resulting in **Y,YYY** bed days and a total annual cost of NZ$**ZZZ,ZZZ**.
* Hip fractures impose a tremendous burden on people who suffer them, resulting in many not being able to walk unaided or requiring assistance with routine activities of daily living.
* Hip fractures are a leading cause of institutionalisation and are associated with considerable excess mortality: up to one quarter of people who break their hip will die within 12 months.
* People who suffer hip fractures are at considerably elevated risk of suffering further falls and fractures in the future.
* Clinical Guidelines and Clinical Care Standards have been published in many countries as a response to the increasing burden of hip fracture among our globally ageing population.
* The Australian and New Zealand Hip Fracture Registry initiative has developed widely endorsed Clinical Guidelines for Australia and New Zealand.
* The Clinical Guidelines have enabled development of an Australian and New Zealand Hip Fracture Care Clinical Care Standard.
* The Clinical Guidelines and Clinical Care Standard state that a patient with hip fracture should be offered treatment based on the orthogeriatric model of care.
* The Australian and New Zealand Hip Fracture Registry provides an opportunity to benchmark the care that hospitals provide for hip fracture patients – in real time – against the average performance in New Zealand and against the Clinical Care Standard.
* The combination of national clinical care standards, data collection through a national hip fracture registry, feedback and sharing of best practice has resulted in significant improvements in the care of hip fracture patients and a significant reduction in 30-day mortality in several countries.
* The Australian and New Zealand Hip Fracture Registry is a key component of a whole of system approach to falls and fracture management in New Zealand.

**This business plan makes the case for participation in the Australian and New Zealand Hip Fracture Registry to enable delivery of, and benchmark performance against the trans-Tasman Hip Fracture Care Clinical Care Standard at [Insert name of hospital] by implementation/development of an/the Orthogeriatrics Service.**

The following three sections could provide the introductory section of the business plan and provide the background and rationale for participation in the Australian and New Zealand Hip Fracture Registry and implementation/development of an Orthogeriatrics Service:

* The impact of hip fracture in New Zealand
* Best practice in hip fracture care: International experience
* A systematic approach to hip fracture care and prevention for New Zealand

Authors of the business plan may decide to precis this information, or add/replace with local data on the impact of hip fracture on quality of life, rates of institutionalisation, mortality, length of stay and health system costs. This information could be obtained from Australasian Rehabilitation Outcomes Centre (AROC) data or the Enhanced Recovery After Surgery (ERAS) initiative.

# The impact of hip fracture in New Zealand

In 2014, approximately 3,600 New Zealanders aged 50 years and over were admitted to hospital with a hip fracture1. The burden imposed by these fractures on those who suffer them is severe:

* Fewer than half of people who survive a hip fracture will walk unaided again2 and in many cases they will never regain their former degree of mobility3.
* A year after hip fracture, 60% of sufferers require assistance with activities such as feeding, dressing or toileting, and 80% need help with activities such as shopping or driving4.
* 60% of hip fracture sufferers report pain in the fractured hip and more than 30% report that the pain disrupts their sleep2.

Hip fracture has also been shown to be a leading cause of institutionalisation of older people in many countries:

* Among women suffering a hip fracture in Belgium, 19% were newly admitted to nursing homes during the year following hospitalisation compared to just 4% of age and residence matched controls5.
* Investigators from Norway reported that the proportion of individuals living in nursing homes increased from 15% to 30% after sustaining a hip fracture2.
* A study from the United States reported the proportion of men and women living in an institution before their hip fracture to be 6.8% and 13%, respectively6. After hip fracture, 26.8% of men and 25.6% of women were newly admitted to institutions.

In the UK, hip fractures have been reported to be the most common cause of accident-related death in older people7. Thirty percent die within a year. A study from New Zealand published in 1999 reported a comparable one-year mortality rate of 24%, with significant variation by gender and age of the sufferer8.

Hip fractures are very expensive. In 2007, the average length of hospital stay across all of New Zealand was 13.9 days, at an estimated cost of almost $15,0009. Approximately 70% of sufferers were transferred to a rehabilitation ward, with the average length of stay being 22 days, at a cost of $12,000 per patient. In addition, 50% of patients received outpatient visits at an average cost of almost $1,000 per patient who attended at least once. Consequently, the average direct cost of treating a hip fracture in New Zealand was $24,000 per case. So, 9 years ago, New Zealand was spending around $100 million per year treating hip fractures.

As New Zealand’s 1 million baby boomers age, hip fractures will continue to place significant demands upon our healthcare system. Accordingly, now is the time to consider how this serious injury can be managed in the most clinically effective and cost-effective manner.

# Best practice in hip fracture care: International experience

## Development of the combined orthogeriatric model of care

The approach taken to improve care for hip fracture patients in the UK provides a useful illustration of how current models of best practice have evolved. The first collaborations between orthopaedic surgeons and geriatricians were described in the 1960s, and since then the majority of trauma services have incorporated some form of formal geriatrician input to the care of older inpatients recovering from hip fractures. In 2007, the British Orthopaedic Association (BOA) and British Geriatrics Society (BGS) published the Blue Book on the care of patients with fragility fracture10. The BOA-BGS Blue Book described the following common models of orthogeriatric care:

* **Traditional orthopaedic care:**
	+ The fracture patient is admitted to a trauma ward and their care and rehabilitation is mainly managed by the orthopaedic surgeon and team.
	+ Geriatrician input to such wards can take a variety of forms.
* **Geriatric Orthopaedic Rehabilitation Unit:**
	+ Peri-operative orthopaedic management is followed by early post-operative transfer to a geriatric rehabilitation unit.
	+ Identification of appropriate patients by orthopaedic staff, specialist orthogeriatric liaison nurses/hip fracture nurses or routine geriatrician rounds.
	+ Orthopaedic input to the rehabilitation ward varies.
	+ A weekly surgeon visit at a fixed time allows multidisciplinary team members to present concerns, problems and x-rays.
* **Orthogeriatric liaison and a Hip Fracture Nurse:**
	+ Collaborative working requires effective communication between senior medical, surgical and anaesthetic staff.
	+ A Hip Fracture Nurse takes responsibility for patients throughout the course of their clinical care; coordinating initial assessment, expediting pre-operative work-up, supervising post-operative care, rehabilitation, discharge planning, secondary prevention and follow-up.
	+ Key benefits of this approach include:
		- A consistent health professional point of contact.
		- The nurse can coordinate input from medical, orthopaedic, or other specialist teams if necessary.
		- Hip Fracture Nurses are ideally placed to coordinate audit data collection, such as for a national hip fracture registry.
* **Combined orthogeriatric care:**
	+ The fracture patient is admitted to a specialised orthogeriatric ward under the care of both geriatricians and orthopaedic surgeons.
	+ This level of collaboration underpins the concept of a Hip Fracture Service, with pre-operative assessment by the orthogeriatric medical team, who will take the lead in post-operative multidisciplinary care.
	+ Rehabilitation may occur in this setting or in a separate rehabilitation unit.

During the last 20 years, development and implementation of the combined orthogeriatric model of care has occurred in many countries10-18, including New Zealand19-23. The core principles underpinning this model of care have been described as24:

1. Most patients benefit from surgical fracture stabilisation.
2. The sooner patients have surgery, the less time they have to develop complications and functional decline.
3. Co-management, with frequent communication between disciplines, avoids iatrogenesis.
4. Standardised protocols decrease unwarranted variability.
5. Discharge planning begins when the patient is admitted to the hospital.

## Benchmarking of hip fracture care against national clinical standards

The BOA-BGS Blue Book identified six standards for hip fracture care10. To enable benchmarking of care against these standards and other relevant metrics, the UK National Hip Fracture Database (NHFD) was launched in tandem with the Blue Book25. The NHFD is the largest and fastest-growing national hip fracture audit in the world with almost half a million cases recorded since its launch in 2007. All hospitals receiving hip fracture patients in England, Wales, Northern Ireland and Channel Islands participate. The most recent report published in 2016 benchmarked care of almost 65,000 presentations during 2015 against current national professional standards26.

In 2015, an external evaluation was undertaken to assess the impact of the national clinical standards, data collection, and feedback, together with NHFD-led activities to support regional and national sharing of best clinical practice and encourage local implementation at hospitals27. Routinely collected data on 471,590 people aged 60 years and older who were admitted with a hip fracture to National Health Service (NHS) hospitals in England between 2003 and 2011 were analysed. The variables of interest were the use of early surgery (on day of admission, or day after) and mortality at 30 days from admission. Time trends were compared for the periods 2003-2007 and 2007-2011 (i.e. before and after the launch of the NHFD). Key findings included:

* The number of hospitals participating in the NHFD increased from 11 in 2007 to 175 in 2011.
* From 2007 to 2011, the rate of early surgery increased from 54.5% to 71.3%, whereas the rate had remained stable over the period 2003–2007.
* Thirty-day mortality fell from 10.9% to 8.5%, compared with a small reduction from 11.5% to 10.9% previously:
	+ The annual relative reduction in adjusted 30-day mortality was 1.8% per year in the period 2003–2007, compared with 7.6% per year over 2007–2011 (P< 0.001 for the difference).

In addition to optimal management of the acute event and rehabilitation, because up to 9% of hip fracture patients will go on to break their other hip28-31, a determined effort to prevent future falls and fractures is needed. In this regard, the NHFD initiative has been associated with a very significant change in the delivery of secondary falls and fracture prevention. The 2016 NHFD annual report indicated that 97.2% of patients had been assessed for the need for bone protection medication. In total, 79.3% of patients had been started on bone protection medication, or referred for a bone density scan or bone clinic appointment, or were already on appropriate medication. Assessment of falls risk was undertaken for 97% of cases.

# A systematic approach to hip fracture care and prevention for New Zealand

Since 2011, informed by the experience from the UK and other countries, a multisector effort to develop and implement a systematic approach to hip fracture care and prevention in for New Zealand has resulted in significant progress:

* **2011:** First meeting of clinicians from Australia and New Zealand to consider how experience from elsewhere could inform development of an ANZ Hip Fracture Registry (ANZ HFR).
* **2012:** Osteoporosis New Zealand published *BoneCare 2020*, which called for development of a national hip fracture registry and nationwide implementation of models of care to improve both acute hip fracture care (Orthogeriatrics Services) and prevention of hip and other fragility fractures (Fracture Liaison Services)32. The Health Quality and Safety Commission New Zealand (The New Zealand Commission) launched the *Reducing Harm from Falls* programme33.
* **2013:** Publication of the first ANZ HFR Facilities Level Audit, which assessed and documented what services, resources, policies, protocols and practices existed across Australia and New Zealand hospitals in relation to hip fracture care34. The first Fracture Liaison Service (FLS) was established in New Zealand.
* **2014:** Publication of the Australian and New Zealand Guideline for Hip Fracture Care35. Publication of the second ANZ HFR Facilities Level Audit36. Ongoing implementation of FLS.
* **2015:** Development and roll out of the ANZ Hip Fracture Registry in both countries. Publication of the third ANZ HFR Facilities Level Audit37. ACC support for National Programme Manager in NZ. Formation of New Zealand Hip Fracture Implementation Committee under ANZ HFR Steering Committee. Ongoing implementation of FLS.
* **2016:** Publication of the Hip Fracture Care Clinical Care Standard by the Australian Commission on Safety and Quality in Health Care in collaboration with the New Zealand Commission38. Publication of the ANZ HFR 2016 Annual Report39, which included the first ANZ HFR Patient Level Audit and the fourth ANZ HFR Facilities Level Audit. Ongoing implementation of FLS.

As illustrated in figure 1 overleaf, implementation of the NZ arm of the ANZ HFR was the first objective of the strategy proposed in Osteoporosis New Zealand’s *BoneCare 2020*32. Four hospitals from New Zealand featured in the first ANZ HFR Patient Level Audit which included data for hip fractures which occurred during 201539. As of September 2016, 6 hospitals in New Zealand and 26 hospitals in Australia are participating in the ANZ HFR.

# Australian and New Zealand Hip Fracture Care Clinical Care Standard

The Clinical Care Standard is comprised of 7 Quality Statements:

1. **Care at presentation:** A patient presenting to hospital with a suspected hip fracture receives care guided by timely assessment and management of medical conditions, including diagnostic imaging, pain assessment and cognitive assessment.
2. **Pain management:** A patient with a hip fracture is assessed for pain at the time of presentation and regularly throughout their hospital stay, and receives pain management including the use of multimodal analgesia, if clinically appropriate.
3. **Orthogeriatric model of care:** A patient with a hip fracture is offered treatment based on an orthogeriatric model of care as defined in the Australian and New Zealand Guideline for Hip Fracture Care.

Figure 1: A systematic approach to hip fracture care and prevention for New Zealand32



1. **Timing of surgery:** A patient presenting to hospital with a hip fracture, or sustaining a hip fracture while in hospital, receives surgery within 48 hours, if no clinical contraindication exists and the patient prefers surgery.
2. **Mobilisation and weight-bearing:** A patient with a hip fracture is offered mobilisation without restrictions on weight-bearing the day after surgery and at least once a day thereafter, depending on the patient’s clinical condition and agreed goals of care.
3. **Minimising risk of another fracture:** Before a patient with a hip fracture leaves hospital, they are offered a falls and bone health assessment (i.e. osteoporosis), and a management plan based on this assessment, to reduce the risk of another fracture.
4. **Transition from hospital care:** Before a patient leaves hospital, the patient and their carer are involved in the development of an individualised care plan that describes the patient’s ongoing care and goals of care after they leave hospital. The plan is developed collaboratively with the patient’s general practitioner. The plan identifies any changes in medicines, any new medicines, and equipment and contact details for rehabilitation services they may require. It also describes mobilisation activities, wound care and function post-injury. This plan is provided to the patient before discharge and their general practitioner and other ongoing clinical providers within 48 hours of discharge.

The orthogeriatric model of care is defined in the ANZ Guideline as follows35. From admission, offer patients a formal, acute orthogeriatric service that includes all of the following:

* Regular orthogeriatrician assessment.
* Rapid optimisation of fitness for surgery.
* Early identification of individual goals for multidisciplinary rehabilitation to recover mobility and independence, and to facilitate return to prefracture residence and long-term wellbeing.
* Early identification of most appropriate service to deliver rehabilitation.
* Continued, coordinated, orthogeriatric and multidisciplinary review and discharge planning liaison or integration with related services, including falls prevention, secondary fracture prevention, mental health, cultural services, primary care, community support services and carer support services.

The Clinical Care Standard comments on the meaning of Quality Statement 3 to health services38:

* For hospitals that do not have a geriatric medicine service available, care should be undertaken by an orthopaedic surgeon, an anaesthetist and a physician or, if unavailable in rural and remote settings, another medical practitioner, using the orthogeriatric model of care.

# Preparedness to participate in the ANZ Hip Fracture Registry at [Insert name of hospital]

The ANZ HFR provides hospitals with an opportunity to benchmark the care that they provide for hip fracture patients – in real time – against the average performance in New Zealand and against the Australian and New Zealand Hip Fracture Care Clinical Care Standard38.

This section of the business plan should describe the current level of preparedness to participate in the ANZ HFR. This could be informed by the hospital’s contribution to the recent fourth ANZ HFR Facilities Level Audit39 and the case studies in Appendix 1 relating to experience of data entry at Auckland City Hospital and Middlemore Hospital. Obtaining ethics approval for the ANZ HFR is described in Appendix 2. Additional information regarding how to get started with ANZ HFR in your hospital is provided in Appendix 3.

The fourth ANZ HFR Facilities Level Audit included information from 121 hospitals: 23 in New Zealand and 98 in Australia. The aim of the Facilities Level Audit is to document and monitor over time the services, resources, policies, protocols and practices that exist in both countries in relation to hip fracture care. In 2012, a standardised audit form was devised by the ANZ HFR Steering Group for use in all public hospitals in both countries.

Several figures have been reproduced from the 2016 ANZ HFR Report below, with permission of the ANZ HFR. As illustrated in figure 2 overleaf, the number of hip fractures treated in hospitals in both countries varies considerably. As illustrated in figure 3, there is considerable variability in terms of the model of care provided for hip fracture patients. Figure 4 illustrates the proportion of hospitals in New Zealand with the following protocols for the period 2013-2016:

* ED protocol/pathway.
* CT/MRI protocol.
* VTE protocol.
* Pain pathway.
* Anaesthetic choice.
* Scheduled theatre list.
* Weekend therapy.

Figure 2. Estimated number of hip fractures treated by Australian and New Zealand Hospitals 2014-2016



Figure 3. Model of care for older hip fracture patients, 2014-2016



1. A shared care arrangement where there is joint responsibility for the patient from admission between orthopaedics and geriatric medicine for all older hip fracture patients.
2. An orthogeriatric liaison service where geriatric medicine provides regular review of all older hip fracture patients (daily during working week).
3. A medical liaison service where a general physician or GP provides regular review of all older hip fracture patients (daily during working week).
4. An orthogeriatric liaison service where geriatric medicine provides intermittent review of all older hip fracture patients (2-3 times weekly).
5. A medical liaison service where a general physician or GP provides intermittent review of hip fracture patients (2-3 times weekly).
6. An orthogeriatric liaison service (2014) / geriatric service (2015/6) where a consult system determines which patients are reviewed.
7. A medical liaison service (2014) / medical service (2015/6) where a consult system determines which patients are reviewed.
8. No formal service exists.
9. Other.

Figure 4. Proportion of hospitals with protocols and pathways for hip fracture care, New Zealand 2013-2016

\* 2015 and 2016: ED hip fracture protocol/pathway includes pathways for ED only and the whole acute journey

# Orthogeriatric service provision at [Insert name of hospital]

This section of the business plan requires input from local lead clinicians which describes:

* **Current provision:** A description of the current model of care in place for hip fracture patients. The current configuration may be similar to one of the four common examples described in the international experience section above. This could be informed by the hospital’s contribution to the recent fourth ANZ HFR Facilities Level Audit39 and/or from the local Hip Fracture Pathway. The ERAS initiative may provide valuable information in this regard.
* **Current performance:** An indication of performance of the current model of care. This could be informed by:
	+ The hospital’s contribution to the recent first ANZ HFR Patient Level Audit39.
	+ The Atlas of Healthcare Variation falls domain developed by the Health Quality and Safety Commission. See <https://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/falls/>.
	+ Analysis of adherence to the local Hip Fracture Pathway and ERAS initiative.
* **Service development:** A description of proposed changes to the current model of care intended to enable delivery of the Hip Fracture Care Clinical Care Standard38. This could be informed by the ANZ HFR documents35, 39 and publications and documentation from several Orthogeriatrics Services from New Zealand which feature in Appendix 1.

The section of the business plan could be structured as follows:

* **Service development proposal:**
	+ **Current provision:** As described above.
	+ **Current performance:** As described above.
	+ **Service development:** This section will identify gaps that exist between current performance and best practice according to the Hip Fracture Care Clinical Care Standard38. This should include the rationale for appointment of any new staff (e.g. an orthogeriatrician, a hip fracture nurse specialist) or re-tasking of existing staff’s roles, and a comprehensive analysis of resources required to support such developments. This section will also include:
		- **Service objectives:** A clear statement of what the new or refined service will deliver for a specific patient population within a given time frame.
		- **Service process and outcome measures:** Based on international experience and publications and documentation from several Orthogeriatrics Services from New Zealand which feature in Appendix 1, provide an estimate of the impact that the new service will have upon delivery of the 7 Quality Statements of the Hip Fracture Care Clinical Care Standard38. Based on international experience, the impact on 30-day mortality could also be estimated over an appropriate time period.
* **Strategic context:**
	+ Description of how the proposed service development is aligned to **national health priorities**, including:
		- **New Zealand Triple Aim** for quality improvement40:
			* Improved quality, safety and experience of care.
			* Improved health and equity for all populations.
			* Best value for public health system resources.
		- **New Zealand Health Strategy:** Future direction41:
			* People-powered.
			* Closer to home.
			* Value and high performance.
			* One team.
			* Smart system.
		- **Healthy Ageing Strategy**: The Ministry is currently updating the Health of Older People Strategy, which will be titled the Healthy Ageing Strategy. A draft update was subject to consultation from July to September 201642. The final version of the strategy will be released at the end of 2016. The following featured in the Acute and Restorative Care section of the draft update, under the heading ‘Improve outcomes from injury prevention and treatment’:
			* Develop, implement and review prevention and treatment of injuries for ACC and health clients, including:
				+ Enhancing fracture liaison services to prevent secondary injury.
				+ Implementing a national hip fracture registry.
				+ Enhancing rehabilitation services for injured older people, including through supported discharge and home and community support to achieve maximum independence and recovery closer to home.
				+ Work with local health systems to integrate prevention and rehabilitation services into existing service models.
			* This is to be implemented in the first 2 years of the strategy (i.e. 2017-18).
		- **New Zealand Positive Ageing Strategy:** *Older New Zealanders: Healthy, independent, connected and respected*43 recognised the importance of a systematic approach to care of patients with fragility fractures.
		- **Outcomes framework for falls and fracture prevention:** In 2016, an Outcomes Framework for falls and fracture prevention is being developed jointly by ACC, Health Quality and Safety Commission and Ministry of Health, in collaboration with non-governmental organisations44.
	+ Description of how the proposed service development is aligned to **District Health Board (DHB) priorities** e.g. for Waitemata DHB:
		- The purpose of the organisation:
			* Prevent, ameliorate and cure ill health.
			* Promote wellness.
			* Relieve suffering of those entrusted to the DHB’s care.
		- The DHB’s priorities are to enhance patient experience and achieve better outcomes.
* **Implementation:**
	+ **Clinical governance:** In order to develop a multidisciplinary approach to hip fracture care in the particular institution, all relevant disciplines must take an active role in the development, implementation and ongoing oversight of the new service model. Accordingly, based on experience from other countries, a multidisciplinary stakeholder group should be established from the outset. In this regard, such a group may already be established to support implementation of the ACC, Ministry of Health and Health Quality and Safety Commission whole of system approach to falls and fracture management.
	+ **Continuous quality improvement:** A range of quality improvement methodologies have been applied to hip fracture care, including Plan-Do-Study-Act Cycles45 in accordance with the Institute for Healthcare Improvement (IHI) methodology and the value stream model known as ‘Lean thinking’46. Utilisation of such an approach should be considered by the multidisciplinary stakeholder group.
	+ **Participation in the ANZ Hip Fracture Registry:** The ANZ Hip Fracture Registry is now able to be fully implemented across New Zealand public hospitals. To date, 6 hospitals in New Zealand and 26 hospitals in Australia are participating in the ANZ HFR. The ANZ HFR collects patient data from participating hospitals which is then used for the annual bi-national report and provides real-time reporting on hospital data with comparisons against the country average, using measures from the Clinical Care Standard. The data can be used to inform ongoing quality improvement in the delivery of hip fracture care.

# Other useful resources

In addition to the various resources described above, the authors of the business plan may find the comprehensive suite of web-based resources from the following organisations useful:

* **Health Quality & Safety Commission New Zealand (HQSC):** The Atlas of Healthcare Variation developed by HQSC has a falls domain. The Atlas provides information on hip fracture care for all DHBs. Read more at:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/falls/>

* **Fragility Fracture Network (FFN):** FFN is a global group of activists committed to improving care of individuals with fragility fractures. The FFN’s strategic goals are completely aligned to the case made in this business plan. Read more at:

<http://fragilityfracturenetwork.org/>.

* **International Osteoporosis Foundation (IOF):** IOF functions as a global alliance of patient societies, research organisations, healthcare professionals and international companies working to promote bone, muscle and joint health. Read more at: <https://www.iofbonehealth.org/>.

# Summary and recommendation

During the last 5 years, significant progress has been made in New Zealand and Australia in relation to hip fracture care and prevention. The Australian and New Zealand Guideline for Hip Fracture Care published in 201435 presented the most current synthesis of clinical evidence on hip fracture care in the world at the time, and was endorsed by the National Health and Medical Research Council in Australia and the following learned societies and NGOs:

* Australasian College for Emergency Medicine
* Australasian Faculty of Rehabilitation Medicine
* Australian and New Zealand Orthopaedic Nurses Association
* Australian and New Zealand Society for Geriatric Medicine
* Australian Orthopaedic Association
* Carers NSW
* New Zealand Orthopaedic Association
* Osteoporosis Australia
* Osteoporosis New Zealand
* Royal Australasian College of Surgeons

This guideline informed development of the Hip Fracture Care Clinical Care Standard38 which supports:

* People to know what care should be offered by their healthcare system, and to make informed treatment decisions in partnership with their clinician.
* Clinicians to make decisions about appropriate care.
* Health services to examine the performance of their organisation and make improvements in the care they provide.

The third Quality Statement of the Clinical Care Standard states that a patient with a hip fracture should be offered treatment based on an orthogeriatric model of care as defined in the Clinical Guideline.

The ANZ Hip Fracture Registry provides hospitals with an opportunity to benchmark the care that they provide for hip fracture patients – in real time – against the average performance in New Zealand and against the Clinical Care Standard.

**This business plan recommends that [Insert name of hospital] participates in the Australian and New Zealand Hip Fracture Registry and develops/refines the/an Orthogeriatrics Service to enable us to deliver the best standards of clinical care for older people in our locality who suffer hip fractures.**

# Appendix 1: Orthogeriatrics Services in New Zealand

The following Orthogeriatrics Services in New Zealand have published studies reporting the organisation and impact of their service on care of patients with hip fractures. A description of the approaches taken to participation in the ANZ Hip Fracture Registry is also provided for Auckland City Hospital and Middlemore Hospital.

## Auckland City Hospital

The Orthogeriatrics Service at Auckland City Hospital has published two studies describing the organisation and impact of their service:

Auckland City Hospital's ortho-geriatric service: an audit of patients aged over 65 with fractured neck of femur. Fergus L, Cutfield G, Harris R. N Z Med J. 2011 Jun 24;124(1337):40-54. [PubMed ID 21946877](http://www.ncbi.nlm.nih.gov/pubmed/21946877)

Auckland City Hospital's Ortho-Geriatric Service: an audit of patients aged over 65 with fractured neck of femur. Wimalasena B, Harris R. N Z Med J. 2016 Jul 1;129(1437):15-26. [PubMed ID 27362595](http://www.ncbi.nlm.nih.gov/pubmed/27362595)

**Participation in the ANZ Hip Fracture Registry at Auckland City Hospital**

Auckland City Hospital manages 280-300 hip fractures per year. About 60% of these are transferred to one ward on Older Peoples Health as soon as possible post operatively. Despite lengthy discussions there was no available time for a person to take on the data collection for the ANZ HFR.

The following system was devised to at least collect the ANZHFR data on these patients (realising that we were missing a significant number of patients).

* A folder was set up that had dividers for each of the two admitting House Officers. As each new hip fracture patient arrived on the ward, the ward clerk set up a new data collection form in the appropriate divider. The ward clerk also filled in the dates / times where appropriate as she had better familiarity with the hospital electronic systems to find this information. A brief orientation was required to ensure that the correct information was obtained.
* After the House Officer had clerked the patient and having read all the notes, they already knew most of the data required and could complete most of the data sheet. This did require a short learning curve to understand what was required and where to check for the correct information e.g. type of fracture and the surgery performed, type of anaesthetic.
* The Patient Information Sheet was handed out during a ward round to the patient or their relatives as appropriate.
* Once weekly the data forms were reviewed by the Geriatrician to check for accuracy and completeness (30 minutes).
* At this weekly review session the forms of discharged patients were completed.
* The ward clerk then entered the data on to the ANZHFR web site.

This system works quite smoothly, but requires the regular weekly review session to keep the system on track. No follow ups have been done. So, a partly successful system.

## Middlemore Hospital, Otahuhu

The Orthogeriatrics Service at Middlemore Hospital has published three studies describing the organisation and impact of their service:

Hip fracture in Auckland: contrasting models of care in two major hospitals. Tha HS, Armstrong D, Broad J, Paul S, Wood P. Intern Med J. 2009 Feb;39(2):89-94. [PubMed ID 18771434](http://www.ncbi.nlm.nih.gov/pubmed/18771434)

Secondary prophylaxis of osteoporotic fractures in an orthogeriatric service. Kenealy H, Paul S, Walker K, Garg A. Australas J Ageing. 2011 Mar;30(1):41. [PubMed ID 21395941](http://www.ncbi.nlm.nih.gov/pubmed/21395941)

Timely delivery of hip fracture care: a Middlemore Hospital audit. De Silva CU, Tha HS, Armstrong D, Walker K. N Z Med J. 2013 Oct 18;126(1384):77-83. [PubMed ID 24162632](http://www.ncbi.nlm.nih.gov/pubmed/24162632)

**Participation in the ANZ Hip Fracture Registry at Middlemore Hospital**

There are two Ortho-geriatricians and an Ortho-geriatrics Registrar. There is a daily orthogeriatric registrar ward round reviewing all patients awaiting acute surgery, and each ortho-geriatrician conducts twice weekly ward rounds reviewing all other patients that they are directly responsible for.

The ward round is attended by the Orthogeriatric Nurse Coordinator. She keeps a folder with patient data forms and Patient Information Sheets. When the ward round meets a patient with a hip fracture, as part of the interaction, the concept of the ANZ HFR is introduced and explained. This may not occur on the first meeting and clinical judgement is used to choose an appropriate time. If relatives are present they also receive an explanation and a Patient Information Sheet. Relatives may be contacted by telephone in the course of normal patient care and this is often a good opportunity to explain ANZ HFR and to obtain any information that is required to complete the patient level data form.

This ward round is an excellent opportunity for the Nurse Coordinator to begin completing the patient level data form as all the information should be available in the hospital notes. Some information may require a phone call to relatives or a residential care facility to obtain and this fits with usual clinical care.

Surgery information and post-operative progress is collected while assessing a patient’s readiness for transfer to the rehabilitation ward as part of a routine post-operative review.

Once the patient is discharged from hospital the paper patient level data form is completed for the stay and then entered on to the ANZ HFR website by the Nurse Coordinator.

Follow-up interviews are completed by telephone. The Nurse Coordinator has already identified the correct person to contact for these calls while the patient is an inpatient. This minimises the time and effort required. A quick check is made before beginning to ensure that the patient has not deceased.

The Nurse Coordinator thinks that completing the patient level data form does not take any additional time. This is because the information required to complete the patient level form is required for usual patient care and is therefore acquired on the daily ward rounds. Because she has become familiar with the patient and family circumstances she is well prepared for the follow up phone calls and so the time required is minimised.

## North Shore Hospital, Takapuna

The Orthogeriatrics Service at North Shore Hospital has published one study describing the organisation and impact of their service, and comparison with provision at Middlemore Hospital:

Hip fracture in Auckland: contrasting models of care in two major hospitals. Tha HS, Armstrong D, Broad J, Paul S, Wood P. Intern Med J. 2009 Feb;39(2):89-94. [PubMed ID 18771434](http://www.ncbi.nlm.nih.gov/pubmed/18771434)

## Princess Margaret Hospital, Christchurch

The Orthogeriatrics Service at Princess Margaret Hospital has published three studies describing the organisation and impact of their service:

Secondary prevention of fractures in older people: evaluation of a protocol for the investigation and treatment of osteoporosis. Sidwell AI, Wilkinson TJ, Hanger HC. Intern Med J. 2004 Mar;34(3):129-32. [PubMed ID 15030462](http://www.ncbi.nlm.nih.gov/pubmed/15030462)

Shared care between geriatricians and orthopaedic surgeons as a model of care for older patients with hip fractures. Thwaites JH, Mann F, Gilchrist N, Frampton C, Rothwell A, Sainsbury R. N Z Med J. 2005 May 6;118(1214):U1438. [PubMed ID 15886733](http://www.ncbi.nlm.nih.gov/pubmed/15886733)

Older patients with hip fractures: evaluation of a long-term specialist orthopaedic medicine service in their outcomes. Thwaites J, Mann F, Gilchrist N, McKie J, Sainsbury R. N Z Med J. 2007 May 18;120(1254):U2535. [PubMed ID 17515939](http://www.ncbi.nlm.nih.gov/pubmed/17515939)

# Appendix 2: All About ANZ HFR Ethics

**Why do we need Ethics Approval?**

The hip fracture registry is a continuous audit of hip fracture care and one may think that this would not require an Ethics application. There is no change to the care received; aspects of the care delivery only are recorded.

There are two concerns:

* A significant proportion of hip fracture patients are vulnerable in that they do not have the capacity to understand and give consent to information collection.
* The proposal is to use the information collected to perform public benchmarking of care between institutions and countries. It is important to ensure that patients are not identifiable.

These issues have been resolved as explained below.

**What type of Ethics approval does ANZ HFR have in New Zealand?**

A single national application for all New Zealand has been submitted and approved.

The type of Ethics is *“Opt Off”* rather than the usual full informed consent with signature type of consenting process. This resolves the issues of a simple audit and information collection with the vulnerable population.

Patients and their relatives are informed about the data collection and the how this information will be aggregated and used. Because there is no treatment risk the only remaining issue is the collection and use of the collected data and related patient confidentiality.

If the patient or their relatives are not happy to have their data contributed they can “opt off” by informing their clinical team or emailing the ANZ HFR.

Below is what was written in the Ethics application.

1. Process for people lacking capacity to participate in the opt out consent process:
	1. As a general principle, this issue will be approached in the usual way that treating clinicians use for managing medical problems in this vulnerable group. In this project, there is no “test intervention” being carried out and there is no clinical risk. The information being collected is about “usual care” and is really an audit of this “usual care” rather than a formal research study in the usual sense.
	2. Where an Enduring Power of Attorney is in place, this person will be contacted and provided with the Participant Information Sheet and an explanation of the project. They will be given the opportunity to ask any questions about the project and to request to opt out if they think that the potential participant would not want to contribute their information the project.
	3. Where an Enduring Power of Attorney is not in place, a conversation will take place with the close family members and next of kin. This will involve the provision of the participant information sheet and an explanation of the project. An opinion will be sought as to whether they think that the potential participant will be agreeable to their information being contributed to the project. This process is how treatment decisions would be approached by clinical teams in this situation.
2. Confidentiality of dataset:
	1. I have discussed this issue with Stewart Fleming who has built the database and will be the ongoing database manager. As mentioned in the application he has experience with developing and managing the National Hip Fracture Database (NHFD) in the UK.
	2. Stewart has provided reassurance that the first step is to de-identify the data. A separate data table (main data table) is created and each individual is assigned a database number and their personal identifying information such as date of birth is converted to age and their name and NHI and any other information that could identify them is removed. This is the table that is made available for the preparation of reports.
	3. If there are concerns about incorrect information or there is a wish to investigate a data trend in more detail the individual records of concern can be re-identified and requests sent to the hospital of origin for further information. The principle is that only clinicians involved in the care of hip fracture patients at the hospital of origin will be able to access identified data.
	4. In this manner, the dataset is rendered potentially identifiable and affords much greater protection for the individuals contributing their information to the project.

**What does your hospital need to do?**

A single national application for all New Zealand has been submitted and approved. You do not have to do a formal Ethics application.

Each site that collects data must get local “site approval”.

* We need to get you connected to the National ethics approval document by having you complete appropriate documentation to get “site approval”.
* We need the email address of the local person(s) who deal with Ethics issues for the DHB.
* We send the linkage information to them.
* You need to decide who is the Principal Investigator for the purposes of Ethics at your site.
* The local Ethics person will contact the Principal Investigator to complete some documents.
* We will send you all the information required to do this.

Preparing the Patient Information Sheet

* We will send you the template for this.
* You will need to insert:
	+ The name of the Site Principal Investigator in the appropriate place.
	+ The DHB logo in the appropriate place.

Main issues:

* 1 person with overall responsibility for ethics in each DHB.
* Main concern is that patients / whanau understand that:
	+ Their information is being used for quality improvement activity.
	+ That if they are not happy about this:
		- to ask questions of the clinical team.
		- they can choose to opt out by letting the clinical team know.

Comment:

* All patients are receiving usual care i.e. there is no new or untested intervention.
* The ethics issue is that they know that information is being collected, how it will be used, and that their identity will remain anonymous to any researchers preparing reports and in any reports, that are produced.

Implications:

* Several clinical staff will need to be orientated to these issues and know who to refer to if patients or whanau want to know more about the project.
* Patient Information Sheets should be easily available and handed out to all patients with hip fractures and their whanau.


# Appendix 3: ANZ HFR - How to get started

**Familiarisation with Demo Website**

As a way to get an idea of the mechanics of data entry and what data fields are collected, log on to the demo website via the ANZ HFR website [www.anzhfr.org](http://www.anzhfr.org).

**Familiarisation with Data Dictionary and Data Collection Form**

Please note that Hip Fracture Clinical Care Standards38 have just been formally adopted by both Australia and New Zealand. This will entail some additional fields in the data set to reflect these standards. This will start on 1st January 2017.

1. Data dictionary:
	1. This is a large document that details the definition and purpose of each of the approximately 56 data items.
	2. On first read this should only be scanned so that you know what it contains and to then use it as a resource as needed.
2. Data Collection Form:
	1. The main data collection fits on both sides of a single A4 sheet of paper. Most of the data items are straight forward to understand, but we think it would be worth going through each item one by one with us to ensure interpretation of each item is correct at the start. There are a couple of tricks.
	2. The 30-day and 120-day post-surgery follow ups are straight forward.
		1. There are a couple of process issues to be aware of and so we would like to discuss aspects of this process before you start.

**Website**

1. Once your hospital has site approval we will organise:
	1. For your hospital to be added to the live website.
	2. Logons for staff that will be involved.
2. Please note there are no charges to your hospital with respect to Information Technology.

**Setting up to collect data**

**Time involvement**

1. Completing data sheet
	1. If doing this by sitting at the clinical workstation and with the notes it will take 10-15 minutes.
	2. If doing this on a ward round – it shouldn’t add any time to the ward round as the majority of items you will want to know as part of clinical care.
2. Entering the data on to the web-site
	1. This will take about 10 minutes per patient.
	2. The website is optimised for mobile devices and so you don’t have to use a desktop computer.
	3. Administration staff can enter the data and save on clinical time.
3. Follow up phone calls:
	1. These take 5-10 minutes.
	2. The information required is simple and can often more easily obtained by a source other than the patient.
	3. It is an advantage if you know the patient and family, have identified the correct person to phone and have already warned them that they will be contacted.
	4. As many patients will be in residential care, we suggest using your local networks to raise awareness about ANZ HFR within the Residential Aged Care sector. It may help if they realise that they may be contacted as part of the follow up.
	5. The information provided to the Ethics Committee on this topic is listed separately at the end of this document.

**System of Data Collection**

1. There is no one correct method for sustainable data collection.
2. We recommend a team approach to developing this reflecting both Orthopaedic and Geriatric Medicine interests. (Also consider Emergency Department, Anaesthetics, Theatre staff, although a small group is likely to be more effective):
	1. This “team” can also review the results on a quarterly basis (see below).
3. Feedback from the NHFD in the UK has the following suggestions:
	1. The key is having interested and committed person(s).
	2. It works better if these persons are involved in the care delivery.
	3. Nursing roles tend to be the most reliable.
	4. Sustainability needs to be considered: holiday and sickness cover etc.
	5. Clerical staff can enter data, saving on clinical time.
	6. It is suggested that there is one person with overall responsibility (usually an SMO). Data accuracy and completeness can be checked by this person by randomly checking say 10% of entries. This person can chair the quarterly “team” review meetings.
4. Consider the benefits of the Registry providing information on how hip fractures are being managed in your hospital.
	1. Quarterly reports on a number of measures (e.g. time to surgery) will be shown in the web site comparing your hospital with the average for all contributing NZ hospitals.
	2. You will be able to download all your data into a spread sheet for your own analysis.

**Additional Notes on Follow-up Interviews**

Below is what was included in the Ethics Application on this topic.

Process of follow-up interviews:

1. These follow-up interviews will be conducted by an experienced health professional.
2. It is agreed that avoiding distress to relatives of recently deceased participants is highly desirable. Before the follow-up phone call is made we will ensure that all appropriate and reasonable steps are carried out to clarify that the participant is still alive.
3. Follow up and participant cognitive function.
	1. The experienced health professional will have access to the patient record before making the follow up phone call and will therefore have a prior understanding of the participant’s recent cognitive function during their hospital stay.
	2. They will use their professional judgement during the interview to ascertain whether it is suitable to continue and obtain the information required directly from the participant. There are other methods of obtaining the required information as explained next.
4. Can the follow up information be obtained by means other than direct participant contact? The short answer is yes.
	1. The information required is: are they alive and if so, living situation, weight bearing status, walking ability, medication for bone protection and if there has been a reoperation.
	2. The required information is fairly objective and could be provided by a family member or if the participant is in residential care by staff of the facility.
5. Given that this information will be obtained by an experienced health professional who was involved in the participant’s in hospital care, clinical judgement will be exercised as to the most appropriate method of obtaining the required follow information.

# References

**1.** Health Quality and Safety Commission. Atlas of healthcare variation: Falls. <http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/falls/>. Accessed 20 September 2016.

**2.** Osnes EK, Lofthus CM, Meyer HE, et al. Consequences of hip fracture on activities of daily life and residential needs. *Osteoporos Int.* Jul 2004;15(7):567-574.

**3.** Magaziner J, Simonsick EM, Kashner TM, Hebel JR, Kenzora JE. Predictors of functional recovery one year following hospital discharge for hip fracture: a prospective study. *J Gerontol.* May 1990;45(3):M101-107.

**4.** Cooper C. The crippling consequences of fractures and their impact on quality of life. *Am J Med.* Aug 18 1997;103(2A):12S-17S; discussion 17S-19S.

**5.** Autier P, Haentjens P, Bentin J, et al. Costs induced by hip fractures: a prospective controlled study in Belgium. Belgian Hip Fracture Study Group. *Osteoporos Int.* 2000;11(5):373-380.

**6.** Kiebzak GM, Beinart GA, Perser K, Ambrose CG, Siff SJ, Heggeness MH. Undertreatment of osteoporosis in men with hip fracture. *Arch Intern Med.* Oct 28 2002;162(19):2217-2222.

**7.** Roberts SE, Goldacre MJ. Time trends and demography of mortality after fractured neck of femur in an English population, 1968-98: database study. *BMJ.* Oct 4 2003;327(7418):771-775.

**8.** Walker N, Norton R, Vander Hoorn S, et al. Mortality after hip fracture: regional variations in New Zealand. *N Z Med J.* Jul 23 1999;112(1092):269-271.

**9.** Brown P, McNeill R, Leung W, Radwan E, Willingale J. Current and future economic burden of osteoporosis in New Zealand. *Appl Health Econ Health Policy.* Mar 1 2011;9(2):111-123.

**10.** British Orthopaedic Association, British Geriatrics Society. *The care of patients with fragility fracture* 2007.

**11.** Adunsky A, Arad M, Levi R, Blankstein A, Zeilig G, Mizrachi E. Five-year experience with the 'Sheba' model of comprehensive orthogeriatric care for elderly hip fracture patients. *Disabil Rehabil.* Sep 30-Oct 15 2005;27(18-19):1123-1127.

**12.** Heyburn G, Beringer T, Elliott J, Marsh D. Orthogeriatric care in patients with fractures of the proximal femur. *Clin Orthop Relat Res.* Aug 2004(425):35-43.

**13.** Kammerlander C, Gosch M, Blauth M, Lechleitner M, Luger TJ, Roth T. The Tyrolean Geriatric Fracture Center: an orthogeriatric co-management model. *Z Gerontol Geriatr.* Dec 2011;44(6):363-367.

**14.** Mak J, Wong E, Cameron I, Australian, New Zealand Society for Geriatric M. Australian and New Zealand Society for Geriatric Medicine. Position statement--orthogeriatric care. *Australas J Ageing.* Sep 2011;30(3):162-169.

**15.** Gregersen M, Morch MM, Hougaard K, Damsgaard EM. Geriatric intervention in elderly patients with hip fracture in an orthopedic ward. *J Inj Violence Res.* Jul 2012;4(2):45-51.

**16.** Doshi HK, Ramason R, Azellarasi J, Naidu G, Chan WL. Orthogeriatric model for hip fracture patients in Singapore: our early experience and initial outcomes. *Arch Orthop Trauma Surg.* Mar 2014;134(3):351-357.

**17.** Friess T, Hartwig E, Liener U, Sturm J, Hoffmann R. [Geriatric trauma centers from the idea to implementation : What has been achieved?]. *Unfallchirurg.* Jan 2016;119(1):7-11.

**18.** Kristensen PK, Thillemann TM, Soballe K, Johnsen SP. Can improved quality of care explain the success of orthogeriatric units? A population-based cohort study. *Age Ageing.* Jan 2016;45(1):66-71.

**19.** Sidwell AI, Wilkinson TJ, Hanger HC. Secondary prevention of fractures in older people: evaluation of a protocol for the investigation and treatment of osteoporosis. *Intern Med J.* Mar 2004;34(3):129-132.

**20.** Tha HS, Armstrong D, Broad J, Paul S, Wood P. Hip fracture in Auckland: contrasting models of care in two major hospitals. *Intern Med J.* Feb 2009;39(2):89-94.

**21.** Fergus L, Cutfield G, Harris R. Auckland City Hospital's ortho-geriatric service: an audit of patients aged over 65 with fractured neck of femur. *N Z Med J.* Jun 24 2011;124(1337):40-54.

**22.** Kenealy H, Paul S, Walker K, Garg A. Secondary prophylaxis of osteoporotic fractures in an orthogeriatric service. *Australas J Ageing.* Mar 2011;30(1):41.

**23.** Wimalasena B, Harris R. Auckland City Hospital's Ortho-Geriatric Service: an audit of patients aged over 65 with fractured neck of femur. *N Z Med J.* 2016;129(1437):15-26.

**24.** Friedman S. The Orthogeriatrics Model of Care. In: Duque G, Kiel DP, eds. *Osteoporosis in Older Persons: Advances in Pathophysiology and Therapeutic Approaches*. Second ed. Switzerland: Springer International Publishing; 2016:265-273.

**25.** British Orthopaedic Association, British Geriatrics Society, Healthcare Quality Improvement Partnership. The National Hip Fracture Database. <http://www.nhfd.co.uk/>. Accessed 21 September 2016.

**26.** Royal College of Physicians. *National Hip Fracture Database (NHFD) annual report 2016.* London: RCP; 2016.

**27.** Neuburger J, Currie C, Wakeman R, et al. The impact of a national clinician-led audit initiative on care and mortality after hip fracture in England: an external evaluation using time trends in non-audit data. *Med Care.* Aug 2015;53(8):686-691.

**28.** Nymark T, Lauritsen JM, Ovesen O, Rock ND, Jeune B. Short time-frame from first to second hip fracture in the Funen County Hip Fracture Study. *Osteoporos Int.* 2006;17(9):1353-1357.

**29.** Lonnroos E, Kautiainen H, Karppi P, Hartikainen S, Kiviranta I, Sulkava R. Incidence of second hip fractures. A population-based study. *Osteoporos Int.* Sep 2007;18(9):1279-1285.

**30.** Lawrence TM, Wenn R, Boulton CT, Moran CG. Age-specific incidence of first and second fractures of the hip. *J Bone Joint Surg Br.* Feb 2010;92(2):258-261.

**31.** Lee SH, Chen IJ, Li YH, Fan Chiang CY, Chang CH, Hsieh PH. Incidence of second hip fractures and associated mortality in Taiwan: A nationwide population-based study of 95,484 patients during 2006-2010. *Acta Orthop Traumatol Turc.* Jul 26 2016.

**32.** Osteoporosis New Zealand. *Bone Care 2020: A systematic approach to hip fracture care and prevention for New Zealand.* Wellington 2012.

**33.** Health Quality & Safety Commission. Reducing Harm from Falls programme evaluation. <http://www.hqsc.govt.nz/our-programmes/reducing-harm-from-falls/publications-and-resources/publication/2595/>. Accessed 16 November 2016.

**34.** Australian and New Zealand Hip Fracture Registry. *Facility level audit of hospitals in Australia and New Zealand performing surgery for hip fracture.* Sydney 2013.

**35.** Australian and New Zealand Hip Fracture Registry (ANZHFR) Steering Group. *Australian and New Zealand Guideline for Hip Fracture Care: Improving Outcomes in Hip Fracture Management of Adults.* Sydney: Australian and New Zealand Hip Fracture Registry Steering Group; 2014.

**36.** Australian and New Zealand Hip Fracture Registry Steering Group. *Australian and New Zealand Facility Level Audit of Hospitals Performing Surgery for Hip Fracture.* Sydney 2014.

**37.** Australian and New Zealand Hip Fracture Registry. *Australian and New Zealand Facility Level Audit of Hospitals Performing Surgery for Hip Fracture.* Sydney 2015.

**38.** Australian Commission on Safety and Quality in Health Care, Health Quality & Safety Commission New Zealand. *Hip Fracture Care Clinical Care Standard.* Sydney 2016.

**39.** Australian and New Zealand Hip Fracture Registry. *2016 Annual Report.* Sydney 2016.

**40.** Health Quality & Safety Commission. The Triple Aim. <http://www.hqsc.govt.nz/news-and-events/news/126/>. Accessed 22 September 2016.

**41.** Minister of Health. New Zealand Health Strategy: Future direction. In: Ministry of Health, ed. Wellington; 2016.

**42.** Ministry of Health. Health of Older people Strategy: Consultation Draft. Wellington: Ministry of Health,; 2016.

**43.** New Zealand Government. Older New Zealanders: Healthy, independent, connected and respected. In: Office for Senior Citizens, ed. Wellington; 2013.

**44.** Hall G. Plenary Session IV: Impact of fragility fractures on health policy. Development of a national falls and fracture prevention strategy for New Zealand. Paper presented at: 5th FFN Global Congress, 2016; Rome, Italy.

**45.** Dodson I. Improving the journey for hip fracture patients. <http://koawatea.co.nz/improving-the-journey-for-hip-fracture-patients/>. Accessed 22 September 2016.

**46.** Yousri TA, Khan Z, Chakrabarti D, Fernandes R, Wahab K. Lean thinking: can it improve the outcome of fracture neck of femur patients in a district general hospital? *Injury.* Nov 2011;42(11):1234-1237.