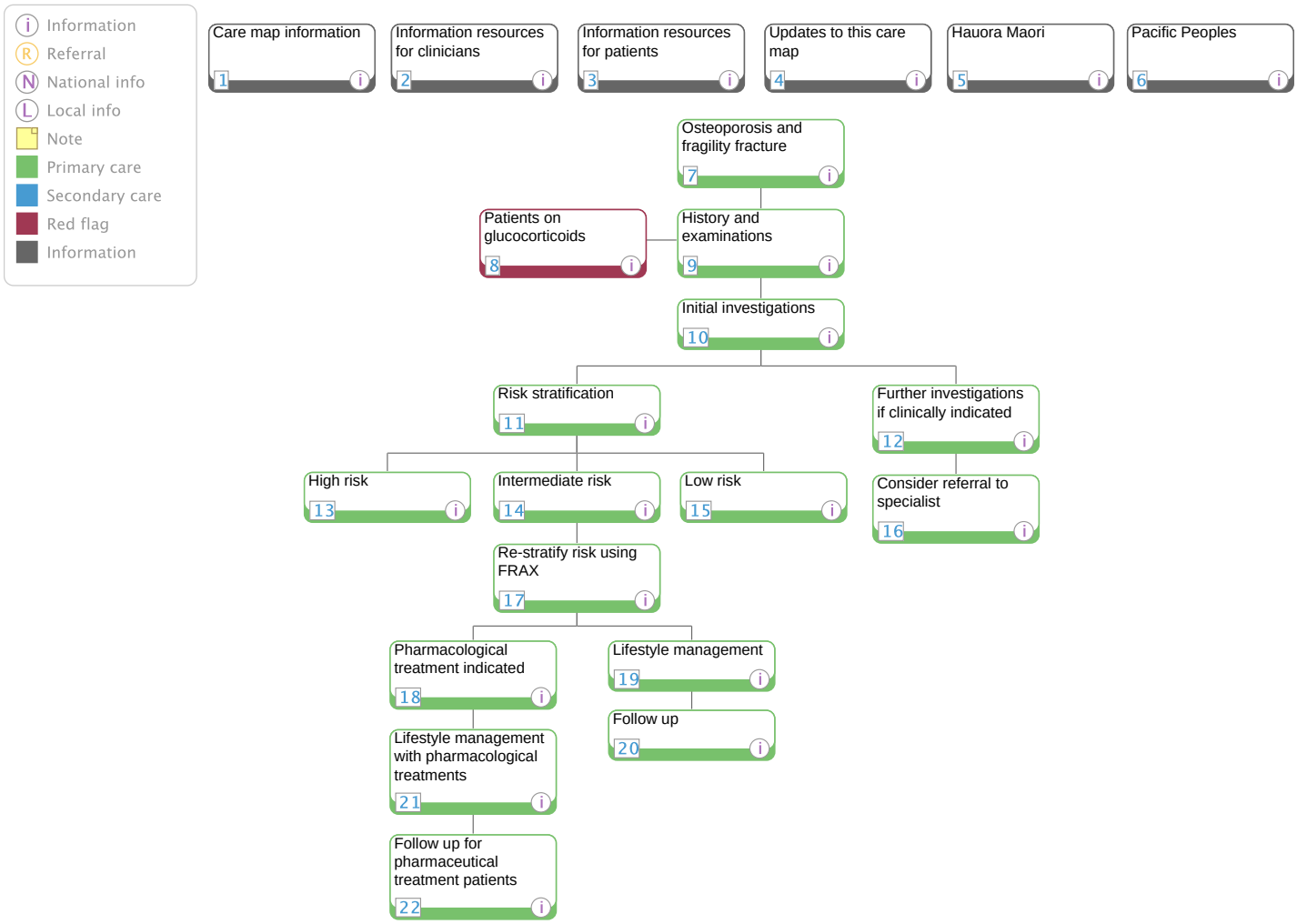
Osteoporosis and Fracture Prevention

Medicine > Osteoporosis > Osteoporosis



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Osteoporosis and Fracture Prevention

1 Care map information

Quick info:

Scope:

- primary care assessment and management of osteoporosis in adults including treatment following fragility fracture

Out of scope:

- other bone diseases

Definitions:

Osteoporosis [1]:

- characterised by low bone mass and structural deterioration of bone tissue resulting in increased bone fragility and susceptibility to fracture
- defined by the World Health Organisation (WHO) as a BMD of 2.5 standard deviations below the mean peak mass (average of young healthy adults), as measured by dual-energy X-ray absorptiometry (DEXA) applied to the femoral neck, and reported as a T-score

Osteoporotic fracture [4]:

- a fragility fracture occurring as a consequence of osteoporosis

Fragility fracture:

- fracture following a fall from a standing height or less; or
- vertebral fracture that has occurred spontaneously, or as a result of routine activities, e.g. bending or lifting
- major osteoporotic fracture; osteoporotic fracture of the spine, hip, forearm, or proximal humerus

Why is Osteoporosis important:

- 2100 quality adjusted life years (QALY) lost due to osteoporotic fractures per year in New Zealand [3]
- more than $300 million spent on osteoporotic fractures per year in New Zealand [3]
- patients with hip fracture nearly always require hospitalisation, 20% of cases are fatal, and 50% of patients are left permanently disabled [2]

References:1. Clinical knowledge summaries (CKS) . Prevention of fragility fractures. September 2013. Newcastle upon Tyne: CKS; 2013.

2. National Clinical Guideline Centre (NCGC), National Institute for Health and Clinical Excellence (NICE). Osteoporosis fragility fracture: full guideline. Clinical guideline 146. London: NCGC/NICE; 2012.

3. Brown P, McNeill R, Leung W, Radwan E, Willingale J Current and future economic burden of osteoporosis in New Zealand. Applied Health Economics and Health Policy, March 2011, Volume 9, Issue 2, pp 111-123

2 Information resources for clinicians

Quick info:

International:

- Osteoporosis. Food fact sheet from The Association of UK Dieticians
- Osteoporosis Bupa UK health information
- Osteoporosis. 'Patient' website
- Preventing steroid-induced osteoporosis

Links to special authority (SA) forms:

- Alendronate form
- Zoledronic acid form
- Raloxifene form
- Teriparatide form

Falls:

- Stay independent, falls prevention toolkit for clinicians
- ACC - Preventing falls

Published: 15-Jan-2016 Valid until: 30-Jun-2019 Printed on: 11-Jul-2018

- ACC - Preventing falls, information for older people
- Health Quality & Safety commission. Reducing harm from falls

3 Information resources for patients

Quick info:

Ministry of Health:

- Your health, conditions and treatments - osteoporosis

Osteoporosis New Zealand

Health Talk Online. A website featuring video interviews with people on various health topics. Osteoporosis

Physical activity:

- The New Zealand Physical Activity Guidelines
- Physical activity guidelines for older people (65 years and over)

Falls:

- Stay independent, falls prevention toolkit for clinicians
- ACC - Preventing falls
- ACC - Preventing falls, information for older people
- Health Quality & Safety commission. Reducing harm from falls

International:

- Osteoporosis. Food fact sheet from The Association of UK Dieticians
- Osteoporosis 'Patient' website

Language translation assistance:

HBDHB Interpreting Service - phone 06 878 8109 ext 5805 or email interpreting@hawkesbaydhb.govt.nz to make an appointment (charges may apply).Language Line. Professional interpreters are available, free of charge, for telephone-based sessions (44 languages are supported):

- Phone 0800 656 656
- Monday - Friday 9am - 6pm
- Saturday 9am - 2pm

4 Updates to this care map

Quick info:

Date of publication: January 2016

Review date: January 2017

This care map has been developed in line with consideration to evidenced based guidelines. For further information on contributors and references please see the Pathway's Provenance Certificate.NB: This information appears on each page of this care map

5 Hauora Maori

Quick info:

Maori are a diverse people and whilst there is no single Maori identity, it is vital practitioners offer culturally appropriate care when working with Maori whanau. It is important for practitioners to have a baseline understanding of the issues surrounding Maori health. This knowledge can be actualised by (not in any order of priority):

- clinicians acknowledging Te Whare Tapa Wha (Maori model of health) when working with Maori whanau

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- asking Maori clients if they would like their whanau or significant others to be involved in assessment and treatment
- asking Maori clients about any particular cultural beliefs they or their whanau have that might impact on assessment and treatment of the particular health issues
- consider the importance of introductions and mihimihi ('whanaungatanga') - a process that enables the exchange of information to support interaction and meaningful connections. This means taking a little time to ask where this person is from or where they have significant connections to. This information is reciprocated; i.e. the health professional also shares where they are from
- knowledge of the Hawke's Bay health sector's strategies and initiatives for improving Maori health and wellbeing
- having a historical overview of legislation that has impacted on Maori well-being

Training is available through the Hawke's Bay DHB to assist you to better understand Maori culture and to better engage with Maori patients. Contact the coordinator (education@hbdhb.govt.nz) to request details of the next courses.

For more information on the regional and national Maori Health Strategies go to:

- **Mai** Maori Health Strategy 2014-2019- Full file or Summary diagram
- **He Korowai Oranga**: Maori Health Strategy - sets the Government's overarching framework to achieving the best health outcomes for Maori

Hawke's Bay District Health Board contracts Maori Providers to deliver screening, and mobile nursing teams. A referral to one of these providers may assist Maori patients to feel more comfortable about receiving these services.

Central Hawke's Bay:

- Central Health

Hastings:

- Te Taiwhenua o Heretaunga
- Kahungunu Health Services (Choices)

Napier:

- Te Kupenga Hauora

Wairoa:

- Kahungunu Executive

6 Pacific Peoples

Quick info:

Pacific people value their culture, language, families, education and their health and wellbeing. Many Pacific families have a religious affiliation to a local church group.

The Pacific people are a diverse and dynamic population:

- more than 22 nations represented in New Zealand
- each with their own unique culture, language, history, and health status
- share many similarities which we have shared with you here in order to help you work with Pacific patients more effectively
- for many families language, cost and access to care are barriers

Pacific ethnic groups in Hawke's Bay include Samoa, Cook Islands, Fiji, Tonga, Niue, Tokelau, Kiribati and Tuvalu. Samoan and Cook Island groups are the largest and make up two thirds of the total Pacific population. There is a growing trend of inter-ethnic relationships and New Zealand born Pacific populations.

Acknowledge The FonoFale Model (Pacific model of health) when working with Pacific peoples and families.

General guidelines when working with Pacific peoples and families (information developed by Central PHO, Manawatu):

- Cultural protocols and greetings
- Building relationships with your Pacific patients
- Involving family support and religion during assessments and in the hospital
- Home visits

Hawke's Bay-based resources:

- HBDHB interpreting service06 8788 109 ext. 5805 (no charge for hospital patients; charges apply for community-based translations)
- Tim Hutchins- Pacific Navigation Services LTD 027 9719199

Published: 15-Jan-2016 Valid until: 30-Jun-2019 Printed on: 11-Jul-2018

- Services to assist Pacific peoples to access healthcare (SIA)
- Improving the Health of Pacific People in Hawke's Bay – Pacific Health Action Plan

Ministry of Health resources:

- Ala Mo'ui - Pathways to Pacific Health and Wellbeing 2014-2018
- Primary care for Pacific people: a Pacific and health systems approach
- Health education resources in Pacific languages (links to a web page where you can download resources)

7 Osteoporosis and fragility fracture

Quick info:

Osteoporosis [1]:

- characterised by low bone mass and structural deterioration of bone tissue resulting in increased bone fragility and susceptibility to fracture
- defined by the World Health Organisation (WHO) as a BMD of 2.5 standard deviations below the mean peak mass (average of young healthy adults), as measured by dual-energy X-ray absorptiometry (DEXA) applied to the femoral neck, and reported as a T-score
- Osteoporotic fracture - a fragility fracture occurring as a consequence of osteoporosis

Fragility fracture:

- fracture following a fall from a standing height or less; or
- vertebral fracture that has occurred spontaneously, or as a result of routine activities, e.g. bending or lifting. This generally excludes fractures of the face, clavicle, hands or feet

Osteoporosis often remains undiagnosed until a fragility fracture occurs [1]. Vertebral fractures or low bone density may be identified incidentally on imaging. This should prompt risk stratification.

References:1. Clinical knowledge summaries (CKS) . Prevention of fragility fractures. September 2013. Newcastle upon Tyne: CKS; 2013. Available from: http://cks.nice.org.uk/osteoporosis-prevention-of-fragility-fractures

8 Patients on glucocorticoids

Quick info:

Glucocorticoids have a detrimental effect on bones.

The result of this is rapid bone loss, particularly during the first 6 months on glucocorticoid therapy, and rapid increase in fracture risk (independent of BMD). Fractures may occur at higher BMD than in non-corticosteroid users. For this reason, intervention thresholds are higher and treatment is recommended at T-score ≤ -1.5.

Risk should be assessed in anyone expected to receive any dose oral glucocorticoid therapy for ≥3months. Assess fracture risk in anyone who has taken a cumulative dose equivalent to 1500mg of prednisone during a year. Initiate osteoporosis management when glucocorticoid is started and stop treatment six months after glucocorticoids stop. Due to effects of glucocorticoids on calcium and vitamin D metabolism, all patients should be considered for replacement therapy.

See lifestyle management information node below.

9 History and examinations

Quick info:

Clinical history, physical examination, and clinical tests aim to:

- exclude diseases that mimic osteoporosis, e.g. osteomalacia, myeloma
- identify the cause of osteoporosis and contributory factors

Enquire about:

- falls
- clinical risk factors

- age
- sex
- low body mass index (BMI) - 19kg/m2 or less
- previous fragility fractures - particularly of the wrist, hip, and spine, including vertebral fracture
- parental history of hip fracture
- family history of osteoporosis
- glucocorticoid treatment
- current smoker
- alcohol intake of 3 or more units daily

- social history and lifestyle factors:
  - prolonged immobility/inactivity
  - diet deficient in calcium
  - risk of vitamin D deficiency e.g. low sunlight exposure especially in: bed bound, house bound and those with naturally very dark skin
- Medications. see medications that may reduce bone density

Co-morbidities causing secondary osteoporosis:

- endocrine disorders:
  - hypogonadism
  - hyperthyroidism
  - hyperparathyroidism
  - hyperprolactinaemia
  - Cushing's disease
  - diabetes
- organ transplantation
- gastrointestinal diseases:
  - coeliac disease
  - inflammatory bowel disease
  - chronic liver disease
  - any cause of malabsorption
- rheumatological conditions
- chronic renal disease
- respiratory diseases, particularly chronic obstructive pulmonary disease

10 Initial investigations

Quick info:

Consider the following for all patients with osteoporosis:

- full blood count (FBC)
- erythrocyte sedimentation rate (ESR) or C-reactive protein (CRP)
- serum calcium:
  - elevated in primary and tertiary hyperparathyroidism
  - decreased in malabsorption, vitamin D deficiency (osteomalacia)
  - normocalcaemia does not exclude diagnosis
  - if result abnormal consider referral endocrinology
- alkaline phosphatase (ALP) elevated in Paget's disease, prolonged immobilisation, acute fractures, and other bone diseases
- phosphate - decreased in osteomalacia
- albumin

- creatinine - bisphosphonates are contraindicated in renal failure (eGFR less than 35mL/min)
- liver transaminases
- thyroid function tests

11 Risk stratification

Quick info:

Assess fracture risk in postmenopausal women and men age 50 years or older. FRAX tool assesses the 10 year probability of a major osteoporotic fracture (spine, hip, forearm, or humerus) and is the preferred tool.

FRAX score will determine level of risk. NOGG graph within the FRAX tool can be used to stratify patients into high, intermediate and low risk groups.

See instructions on use of FRAX tool. Garvan or QFracture tools can also be used as an alternative to FRAX. Do not routinely assess fracture risk in people under age 50 years unless they have major risk factors as there is little evidence for treatment in younger people and their overall fracture risk is low [4]. Tools may underestimate fracture risk in certain circumstances, e.g. having a history of multiple fractures.

References:

4. Contributors representing the Royal College of Physicians (RCP). 2013. Medicines and Healthcare products Regulatory Agency (MHRA). Calcitonin (Miacalcic): increased risk of cancer with long-term use - all intra-nasal formulations for osteoporosis to be withdrawn. Drug Safety Update. London: MHRA; 2012.

12 Further investigations if clinically indicated

Quick info:

Consider the following tests where clinically indicated:

- parathyroid hormone (PTH) if calcium abnormal
- sex hormone profile
- test for coeliac antibodies
- myeloma screen
- 24 hour urinary cortisol if Cushings suspected

13 High risk

Quick info:

Pharmacological treatment is indicated without the need for bone mineral density (BMD) measurement.

14 Intermediate risk

Quick info:

Consider measurement of bone mineral density (BMD) using a dual-energy X-ray absorptiometry (DEXA) scan and reassess fracture probability with FRAX

No other imaging modality accurately measures BMD.

Patient information on bone density scan from TRG Imaging at Hawkes Bay Radiology.

At present (November 2015) access to publicly funded DEXA scan is limited therefore most patients choose to pay privately.

Some patients may be unable to access a DEXA scan due to cost and/or mobility issues therefore clinician should use their judgement and discussion with patient to decide between treatment and lifestyle management options.

Bisphosphonate (risedronate) is available without DEXA or special authority (SA).

A ten year probability of hip fracture >3% or any osteoporotic fracture >20% should be considered for treatment.

15 Low risk

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Quick info:
DEXA is not required.
See lifestyle management information node below.

16 Consider referral to specialist

Quick info:
Referral to Endocrinology should be considered for:

- a history of low trauma fracture in younger patients (<50 yrs) involving hip, vertebrae, ulna, ribs
- suspected secondary cause of osteoporosis
- abnormal serum calcium without recognised cause
- younger patients (<50 yrs) with a T score <2.0 without readily identifiable risk factors
- very low BMD (e.g. T score <-4)

17 Re-stratify risk using FRAX

Quick info:
Using bone mineral density (BMD) result if available.

18 Pharmacological treatment indicated

Quick info:
Management of high risk patients is primarily with bisphosphonates
Calcium and vitamin D should be considered if appropriate.
If bisphosphonates are contraindicated or not tolerated, consider other agents
Bisphosphonates should be avoided:

- where eGFR<30ml/min
- in patients with active upper gastrointestinal symptoms
- where cognitive impairment may affect administration
- if patients are bed bound or unable to sit upright for 30 minutes
- if life expectancy is less than 12 months

Links to special authority (SA) forms:

- Alendronate form
- Zoledronic acid form
- Raloxifene form
- Teriparatide form

19 Lifestyle management

Quick info:
Encourage a healthy diet. Body mass index (BMI) less than 19kg/m2 is a strong risk factor for osteoporosis.
Regular exercise. Encourage regular weight bearing exercise and avoid immobilisation [1]:

- physical activity to gain health benefits and ways to incorporate incidental physical activity into everyday life. Physical activity for older people (over 65 years)
- further information in the information resources for clinicians and patients nodes above

Encourage smoking cessation
Discourage excessive alcohol intake.
Falls prevention [5] – consider factors such as:

Published: 15-Jan-2016 Valid until: 30-Jun-2019 Printed on: 11-Jul-2018

- home environment hazards
- medicines:
  - medicines use review (MUR) Pharmacists
  - community pharmacists in primary care
- decreased visual acuity
- mobility problems and need for gait aids

Further information from Health Quality Safety Commission on falls prevention:

- clinicians toolkit
- reducing harm from falls

Consider Calcium and vitamin D supplementation.

References:1. Clinical knowledge summaries (CKS) . Prevention of fragility fractures. September 2013. Newcastle upon Tyne: CKS; 2013.5. National Osteoporosis Guideline Group (NOGG). Guideline for the diagnosis and management of osteoporosis in postmenopausalwomen and men from the age of 50 years in the UK. Sheffield: NOGG; 2013.

20 Follow up

Quick info:

Review every 1-2 years or if new fracture.

Consider repeating initial investigations and re-stratify risk (see above risk stratification information).

Review lifestyle factors and falls risk.

DEXA scanning:

- there is low utility in repeating DEXA scanning in intervals of less than 5 years. Exceptions are:
  - new fractures while on bisphosphonate
  - initiated long term steroid therapy

21 Lifestyle management with pharmacological treatments

Quick info:

Encourage a healthy diet. Body mass index (BMI) less than 19kg/m2 is a strong risk factor for osteoporosis.

Regular exercise. Encourage regular weight bearing exercise and avoid immobilisation [1]:

- physical activity to gain health benefits and ways to incorporate incidental physical activity into everyday life. Physical activity for older people (over 65 years)
- further information in the information resources for clinicians and patients nodes above

Encourage smoking cessation

Discourage excessive alcohol intake.

Falls prevention [5] – consider factors such as:

- home environment hazards
- medicines
  - medicines use review (MUR) Pharmacists
  - community pharmacists in primary care
- decreased visual acuity
- mobility problems and need for gait aids

Further information from Health Quality Safety Commission on falls prevention:

- clinicians toolkit

Published: 15-Jan-2016 Valid until: 30-Jun-2019 Printed on: 11-Jul-2018

- reducing harm from falls

References:1. Clinical knowledge summaries (CKS) . Prevention of fragility fractures. September 2013. Newcastle upon Tyne: CKS; 2013.
5. National Osteoporosis Guideline Group (NOGG). Guideline for the diagnosis and management of osteoporosis in postmenopausalwomen and men from the age of 50 years in the UK. Sheffield: NOGG; 2013.

22 Follow up for pharmaceutical treatment patients

Quick info:

New fractures:

- explore cause e.g. poor medication adherence, modifiable lifestyle factors
- consider changing from oral to IV bisphosphonates
- consider specialist advice

Annual review:

- medication adherence/tolerance
- renal function
- review lifestyle factors
- falls

There is no data to support use of FRAX/Qfracture to re-evaluate patients already started on pharmacological treatment.

Review need for bisphosphonate treatment [6]:

- review risedronate and alendronate after 5 years and zoledronic acid after 3 years
- consider discontinuing bisphosphonate if there is a low to moderate risk, as the benefits of treatment in this group beyond the 5 (risedronate and alendronate) or 3 (zoledronic acid) years are limited
- continue if high risk, but re-review annually; high risk factors:
  - prior hip or multiple vertebral fractures
  - age ≥75 years
  - continued fragility fractures on treatment
  - total hip or femoral neck BMD T-score £ -2.5 at time of treatment review
  - recurrent falls
  - other risk factors including secondary osteoporosis, co-morbidities, oral glucocorticoids
- after a total of 10 years for risedronate and alendronate or 6 years for zoledronic acid, stop bisphosphonate but continueadjunctive therapies i.e. vitamin D, dietary advice, falls prevention
- when treatment is discontinued, fracture risk should be reassessed every two years or after a new fracture (regardless of whenthis occurs)
- treatment review is essential as there may be an increased incidence of rare adverse effects (osteonecrosis of the jaw andatypical femoral fractures) with long-term bisphosphonate use

References:6. Bay of Plenty District Health Board. Orthopaedics. Fragility Fractures Pathway – Treatment. Bay Navigator. (Accessed 13September 2015).
7. National Osteoporosis Foundation. Clinician' s guide to prevention and treatment of osteoporosis. Washington DC. NationalOsteoporosis Foundation. 2014 Issue, Version 1, Release Date: April 1, 2014. (Accessed 13 September 2015)

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Osteoporosis and Fracture Prevention. Provenance Certificate

Overview

This document describes the provenance of Hawke's Bay's District Health Board's Osteoporosis and fracture prevention pathway. It was developed in August – November 2015 and first published in December 2015. A review of the Pathway is due in December 2016.

The Collaborative Clinical Pathways programme is one initiative stemming from the *Transform and Sustain* agenda. The main aims of CCP are to:

- → Identify opportunities to improve how health and disability care is planned and delivered within the district to improve patient access to a wider range of health services that are both closer to home and reduce avoidable hospital admissions.
- → Provide health professionals throughout the Hawke's Bay district with best practice, evidence-based clinical pathways that are available at the point of care.

Outcomes we expect to achieve include faster access to definitive care, improved health equity and outcomes, better value from publically-funded resources, and better patient experience through clear expectations, improved access and greater health literacy. These outcomes are clearly aligned to the NZ healthcare *Triple Aim* and *Better, Sooner, More Convenient* policy directions.

Editorial methodology

This Pathway was based on high-quality information and known Best Practice guidelines from New Zealand and around the world including Map of Medicine editorial methodology. It was developed by individuals with front-line clinical experience (see Contributors section of this document) and has undergone consultation to gain feedback and input from the wider clinical community.

Map of Medicine Pathways are constantly updated in response to new evidence. Continuous evidence searching means that Pathways can be updated rapidly in response to any change in the information landscape. Indexed and grey literature is monitored for new evidence, and feedback is collected from users year-round. The information is triaged so that important changes to the information landscape are incorporated into the Pathways through the quarterly publication cycle.

An update to this Pathway is scheduled for 12 months after first publication. However, feedback is welcomed at any time, with important updates added at the earliest opportunity within the Map of Medicine publishing schedule (the third Friday of each month).

References

This Pathway has been developed according to the Map of Medicine editorial methodology. Its content is based on high-quality guidelines and practice-based knowledge provided by contributors with front-line clinical experience. Feedback on this Pathway was received from stakeholders during a consultation process.

1	Clinical knowledge summaries (CKS) . Prevention of fragility fractures. September 2013. Newcastle upon Tyne: CKS; 2013.
2	National Clinical Guideline Centre (NCGC), National Institute for Health and Clinical Excellence (NICE). Osteoporosis fragility fracture: full guideline. Clinical guideline 146. London: NCGC/NICE; 2012.
3	Brown P, McNeill R, Leung W, Radwan E, Willingale J Current and future economic burden of osteoporosis in New Zealand. Applied Health Economics and Health Policy, March 2011, Volume 9, Issue 2, pp 111-12
4.	Contributors representing the Royal College of Physicians (RCP). 2013. Medicines and Healthcare products Regulatory Agency (MHRA). Calcitonin (Miacalcic): increased risk of cancer with long-term use - all intra-nasal formulations for osteoporosis to be withdrawn. Drug Safety Update. London: MHRA; 2012.
5.	National Osteoporosis Guideline Group (NOGG). Guideline for the diagnosis and management of osteoporosis in postmenopausal women and men from the age of 50 years in the UK. Sheffield: NOGG; 2013.
6.	Bay of Plenty District Health Board. Orthopaedics. Fragility Fractures Pathway – Treatment. Bay Navigator. (Accessed 13 September 2015).
7.	National Osteoporosis Foundation. Clinician' s guide to prevention and treatment of osteoporosis. Washington DC. National Osteoporosis Foundation. 2014 Issue, Version 1, Release Date: April 1, 2014.

Contributors

The following individuals contributed to this Pathway:

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