Osteoporosis is known as the silent disease, as often the first sign of a patient having the condition is when they present with a fracture. The most common osteoporosis-associated fractures are of the hip, spine and wrist; however, a low trauma fracture of any bone can be due to ‘brittle bones’ disease. Osteoporosis is a systemic metabolic bone disease that is characterised by a decrease in the bone mass of an individual and also by a deterioration in the microstructure of the bone itself. These changes in the bone may lead to an increase in the fragility of the skeleton and to the likelihood of fracture.1

Dr Ann Manley is a Board Member of the Irish Osteoporosis Society and a Committee Member of the Irish Menopause Society. She is currently completing a full time Masters in Management at UCD Smurfit Business School.

PREVENTABLE DISEASE
I believe there are four reasons why we should care about osteoporosis. Firstly, osteoporosis is a preventable and treatable disease in most cases. If we can prevent a fracture, we can prevent the subsequent health implications of that fracture, which include pain, deformity, reduced quality of life and loss of independence. An individual can lose up to 16cm of height due to vertebral fractures deforming the spine. The major complication of osteoporosis is the dreaded hip fracture,2 as 20% of patients who have a hip fracture will die of complications of that fracture within a year. Half of these
3 Many will end up in nursing homes or blocking acute hospital beds. Only one third of osteoporotic vertebral fractures actually come to clinical attention. One in five post-menopausal women with a prior vertebral fracture will have another vertebral fracture within 12 months. Vertebral fractures have been shown to increase the morbidity and mortality of patients. The second reason why we should care about osteoporosis is that the incidence is increasing. Currently, osteoporosis affects one in two women over the age of 65 and one in five men, however, it affects adults and children of all ages. The projected number of hip fractures is estimated to triple from the year 2000’s figures worldwide and by 2050, the incidence of hip fracture is predicted to have increased by 135% in the EU alone.

Thirdly, the causes of, and risk factors for, osteoporosis are common. Osteoporosis is a complication of many medical and surgical conditions, either by the disease process itself or by the medications used to treat these conditions. Identifying the patient’s risk factors for osteoporosis is of paramount importance in the diagnosis and subsequent treatment of a patient. Some of the risk factors and causes osteoporosis are demonstrated in Figure 1.

Finally, Osteoporosis fractures pose a huge financial burden on the state, particularly hip fractures. Figures in 2000 from the International Osteoporosis Foundation showed that it cost €20 billion to treat the hip fractures that occurred worldwide that year. In 2008, the Irish Osteoporosis Society calculated that the cost of treating eight hip fractures in Ireland cost the health service €250,000. Thus, if we can prevent the fracture, we can prevent the suffering of the patient and the state’s coffers.

**DIAGNOSIS**

The Gold Standard test for diagnosing osteoporosis is the DEXA scan. This is a simple low radiation scan that takes approximately six minutes to complete and involves scanning either one or both hips and the lower spine through a patient’s clothing. Some DEXA machines will also allow the technician to do a lateral vertebral assessment view to look for vertebral fractures, which as we’ve seen are less likely to come to clinical attention. The DEXA scan will demonstrate by means of a T-score if the patient has brittle bones or not. If a patient has a T-score of – 1 or greater, they have normal bone density. If it lies between – 1 and – 2.5, they are in the osteopenic range (osteopenia is an early stage of osteoporosis; patients are at risk of developing osteoporosis at a later stage). If they lie below – 2.5, they have osteoporosis. Interestingly, more people actually fracture in the osteopenic range than in the osteoporotic range. If a patient with osteopenia fractures with minimal trauma, they automatically will be defined as having osteoporosis and should be treated appropriately.

"If we can prevent a fracture, we can prevent the subsequent health implications of that fracture, which include pain, deformity, reduced quality of life and loss of independence.”
Calcium and/or vitamin D deficiency in the elderly can lead to loss of muscle tone and increased risk of falls and osteoporotic fractures.1-5

Calcichew-D3 Forte is indicated for the treatment and prevention of calcium and vitamin D deficiency.6

**CALCICHEW-D3 FORTE CHEWABLE TABLETS PRESCRIBING INFORMATION**

(Please refer to full Summary of Product Characteristics when prescribing)

**Presentation:** Chewable tablet containing 1250mg calcium carbonate (equivalent to 500mg of elemental calcium) plus 400IU colecalciferol (equivalent to 10 micrograms vitamin D3).

**Uses:** Prevention and treatment of vitamin D/calcium deficiency. Supplementation of vitamin D and calcium as an adjunct to specific therapy for osteoporosis, in pregnancy, in established vitamin D dependent osteomalacia and in other situations requiring therapeutic supplementation of malnutrition.


**Contraindications:** Diseases and/or conditions resulting in hypercalcaemia and/or hypercalciuria, severe renal impairment, renal stones, hyperuricemia, D, hypersensitivity to ingredient(s) especially soybean oil and peanut.

**Precautions:** Monitor serum calcium and creatinine levels, particularly in patients on cardiac glycosides or diuretics and in patients with high tendency to calculus formation. Use with caution in patients with impaired renal function. Take into account risk of soft tissue calcification. Avoid in patients with phenylketonuria or sugar intolerance. Prescribe with caution in patients with sarcoidosis. Use with caution in immobilised patients. Additional doses of calcium or vitamin D should only be taken under close medical supervision.

**Interactions:** Tetracyclines (take 2 hours before, or 4 to 6 hours after Calcichew-D3 Forte), bisphosphonates or sodium fluoride (take 3 hours before Calcichew-D3 Forte), quinolone antibiotics (take two hours before or after), thiazide diuretics, corticosteroids, cardiac glycosides, ion exchange resins (cholestyramine), laxatives (paraffin oil). Calcichew-D3 Forte should not be taken within 2 hours of eating foods high in oxalic acid (e.g. spinach and rhubarb) or phytic acid (e.g. whole cereals).

**Side effects:** Hypercalcaemia, hypercalciuria, constipation, dyspepsia, flatulence, nausea, abdominal pain, diarrhoea, pruritus, rash, urticaria. Very rarely (usually only seen on overdose) milk-alkali syndrome.

**Use in pregnancy and lactation:** Can be used in case of calcium and vitamin D deficiency. Daily intake in pregnancy should not exceed 1500mg calcium and 600IU colecalciferol (15 micrograms vitamin D3). Avoid overdose as permanent hypercalcaemia affects developing foetus. Calcium and vitamin D pass into breast milk so consider this when giving additional vitamin D to the child.

**Pharmaceutical precautions:** Do not store above 30°C. Do not use if outer packaging is damaged.

**Adverse events:** Adverse events should be reported to the Pharmacovigilance Unit at the Irish Medicines Board (IMB) (imbpharmacovigilance@imb.ie). Information about adverse event reporting can be found on the IMB website (www.imb.ie). Adverse events may also be reported to Shire Pharmaceuticals Ltd on +44 1256 894000.

**Date of revision:** November 2010

**CALCICHEW is a registered trademark of Shire Pharmaceuticals Ltd in the Republic of Ireland.**

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**References:**
7. MIMS 2011.

**Date of preparation:** January 2011.

**Item Code:** RE/CD/11/0002

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**HELP PROTECT THE FRAGILE ELDERLY**

Calcium and/or vitamin D deficiency in the elderly can lead to loss of muscle tone and increased risk of falls and osteoporotic fractures.1-5

Calcichew-D3 Forte is indicated for the treatment and prevention of calcium and vitamin D deficiency.6

**Now the least expensive in class* - 40% less than nearest competitor**

*Referencing MIMS 2011 (calcium and vitamin D combination products at the indicated maintenance dose)

**REFERENCES:**
7. MIMS 2011.
WHO NEEDS A DEXA SCAN?
When attempting to identify patients who may be affected by osteoporosis, one must consider that bone is a living tissue and needs five factors to be in balance in order for bone to function correctly. Having normal hormone levels is crucial. This means not only having the essential levels of oestrogen in women and testosterone in men, but also the correct balance of the other endocrine hormones in the body. Next, one needs to consider the patients’ diet, ensuring that they have adequate calories and protein, as well as looking at calcium and vitamin D intake. Finally, one must look at the level of weight bearing exercise the individual is partaking in. This should be at least 30 minutes of exercise a day that involves activities such as walking, running, skipping, dancing or hiking for example.

If one considers both the list of risk factors and the causes of osteoporosis as well as the five factors that maintain healthy bones, one can build a risk profile for a patient. To aid memory and to ensure nothing is missed, especially in a busy clinic, a questionnaire that contains a patient friendly assessment of an individual’s risk of osteoporosis could and should be used. These will also form a broader base for a diagnosis when put together with the DEXA scan result.

TREATMENT
So, we have the questionnaire complete and we have decided the patient is at risk and we have scanned them. What now? When considering treatment for osteoporosis, one must first look at simple non pharmaceutical interventions; modifying the patient’s diet, supplementing calcium and vitamin D intake, and evaluating their exercise history. One must look at the patient’s medical history and look for the secondary causes of osteoporosis. By treating the causes, one can improve the bone mineral density in many causes. Then, after examining these reversible and modifiable components, including a falls risk assessment, one can prescribe pharmaceutical therapies.13

Most commonly used and first-line therapy for most osteoporotic patients are the class of drugs called the bisphosphonates. These come in tablet form to be taken weekly or monthly on an empty stomach. The patient must stay upright for at least half an hour to ensure absorption. They are very effective drugs in reducing the risk of fracture. They can also be given in hospital in an intravenous infusion once yearly. This form is more potent and useful in severe osteoporosis or where compliance with oral medications is an issue.

Strontium ranelate is used to treat osteoporosis also. It is a once a day oral sachet therapy that is particularly effective in reducing risk of vertebral fractures. Patients must not have calcium containing foods for two hours either side of the medication. It is useful as an alternative to bisphosphonates if a patient cannot tolerate them.

Hormone replacement therapy (HRT) is useful in the younger peri-menopausal woman for both menopausal symptoms relief and for the maintenance of bone health. A discussion and risk assessment should be undertaken with the woman prior to commencement of therapy. The Selective oEstrogen Receptor Modulators (SERMs) are also an option for some women who have no contraindications to hormone therapy and no menopausal symptoms.

Parathyroid hormone injections are reserved for the more severe osteoporosis sufferer, especially those who have a known osteoporotic vertebral fracture. This is a highly potent treatment which is licensed for two years therapy which is given daily by injection.
ABRIDGED PRESCRIBING INFORMATION
(For full prescribing information refer to the Summary of Product Characteristics [SmPC])

Bonviva® (ibandronic acid) 150mg film-coated tablets

Indication: Treatment of osteoporosis in postmenopausal women at increased risk of fracture. A reduction in the risk of vertebral fractures has been demonstrated, efficacy on femoral neck fractures has not been established.

Dosage and Administration:
No relevant use in children. Not studied in the pediatric population. Not recommended where creatinine clearance <30 ml/min. Patients should receive supplemental calcium and/or Vitamin D – see SmPC. 150 mg once a month swallowed whole (the tablet should not be sucked or chewed) with plain water only (180-240 ml) whilst sitting or standing in an upright position. Take after overnight (≥6 hours) fast and one hour before the first food, drink (except water) or any other oral medicinal products or supplements (including calcium). Patients must not lie down for 1 hour after administration. Refer to SmPC for missed doses.

Contraindications:
Abnormalities of the oesophagus which delay oesophageal emptying such as stricture or achalasia, inability to stand or sit upright for at least 60 minutes, hypocalcaemia and hypersensitivity to any ingredient.

Warnings and Precautions:
Caution should be used when Bonviva is given to patients with active upper gastrointestinal problems. Risk of severe oesophageal adverse experiences appears to be greater in patients who do not comply with the dosing instruction and/or who continue to take oral bisphosphonates after developing symptoms suggestive of oesophageal irritation. Instruct patients to pay particular attention to and be able to comply with the dosing instructions. Monitor for signs or symptoms of possible oesophageal irritation – instruct patients to discontinue therapy and seek medical attention if they develop dysphagia, odynophagia, retrosternal pain or new or worsening heartburn. Caution with concomitant administration of NSAIDs, hypocalcaemia and other disturbances of bone and mineral metabolism before starting Bonviva. Ensure adequate intake of calcium and vitamin D. Osteonecrosis of the jaw reported. A dental examination with appropriate preventive dentistry should be considered prior to treatment in patients with concomitant risk factors. Avoid invasive dental procedures if possible during treatment. Refer to SmPC for full details. Not recommended if creatinine clearance <30 ml/min. Patients with rare hereditary problems of galactose intolerance, the Lapp lactase deficiency or glucose-galactose malabsorption should not take the tablet presentation.

Drug Interactions:
Observe fasting requirements for food, drink and oral medicinal products/supplements.

Pregnancy and Lactation:
Do not use.

Side Effects and Adverse Reactions:
Common adverse reactions (≥1/100 to <1/10): Headache, oesophagitis, gastritis, gastro-oesophageal reflux disease, dyspepsia, diarrhoea, abdominal pain, nausea, rash, arthralgia, myalgia, musculoskeletal pain, muscle cramp, musculoskeletal stiffness and inflammatory illness. Refer to the SmPC for a full listing of adverse events including post marketing experience.

Legal Category: Limited to sale and supply on prescription only.

Presentation and Marketing Authorisation Numbers: 1 tablet blister pack EU/1/03/265/003.

Marketing Authorisation Holder: Roche Registration Limited, 6 Falcon Way, Shire Park, Welwyn Garden City, AL7 1TW, United Kingdom. Further information is available from Roche Products (Ireland) Limited, 3004 Lake Drive, Citywest, Naas Road, Dublin 24. Telephone: (01) 4690700. Fax: (01) 4690791. Bonviva is a registered trade mark. Date of Preparation: March 2010.
The newest therapy on the market is Denosumab or Prolia. This is the first biological therapy for osteoporosis and is effective at both the hip and spine. It is given by injection every six months and is licensed for the treatment of postmenopausal osteoporosis. Its risk reduction is similar to the intravenous bisphosphonate, zoledronate.

Finally, kyphoplasty or vertebroplasty are techniques used to treat new vertebral fractures, which try to restore the height of a collapsed vertebra.

Conclusion
Osteoporosis is an expensive disease which is costly to the patients’ health and to our health service itself. By early risk assessment and treatment, osteoporosis is a preventable and treatable disease in most cases. Practice nurses have a unique opportunity to aid in the identification of at risk patients, most especially in patients who have recently had a low trauma fracture. In osteoporosis management treatment, prevention is better than cure so let’s beat the break!

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