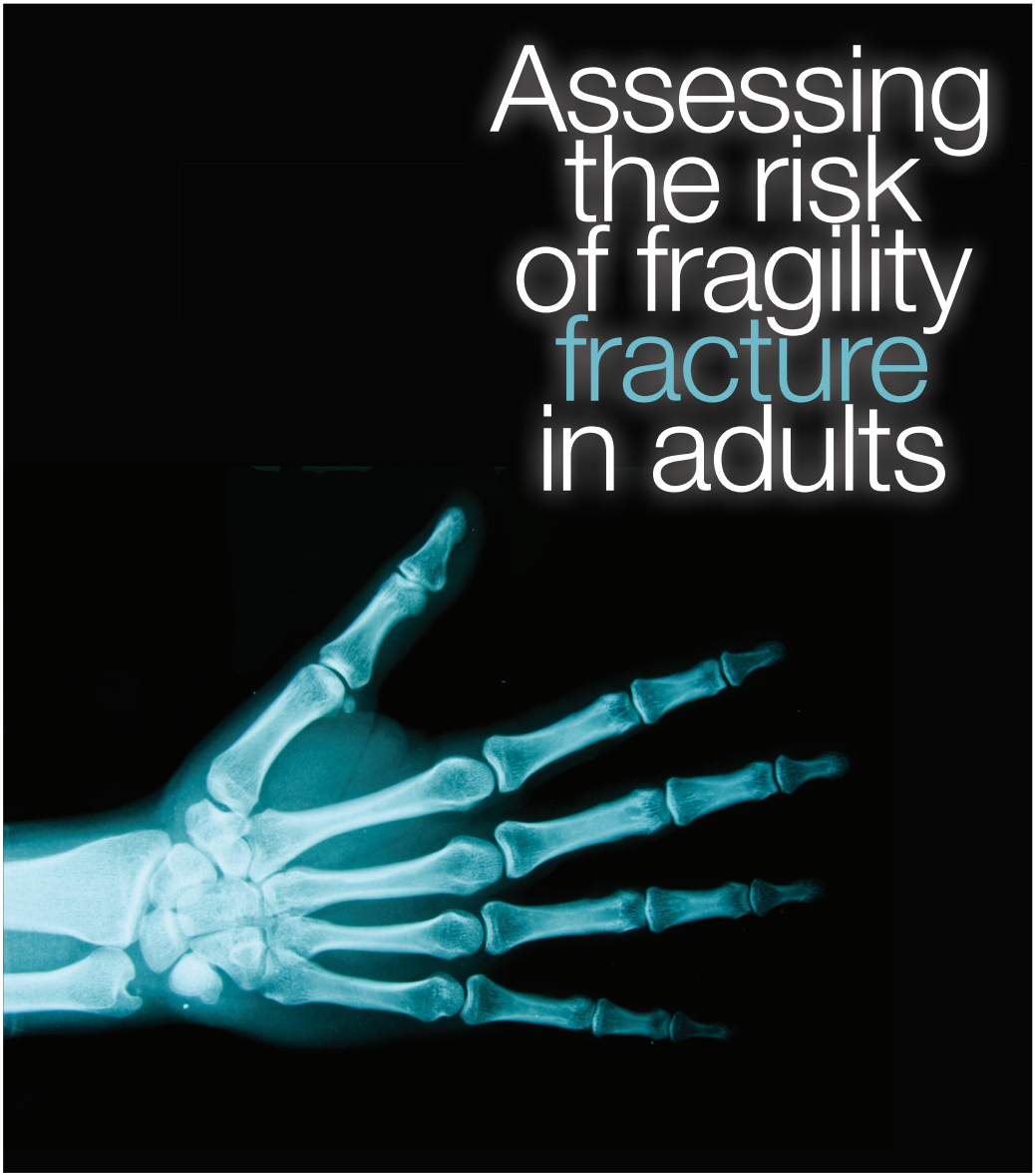
NICE BULLETIN

NHS
National Institute for
Health and Clinical Excellence

Assessing the risk of fragility fracture in adults



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Welcome

In August 2012, the National Institute for Health and Clinical Excellence (NICE) published a short clinical guideline on assessing the risk of fragility fracture in adults. The guideline advises on methods to help clinicians assess who might be at risk of a fragility fracture, and will support them in identifying who will benefit from treatments that help prevent such fractures occurring, and important factors that should alert health professionals to consider risk assessment.

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Background

Fragility fractures are often linked to osteoporosis – the condition where bone tissue deteriorates and the bone density is lower than normal. This can lead to the bone fracturing as a result of a force that wouldn't normally cause a break in a healthy bone, such as a fall from a standing height or less. Each year in the UK over 300,000 people are seen in hospital because of fragility fractures, with the most common sites for these fractures being the spinal vertebrae, hip and wrist. Osteoporotic fragility fractures can cause a great deal of pain, disability and reduction in quality of life. These fractures can also be linked with decreased life expectancy: about 10% of people with a hip fracture die within 1 month, although most of the deaths are due to associated conditions and not to the fracture itself.

The guideline defines the role of fracture risk assessment for men and women aged 18 years or older, including advising on the selection and use of risk assessment tools in the care of people who may be at risk of fragility fractures, making 12 recommendations in total. These key objectives essentially cover: who to assess, how to assess and when to assess.

WHO TO ASSESS

The guideline promotes the use of clinical risk factors (CRFs) to target opportunistic assessment of those at increased risk. Age stratifies risk and recommendation 1 is: **Consider assessment of fracture risk in women of 65yrs and over and men of 75 yrs and over.**

For patients aged over 50 years (but under 65 years for women and under 75 years for men) the presence of at least one further CRF prompts assessment. The list of CRFs may be recognised from FRAX , although with slightly different thresholds, plus inclusion of falls:

- Previous fragility fracture
- Glucocorticoid treatment
- History of falls
- Family history of hip fracture
- Other secondary causes (with an extensive list)
- Low BMI (<18.5kg/m2)
- Smoking (>10 per day)
- Alcohol (>4 units per day)

For those aged 40 to 50 years of age fracture risk assessment is not advocated, unless patients have major risk factors, which comprise: glucocorticoid therapy, untreated premature menopause or previous fragility fracture.

HOW TO ASSESS

Having broadly outlined who to assess, Recommendations 4 and 5 confirm the methods to be used:

Calculate absolute risk when assessing risk of fracture and **Use either FRAX (without BMD[2]) or QFracture[3] to calculate 10 year predicted absolute fracture risk**

This guideline focuses on defining who to assess and how to assess them, introducing absolute fracture risk as the key metric. Decisions about treatment (intervention) thresholds are not addressed, as this was not within the remit of this guideline. However, in order to develop intervention thresholds, health economic assessments are needed and they can only be done in the context of a defined treatment at a known cost, as was done in NICE Technology Appraisals TA160, TA161 and TA204. Therefore standardising the assessment of risk will assist in defining thresholds of risk to establish the cost effectiveness of treatments.

There are some differences between FRAX & QFracture (see Table 1) but they appear to produce remarkably similar results in predicting fracture across all levels of risk, although there are few data comparing them within the same population. However both tools are evolving with recent extensions of age limits, for example. Recommendation 12 says:

Consider that fracture risk may be affected by factors that are not included in FRAX and or QFracture:

The guideline highlights the challenges of fracture risk assessment in: patients who fall, care home residents, patients taking drugs that impair bone metabolism and those who are immobile. Recommendations 6 and 11 also recognise the imperfections of risk assessment tools, particularly in older age:

Use clinical judgement in assessing fracture risk in people aged more than 85 years and **We should recognise underestimation of fracture risk**

The following contexts, where risk may be under-estimated, are highlighted:

- Multiple fractures
- High alcohol intake
- Obesity
- Heavy smoking
- High dose oral or high dose systemic glucocorticoids
- Other secondary causes of osteoporosis

THE ROLE OF BMD

The use of CRFs to identify patients potentially at increased risk of fragility fracture and then estimation of 10-year fracture risk should focus clinical practice on those at highest risk of fragility fracture. Recommendation 7 therefore makes a strong direction:

Do not routinely measure BMD without prior assessment using FRAX of QFracture

Currently clinicians often don't evaluate fracture risk in many patients and access to and use of DXA scanning across the country is inconsistent. This guideline is arguing against routine DXA scanning as there appears to be little evidence that BMD significantly improves performance, even added to FRAX, as reclassification rarely moves individuals from high to low risk or vice versa.

However, recommendation 8 suggests

TABLE 1 COMPARISON OF FRAX AND QFRACTURE

FRAX	QFacture	Comment
Used with or without BMD	Without BMD only	QFracture does not (and cannot) interpret fracture risk in the context of BMD.
Age 40 – 90yrs	Age 30-84 years	Both tools are expanding their age range.
Includes previous fracture	Does not include previous fracture	QFracture excludes patients with a history of fragility fracture. For FRAX, this is an important determinant of fracture risk.
Risk per 10 years only	Offers risk per year	The ability of QFracture to estimate annual fracture risk, up to risk per 10 years is attractive; particularly for older patients whose shorter life expectancy may decrease 10-year fracture risk.
Binary variables	Combination of binary and dose variables	FRAX only includes binary variables except for height, weight and BMD. QFracture requires "dose" for a number of variables, such as hormone replacement therapy, smoking and alcohol.
	Inclusion of frailty factors, e.g. Falls, Parkinson's Diseases	Data relating to co-morbidities are of value, in principle. However, their improvement of performance is unproven.

that BMD measurement should be considered:
If fracture risk is in the region of an intervention threshold for a proposed treatment or **Before starting treatments that may adversely affect bone density (High dose Glucocorticoids, AI or ADT).**

The guideline also highlights that the evaluation of fracture risk in younger people is more difficult and recommends expert opinion, probably with DXA, as recommendation 9 states that:
FRAX & QFracture are not applicable to younger patients but **if a younger person**

has significant risk factors BMD measurement would be the most appropriate.

WHEN TO ASSESS (MONITORING)

Recommendation 10 addresses the question of monitoring with the direction **Recalculate - After a minimum of 2 years and original risk was close to intervention threshold for a proposed treatment** or **When there has been a change in the person's risk factors (e.g. fracture)**

RESEARCH RECOMMENDATIONS

The research recommendations are a useful guide to some of our knowledge gaps. There are six, which relate to the utility of FRAX, QFracture (and BMD):

- In adults receiving bone protective therapy
- In adults of different ethnic origins in the UK
- In adults with secondary causes for osteoporosis
- Using GP practice lists to identify people at high risk of fracture
- In long term care residents
- The added prognostic value of BMD in assessing fracture risk with FRAX.

IN SUMMARY

This guideline is an important step forward in the care for people at risk of fragility fracture. As well as clarity on the strengths of the QFracture and FRAX tools, the guideline also highlights common and important factors that should alert health professionals to consider risk assessment. Following the recommendations will help ensure that the most appropriate risk assessment tool is used for different people depending on factors such as their clinical history and age, so that well-informed decisions can be made about their future care.

The full guideline recommendations are available at http://www.nice.org.uk/CG146

ACKNOWLEDGEMENTS

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[1] FRAX, the WHO fracture risk assessment tool, is available from www.shef.ac.uk/FRAX. It can be used for people aged between 40 and 90 years, either with or without BMD values, as specified.

[2] Bone mineral density measurements indicate the amount of calcium in bones, and are determined using a type of X-ray scan.

[3] QFracture is available from www.qfracture.org. It can be used for people aged between 30 and 84 years. BMD values cannot be incorporated into the risk algorithm.

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