

# Assessing bone health in Parkinson's

## Introduction

As the Parkinson's support and research charity, we provide a range of services to people with Parkinson's. We also support the [Parkinson's Excellence Network](#) - the driving force for improving Parkinson's care, connecting and equipping professionals with free tools, education and data for better services and professional development.

People with Parkinson's are more than twice as likely to have osteoporosis and fractures than those without the condition. Yet many are not routinely assessed for fracture risk.

We're now working to improve awareness of bone health among people with Parkinson's and increase confidence in assessment and management among clinicians.

It is good practice and in keeping with the UK Parkinson's audit, that people with Parkinson's have their bone health assessed regularly. This may only need to be a quick check; from this you can decide if a more detailed assessment is needed.

## Contents:

<b>Step A:</b>	Check	Page 3
<b>Step B:</b>	Score	Page 4
B1:	Fracture Risk Assessment Tool (FRAX)	
B2:	Using QFracture	
<b>Step C:</b>	Test	Page 10
<b>Step D:</b>	Treat	Page 10
<b>Appendix 1:</b>	Service variations and further information	Page 12

## Step A: Check

### Does the patient need a bone health assessment?

A detailed assessment is usually not needed when:

- The patient has been fully assessed in the past year

*Think about any changes*  
- any new loss of balance or falls?  
- any new fractures?  
- any possible vertebral fractures?

- The patient is established on bone health medication\* (bisphosphonate or denosumab, plus vitamin D and/or calcium)

*Check the treatment is going well*  
- any side-effects preventing the patient taking it?  
- would a different treatment be better?

- The patient is being referred to another service to address this (eg, falls clinic, day hospital, bone/endocrine)

- The patient is very low risk

*Who is very low risk?*  
- younger patients with normal BMI and no risk factors  
- if in doubt, proceed with FRAX assessment  
- you will develop experience of which type of cases can have a quick decision that they are very low risk

- The patient has advanced disease/severe comorbidity  
anti-resorptive bone health medications include:
  - Bisphosphonate - oral (eg Alendronic acid, Ibandronic acid, Risedronate, Sodium clodronate)
  - Bisphosphonate - parenteral (eg Zoledronic acid)
  - Denosumab (given subcutaneously)

- not mobilising from bed  
- or estimated as in last year of life

**If none of the above applies, go to Step B**

## Step B: Score

Use the Fracture Risk Assessment Tool (FRAX) - go to section B1 below, or QFracture if expected survival is <10 years - go to section B2 below

### B1 - Fracture Risk Assessment Tool (FRAX)

Go to <https://www.sheffield.ac.uk/FRAX/tool.aspx?country=1>

The above link goes directly to the UK version. You may wish to save it in your favourites. If you Google 'FRAX' you need to choose the UK version by selecting Calculation Tool (top bar), then the drop-down for Europe then UK (if you follow it correctly, you see the Union Jack flag)

Home Calculation Tool Paper Charts FAQ References CE Mark English

### Calculation Tool

Please answer the questions below to calculate the ten year probability of fracture with BMD.

Country: **UK** Name/ID:  [About the risk factors](#)

#### Questionnaire:

1. Age (between 40 and 90 years) or Date of Birth  
Age:  Date of Birth: Y:  M:  D:

2. Sex  Male  Female

3. Weight (kg)

4. Height (cm)

5. Previous Fracture  No  Yes

6. Parent Fractured Hip  No  Yes

7. Current Smoking  No  Yes

8. Glucocorticoids  No  Yes

9. Rheumatoid arthritis  No  Yes

10. Secondary osteoporosis  No  Yes

11. Alcohol 3 or more units/day  No  Yes

12. Femoral neck BMD (g/cm<sup>2</sup>)  
Select BMD

#### Weight Conversion

Pounds  kg

#### Height Conversion

Inches  cm

**09543972**  
Individuals with fracture risk assessed since 1st June 2011

- Answer **Yes** for Question 10, because Parkinson's is a cause of Secondary osteoporosis.
- You can leave Question 12 blank (unless you have a DXA result – see 'Recalculating FRAX after a DXA result' below).
- Click **Calculate** and you will see 2 values, showing the probability of major osteoporotic (fracture), and the probability of hip fracture:

## Calculation Tool

Please answer the questions below to calculate the ten year probability of fracture with BMD.

Country: **UK** Name/ID:  [About the risk factors](#)

**Questionnaire:**

1. Age (between 40 and 90 years) or Date of Birth  
 Age:  Date of Birth: Y:  M:  D:

2. Sex  Male  Female

3. Weight (kg)

4. Height (cm)

5. Previous Fracture  No  Yes

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10. Secondary osteoporosis  No  Yes

11. Alcohol 3 or more units/day  No  Yes

12. Femoral neck BMD (g/cm<sup>2</sup>)  
 Select BMD

**BMI: 30.8**  
 The ten year probability of fracture (%)

without BMD	
Major osteoporotic	<b>16</b>
Hip Fracture	<b>5.3</b>



### Weight Conversion

Pounds ➔ kg

### Height Conversion

Inches ➔ cm

**09543972**

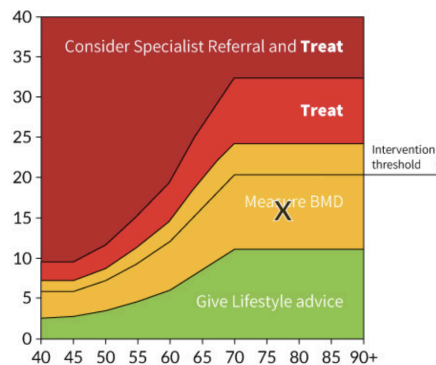
Individuals with fracture risk assessed since 1st June 2011

- Click the **View NOGG Guidance** button and this will lead to a chart showing an X for this case, which will be in the green, amber, red, or dark red area:

Welcome to the NOGG 2021 Guideline. These new thresholds ensure equality of access to treatment for older patients with and without fracture, and identify a group who are at very high fracture risk who should be considered for specialist referral (for full details, see the [Full Clinical Guideline](#)).

### Intervention Thresholds

**(%) 10-year probability of Major Osteoporotic Fracture**



**If green:** Give lifestyle advice, see details on [Parkinson's UK's website](#).

**If amber:** Consider requesting a bone density (DXA) scan - look at the BONE-PARK algorithm which guides you when this may not be appropriate or feasible. You can also check for more guidance on the [NOGG website](#).

**If red:** Consider starting bone health medication. There is a summary on the BONE-PARK algorithm and there are more detailed notes on the [NOGG website](#).

**If dark red:** Check the [NOGG website](#).

Lifestyle advice is appropriate for all patients, regardless of NOGG category.

## B2 - Using QFracture

Use QFracture instead of FRAX for patients with life expectancy <10 years.

Go to <https://qfracture.org/>

Answer the questions and select how many years you want you calculate the risk for.

Age (33-99):

Sex:  Male  Female

Ethnicity:

## Clinical information

Smoking status:

Alcohol status:

Diabetes:

Do either of your parents have osteoporosis/hip fracture?

Do you live in a nursing or care home?

Have you had a wrist spine hip or shoulder fracture?

History of falls?

Dementia?

Cancer?

Asthma or COPD?

Heart attack, angina, stroke or TIA?

Chronic liver disease?

Chronic kidney disease (stage 4 or 5)?

Parkinson's disease?

Rheumatoid arthritis or SLE?

Malabsorption eg Crohn's disease, ulcerative colitis, coeliac disease, steatorrhea or blind loop syndrome?

Endocrine problems eg thyrotoxicosis, hyperparathyroidism, Cushing's syndrome?

Epilepsy or taking anticonvulsants?

Taking antidepressants?

Taking steroid tablets regularly?

Taking oestrogen only HRT?

Leave blank if unknown

Body mass index

Height (cm):

Weight (kg):

Calculate risk over  years.



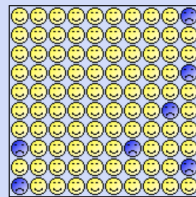
You will then see risk values on the next page:

### Your results

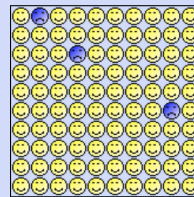
Your risk of having any osteoporotic (i.e. hip, wrist, shoulder or spine) fracture or hip fracture alone within the next 5 years is:

Hip, wrist, shoulder or spine fracture	7%
Hip fracture	3.3%

In other words, in a crowd of 100 people like you, 7 will develop osteoporotic fracture of hip, wrist, shoulder or spine within the next 5 years. Similarly, 3 will develop hip fracture within the next 5 years. This is represented by the smileys below.



fracture of hip, wrist,  
shoulder or spine



hip fracture

## Step C - Test

### When should the patient have a DXA scan?

If you have scored with FRAX and followed through to NOGG you have an **initial indication** of whether the patient should have a DXA scan:

- The X for the patient will be in the amber zone called 'Measure BMD' (bone marrow density), or
- The X for the patient will be in the red zone ('Treat') and a baseline DXA would be helpful to monitor the response to treatment (see BONE-PARK algorithm).

If you have scored with QFracture you need to use the values for hip, wrist, shoulder or spine fracture and hip fracture, along with the BONE-PARK algorithm, to decide about a DXA.

But not all patients in the amber or red zones (NOGG) or above the investigation threshold (QFracture) should have a DXA – check the guidance in the BONE-PARK algorithm.

### Recalculating FRAX after a DXA result

After getting the DXA result, you can re-calculate FRAX (and the NOGG category).

Add the lowest T score from the report to Question 12, then re-check the NOGG group. You do not need to do this if others (eg. local bone or endocrine team, or GP) request DXA scans and decide about treatment.

## Step D - Treat

### Who should be started on bone health treatment?

If you have scored with FRAX and followed through to NOGG you have an indication of whether the patient should have bone health treatment started.#

- When the X for the patient is in the Red ('Treat') or Dark Red ('Consider specialist referral and Treat') zones, treatment is usually needed.
- When the X for the patient is in the amber ('Measure BMD') zone:
  - treatment is usually deferred until after the DXA result (see above under 'Recalculating FRAX after a DXA result').
  - however, if DXA is impractical (due to patient factors – the patient needs to be able to get up onto a firm couch and lie flat for around 10 minutes, or because testing is not available), treatment is usually needed if the X is above the 'Intervention threshold' line ie. the upper part of the amber zone (see NOGG website).

If you have scored with QFracture you need to use the values for hip, wrist, shoulder or spine fracture and hip fracture, along with the BONE-PARK algorithm, to decide about the need for bone health treatment.

### **What treatment should be started?**

Follow the guidance in the BONE-PARK algorithm and the NOGG guidelines,

Local formulary choices may affect treatment options, but first line choices (eg. alendronic acid) are largely standard across the UK.

As always with medication, the balance between potential benefit and side effects should be considered. Guidance on side effects is summarised in the [NOGG guideline \(section 6 Pharmacological Treatment Options\)](#), and is also available from the usual sources [eg. British National Formulary, Summary of Product Characteristics.](#)

Follow up of any side effects from treatment is necessary, as patients may stop treatment and need further guidance. If oral treatments are not tolerated, there may be an injectable alternative.

## Appendix A - Service variations and further information

The way in which patients access DXA scans, and get new medication, varies in different services. We recommend that you make the bone health assessment in the specialist clinical service, then:

- organise any investigation and treatment indicated, or
- inform others of the results of your assessment (eg. the patient's GP, or bone metabolism colleagues) according to how your service works.

### Useful links

#### Patient Assessment Form

- You can use this to record a summary of the above steps
- This follows the steps above in the same A B C D order
- You may wish to file this in the patient's records

*The above are outline guide notes – more detailed guidance about assessment, investigation, and treatment of bone health is in the sources below.*

Go to the summary [BONE-PARK algorithm](#)

Go to the [NOGG guideline](#)

Go to the [full publication](#) of the BONE-PARK algorithm (a journal subscription is needed, this may be available via your hospital or university)

The Excellence Network is here to help health and social care professionals provide better support for people with Parkinson's, every day. Find out about the [Excellence Network](#).

Find out more about the [Parkinson's UK Bone Health priority programme](#).