

## FDG-PET/CT for myeloma

### What is myeloma?

Myeloma is a type of blood cancer that affects the cells within the bone marrow. In Scotland each year there are approximately 500 people who will be newly diagnosed with myeloma and the disease accounts for approximately 200 deaths each year in Scotland. Bone pain is the most common symptom of myeloma.

Diagnosis of myeloma usually requires a range of laboratory tests to confirm the presence and the extent of the disease. Additional imaging tests are used, and traditionally for patients with suspected or newly-diagnosed disease, x-rays were used, but nowadays newer imaging techniques such as positron emission tomography/computed tomography (PET/CT) or magnetic resonance imaging (MRI) can be considered.

### What is PET/CT?

PET/CT is an imaging technology that combines different ways of scanning the human body, namely positron emission tomography (PET) and computed tomography (CT), to get more information from the resulting images. Before the procedure, patients are given a radioactive substance (typically by injection but can be inhaled or swallowed depending on the substance being used). This accumulates within the body around the cancer cells and because of its radioactivity emits gamma rays that can be picked up by the PET/CT technology. This highlights on the scan the areas of the body where cancer cells are present. The radioactive substance is later passed out of the body naturally (in the urine or bowel movement). The most commonly used radioactive substance for PET/CT is 18F-fluorodeoxyglucose (FDG). When it is used in a scan, it is called FDG-PET/CT.

### What we did

We looked at whether FDG-PET/CT can help diagnose people who are suspected of having myeloma and whether it can help determine the characteristics and extent of a patient's disease, which helps to guide treatment after they have been diagnosed.

### What we found

The evidence base for the diagnostic accuracy of FDG-PET/CT for patients suspected of having myeloma was limited. One review found it was not cost-effective for the diagnosis of myeloma.

For newly diagnosed myeloma patients, FDG PET/CT detected a higher number of cancerous lesions when compared with x-ray. When compared with MRI the evidence suggested these

imaging techniques were comparable, identifying the same number of cancerous lesions in between 50% to 70% of patients.

However, there was not enough evidence to determine whether PET/CT is good value for money among this patient group.

### **What is our advice to NHSScotland?**

For patients who are suspected of having myeloma, there was limited evidence about how useful PET/CT could be, but it was unlikely to be cost-effective compared to other technologies that clinicians in Scotland already use.

For patients who have been diagnosed with myeloma, there is some evidence that PET/CT detects a greater number of lesions than plain film radiography (x-ray), but there is insufficient evidence to determine if the technology can detect more lesions than MRI.

PET/CT should not be routinely considered in the diagnosis and staging of myeloma.

### **Future work**

More research is needed to find out whether using PET/CT to better understand the characteristics of a patient's myeloma (after the patient has been diagnosed), is useful compared to other technologies clinicians can use, and whether such use would be good value for money.

**This plain language summary has been produced based on SHTG Advice Statement 007/18 May 2018.**