

The provision of microprocessor controlled prosthetic knees

This leaflet is for patients who want to know more about microprocessor knees (MPK's), their use and possible provision.

NHS England have now set aside limited funding for the provision of these specialist knees and this leaflet will explain what they are, the advantages and disadvantages of using one, and how to find out if you are eligible to change from a mechanical knee to a microprocessor knee.

This leaflet will not determine your eligibility. The criteria, which have been set nationally, are complex and will be applied on a case by case basis.

1) What is a Microprocessor Knee (MPK)?

- There are a range of knees that include a battery powered computer which provides continuous control of the resistance of the knee.
- The computer is linked to gait analysis sensors within the knee, allowing it to respond to different functions, including walking speed, inclines, uneven surfaces and stairs.
- A patient with the following level of amputation may benefit from an MPK:
 - Hemipelvectomy:
(where the leg and part of the pelvis is removed)
 - Hip disarticulation:
(where the whole leg is removed but the pelvis and hip socket are intact)
 - Above knee amputation:
(Where the leg has been amputated between the hip and the knee joints.)
 - Through knee amputation:
(where the leg has been amputated through the two interfaces of the knee joint.)

2) What are the advantages of a Microprocessor Knee?

- Recent published research evidence demonstrated that MPK's improve safety and stability when walking on uneven terrains.
- They also reduce the amount of energy needed to walk.
- The research found that as a consequence there was a reduced risk of falls, improved confidence in walking, increased level of activity and possibly less dependence on walking aids.
- Most patients who use an MPK report an improvement in their walking pattern which became more even and symmetrical.
- There may also be some long-term advantages of using an MPK in terms of reducing the risk of osteoarthritis in the remaining limb and the lower back.

3) What are the disadvantages of a Microprocessor Knee (MPK)?

- MPK's are complex medical appliances that need regular maintenance and strict adherence to the manufacturer's recommendations for use.
- Each knee contains a rechargeable battery which needs to be charged each night. When the battery power runs down the knee converts to a safety mode, the ability of which varies depending on the model.
- Because of the battery and advanced componentry, the knee unit is heavy when compared with the mechanical knees, and some patients will not have the strength and stamina to use the knee because of this.
- A new MPK user will need to have a period of physiotherapy for gait training in order to fully use their new device.
- The knee requires regular maintenance and users will need to commit to the manufacturer's maintenance recommendations and attend the Prosthetic Centre for regular maintenance checks and repairs.
- Most Microprocessor Knees are not waterproof and will be severely damaged through contact with water.
- All Microprocessor Knees have a recommended upper limit for the user's weight and therefore it is clinically contraindicated to use an MPK if the user is above the weight limit.
- A foam is sometimes added to a prosthetic leg to make it look similar to the remaining leg. This is called a cosmesis. If a cosmesis is used with an MPK (or any other prosthetic knee) it can impede the function of the device. Please talk to your prosthetist if you are prescribed an MPK and think that you would like a cosmesis.
- Micro processor knees are not recommended for patients who are extremely active. This is because the MPK may not be sufficiently robust to withstand constant impact as for example, the repetitive impact when running. Also, it is worth bearing in mind that some patients have reported that the MPK responds more slowly than their mechanical knee when undertaking activities.

4) Are Microprocessor Knee Units suitable for children?

- A child would need to meet the criteria for an MPK as set out in the Policy in order to be considered. However, owing to the weight of the units and the amount of space that they take up in a limb build, an MPK is unlikely to be suitable for use by a child unless they are of a similar build to an adult.

5) What do I need to know about costs and warranty?

- Microprocessor knees are generally more costly than a mechanical knee (4-10 times the cost). If it is prescribed to you it will be free to you and you will be required to take great care of it.

Most MPK's have a manufacturer's warranty lasting between 2 & 6 years depending on the manufacturer. Faults or damage that occur to the MPK that are as a result of misuse or not following the manufacturers guidelines will void the warranty. Patients who use an MPK will therefore need to ensure that they follow all instructions for use and care very carefully.

- The whole prosthesis, including the MPK remains the property of the NHS at all times. All maintenance and repairs need to be undertaken by the NHS Prosthetic Centre and/or the manufacturer **AND MUST NOT BE UNDERTAKEN BY THE PATIENT, FRIENDS OR FAMILY, OR ANY OTHER PROVIDER.**
- If the unit is lost, stolen or intentionally damaged it may not be replaced and the hospital may wish to reclaim the cost of the unit.

6) What are the arrangements for provision of Microprocessor Knees from the NHS Centre?

- If you are interested in finding out if you are eligible to be prescribed an MPK, please discuss with one of the clinicians in the Centre.
- Prescribing of an MPK is done through a defined process as laid out in the National MPK Policy*
- There are strict criteria that will determine whether or not you are eligible for an MPK and the Team will compare your details with the criteria.
- Patients who are deemed eligible will be able to trial an MPK.

7) What criteria do I need to meet in order to be eligible for a Microprocessor Knee?

- You will need to be eligible for NHS funded care in England. (This excludes patients who have a G.P. in Scotland, Wales and Northern Ireland.)
- The Multidisciplinary Team will first consider your amputation level, current mobility status, your socket comfort, and your activity level.
- Providing that these indicate that you meet the criteria set down in the policy the team will proceed to assess a range of other criteria including any additional medical problems that affect your prosthetic use, your risk of falling and your history of prosthetic use, as well as your engagement with the service to date.
- The MPK issued to you by the centre will need to be your only microprocessor knee, used as your main limb and worn each day.
- Any decision regarding your eligibility will be discussed with you and you will have the opportunity to ask questions regarding this.
- You will need to take part in a trial of an MPK with positive outcomes which clearly demonstrate the advantages of being prescribed the unit.
- The criteria are extensive and cannot be detailed in this leaflet. A link to the information is included at the end of this leaflet. If you would like a printed copy of the criteria please contact a clinician at the Prosthetic Centre.

8) What will the trial of the MPK consist of?

- You will need to undertake various tests or exercises with the physiotherapist with both your mechanical knee and an MPK unit so that your abilities with each can be compared.
- If this is successful you will be given an MPK to trial for 4 weeks.
- There may need to be changes to both your socket and alignment of your prosthesis in order to fit the MPK satisfactorily. In some cases a new cast for a new socket will need to be made.
- You will be asked to keep a diary of your everyday activities whilst you are using the MPK so that you can report back to the team in detail.
- You will need to attend the Centre for additional appointments which may take some time and you will need to keep the diary up-to-date in order to provide the evidence required. Patients who are unable to commit to this process will be removed from the trial and their eligibility will be reviewed.
- Users who commence an MPK trial are requested not to transfer to an alternative Centre during this period. If this occurs the trial will be suspended.

9) What will happen if the trial does not demonstrate any benefit from an MPK?

- The MPK will only be prescribed if you meet the criteria and there is evidence that you will benefit from using an MPK.
- If this is not the case, this will be discussed with you. Your clinical needs and current prescription will then be reviewed by the Multidisciplinary Team to optimise your prosthetic prescription.

10) If I am eligible for a micro-processor knee will I be given a spare one?

- No. You will only be issued with one micro-processor knee. Your second, spare limb will consist of components that are sufficient for you to use to get to the centre should your MPK fail. If you already have a functioning prosthesis, it is unlikely that this will be changed. The centre will only maintain two prosthetic limbs at any one time.

What happens if the MPK fails?

- Should the MPK fail, your prosthetist will request a loan unit for you from the manufacturer to use whilst yours is being repaired/maintained. It can take several days to obtain a loan unit and you will need to wear your spare limb whilst waiting.

11) How soon can I be assessed for an MPK?

- Owing to practical limitations related to staffing and equipment, the high cost of MPK's and the need to trial them thoroughly prior to provision; all NHS Centres have a limited capacity to upgrade users from a mechanical knee to an MPK.
- NHS Centres will work towards screening patients for eligibility and setting up a list of patients who will benefit from provision of an MPK in priority order.
- It is anticipated that it will take many months to work through this list of patients.
- Once a successful trial has been completed the Centre will need to submit information to NHS England for audit purposes and to secure funding.
- If you have any questions regarding provision of a Microprocessor Knee Unit, please contact:

Rosemary Mead, Manager, Dorset Prosthetics Centre

Tel: **0300 019 4363**

Email: prosthetics.centre@uhd.nhs.uk

Policy Link: www.england.nhs.uk/wp-content/uploads/2016/.../clin-comm-pol-16061P.pdf

The Royal Bournemouth Hospital, Castle Lane East, Bournemouth, Dorset, BH7 7DW

Author: **Rosemary Mead** Date: **January 2022** Version: **Two** Review date: **January 2025** Ref: **543/21**

t: 01202 303626 w: www.uhd.nhs.uk : @UHD_NHS : @UHTrust : @uhd_nhs