Prosthesis that 'Grows' as a Child Grows

The innovation is an endoprosthetic device for use in replacing and extending human limbs, particularly, but not exclusively, in skeletally immature patients.

In children, osteosarcoma necessitates the removal of cancerous bone and often the end region of the bone where the cells are actively replicating to grow and lengthen the bone. Prostheses that are implanted to replace the bone need to allow for extension to mimic normal growth in the other limb.

Competing devices either require surgery to achieve the lengthening, or if motorised, require cumbersome external induction coils to actuate the motors. The use of microcontrollers in these devices ensure that precise incremental extension is achieved. Unfortunately, the use of microcontrollers has negative consequences. They limit the type of sterilisation used and also preclude the use of radiation for imaging due to component damage. The UCT innovation overcomes all these limitations.

Benefits

- A sterilisable implant that is capable of 'growing' in tandem with a child's normal limb
- Radiation can be used for both patient imaging post implant and sterilisation prior to implantation
- A medical practitioner can program the time-extension profile and the patient can extend the implant on a daily basis at home

Market

Companies with an orthopaedic range.

Technical Description

The device is an endoprosthesis, which includes an elongate housing having a drive secured through a threaded drive shaft to an extension shaft therein. The drive is operable to cause the extension shaft to move axially with respect to the housing and the extension shaft. The housing is configured to be securable to a bone to act as a prosthetic replacement for removed bone, and for the drive to be operable through a control circuit which includes an inductive coil, characterised in that the control circuit is configured to provide a predetermined output which operates the drive in a step-wise fashion upon receiving power through the inductive coil.

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Prostetics, endoprostehtics, prosthesis, orthpaedic endoprosthesis

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