



## Service Priorities and Programmes Electronic Presentations

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### **Traditional Growing Rod versus Magnetically Controlled Growing Rod for Early Onset Scoliosis: Cost-analysis from Implantation till Skeletal Maturity**

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#### **Introduction**

Magnetically controlled growing rods (MCGRs) are novel implants used for managing early onset scoliosis (EOS) patients. Clinical effectiveness has been proven but due to its high cost, there is limited accessibility.

#### **Objectives**

(1) To analyze the yearly cost per patient for using MCGRs compared with traditional growing rods (TGRs) for treatment of EOS and (2) to assess the overall cost burden to patient and healthcare infrastructure.

#### **Methodology**

A decision-tree model using TreeAge Software was developed to simulate annual health state transitions and compare the 8-year accumulative direct, indirect and total cost among the four groups: 1) dual MCGRs with exchange every 2 years, 2) dual MCGRs with exchange every 3 years, 3) TGR with surgical distraction every year, and 4) TGR with surgical distraction every 6 months. Base-case values and ranges of clinical parameters reflecting complication rate after each type of surgical distraction were determined from a review of literature and expert opinion. Government gazette and expert opinion provided cost estimation of growing rods, surgeries, surgical complications, and routine follow-up. Microsimulation following 1,000 individuals was conducted to test the variation in total direct costs (in 2016 Hong Kong dollars (HKD)) between individuals, and estimated the standard deviations of total direct costs for each group.

#### **Result**

Over the projected treatment period, indirect costs incurred by patients and family were higher for the MCGR as compared to the TGR. However, the total costs in MCGR groups (group 1: HKD164k; group 2: HKD138k) were lower than those in TGR groups (group 3: HKD191k; group 4: HKD290k). Although the accumulative costs of

three groups (TGR with distraction every year and MCGR replacing every 2 and 3 years) were approaching each other in the first two years after initial implantation, at year 3 the accumulative cost of MCGR exchange every 2-years was HKD36k more than yearly TGR surgery due to the cost of implant exchange. Both MCGR groups costed less than TGR groups from year 4 to skeletal maturity. Despite higher patient-related costs during MCGR treatment, it is important to consider the reduced risks and mental burden suffered by these children with repeated surgeries. With improved knowledge of the costs associated with long-term MCGR use, better constructed cost-effectiveness studies can be performed in the future.