

## PRESS RELEASE

### A world first in paediatric surgery at Amiens-Picardie University Hospital: robot-assisted reconstruction of the anterior cruciate ligament in a child

The paediatric surgery team at Amiens-Picardie University Hospital (Amiens, France) has confirmed a new world first by performing robot-assisted reconstructive surgery of the anterior cruciate ligament in a child.

The objective of this new surgical technique is to **plan and guide the surgical procedure with the greatest possible precision**, using robotic assistance. At the site of the ruptured ligament, the new ligament graft must be inserted into tunnels drilled in the femur and the tibia. The creation of these tunnels is a key step. The objective of using this new robot-assisted operating technique in the child is **to optimize the tunnels' positions by avoiding growth zones in the femur**.

Together with robotic assistance, the expertise of the team headed by Dr François Deroussen and Professor Richard Gouron (paediatric orthopaedic surgeons) and Professor Michel Lefranc (a neurosurgeon) and that of the operating theatre staff (anaesthetists, operating theatre nurses, anaesthetic nurses, and radiology technicians) made it possible to reconstruct a ruptured anterior cruciate ligament in three boys.

The first two boys were operated on in late December, 2019. In both cases, the highly symptomatic status of the ruptured anterior cruciate ligament meant that waiting until the boys had stopped growing was not an option. A third boy underwent surgery on February 6<sup>th</sup>, 2020, under the same conditions and with the same successful outcome.

Before obtaining regulatory approval, the team had **simulated the new technique at the SimUSanté® healthcare simulation and training centre** (Amiens-Picardie University Hospital and Jules Verne University of Picardie (UPJV)) and the **GRECO robotic surgery research institute** (UPJV).

This new operating technique is **part of a research project** (Mini Invasive Robotic Reconstruction of Anterior Cruciate Ligament, MIRACL) approved by the French Medicines Agency (ANSM) and the local independent ethics committee.

The innovation process used to develop the surgical procedure before application in humans is part of the Process to Innovate in Care Assisted by Robots (PICAR) programme. The robot-assisted cruciate ligament reconstruction technique was developed in line with the PICAR process, which is highly rated by the surgical team.



Dr François Deroussen and Professor Richard Gouron (paediatric orthopaedic surgeons) and Professor Michel Lefranc (a neurosurgeon), together with the operating theatre staff (anaesthetists, operating theatre nurses, anaesthetic nurses, and radiology technicians) in February 2020 at Amiens-Picardie University Hospital.



Dr François Deroussen (a paediatric orthopaedic surgeon) operating on a child's cruciate ligaments with robotic assistance in February 2020 at Amiens-Picardie University Hospital.

## About the Paediatric Surgery Department at Amiens-Picardie University Hospital

The Paediatric Surgery Department treats children of all ages - from newborns through to the end of adolescence. The Department has an 8-bed **day surgery unit** for scheduled operations, which enables the patient to leave hospital on the day of surgery (after approval by the anaesthetist and the surgeon).

The Department also has a 28-bed **conventional surgery unit** for other patients. Each unit can host the young patient and one of their parents. The Paediatric Surgery Department is one of the key components of the hospital's mother and child division, which means that all the requisite skills (obstetrics, surgery, paediatrics, neonatal and paediatric intensive care units, specialist anaesthetists, etc.) are readily available.

Several surgical specialities are covered:

- orthopaedics, trauma medicine, and plastic and reparative surgery.
- visceral, surgery and urological surgery.
- neurosurgery.
- ENT surgery.
- eye surgery.
- maxillofacial surgery.

The wide variety of diseases and operating techniques means that surgeons increasingly have to specialize if they are to offer the best possible care. This is why the paediatric orthopaedics department provides **hyperspecialized care, delivered by medical professionals dedicated to paediatric orthopaedics.**

The hospital's **fields of expertise** in paediatric orthopaedics and trauma medicine are:

- paediatric trauma medicine.
- general paediatric orthopaedic surgery.
- neuro-orthopaedics, and surgery for handicap.
- spinal surgery.
- surgery for sports injuries.
- surgery of the hand and microsurgery in the child.
- surgery for congenital malformations of the limbs and arthrogyrosis.
- reparative surgery and burn surgery.
- surgery for bone tumours in the child.

The Department is **accredited** as a skills centre for treating congenital malformations of the limbs and neuromuscular diseases.

Furthermore, the Department is a leader in **research and innovation**. In September 2017, Dr François Deroussen (the paediatric orthopaedic surgeon behind the present project) and Professor Richard Gouron, (head of department) achieved **a world first: robot-assisted surgery on the spinal column of a child suffering from severe, progressive scoliosis**. The collaboration between paediatric orthopaedic surgeons, neurosurgeons (including Professor Michel Lefranc) and the anaesthesia team enabled the minimally invasive, robot-assisted placement of iliosacral screws in a frail 6-year-old child with severe, progressive scoliosis and no other treatment options (e.g. a corset brace). The simulated technique had been repeated in three dimensions in the SimUSanté® healthcare simulation and training centre (Amiens-Picardie University Hospital/UPJV).

Since this world first, **16 children have been operated on** with this technique. The results of this high-precision surgery were presented in October and November 2019 at international conferences on spinal surgery.

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## About research on robotic-assisted surgery at the Jules Verne University of Picardie in collaboration with Amiens-Picardie University Hospital

Research on robotic-assisted surgery (4 research teams in robot-assisted reconstructive surgery – MIS / CHIMERE / SSPC / SIMUSANTE) is structured around four groups in the GRECO robotic surgery research institute, supported by the Jules Verne University of Picardie. The goal is to create an internationally reputed centre of excellence using a surgical innovation method based on simulation. The GRECO institute treats robotic tools as multitasking platforms, and creates new applications that meet clinical needs and take account of health economic constraints. For

With this robot-assisted reconstruction of the anterior cruciate ligament in a child, the GRECO institute and Amiens-Picardie University Hospital now account for 6 world's firsts et 1 european's first.

*more information: [u-picardie.fr/recherche/greco/](http://u-picardie.fr/recherche/greco/)*

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## About surgical expertise at Amiens-Picardie University Hospital

Over the last 40 years, Amiens-Picardie University Hospital Centre and its key partner the UPJV have created an internationally reputed centre for innovation and excellence in surgery, driven by an increasing number of world firsts.

More recently, this dynamic process has enabled a number of striking new achievements:

- innovative procedures in ambulatory surgery, the development of a minimally invasive surgical robot as part of an industrial collaboration, the removal of barriers between surgical disciplines during joint procedures, and the development of techniques for enhanced recovery after surgery.
- world or European firsts:
  - 2014: closed osteosynthesis and robot-guided screw placement in the spine (Dr Anthony Fichten, Professor Michel Lefranc and Professor Johann Peltier).
  - 2015: robot-assisted surgery for herniated discs (Professor Michel Lefranc and Professor Johann Peltier).
  - 2016: robot-assisted radiofrequency ablation of a bone tumour (Dr Bruno Bonnaire, Professor Antoine Gabrion and Professor Michel Lefranc).
  - 2018: robot-assisted spinal surgery on a child with severe scoliosis, developed using simulation (Professor Christine Ammirati, Dr François Deroussen, Professor Richard Gouron and Professor Michel Lefranc).
  - 2019: laser surgery (thalamotomy) with real-time MRI guidance for treating tremor in Parkinson's disease and related diseases (Professor Michel Lefranc).
  - 2019: placement of a cochlear implant with full robotic assistance (i.e. the initial surgical approach and insertion of the electrode holder into the inner ear) and peroperative CT (Dr Nathalie Klopp-Dutote, with support from Professor Vladimir Strunski and Professor Michel Lefranc), prepared in the SimUSanté® simulation centre.

Amiens-Picardie University Hospital's 2019–2023 strategic plan includes actions that will strengthen its position in innovation and surgical excellence, including:

- innovative therapeutics, robotics in surgery, and e-health.
- collaboration with the other research partners (primarily the UPJV), in order to leverage synergies and thus continuously improve medical care, high-quality research, and medical education.

## About Amiens-Picardie University Hospital

Amiens-Picardie University Hospital is a centre of excellence in healthcare, with four missions: care provision, research, teaching, and the management of regional healthcare supply and demand. It is one of two university hospitals in the Hauts-de-France region, and is the leading employer in the Picardie area.

Amiens-Picardie University Hospital is a tertiary reference centre that serves its immediate catchment area and the whole of the Picardie area for referrals (transplantation, oncology, conventional and ambulatory surgery, a level 3 maternity unit, emergency medicine, etc.). The hospital's dynamic, innovative teams have won many national and international awards and distinctions.

As a major player in medical education, Amiens-Picardie University Hospital proactively contributes to the syllabuses followed by medical students and pharmacy students. The hospital also hosts 16 training centres (e.g. nursing colleges) and an internationally acknowledged simulation centre (SimUSanté®).

Thanks to an ambitious research and innovation programme, Amiens-Picardie University Hospital has put forward a dynamic investment policy that seeks to provide safe, high-quality care for each patient.

Furthermore, Amiens-Picardie University Hospital is fully committed to hospital-private practice collaboration, and also leads the "GHT Somme Littoral Sud" hub of 10 public-sector healthcare establishments. It also promotes regional development and the emergence of new skills and know-how.

Amiens-Picardie University Hospital: excellence in healthcare.

<http://www.chu-amiens.fr>

### *Key figures (from 2018) for Amiens-Picardie University Hospital*

- over 800,000 admissions per year.
- 1,673 beds.
- 6,352 staff, including 800 physicians.
- 453,700 outpatient consultations.
- 33,996 surgical procedures in 33 operating theatres.
- 101,340 admissions to the emergency department.
- 2,462 births.
- 16 training colleges and schools.

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