Rapid Recovery Symposium Report

Nearly one hundred orthopaedic surgeons and anaesthetists from seventeen European countries gathered in Barcelona on 4-5th November to discuss the need for more rapid recovery programmes for hip and knee replacement patients across the Continent. Medical Writer Rhonda Siddall attended the CME-accredited symposium and reports on the meeting’s themes and messages.

Introduction
The concept of “fast-track” or “rapid recovery” surgery has evolved over the past two decades. Based on a multimodal intervention of peri-operative care principles, the concept has been tested across a number of surgical specialities. Most of the evidence for improved clinical outcomes related to the rapid recovery approach to surgery has come from abdominal procedures. More recently, the concept of rapid recovery has been applied and developed in major joint replacement but in spite of a good evidence base supporting the benefits of rapid recovery surgical programmes, the widespread application and implementation of this approach has not occurred. This issue, the evidence base for a rapid recovery approach to surgery and the experience of setting up and running rapid recovery programmes in a number of centres were described and discussed by a faculty of speakers over the two-day symposium. Chaired by the pioneer of “fast-track” surgery, Professor Henrik Kehlet, Professor of Peri-Operative Therapy at Copenhagen University, 100 delegates heard a number of presentations about the latest developments in this field. Opening the symposium Professor Kehlet said: “This meeting is a unique opportunity to take back the positive messages about rapid recovery programmes and hopefully to encourage its greater uptake for the benefit of our patients.”

Presenting a review of the history of rapid recovery, Dr Peter Pilot, a senior scientist from the orthopaedic department at Reinier de Graaf Hospital in Delft, The Netherlands, defined the rapid recovery multi-modal approach. “The use of a critical care pathway, combining peri-operative pain management with a shift from general to local anaesthesia and opioid sparing, besides careful fluid management and a restrictive transfusion policy is the best option for most patients.”

Key questions and the evidence
Most of the presentations on the first day of the symposium concerned key practical questions, with faculty speakers reviewing the supportive evidence.

Which anaesthesia and analgesia for lower limb arthroplasty?
The main aim of rapid recovery programmes is to achieve hospital discharge quickly and safely, but good analgesia in the weeks after discharge is crucial to avoid patients being in chronic pain. Dr Nick Scott, Head of the Acute Pain Service at the Golden Jubilee National Hospital in Glasgow, Scotland, focused his presentation on the question of the best type of analgesia for Rapid Recovery programmes. Reviewing the trials and meta-analyses, he concluded: “The central component of any rapid recovery programme should be regional anaesthesia from which current evidence supports the use of combined spinal/local infiltration plus multi-modal analgesia.”
He said there had been a significant reduction in the use of post-operative epidural infusions across the world and a trend towards using peripheral nerve blockade instead in the past decade. Dr Scott argued that as local infiltration is much simpler to perform, is cheap, effective and has minimal risk of proprioceptive and motor blockade, it is preferable to nerve blocks for postoperative analgesia for lower limb arthroplasty.

What is the role of LIA in Total Knee Arthroplasty (TKA) and Total Hip Arthroplasty (THA)?
High-volume local infiltration (LIA) is a promising technique, argued Professor Kehlet, but the evidence is difficult to interpret and therefore it is premature to recommend its role in major joint replacement surgery. “Only a handful of the studies published on the technique were placebo-controlled and many of the studies have methodological inadequacies,” said Professor Kehlet, who concluded that high-volume LIA appeared to be effective in total knee arthroplasty but not in total hip replacement. Dr Henrik Husted, Head of the Arthroplasty Section at the Hvidovre University Hospital in Copenhagen, Denmark, described the LIA technique used at his hospital for knee and hip replacements. Both Professor Kehlet and Dr Husted are part of the same multidisciplinary research team at Hvidovre University Hospital and the majority of published studies on the LIA technique have been performed there.

Should cryotherapy be used?
Dr Pilot discussed the use of cryotherapy, arguing that the lack of data concerning various aspects of it suggests that post-operative cooling after joint prosthesis is not recommended. This was not because cooling influenced proprioception since he cited evidence showing no influence of local cooling on proprioceptive activity in the quadriceps muscle and isometric variability. And cooling can be helpful for reducing swelling and inflammation in joints if there is no major wound. However, hypothermia during surgery may facilitate peri-operative wound infections through thermoregulatory vasoconstriction and impaired immune functioning. So, more concerns than evidence for benefits are present.

Role of short-term thromboprophylaxis and early mobilisation?
Dr Harmen Ettema, an orthopaedic surgeon from the Isala Clinics Zwolle in The Netherlands and Dr Husted discussed the use of thromboprophylaxis. Dr Ettema provided an overview of the evidence for venous thromboprophylaxis after major orthopaedic surgery, concluding thromboprophylaxis should be administered for a period of at least 10 days following total knee arthroplasty and up to 35 days following hip arthroplasty. Dr Husted presented new data, just published in the November issue of Acta Orthop, from his centre, where since 2003 all THA and TKA patients have been fast-tracked resulting in a reduced length of stay from 5 days to less than 3 days. Patients are mobilised within two hours after surgery and DVT-prophylaxis was initiated six hours after surgery and only up until discharge. Data on a series of 1,977 operations performed from 2004-2008 showed that three deaths may have been related to clotting episodes. Results from the most recent two years showed that the risk of pulmonary embolism was 0.30% after TKA and 0% after THA. “We found a very low risk of clinically symptomatic VTE and deaths potentially related to the operation. Early mobilisation may play an important role in the reduction of VTE and our study appears to...
confirm this,” concluded Dr Husted. He argued that recommendations to provide extended thromboprophylaxis following discharge should be considered in context of the time of first mobilisation.

**Should we use surgical drains?**
Dr Pilot said the evidence base on the use of surgical drains in arthroplasty is clear-cut. “There is insufficient evidence from randomised trials to support the routine use of closed suction drainage in orthopaedic surgery.” He argued that drains do not reduce joint effusion or have any effect on wound healing though they do reduce haematoma formation.

**Liberal or restrictive transfusion?**
The negative effects of perioperative anemia have been well documented. However, transfusion is not risk-free and surveys from several European countries have shown highly variable transfusion rates among surgical centres but only limited evidence on the impact of different transfusion triggers exists, explained Dr Øivind Jans, an anaesthesiologist in training and research fellow at Copenhagen University. He called for large randomised controlled studies to evaluate the effects of liberal versus restrictive transfusion in fast-track hip and knee arthroplasty.

**Which surgical traditions are supported by evidence?**
Led by a presentation by Dr Husted, the audience discussed a variety of traditions in TKA and THA and whether or not they influence outcome with respect to infection, the need for blood transfusion, length of stay, pain and DVT. The faculty concluded the following traditions were unsupported by evidence of beneficial outcome:

- Hair removal
- Plastic drapes
- Pre-emptive analgesia
- Tourniquets (except for better visibility during surgery)
- Drains
- CPM
- Urinary catheters
- Bed rest
- Compression stockings

**Surgical techniques**
Three leading experts on minimally invasive surgical techniques discussed their experience with the audience.

**LIKA**
Dr Claudio Zorzi, head of orthopaedics at the Sacro Cuore Hospital in Verona, Italy, described the use of LIKA (less invasive knee arthroplasty). He acknowledged recent concerns within the surgical community over the possible effect on post-operative functional recovery, complications and survival rate after TKA. In this context, he advised surgeons to not ream the femoral canal, to reach the intramedullary alignment, using navigation or a new extramedullary femoral alignment. He concluded that the minimally invasive approach results in better outcomes with regard to maintaining extensor strength than conventional surgery but at six months there are no differences between the two approaches.
LISA
Dr Emmanuel Thienpont, orthopaedic consultant surgeon at the St Luc University Hospital in Brussels, Belgium, argued that advanced surgical techniques can allow patients to go through fast-track programmes with greater ease and better outcomes. He described the LISA (Less Invasive Signature Arthroplasty) technique and urged surgeons to consider its use to help patients recover more quickly. The LISA technique consists of:
- Medial approach with subvastus arthrotomy
- No touch technique of medial collateral ligament and posterior capsule
- Use of Patient Specific Instruments
- Pie crust needling of ligaments
- Blood reduction methods (coagulation, topical thrombine, no drains and postoperative knee flexion)
- LIA
- Cryotherapy
- Early mobilisation without crutches
- Electrostimulation of quadriceps muscle

ASI
The Anterior Supine Intermuscular (ASI) approach for total hip arthroplasty was described by Dr Erik De Witte, an orthopaedic surgeon from the ASZ Hospital in Aalst, Belgium, concluding that it was a safe and reproducible technique. “This approach has good short-term results and a complication rate comparable to or even lower than that of other approaches”.

Rehabilitation – When and How?
Professor Kehlet said that more data was needed to determine the exact role and timing of physiotherapy after THA and TKA. He explained that well-designed trials were needed to answer when exercise and strength training should begin, for how long and what kind of strength training could best enhance recovery after these operations. Most published trials, he added, had not included strength training or had only looked at the question of how exercise could enhance recovery once started a few weeks post-operatively.

Does fast-track TKA or THA increase readmission rates and complications?
There has been some concern that fast-track surgery and a reduced length of stay (LOS) could lead to an increase in readmissions. Dr Husted reported readmission rates from his unit based on a series of fast-track TKA and THA according to varying LOSs. He said that length of stay had been decreasing in his unit over the past six years from about six to three days. Dr Husted said: “Readmissions do not increase as LOS is decreasing. And specifically, dislocation following THA does not increase (on the contrary) and neither does manipulation after TKA,” he reported.

Trauma and Orthopaedics Consultant Mr Mike Reed from the UK’s Northumbria Hospitals gave data that showed fast-track joint replacement surgery reduces early complications. Based on an evaluation of 5,000 consecutive unselected total hip and knee patients, Mr Reed explained that the group (2060) that underwent a Rapid Recovery protocol experienced a reduced length of hospital stay of, on average, 4.7 days compared to an average of 8.5 days for
patients who underwent a traditional protocol. Moreover, there was a significant reduction in death rate amongst the fast-track group (0.5% to 0.14%) and blood transfusion requirement was reduced from 22.8% to 9.8%. Gastro-intestinal bleeding was also significantly reduced from 0.6% to 0.2%. There was a trend towards a decreased rate of 30-day myocardial infarction, stroke and 60-day DVT.

**Patient Perspective**

Dr Francisco Maculé, an orthopaedic surgeon from the Hospital Clinic of Barcelona in Spain, spoke about the value of rapid recovery programmes from the patient perspective. He said:
- Rapid Recovery programmes are very important because they reduce the number of days that surgical patients stay in hospital which is good for both the patient and for the hospital.
- If patients are given information and educated, they are very supportive of being able to leave hospital sooner after their operation.

**Results from Rapid Recovery Programmes**

- **Reduced Length of stay – Bremen, Germany**
  Eight years ago, the average length of stay in German hospitals after total joint replacement was more than 19 days reported Dr Adrianus den Hertog, orthopaedic surgeon from Paracelsus Kurfürstenklinik in Bremen, Germany. Dr den Hertog’s hospital was the first in Germany to adopt Rapid Recovery in response to the growing number of total joint replacements being performed. In the country overall, length of stay has been reduced to 12 days and in Dr den Hertog’s hospital it is now 6 days. “Rapid Recovery programmes should be mandatory in all cases of total joint replacement,” argued Dr den Hertog.

- **Reduced Length of stay – Copenhagen, Denmark**
  At the Hvidovre University Hospital, LOS is now 1-2 days and collaboration between four fast-track surgery departments in Denmark has been instituted in order to study various aspects of fast track on a larger scale. Dr Husted described a number of organisational and clinical features that have contributed to this achievement, including the retention of dedicated staff, well-developed pre-operative information and procedures, functional discharge criteria, spinal anaesthesia, LIA, small incisions and no drains. From a post-operative perspective, multi-modal opioid-sparing analgesia, early mobilisation and discharge when functional criteria were met have facilitated early rehabilitation.

- **Reduced Length of stay – London, United Kingdom**
  Over the past ten years, implementation of rapid recovery programmes in the United Kingdom has been happening in a piece meal fashion, explained David Houlihan-Burne, Senior Consultant Surgeon Trauma and Orthopaedics at Hillingdon Hospital, London. Mr. Houlihan-Burne described how his unit has implemented a more formal, evidence based programme. He also explained how regular data is now collected and that they can clearly demonstrate that patient satisfaction rates have increased as result of this programme. Furthermore he highlighted the benefits this programme offers for the surgeon and the Trust such as cost savings without any increase in complication rates or readmission rates and on-going reductions in length of stay.
Launching Rapid Recovery
Mr Houlihan-Burne drew the symposium to a close with a presentation on the role of the quality road map to help implement rapid recovery programmes. “Breaking down traditional barriers for implementation including the ability to work closely with management and inter-departmental relationships between anaesthetists and surgeons is paramount to the successful launch and perseverance of these programmes,” explained Mr Houlihan-Burne. His key piece of advice to those wishing to begin the development of a rapid recovery programme was to approach it with small, stepwise changes in mind. “If you need to change something big, you need to change small things first and systematically. Set out with a clear aim, implement change strategies and then keep measuring what you are doing to be clear on the improvements any changes are bringing,” he added.

Conclusion
Mr Houlihan-Burne helped to close the symposium and summed up the general view amongst delegates. He said: “To have the opportunity to hear the experiences of colleagues who have also set up rapid recovery programmes has been very valuable and inspiring.” The chairman ended the meeting with a call to action: “Spread the message that rapid recovery programmes produce great improvements for patients and the hospital,” concluded Professor Kehlet.

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References

- Röstlund T & Kehlet H. High-dose local infiltration analgesia after hip and knee replacement - what is it, why does it work, and what are the future challenges? Acta Orthop 2007; 78:159-161.
- Shankar NS, Minimally invasive technique in total knee arthroplasty – history, tips, tricks and pitfalls. Injury. 2006 Dec; 37 suppl 5; S25-30
- Rachbauer F. Minimally invasive total hip arthroplasty via direct anterior approach Orthopade. 2005 Nov;34(11):1103-1110