

Appendix B: International case study – Coxa Hospital for Joint Replacement¹

Summary

- Purpose-built specialist centre designed around the joint replacement patient pathway
- Concentrates services on a single site; previously provided by five separate hospitals
- Treats patients at all levels of acuity, including national and international referrals
- Participates extensively in research, including longitudinal studies of joint replacement outcomes
- Fully dedicated resources and teams leading to low rates of infections and revisions (half Finnish national average)
- Independent status allows for innovation in use of incentives, eg:
 - volume/casemix-related pay
 - reimbursement for patients for avoidable complications
- Operates in close collaboration with other providers in the local system, eg:
 - purchase of services from co-located university hospital
 - provides training and support to local community physiotherapy network
 - provides training and support to local diagnostic imaging providers

Delivery model

- Independent, specialist centre for joint replacement surgery at all levels of acuity
- Co-located with a large university hospital which owns a majority stake in Coxa
- Serves a regional catchment population plus national and international referrals

Background and history

- Established 2002 as a public–private partnership new-build centre to provide arthroplasty for a population previously served by five local hospitals
- Mission was to improve quality of care, reduce waiting times and address service duplication
- Since 2002 has expanded twice and shifted to full public ownership

Health system context

- Finland has a tax-financed public health system
- Since 2014, patients free to choose their provider
- 20 hospital districts and 5 university hospitals are responsible for delivery of secondary/tertiary care²
- Primary and community care is the responsibility of >400 local municipalities

¹ This case review was externally commissioned. Sources included site visits, interviews and review of company reports/information systems. Specific additional sources are given where appropriate.

² Hospitals are funded on a DRG basis (plus patient co-payments).

ECHAA and University of Liverpool, Case study Coxa Hospital Finland, Barrie Dowdeswell; In search for the excellence – Coxa hospital for joint replacement, Teemu Moilanen, 2010; Matti Lehto (Coxa CEO) presentation to EHMA, Efficiency by redesigning healthcare delivery organization structures – a focus hospital model, 2010

Overview of the Coxa Hospital for Joint Replacement



Overview

- Established in 2002 as a new-build hospital on land purchased from Tampere University Hospital
- Provides elective orthopaedic services for a population previously served by five separate hospitals
- 62 ward beds
- 16 recovery room beds (in one 'control room')
- Seven operating theatres (five for joint replacement)
- Coxa buys some services from Tampere University Hospital:
 - administrative services and telecommunications
 - food, maintenance and cleaning
 - radiology and clinical consultations
 - pharmacy and laboratory services
 - intensive care and emergency services

History

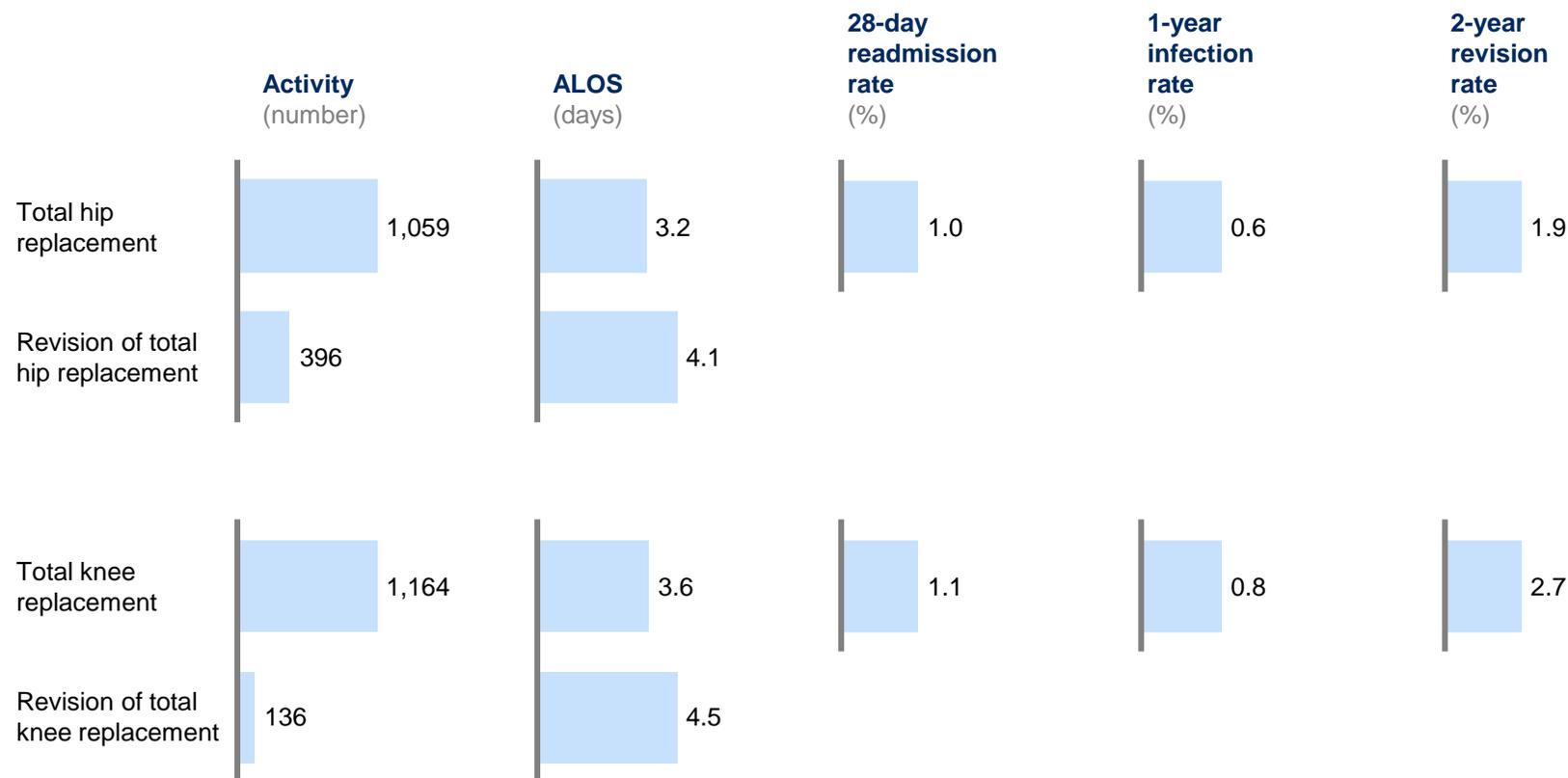
- Elective orthopaedic services withdrawn from five district hospitals; now concentrated at Coxa
- Rationale: seamless, quality regional care – vertical and horizontal integration
- Moved from being run by the public sector to a public–private partnership, delivering 5% return on investment

Clinical services

- Delivers 3,000 joint replacements/year (~20% revisions)
- Provides elective orthopaedic services for:
 - 500,000 in Tampere region: 70% of all elective activity
 - patient freedom of choice (national scheme started in 2014): 15%
 - referrals from outside region catchment of 1.2 million: 8%
 - national referral service for complex procedures: 5%; international (and national) private patients: 2%
- Emergency orthopaedic surgery in collaboration with Tampere University Hospital (<10% of total activity)
- Orthopaedic medical students at Tampere University Hospital spend four to six months of their training at Coxa
- Specialist nursing and therapist training provided
- 14 fully qualified orthopaedic surgeons:
 - three full days per week in theatre (per surgeon)
 - 200 to 250 joints/year (per surgeon)
- Five anaesthetists
- 109 nursing staff
- 12 physiotherapists

Coxa: Orthopaedic activity and outcomes for selected pathways

Data for 2014



ALOS, average length of stay (mean).

Coxa was built in early 2000s – the outcome of a shared vision to improve access, quality and value by centralisation and specialisation

Situation

- A national study of joint replacement surgery revealed **suboptimal quality** of services in Finland
- Increasing **waiting times** for treatment:
 - new government legislation encourages municipalities to purchase more procedures from the private sector to reduce public sector waiting times
- Projected **doubling in demand** for hip replacements between 1997 and 2015
- Extensive **service duplication**
- Both hospital and regional health system **lack capital**
- Study recommends services are concentrated in fewer, specialised units

Coxa project developed

- Consultancy firm, Finnmedi, commissioned to review options for a new joint replacement surgery organisation
- ‘Coxa model’ developed:
 - quality-driven vertical and horizontal integration
 - freedom of capital spending, design, procurement and workforce contracts
 - IT/technology to support region-wide pathways
 - major culture change
- Coxa Ltd, a **public–private partnership (PPP)** established in February 2001 with **former ortho surgeon as CEO¹**
- **Purpose-built hospital** opens in 2002, with an **architectural design based on hospital’s proposed care pathways**

First 10 years and future plans

- Hospital redevelopment in 2008 to **expand capacity**:
 - 28 new ward beds (to 54)
 - six new recovery beds (from 10 to 16)
 - one new theatre (from five to six)
- Hospital redevelopment in 2012 to **further expand capacity**:
 - eight new ward beds (to 62)
 - one new theatre (from six to seven)
- Over time, Coxa’s **catchment population has expanded**:
 - Pirkanmaa Health District (~500,000)
 - four central hospital districts (~1,200,000)
 - national referrals
 - international patients
 - patient freedom of choice law (2014)
- Coxa **‘model’ applied to cardiology/cardiothoracic surgery** in 2010 as Heart Centre Ltd
- Plans to create ‘Coxa’ units for **ophthalmology, vascular surgery, neurology and neurosurgery**

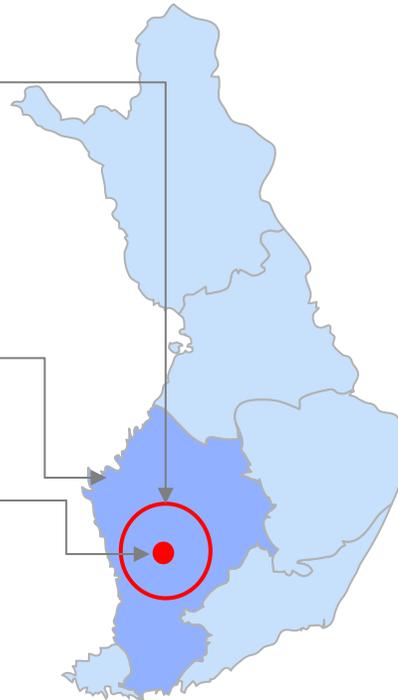
¹ Matti Lehto

Elective orthopaedic services were transferred from five hospitals and centralised at Coxa

- **Coxa replaced existing elective orthopaedic services in the Pirkanmaa Health District:**
 - Tampere University Hospital
 - three local general hospitals
 - Orton private hospital (offered but declined opportunity to co-invest/joint ownership)
- Pirkanmaa Health District provides tax-funded health services for **a population of 500,000***

- Over time, Coxa has expanded to provide elective orthopaedic services for a **wider catchment:**
 - referrals from **four surrounding health districts** – with combined catchment population of 1.2 million
 - national **tertiary referrals**
 - national freedom of choice
 - national and international **private patients**

Coxa is **co-located with Tampere University Hospital**



The quest for sustainability was based on pursuit of **strategic value across the district system rather than short-term tactical positioning** of individual facilities or players within it

The **breakthrough in changing mindsets and gaining comprehensive commitment** to the project was achieved not through formalised processes but an **intricate, delicate and time-consuming series of conversations, briefings, negotiations and persuasions** undertaken away from the public spotlight. These processes prepared the ground for the publicly visible agreements with key stakeholders

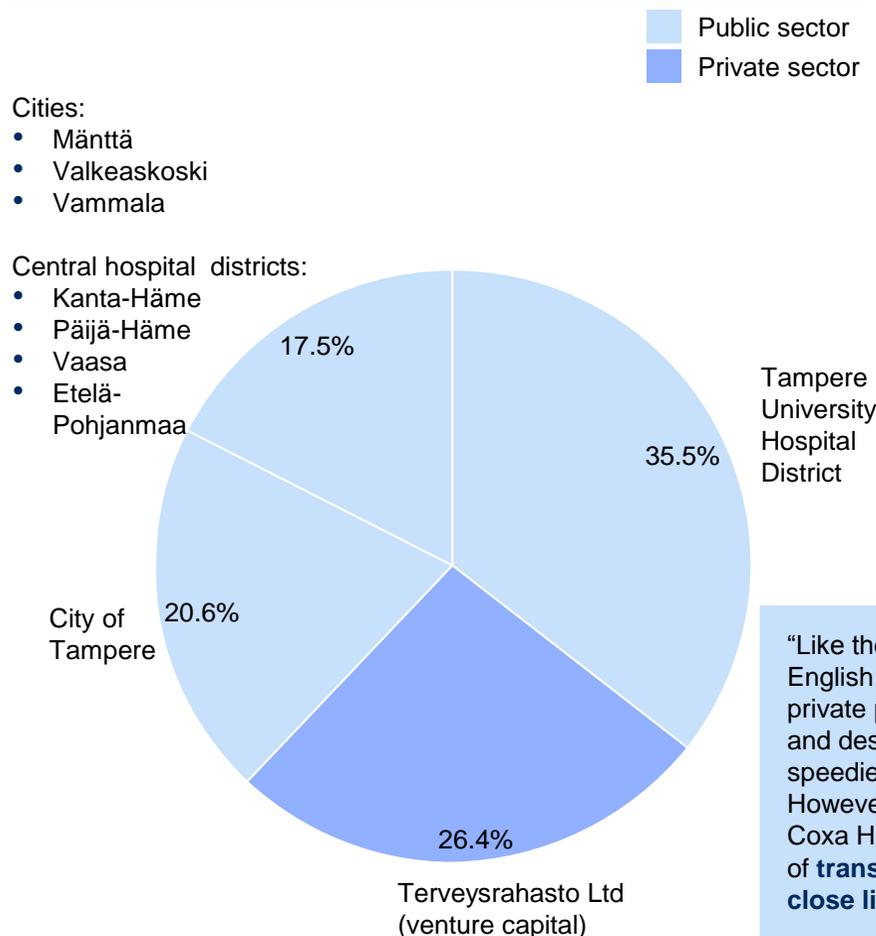
Politicians involved in the Coxa project stood back, only taking visible action when necessary to consolidate progress or open doorways

* Hospitals are funded on a DRG basis (plus patient co-payments)
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From 2002 to 2012, Coxa's PPP ownership model allowed private sector flexibility with a clear commitment to the public sector

Coxa Ltd shareholder structure

% of share capital, 2012



Core principles of Coxa's public-private partnership (PPP)

- Fully integrated with the public sector:
 - funded mostly by public money
 - integrated with local public health-care organisations
 - mostly governed by public shareholders
 - serves >95% publicly-funded patients
- Private sector freedoms:
 - access to capital
 - limited company – economic independence and responsibilities
 - flexible organisation
 - Coxa can offer employees salary incentives

“The main reason favouring that alternative [the limited company status] was the fact that as a public utility our profits would not come to our benefit, but, instead, it would go to this ‘Moloch’s mouth’ [referring to the predisposition of public services to always ask for more]. We were aware of Companies Act concerning a situation of something going wrong. But we decided to take the risk.”

Matti Lehto, Founding CEO*

“Like the diagnostic and treatment centres in the English NHS, the Coxa Hospital is a public-private partnership providing specialist services and designed to meet patient demands for speedier access to elective surgery. However, in contrast to the English model, the Coxa Hospital is based on a strong component of **transparent public ownership** and has **close links to its former parent hospital.**”

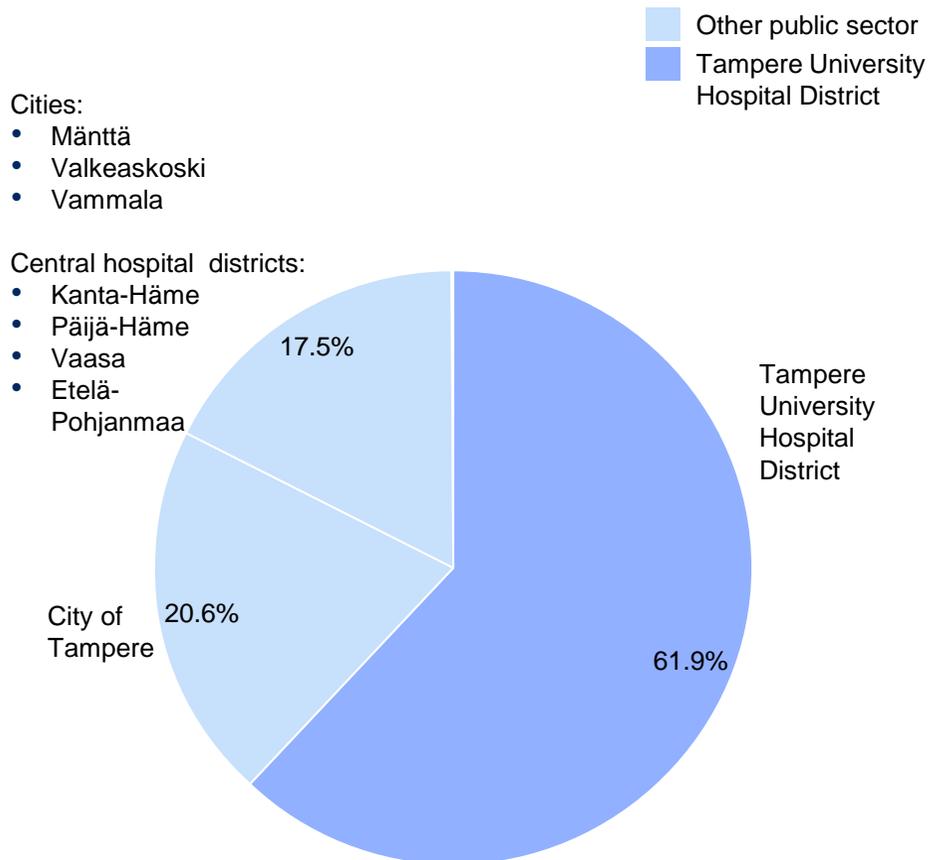
Dowdeswell/Vauramo

* Now Head of Pirkanmaa Hospital District

Since 2012, Coxa has been in full public sector ownership

Coxa Ltd shareholder structure

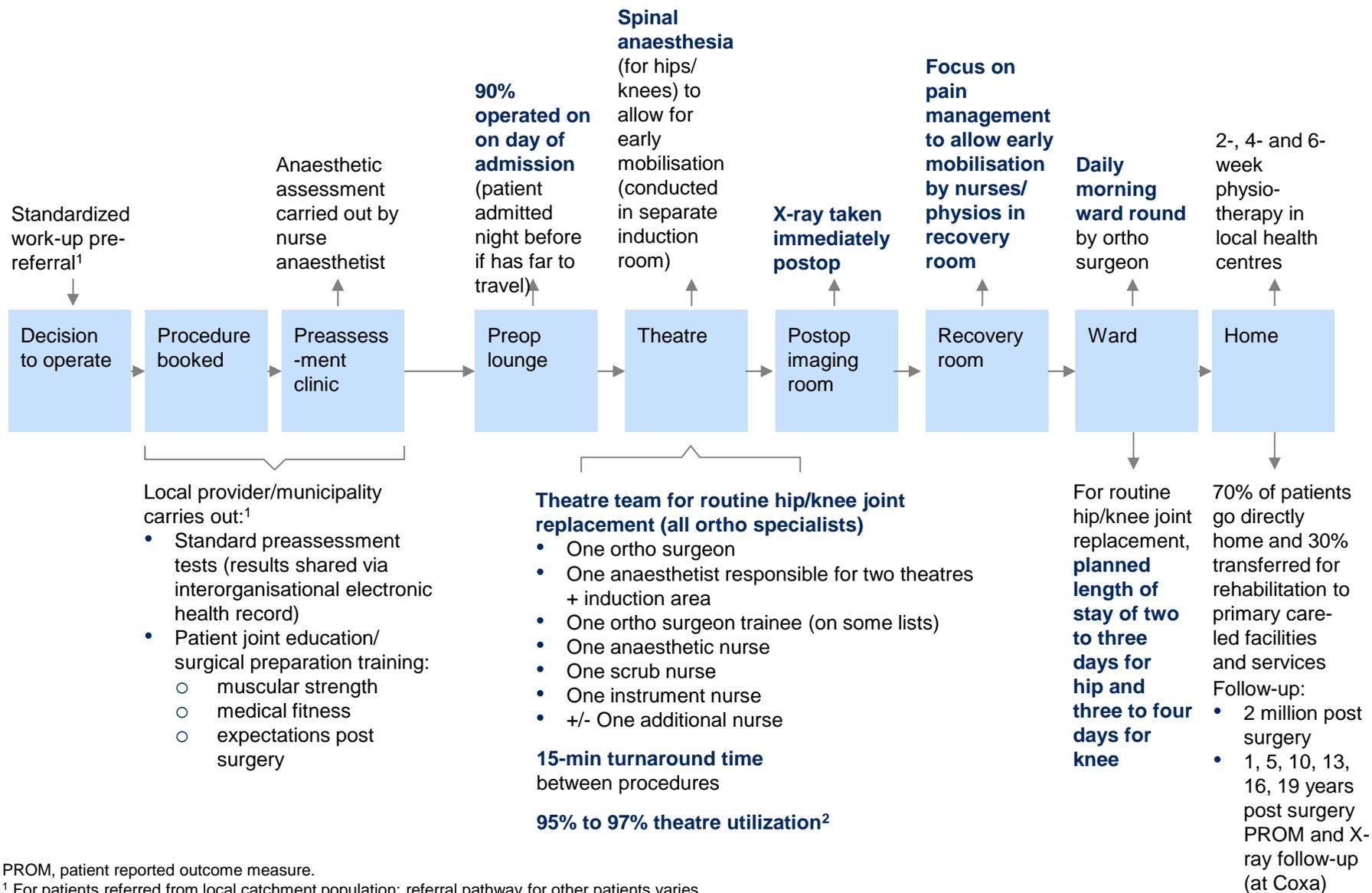
% of share capital, 2015 (since 2012)



Changing ownership structure

- In 2012, **Tampere University Hospital District bought the shares held by Terveystaloustutkimus Ltd** (accounting for 26.4% of Coxa share capital) and became the biggest shareholder (61.9%)
- Hospital **operations continue as they did** under the previous ownership model with **some new rights and responsibilities**:
 - Coxa must comply with **public tendering regulations for procurement**
 - Coxa can **take advantage of the Freedom of Choice law** introduced in 2014 which allows all public patients in Finland to choose their hospital of treatment from all public hospitals

Coxa's approach to optimising the joint replacement pathway



PROM, patient reported outcome measure.

¹ For patients referred from local catchment population; referral pathway for other patients varies.

² Calculated as actual time (when patient is in theatre) plus turnaround time (15 min) as % of planned theatre time.

Coxa has a streamlined one-stop shop preadmissions process for routine joint replacement patients

Standard work-up before referral

- Diagnostic imaging performed by local provider (to Coxa specifications) and sent to Coxa with referral
- Local imaging providers trained and audited by Coxa¹
- Patient completes meds/medical history form pre-outpatient attendance

Ortho surgeon: creates surgical plan and choice of implant. This information is input into electronic health record (EHR) to inform theatre scheduling and ensure right devices are in the theatre on day of surgery

Nurse anaesthetist: routine pre-anaesthesia assessment
Escalation to anaesthetist or orthopaedic surgeon if required (~10% of cases)

One-stop shop for routine patients (~60%)

Decision to operate

Procedure booked

Preoperative assessment

Local provider carries out:

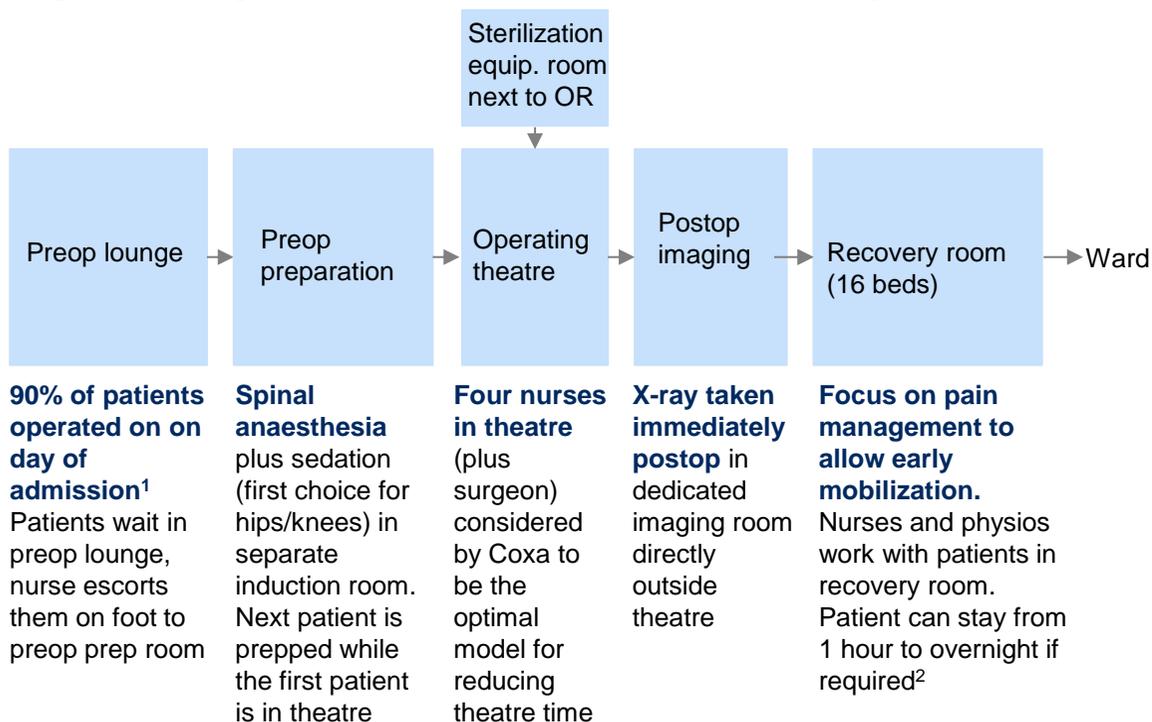
- standard preassessment diagnostic tests (data fed into shared electronic health record)
- local network of physiotherapists (trained twice yearly by Coxa) provides group joint education/surgical preparation training classes:
 - muscular strength/fitness
 - expectations post surgery
 - discharge preparedness

Enablers

- Shared cross-organisational EHR
- Availability of trained and specialist nurse anaesthetists
- Strong team working between Coxa and other providers:
 - community physio-therapist network
 - diagnostic imaging providers

¹ Process in place for local referrals (majority of all activity); international/private patients follow different referral patterns. No reported issues with lost or poor quality images delaying surgical decision-making.

Coxa Hospital is a new-build site designed around the main patient pathways in elective orthopaedics



Key performance measures

- 15-min turnaround time (reduced from >60 min in pre-Coxa orthopaedic service at the Tampere University Hospital). Three factors support this:
 - sterilization equipment room located next to theatre
 - theatre cleaning arrangements
 - separate induction room
- Four primary joint replacement procedures (hip/knee) per 7-hour theatre session (or three in 6.5-hour session)

Enablers

- Coxa is a new-build hospital designed around the core, high-volume patient pathways in elective orthopaedics
- All space, equipment and staff are dedicated to orthopaedics
- Very low volumes of emergency activity (<10%)



Preop lounge



Recovery room

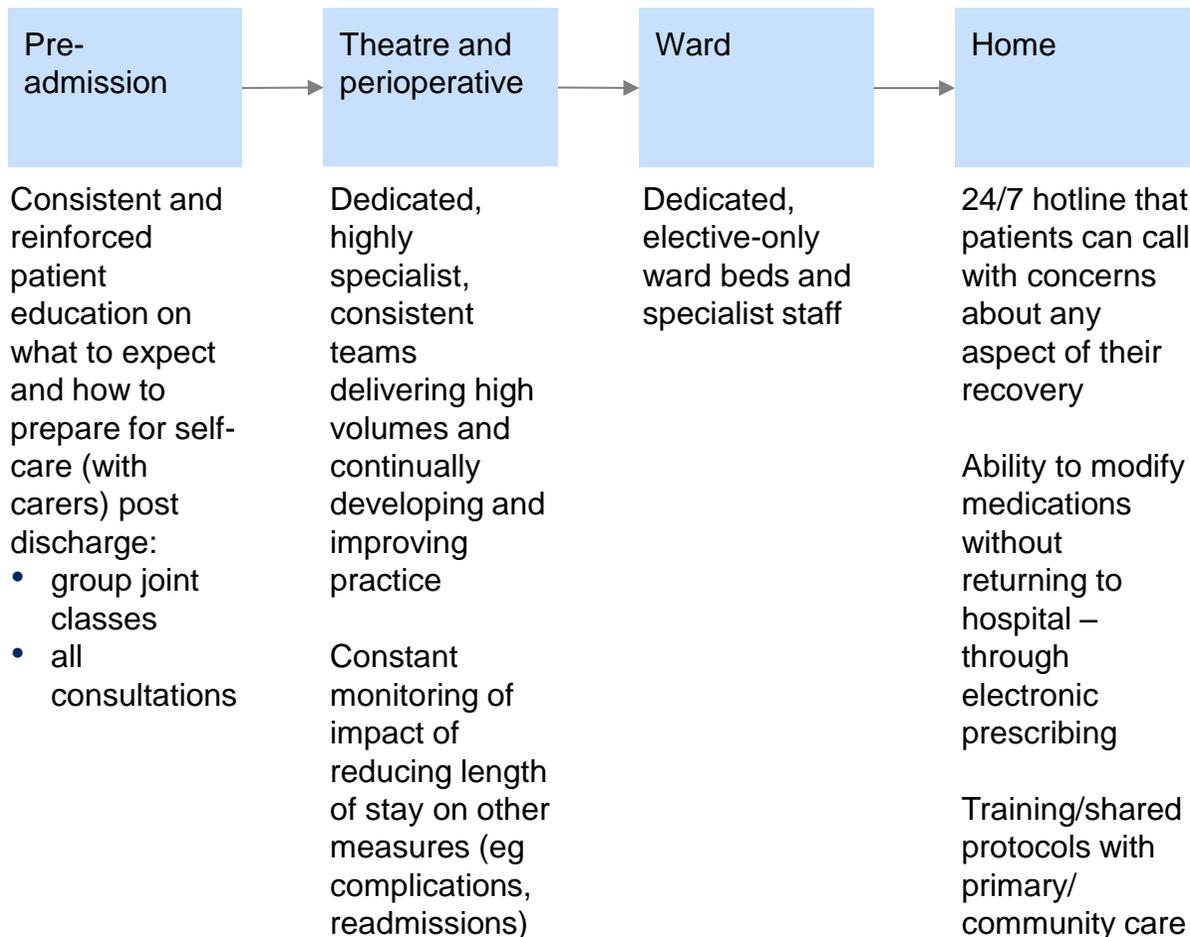


Physio in recovery room

¹ Coxa serves a geographically large catchment population and patients travelling long distances are admitted to a ward the evening before surgery.

² Coxa is working to reduce time in recovery room while maintaining very high levels of infection control and patient outcomes.

Achieving low complication and readmission rates requires effort at every step of the pathway



Outcomes

- Revision rate at 2 years is half the Finnish national average:
 - 2.7% for knee replacement
 - 1.9% for hip replacement
- Infection rate (at 1 year):
 - 0.8% for knee replacement
 - 0.6% for hip replacement
- Deep infection rate (in risk-free patients): <0.1%
- Dislocation rate:
 - primary hip: 0.8%
 - hip revision: 2.8%

Enablers

- Incentives** – Coxa reimburses the patient for avoidable complications, so infections and readmissions are twice as costly to the hospital (higher costs + penalties). Coxa is the only hospital in Finland to do this
- Dedicated, highly-specialist teams operating at **high volumes**

Organisational culture, incentives and technology are all critically important to Coxa's success

Description

Standardisation

- **Patient pathways:**
 - Coxa does not have standard protocols for every procedure but staff work as a united team sharing knowledge, issues and lessons from hands-on training. This leads to a consistent level of standardisation within a small team:
 - daily surgical review meeting: review all previous day's cases, plan for emergency patients
 - weekly (Friday) extended full team meeting: in-depth performance review and collaborative knowledge sharing
- **Procurement of implants:**
 - one to two implant choices per type (typically 80% first choice; 20% alternative choice) selected via tender process to get best price:
 - clinicians help design the tender specification
 - clinicians are core members of the tender evaluation team

Technology/IT

- **Cross-organisational shared EHR** allows all providers in the regional network to submit data (eg diagnostic information to support referral) and carry out post-discharge follow-ups off site
- **Transparency of surgeon-level performance data** on all indicators (eg theatre time and utilization; infection rates; outcomes) within the organisation; supports and provides evidence base for:
 - open review and support
 - self-monitoring
 - peer pressure
 - intervention by chief medical officer when necessary

Employment model and incentives

- Physician salary has a large performance-related element (this payment structure is possible because of Coxa's independent sector status):
 - 50% base salary
 - 50% adjusted for casemix and volume

Culture

- Role of culture is very strong:
 - **no hospital/physician-led cancellations** of lists/operations (approximately 2% of patients cancel; these are back-filled from the list of 'theatre-ready' patients)
 - very low staff turnover (one orthopaedic surgeon has left in the last 6 years)
 - full team **commitment to excellence in outcomes**: through collaborative, open knowledge sharing and performance review
 - commitment to **research**: high volumes mean that Coxa can be heavily involved in joint registry and other research and long-term outcomes evaluations