

Outpatient Arthroplasty with Rapid Recovery™

WHITE PAPER 2021

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1. INTRODUCTION

OUTPATIENT ARTHROPLASTY WITH RAPID RECOVERY™

This white paper is written by members of Zimmer Biomet's Rapid-recovery Advisory board and Zimmer Biomet team members to address potential questions or concerns Health Care Professionals might have about the subject of outpatient arthroplasty.

The evidence-based clinical summary to support the protocols for TJA outpatient surgery (chapter 1), the testimonials with personal experiences on how to start outpatient arthroplasty (chapter 5) and the FAQ in chapter 8 have been written, reviewed and validated as a consensus statement by the Zimmer Biomet Rapid-recovery Advisory board members.

The selection criteria for patients eligible for outpatient arthroplasty (Chapters 3) as well as discharge criteria (chapter 4) were suggested by the advisory board.

At Zimmer Biomet our mission is to alleviate pain and improve the quality of life for people around the world. Rapid Recovery supports this mission by aiming to optimise all aspects of patient care to achieve the best possible outcome by addressing the needs of patients and staff before, during and after arthroplasty surgery. Over the past twenty years, the program has delivered impactful and sustainable change across Europe, through multidisciplinary collaboration and clearly defined standards.

Put simply, Rapid Recovery is about giving the best available patient care in the shortest necessary time. The program does so by combining optimized logistics and clinical enhancements to target faster postoperative

recovery, a reduction of peri- and postoperative complications and earlier achievement of discharge criteria^{1,2,3}. Together this leads to a shorter length of stay (LOS) which has decreased in certain countries to a point where some patients meet the discharge criteria on the day of surgery^{1,2,3}. In these countries, patients may therefore be operated in an outpatient setting and might be fit for discharge on the same day as surgery.

Definition of Outpatient Joint Arthroplasty

There is no consistent definition of outpatient joint arthroplasty (OJA) in literature. The most common definitions used are:

- Discharge on day of surgery
- Discharge within 24 hours after admission

In Rapid Recovery Outpatient we use the following definition:

- Day of Surgery Admission and Discharge (DOSA and DOSD)

In addition to this definition, patients are discharged to their original destination, so patient who came from their own home, are discharged to their own home.

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2. WHAT CLINICAL EVIDENCE SUPPORTS THE OUTPATIENT PROTOCOL?

Outpatient joint replacement is not a new concept. It was introduced over a decade ago¹, but is still underutilized and only performed at a few selected centres across Europe. Recent NHS data shows, that only 0.5% of all total hip and total knee arthroplasties (THA and TKA) and 5% of unicompartmental knee arthroplasties (UKA) in the UK in 2018-2019 were performed as outpatient procedures, with large variations between departments².

A barrier for more widespread utilization of outpatient arthroplasty lies in assumed safety considerations. Single centre data shows, however, that outpatient THA, TKA and UKA can be performed in selected patients with few readmissions or complications. Day of surgery discharge rates range from 30% to almost 100%^{3,4,5,6,7,8}.

Recent reviews show that outpatient joint replacement can be performed safely, with readmission rates and complication rates comparable to the conventional treatment with at least one overnight stay^{9,10,11,12}. However, patient selection criteria vary between studies. While no specific recommendations can be made on selecting optimal candidates for outpatient surgery, it is clear that patients with severe comorbidities should not undergo outpatient surgery due to safety considerations¹³. Tools for patient selection have been proposed, but are not validated in a European set-up.

The overall care plan for outpatients versus the conventional one to two days stay is the same. It also has the same updated evidence-base¹⁴. The only difference is a detailed patient contact and follow-up organization.

Studies have shown that outpatient arthroplasty in selected patients can be financially more attractive: overall costs are lower compared to traditional treatment¹⁰. 'Overall' means that possible costs of primary care providers or emergency departments are included^{15,16}. The financial argument, however, may depend on local reimbursement conditions. Recently the COVID-19 pandemic has fuelled interest in outpatient arthroplasty, as a large number of hospitalizations puts pressure on hospital capacity and requires optimal utilization of health care resources^{17,18}.

Recently published NICE guidelines support the use of medial Unicompartmental Knee Arthroplasty (UKA) for eligible patients with isolated anteromedial osteoarthritis. Studies have shown UKA to be a suitable procedure for outpatient arthroplasty with a high rate of DOSD^{19,20}, and higher DOSD rates compared to TKA²¹. Also, centres with a high utilization of UKA are more likely to discharge patients on the day of surgery²². UKA should therefore be considered for eligible patients in a Rapid Recovery Pathway as it allows for quicker recovery, shorter length of stay and higher chance of DOSD.

A recent study of 574375 THA, TKA, UKA patients concludes that contemporary outpatient joint arthroplasty demonstrates lower rates of adverse events with no increased rate of 30-day readmission when compared with risk-matched inpatient counterparts. Outpatient arthroplasty therefore may be a safe alternative to inpatient arthroplasty²³.

To summarize, the current literature supports use of outpatient THA, TKA and UKA in carefully selected patients.



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3. SUGGESTED INCLUSION AND EXCLUSION CRITERIA FOR OUTPATIENT HIP AND KNEE REPLACEMENT

Inclusion criteria:

- Unilateral primary THA, TKA or UKA
- Age 18-80¹
- Interested in discharge on DOS.
- Another person present at home for care after discharge for at minimum 24 hours after discharge

Exclusion criteria:

- Acute Myocardial Infarction, Cerebrovascular Accident, Transient Ischemic Attack or Coronary Artery Disease within last three months
- Unstable ischemic heart disease

- Ejection fraction < 40 % or severe valve disease
- Glomerular filtration rate < 60
- Chronic obstructive pulmonary disease with home oxygen
- Insulin dependent diabetes mellitus
- Sleep apnoea requiring treatment
- Use of a walking aid other than a cane
- Two or more falls within the last three months
- BMI < 18.5 or > 40²
- Hb levels < 130 g/dl

4. SUGGESTED DISCHARGE CRITERIA AFTER OUTPATIENT HIP OR KNEE REPLACEMENT

Activity level:

- Steady gait with crutches.
- No dizziness during mobilization (Can use stairs, if required at home).

Postoperative nausea and vomiting (PONV):

- Minimally and efficiently treated with or without medication.

Early Warning Score (EWS) < 2:

- Patients with EWS = 1 must be conferred to a doctor prior to discharge.

Pain:

- The pain level should be acceptable for the patient before returning home.

Postoperative bleeding:

- Should be consistent with expected blood loss for this procedure. Repeated dressing should not be required.

Urination:

- Patients should have spontaneous urination prior to discharge.

1. The age range of 18 to 80 years is known to be successful in units that have a long experience with outpatient arthroplasty. One could consider narrowing the range when starting a new outpatient system and expanding the range later.

2. BMI is not a block to outpatient arthroplasty, but as it rises above 40, associated factors (Non-insulin dependent diabetes mellitus, metabolic syndrome, level of mobility, intra operative blood loss, associated wound problems) start to combine. This inhibits successful discharge on the day of surgery. 40 is therefore the cut-off point in a number of units that successfully practice outpatient arthroplasty.



5. TESTIMONIAL & PERSONAL EXPERIENCE ON HOW TO START WITH OUTPATIENT TJA*



Professor Oliver Pearce,
Milton Keynes University Hospital UK

What conditions should be met, according to you, before starting outpatient TJA becomes realistic?

[Prof. Pearce]: “First, we felt it was important to ensure there was a mature recovery program in place with consistent results in terms of pain relief, early mobilization and short length of stay. I would like to suggest a mean LOS of less than two days. This was the case in our department. So it gave a good platform to start development of this step-up.”

Can you mention another vital precondition for the introduction of outpatient TJA?

“Our first step was to meet with the Rapid Recovery Programme team and have a gauge level of support to raise the bar to achieve outpatient arthroplasty. It was something we had been considering for a long time, so there was support from all team members. Without a team approach there are numerous points along the pathway which could stall the process.”

How did you design a road map for the introduction process?

“During our first meeting we drew up a list with bullet points. They actually were a really good road map for the process we followed.”

What was on that road map? Which steps should be taken to organize outpatient TJA in practice?

[Prof. Pearce] “It was as follows:

- Choose between **ward or Outpatient Unit**;
- Cover radiology;
- Include Anaesthetic protocols;
- Include Analgesia protocol;
- See to physiotherapy;
- Address Pre-Assessment;
- Decide on cut off time for safe discharge;
- Handle infection control.”

Can you comment on these points, starting with the choice between ward or Outpatient Unit?

“Definitely ward for us in Milton Keynes. Having had a spike in infection rate two years back, we are on high-alert for any changes from our current practice that may have any implication on infection risk. Our elective ward is ring-fenced. And our Day Surgery Unit is a general ward for numerous different surgical specialties. This was therefore an easy decision.”

How should Radiology be included in your opinion?

“When should the post-surgery x-ray check take place? Should it even take place at all? Both are options. Our preference in Milton Keynes is to continue with a ‘post-op x-ray of the operated joint. But where? In the Recovery ward, in the ward in an ambulatory setting or in the Main x-ray department? On balance, we will go with the existing x-ray in the main x-ray department. It may incur delay, and requires chasing on the day. But the other options are compromises with poorer quality x-rays.”

* Results are not necessarily typical, indicative, or representative of all recipient patients. Results will vary due to health, weight, activity and other variables. Not all patients are candidates for this procedure. Professor Oliver Pearce is a paid consultant of Zimmer Biomet or its affiliates.



...and anaesthetic protocols?

“We did a literature review of landmark publications by Vehmeijer, Gromov, Kort, Wainwright, Thienpont, Amundson, Goyal on units who have already been through the process of upgrading to outpatient arthroplasty. We focused on the identification of differences in care required here in Milton Keynes. Principles were to spare opiate analgesia and to avoid intra-theal opiates. We chose to use COX2 inhibitor pre-med. Other takeaways: consider avoiding sedation with spinal anaesthesia, or at least minimise sedation. All with a view to early safe mobilisation and minimal PONV or orthostatic hypotension. To this end, out of the 25+ routine anaesthetists on the rota, a core team of four anaesthetists agreed to work on this with me for identified lists for outpatient cases. In our unit there is a strong tendency for intra-theal opiates in spinals, but the core team was happy to trial without. Clearly, when starting out, the outpatients will be scheduled first on our list. Only when a mature and successful system is up and running would we consider planning them as second or even third case on the list.”

What decisions were made on the analgesia protocol?

“The analgesia protocol remains the same on the ward: regular provision of Paracetamol and Celecoxib (anti-emetics as required). Only use opiates for breakthrough pain (Shortec - Oxycodone). Limited number of doses of modified release opiates on discharge, 48 hours’ worth for any breakthrough pain. Then standard PRN analgesia, such as Co-codamol. This new protocol will be embedded in the electronic patient record system with a keystroke shortcut to simplify prescribing for the junior doctors. They only need to sign the protocol, they don’t need to remember each new medicine, dose and timing.”

“

Decision for ‘safe for discharge’ is to be based on unchanged, routine discharge criteria. The decision can be made by physiotherapists or by senior ward nurses.

”

How is Pre-Assessment addressed?

“The only change here would be to have a ‘separate pathway’ for these outpatient arthroplasty patients. Following the principle of having the same message at every step of the pathway. For instance: that it is safe to go home the same day as surgery. So a separate section in the patient education app ‘Mymobility’ for outpatients where the message varies from that for standard pathway patients.”

How do you handle Physiotherapy?

“There may be a staffing implication on the days we plan outpatient joint surgery for physiotherapists to stay later. Later on, when the system achieves steady-state, this need may disappear. But permission was sought, and agreed to, from the management to fund bank-rates for physiotherapists to stay on outpatient surgery days past their normal 16:30 hours finish time. Decision for ‘safe for discharge’ is to be based on unchanged, routine discharge criteria. The decision can be made by physiotherapists or by senior ward nurses. Again: this is exactly the same as current practice in Milton Keynes.”





How do you decide on the cut off time for safe discharge?

“At first, 21:00 hours was postulated in our group meeting. But subsequent review of literature has brought that back to 19:00 hours. The later discharge time had no real benefit. So 19:00 it will remain.”

How is infection control covered?

“We have a policy in place with plans for what to do when there is an oozy wound after the patient has gone home. A dedicated baton-phone is to be held by the senior nurse on the ward. This number is given to discharged patient as a direct line. We have a policy to bump up to the resident junior doctor on call in case of a patient query that the nurse is not comfortable answering. A similar bump up is foreseen for the junior doctor when this professional doesn't not feel comfortable answering; to contact the operating surgeon. There is a default setting of re-admission for safety if indicated.

There is also the use of an in-app video conferencing option in 'Mymobility' – the patient engagement and information app we are using, enabling wound review. This can either the patient, or we decide that there is a need for face-to-face review.”

Beyond these eight points, do you have any other issues you might want to comment on?

“Yes, we also chose to leverage a full time Registered Rehabilitation Professional in a co-ordinating role. All of our Rapid Recovery program system changes over the years had been entirely cost neutral and performed with existing staff and resource. But we felt it might be time now to hire a central person whose role is to run the Rapid Recovery Program and outpatient surgery systems, who has more time on his or her hands and could implement regular audit cycles and improvements.”

What was learned during implementation?

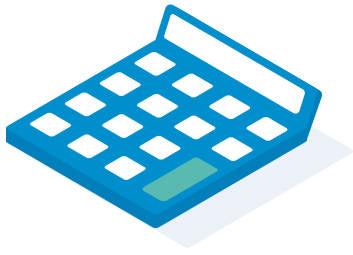
“Following the planning meetings, each member of the group instituted the changes needed to their practice in preparation. They cascaded down the message to all of their teams. Pre-Assessment requested a face-to-face presentation from myself to bring the concept to life for them. Thereafter they came on board heavily in favour, and with a much more profound understanding of what is needed.”

So this pre-assessment proved to be vital?

“One of the knock-on benefits of such a pre-assessment meeting is that all those involved henceforth, as a group, look out for likely candidates for outpatient hip or knee surgery. They then flag them to the operating surgeon as potential cases. This is useful in our UK practice as the waiting list of nine months at the time of writing means that the patients coming up for surgery were already listed before the case for outpatient surgery was discussed. Unfortunately, the Coronavirus pandemic struck with its third wave in the UK, and the department closed down for elective surgery while greater priority patients were treated. Then upon re-opening up shop, the trial has only recently commenced.”

Did anything unexpected occur during implementation so far?

“Our planned first step was to use the new anaesthesia and analgesia protocols on my operating lists. And as is normal with system change, it revealed unexpected gaps. In this case, despite seeking permission from Pharmacy to use Celecoxib instead of Ibuprofen, as was our previous protocol, it was not available on the ward when prescribed. It took a day to work through the system. As a consequence, only one patient got it on the first day of the trial, the others ended up on the older protocol.”



6. FINANCIAL CONSIDERATIONS

Inpatient and outpatient care

the terms ‘Inpatient care’ and ‘outpatient care’ refer to the way in which a healthcare service is provided. Inpatient care involves medical services that require you to get admitted into a hospital.

Outpatient care is the medical service received when you are not required to stay at a hospital. This includes routine check-ups or clinic visits and surgical procedures that allow you to leave the hospital on the same day. Outpatient care provides many benefits for patients. First of all, they are able to recover in the comfort of their own home. They can also enjoy activities of their choice (as long as these do not contradict restrictions given by their healthcare provider). The best care will be driven through easy and convenient communications among providers, patients, caregivers, and specialists. A patient management and communications software platform can help to improve this experience.

More importantly, outpatient procedures usually cost less than the comparable inpatient procedures^{1,2,3}. Staying in a hospital for even one night is already costly.

In the past few decades, the number of surgical procedures carried out on a same-day basis has markedly increased in European countries⁴. Advances in medical technologies – in particular the diffusion of less invasive surgical interventions – and better anaesthetics have enabled this development. These innovations have improved patient safety and health outcomes. Furthermore, by shortening the treatment episode, same-day surgery can save important resources without

any adverse effects on care quality^{1,2,3}. It also frees up capacity within hospitals to focus on more complex cases or to reduce waiting lists.

As technology improves and products such as portable diagnostics and wearable sensors become feasible and more prevalent, business models will need to adapt to this new market landscape. More intuitive, patient friendly and human-centred designs will be required to ensure efficient delivery at the point of care, without having impact on clinical workflows.

Examinations, therapies, and treatments are migrating out of the hospital and into new points of care. This shift is facilitated by changing laws and regulations, allowing patients to receive care in a broader range of settings, including their own homes.

Thanks to these advancements in technology, a shift in healthcare delivery takes place. The needs from clinicians, consumers, governments and health insurers see to it that outpatient care is increasingly compared to inpatient care. This trend will continue in the upcoming years.

Cost allocation problems

Measuring healthcare costs and making them transparent empowers clinical teams to act as ‘resources stewards’⁵ In the value framework, the relevant cost is the total cost of all inputs – such as clinical and administrative – used during a patient’s full care cycle. One may also include social costs related to sick leave and societal costs resulting from lack of autonomy into the total cost overview.

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2. Husted CE, Husted H, Nielsen CS, Mikkelsen M, Troelsen A, Gromov K. No increase in postoperative contacts with the healthcare system following outpatient total hip and knee arthroplasty. Acta Orthop. Acta Orthop; 2021 May 12;1–5.
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5. European Institute of Innovation and Technology Health, Implementing Value-Based Health Care in Europe: Handbook for Pioneers (Director: Gregory Katz), 2020.



Costs remain largely a black box to those who pay for it. It is also still largely a blind spot for hospital managers. As the denominator of the value ratio, cost is difficult to measure for several reasons. First, most hospital cost accounting systems are department-based and not patient-based. In most healthcare organizations, there is virtually no accurate information on the full cost of the care cycle for a patient's particular medical condition. As a result, cost allocations are often based on charges and not on actual costs. Secondly, most healthcare providers are reluctant to share cost information in order to ensure that their net profit margin remains confidential. This is particularly the case since this information could weaken their negotiating stance with health insurance companies and other funders. Finally, prices, tariffs and charges differ dramatically across European health systems.

Diagnosis-Related Groups

Waiting lists for elective surgery are likely to increase further following the COVID-19 pandemic. Long waiting times for health services like elective surgery have been a longstanding issue in many EU countries. Even before the COVID 19 pandemic, these waiting times were on the rise in many countries, as demand for surgery increased more rapidly than supply.

The average length of stay in hospital is often regarded as an indicator of efficiency in health service provision. All else being equal, a shorter stay will reduce the cost per discharge and shift care from inpatient settings to less expensive settings. Longer stays can be a sign of poor care co-ordination, resulting in some patients waiting unnecessarily in the hospital until rehabilitation or long-term care can be arranged.

The hospital stay for the same services differs throughout Europe. Beyond differences in clinical needs, several other factors can explain these cross-country variations. The combination of an abundant supply of beds, together with hospital payment methods may provide incentives for hospitals to keep on patients longer. A growing number of countries, among them France, Germany, Poland, The Netherlands, Austria and Sweden, have moved to prospective payment methods. These are often based on diagnosis-related groups (DRGs) to set payments based on the estimated cost of hospital care for different patient groups in advance of service provision. These payment methods have the advantage of encouraging providers to reduce the cost of each individual hospitalization.

Costs comparison

The following table shows the approximate inpatient tariff versus the outpatient tariff in specific European countries. This table also shows the average bed day costs in that country. All data in this table is based on the current situation at publication of this White Paper and may vary per hospital. We are by no means providing a complete overview. The purpose of this table is to illustrate the complexity of cost comparison and to show that prices differ across European health systems.

Country		Approx. In-patient tariff	Approx. Out-patient tariff	Bed day costs	Remarks
UK	THA	7100	7100	300	HRG code for THR = HN12F
	TKA	7100	7100	300	HRG code HN22E
	UKA	7100	7100	300	HRG code HN22E (procedure code W581)
					Source : NHS England 2020/21 national Tariff All tariffs quoted are exclusive of best practice uplift and market forces factor
Germany	THA	5750	1050	225	DRG 147C
	TKA	6750	1050	225	DRG 144C
	UKA	6000	1050	225	DRG 144D Does not include implant cost Source EBM chapter 31
					Source: Inpatient: DRG Gruppe Uni Münster. Inpatient tariff is exclusive of nursing costs Average bed cost: In EK lump sum catalog 2021
Denmark	THA	6700		1100	KNFC20
	TKA	6700		1100	KNGB40
	UKA				Source, expert opinion Prof Trolsen
Netherlands	THA	8750	6800	400	Zorgproductcode: 131999052/ 051
	TKA	9400	7400	400	Zorgproductcode: 131999104 /103
	UKA				
					Source: 2021 data www.opendisdata.nl accessed 30/9/21
Belgium	THA	9300		600	Code 301 VERVANGING VAN HEUPGEWRICHT
	TKA	8550		600	Code 302 VERVANGING VAN KNIEGEWRICHT
	UKA				
					Source : https://tct.fgov.be/webetct/etct-web/
France	THA	4750			Code: 08C481/482/483/48
	TKA	5250			Code: 08C241/242
	UKA				Source : aideaucodage.fr
					Inpatient tariff is exclusive of implant costs
Italy	THA	8850		750	Code: 544 Sostituzione di articolazioni maggiori o reimpianto degli arti inferiori (Major Joint replacement)
	TKA	8850		750	Code: 544
	UKA				Source : Ministero della Salute
					Ministero tariff, exclusive of additional regional reimbursements; excl. patient death cases where tariff is reduced

OUTPATIENT

The number of cases performed in an OR per day depends on many factors – anaesthesia, recovery room capacity, pre-op processes, efficient movement of patients, staffing. Etc. This of course needs to be a lean process that requires multi-disciplinary collaboration.

In essence the capacity to perform TJA's is determined by the number of beds available, the number of surgeries that can be performed in a day and the mean length of stay (LOS).

The costs involved are usually defined by operational expenditure and capital expenditure (opex and capex). Opex are costs per patient, roughly the costs per day for having a patient in hospital (bed day costs), Staffing costs, diagnostic costs, consumables (mostly surgical) and for TJA, the implant.

Capex costs remain the same, in theory, when the number of surgeries in a day or the LOS changes, provided there are no changes to buildings or spaces and recourses.

A publication in HEALTH ECONOMICS ¹ shows the following numbers ² :

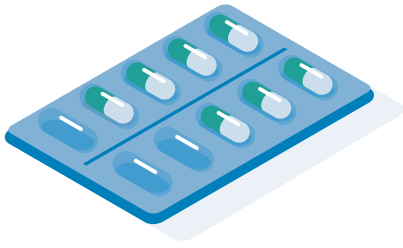
	onetime costs per patient	costs if los=3	# of pat independent
Diagnostic costs	€125,00		
Overall staffing			€1.400,00
Overall material	€150,00		
Operation staffing	€1.300,00		
Operation material	€300,00		
Operation implant	€1.200,00		
Operation drugs	€125,00		
Bed day costs ^c		€ 1.200,00 ³	
Overhead costs			€2.250,00
		Total costs	€8.050,00

If the reimbursement for TKA is €9.400 and the costs are €8.050, the margin could be € 1.150 per patient with a LOS of 3, based on current production and performance.

1. Health Econ. 17: S9–S20, 2008

2. Numbers are corrected to 2021 by 25%

3. For a Dutch hospital



But what if parameters change?

The following cost calculation examples are hypothetical and for demonstration purposes only. All values are estimates only and are not necessarily indicative nor reflective of results in the real world. The numbers are based on the publication in HEALTH ECONOMICS mentioned on the previous page

For the hospital in the example below, where 500 surgeries are performed annually with a length of stay of 3 days, the annual margin on TJA could be € 675.000.

number of patients per year:	500	
los:	3	
	Per pat	Total
One time costs	€3.200,00	€1.600.000,00
Bed day costs per day	€400,00	
Bed day costs total stay	€1.200,00	€600.000,00
Independent costs	€3.650,00	€1.825.000,00
Reimbursement	€9.400,00	€4.700.000,00
Margin		€675.000,00

If this hospital will change the LOS to 1 day by performing all TJA in an outpatient setting, the lower reimbursement rate would cause the margin for this type of surgery to drop to € 75.000 annually.

number of patients per year:	500	
los:	1	
	Per pat	Total
One time costs	€3.200,00	€1.600.000,00
Bed day costs per day	€400,00	
Bed day costs total stay	€400,00	€200.000,00
Independent costs	€3.650,00	€1.825.000,00
Reimbursement (lower tarif)	€7.400,00	€3.700.000,00
Margin		€75.000,00

However, the freed up capacity (which is also determined by LOS) can in theory be utilized without increase in patient independent costs.

LOS	# Surgeries /day	bed capacity (day)	Surgeries per week	Surgeries per year
3	2	6	10	500
2	3	6	15	750
1,5	4	6	20	1000
1	6	6	30	1500

By utilizing this capacity, even by 50%, margins could be back

number of patients per year:	750	
los:	1	
	Per pat	Total
One time costs	€3.200,00	€2.400.000,00
Bed day costs per day	€400,00	
Bed day costs total stay	€400,00	€300.000,00
Independent costs	€2.433,33	€1.825.000,00
Reimbursement (lower tarif)	€7.400,00	€5.550.000,00
Margin		€1.025.000,00

A more realistic scenario, however, is that not all patients will be treated in an outpatient setting. Let's assume it is possible for 50% of the patient population. This would lead to a mean length of stay of 1,7. As a result, margins could be still higher than the conventional setting:

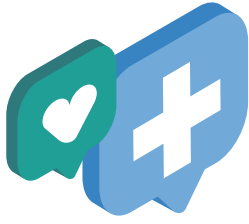
Number of patients per year:	750	
Los:	1,7	
	Per pat	Total
One time costs	€3.200,00	€2.400.000,00
Bed day costs per day	€400,00	
Bed day costs total stay	€680,00	€510.000,00
Independent costs	€2.433,33	€1.825.000,00
Reimbursement (50% normal tarif)	€9.400,00	€3.520.000,00
Reimbursement (50% lower tarif)	€7.400,00	€2.775.000,00
Margin		€1.565.000,00

Hypothetically it would be possible to increase margins even more by switching to a 100% day-care setting, but probably more process optimization, with a focus on OR capacity is needed in that case.

Number of patients per year:	1500	
Los:	1	
	Per pat	Total
One time costs	€3.200,00	€4.800.000,00
Bed day costs per day	€400,00	
Bed day costs total stay	€400,00	€600.000,00
Independent costs	€1.216,67	€1.825.000,00
Reimbursement (lower tarif)	€7.400,00	€11.100.000,00
Margin		€3.875.000,00

Of course this example is highly theoretic, but it highlights that DOS discharge alone does not reduce costs. It does, however, allow the hospital to increase capacity. By utilizing this freed up capacity, or to use the freed up resources in another way, there might be a financial benefit to DOS discharge.





7. HOW CAN ZIMMER BIOMET HELP?

Rapid Recovery enables you to address today's healthcare challenges

The Rapid Recovery Program enables healthcare teams to optimize all aspects of a patient's orthopedic journey with evidence-based clinical protocols.

The program is designed to improve outcomes, quality of treatment and economic performance, minimizing complications and delivering patient-centered care. Standardizing and minimizing variance is an important part of the process, leading to more predictable outcomes. Zimmer Biomet recognizes, however, that process and clinical practice change on this scale can be daunting.

Zimmer Biomet's change management experts partner with hospitals to support executives in the delivery of high-level patient care, improving staff satisfaction, surgical outcomes and financial performance.

Staff at all levels are engaged to establish and develop a multidisciplinary team approach. This can create more efficient pathways that provide the highest levels of patient care with enhanced patient outcomes and patient satisfaction.

Zimmer Biomet's team plays a critical part in successfully implementing and continuously improving the Rapid Recovery Program. We don't just help you to improve the efficiency of your day-to-day logistics – **your department will have access to our European network of key opinion leaders for their expertise as well as the opportunity to visit our Centers of Reference and our European and local symposia.**

Implementing Rapid Recovery Outpatient involves a four step process:

1. **Compass** - Assessing the current situation
2. **Conception** - Creating a project plan
3. **Implementation** - Developments and implementation of the new patient pathway
4. **Continuous improvement** - Qualitative and Quantitative follow up

We'll come and see what you're doing well... and work with you to help you achieve even more.

Learn more with our implementation case studies, at www.rapidrecovery.eu
Or contact rapidrecovery@zimmerbiomet.com





8. FAQ ON OUTPATIENT ARTHROPLASTY*

Prof. Parratte, Prof. Clarius and Prof. Thienpont**

In EMEA, Outpatient arthroplasty is a well discussed topic between orthopaedic surgeons.

In the following section, the most frequently asked questions or concerns are listed with the aim to answer or address these questions or concerns.

On the topic of organizational aspects;

In our organisation patients follow the same pathway, this makes it easy for patients and staff, communication is clear and easy to understand. But outpatient arthroplasty means an additional pathway and this differentiation may cause problems. You must explain to your patients who is suitable and why, so confusion may occur!

(Prof Clarius, Prof Parratte, Prof Thienpont) It's important to understand that the first step towards the implementation of an outpatient pathway is to have a well-organized and well-functioning Rapid Recovery pathway in place. The step to move from a standard pathway to a rapid recovery pathway is probably more important than the step from a Rapid Recovery protocol to an outpatient pathway.

Because of the training and the organization of the team, they will be used to safely implement an outpatient pathway based on the medical and surgical protocols presented earlier in this document. Patients need to be selected very carefully according to our presented criteria.

Patients might need more help at home instead of being cared for in hospital therefore a new treatment network needs to be set up with a new costs!

(Prof Clarius, Prof Parratte, Prof Thienpont) Patient`s undergoing outpatient surgery have the same protocol at home as the patients staying 2 or 3 nights in the hospital. This doesn't really require any specific treatment network compared to the actual system.

Implementing outpatient protocols means additional tasks such as telephone hotline for pain, complication and self-medication, or for remote follow-up!

(Prof Clarius, Prof Parratte, Prof Thienpont) The additional tasks are very limited compared to an inpatient Rapid Recovery pathway. As for any other surgery, patients should be able to reach the treating department over the phone.

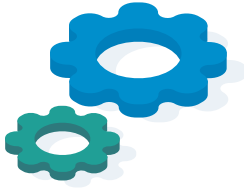
But outpatient arthroplasty means a change in the order of the OR planning, it used to be old and ill patients first, now it's outpatients first!

(Prof Clarius, Prof Parratte, Prof Thienpont) Indeed, some changes have to be made, but good teamwork and a combined effort in the preparation of the OR planning will allow the team to perform all surgeries safely. As the experience with outpatient arthroplasty grows, you will find that scheduling outpatient later on the OR planning will still allow for safe discharge at the day of surgery.

* Results are not necessarily typical, indicative, or representative of all recipient patients. Results will vary due to health, weight, activity and other variables. Not all patients are candidates for this procedure.

** Prof. Parratte, Prof. Clarius and Prof. Thienpont are paid consultants of Zimmer Biomet or its affiliates.





There will be a need for backup beds, if the patient is not able to be discharged, with the associated costs!

(Prof Clarius, Prof Parratte, Prof Thienpont) The rate of patients not able to meet the discharge criteria is very low in a running practice with outpatient arthroplasty and it usually doesn't require any extra backup beds. At the beginning of the journey however this might be a safe measure, but only for a limited period of time.

There will be a transfer of tasks to GP's!

(Prof Clarius, Prof Parratte, Prof Thienpont) As for the Rapid Recovery protocols, GP's are involved in the follow-up of the patients' medical conditions but not more than for the normal inpatient orthopaedic follow-up.

What happens with the ward? Only frail patients will be hospitalized, changing the patient mix and putting more pressure on the nurses!

(Prof Clarius, Prof Parratte, Prof Thienpont) The adoption of outpatients protocols might change the split of the workload and pressure for the nurses but not increase it

On the topic medical aspects;

What about the management of complications : who will do this and how ?

(Prof Clarius, Prof Parratte, Prof Thienpont) As for the Rapid Recovery protocols, patients should be able to contact the hospital at any time for the appropriate and dedicated management of potential complications. The protocols to prevent complications such as dizziness, pain, nausea, vomiting, bleeding, oozing wounds and anaemia have been defined earlier in the document and are already a part of the inpatient Rapid Recovery process. Patients and families alike should be instructed to contact the hospital in case of any adverse event during the days following the surgery.

But wont I lose control over the process!

(Prof Clarius, Prof Parratte, Prof Thienpont) The opposite effect will occur as the surgeon will remain the leader of the team, making sure that clear and standardized protocols are applied all along the patient pathway.

On the topic financial aspects;

It all sounds like a good idea, but I will be punished financially!

(Prof Clarius, Prof Parratte, Prof Thienpont) The financial aspect of outpatient surgery is different for every country and it's still true that the financial benefit to implement an outpatient pathway for arthroplasty is not positive in every country in EMEA.

But the financial pressure on the healthcare systems and positive examples in Nordic countries will probably help to recognize the financial benefits of these protocols and allow their applications in more and more countries in the years to come.



