

## Questionnaire S1 – for orthopaedists

### Preoperative examinations

1. What laboratory and microbiological tests do you routinely order for EVERY patient before elective total hip or knee arthroplasty?\*

- Complete blood count (CBC)
- Iron
- Ferritin
- TIBC
- Electrolytes
- Albumins
- Total protein
- aPTT/INR
- CRP
- ESR
- Creatinine
- Urea
- ALT/AST
- TSH
- fT3/fT4
- Troponins
- BNP/NT-proBNP
- Fasting blood glucose
- Incidental blood glucose
- Blood group
- Urinalysis
- MRSA/MSSA nasal swab
- Rectal swab for multidrug-resistant strains
- Anti-HIV antibodies
- HBsAg
- Anti-Hbs antibodies
- Anti-HCV antibodies
- Others:

2. What additional examinations do you routinely order for EVERY patient before total hip or knee arthroplasty?\*

- Resting ECG
- Exercise ECG (exercise stress test)
- Comparison of resting ECG data (e.g. ECG performed at the outpatient clinic/GP's practice and in hospital)
- Cardiac echo
- Chest X-ray
- Spirometry
- Peak flow screening test
- 6-minute walk test (6MWT)
- X-ray of surgery site
- Ultrasound of surgery site
- CT scan of surgery site
- MRI scan of surgery site

- Bone mineral density test of surgery site (in patients aged 75+)
- Others

3. What consultations do you routinely order for EVERY patient before total hip or knee arthroplasty?\*

- No consultation is routinely required
- Internal medicine or family physician
- Internal medicine physician
- Family physician
- Cardiologist
- Pulmonologist
- Gynaecologist (in women)
- Dentist
- Laryngologist
- Vascular surgeon
- Dermatologist
- Physiotherapist
- Dietitian
- Others

### **Patient preparation for surgery**

4. Does your hospital have a standardized perioperative management procedure for patients undergoing elective total hip or knee arthroplasty?\*

- Yes, for both procedures
- Only for total hip arthroplasty
- Only for total knee arthroplasty
- No standard protocol is used

5. During patient preparation for elective total hip or knee arthroplasty, do you prescribe treatment to patients diagnosed with asymptomatic bacteriuria?\*

- I never order this test in asymptomatic patients
- I never prescribe antibiotics in such cases
- Yes, after obtaining microbiological test results I prescribe targeted antibiotics (based on antibiotic susceptibility test results)
- Yes, I prescribe empiric antibiotics
- I order a repeat urine test and if it is positive again, I prescribe targeted antibiotics (based on antibiotic susceptibility test results)

6. Is patient rehabilitation routinely prescribed in your hospital department before performing total hip or knee arthroplasty?\*

- No preoperative rehabilitation is prescribed
- Yes, patients receive preoperative rehabilitation covered by the National Health Service (NFZ)
- Yes, patients are advised to arrange privately-funded rehabilitation services
- Others:

7. Does your hospital provide patient education prior to total hip or knee arthroplasty, covering perioperative management and postoperative recovery and rehabilitation?

- No, there is no preoperative patient education

- Yes, education is provided during the patient's appointment at the orthopaedic outpatient clinic to assess eligibility for the procedure
- Yes, education is provided during a separate appointment/session with an educator prior to surgery
- Yes, education is provided after the patient's hospital admission for surgery
- Yes, patients are provided with brochures and posters
- Others:

### **Perioperative therapy with drugs affecting blood coagulation**

8. Do you routinely use tranexamic acid (Exacyl) perioperatively in elective total hip or knee arthroplasty procedures (in the absence of contraindications)?\*

- No, I never use it
- Yes, orally
- Yes, intravenously
- Yes, it is administered topically by the operator during the procedure
- I leave it to the anaesthesiologist to decide
- Others

9. When do you routinely initiate thromboprophylaxis in patients scheduled for elective total knee or hip arthroplasty?\*

- I never prescribe thromboprophylaxis
- On the day before the procedure
- On the day of the procedure (immediately before surgery)
- On the day of the procedure, several/about a dozen hours after surgery
- On postoperative day 1
- I leave it to the anaesthesiologist to decide

10. What drug do you routinely use for thromboprophylaxis after elective total hip arthroplasty? (in the absence of contraindications)\*

- Low-molecular-weight heparin (LMWH)
- New-generation oral anticoagulant
- Aspirin without other anticoagulants
- I never prescribe thromboprophylaxis
- Others

11. What drug do you routinely use for thromboprophylaxis after elective total knee arthroplasty? (in the absence of contraindications)\*

- Low-molecular-weight heparin (LMWH)
- New-generation oral anticoagulant
- Aspirin without other anticoagulants
- I never prescribe thromboprophylaxis
- Others

12. For how long after hospital discharge do you recommend to continue thromboprophylaxis in patients after elective total hip arthroplasty?\*

- I never prescribe thromboprophylaxis after hospital discharge
- < 7 days after hospital discharge
- 7-14 days after hospital discharge
- 15-21 days after hospital discharge

- 22-28 days after hospital discharge
- 29-35 days after hospital discharge
- > 35 days after hospital discharge

13. For how long after hospital discharge do you recommend to continue thromboprophylaxis in patients after elective total knee arthroplasty?\*

- I never prescribe thromboprophylaxis after hospital discharge
- < 7 days after hospital discharge
- 7-14 days after hospital discharge
- 15-21 days after hospital discharge
- 22-28 days after hospital discharge
- 29-35 days after hospital discharge
- > 35 days after hospital discharge

### **Perioperative procedures**

14. On which postoperative day is the urinary catheter removed routinely in patients after elective total hip or knee arthroplasty?\*

- Urinary catheterization is not routinely performed before such procedures
- On the day of the procedure
- On postoperative day 1
- On postoperative days 2–4
- On postoperative days >4
- After upright positioning of the patient

15. Do you use a tourniquet (Esmarch bandage) during total knee arthroplasty?\*

- Yes, on a routine basis
- Yes, usually
- Yes, occasionally
- No, never

16. Do you leave a drain in the surgical site after elective total hip arthroplasty?\*

- Yes, on a routine basis
- Yes, usually
- Yes, occasionally
- No, never

17. Do you leave a drain in the surgical site after elective total knee arthroplasty?\*

- Yes, on a routine basis
- Yes, usually
- Yes, occasionally
- No, never

### **Patient preparation for discharge**

18. On which postoperative day are patients typically discharged home after elective total hip arthroplasty?\*

- On postoperative day 1
- On postoperative days 2-4
- On postoperative days 5-7

- On postoperative days 8-10
- On postoperative days 11-14
- On postoperative days > 14

19. On which postoperative day are patients typically discharged home after elective total knee arthroplasty?\*

- On postoperative day 1
- On postoperative days 2-4
- On postoperative days 5-7
- On postoperative days 8-10
- On postoperative days 11-14
- On postoperative days > 14

20. Does your hospital perform elective total hip or knee arthroplasty on a same-day surgery basis?\*

- Yes, both procedures
- Only total hip arthroplasty
- Only total knee arthroplasty
- No

21. Does your hospital have a set of patient discharge criteria which must be met by patients undergoing elective total hip or knee arthroplasty to be discharged from the hospital?\*

- No standardized protocol is followed
- Yes, for both procedures
- Only for total hip arthroplasty
- Only for total knee arthroplasty

22. On which postoperative day after elective total hip arthroplasty are patients usually positioned upright?\*

- On the day of the procedure
- On postoperative day 1
- On postoperative day 2
- On postoperative day 3
- On postoperative day 4
- On postoperative days > 4

23. On which postoperative day after elective total knee arthroplasty are patients usually positioned upright?\*

- On the day of the procedure
- On postoperative day 1
- On postoperative day 2
- On postoperative day 3
- On postoperative day 4
- On postoperative days > 4

24. Is a cardiac troponin test performed in your hospital in patients at high risk of cardiovascular complications on a routine basis (i.e. without symptoms of stenocardia or dyspnoea) after total hip or knee arthroplasty?\*

- A cardiac troponin test is not performed in asymptomatic patients
- Yes, on postoperative day 1

- Yes, I order a series of tests during the first 2–3 days after the procedure
- I leave it to the anaesthesiologist to decide

### Statistical questions

25. How many beds are there in the orthopaedics department where you work?\*

- < 10
- 10-20
- 21-30
- 31-40
- 41-50
- > 50

26. What type of hospital do you work in?\*

- University hospital
- Non-university hospital
- Military hospital

27. How many beds are there in the hospital where you work?\*

- < 200 beds
- 200-400 beds
- 400-600 beds
- 600-800 beds
- 800-1000 beds
- > 1000 beds

28. In terms of population, how big is the town/city where the hospital you work in is located?\*

- < 25,000 inhabitants
- 25,000-49,000 inhabitants
- 50,000-99,000 inhabitants
- 100,000-249,000 inhabitants
- 250,000-499,000 inhabitants
- 500,000-1 million inhabitants
- > 1 million inhabitants

29. How many years have you been in the profession?\*

- < 5 years
- 5-10 years
- 10-15 years
- 15-20 years
- > 20 years

30. What is the full name of the hospital where you work?\*

Please enter your answer here:

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## Questionnaire S2 – for anaesthesiologists

### Preoperative assessment for anaesthesia

1. What laboratory and microbiological tests do you routinely order for EVERY patient before anaesthesia for elective total hip or knee arthroplasty?\*

- Complete blood count (CBC)
- Iron
- Ferritin
- TIBC
- Electrolytes
- Albumins
- Total protein
- aPTT/INR
- CRP
- ESR
- Creatinine
- Urea
- ALT/AST
- TSH
- fT3/fT4
- Troponins
- BNP/NT-proBNP
- Fasting blood glucose
- Incidental blood glucose
- Blood group
- Urinalysis
- MRSA/MSSA nasal swab
- Rectal swab for multidrug-resistant strains
- Anti-HIV antibodies
- HBsAg
- Anti-Hbs antibodies
- Anti-HCV antibodies
- Others:

2. What additional examinations do you routinely order for EVERY patient before anaesthesia for elective total hip or knee arthroplasty?\*

- Resting ECG
- Exercise ECG (exercise stress test)
- Comparison of resting ECG data (e.g. ECG performed at the outpatient clinic/GP's practice and in hospital)
- Cardiac echo
- Chest X-ray
- Spirometry
- Peak flow screening test
- 6-minute walk test (6MWT)
- Others:

3. What consultations do you routinely order for EVERY patient before anaesthesia for elective total hip or knee arthroplasty?\*

- No consultation is routinely required
- Internal medicine or family physician
- Internal medicine physician
- Family physician
- Cardiologist
- Pulmonologist
- Gynaecologist (in women)
- Dentist
- Laryngologist
- Vascular surgeon
- Dermatologist
- Physiotherapist
- Dietitian
- Others

4. Where and when do patients undergo preanesthetic evaluation before elective total hip or knee arthroplasty?\*

- In an anaesthesia outpatient clinic prior to hospital admission
- Preliminary assessment in an anaesthesia outpatient clinic prior to hospital admission, final assessment upon admission to the orthopaedics department
- Upon hospital admission

5. Does your hospital have a standardized perioperative anaesthetic management procedure for patients undergoing elective total hip or knee arthroplasty?\*

- Yes, for both procedures
- Only for total hip arthroplasty
- Only for total knee arthroplasty
- No standard protocol is used

### **Anaesthetic management in patients undergoing total knee arthroplasty**

6. What is your preferred type of anaesthesia for total knee arthroplasty (in the absence of contraindications)?\*

- General anaesthesia
- Subarachnoid (spinal) anaesthesia
- Combine

7. What methods to control postoperative pain do you routinely use in patients undergoing total knee arthroplasty under general anaesthesia (in the absence of contraindications)?\*

- Systemic analgesics
- Plexus or peripheral nerve block
- Epidural anaesthesia
- Local anaesthetic wound infiltration (performed by the operator)
- Others:

8. What methods to control postoperative pain do you routinely use in patients undergoing total knee arthroplasty under subarachnoid block (in the absence of contraindications)?\*

- Systemic analgesics



- Plexus or peripheral nerve block
- Epidural anaesthesia
- Local anaesthetic wound infiltration (performed by the operator)

9. What is your preferred peripheral regional block used for perioperative analgesia in patients undergoing elective total knee arthroplasty (in the absence of contraindications)?\*

- I never use peripheral regional nerve block
- Femoral nerve block
- Adductor canal (saphenous nerve) block
- Sciatic nerve block
- Tibial nerve block
- iPACK block (infiltration of local anaesthetics between the popliteal artery and capsule of the posterior knee)
- Others:

### **Anaesthetic management in patients undergoing total hip arthroplasty**

10. What is your preferred type of anaesthesia for total hip arthroplasty (in the absence of contraindications)?\*

- General anaesthesia
- Subarachnoid (spinal) anaesthesia

11. What methods to control postoperative pain do you routinely use in patients undergoing total hip arthroplasty under general anaesthesia (in the absence of contraindications)?\*

- Systemic analgesics
- Plexus or peripheral nerve block
- Epidural anaesthesia
- Local anaesthetic wound infiltration (performed by the operator)
- Others:

12. What methods to control postoperative pain do you routinely use in patients undergoing total hip arthroplasty under subarachnoid block (in the absence of contraindications)?\*

- Systemic analgesics
- Plexus or peripheral nerve block
- Epidural anaesthesia
- Local anaesthetic wound infiltration (performed by the operator)

13. What is your preferred peripheral regional block used for perioperative analgesia in patients undergoing elective total hip arthroplasty (in the absence of contraindications)?\*

- I never use peripheral regional nerve block
- Lumbar plexus block
- Fascia iliaca compartment block
- Femoral nerve block
- Sciatic nerve block
- Obturator nerve block
- Others:

## Perioperative pain therapy

14. Do you use opioids for central nerve block (in addition to local anaesthetics) in patients undergoing total hip or knee arthroplasty?\*

- Yes, on a routine basis
- Yes, usually
- Yes, occasionally
- No, never

15. Do you use preemptive analgesia in patients undergoing general anaesthesia for elective total knee or hip arthroplasty?\*

- Yes, on a routine basis
- Yes, usually
- Yes, occasionally
- No, never

16. What medications do you routinely use perioperatively for multimodal analgesia in patients undergoing elective total knee or hip arthroplasty (in the absence of contraindications)?\*

- Paracetamol
- Nonsteroidal antiinflammatory drugs
- Metamizole (dipyrone)
- Opioids (does not include opioids administered intraoperatively)
- Intravenous lignocaine
- Ketamine
- Glucocorticoids
- Magnesium
- Gabapentin
- Pregabalin
- Others:

## Perioperative procedures

17. Do you routinely use tranexamic acid (Exacyl) perioperatively in patients undergoing elective total hip or knee arthroplasty (in the absence of contraindications)?\*

- No, I never use it
- Yes, orally
- Yes, intravenously
- Yes, it is administered topically by the operator during the procedure
- I leave it to the operator to decide

18. Do you routinely perform urinary catheterization in patients undergoing elective total hip or knee arthroplasty?\*

- No, I do not perform it
- Yes, for both procedures
- Yes, for total hip arthroplasty
- Yes, for total knee arthroplasty
- Only in selected patients

19. Is a cardiac troponin test performed in your hospital in patients at high risk of cardiovascular complications on a routine basis (i.e. without symptoms of stenocardia or dyspnoea) after total hip or knee arthroplasty?\*

- A cardiac troponin test is not performed in asymptomatic patients
- Yes, on postoperative day 1
- Yes, I order a series of tests during the first 2–3 days after the procedure
- I leave it to the physician in charge (orthopaedist) to decide

### Statistical questions

20. What type of hospital do you work in?\*

- University hospital
- Non-university hospital
- Military hospital

21. How many beds are there in the hospital where you work?\*

- < 200 beds
- 200-400 beds
- 400-600 beds
- 600-800 beds
- 800-1000 beds
- > 1000 beds

22. In terms of population, how big is the town/city where the hospital you work in is located?\*

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23. How many years have you been in the profession?\*

- < 5 years
- 5-10 years
- 10-15 years
- 15-20 years
- > 20 years

24. What is the full name of the hospital where you work?\*

Please enter your answer here:

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**Table S1.** Laboratory tests ordered by medical specialty

Type of laboratory test	Orthopaedics	Anaesthesiology	<i>P</i>
Complete blood count	147 (79%)	297 (99%)	< 0.001
Iron	3 (2%)	2 (1%)	0.595
Ferritin	0 (0%)	1 (0%)	1.000
TIBC	0 (0%)	1 (0%)	1.000
Electrolytes	141 (75%)	284 (95%)	< 0.001
Albumins	15 (8%)	11 (4%)	0.063
Total protein	26 (14%)	17 (6%)	0.003
Creatinine	132 (71%)	234 (78%)	0.072
Urea	100 (53%)	158 (53%)	0.966
ALT/AST	32 (17%)	18 (6%)	< 0.001
APTT/ INR	100 (53%)	263 (88%)	< 0.001
CRP	99 (53%)	78 (26%)	< 0.001
ESR	46 (25%)	12 (4%)	< 0.001
TSH	21 (11%)	11 (4%)	0.002
ft3/ft4	10 (5%)	4 (1%)	0.022
Troponins	2 (1%)	3 (1%)	1.000
BNP/NT-proBNP	1 (1%)	1 (0%)	1.000
Fasting blood glucose	97 (52%)	170 (57%)	0.327
Incidental blood glucose	14 (7%)	32 (11%)	0.308
Blood group	137 (73%)	256 (86%)	0.001
Urinalysis	88 (47%)	60 (20%)	< 0.001
MRSA/MSSA nasal swab	79 (42%)	38 (13%)	< 0.001
Rectal swab for multidrug-resistant strains	12 (6%)	14 (5%)	0.535
Anti-HIV antibodies	6 (3%)	11 (4%)	0.983
HBsAg	29 (16%)	52 (17%)	0.677
Anti-Hbs antibodies	21 (11%)	22 (7%)	0.194
Anti-HCV antibodies	25 (13%)	52 (17%)	0.292

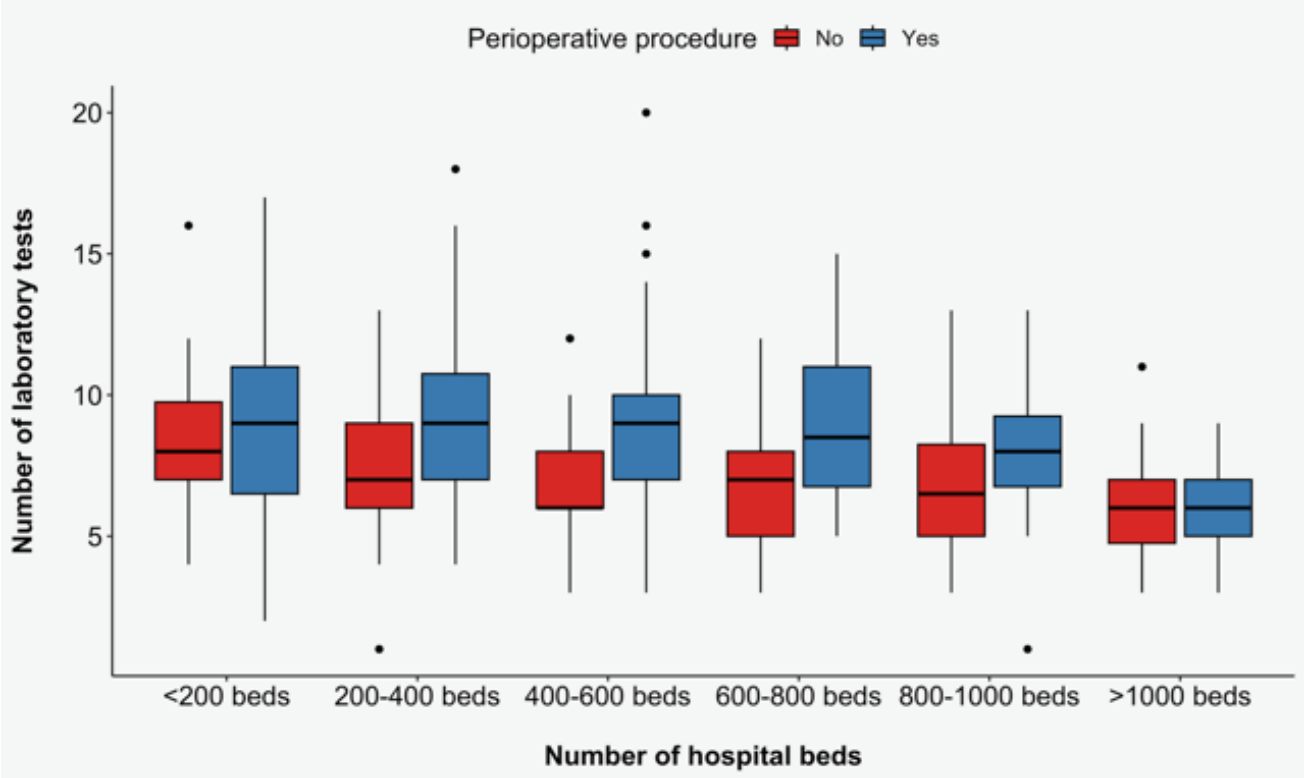
**Table S2.** Comparison of replies to the question about routinely performed additional imaging examinations (broken down by medical specialty)

<b>Type of additional examination</b>	<b>Orthopaedics</b>	<b>Anaesthesiology</b>	<b><i>P</i></b>
Resting ECG	141 (75%)	276 (92%)	0
Exercise ECG	1 (1%)	0 (0%)	1
Cardiac echo	10 (5%)	2 (1%)	0.158
Chest X-ray	67 (36%)	97 (32%)	1
Spirometry	1 (1%)	0 (0%)	1
Peak flow screening test	0 (0%)	1 (0%)	1
6-minute walk test (6MWT)	0 (0%)	1 (0%)	1

**Table S3.** Replies given by orthopaedists to the question about routine imaging examinations of the surgical site

<b>Examination type</b>	<b>Yes (%)</b>
X-ray of the surgical site	127/187 (68)
Ultrasound of the surgical site	4/187 (2)
CT of the surgical site	10/187 (5)
MRI of the surgical site	4/187 (2)
Bone mineral density test	3/187 (1.6)

**Figure S3** presents a comparison of incidence of laboratory tests and consultations ordered by medical practitioners (expressed as percentage), in reference to perioperative procedure application and hospital size



**Table S4.** Recommendations of anaesthesiologists' societies regarding preanaesthesia evaluation

	<b>The Royal College of Anaesthetists [1]</b>	<b>Gesellschaft für Anästhesiologie &amp; Intensivmedizin [2]</b>	<b>American Society of Anesthesiologists [3]</b>
<b>Time of pre-anaesthesia evaluation</b>	As soon as possible after surgical eligibility assessment, at least two weeks before the date of the elective procedure	Adequately in advance, to be able to implement the instructions of the person performing eligibility assessment, not earlier than six weeks before the procedure	No timelines are set. In minimally invasive procedures, eligibility assessment is acceptable on the same day.
<b>Modifications</b>	Eligibility assessment is frequently performed by a trained nurse, a physician serves as a consultant evaluating eligibility for the procedure in patients at higher risk of perioperative complications.	N/A	<i>Perioperative Surgical Home (Kain) [3]</i> Comprehensive standardized perioperative care (eligibility assessment-treatment-discharge). Major emphasis on patient preparation according to the guidelines, involving patients in the decision-making process and close cooperation between specialists.

## References

- Chapter 2: Guidelines for the Provision of Anaesthesia Services for the Perioperative Care of Elective and Urgent Care Patients, The Royal College of Anaesthetists, 2022, <https://rcoa.ac.uk/gpas/chapter-2>
- Präoperative Evaluation erwachsener Patienten vor elektiven, nichtkardiologischen Eingriffen, *Der Kardiologe* 5, no 1: 13-26. doi: <https://doi.org/10.1007/s12181-010-0315-x>.
- Committee on Standards and Practice Parameters, Apfelbaum JL, Connis RT, Nickinovich DG; American Society of Anesthesiologists Task Force on Preanesthesia Evaluation, Pasternak LR, Arens JF, Caplan RA, et al. Practice advisory for preanesthesia evaluation: an updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. *Anesthesiology* 2012; 116: 522-538. doi: 10.1097/ALN.0b013e31823c1067. PMID: 22273990.