



Supplement of

A desirability of outcome ranking (DOOR) for periprosthetic joint infection – a Delphi analysis

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Round 1 of Delphi

A Desirability of Outcome Ranking for Prosthetic Joint Infection

This questionnaire is aimed at experts in the management of prosthetic joint infection, including orthopaedic surgeons and infectious diseases physicians / clinical microbiologists. Please answer from your perspective as a clinician considering what is most important for your patient.

Responses will be anonymous and confidentiality will be maintained. Only combined results (by speciality e.g. infectious diseases or orthopaedics, and in total), not individual responses, from the questionnaire will be published.

“Cure” for periprosthetic joint infection means no clinical or microbiological evidence of ongoing infection, no further suppressive antibiotics and retention of the original prosthesis at the end of the initial treatment as defined by the international consensus criteria (Diaz-Ledezma et al, 2013).

There are 17 questions for acute prosthetic joint infections, 17 questions for chronic prosthetic joint infections and 17 questions for a frail patient with a prosthetic joint infection. Though the questions may seem repetitive between scenarios we are interested to see if answers differ between scenarios. We estimate the survey will take 15-20 minutes to complete.

There are no “correct” answers, rather we are interested in your expert opinion.

1. Please select your speciality
 - Infectious Diseases
 - Orthopaedic Surgery

Scenario #1: Late acute knee PJI treated with DAIR

A 64-year-old patient, with well controlled type 2 diabetes but otherwise well had a left knee replacement 5 years ago for osteoarthritis. He has functioned very well after the knee replacement. At 4 years post-operatively he 24 hours of symptoms and had a prosthetic joint infection of that knee with blood and synovial fluid growing a sensitive Staphylococcus aureus (MSSA). The implant appeared stable on plain X-rays and intra-operatively. He was treated with debridement, antibiotics and implant retention (DAIR), an initial debridement, including liner exchange, and implant retention, along with a 6-week course of intravenous flucloxacillin, followed by 6 weeks of oral rifampicin and fusidic acid. At the end of 12 weeks of antibiotics, he was considered clinically cured and antibiotics were ceased. You review the patient 12 months after the initial infection presentation.

2. In this scenario, please rank the following from most desirable (1) to least desirable (6) outcome at 12 months after the initial infection presentation.
 - Relapsed and attempted 2-stage revision failed, requiring radical surgery in the form of above knee amputation. Stump well healed and walking with prosthesis
 - Ongoing clinical cure with no need for further surgery or antibiotics.
 - Ongoing clinical cure but required a repeat debridement and a further 12 weeks of antibiotics
 - Death
 - Relapsed and now has chronically infected joint requiring long term oral antibiotic suppression. Walks with a stick and has some knee pain requiring regular paracetamol
 - Relapsed and required a 2-stage revision, with 6 weeks of IV antibiotics between the 2 stages. The new (2nd) prosthesis is now functioning well and the patient is not on antibiotics any longer.

3. In this scenario, please rank the following from most important (1) to least important (6) component of the outcome at 12 months after the initial infection presentation.
 - Need for further unplanned debridements (e.g. DAIR)
 - Need for revision of the original prosthesis (e.g. 2-stage exchange arthroplasty)
 - Joint function (e.g. able to walk unaided)
 - General mental & physical health (e.g. SF-12 scores)
 - Infection cure
 - Avoiding major antibiotic-related adverse effects (e.g. C. Difficile diarrhoea, acute kidney injury, PICC-related DVT)

4. Which is more important?
 - Good joint function

- Not requiring another operation after the initial operation
5. Which is more important?
 - Infection cure
 - Not requiring another operation after the initial operation
 6. Which is more important?
 - Infection cure
 - Good joint function
 7. Which is more important?
 - Infection cure
 - Overall mental & physical health
 8. Which is more important?
 - Good joint function
 - Overall mental & physical health
 9. Which is more important?
 - Infection cure
 - Avoiding common antibiotic side effects
 10. Which is more important?
 - Not requiring another operation after the initial operation
 - Overall mental & physical health
 11. Which is more important?
 - Not requiring another operation after the initial operation
 - Avoiding common antibiotic side effects
 12. Which is more important?
 - Overall mental & physical health
 - Avoiding common antibiotic side effects
 13. Which is more important?
 - Avoiding taking lifelong antibiotics
 - Not requiring another operation after the initial operation
 14. Which is more important?
 - Good joint function
 - Avoiding common antibiotic side effects

15. Which is a better outcome?

- Infection suppression with lifelong antibiotics and no further operations
- Have one or more further operations with the possibility of curing the infection

16. Which is a better outcome?

- A chronically infected joint replacement on lifelong suppressive antibiotics and no further operations
- Have an amputation which cures the infection

17. Which is a better outcome?

- Having had a smaller operation (debridement / washout) that has a lower chance of infection cure
- Having had a more extensive operation (revision of replacement) that has a greater chance of infection cure

18. Please include any information regarding the reasoning or thinking for your answers in this scenario.

Scenario #2: Chronic hip PJI treated with 2-stage revision

A 67-year-old man with well-controlled type 2 diabetes and renal impairment but otherwise well had a total hip replacement 3 years ago. His hip replacement became infected 2 years post-operatively which was considered a chronic infection. He underwent a 2-stage revision arthroplasty 1 year ago which did not eradicate the infection and subsequently had a chronic prosthetic hip joint infection. He has continued on lifelong suppressive antibiotics. He lives at home and mobilises independently. You arrange to check his current CRP and FBC. You are reviewing him for his 12-month follow up appointment.

19. In this scenario, please rank the following from most desirable (1) to least desirable (6) outcome at 12 months after the initial infection presentation.

- Relapsed and attempted 2-stage revision failed, requiring radical surgery in the form of above knee amputation. Stump well healed and walking with prosthesis
- Ongoing clinical cure with no need for further surgery or antibiotics.
- Ongoing clinical cure but required a repeat debridement and a further 12 weeks of antibiotics
- Death
- Relapsed and now has chronically infected joint requiring long term oral antibiotic suppression. Walks with a stick and has some knee pain requiring regular paracetamol
- Relapsed and required a 2-stage revision, with 6 weeks of IV antibiotics between the 2 stages. The new (2nd) prosthesis is now functioning well and the patient is not on antibiotics any longer.

20. In this scenario, please rank the following from most important (1) to least important (6) component of the outcome at 12 months after the initial infection presentation.

- Need for further unplanned debridements (e.g. DAIR)
- Need for revision of the original prosthesis (e.g. 2-stage exchange arthroplasty)
- Joint function (e.g. able to walk unaided)
- General mental & physical health (e.g. SF-12 scores)
- Infection cure
- Avoiding major antibiotic-related adverse effects (e.g. C. Difficile diarrhoea, acute kidney injury, PICC-related DVT)

21. Which is more important?

- Good joint function
- Not requiring another operation after the initial operation

22. Which is more important?

- Infection cure
- Not requiring another operation after the initial operation

23. Which is more important?

- Infection cure
- Good joint function

24. Which is more important?

- Infection cure
- Overall mental & physical health

25. Which is more important?

- Good joint function
- Overall mental & physical health

26. Which is more important?

- Infection cure
- Avoiding common antibiotic side effects

27. Which is more important?

- Not requiring another operation after the initial operation
- Overall mental & physical health

28. Which is more important?

- Not requiring another operation after the initial operation
- Avoiding common antibiotic side effects

29. Which is more important?

- Overall mental & physical health
- Avoiding common antibiotic side effects

30. Which is more important?

- Avoiding taking lifelong antibiotics
- Not requiring another operation after the initial operation

31. Which is more important?

- Good joint function
- Avoiding common antibiotic side effects

32. Which is a better outcome?

- Infection suppression with lifelong antibiotics and no further operations
- Have one or more further operations with the possibility of curing the infection

33. Which is a better outcome?

- A chronically infected joint replacement on lifelong suppressive antibiotics and no further operations
- Have an amputation which cures the infection

34. Which is a better outcome?

- Having had a smaller operation (debridement / washout) that has a lower chance of infection cure
- Having had a more extensive operation (revision of replacement) that has a greater chance of infection cure

35. Please include any information regarding the reasoning or thinking for your answers in this scenario.

Scenario #3: Chronic knee PJI treated with DAIR then 2-stage revision in a frail elderly patient

An 86-year-old frail patient, who is underweight with multiple comorbidities including congestive cardiac failure, chronic renal failure, osteoporosis, and chronic obstructive pulmonary disease after previously smoking. He takes prednisone for systemic lupus erythematosus. They had a left knee replacement 10 years ago for osteoarthritis. The result of the knee replacement was excellent with good pain relief and function post-operatively. He currently mobilises with a wheeled walking frame. Two years ago, his knee replacement became infected. He had 4 months of symptoms with positive intra-operative tissue cultures for MSSA. He underwent a DAIR then a 2-stage exchange arthroplasty and had 6 weeks of IV antibiotic therapy treatment followed by oral antibiotics for 4 months. At the end of his antibiotic treatment, he was considered clinically cured and antibiotics were ceased. You review the patient 12 months after his initial infection presentation.

36. In this scenario, please rank the following from most desirable (1) to least desirable (6) outcome at 12 months after the initial infection presentation.

- Relapsed and attempted 2-stage revision failed, requiring radical surgery in the form of above knee amputation. Stump well healed and walking with prosthesis
- Ongoing clinical cure with no need for further surgery or antibiotics.
- Ongoing clinical cure but required a repeat debridement and a further 12 weeks of antibiotics
- Death
- Relapsed and now has chronically infected joint requiring long term oral antibiotic suppression. Walks with a stick and has some knee pain requiring regular paracetamol
- Relapsed and required a 2-stage revision, with 6 weeks of IV antibiotics between the 2 stages. The new (2nd) prosthesis is now functioning well and the patient is not on antibiotics any longer.

37. In this scenario, please rank the following from most important (1) to least important (6) component of the outcome at 12 months after the initial infection presentation.

- Need for further unplanned debridements (e.g. DAIR)
- Need for revision of the original prosthesis (e.g. 2-stage exchange arthroplasty)
- Joint function (e.g. able to walk unaided)
- General mental & physical health (e.g. SF-12 scores)
- Infection cure
- Avoiding major antibiotic-related adverse effects (e.g. C. Difficile diarrhoea, acute kidney injury, PICC-related DVT)

38. Which is more important?

- Good joint function
- Not requiring another operation after the initial operation

39. Which is more important?

- Infection cure
- Not requiring another operation after the initial operation

40. Which is more important?

- Infection cure
- Good joint function

41. Which is more important?

- Infection cure
- Overall mental & physical health

42. Which is more important?

- Good joint function
- Overall mental & physical health

43. Which is more important?

- Infection cure
- Avoiding common antibiotic side effects

44. Which is more important?

- Not requiring another operation after the initial operation
- Overall mental & physical health

45. Which is more important?

- Not requiring another operation after the initial operation
- Avoiding common antibiotic side effects

46. Which is more important?

- Overall mental & physical health
- Avoiding common antibiotic side effects

47. Which is more important?

- Avoiding taking lifelong antibiotics
- Not requiring another operation after the initial operation

48. Which is more important?

- Good joint function
- Avoiding common antibiotic side effects

49. Which is a better outcome?

- Infection suppression with lifelong antibiotics and no further operations
- Have one or more further operations with the possibility of curing the infection

50. Which is a better outcome?

- A chronically infected joint replacement on lifelong suppressive antibiotics and no further operations
- Have an amputation which cures the infection

51. Which is a better outcome?

- Having had a smaller operation (debridement / washout) that has a lower chance of infection cure
- Having had a more extensive operation (revision of replacement) that has a greater chance of infection cure

52. Please include any information regarding the reasoning or thinking for your answers in this scenario.

Thankyou for completing the questionnaire

Round 2 of Delphi

Thank you for participating in the Delphi process for the Desirability of Outcome Ranking for Periprosthetic Joint Infection. The DOOR options have been formed based on the responses from the 1st round.

1. Please select your speciality
 - Infectious Diseases
 - Orthopaedic Surgery

2. Please select one of the following Desirability of Outcome Rankings for Periprosthetic Joint Infection

DOOR 1

- 1st • Good Joint Function with clinical cure
- 2nd • Good Joint Function without clinical cure
- 3rd • Poor Joint Function with clinical cure
- 4th • Poor Joint Function without clinical cure
- 5th • Death

(with Overall Health as Tie-Breaker if two patients have the same ranking in the DOOR)

Where,

Good joint function = e.g. Oxford Knee Score of 30 or better or Oxford Hip Score of 33 or better

Poor joint function = e.g. Oxford Knee Score of 29 or less or Oxford Hip Score of 32 or less

Clinical cure = that defined in the international consensus criteria

Overall health = measured by quality of life score such as SF-12

DOOR 2

1st • Good Overall Health with Clinical Cure

2nd • Good Overall Health without Clinical Cure

3rd • Poor Overall Health with Clinical Cure

4th • Poor Overall Health without Clinical Cure

5th • Death

(with Joint Function as Tie-Breaker if two patients have the same ranking in the DOOR)

Where,

Good overall health = e.g. SF-12 PCS score of 36 or better and MCS of 52 or better

Poor overall health = e.g. SF-12 PCS score of less than 36 and MCS less than 52

Clinical cure = that defined in the international consensus criteria

Joint function = measured by joint score such as Oxford hip or knee score