

# Prosthetic Joint Intraoperative Specimen Microbiology Protocol

In Clinic / Ward

Infection suspected

- Aspirate or Biopsy through intact skin
- Blood culture
- MRSA and ESBL screen
- CRP

**Not:**

- Swabs,
- Sinus fluid
- Drain fluid

In Theatre

Infection suspected

Infection not suspected  
Aseptic loosening, metal, periprosthetic fracture etc

## Intraoperative Specimens Collected at Revision:

- 5 x microbiology biopsies
- 1 x biopsy for histology from most affected area
- eg capsular tissue, femoral and capsular membranes and any other sites of suspected infection.
- An aspirate from the joint capsule may be sent instead of one of the biopsies
- It is OK to collect more than 5 biopsies and they will be combined so that only 5 specimens are processed and reported.
- Metalware may be sent in addition to the 5 biopsies but we are not doing sonication at present.

**Not:**

- Swabs
- Sinus tract tissue
- Washout fluid

## Request:

"Prosthetic Joint Protocol"

- Contact name & number to phone gram stain results to.
- Indicate site where each biopsy was taken from and label A to F
- Indicate which biopsy is for histology
- Indicate whether metalware should be returned and who to.

## Transport:

- In formalin for histology (But send sample to main lab with micro specs)
- With sterile saline or dry or in syringe for aspirates for microbiology.

## Expect:

- Gram stain results from micro samples in 2 hr
- Histology report in 2 working days
- Microbiology culture and antibiotic susceptibility results in 4 days (interim results may come sooner).
- Extended microbiology culture reported at 2 weeks.

Chris Mansell clinical microbiologist Lenny Sanders senior scientist Waikato Hospital 31 July 2015

**In the lab**

This is based on the Oxford protocol validated in Atkins B L et al J Clin Micro 1998 36 2932-2939 and British HPA guideline 2014 <https://www.gov.uk/government/collections/standards-for-microbiology-investigations-smi>

**Forward a sample to histology.**

- If one is labelled for histology, then put it in formalin and send to histo.
- If only 5 biopsies have been received then gently cut the most purulent one in half and send half to histo.

**Histology**

- Report presence of neutrophils > 5 per high power (x400) field

**Combine biopsies until there are only 5 samples.**

- Process any aspirates individually
- Register all aspirates and biopsies under the same number with suffix .900, .901, .902, .903, .904
- Register any metalware separately. This is a good specimen..
- Register any swabs under a separate number, also with .9000, .901, .902 as needed, same for washout fluids and sinus tract tissues. These are suboptimal specimens.

**Findings which should be considered for diagnosis of prosthetic joint infection:**

- clinical examination,
- imaging,
- antibiotic history
- Intraoperative biopsies
- blood cultures
- swabs and CRP

**Gram stain** each of the 5 samples and report after having inoculated all cultures

Clinical guidelines recommend diagnosing PJI when 2 or more intraoperative samples yield the same organism. eg IDSA Clin Infect Dis 2013 56(1) e1-25. However, a breakpoint of  $\geq 3$  is has much better predictive value when 5 good quality intraoperative specimens are available.

**Culture:**

- Extended bacterial culture: SBA and Choc @37C x10 days
- Fungal: SDA @ 30C x14 days
- Anaerobic: FAA x5 days
- Broth: CM 37C CO2 2 days subculture if cloudy to SBA/Choc split plate CO2 x2 days and FAA -)2 x5days
- SBA saline sterility check

**Same or different organism criteria are:**

- Species identification by MALDI-TOF
- Antibiotic susceptibility
  - $\geq 2$  differences in the full range of antibiotics tested (including those not reported) is categorised as a different organism

**Interpretation of the 5 intraoperative biopsy/aspirate samples:**

- $\geq 3/5$  samples with same organism "Evidence of prosthetic joint infection"
- 1 or 2 samples with same organism "Uncertain"
- No samples positive: "Negative"

- **Metalware** samples reported separately
- **Suboptimal specimens** (swabs, sinus tissues and washout fluids) reported separately

**Antibiotic Susceptibility**

Isolate	Antibiotics to test and report		
Staphylococci (Vitek AST-P plus MIC by strip)	Rifampicin Ciprofloxacin Moxifloxacin Fusidic Acid	Cotrimoxazole Clindamycin Vancomycin (MIC @ 0.5 + 2 McF)	Fludoxacillin *Minocycline *Doxycycline
Streptococci (Vitek AST-ST)	Penicillin	Ceftriaxone	Amoxicillin
Enterococci (Vitek AST-P and MIC)	Amoxycillin	Gentamicin (synergy)	Vancomycin
Enterobacteriaceae (Vitek AST-N)	Ciprofloxacin	Gentamicin Tobramycin	Amikacin Cotrimoxazole
Non-Enterobacteriaceae (MIC)	Ciprofloxacin	Gentamicin Tobramycin	Amikacin Cotrimoxazole
Anaerobes (MIC Anaerobe agar)	Clindamycin Augmentin	Meropenem	Metronidazole

Chris Mansell clinical microbiologist Lenny Sanders senior scientist 31 July 2015