

**Joint Trust Guideline for the Management of  
Vertebral Osteomyelitis (VOM), Infective Discitis (ID) and  
Spinal Epidural Abscess (SEA) in Adults**

**A Clinical Guideline recommended**

<b>For use In:</b>	All areas
<b>By:</b>	Medical and Surgical Staff
<b>For:</b>	Adults with Spinal column infection
<b>Division responsible for document:</b>	Trauma and Orthopaedics – Spinal Surgery
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This guideline has been approved by the Trust's Clinical Guidelines Assessment Panel as an aid to the diagnosis and management of relevant patients and clinical circumstances. Not every patient or situation fits neatly into a standard guideline scenario and the guideline must be interpreted and applied in practice in the light of prevailing clinical circumstances, the diagnostic and treatment options available and the professional judgement, knowledge and expertise of relevant clinicians. It is advised that the rationale for any departure from relevant guidance should be documented in the patient's case notes.

The Trust's guidelines are made publicly available as part of the collective endeavour to continuously improve the quality of healthcare through sharing medical experience and knowledge. The Trust accepts no responsibility for any misunderstanding or misapplication of this document.

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## Version and Document Control:

Version Number	Date of Update	Change Description	Author
1		New document	Mr L Lutchman, Dr O Kakisi, C Cubelo

## This is a Controlled Document

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## Abbreviations used within the document:

<b>CT</b>	Computerised Tomography
<b>ECHO</b>	Echocardiogram
<b>ID</b>	Infective Discitis
<b>IE</b>	Infective Endocarditis
<b>IVAB</b>	Intravenous antibiotics
<b>MRI</b>	Magnetic Resonance Imaging
<b>PICC</b>	Peripherally Inserted Central Catheter
<b>PUO</b>	Pyrexia of Unknown Origin
<b>SEA</b>	Spinal Epidural Abscess
<b>SCI</b>	Spinal Cord Injury
<b>TB</b>	Tuberculosis
<b>TOE</b>	Trans Oesophageal Echocardiogram
<b>TTE</b>	Trans Thoracic Echocardiogram
<b>VOM</b>	Vertebral Osteomyelitis

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## Quick Reference Guideline:

- Diagnosis of spinal column infection (Vertebral Osteomyelitis (VOM), Infective Discitis (ID), Spondylodiscitis, Spinal Epidural Abscess) is frequently delayed and a high index of suspicion is required in patients presenting with pyrexia of unknown origin (PUO) with or without spinal pain.
- In patients presenting with sepsis/PUO and who complain of **new onset axial spinal pain**, urgent whole spine MRI should be performed as part of the initial septic screen. Refer to Sepsis Bundle:  
<http://intranet/depart/CriticalCareOutreach/index.htm?p=sepsis.htm&q=>
- In patients presenting with sepsis/PUO but **without any spinal pain**, if no primary infective focus is identified following the usual septic screen investigations (chest X-ray, urine screen, echocardiography, chest/abdominal CT etc.) a whole spine MRI scan should still be performed. VOM and ID can be present even in the absence of spinal pain.
- Neurological compromise is a late manifestation of spinal column infection. The absence of a neurological deficit does not exclude VOM/ID. MRI of the whole spine should be performed prior to the onset of a neurological deficit and a high index of suspicion for VOM/ID should be present in any patient presenting with new onset axial pain, pyrexia and elevated inflammatory markers.
- When MRI confirms the diagnosis of infective discitis or epidural abscess, discuss the patient with the on-call Orthopaedic SpR at the Norfolk and Norwich University Hospital to determine the requirement for any spinal surgery.
- The key to effective management is early recognition and initiation of appropriate antibiotic treatment
- Surgery may be indicated if:
  - There is an epidural abscess causing a neurological deficit.
  - The patient has spinal instability as a consequence of vertebral destruction secondary to the infective process.
  - There are clinical, biochemical or radiological features of worsening infection or a failure to eradicate the infection with antibiotic therapy.
  - There is a presence of an EA or other space-occupying lesion

These patients will be taken over immediately by the spinal team on call.

- The treatment of VOM/ID without surgical indication is long term IVAB. The patient should remain under the admitting team during the investigation of and after the confirmation of VOM or ID with input from the spinal surgical team as required.
- When there is an associated spinal cord injury (SCI), manage patient as per Acute SCI Protocol [Trustdocs Id:12076](#)

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Contact the Lead Spinal Injuries Nurse on extension 3792 or bleeps 0671/0482. Out of hours, contact the Edgefield Ward Coordinator on extension 6012/2502/5964.

- Management is multidisciplinary and involves the physicians, microbiologists, radiologists and rarely spinal surgeons and intensive care specialists.
- Enter any new cases of VOM/ID onto the ICE Spinal MDT Referral Pathway. Enter as much clinical detail as possible and please try to attend the Spinal Surgery/Radiology MDT on Tuesdays at 1300 in the Radiology Seminar Room to present the case. This is the best forum for ensuring good care for these often-complex patients.

## Objective

To ensure safe care of patients and provide appropriate guidance for practitioners in the diagnosis and treatment of VOM, ID and SEA.

To eliminate any ambiguity in the pathway for patients with VOM, ID and SEA and to emphasise that transfer of care to the Spinal Surgery Team is usually not required.

To prevent unnecessary intra or inter hospital transfer of patients with VOM, ID and SEA.

## Rationale

Early diagnosis of VOM/ID, however challenging, is essential in achieving favourable patient outcomes. A high index of suspicion for VOM/ID is required in patients presenting with PUO or sepsis. Careful but basic assessment of patients with particular attention to neurologic manifestations is required (Parra et al 2012).

All medical practitioners require a basic knowledge of the pathology. Once the diagnosis is considered, it is easily confirmed by widely available standard MRI imaging.

Immediate blood culture is mandatory in order to identify the causative organism. Early discussion with the microbiologist and commencement of IVAB are required.

Few patients actually require spinal surgery. These patients often have multiple co-morbidities and additional (primary) sources of sepsis and can be more appropriately managed by the medical team under whom they are admitted with PUO provided they are aware of the potential indications for surgical intervention.

Prolonged, appropriate antibiotic treatment (six weeks of IVAB followed by six weeks of oral antibiotics) is the key factor in the successful management of the majority of patients with VOM/ID or SEA.

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## Broad recommendations

- Start IV Ceftriaxone 2gm OD as per Trust Guideline [Trustdocs Id:12128](#)
- Take baseline blood tests, which include: FBC, U/E's, CRP, ESR, coagulation screen, LFTs, GGT and bone profile.
- Take three sets of blood sample for culture from three different sites, at least six hours apart.
- MRI is the investigation of choice to exclude spinal column infection. Each case should be discussed with the duty radiologist prior to requesting the scan.
- If MRI is not feasible or is contraindicated, the radiologist will usually advise CT spine with contrast.
- Lumbar VOM, ID and SEA is frequently associated with the presence of a psoas abscess. This is not an indication for spinal surgery. Discuss cases of psoas abscess with the consultant radiologist.
- Manage pain appropriately and consider referring to Pain Team.
- Ensure long-term venous access. Book for Peripherally Inserted Central Catheter (PICC) line insertion as soon as possible after discussion with the patient and the Microbiology Department.
- If VOM, ID or SEA is due to Staphylococcus Aureus, discuss with Cardiology Department and consider doing an echocardiogram (ECHO) or Transoesophageal Echocardiogram (TOE).
- Insert self-retaining catheter (SRC) and monitor intake and output.

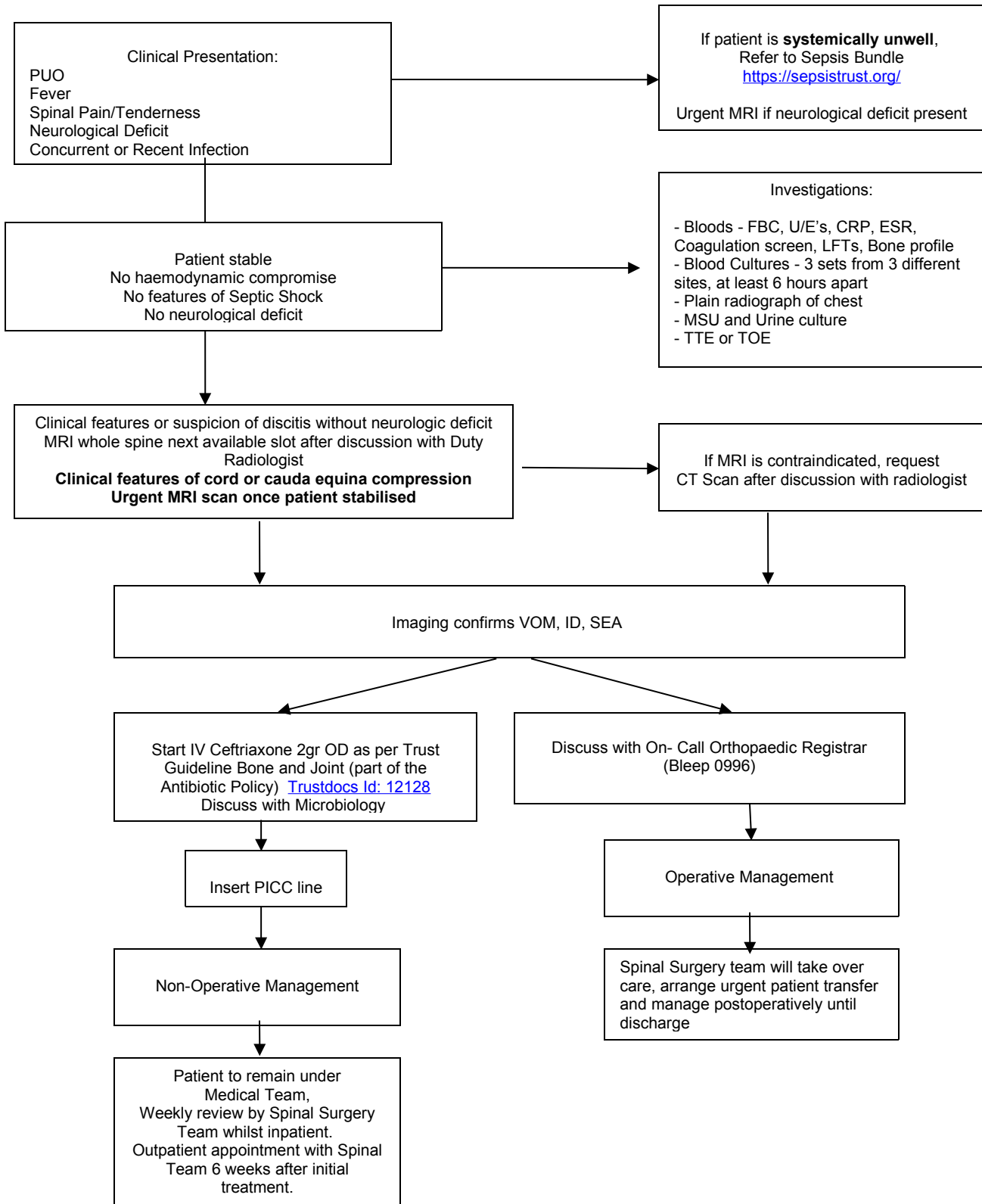
Patients with sepsis and associated discitis and discitis patients with associated medical comorbidities will remain under the care of the admitting team. The spinal surgical on-call team will see these patients on a daily basis.

The spinal surgeons will manage patients with neurological compromise or spinal instability. Following the decision to operate, the surgeons will take over their care and the patient transferred to the orthopaedic ward. After surgery, if the patient requires on-going medical input, the patient will go back under the care of the physicians or they will continue to see the patient on a daily basis on the orthopaedic unit.

Patients with discitis who are over 80 years old (and possibly patient's in their late 70's with severe frailty) will continue to be looked after by OPM.

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## Flowchart for Management of Vertebral Osteomyelitis (VOM), Infective Discitis (ID) and Spinal Epidural Abscess (SEA)



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## Microbiology

### Microbiology Sampling

Perioperative sampling should include at least 3-5 pus, aspirate or tissue material from the affected area.

Patients with suspected/confirmed discitis are at increased risk of being affected with other serious deep-seated infections, such as Infective endocarditis (IE) or deep intraabdominal abscesses. Please obtain at least one set of blood cultures (preferably three if clinical condition allows) for all patients presenting with the clinical or radiological criteria for the diagnosis of discitis. If blood cultures are positive, discuss with Microbiology. The microorganisms may provide some insight regarding the origin of the infection, likely seeding and the need for further imaging.

Patients with spinal surgical site infection are also at risk for haematogenous spread and swabs from the affected area should also accompany a blood culture set.

If the patient has recently travelled from or ordinarily resides in a region where Tuberculosis (TB) is endemic, the likelihood of TB Osteomyelitis in the spine should be considered. Such patient should be discussed with Microbiology Department before samples are taken as special culture methods will be required.

### Antibiotic Management

Following the appropriate criteria evaluation, a patient with suspected or confirmed VOM, ID and SEA should be started empirically on IV antibiotics in the ward. The current guidelines that NNUH follows are in line with the IDSA report on the management of discitis (1) and these suggest the use of 6 weeks of intravenous therapy and additional 6 weeks of oral continuation with an appropriate agent according to microbiological findings. The first line choice for discitis is IV Ceftriaxone 2 gr OD (see flowchart) and after the initial inpatient administration, the remaining duration can also be administered via NNUH@H or Aylsham Suite Services after discussion with the clinical team and Microbiology.

In Severe Penicillin Allergy (history of anaphylaxis or urticarial occurring immediately after penicillin therapy) or if MRSA positive- use 1st line Vancomycin IV (as per hospital policy target level 15-20).

In cases where spinal epidural abscess is involved, you are urged to discuss the duration of treatment and initial choice of antibiotics with Microbiology.

If dural tear present and/or CSF/CNS infection is suspected, please consult with Microbiology for the adjustment of dose.

In cases of the extension of a sacral ulceration you should consider adding in PO Metronidazole 400 mg TDS or discuss with Microbiology regarding extending cover.

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In cases where samples are not positive/ inconclusive for a particular isolate and no response to the empiric antibiotic is seen within 72 hours of the start of treatment, you are also urged to discuss the appropriate antibiotic switch to second line options with Microbiology.

In patients where metalwork/ implants are present/ retained please discuss with Microbiology regarding additional treatment.

The progression of symptoms following the successful start of antimicrobial treatment is expected to move towards resolution of the pain, pyrexia or any other neurological manifestation within the first week and usually by the end of the second week of treatment. By 2 weeks it is widely expected that the symptoms have significantly improved and CRP has at least halved in most of the uncomplicated patient cases. In the patients that have progressed with at least a 50% reduction in the inflammatory markers (CRP) and reduction in pain, we are able to **switch sooner to oral equivalents to the IV antibiotics**, with appropriate follow up and monitoring (2,3). The choice of PO antibiotics must be discussed with Microbiology according to the likely organism/ profile and to maintain equivalent bioavailability to the IV counterpart antibiotics.

The use of adjunctive IV Gentamycin is not recommended universally but only in cases where infective endocarditis (IE) is also diagnosed in which case its use must not exceed that of the initial 2 weeks of overall treatment (1).

## Radiology

Appropriate early imaging (ideally MRI) will usually confirm the diagnosis. Whole spine MRI is preferred as this will exclude skip lesions (other non-contiguous foci of spinal column infection) or multifocal VM O/ID.

The radiologist will usually instruct the MRI radiographers to perform a full-spine T2 “scout” with more dedicated imaging (including axial sequences) confined to only those areas of the spine that appear abnormal.

In patients who cannot undergo an MRI scan (incompatible pacemaker or intracranial clips), urgent CT is indicated. CT myelogram is rarely required.

The advice of a radiologist should be sought once the diagnosis is considered so that expeditious and appropriate imaging is performed.

The yield from CT-guided vertebral biopsy is low and is usually only undertaken when blood cultures are negative and the infection fails to respond to IV antibiotic therapy. If an atypical infection is considered (mycobacterial or fungal) biopsy may be indicated and discussion with the consultant radiologist is recommended.



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As noted previously, large psoas abscesses may require drainage and this is achieved by the passage of a percutaneous drainage catheter (under ultrasound or CT guided) performed by the radiology department.

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### Surgery for spinal column infection

VOM and ID are an increasingly common cause of sepsis. Over 50 cases are treated at NNUH every year. Approximately 30% of patients are intravenous drug abusers. Immunosuppression from any cause is a risk factor but many cases occur in elderly but ordinarily healthy individuals. VOM/ID is uncommon in healthy, young adults.

Few patients require spinal surgery. The majority of VOM/ID responds to medical management.

Surgery may be indicated in the following instances:

#### 1. The presence of an epidural abscess causing a neurological deficit.

Incision and drainage with tissue biopsy may be required (Cottle and Riordan 2008). In the absence of a deficit, surgery is not ordinarily indicated and the epidural abscess can be managed with antibiotics. Regular (twice daily), careful neurological assessment is required to ensure that a neurological deficit does not develop or deteriorate.

#### 2. The patient has spinal instability.

If the patient has persistent, severe spinal pain on mobilisation even after a trial period of broad-spectrum intravenous antibiotics, this might indicate a failure of the structural integrity of the spine. Surgical stabilisation may be required.

#### 3. A failure of antibiotic and conservative treatment.

This is uncommon follow the initiation of appropriate antibiotic therapy.

**Clinical features** of antibiotic failure include persistent, severe spinal pain or a new or progressive neurologic deficit.

**Biochemical indicators** of treatment failure include persistently elevated or increasing inflammatory markers.

**Radiological features** may include deteriorating appearances on MRI or CT with increased inflammatory tissue, enlarging abscesses or progressive bony destruction. Debridement of infected tissue and surgical stabilisation may be required. Surgical samples are subjected to microbiological evaluation to identify resistant organisms.

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**Spinal surgery is otherwise not indicated and there is no merit in the patient being transferred to the Spinal Surgery Service if antibiotic treatment is proceeding successfully.**

## **Clinical audit standards / audit standards / monitoring compliance**

To ensure compliance the above standards, the following monitoring processes will be undertaken:

An audit will be undertaken in 1-2 years. The audit results will be sent to Spine Department, Trauma and Orthopaedic Clinical Director and Matron who will ensure that these are discussed at relevant governance meetings, review the results of the audit, and make recommendations for further action.

## **Summary of development and consultation process undertaken before registration and dissemination**

This policy was drafted on behalf of the Trauma and Orthopaedic Directorate, who has approved final contents of this document. The authors draft was checked and approved by the: Spinal Team, Microbiology Team, Medical and Surgical Doctors.

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