Quality of care indicators for the management of *Staphylococcus aureus* bacteraemia (SAB) in adults

The 'Quality of care indicators for the management of SABs in adults' are also available on the [SAPG website](#) where you will also find the algorithm developed to support the indicators.

	Quality of care indicator	Definition criteria and documentation requirements with rationale(s)
Diagnosis and early clinical management	**1. Clinical Assessment**	• **Assess for severity and sepsis** if national early warning score (NEWS) is 5 or more and seek immediate assessment by senior clinician • **Consider source:** skin or soft tissue, surgical site, vascular device, indwelling device or prosthesis, bone or joint, spine, endocarditis, pacemaker or endovascular infection or injection drug use related infected deep vein thrombosis (DVT) are most common • **Collect relevant microbiology samples**, eg 2 further blood cultures (BCs) sets if endocarditis suspected, urine, pus, sputum, prosthetic material • **Document SAB source and clinical management plan** in patient records
	2. Source control	• Initiate discussion on source control within 24 hours of laboratory confirmation of SAB or identification of infection source • Remove any suspected non-permanent IV catheters immediately • Document IV catheter removal or reason for non-removal **Involve surgical specialist** • To drain collections, abscesses, wash out joints and remove joint prosthesis or cardiovascular implantable device as soon as feasible **If source unknown** – document details of full clinical examination conducted, and planned investigations, including specialist (surgical) review or imaging
	3. Echocardiography	**Perform transthoracic echocardiogram (TTE) in all patients with SAB** • Refer to cardiology if TTE suggestive of endocarditis **Transoesophageal echocardiogram (TOE)** (In patients where TOE is performed first-line a TTE is not needed.)

Quality of care indicator	Definition criteria and documentation requirements with rationale(s)
	• TOE is significantly more sensitive (90-100%) in detecting vegetations than TTE (50-60%) • Refer for TOE if patient has negative or equivocal TTE with predisposing cardiac conditions, prosthetic valve or pacemaker or complicated bacteraemia **Optimal time to perform TTE or TOE:** • If patients has predisposing cardiac conditions for endocarditis or risk factors for complicated bacteraemia then perform TTE/TOE within 3–5 days of first positive blood culture and no more than 14 days later
4. Repeat blood cultures	• **Repeat blood cultures 48 hours after starting IV antibiotics and at 48 hour intervals until negative culture obtained** • **End collection of repeat blood cultures** when first negative blood culture is obtained • Urgently reassess if persistently positive or if clinical deterioration • Persistent bacteraemia is associated with metastatic infection and increased risk of mortality
5. Infection specialist consultation	**Discuss all patients with SAB with an infection specialist (ID physician or microbiologist) who will:** • Advise on those with endocarditis, complex, deep seated, device-related or persistent SABs, people who inject drugs (PWID) with associated infections, or where source is unknown • Confirm therapy recommendations and duration • Advise on suitability or appropriateness of outpatient parenteral antimicrobial therapy (OPAT) or future intravenous to oral switch therapy (IVOST) options • Consider antibiotic-related adverse events or failure to respond to treatment • Advise on healthcare associated SAB

Quality of care indicator	Definition criteria and documentation requirements with rationale(s)

Antibiotic therapy and monitoring

6. Intravenous (IV) antibiotic therapy

Flucloxacillin sensitive (MSSA) and no penicillin allergy
- IV flucloxacillin 2g 4-6 hourly (max 8g daily)
- Consider dose reduction only if creatinine clearance less than 10mls/min. Reduce to 1g 6 hourly if significant renal impairment
- Treatment of endocarditis:

Patient weight	Dose
under 85kg	8g daily in 4 divided doses
85kg and over	12g daily in 6 divided doses

MSSA and true penicillin allergy – use vancomycin as per local guidelines and review when microbiology results are available

MRSA (Methicillin-resistant staphylococcus aureus) - if known MRSA carrier or previous MRSA infection
- Use IV vancomycin (or as per previous microbiology sensitivities)
- Consider adding IV flucloxacillin (if no penicillin allergy) pending sensitivity results
- Review when microbiology results are available

Vancomycin alternative may be recommended by infection specialists based on laboratory or clinical factors

MRSA accounts for less than 4% of SAB infections in Scotland

7. Duration of antibiotic therapy

Duration of therapy depends on whether bacteraemia is complicated or uncomplicated

- **Uncomplicated bacteraemia**
  Definition: clearance of bacteraemia within 4 days for patients with repeat blood cultures, and no fever within 72 hours after the initiation of effective therapy. No implanted prostheses, endocarditis or other metastatic sites of infection.

  Continue IV antimicrobial therapy for 14 days after clearance of bacteraemia

	Quality of care indicator	Definition criteria and documentation requirements with rationale(s)
		• **Complicated bacteraemia** Definition: not meeting the criteria for uncomplicated bacteraemia **Duration is dependent on source control and site/extent of infections but usually a minimum of 28 days with at least 14 days of IV therapy**
	8. IV to oral switch therapy (IVOST)	• Consider after 2 weeks IV therapy if deep seated/complex (non-endocarditis) infection if clinical improvement. Oral options, treatment duration, monitoring and follow up should be agreed with an infection specialist
Other considerations	**9. Outpatient parenteral antimicrobial therapy (OPAT) referral**	• Appropriateness and assessment of OPAT suitability requires evaluation by an OPAT infection specialist and OPAT specialist nurse and only if suitable local service is established • Consider OPAT referral to complete treatment of SAB if: clinically improving, repeat BCs at 48 hours are negative and no other indication for hospital admission. *S.aureus* endocarditis requires 14 days of inpatient treatment but may be considered later for OPAT if clinically improving and not requiring surgical intervention. PWIDs and others at risk of not completing inpatient treatment should be assessed carefully, including by addiction services, prior to discharge
	10. Medical discharge summary	• Document SAB investigations and treatment plan in the medical discharge summary

Further reading

[Management of *Staphylococcus aureus* bacteraemia in adults](#)

[Impact of an evidence-based bundle intervention in the quality-of-care management and outcome of *Staphylococcus aureus* bacteraemia](#)

[Development of quality indicators for the management of *Staphylococcus aureus* bacteraemia](#)

[Transition from intravenous to oral antimicrobial therapy in patients with uncomplicated and complicated bloodstream infections](#)

[Early oral antibiotic switch for *Staphylococcus aureus* bacteraemia: many are called, but few are chosen](#)

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