# Urinary Tract Infection in Pregnancy including Asymptomatic Bacteriuria

Standard Operating Procedure

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| **Written by** | Daisy Bradley – Audit, Guideline and Patient Experience Midwife |
| **Approved by** | **Maternity Governance Meeting** |
| **Date of Approval** | **20th October 2023** |
| **Date of next review**<br>This is the most current document and is to be used until a revised version is available | **20th October 2026** |

## Aim and scope of Standard Operating Procedure

Urinary tract infection and bacteriuria is managed according to current evidence and standards of practice in the wider healthcare community.

A standard of care is specified to facilitate a consistent approach between obstetrics, microbiology, and pharmacy in terms of patient management, specimen processing and drug availability.

## Target Staff Categories

All Maternity staff

## Key amendments to this Standard Operating Procedure

| Date | Amendment | Approved by: |
|---|---|---|
| October 2023 | New SOP | MGM |

## Definitions

**Bacteriuria –** presence of bacteria in the urine

**Asymptomatic bacteriuria (ASB) -** Asymptomatic bacteriuria (ASB) is the presence of 1 or more species of bacteria growing in the urine at specified quantitative counts ($\geq 10^5$ colony-forming units (cful/ml) of a mixed culture with one predominant organism or $\geq 10^4$ cfu/ml of a single organism; some authors accept $\geq 10^3$ cfu/ml of a well-recognised uropathogen like *E.coli*), irrespective of the presence of pyuria, in the absence of signs or symptoms attributable to urinary tract infection (UTI).

**Acute cystitis** - Lower urinary tract symptoms such as dysuria, urinary frequency nocturia, haematuria and supra-pubic discomfort in afebrile women with no evidence of systemic illness. May be bacterial, chemical or trauma induced. For the purposes of this guideline, only bacterial cystitis will be discussed.

**Pyelonephritis** - Significant bacteriuria in the presence of systemic illness and symptoms such as flank / renal angle pain, pyrexia, rigors, nausea and vomiting. Indicates infection of the upper renal tract.

**UTI** – urinary tract infection

**GBS** – Group B *Streptococci*

**M, C&S** – microscopy, culture and sensitivity

**MSU** – mid-stream urine sample

## Introduction

Significant bacteriuria in pregnancy is common and a serious cause of maternal and perinatal morbidity and mortality.

Bacteriuria in pregnancy is associated with increased risk of anaemia, pre-eclampsia, chorioamnionitis, pre-term delivery and post-partum endometritis in the mother.

Fetal and infant risks include foetal growth restriction, pre-term delivery, stillbirth, perinatal mortality, mental retardation, and developmental delay – it is postulated that direct bacterial endotoxin damage, in combination with cerebral hypo perfusion is responsible.

Bacteriuria in pregnancy has three principal presentations: asymptomatic bacteriuria, acute cystitis and pyelonephritis. In pregnancy, the overall incidence of UTI is approximately 8%, but around 30% of women with ASB will develop acute cystitis during their pregnancy. All are amenable to investigation and treatment, substantially improving outcome.

Risk factors which increase the incidence of bacteriuria in pregnancy:

- Urinary stasis and reflux, due to physiological changes in the genitourinary tract during pregnancy
- Presence of glycosuria, amino-aciduria of pregnancy and a fall in urine osmolality favours bacterial proliferation
- Sexual activity: intercourse can traumatise the urothelial of the distal urethra, resulting in increased bacterial invasion. The vagina can act as a reservoir for gastrointestinal bacteria, facilitating inoculation
- Concomitant urinary tract anomalies and maternal disease (e.g. diabetes or sickle cell disease)
- Role of immune status modification in pregnancy and its effect on pathogenicity remains controversial.
- Medical Interventions during pregnancy such as urethral instrumentation and catheterisation predispose to ascending bacteria and can result in nosocomial infection

National guidance is to **NOT** offer ASB screening at booking for all women (DOH, 2020). However, due to our local population and audit findings in preterm birth, WAHT have decided that this should be offered to **ALL** women booking with WAHT.

**General Management of Urinary Tract Infections in Pregnancy**

Pregnant women should be screened for asymptomatic bacteriuria (ASB) by urine culture and treated with appropriate antimicrobials because ASB is a known risk factor for developing pyelonephritis and proceeding to premature delivery.

- Active urinary tract infection should be treated promptly on diagnosis – it is not appropriate to wait for culture and sensitivity results in the pregnant population due to risks of developing ascending infection.
- An MSU must be obtained prior to treatment in order to tailor antibiotic treatment as per the “Start Smart Then Focus” principles of antibiotic stewardship.
- Any decision to treat should be re-evaluated once culture and sensitivity reports are available. Narrow spectrum antibiotics should be used, where safe to do so, guided by the urine culture report.
- Acute cystitis and pyelonephritis demand full assessment and treatment, with early involvement of other specialists in severe or systemic infection.
- DO NOT use dipstick testing to screen for ASB at first or subsequent visits as it lacks sensitivity.

**All women should be reviewed 7 days after completion of treatment course and an MSU sent to confirm post-treatment urine sterility for both ASB and active infections.**

**Self-care advice:**

- Paracetamol can be used to relieve pain and fever.
- Increase fluid intake to avoid dehydration.
- Cranberry juice or other cranberry products are not recommended as there is no good evidence to support their use for treating urinary tract infection. Although urine alkalization has been traditionally used to relieve the symptoms of urinary tract infection, there is a lack of good evidence to support its use. (NICE, 2018)

ASB/Uncomplicated lower UTI: NO signs of sepsis. NO pyelonephritis. (microguide.global)

Upper UTI/Pyelonephritis or signs of sepsis: Signs of sepsis AND/OR pyelonephritis (microguide.global)

For GBS Urine infection, See Local GBS Guideline:

Group B Streptococcal (Early Onset - EOGBS) Disease (Prevention and management)

# Asymptomatic Bacteriuria Screening (Booking MSU)

**All** women should be screened at the antenatal booking appointment by sending a urine sample (MSU) for culture and sensitivity.

Results to be followed up by **requestor** and acted upon within 10 days. *

## Culture Positive?

Yes

Send a second urine sample for culture to confirm the diagnosis and to eliminate contamination. ***This Includes a Mixed Growth result.***

If the woman is **High Risk** for preterm birth treat with broad spectrum Abx at point of first result. (pathway should still be followed). **See appendix 1, page 8**.

Further samples will be required if a **different** organism is grown on second culture.

**Asymptomatic Bacteriuria** diagnosed if second urine sample grows the same organism as the first sample. ***If Mixed Growth for second time treat with broad spectrum Abx.***

**If GBS is Isolated; follow GBS Guideline, counsel appropriately and document clearly on badgernet adding an alert to the records.**

No

No second sample is required if the urine sample is clear.

**Treat asymptomatic bacteriuria as per isolated organism sensitivity results on ICE.**

Taking into consideration the clostridium difficile infection risk of each antimicrobial when deciding which one to use.

Repeat Urine culture should be sent 7 days after completion of antimicrobial treatment as a test of cure.

Positive with same species

**Persistent bacteriuria**
Another course of antibiotics based on MC&S result (same antibiotic(s)) for a longer duration or different antibiotic for standard duration.

Bacteriuria persists after two or more course of therapy.

Discuss with ***Consultant Microbiologist*** to consider long-term suppressive therapy.

Negative or different species

Repeat MSU at every ante-natal visit and treat with appropriate antibiotic when indicated until delivery.

*All Results **must** be filed and actioned on the ICE system as well as entered and published in the Badgernet records.

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# Uncomplicated Lower UTI

# (Cystitis)

Presentation of lower urinary tract infections only, absence of symptoms of systemic infection

Carry out Physical examination in addition to clinical history of presenting complaint

Convincing clinical picture of cystitis or mild lower urinary tract

**Always** send MSU for MC&S before starting antibiotic treatment.

*Dipstick urinalysis is not helpful in diagnosing UTI in pregnancy but may be useful in ruling in/out other diagnoses.*

**Previous MC&S Results on pathology within past 2**

Choose an antibiotic which is suitable for the trimester of pregnancy and according to most recent sensitivity whilst awaiting MC&S results.

***Contact Microbiology if any concerns around previous resistant isolate(s)***

**No Previous Urine Specimen results available**

Choose an empirical antibiotic which is suitable for the trimester of pregnancy whilst awaiting MC&S results.

Follow up MC&S Results **within 48 hours** of diagnosis

No significant bacteriuria

Consider differential diagnosis

Positive Growth and Sensitivities reported.

Change antimicrobial if needed according to culture and sensitivity results. (7-day course)

All Positive MC&S should be treated even in the absence of symptoms – **follow ASB Flowchart.**

**MC&S should be performed 7 days after completion of antibiotic course as a test of cure.**

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# Upper UTI (Pyelonephritis)

Presentation of upper urinary tract infections (Flank/Renal Pain), fever, rigors, nausea and vomiting.

Carry out Physical examination in addition to clinical history of presenting complaint

Convincing clinical picture of pyelonephritis or systemically unwell.

**Always** send MSU for MC&S before starting antibiotic treatment.

Send Bloods: Cultures, FBC, Clotting, Creatinine, U&Es, LFTs, CRP and Blood Glucose

*Dipstick urinalysis is not helpful in diagnosing UTI in pregnancy but may be useful in ruling in/out other diagnoses.*

**Previous MC&S Results on pathology within past 2 years with high level resistance.**

***Contact Microbiology if any concerns around previous resistant isolate(s)***

**No Previous Urine Specimen results available or previous sensitivities reported**

Choose an empirical antibiotic treatment

Consider Renal Ultrasound for ALL patients with suspected pyelonephritis, perform VTE risk assessment and consider thromboprophylaxis.

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Follow up MC&S Results **within 48 hours** of diagnosis

No significant bacteriuria, Blood cultures negative and renal USS NAD.

Consider differential diagnosis

Consider re-imaging the renal tract if there is treatment failure, to exclude physiological abnormality. ***Discuss with radiology and microbiology***.

**MC&S should be performed 7 days after completion of antibiotic course as a test of cure.**

Positive Growth and Sensitivities reported.

Change antimicrobial if needed according to culture and sensitivity results. (10-day course)

All Positive MC&S should be treated even in the absence of symptoms – **follow ASB Flowchart.**

## Appendix 1

**Maternal factors indicating high risk for pre-term birth** (reproduced from Saving babies' lives: version 3, A care bundle for reducing perinatal mortality. NHS England, July 2023).

- Age <18
- Previous preterm birth or mid-trimester loss (16 to 34 weeks' gestation).
- Previous preterm pre-labour rupture of membranes <34/40.
- Previous use of cervical cerclage.
- Known uterine variant (i.e., unicornuate, bicornuate uterus or uterine septum).
- Intrauterine adhesions (Ashermann's syndrome).
- History of trachelectomy (for cervical cancer).