Diagnosis of urinary tract infections: quick reference tool for primary care

Flowchart for adults over 65 years with suspected UTI

**Urinary signs/symptoms, abnormal temperature, non-specific signs of infection**

**Do not perform urine dipsticks**

Dipsticks become more unreliable with increasing age over 65 years. Up to half of older adults, and most with a urinary catheter, will have bacteria present in the bladder/urine without an infection. This “asymptomatic bacteriuria” is not harmful, and although it causes a positive urine dipstick, antibiotics are not beneficial and may cause harm.

**THINK SEPSIS** - check for signs/symptoms using local or national tool

- Such as NICE, RCGP or NEWS2

**CHECK for signs/symptoms of pyelonephritis**

- Kidney pain/tenderness in back, under ribs
- New/different myalgia, flu-like illness
- Nausea/vomiting
- Shaking chills (rigors)
- OR temp over 37.9°C OR 36°C or below
- New onset dysuria alone
- Signs of pyelonephritis

**Think sepsis OR pyelonephritis**

- Send urine for culture before antibiotics
- Immediately start antibiotic/management for upper UTI/sepsis using NICE/PHE guideline on pyelonephritis: antimicrobial prescribing or local/national guidelines for sepsis, considering resistance risk
- If urinary catheter: consider removing or changing as soon as possible
- Refer if signs/symptoms of serious illness or condition

**CHECK ALL FOR NEW signs/symptoms of UTI**

- New onset dysuria alone
- OR 2 or more:
  - Temperature 1.5°C above patient’s normal twice in the last 12 hours
  - New frequency or urgency
  - New incontinence
  - New or worsening delirium/debility
  - New suprapubic pain
  - Visible haematuria

If fever and delirium/debility only: consider other causes before treating for UTI (*see box below)

If urinary catheter: also check for catheter blockage AND consider catheter removal or replacement

Consider Genitourinary Syndrome of Menopause (vulvovaginal atrophy), urethritis, sexually transmitted infections, and prostatitis

**CHECK for other causes of delirium if relevant**

- P: Pain
- I: Other infection
- N: Poor Nutrition
- C: Constipation
- H: Poor Hydration

**CHECK ALL for other localised symptoms/signs**

- Two or more symptoms or signs of: respiratory tract infection, gastrointestinal tract infection, skin and soft tissue infection

Advise “watchful waiting” with further investigation for other causes

**UTI LIKELY**: share self-care and safety-netting advice using TARGET UTI leaflet

- Always send urine culture before antibiotics are taken, as greater resistance in older adults
- If mild symptoms consider back-up antibiotics in women without catheters and low risk of complications
- Offer immediate antibiotics using NICE/PHE guideline on lower UTI catheter-associated UTI: antimicrobial prescribing
- If urinary catheter for over 7 days consider changing (if possible remove) as soon as possible, but do not delay antibiotics
- Review antibiotic choice and culture result, use narrow-spectrum antibiotics if possible

**Consider other local/national resources for delirium management**

Give safety-netting advice about consulting if:

- Worsening symptoms
- No improvement 48 hrs after starting antibiotics
- Signs of pyelonephritis
- Any symptom/sign of sepsis

Follow local diagnostic and treatment guidance

If worsening signs or symptoms consider:

- Admission or start/change antibiotic

Key:

- Suspected sepsis alert
- UTI symptom
- Action advised
- Other advice
Sending urine for culture and interpreting results in ALL adults

**Review need for culture when considering treatment**

**Send a urine for culture in:**
- over 65 year olds if symptomatic and antibiotic given\(^b\)
- pregnancy: for routine antenatal tests, or if symptomatic\(^b\)
- suspected pyelonephritis or sepsis\(^c\)
- suspected UTI in men\(^a\)
- failed antibiotic treatment or persistent symptoms\(^a\)
- recurrent UTI (2 episodes in 6m or 3 in 12m)\(^a\)
- if prescribing antibiotic in someone with a urinary catheter\(^a\)
- as advised by local microbiologist

**Consider risk factors for resistance and send urine for culture if:**
- abnormalities of genitourinary tract\(^c\)
- renal impairment\(^c\)
- care home resident\(^a\)
- hospitalisation for > 7 days in last 6m\(^a\)
- recent travel to a country with increased resistance\(^a\)
- previous UTI resistant\(^a\)

**If prescribing an antibiotic, review choice when culture and antibiotic susceptibility results are available**

**Sampling in all men and women**

**Women:** mid-stream urine (NHS choices) and holding the labia apart may help reduce contamination but if not possible, sample can still be sent for culture\(^b\): Do not cleanse with antiseptic, as bacteria may be inhibited\(^b\)

**Elderly frail:** only take urine sample if symptomatic and able to collect good sample. If incontinent, clean catch in disinfected container and condom catheters for men may be viable options but little evidence to support\(^a\)

**Men:** advise on how to take a mid-stream specimen (NHS choices)

**People with urinary catheters:** collect from newly placed catheter using aseptic technique if changed, drain a few mL of residual urine from the tubing before using sampling port, then collect a fresh sample from catheter sampling port\(^b\)

Cultures of urine within 4 hours of collection, refrigerate, or use boric acid preservative. Boric acid can cause false negative culture if urine not filled to correct mark on specimen bottle and can affect urine dipstick tests\(^a\)

**How do I interpret a urine culture result if I suspect a UTI?**

Culture should be interpreted in parallel to severity of signs/symptoms. False negatives/positives can occur Do not treat asymptomatic bacteriuria unless pregnant as it does not reduce mortality or morbidity\(^a\)

**Urine culture results in patients with urinary symptoms that usually indicate UTI:**
- many labs use growth of 10^7-10^9 cfu/L (10^4-10^6 cfu/mL) to indicate UTI\(^b\)
- lower counts can also indicate UTI if patient symptomatic:
  - strongly symptomatic women - single isolate \(\geq 10^6\) cfu/L (\(\geq 10^2\) cfu/mL) in voided urine\(^a\)
  - in men counts as low as \(10^6\) cfu/L (\(10^3\) cfu/mL) of a pure or predominant organism\(^b\)
  - any single organism \(\geq 10^7\) cfu/L (\(\geq 10^4\) cfu/mL)\(^b\)
  - *Escherichia coli* or *Staphylococcus saprophyticus* \(\geq 10^6\) cfu/L (\(\geq 10^3\) cfu/mL)\(^b\)
- \(\geq 10^6\) cfu/L (\(\geq 10^5\) cfu/mL) mixed growth with 1 predominant organism\(^b\)

**Epithelial cells/mixed growth:**
- the presence of epithelial cells is not necessarily an indicator of perineal contamination, culture result should be interpreted with symptoms and repeated if significance is uncertain\(^b\)
- mixed growth may indicate perineal contamination; however, a small proportion of UTIs may be due to genuine mixed infection. Consider a re-test if symptomatic\(^b\)

**Red cells:** may be present in UTI\(^b\)
- chemical tests may be more sensitive than microscopy as a result of the detection of haemoglobin released by haemolysis\(^b\)
- refer patients with persistent haematuria post-UTI to urology\(^a\)

**White blood cells/leucocytes:**
- white cells \(\geq 10^7\) WBC/L (\(\geq 10^4\) WBC/mL) are considered to represent inflammation in urinary tract, this includes the urethra\(^a\)
- white cells can be present in older people with asymptomatic bacteriuria, as the immune system does not differentiate colonisation from infection\(^a\)

**Sterile pyuria:**
- in sterile pyuria, consider *Chlamydia trachomatis* (especially if 16 to 24 years), other vaginal infections, other non-culturable organisms including TB or renal pathology\(^b\)
- if recurrent pyuria with UTI symptoms, discuss with local microbiologist as lower counts down to \(10^5\) cfu/L (\(10^2\) cfu/mL) may be significant. Higher volume of urine may need to be cultured, including for fastidious organisms\(^a\)

**For all patients:** take into account antibiotic susceptibility results and resistance when deciding on management and reviewing antibiotic treatment.

**Please refer to joint NICE/PHE guidance:** NICE/PHE guidelines on UTI (lower): antimicrobial prescribing or NICE/PHE guidelines on pyelonephritis (acute): antimicrobial prescribing or NICE/PHE guideline on catheter-associated UTI: antimicrobial prescribing

**Follow up:** Do not send follow-up urine unless pregnant, or advised by the laboratory

Consider non-urgent referral for bladder cancer in patients > 60 years with recurrent/persistent unexplained UTIs\(^a\)
## Table summary of flowchart for adults over 65 years with suspected UTI

### Men and women over 65 years may present with:
- localised signs or symptoms of a UTI including new onset dysuria; incontinence; urgency
- temperature: 38°C or above; 36°C or below; 1.5°C above normal twice in the last 12 hours
- non-specific signs of infection; for example delirium; loss of diabetic control

### Do not perform urine dipstick as they become more unreliable with increasing age over 65 years
- up to half of older adults in long term care facilities, and most of those who have had a urinary catheter for over 30 days, will have bacteria present in the bladder/urine without an infection
- this so called asymptomatic bacteriuria is not harmful, and although it causes a positive urine dipstick, antibiotics are not beneficial

### Use symptoms and signs to determine the most appropriate management

#### First think sepsis:
- check for signs using local or national tool such as NICE, RCGP or NEWS2
- exclude pyelonephritis checking for any one sign:
  - kidney pain/tenderness in back, under ribs
  - new/different myalgia, or flu-like symptoms
  - nausea/vomiting
  - shaking chills (rigors) or temp over 37.9°C or 36°C or below

#### If signs of sepsis or pyelonephritis
- send urine for culture
- consider other local/national resources for using PINCH ME can help identify other potential underlying causes of delirium superimposed on dementia. It can be used in different clinical settings
- if urinary catheter for more than 7 days: days: consider changing (if possible remove) as soon as possible but do not delay antibiotics
- refer if signs or symptoms of serious illness or condition

#### Then check all for NEW URINARY symptoms/signs

- NEW onset dysuria alone
- OR 2 or more new:
  - temperature: 1.5°C above normal twice in the last 12 hours
  - new frequency or urgency
  - new incontinence
  - new or worsening delirium/debility
  - new suprapubic pain
  - visible haematuria

If fever and delirium/debility only: consider other infections before treating for UTI:

#### Consider:
Genitourinary Syndrome of Menopause (vulvovaginal atrophy) as can present with dysuria
Also consider risk of urethritis, prostatitis or STI

#### Check all for 2 or more signs or symptoms suggesting other infection
- respiratory tract infection: shortness of breath; cough or sputum production; new pleuritic chest pain
- gastrointestinal tract infection: nausea/vomiting; new abdominal pain; new onset diarrhoea
- skin and soft tissue infection: new redness; warmth

Follow diagnostic and treatment guidance if infection suspected

#### Check all for other causes of DELIRIUM (PINCH ME) and manage as needed

- P: Pain
- I: other Infection
- N: poor Nutrition
- C: Constipation
- H: poor Hydration

#### Using PINCH ME can help identify other potential underlying causes of delirium superimposed on dementia. It can be used in different clinical settings
- consider other local/national resources for delirium management
- Advise watchful waiting, with further investigation if needed

#### Share self-care and safety-netting advice using TARGET UTI leaflet for older adults

### Safety-netting to seek advice if:
- worsening symptoms
- signs of pyelonephritis
- signs/symptoms of sepsis
- no improvement after 48 hours

### Self-care advice
- drink enough fluids to avoid feeling thirsty and to keep urine pale
- taking paracetamol regularly up to 4 times daily for relief of pain or fever
- ways of preventing further episodes of UTI

Please refer to the information and reference tables in joint NICE/PHE guidance:
- antimicrobial prescribing or NICE guidelines on pyelonephritis
- NICE guidelines on UTI (lower): antimicrobial prescribing or NICE/PHE guideline on catheter-associated UTI: antimicrobial prescribing

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