

# Urinary tract infections: Applying diagnostic and prescribing guidance in practice

TARGET Antibiotics Webinar March 2024



## Introductions – TARGET and RCGP



Dr Donna Lecky



**Emily Cooper** 



**Catherine Hayes** 



Ming Lee



Julie Brooke



Liam Clayton



Joseph Besford



Lizzie Richmond



Dr Dharini Shanmugabavan

2



## Introductions Speakers and panellists











Dr Philippa Moore
Consultant Medical
Microbiologist,
Gloucestershire Hosp.
NHS Foundation Trust

Elizabeth Beech MBE
Regional Antimicrobial
Stewardship Lead
South West Region,
NHS England

Naomi Fleming
Regional Antimicrobial
Stewardship Lead
East of England
Region, NHS England

Avril Tucker Antimicrobial Pharmacist, NHS Wales **Dr Leigh Sanyaolu**General Practitioner
and Doctoral Fellow
at Cardiff University

Panellist/Speaker

Panellist/Speaker

**Panellist** 

**Panellist** 

**Panellist** 



### Aims

- 1. Discuss antibiotic resistance rates and trends linked to urinary tract infections (UTIs)
- 2. Capture and discuss ways to assess prescribing trends for your practice and locality
- Identify and discuss national diagnostic and prescribing guidance specific to the management of UTIs in different patient groups
- 4. Utilise evidence-based strategies and resources when discussing antibiotics with patients in the context of UTIs



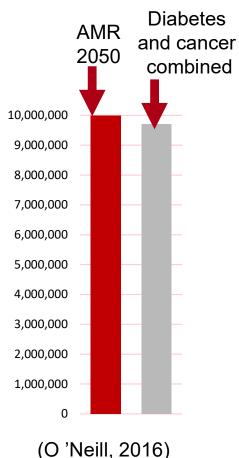


Dr. Philippa Moore

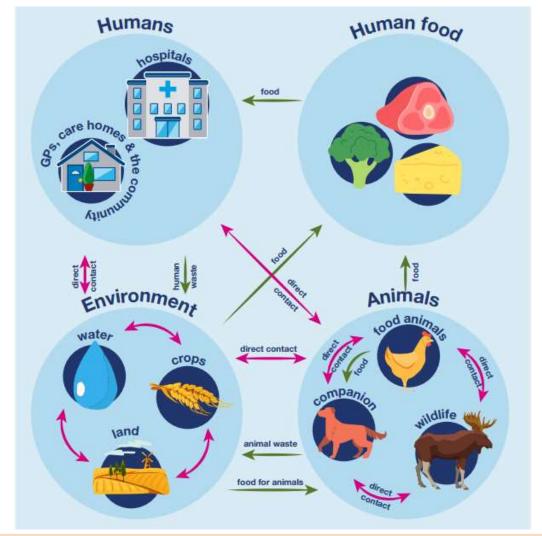
Consultant Medical Microbiologist Speaker



### The challenge of antimicrobial resistance

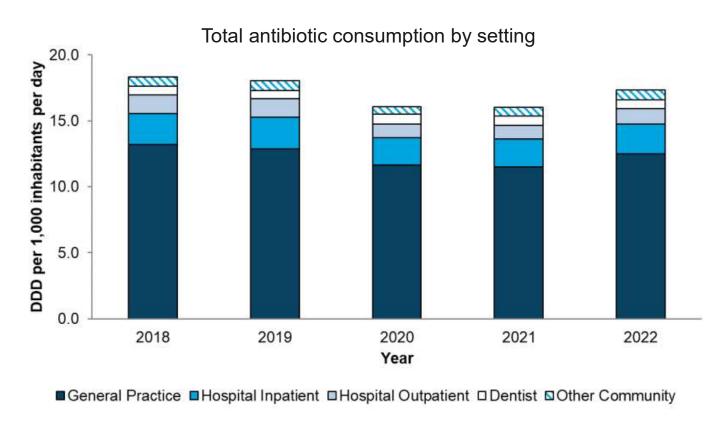


One Health approach targets multiple causes of antimicrobial resistance





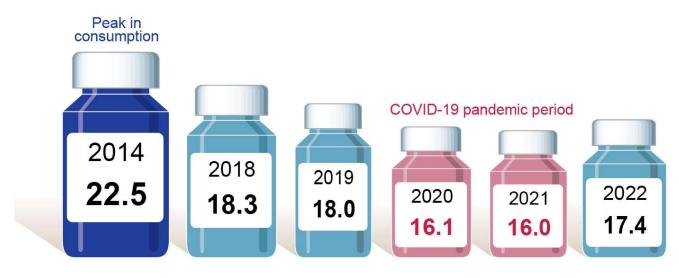
## The majority of antibiotics are prescribed in general practice



(UKHSA, 2023)



## Antibiotic prescribing increased in 2022



(DDDs per 1,000 inhabitants per day)

Antibiotic prescribing in England 2014-2022

(UKHSA, 2023)



### Clinical Scenario: Urinary Tract Infection (UTI)





## Clinical Scenario: UTI – women under 65 years

Please consider the following details:

- 35 year old
- Strong smelling urine
- Dysuria over 2 days
- Frequency
- Recent laparoscopy and removal endometriosis
- Had trimethoprim in the past month for suspected UTI post operation

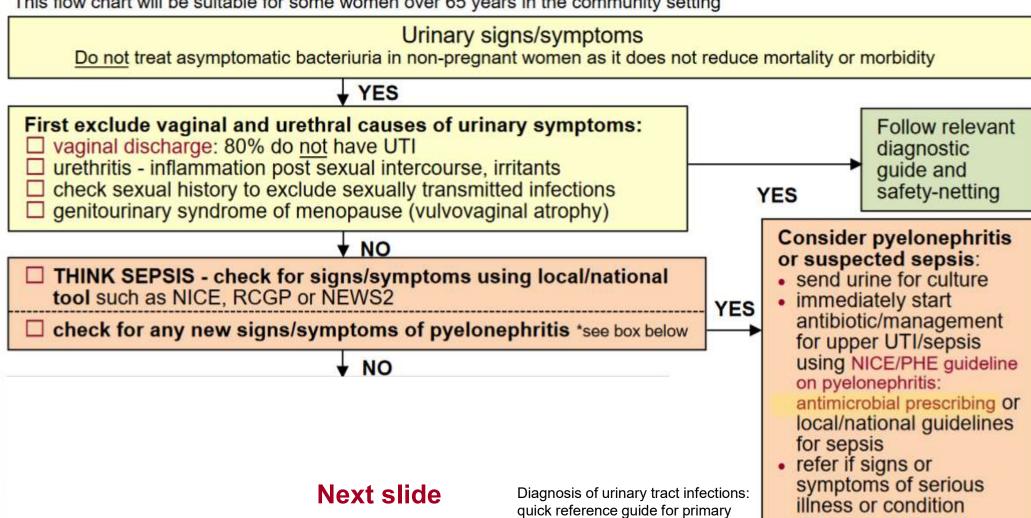
What more could you ask?



### **UKHSA UTI Diagnostic Tool:**

#### Flowchart for women (under 65 years) with suspected UTI

Excludes women with recurrent UTI (2 episodes in last 6 months, or 3 episodes in last 12 months) or urinary catheter. This flow chart will be suitable for some women over 65 years in the community setting



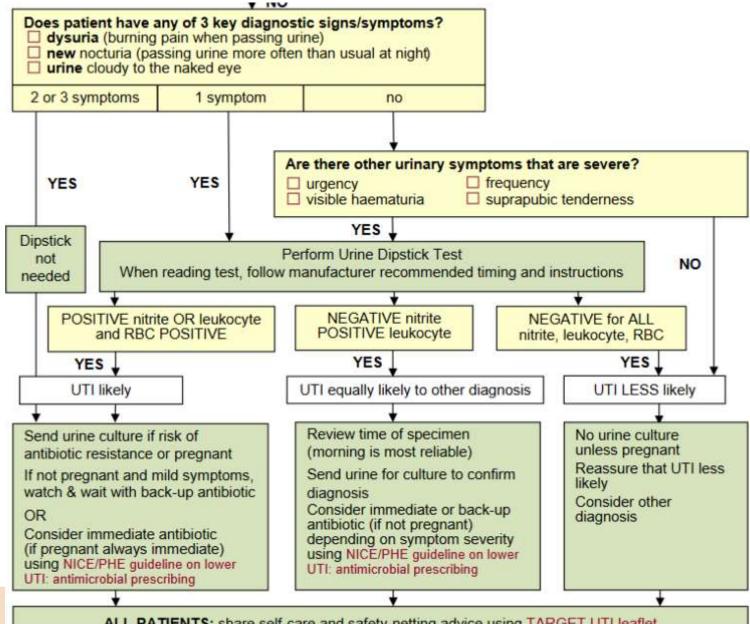
care, UKHSA, October 2020



### **UKHSA UTI Diagnostic Tool:**

Keep Antibiotics Working

Urinary Tract Infection





## What about those at higher risk of asymptomatic bacteriuria like older adults and those with a urinary catheter?

- 80 year old resident in nursing home
- Strong smelling urine, but clear looking
- Increasing confusion over 2 days
- No history of fever, temp 37.4° C.
- Has had antibiotics in past for suspected UTI

What do you think a urine dipstick result will be?

- 1. Positive for all
  - + Nitrite
  - + Leukocyte
  - + RBC
- 2. Positive nitrite, negative leukocyte and RBC positive
  - + Nitrite
  - Leukocyte
  - + RBC

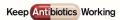
- 3. Positive nitrite, positive leukocyte and RBC negative
  - + Nitrite
  - + Leukocyte
  - RBC
- 4. Negative for all
  - Nitrite
  - Leukocyte
  - RBC

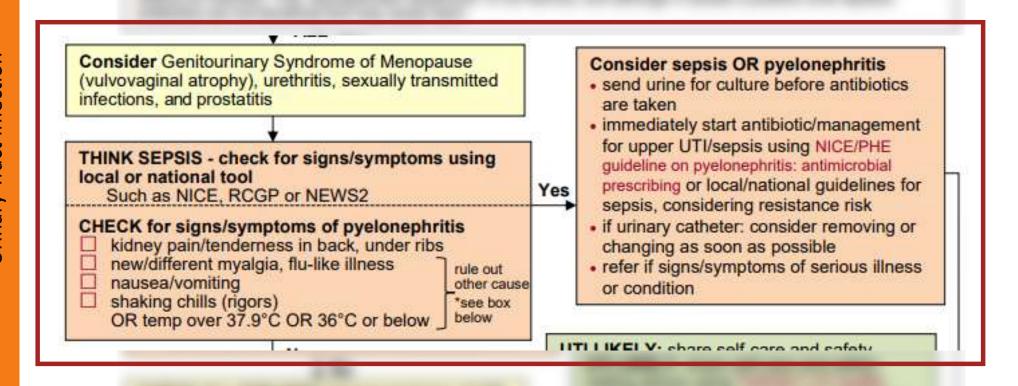


### UKHSA UTI Diagnostic Tools: Older adults TARGET and those with a Urinary Catheter

Keep Antibiotics Working Flowchart for suspected UTI in catheterised adults or those over 65 years Urinary signs/symptoms, abnormal temperature, non-specific signs of infection18+,28+,30,48-Do not perform urine dipsticks: Dipsticks become more unreliable with increasing age over 65 years. By 80 years half of older adults in care, 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 5B+,6A-,7B+,8C,9A+ ALL

## UKHSA UTI Diagnostic Tools: Older adults and those with a Urinary Catheter

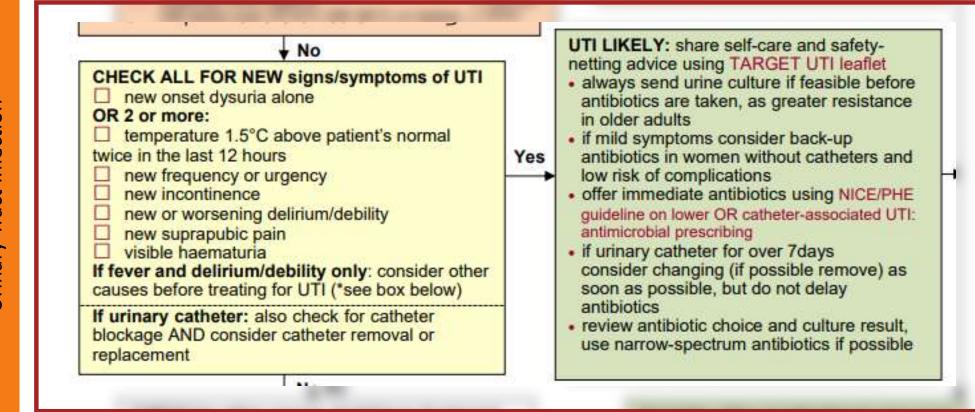






### UKHSA UTI Diagnostic Tools: Older adults TARGET and those with a Urinary Catheter

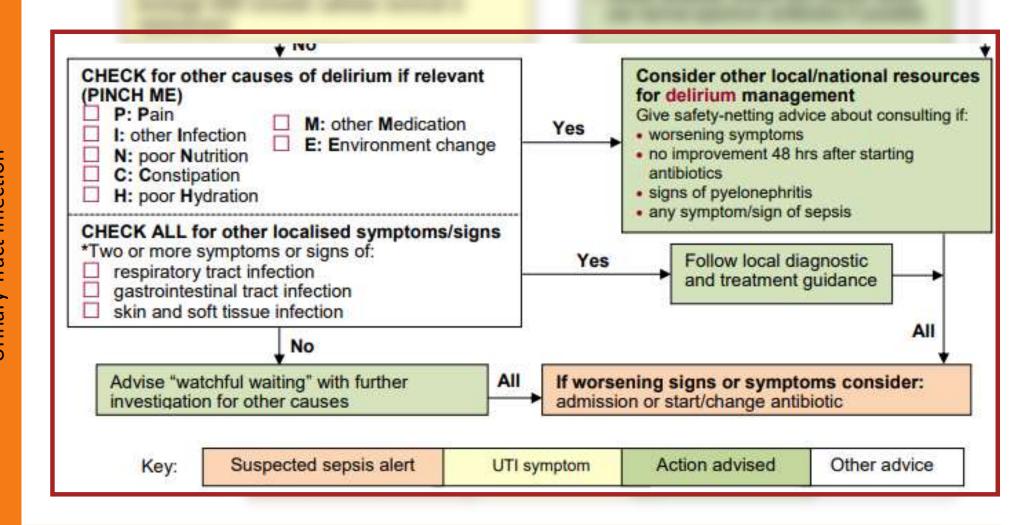
Keep Antibiotics Working





### UKHSA UTI Diagnostic Tools: Older adults

Keep Antibiotics Working





## Why do we need to worry about our antibiotic use for UTI?







### UTIs are linked to blood stream infections and resistance

Yearly estimated burden of *E.coli* resistant blood stream infections (BSIs) has reduced from 2017 but we need to keep momentum<sup>1</sup>

E. coli bacteria are the most common cause of BSIs that are resistant to antibiotics<sup>1</sup>

51% of *E. coli* blood stream infections are potentially linked to the urogenital tract<sup>2</sup>

After RTIs, UTIs are the most prescribed for infection in primary care<sup>3</sup>

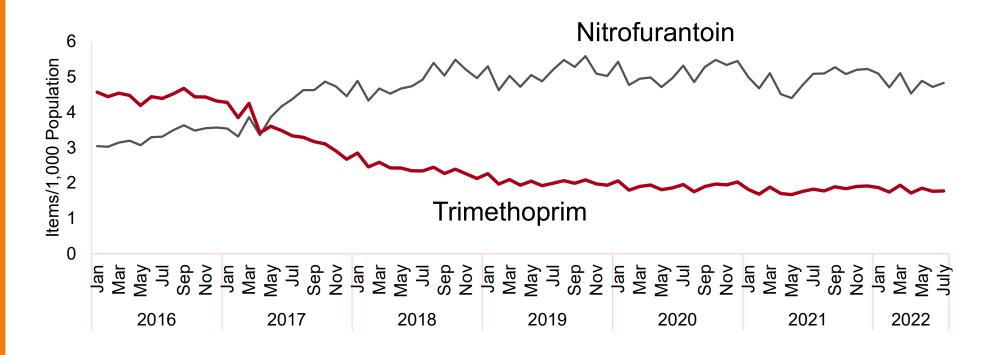
3. Dolk et al. Journal of Antimicr Chem., 2018

<sup>2.</sup> Abernethy et al. J. Hosp. Infect, 2017



### Antibiotic use for UTI has changed

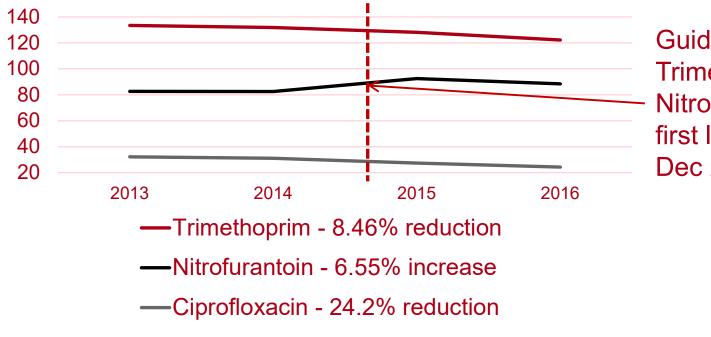
### Trimethoprim and Nitrofurantoin use across England





## Antibiotic resistance in UTI can be reduced

Median number of dispensed antibiotic items/1000 registered practice population/year in South West of England 2013-2016



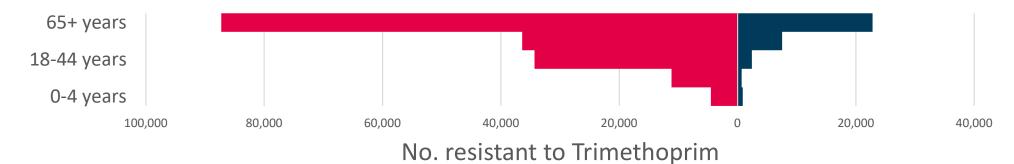
Guidance replaced Trimethoprim with Nitrofurantoin as first line choice – Dec 2014.

- Relationship between antibiotic dispensing and resistance in following quarter:
  - Ciprofloxacin Odds of resistance 0.982 (95% CI: 0.965 to 0.999)
  - Trimethoprim Odds of resistance 0.992 (95% CI: 0.988 to 0.997)
  - Nitrofurantoin Odds of resistance 0.999 (95% CI: 0.988 to 1.013)



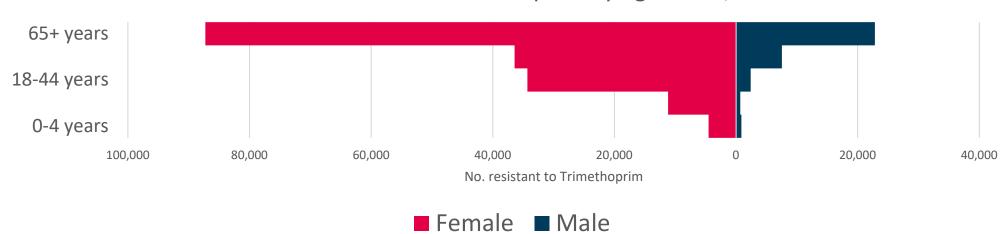
## Antibiotic resistance in urine samples rises with age

E. coli resistance to Trimethoprim by age & sex, 2022



E. coli resistance to Trimethoprim by age & sex, 2022

■ Female ■ Male





## Antibiotic resistance affects the recovery of patients with UTI

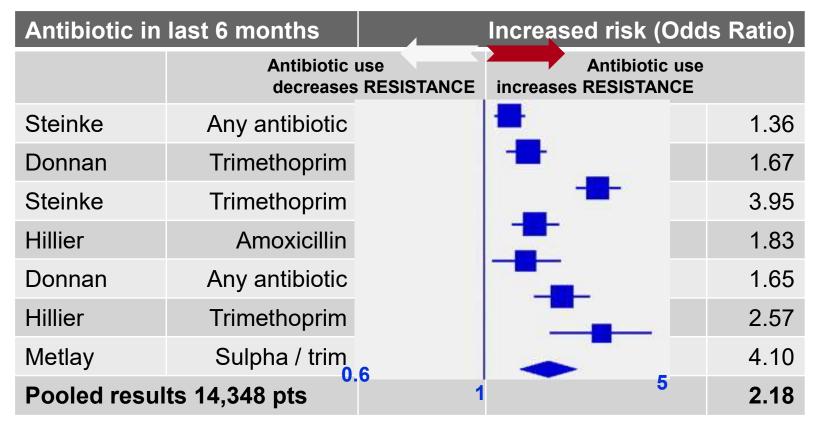
## Clinical outcomes of uncomplicated UTIs in English GP treated with empirical trimethoprim

	Patients with:		
	Resistant UTI	Susceptible UTI	P-value
Median time to symptom resolution (207)	7 days	4 days	0.0002
Re-consultation in first week or less (317)	17/44, 39%	17/273, 6%	<0.0001
Further antibiotic in first week (317)	16/44, 36%	11/273, 4%	<0.0001
Still had bacteriuria at 1 month (132)	8/19 42%	23/113, 20%	0.04



## Antibiotic use in UTI increases risk of resistance

This Forest plots shows individual study and pooled odds ratio of increased risk of resistance



Longer duration and multiple courses associated with greater resistance



# Risk of resistance persists for at least 12 months after your prescribing

Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: systematic review and meta-analysis

	Increased risk of resistant organism		
	Antibiotic in past 2 months	Antibiotic in past 12 months	
<b>UTI</b> 5 studies: n = 14,348	2.5 pooled odds of resistance	1.33 pooled odds of resistance	



## UTI management and shared decision making





#### TREATING YOUR INFECTION - URINARY TRACT INFECTION (UTI)



For women under 65 years with suspected lower urinary tract infections (UTIs) or lower recurrent UTIs (cystitis or urethritis)

Possible urinary signs & symptoms	The outcome	Recommended care	0.1
Key signs/symptoms: Dysuria: Burning pain when passing urine (wee) New nocturia: Needing to pass urine in the night Cloudy urine: Visible cloudy colour when passing urine Other signs/symptoms to consider: Frequency: Passing urine more often than usual Urgency: Feeling the need to pass urine immediately Haematuria: Blood in your urine Suprapubic pain: Pain in your lower turnmy Other things to consider: Recent sexual history Inflammation due to sexual activity can feel similar to the symptoms of a UTI Some sexually transmitted infections (STIs) can have symptoms similar to those of a UTI	Possible urinary symptoms other thing GP & patie consider	I or backup prescription f-care and pain relief tibiotics if symptoms: orse t get a little better with are within 48 hours ate antibiotic prescription	Outcome and plander, to plan can be personalised  Pyeloneprinus (pie-io-net-right-is). Not covered in this leaflet and always needs antibiotics  Bladder (stores urine) Infection in the lower urinary tract  Cystitis (sis-tight-is).
Changes during menopause Some changes during the menosymptoms similar to those of a  If you think your alform to help your alf	se risk factors: your bowel into you k (bottom) after using	www.cord How to prevent UTIs	
or caffeine that can irritate your bladder  • Take paracetamol or ibuprofen at regular intervals for pain relief. If you ash away any bacteria urethra.  • Canberry products a evidence to say that the After the menopause: for example, vaginal per services or caffeine that can irritate your bladder  • Canberry products a evidence to say that the After the menopause: for example, vaginal per services or cample, vaginal per services or cample.	a area with water before and afthat may be near the opening to ake sure you wee regularly throat weather.  TI, the following may help and D-mannose: There is some see work to help prevent recurrence to the prevent recurrence of the prevent recurrence o	Antibiotics taken by mouth, for any affect our out bacteria making some reserved by the bughout the bu	

### What symp

#### What

#### When should you seek more urgent help?

#### Signs/symptoms in A

#### Burning pain when pa

- A new need to pass urin
- Urine is a visible cloud
- Passing urine more often than usual
- Feeling the need to pass urine immediate
- Blood in your urine
- Pain in your lower tun

#### If you have a catheter, consider these sympto

- Shivering or shaking
- High or low temperatu
- Kidney pain in your ba just under the ribs

during



Take p regular 4 time



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Wha

Drink enough fluid (6 the day, and to avoid Your bladder can be Prevent constipation If diabetic, maintail

TARGET

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A urinary tract infe

occurs when bacte

the urine system ca

Diagnosis is made

your symptoms. Ui

are only used in w

65 without cathete

Are you drinking

#### Stop bacteria spr

- Keep the genital
- Change incontine
- Pass urine after I
- Women should wa after sex, and wip

#### If you have recuri D-mannose or cran

#### Urinary symptoms may also be caused by:

- · Pain or discomfort after sexual activity
- A sexually transmitted infection (STI)
- Vaginal changes durir or after the menopaus

#### Con

If you think you may ha http://www.gov.uk/co guidance and informati

#### What can you do



Drink e so that urine re the day



to relie

sachet

#### If you have re

- Antibiotics at n
- Vaginal hormon

#### Advice about a

- Antibiotics can b serious urine infe antibiotics are no for mild urinary s
- Antibiotics make bacteria resistar your next UTI m

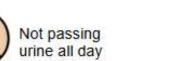
#### You should consult a health professional if you have UTI symptoms and:

- Your symptoms are getting a lot worse, or not starting to improve within 2 days of starting antibiotics
- You are pregnant, male or post operation

#### The following symptoms are possible signs of a serious urinary infection and should be assessed urgently:



Shivering, chills and muscle pain





Trouble breathing



Visible blood in your urine



Feeling very confused, drowsy or slurred speech



Temperature is above 38°C or less than 36°C



Kidney pain in your back just under the ribs



Verv cold skin

#### Contact your GP Practice or

#### NHS 111 (England and Wales)



NHS Direct Wales 08454647 Galw IEGHYD Cymru

www.111.nhs.uk www.111.wales.nhs.uk

Dial 111 (Scotland)



www.nhs24.scot

GP practice (NI)



Trust your instincts, ask for advice if you are not sure how urgent your symptoms are

Speak to your

Speak to NHS111, a pha

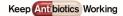
Taking antibiotics

TARGET is operated by the UK Health Security Agency. Developed in collaboration with professional medical bodies. Version 1.1, March 2021, Revision: March 2023

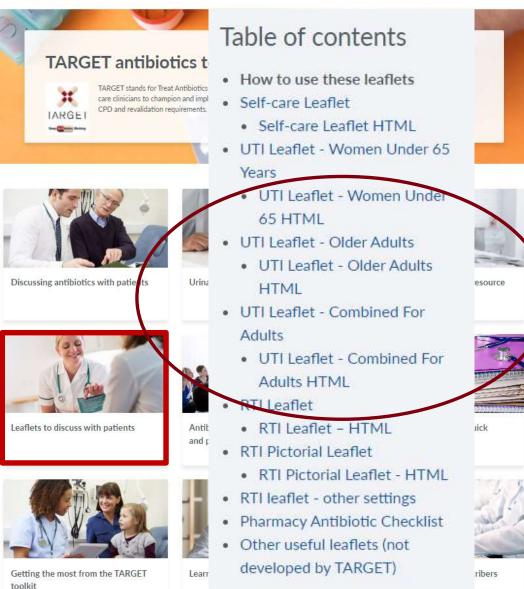


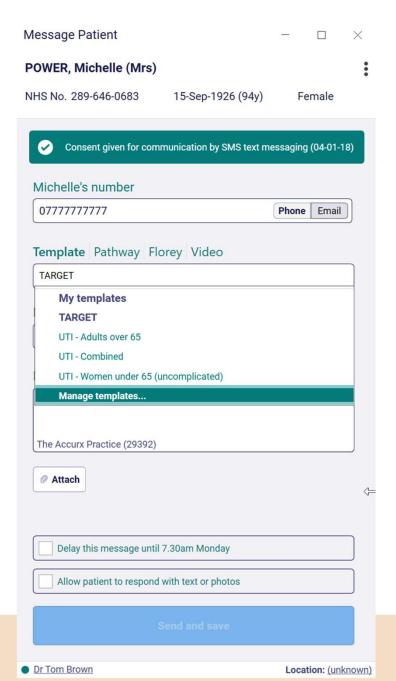
### Web text - UTI Patient Information

Leaflets











## Non-antibiotic prevention and management

#### Always discuss risks and facilitate shared decision making!

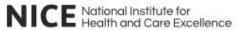
NICE guideline for prevention of **non-recurrent** lower UTI:

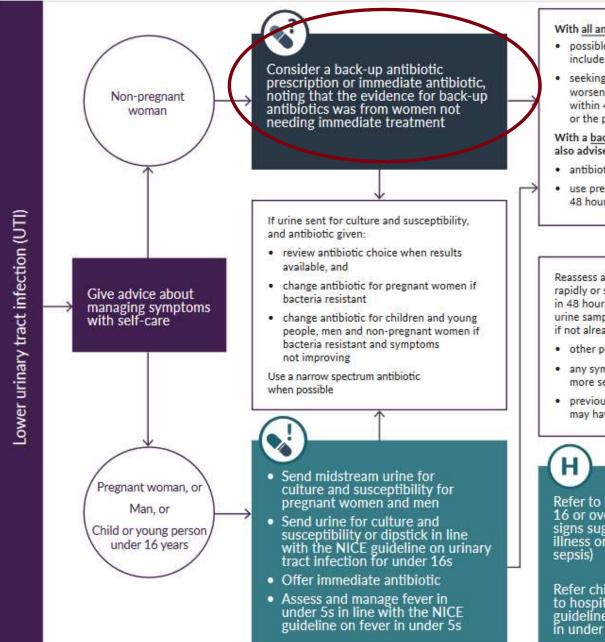
- no evidence was found to support or disprove use of cranberry products
- recommend paracetamol (or ibuprofen if appropriate) and drinking enough fluid to avoid dehydration

NICE guideline for recurrent UTI prevention in non-pregnant women

- lowest effective dose of vaginal oestrogen
- some may wish to try D-mannose or other cranberry products
- in 2022, NICE have reviewed the evidence for use of Methenamine
   Hippurate (Hiprex) and state that this may impact guidance

### **UTI** (lower): antimicrobial prescribing





With all antibiotic prescriptions, advise:

- possible adverse effects of antibiotics include diarrhoea and nausea
- seeking medical help if symptoms worsen at any time, do not improve within 48 hours of taking the antibiotic, or the person becomes very unwell

With a back-up antibiotic prescription, also advise:

- · antibiotic is not needed immediately
- use prescription if no improvement in 48 hours or symptoms worsen at any time

Reassess at any time if symptoms worsen rapidly or significantly or do not improve in 48 hours of taking antibiotics, sending a urine sample for culture and susceptibility if not already done. Take account of:

- · other possible diagnoses
- any symptoms or signs suggesting a more serious illness or condition
- previous antibiotic use, which may have led to resistance

Refer to hospital if a person aged 16 or over has any symptoms or signs suggesting a more serious illness or condition (for example, sepsis)

Refer children and young people to hospital in line with the NICE guideline on urinary tract infection in under 16s



#### Background

 Lower UTI (cystitis) is a bladder infection usually caused by bacteria travelling up to the urethra from the gastrointestinal tract



#### Self-care

- Advise paracetamol for pain or, if preferred and suitable, ibuprofen
- Advise drinking enough fluid to avoid dehydration
- No evidence found for cranberry products or urine alkalinising agents to treat lower UTI



#### Antibiotics

 When considering antibiotics, take account of severity of symptoms, risk of complications, previous urine culture and susceptibility results, previous antibiotic use which may have led to resistant bacteria and local antimicrobial resistance data



#### Asymptomatic bacteriuria

- Asymptomatic bacteriuria is significant levels of bacteria in urine with no UTI symptoms
- Treated in pregnant women because risk factor for pyelonephritis and premature delivery
- Not screened for or treated in non-pregnant women, men, children or young people

May 2022

NICE uses 'offer' when there is more certainty of benefit and 'consider' when evidence of benefit is less clear.

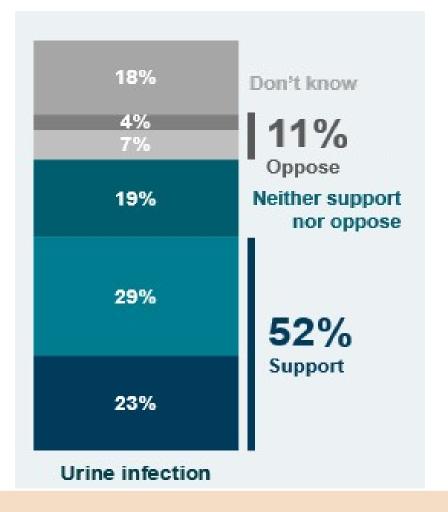


## Back up prescribing for UTI is generally acceptable to patients – data from 2023

Do you support or oppose clinicians prescribing delayed/back-up antibiotic prescriptions for UTI?

- 54% of the population are in favour of delayed antibiotics
- 16% of patients who received a delayed prescription had a UTI
- When asked about UTI, 52% of respondents were in favour of a delayed antibiotic

Consider back-up rather than immediate antibiotics — but explain rationale, pain relief, and how to collect prescription





## NICE prescribing guidance for lower UTI – non-pregnant women

#### First choice:

- Nitrofurantoin if eGFR] is 45 ml/minute or more:
   100mg m/r BD (or if unavailable 50mg QDS)
- days
- Trimethoprim if low risk of resistance 200mg BD

Always safety net, and provide information on pain relief and self-care

If giving antibiotics send urine for culture & susceptibilities, if risk of resistance or over 65 years old



### Consider: Risk factors for resistance

#### Low risk of resistance:

younger women with acute UTI and no resistance risks

Risk factors for increased resistance include:

- care home resident,
- recurrent UTI (2 in 6 months; >3 in 12 months),
- unresolving urinary symptoms,
- hospitalisation for >7d in the last 6 months,
- recent travel to a country with increased resistance,
- previous UTI resistant to trimethoprim, cephalosporins, or quinolones.

If risk of resistance: always safety net and send urine for culture & susceptibilities



## UTI and the link to blood stream infections

Estimate the prevalence of *E.coli* **blood stream** infections, which are resistant to co-amoxiclav last year in England.

- a) 0-10%
- b) 11-20%
- c) 21-30%
- d) 31-40%
- e) Over 40%





## Reduced 3Cs to help reduce Clostridium difficile in the community

#### Reduce use of

- Ciprofloxacin
- Cephalosporins | for UTI
   Pivmecillinam
- Co-amoxiclav

#### Increase use of

- Nitrofurantoin

Trimethoprim still good for UTI if there is a low risk of resistance



## NICE prescribing guidance for lower UTI – non-pregnant women

#### Second choice:

- Nitrofurantoin (if eGFR is 45 ml/minute or more, and it was not used as first-choice)
- Pivmecillinam: 400 mg initial dose, then 200 mg three times a day for a total of 3 days
- Fosfomycin: 3g single dose sachet in women



### NICE prescribing guidance - pyelonephritis

TARGET

Keep Antibiotics Working

First choice for nonpregnant women and men aged 16

years and over

First choice for pregnant women aged 12 years and over

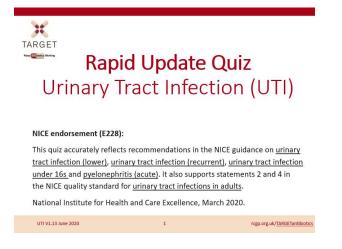
Antibiotic <sup>1</sup>	Dosage and course length
First choice oral antibiotic <sup>2</sup>	
Cefalexin	500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infections) for 7 to 10 days
Co-amoxiclav (only if culture results available and susceptible)	500/125 mg three times a day for 7 to 10 days
Trimethoprim (only if culture results available and susceptible)	200 mg twice a day for 14 days
Ciprofloxacin (consider safety issues <sup>3</sup> )	MHRA Ian 2024: Fluoroquinolones only

prescribed when others inappropriate -

Antibiotic.	Check NICE for updates regarding Cipro	
First choice oral antibiotic <sup>2</sup>		
Cefalexin	500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infections) for 7 to 10 days	
First choice intravenous antibiotic (if vomiting, unable to take oral antibiotics, or severely unwell) <sup>2, 3</sup>		
Cefuroxime	750 mg to 1.5 g three or four times a day	
Second choice antibiotics or combining antibiotics if susceptibility or sepsis a concern		
Consult local microbiologist		



## What can <u>you</u> do to learn more about UTI using TARGET resources?



Rapid update quiz: This training quiz is for clinicians who manage patients with suspected UTI.





Encourage non-medical staff to watch this To Dip or Not To Dip **training animation**:

https://www.youtube.com/watch?v=rZ5T1Cz7DHQ

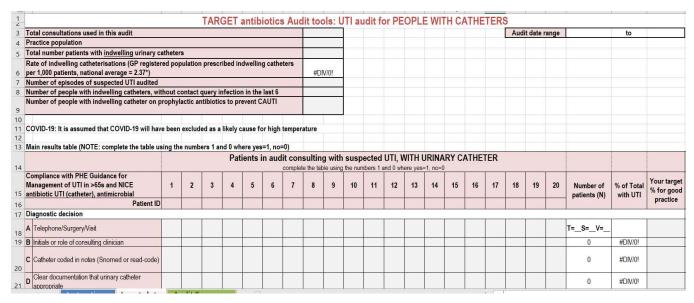




## TARGET Audits: Urinary Tract infection (UTI)

#### The TARGET website has audit templates for:

- Acute otitis media
- UTI
  - Women under 65 years
  - Older adults
  - CAUTI
- Sore Throat
- Acute Cough
- Otitis Externa
- Acute Sinusitis





# Routine data for UTI improvement

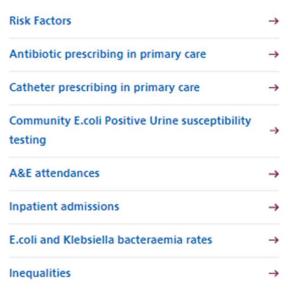
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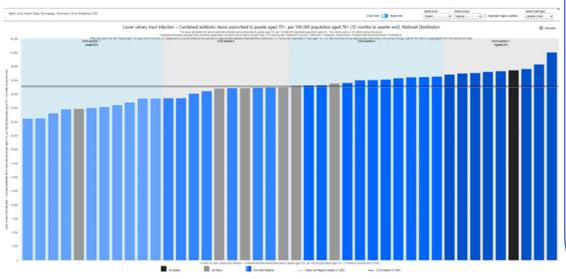
Elizabeth Beech MBE Regional Antimicrobial Stewardship Lead South West Region

## NHS England Model Health System AMR Dashboard - UTI



#### **Urinary Tract Infection**





#### How to access?

Via Model Health System <a href="here">here</a> registration required

#### Why use?

Improvement of the UTI pathway at an integrated care system level. Reports a wide variety of UTI related metrics based on routine NHS data. Includes metric reporting by gender

#### **Good for:**

System level improvement in a defined population known to have higher risk of antibiotic resistant UTI, and highest burden of Gram-negative blood stream infections (GNBSI). Reports population use of urinary catheters

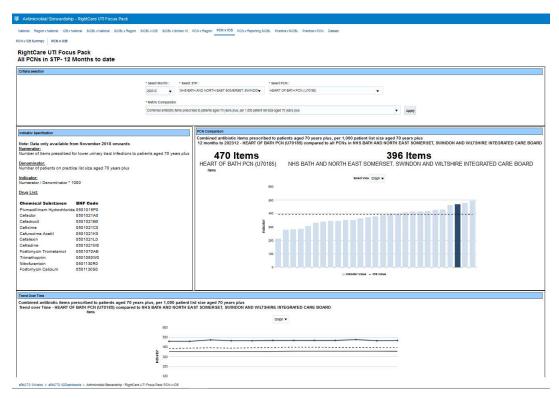
## NHS BSA ePACT2 Antimicrobial Stewardship Dashboard



RightCare UTI Focus Pack

This dashboard is due to be replaced in 2024

Combined antibiotic items prescribed to patients aged 70 years plus per 1,000 patient list size aged 70 years plus for BSW PCN



#### How to access?

Via NHSBSA ePACT2 <u>here</u> registration required. RightCare UTI data packs via FutureNHS <u>here</u>

#### Why use?

Aligns to the primary care antibiotic prescribing metrics in use in RightCare UTI data pack which focus on improving the management of lower UTI in people aged 70+Y in primary care

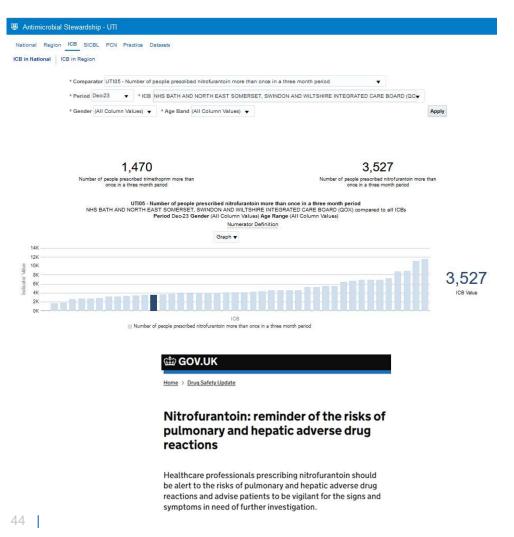
#### **Good for:**

Improvement in a defined population known to have higher risk of antibiotic resistant UTI, and highest burden of Gram-negative blood stream infections (GNBSI).

### NHS BSA ePACT2 Antimicrobial Stewardship Dashboard



## Nearing publication and will report people metrics



#### How to access?

Via NHSBSA ePACT2 <u>here</u> registration required.

#### Why use?

Aligns to the primary care antibiotic prescribing metrics in use in Model Health System which focus on improving the management of lower UTI in people aged 70+Y in primary care

#### **Good for:**

Improvement in antibiotic management of LUTI in selected populations by age and gender. Includes population metric for urinary catheter use by age and gender.

Reports people counts for repeated nitrofurantoin and trimethoprim risks



## Many thanks

- Avril Tucker Antimicrobial Pharmacist, NHS Wales
- Catherine Hayes PCIU, UKHSA
- Dharini Shanmugabavan RCGP
- Donna Lecky PCIU, UKHSA
- Elizabeth Beech Antimicrobial Stewardship Lead, NHS South West
- Emily Cooper Primary Care and Interventions Unit (PCIU), UKHSA
- Joseph Besford RCGP
- Katherine Henderson Lead Scientist for AMR/AMU, UKHSA
- Kate Ellis Senior Scientist for NIHR IPAP AMRP in UTI. UKHSA

- Leigh Sanyaolu GP and Researcher at Cardiff University
- Liam Clayton PCIU, UKHSA
- Lizzie Richmond RCGP
- Naomi Fleming Antimicrobial Stewardship Lead, NHS East of England
- Philippa Moore Consultant microbiologist, NHS Gloucestershire
- Rebecca Guy Principal Scientist -Epidemiology, UKHSA
- The AMR team within UKHSA



### Panel Discussion











Dr Philippa Moore
Consultant Medical
Microbiologist,
Gloucestershire Hosp.
NHS Foundation Trust

Elizabeth Beech MBE
Regional Antimicrobial
Stewardship Lead
South West Region,
NHS England

Naomi Fleming
Regional Antimicrobial
Stewardship Lead
East of England
Region, NHS England

Avril Tucker Antimicrobial Pharmacist, NHS Wales **Dr Leigh Sanyaolu**General Practitioner
and Doctoral Fellow
at Cardiff University

Panellist/Speaker

Panellist/Speaker

**Panellist** 

**Panellist** 

Panellist