Antimicrobial Guidelines for the management of Genitourinary Tract Infections (UTI) in adults

University Hospitals of Leicester NHS
NHS Trust

Trust Reference: B20/2019

1. Introduction and Scope

This guideline is for the microbiological diagnosis and antimicrobial management of urinary tract infections (UTI) in adult patients admitted to University Hospitals of Leicester NHS Trust (includes all ED and inpatient departments, excluding maternity assessment unit(s)).

It is to be used by clinical staff to correctly assess and diagnose patients with suspected UTI and guide the initial management of these patients by prescribers and all health professionals. Further investigation of patients especially those with recurrent infections may be needed and staff should refer to appropriate specialists

1.1. Guideline Contents

1.2. This guideline does not cover

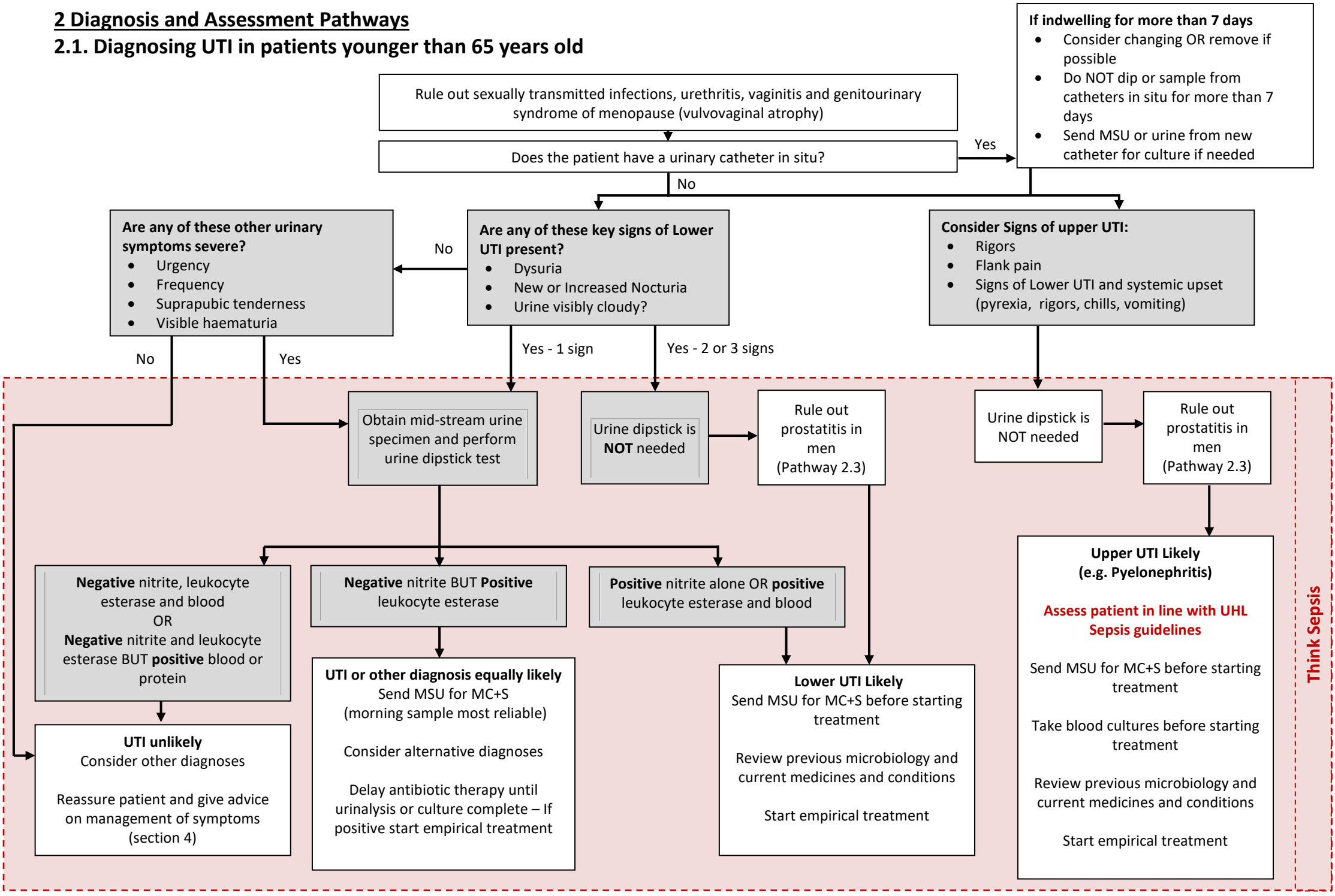
Condition/Situation	Primary Care guideline	Secondary Care Guideline
Adult UTI in primary care settings	See empirical primary care antimicrobial guidance, catheter associated UTI, and multi drug resistant treatment pathways via the LMSG website: http://bit.ly/LMSGpcGuideline	

1.3. Abbreviations

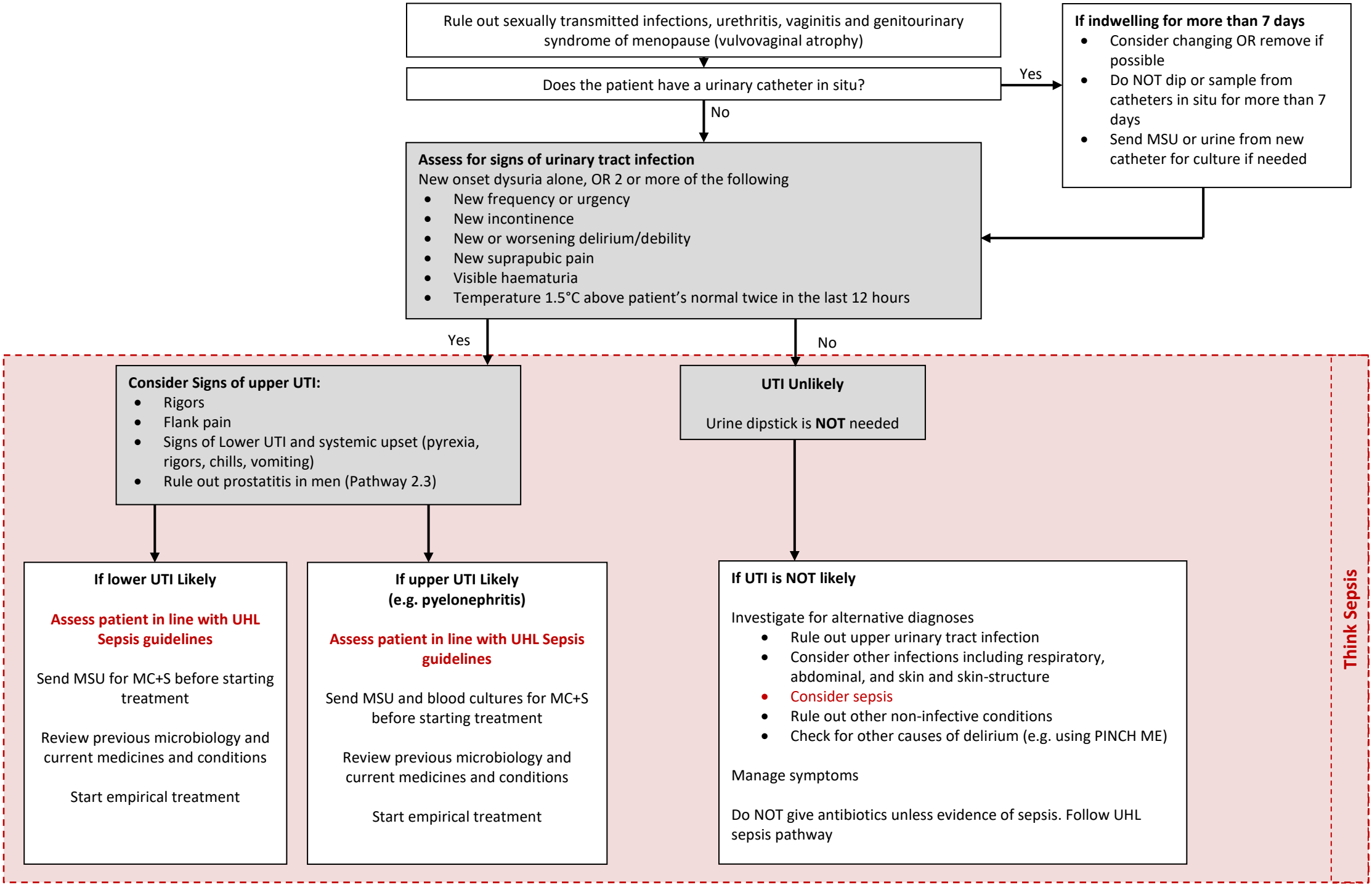
MSU - mid-stream urine
MC+S – microscopy, culture, and sensitivities
UTI – Urinary Tract Infection
LUTI – Lower Urinary Tract Infection
UUTI – Upper Urinary Tract Infection

2 Diagnosis and Assessment Pathways

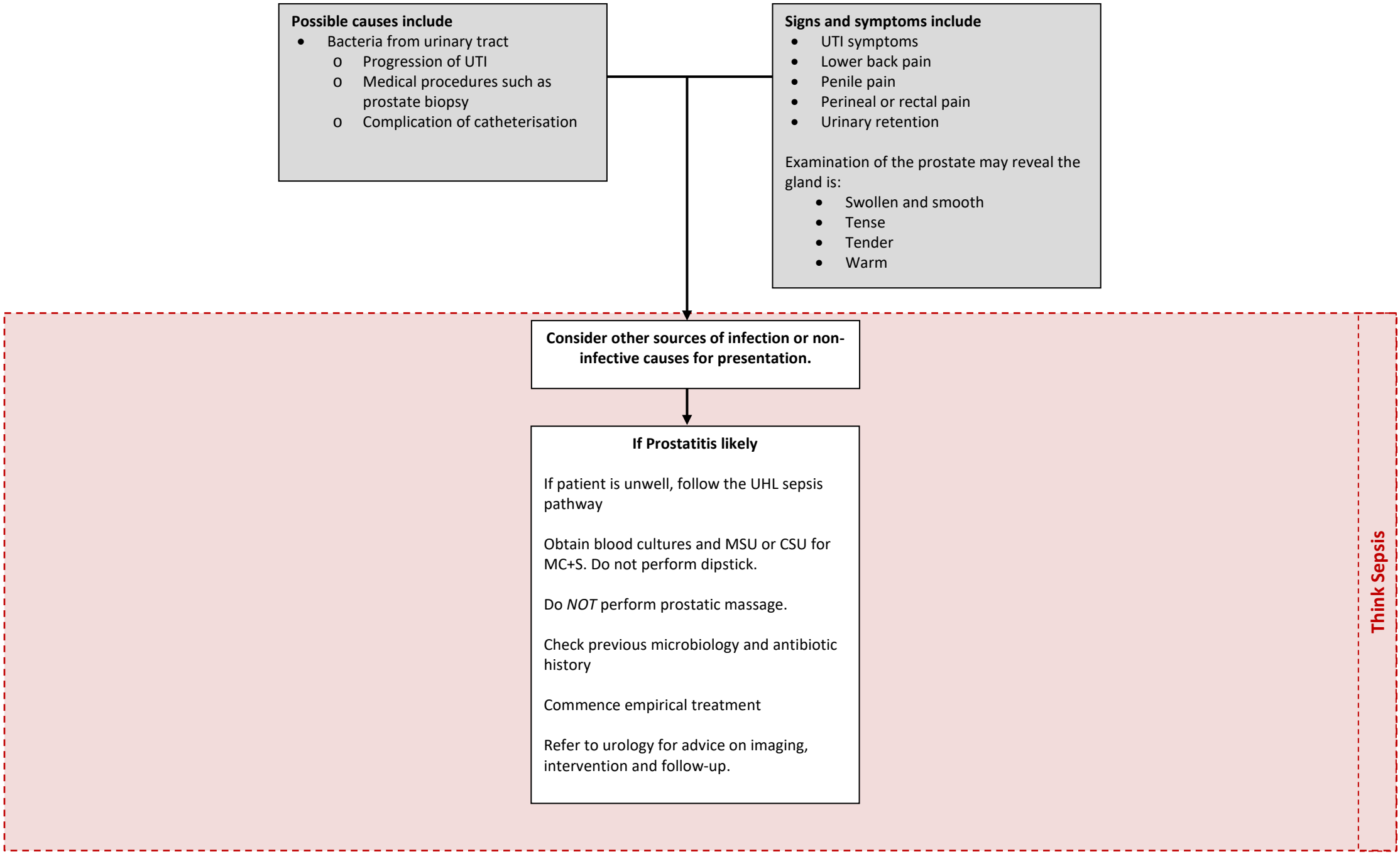
2.1. Diagnosing UTI in patients younger than 65 years old



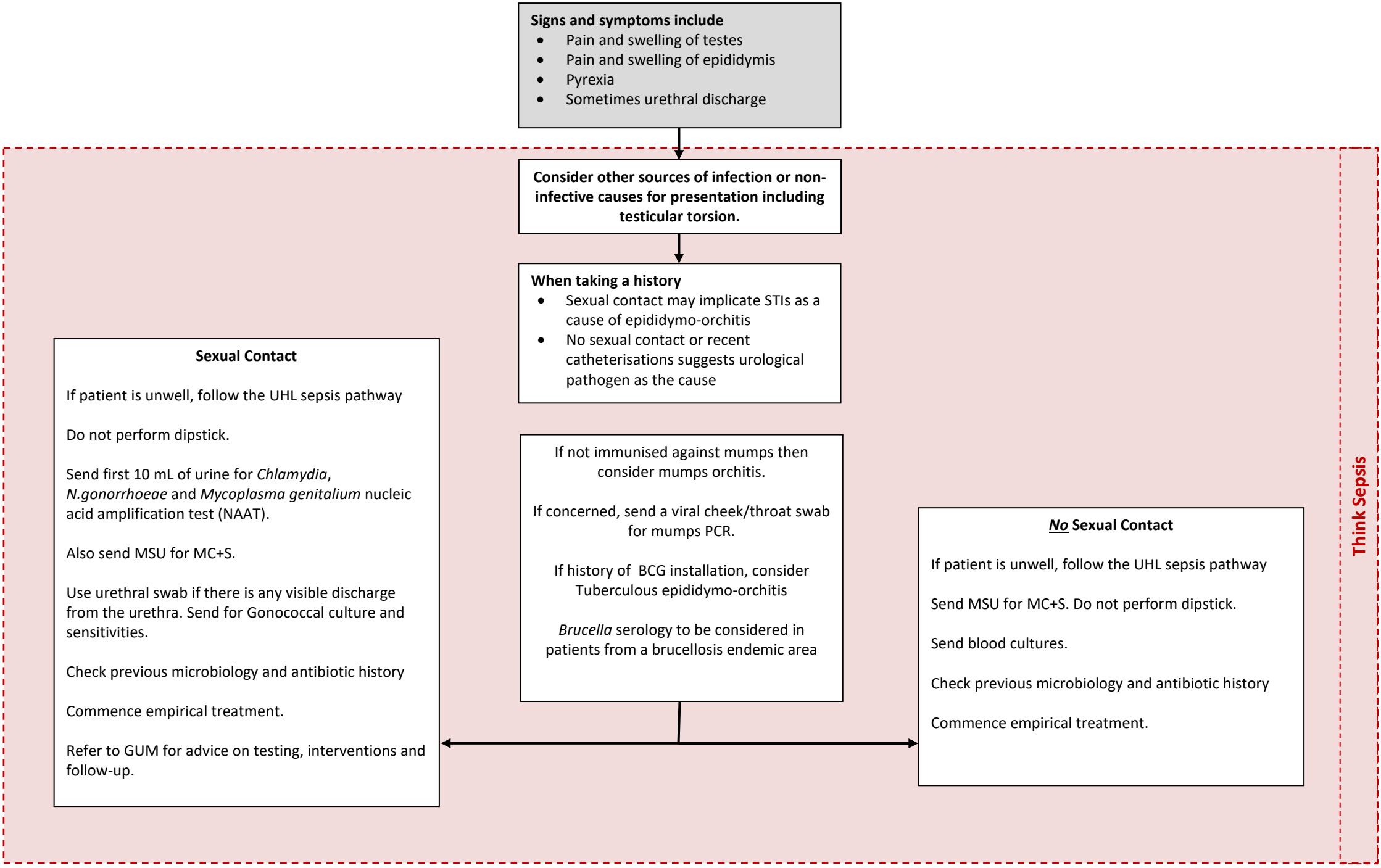
2.2. Diagnosing UTI in patients 65 years of age and older



2.3. Diagnosing acute prostatitis



2.4. Diagnosing acute epididymo-orchitis



3 Empirical Treatment

3.1. Treatment of Lower Urinary Tract Infections

Follow diagnostic pathway 2.1 or 2.2 depending on age

Follow this pathway for prescribing choices for lower UTI

This section also covers antimicrobial treatment of urinary catheter associated lower UTI

Dipstick tests taken without symptoms or evidence of UTI should NOT be acted upon

Non-pregnant women with lower urinary tract infections	
Consider delaying prescribing If patient not unwell and urine has been sent for culture • Manage symptoms (see section 4) • Organise for review of cultures and prescribing of antibiotics if needed, based on sensitivities • If patient is ambulatory consider delayed prescription if patient is able to get this dispensed at a later date.	**Give immediate treatment** If patient is unwell or has severe symptoms • Advise patient on managing symptoms (see section 4) • Organise for review of culture results when available (usually within 48 hours). • Advise urgent medical attention if there is deterioration at any time, or symptoms do not improve within 48 hours of treatment

All men, and women who are pregnant or have urological abnormalities, diabetes or immunosuppression with lower urinary tract infections
Give immediate treatment • Advise patient on managing symptoms • Organise for review of culture results when available (usually within 48 hours).

Oral treatment for lower UTI in NON-PREGNANT WOMEN and MEN			
First line Treatment Nitrofurantoin modified release 100 mg twice daily • For 3 days in non-pregnant women • For 7 days in men, and women who have urological abnormalities, diabetes or immunosuppression • For 7 days in men and women with urinary catheter associated lower UTI.	**Second line treatment in those for whom nitrofurantoin is not suitable (eGFR below 45 mL/min, allergy, or treated with nitrofurantoin within the last month)**		
	Trimethoprim 200 mg twice daily • For 3 days in non-pregnant women • For 7 days in men, and women have urological abnormalities, diabetes or immunosuppression • For 7 days in men and women with urinary catheter associated lower UTI. *Not suitable for those with a history of trimethoprim resistant UTI or received trimethoprim in last 3 months.*	**Fosfomycin** 3g oral sachet • Single STAT dose for non-pregnant women • STAT dose, followed by a second dose 48 hours later, for men, and women who have urological abnormalities, diabetes or immunosuppression • STAT dose, followed by a second dose 48 hours later, for men and women with urinary catheter associated lower UTI. *Most effective taken in the evening on an empty stomach, after emptying the bladder.*	**Pivmecillinam** 400 mg STAT then 200 mg three times a day • For 3 days in non-pregnant women • For 7 days in men or women who have urological abnormalities, diabetes or immunosuppression • For 7 days in men and women with urinary catheter associated lower UTI. *Not suitable for patients with penicillin allergy, oesophageal strictures or inability to swallow tablets whole.*

Oral treatment for lower UTI in PREGNANT WOMEN

First line Treatment	**Second line treatment in those for whom nitrofurantoin is not suitable (eGFR below 45 mL/min, allergy, or treated with nitrofurantoin within the last month, or at term)**		
Nitrofurantoin modified release 100 mg twice daily for 7 days *Avoid at term (36 weeks) or risk of preterm labour, as may precipitate neonatal haemolysis*	**Cefalexin** 500 mg twice a day for 7 days *Not suitable for patients with severe penicillin allergy.*	**Fosfomycin** 3g oral sachet as a STAT dose, followed by a second dose 48 hours later. *Most effective taken in the evening on an empty stomach, after emptying the bladder.*	**Trimethoprim** 200 mg twice daily for 7 days Discuss with obstetrics before prescribing. *Avoid in first trimester or known low folate.* *Not suitable for those with a history of trimethoprim resistant UTI or received trimethoprim in last 3 months.*

Initial parenteral treatment for lower UTI in those who are too unwell or unable to take oral therapy.

Patients with lower UTI should otherwise be given oral therapy.

First line Treatment in men and <u>non-pregnant women</u>	**First line Treatment in <u>pregnant women</u>**
IV co-amoxiclav 1.2 g every eight hours • Review within 48-72 hours and switch to oral as soon as possible • Maximum duration 3 days in non-pregnant women, or 7 days in men, and women who have urological abnormalities, diabetes or immunosuppression	IV cefuroxime 1500mg every eight hours • Review within 48-72 hours and switch to oral as soon as possible • Maximum duration of 7 days

Second line treatment in those with penicillin allergy (all patients)

IV Gentamicin prescribed in line with the Trust policy

- Review within 48-72 hours and switch to oral as soon as possible
- Maximum duration 3 days in non-pregnant women, or 7 days in men, and women who are pregnant or have urological abnormalities, diabetes or immunosuppression

Review Patients and Antimicrobial Therapy Daily

- Review cultures and sensitivities and change treatment if resistant to empirical therapy
- If on IV therapy: If clinically improving and able to take medicines enterally, change to oral therapy choice given above
- If not clinically improving within 48-72 hours: Review diagnosis and discuss options with microbiology

3.2. Treatment of Upper Urinary Tract Infections: e.g. Pyelonephritis (see 3.3 and 3.4 for other upper tract infections in men)

Follow diagnostic pathway 2.1 or 2.2 depending on age

Follow this pathway for prescribing choices for pyelonephritis

This section also covers antimicrobial treatment of urinary catheter associated pyelonephritis

If treating prostatitis or epididymo-orchitis see sections 3.3 and 3.4

Dipstick tests taken without symptoms or evidence of UTI should NOT be acted upon

Initial treatment for pyelonephritis in NON-PREGNANT patients					
Oral Therapy			**Intravenous Antibiotics** If vomiting, unable to take medicines enterally, severe illness or sepsis		
First line	**Second line**	**Alternative**	**First line**	**Second line**	**Alternative**
Co-amoxiclav 625 mg three times a day COMBINED WITH Amoxicillin 500mg three times a day for 10 days	Ciprofloxacin 500 mg twice daily for 7 days *Caution in those at risk of tendon damage and aortic aneurysm and dissection*	*Only use if cultures show sensitivities to this agent, and if all alternatives are unsuitable* Trimethoprim 200 mg twice daily for 14 days	IV co-amoxiclav 1.2 g every eight hours	Ciprofloxacin IV 400 mg twice daily *Caution in those at risk of tendon damage and aortic aneurysm and dissection*	IV gentamicin as per Trust prescribing protocol

Initial treatment for pyelonephritis in PREGNANT WOMEN					
Oral Therapy			**Intravenous Antibiotics** If vomiting, unable to take medicines enterally, severe illness or sepsis		
First line	**Second line (penicillin allergy)**	**Alternative**	**First line**	**Second line**	**Alternative**
Cefalexin 500 mg twice daily for 10 days	Ciprofloxacin 500 mg twice daily for 7 days *Caution in those at risk of tendon damage and aortic aneurysm and dissection*	*Only use if cultures show sensitivities to this agent, and if all alternatives are unsuitable* Trimethoprim 200 mg twice daily for 14 days *Avoid in first trimester and known folate deficiency. Discuss with obstetrics before prescribing.*	Cefuroxime IV 1500mg three times a day	IV gentamicin prescribed as per Trust policy	Discuss with microbiology for advice

Review Patients and Antimicrobial Therapy Daily

- Review cultures and sensitivities and change treatment if resistant to empirical therapy
- If on IV therapy: If clinically improving and able to take medicines enterally, change to oral therapy choice given above
- If not clinically improving within 48-72 hours: Review diagnosis, consider STAT dose of gentamicin, and discuss options with microbiology

3.3. Treatment of Acute Prostatitis

Follow pathway 2.3 then see the tables below for prescribing choices.

Treatment for all patients			
Oral Therapy		**Intravenous Antibiotics** If vomiting, unable to take medicines enterally, severe illness or sepsis	
First line Ciprofloxacin 500 mg twice daily for 14 days then review. Or Ofloxacin 200 mg BD for 14 days then review If clinically improved but symptoms still present treatment should be continued to complete 28 days' treatment. *Caution in those at risk of tendon damage and aortic aneurysm and dissection*	**Second line** Trimethoprim 200 mg twice daily for 14 days then review. If clinically improved but symptoms still present treatment should be continued to complete 28 days' treatment.	**First Line** Ceftriaxone IV 2 g once daily	**If penicillin allergy** Ciprofloxacin IV 400 mg twice daily *Caution in those at risk of tendon damage and aortic aneurysm and dissection*	**Alternative** Gentamicin as per prescribing chart
		Review patients to one of the enteral options opposite within 72 hours. **Maximum duration 28 days (combining IV and oral doses)**	

3.4. Treatment of Acute Epididymitis and Orchitis

Follow pathway 2.4 then see the tables below for prescribing choices.

Sexual contact	***No*** **Sexual Contact**
First Line Ceftriaxone 1000 mg (1 g) intramuscularly STAT AND Doxycycline 100 mg oral BD for 14 days Refer patient to GUM for follow-up If *Mycoplasma genitalium* confirmed: Moxifloxacin 400mg oral OD for 14 days	**First Line** Ofloxacin 200 mg oral BD for 14 days Or Levofloxacin 500mg OD for 10 days *Caution in those at risk of tendon damage and aortic aneurysm and dissection* If patient has red flag sepsis add in gentamicin IV once daily as per Trust prescribing guideline. Follow Sepsis guideline regarding supportive therapies.
Second line if patient has contra-indications to above agents Discuss treatment options with microbiology or GUM	**Second line if unable to take quinolones or gentamicin** Discuss treatment options with microbiology or GUM.

4. Prophylaxis against Recurrent Urinary Tract Infections (not catheter related)

Please see "LLR Guideline on Management of Lower Recurrent Urinary tract Infections in Adults" (trust reference E2/2024) for the management of recurrent UTI.

5. General advice and information for patients

5.1. Self-care of lower UTI

If an antibiotic is not given immediately for UTI then the following advice should be given:

- Advise patient to seek medical attention, or use delayed antimicrobial prescription, if symptoms to not improve or worsen within 48 hours.
- Explain to patients why an antibiotic has not been given
- Simple analgesia with regular ibuprofen and/or paracetamol (ask patient if they have this at home to avoid prescribing and dispensing related costs).
- Drink enough to avoid thirst. Generally 6-8 glasses of caffeine-free, sugar-free, fluids per day.
- Patients should be given information about how to avoid UTI (see 5.2).
- Consider providing a patient information leaflet

5.2. Advice on preventing future UTIs

The following verbal advice should be provided to all patients:

- Wipe front to back after defecation
- Drinking plenty of fluids and remaining hydrated
- Not delaying urination and encourage post-coital urination
- Avoid occlusive underwear
- Take showers instead of baths and discourage douching

See "LLR Guideline on Management of Lower Recurrent Urinary tract Infections in Adults" Trust reference E2/2024 for further information.

5.3. Providing written information

There are two leaflets written by Public Health England, and endorsed by the Royal College of Physicians, that may help reinforce the above information. These are freely available to download and print from:
https://www.rcgp.org.uk/clinical-and-research/resources/toolkits/target-antibiotic-toolkit.aspx

Quick links to leaflets in different languages (click language to access directly)

Patients under 65 years of age	Patients 65 years or older
English	English
Arabic	Arabic
Bengali	Bengali
Gujarati	Gujarati
Hindi	Hindi
Mandarin	Mandarin
Polish	Polish
Punjabi	Punjabi
Romanian	Romanian
Somali	Somali
Urdu	Urdu

6. Education and Training

No additional education or training is required

7. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Adherence to antimicrobial prescribing guidelines	Annual Trust Wide Antimicrobial prescribing audit and ad-hoc audits (e.g. CDI PII)	Antimicrobial Pharmacists	Annually	To specialities, CMG, and TIPAC.

8. Supporting References

- NICE 2018 Guidelines for the management of UTIs (https://www.nice.org.uk/guidance/conditions-and-diseases/urological-conditions/urinary-tract-infection/products?ProductType=Guidance&Status=Published) [Accessed December 2018]
- PHE 2018 Guidelines on the diagnosis of UTIs (https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis) [Accessed January 2019]
- BASHH 2020 Guidelines on the management of epididymo-orchitis https://www.bashhguidelines.org/current-guidelines/systemic-presentation-and-complications/epididymo-orchitis-2020/) [Accessed June 2023]
- BASHH 2018 Guidelines on the management of Mycoplasma genitalium (https://www.bashhguidelines.org/current-guidelines/urethritis-and-cervicitis/mycoplasma-genitalium-2018/) [accessed June 2023)
- NICE CKS for epididymo-orchitis and prostatitis (https://cks.nice.org.uk/scrotal-swellings#!scenario:4) [Accessed January 2019] (https://cks.nice.org.uk/prostatitis-acute#!scenario) [Accessed January 2019]

9. Key Words

UTI, Pyelonephritis, prostatitis, epididymitis, orchitis, epididymo-orchitis, urinary tract infection

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) Dr James Veater – consultant microbiologist and AWP chair	**Executive Lead** Medical Director
Contributing Authors Dr Ryan Hamilton – Antimicrobial Pharmacist Corrine Ashton – Lead antimicrobial Pharmacist Dr Jaskarn Rai – Consultant Urologist Mr Jonathan Goddard – Consultant Urological Surgeon Dr Simon Conroy – Professor of Geriatric Medicine Dr Sharon Koo – Consultant Microbiology Dr Sonia Agarwal – Consultant Obstetrician	**Ratified by** Antimicrobial Working Party – 15th January 2019 Antimicrobial Working Party – 10th September 2019

Details of Changes made during review: January 2019

- Reformatted as per Trust guidelines
- New diagnostic and treatment information for prostatitis and epididymo-orchitis
- New pathway for recurrent UTI and management of this
- Diagnosis and treatment updated in line with latest evidence – particularly new NICE and PHE guidance
- Antimicrobial therapy updated in line with local sensitivity data and new warnings around the use of quinolones.

July 2019

- Changed epididymo-orchitis dose of ceftriaxone to 1000 mg as per updated BASHH guidelines for gonococcal diseases, from 500mg.
- Clarified how many weeks' gestation "term" relates to for nitrofurantoin in pregnancy, and to avoid in immediate risk of premature delivery.
- Changed first line IV therapy for LUTI in pregnant women to cefuroxime, from co-amoxiclav
- Changed second line oral therapy for pyelonephritis in pregnant women to ciprofloxacin, from co-amoxiclav

30th March 2020

- IV co-amoxiclav crossed out and advice to use alternatives highlighted. Temporary changes made in light of shortages of IV co-amoxiclav.

June 2023

IV co-amoxiclav re-instated

PO treatment of pyelonephritis in non-pregnant patients updated in line with EUCAST guidance on PO co-amoxiclav dosing

Epipdydimo-orchitis section updated in line with 2020 BASHH guidelines (recommend consider tuberculous orchitis, brucella, and test for M.genitalium)

Doses of IV cefuroxime updated in line with EUCAST