POAC CLINICAL GUIDELINE

Acute Pylonephritis

DIAGNOSIS

Acute Pylonephritis is more likely if:

- **Fever > 38°**
- **Rigors**
- **Loin pain or tenderness**

COMPLICATED PYELONEPHRITIS EXCLUSION CRITERIA:

- Male
- Known or suspected renal impairment (eGFR < 60)
- Abnormality of renal tract
- Known or suspected renal stones
- Bilateral pyelonephritis
- Pregnancy
- Immunocompromised e.g., diabetes, steroids, renal transplant
- Age >55y
- Evidence of sepsis (see below)
- History of UTI with resistant organism e.g. ESBL (Extended-spectrum beta-lactamase) organisms.
- Recent admission to hospital with UTI, or hospital acquired UTI
- UTI following instrumentation
- Catheter in situ
- Recent travel to India (resistant organisms)
- Failure to respond to a single dose of IV antibiotics in the community

UNCOMPLICATED PYELONEPHRITIS INCLUSION CRITERIA:

- **Female 15-54**
- **Clinically stable**
- **Normal kidney function**
- **Normal renal structure**
- **Not pregnant**
- **No complicating disease (e.g. Diabetes)**

If moderate-severe dehydration – admit to hospital

SINGLE DOSE IV ANTIBIOTICS FOR ACUTE PYELONEPHRITIS:

- **Patient is physiologically stable (pulse, BP, peripheral circulation, hydration)**
- **Patient has uncomplicated pyelonephritis *with* vomiting and *mild* dehydration**
- **Patient has uncomplicated pyelonephritis and failed oral treatment (refer Oral antibiotic therapy)**

Oral Antibiotics

- Treat with trimethoprim-sulphamethoxazole (co-trimoxazole) 160/800mg twice daily. Check sensitivities and change if appropriate.
- If allergic to trimethoprim-sulphamethoxazole use ciprofloxacin 500mg twice daily (subsidised if patient has pyelonephritis) for 24 hours only. Check sensitivities and change to an alternative where one is available. Use with caution in the elderly (adjust dose for renal impairment) and not if < 15 years.
- Once sensitivities are known change antibiotic if appropriate. All patients started on ciprofloxacin should be changed if an alternative is available.

Continue oral antibiotics for 7 days (10 days in recurrent infection).

INVESTIGATIONS
(Required for POAC funding)

- **Urine for urgent microscopy and culture**
- **FBC, serum creatinine and blood cultures**
- **Urine pregnancy test if any chance of pregnancy**

Suitability for community based management:

Satisfactory IV access
Safe home environment
Adequate social supports
Access to telephone

IV THERAPY TREATMENT

- **Treat with stat dose of IV Gentamicin 4mg per Kg (refer table)**
- **Prescription must be endorsed stating "For use in Complicated Urinary Tract Infection".**
- **IV Fluids may also be appropriate**

Note: Ceftriaxone 1g may be used only where Gentamicin is not available due to timing/pharmacy closed.

ADMIT IF:

- **Ongoing Fever > 39°C**
- **Dehydration**
- **Tachycardia > 100**
- **Systolic BP < 100**
- **Confusion/delirium**
- **Other ongoing symptoms**

REVIEW

- **Review within 24 hours**
- **Continue oral antibiotics**
- **Treat pain and fever (paracetamol)**
- **Encourage good fluid intake**
- **If patient is now complicated, admit**

Acute Pyelonephritis

IV antibiotics for acute pyelonephritis are funded under POAC, for a single dose only, and IV fluids for a maximum of 24 hours, under the following circumstances:

- Patient is **physiologically stable** (pulse, BP, peripheral circulation, hydration);
- Patient has **uncomplicated** (see below) pyelonephritis with vomiting and *mild* dehydration;
- Patient has **uncomplicated** pyelonephritis and **failed oral treatment**.

Treatment outside of these parameters will only be funded upon advice from a named hospital specialist.

POAC does NOT normally fund the use of IV antibiotics for patients with:

- Complicated pyelonephritis (discuss/admit);
- Uncomplicated pyelonephritis with vomiting and moderate to severe dehydration (discuss/admit);
- Uncomplicated pyelonephritis *without* vomiting or dehydration (treat with oral antibiotics).

See below for further guidance on managing these patients.

Complicated pyelonephritis (exclusion criteria):

- Known or suspected renal impairment (eGFR < 60)
- Abnormality of renal tract
- Known or suspected renal stones
- Bilateral pyelonephritis
- Pregnancy
- Immunocompromised e.g., diabetes, steroids, renal transplant
- Age >55y
- Male
- Evidence of sepsis (see below)
- History of UTI with resistant organism e.g. ESBL (Extended-spectrum beta-lactamase) organisms.
- Recent admission to hospital with UTI, or hospital acquired UTI
- UTI following instrumentation
- Catheter in situ
- Recent travel to India (resistant organisms)
- Failure to respond to a single dose of IV antibiotics in the community

Uncomplicated pyelonephritis (inclusion criteria):

- Female 15 – 54
- Clinically stable
- Normal kidney function
- Normal renal structure
- Not pregnant
- No complicating disease e.g., diabetes

Diagnosis

HISTORY AND EXAMINATION – documentation required for POAC funding

Documented history and examination supporting diagnosis of uncomplicated acute pyelonephritis and degree of dehydration is mandatory for POAC funding of IV antibiotics and IV fluids.

Acute pyelonephritis is more likely if:

- Fever > 38°C
- Rigors
- Loin pain or tenderness

The patient's temperature and a urine dipstick result must be recorded. If there is no abnormality on dipstick the diagnosis of acute pyelonephritis is less likely (or the collecting system is obstructed) – seek specialist advice.

Admit if there is evidence of sepsis, for example:

- Fever > 39°C
- Tachycardia > 110
- Systolic BP< 100
- Confusion/delirium

INVESTIGATIONS – required for POAC funding

- Send **urine for URGENT microscopy and culture**
- Arrange **FBC, serum creatinine and blood cultures**
- **Urine pregnancy test** if any chance of pregnancy

The diagnosis is usually made clinically and antibiotics started empirically. Antibiotics should be adjusted according to sensitivities once received. If unsure, discuss with the on-call medical team.

Management

1) **Complicated infection or uncomplicated *with* moderate to severe dehydration:** admit

2) **Uncomplicated infection *without* vomiting or dehydration**: start **ORAL** antibiotics:

ORAL ANTIBIOTICS:

- Treat with **trimethoprim-sulphamethoxazole (co-trimoxazole) 160/800mg twice daily.** Check sensitivities and change if appropriate.

- If allergic to trimethoprim-sulphamethoxazole use ciprofloxacin 500mg twice daily (subsidised if patient has pyelonephritis) **for 24 hours only. Check sensitivities and change to an alternative where one is available.** Use with caution in the elderly (adjust dose for renal impairment) and not if < 15 years.

- Once sensitivities are known change antibiotic if appropriate. All patients started on ciprofloxacin should be changed if an alternative is available.

- Nitrofurantoin is not recommended as therapeutic levels are not achieved in the kidney substance.

Continue oral antibiotics for 7 days (10 days in recurrent infection).

Treat pain and fever (use paracetamol rather than NSAIDs to reduce the risk of renal impairment) and encourage good fluid intake. Advise review if there is no improvement or deterioration within 24 hours.

If patient is deteriorating or not improving and requires review within 24 hours POAC will fund a review appointment. Check urine culture results if available and consider IV antibiotics as below. Reconsider the diagnosis. If patient is now complicated admit.

3) **Uncomplicated *with* vomiting or mild dehydration:** consider if patient and circumstances are appropriate for **IV antibiotic and IV fluid therapy** in the community:

   - Safe home environment
   - Adequate social support
   - Access to telephone
   - IV access

   IV fluids may be appropriate. POAC will fund up to 24 hours of IV fluids. Also consider appropriate analgesia and antiemetic medication.

IV ANTIBIOTICS

POAC will fund a single dose of IV antibiotics.

Be guided by sensitivities if available, otherwise treat with stat dose of **IV gentamicin** 4mg per Kg, with a maximum dose of 320 mg, based on ideal body weight (see table below).

Male 50kg+ (2.3kg/inch >5ft) 50kg+ (0.9kg/cm >150cm)				**Female** 45kg+ (2.3kg/inch >5ft) 45kg+ (0.9kg/cm >150cm)			
Height			**IBW**	**Height**			**IBW**
ft	**in**	**cm**	**kg**	**ft**	**in**	**cm**	**kg**
4	6	137	36	4	6	137	31
4	7	140	39	4	7	140	34
4	8	142	41	4	8	142	36
4	9	145	43	4	9	145	38
4	10	147	45	4	10	147	40
4	11	150	48	4	11	150	43
5	0	152	50	5	0	152	45
5	1	155	52	5	1	155	47
5	2	157	55	5	2	157	50
5	3	160	57	5	3	160	52
5	4	163	59	5	4	163	54
5	5	165	61	5	5	165	56
5	6	168	64	5	6	168	59
5	7	170	66	5	7	170	61
5	8	173	68	5	8	173	63
5	9	175	71	5	9	175	66
5	10	178	73	5	10	178	68
5	11	180	75	5	11	180	70
6	0	183	78	6	0	183	73
6	1	185	80	6	1	185	75
6	2	188	82	6	2	188	77
6	3	190	84	6	3	190	79
6	4	193	87	6	4	193	82
6	5	196	89	6	5	196	84

IV gentamicin

- No blood monitoring is required for a single dose in an uncomplicated patient.
- Gentamicin can be ordered on MPSO but is not subsidised. POAC funding covers the cost of gentamycin.
- It may take a community pharmacy about 24 hours to order and receive stock, so ideally a general practice/A & M clinic should have a supply in storage for future use.
- The cost is about $20 for 10 x 40 mg/mL 2 ml ampoules, with about a 12 to 18 months expiry. An 80 kg person (at 4 mg/kg) would need 320 mg or 4 ampoules.

Gentamicin is available on a prescription, not as a Prescriber supply order (PSO). Each patient requiring gentamicin for pyelonephritis must be given a prescription stating the appropriate dose, route of administration and that it is to be administered immediately (no repeat courses). The prescription must also be endorsed stating "For use in Complicated Urinary Tract Infection".

> Example: *Gentamicin 280mg to be given intravenously as a STAT dose – for Complicated Urinary Tract Infection.*

The prescription must be filled at a pharmacy and the gentamicin returned for administration in the Practice. Note that a representative of the patient (family member or practice nurse) can have the prescription filled if the patient is unable.

When gentamicin is not available due to timing of patient presentation (pharmacy closed) use ceftriaxone 1g. Add 10mL Water for injection to 1g vial Ceftriaxone. Shake well until all powder is dissolved and inject slowly over 2-4minutes. Ceftriaxone is not currently funded for acute pyelonephritis. POAC will cover the cost of this antibiotic.

Monitor the patient whilst IV antibiotics and fluids are given. If unstable admit. Arrange telephone follow up at 3-4 hours or a POAC funded nurse visit if appropriate (next morning if very late presentation).

Review 24 hours post IV antibiotics (POAC funded). If significant improvement, discharge home with suitable analgesia and antibiotics for 7 days as guided by sensitivities (10 days for recurrent infection). Advise to re-present if there is any deterioration.

If ongoing significant fever, dehydration or other symptoms admit. It is important to consider whether there may be an obstruction or renal stone, or another diagnosis.

ULTRASOUND (USS) IN PYELONEPHRITIS

POAC does **not** fund renal USS for pyelonephritis or for suspected (or exclusion of) perinephric abscess.

In uncomplicated pyelonephritis ultrasound is not indicated during the acute episode.

If the patient is not improving despite IV antibiotics they should be considered as a complicated case and admitted for further assessment and management.

FOLLOW UP

If no recent renal tract imaging (within the last 6 months) arrange ULTRASOUND (via DHB or Access to Diagnostics) in:

- Male with acute pyelonephritis (NB these will have been admitted, but ensure USS has been arranged).

- Female with two episodes of acute pyelonephritis within 12 months, as the infection is likely to be from an ascending lower tract UTI

POAC funding for management of acute pyelonephritis is detailed on the POAC fee schedule.

DISCLAIMER:
This management guideline has been prepared to provide general guidance with respect to a specific clinical condition. It should be used only as an aid for clinical decision making and in conjunction with other information available. The material has been assembled by a group of primary care practitioners and specialists in the field. Where evidence based information is available, it has been utilised by the group. In the absence of evidence based information, the guideline consists of a consensus view of current, generally accepted clinical practice.

This guideline should not replace professional clinical judgment in managing each individual patient.

ENDORSEMENT:
This guideline has been endorsed by the POAC Clinical Reference Group