



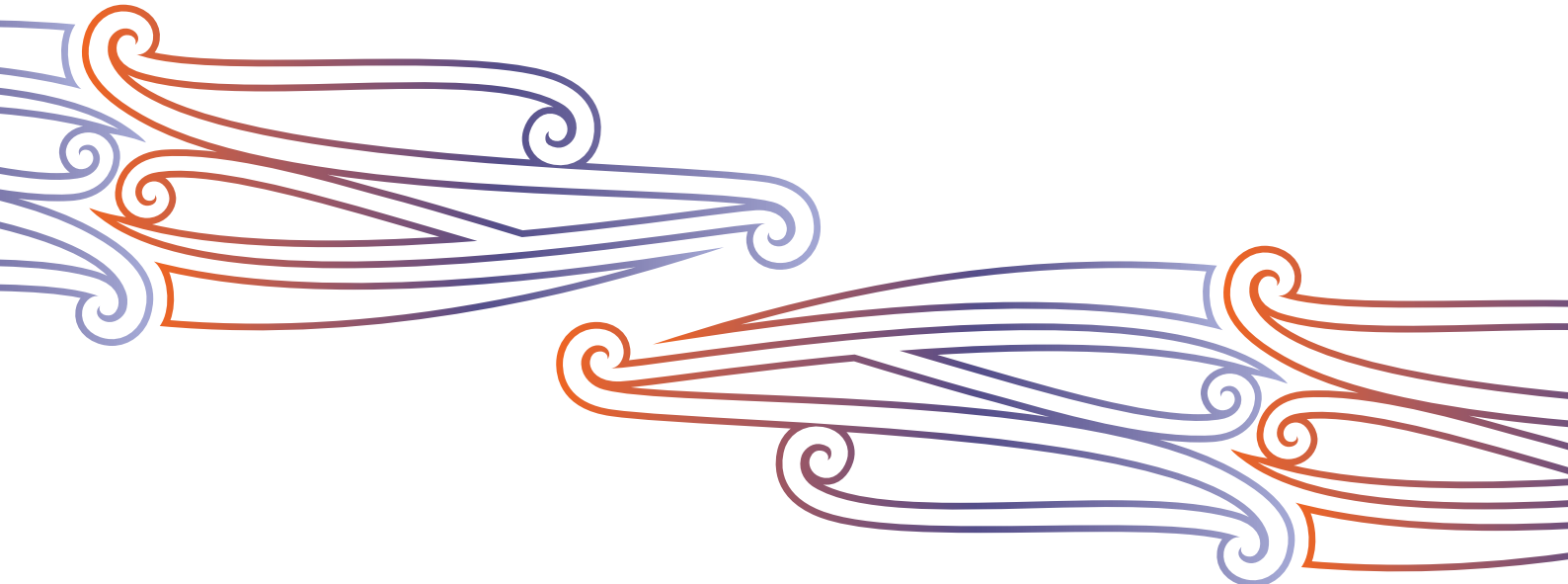
**Te Kāwanatanga o Aotearoa**  
New Zealand Government



HEALTH QUALITY & SAFETY  
COMMISSION NEW ZEALAND  
*Kupu Taurangi Hauora o Aotearoa*

# Guide to improving the use of antibiotics in the management of urinary tract infections in aged residential care

**He aratohu mō te whakamahi rongoā  
paturopi te whakahaere i ngā pokenga  
ara mimi i te whare tiaki kaumātua**



Published September 2022 by Health Quality & Safety Commission New Zealand, PO Box 25496, Wellington 6146, New Zealand.

Available online at [www.hqsc.govt.nz](http://www.hqsc.govt.nz) | Enquiries to: [info@hqsc.govt.nz](mailto:info@hqsc.govt.nz)



This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy, visit: <http://creativecommons.org/licenses/by-nc-sa/4.0/>

## Contents | Rārangi take

Glossary   <b>Kuputaka</b> .....	4
Introduction   <b>He kupu whakataki</b> .....	5
Acknowledgments .....	5
Background .....	6
About this guide .....	6
Ethics and privacy.....	7
Responsiveness to Māori .....	7
Case for change   <b>He take hei panoni</b> .....	8
Improvement methodology   <b>He tukanga whakapai</b> .....	10
Strategies to reduce antibiotic prescribing for asymptomatic bacteriuria   <b>He rautaki e whakaiti ai i te kai rongoā pa-turopi mō te moroiti tahumaero</b> .....	11
Improvement ideas   <b>He whakaaro hei whakapai ake</b> .....	13
Use of diagnostic criteria .....	13
Use of dipstick.....	13
Urine collection, storage and reporting .....	14
Prescribing antibiotics .....	14
Education and awareness of infection prevention and control (IPC) and antimicrobial stewardship.....	15
Governance and surveillance .....	15
Process surveillance.....	16
Measurement   <b>Aromatawai</b> .....	17
Implementation of the strategies   <b>Te whakarite rautaki</b> .....	19
Sustaining improvement   <b>Hei ukauka i te whakapai</b> .....	19
Supporting resources and tools   <b>Ngā rauemi</b> .....	20
References   <b>He tohutoro</b> .....	21

## Glossary | Kuputaka

Term	Meaning
Antibiotic	An agent (eg, medicine) that can kill or slow the growth of bacteria.
Antimicrobial	An agent that destroys or slows the growth of microorganisms, including parasites, fungi, viruses and bacteria. All antibiotics are antimicrobials, but not all antimicrobials are antibiotics.
Antimicrobial stewardship (AMS)	Actions that promote the responsible use of antimicrobials (including antibiotics) to improve patient/resident outcomes, which in turn reduce antimicrobial resistance and the spread of infections caused by multi-drug-resistant organisms.
Asymptomatic bacteria	The presence of bacteria in the properly collected urine of a person who has no signs or symptoms of a urinary tract infection.
Infection prevention and control (IPC)	An area of expertise that aims to prevent or control (limit) the spread of infections in health care facilities and the community.
Multi-drug-resistant organism (MDRO)	Microorganisms (mainly bacteria) that have developed resistance to one or more classes of antimicrobial agents. They are often called 'superbugs'.
Situation-Background-Assessment-Recommendation (SBAR)	A technique that provides a framework for prompt and appropriate communication between members of a health care team about a resident's condition.
Urinary tract infection (UTI)	<p>An infection in any part of the urinary system, including the kidneys, bladder or urethra. UTIs are more common in women. They usually occur in the bladder or urethra (cystitis), but more serious infections involve the kidney (pyelonephritis). A bladder infection may cause pelvic pain, increased urge to urinate, pain or burning with urination (dysuria) and blood in the urine. A kidney infection may cause back pain, nausea, vomiting and fever. UTIs are commonly treated with antibiotics.</p> <p>The majority of UTIs can be treated in aged residential care following this guide. Unstable patients or those with pyelonephritis may need intravenous antibiotic therapy and transfer to hospital for treatment and or investigation (as directed by nurse practitioner/general practitioner).</p>

## Introduction | He kupu whakataki

---

### Acknowledgments

The Health Quality & Safety Commission New Zealand (the Commission) acknowledges the use of Public Health Ontario's urinary tract infection (UTI) programme (2019) in the development of this guidance.

We also acknowledge the Aotearoa New Zealand project teams and sponsors who contributed to localising systems and practice improvements within geographically and culturally diverse aged residential care (ARC) settings. These include:

- Summerset New Zealand
- Auckland District Health Board (DHB)
- Northland DHB
- South Island Alliance
- Summerset in the Vines
- Summerset Mountain View
- Summerset by the Park
- Radius Baycare
- Claud Switzer Memorial Trust
- Kaikohe Care Centre (Lexhill Ltd)
- Lakewood Court Rest Home
- Southanjer
- The Observatory Village
- Presbyterian Support South Canterbury
- Elizabeth Knox Home and Hospital.

The Commission also thanks the project leadership and steering governance group, who provided clinical oversight, guidance and feedback from the planning and implementation to the conclusion of the project work. The Commission is grateful to the following project leads who have supported the design, execution and implementation of the project. Project leads worked with facilities to collect data and test interventions.

- Elizabeth Lear, Quality improvement advisor | Kaitohutohu-whakapai kounga
- Andrea Taylor, Nurse consultant manager & service manager specialist diabetes service, Te Tai Tokerau/Northern Region
- Sharon Mildon, Quality nurse leader – Health of older people, Te Toka Tumai – Auckland and Waitemātā Districts
- Anna Carey, Clinical improvement manager, Summerset Group Holdings Limited

The stories and learning of project teams, staff, residents and whānau have informed this document.

## Background

The Commission works with others within strong partnerships and relationships (involving) to gather and share intelligence (informing), to raise awareness and encourage thought and knowledge sharing (influencing) and to support change to improve the health and disability system (improving).

The Commission partners with the ARC sector to develop and implement ARC quality improvement initiatives. The goal is to improve resident and whānau experiences of care, reduce care-related harm, reduce variations in patterns of care and support a culture of continuous quality improvement.

Optimising the use of medicines in the ARC sector has been one area of focus. Medicine optimisation is a person-centred approach to improving the safe and appropriate use of medicines, including minimising the risks associated with polypharmacy, the potential for adverse events and – in the case of antibiotics – the global health threat of antimicrobial resistance.

The Commission, with the help of the sector, identified a suite of interventions to optimise the use of antibiotics for suspected UTI. These interventions were tested with several facilities across the country. A measurement plan was also developed to support the improvement work. This guide is the outcome of this initiative. The purpose of this guide is to support organisations and facilities with the implementation of the identified interventions and make the system safer and more efficient for consumers.

## About this guide

This guide was developed to support ARC multidisciplinary teams in implementing strategies to:

- improve symptom recognition and communication in the diagnosis of UTI
- reduce the rate of urinary antibiotic prescriptions for residents whose symptoms do not meet clinical criteria for UTI
- improve systems for review of antibiotic treatment following results of laboratory testing: urine microscopy, sensitivity and culture (MC&S).

A literature review [Appropriate medication use in aged residential care \(2020\)](#) was undertaken to inform the development of interventions to improve systems and practice.

This review captures national and international evidence to support the need for a unified national approach. Various interventions are explained in detail with evidence to optimise the use of antibiotics for UTI.

It is worth noting that interventions mentioned in this document may differ from those in the review document, which provided examples rather than tools tailored to the current ARC context in Aotearoa New Zealand. One such difference is the decision-support tool. Users are encouraged to use the interventions listed in this guide before implementing any other interventions.

The interventions in this guide were developed and tested through partnership between a range of ARC providers through the DHB Health of Older People networks. A geographically spread cohort of 11 test facilities and four project leads collaborated to iterate this guidance for sharing and use in the wider Aotearoa New Zealand ARC sector.

Interventions recommended in this guide sit within the nursing sphere of influence.

This guide focuses on antibiotic treatment of suspected UTI and excludes the following areas of practice:

- indwelling catheter insertion and maintenance practices
- necessity of indwelling catheters
- specific antibiotic prescribing advice (antibiotic type/dose/timing/regimen).

This guide is informed by the currently available evidence. Evidence around new interventions may emerge in future, and users of this guide are encouraged to review clinical practice periodically. This guide is also aligned with the [UTI frailty care guide](#).

A range of tools and templates to support the implementation, along with the guide itself, are available to download at: [www.hqsc.govt.nz/resources/resource-library/ARC-UTI-guide](http://www.hqsc.govt.nz/resources/resource-library/ARC-UTI-guide).

## Ethics and privacy

Implementation of this guide requires facilities to work with residents and their whānau to implement, and adapt when needed, a set of interventions to optimise antibiotic use. Activities such as capturing residents' stories, conducting surveys and collecting other staff- and resident-related information are important parts of the project. Appropriate consenting processes should be followed before the use of such information.

For more details on ethics, refer to the [National Ethical Standards for Health and Disability Research and Quality Improvement](#).

## Responsiveness to Māori

The Commission is committed to working for Māori health advancement, sharing the He Korowai Oranga vision of 'Pae Ora' (healthy futures) for Māori and drawing on the articles and principles of Te Tiriti o Waitangi. Recognising that Māori have their own health aspirations, priorities, goals and ways of working, we aim to partner with and work alongside Māori to advance Māori health across the lifespan.

During the testing of interventions, the Commission took steps to better understand how health inequities affect Māori elderly living in ARC. The inclusion of Māori clinicians and consumers on the relevant advisory and steering groups was fundamental to the project to ensure decisions on the development of interventions to optimise antibiotic use will benefit and not disadvantage Māori residents and whānau. Interventions captured in this guide were also tested in services where Māori residents and their whānau could participate in feedback.

## Case for change | He take hei panoni

---

UTI is one of the most common infections diagnosed in ARC (Nicolle 2016). However, international evidence suggests that up to three-quarters of the prescriptions for UTI in ARC are for residents who do not meet the clinical criteria for UTI. Furthermore, over half of antibiotic courses administered in ARC for UTI may be unnecessary or excessively broad spectrum (Jump et al 2018).

Not all bacteria in the urine are harmful. Asymptomatic bacteriuria (the presence of bacteria in urine without symptoms) does not need antibiotic therapy as it is effectively harmless. Needlessly treating residents with antibiotics exposes them to an increased risk of antibiotic-associated adverse effects such as diarrhoea and nausea and the development of resistant organisms.

Additionally, in some people, the normal microflora of the urinary tract protects against the development of UTI. Disrupting the natural growth of microorganisms in the urinary tract with unneeded antibiotics increases a person's risk of developing a symptomatic UTI in the future (Grabe et al 2021).

Antibiotic resistance is a growing international threat that has been driven by inappropriate use or over-prescribing of antibiotics. Antimicrobial resistance is a major threat to health care globally and has the potential to limit the effectiveness of future medical care.

In ARC, treating asymptomatic bacteriuria with antibiotics increases the risk of a person developing an infection from bacteria that is resistant to treatment. This in turn can increase the risk of an outbreak of antibiotic-resistant infections across the facility.

To improve antibiotic selection and reduce the spread of multi-drug-resistant organisms in ARC, it is recommended that a urine culture be completed for all residents with signs and symptoms of a UTI (Best Practice Advocacy Centre New Zealand 2015).

Residents with specific UTI symptoms such as dysuria usually need treatment, but urinalysis and cultures that may be obtained for a variety of reasons may lead to a prescription for an antibiotic when only bacteriuria or pyuria is present (Jump et al 2016). Because dipstick urinalysis has poor positive predictive value in diagnosing UTIs in this cohort, urinalysis and culture should only be undertaken if there is clinical evidence of UTI (Ninan et al 2014).

The urine dipstick test indicates whether bacteria are likely to be present in urine, not whether the bacteria are causing an infection. A dipstick that is positive for leukocytes and nitrites is more likely to lead to antibiotic treatment, which may not be appropriate because asymptomatic bacteriuria is relatively common in frail older people. Therefore, dipstick tests may be useful to rule out a UTI but should not be used to diagnose a UTI.



Improving the appropriate use of antibiotics directly contributes to the [New Zealand Antimicrobial Resistance Action Plan](#) and may also result in savings for health districts and ARC providers.

Implementation of this programme will contribute towards achieving the criteria set out in section 5 of the updated Ngā paerewa Health and disability services standard (HDSS) [NZS 8134:2021](#).

Specifically, this guide will help your organisation meet the requirements of sections 5.1, 5.2, 5.3 and 5.4 of the standard. Standardised definitions and data-capturing methods given in the measurement section of this guide will help to measure antibiotic usage and surveillance of healthcare-associated infection-related data as required in section 5.4 of the HDSS.



#### **Evidence base and more information**

- [Appropriate medicines use in aged residential care: optimising use of antibiotics, antipsychotics and fentanyl](#)
- [A pragmatic guide to asymptomatic bacteriuria and testing for urinary tract infections \(UTIs\) in people aged over 65 years](#)
- [Frailty care guides: Urinary tract infection](#)

## Improvement methodology | He tukanga whakapai

---

The Model for Improvement, which is a part of the science of improvement, was used as an approach to address the problem. The science of improvement is an applied science that emphasises innovation, rapid cycle testing in the field and spread in order to generate learning about what changes, in which contexts, produce improvements. It is characterised by the combination of expert subject knowledge with improvement methods and tools. It is multidisciplinary and draws on multiple fields such as science, systems theory, psychology and statistics.

Model for Improvement methodology traces back to W Edwards Deming (1900–93), who taught that, by adhering to certain principles of management, organisations can increase quality and simultaneously reduce costs. Based on Deming’s work, the Model for Improvement was created by Associates for Process Improvement as a simple, effective tool for bringing about change and improvement. The Commission uses the Model for Improvement as the primary methodology for its quality improvement initiatives. It includes:

- having a clear, measurable aim
- using a measurement framework in support of reaching the aim
- having a clear description of the ideas (intervention) and how these ideas are expected to impact the results (the causal pathway from changes to desired outcomes)
- dedication to rapid testing using plan–do–study–act (PDSA) cycles, prediction and learning from tests
- learning from variation and heterogeneity by using time-ordered data to detect variation, special cause and improvement
- application of behavioural and social sciences to change.

Where possible, we encourage teams within facilities to implement the intervention using the Model for Improvement. Information related to this model and its application in the ARC setting are captured in the [Quality improvement toolkit for use in age related residential care](#) document available on the Commission website ([www.hqsc.govt.nz](http://www.hqsc.govt.nz)).

## Strategies to reduce antibiotic prescribing for asymptomatic bacteriuria | He rautaki e whakaiti ai i te kai rongoā pa-turopi mō te moroiti tahumaero

---

Table 1 captures the strategies to diagnose and manage asymptomatic bacteriuria. The improvement areas in the table reflect the focus area of the improvement work. This is followed by the improvement strategies, which explain the specific areas that need to be addressed to achieve the desired results. Strategies are the specific ideas that, when applied, will improve the system, process and outcomes for residents. Strategies that were tested are explained in the [Improvement ideas](#) section of this document.

**Table 1: Overall strategies to improve the use of antibiotics for UTI**

Improvement areas	Improvement strategies
Use of diagnostic criteria	<ul style="list-style-type: none"> <li>• Use of decision-support tool</li> <li>• Use of 'SBAR' (situation-background-assessment-recommendation) tool to communicate symptoms</li> </ul>
Use of dipsticks to diagnose UTI	<ul style="list-style-type: none"> <li>• Only use dipsticks to rule out UTI</li> </ul>
Urine collection, storage and reporting	<ul style="list-style-type: none"> <li>• Training for staff on how to collect, store and transport urine samples correctly (these should be reflected in relevant policies and procedures)</li> <li>• Identify signs and symptoms on laboratory request</li> <li>• Only send a urine sample to the laboratory for culturing if signs and symptoms criteria are met</li> <li>• Timely access to and follow-up of the laboratory report</li> </ul>
Antimicrobial stewardship (AMS)	<ul style="list-style-type: none"> <li>• Engagement with prescriber to use treatment algorithm</li> <li>• Request or initiate empiric treatment only when diagnostic criteria are met</li> <li>• Initiate a system/alert for prescriber review of treatment once the MC&amp;S result is available</li> </ul>
Education and awareness of IPC and AMS	<ul style="list-style-type: none"> <li>• Staff education on:               <ul style="list-style-type: none"> <li>- UTI symptom recognition and escalation</li> <li>- risk factors for UTI</li> <li>- how to collect, store and send urine samples</li> <li>- infection prevention</li> <li>- AMS</li> </ul> </li> <li>• Resident and whānau awareness               <ul style="list-style-type: none"> <li>- Resident and whānau awareness of the prevention of UTIs and of AMS, including awareness sessions, notice boards, pamphlets and kōrero</li> <li>- Test the health literacy and cultural accessibility of resources and approaches with a consumer focus group</li> </ul> </li> </ul>
Governance and surveillance	<ul style="list-style-type: none"> <li>• Agree on an evidence-based definition for UTI</li> <li>• Streamline laboratory data collection</li> <li>• Review functions in electronic systems to document signs and symptoms and alert treatment review</li> <li>• Use process surveillance to audit the consistency of and adherence to best practice</li> <li>• Review policies and procedures</li> </ul>

Abbreviations:

AMS = antimicrobial stewardship                      IPC = infection prevention and control  
 MC&S = microscopy culture and sensitivity        UTI = urinary tract infection

## Improvement ideas | He whakaaro hei whakapai ake

---

This section explains each of the improvement areas and the related strategies to improve the process and achieve the desired outcomes.

### Use of diagnostic criteria

#### Intervention

- Use a decision-support tool to check whether signs and symptoms meet criteria for UTI.

We recommend using a set of criteria to diagnose a suspected UTI because this will help keep decision-making consistent. The [UTI decision-support tool](#) was adapted from the McGeer (Stone et al 2012) UTI criteria and the Ontario UTI assessment algorithm. This decision-support tool captures the pathway for residents with or without a urinary catheter. Proposed diagnostic criteria were agreed based on advice from the steering group and tools currently used across ARC facilities.

### Use of dipstick

#### Intervention

- Only use dipsticks to rule out UTI, not to diagnose UTI.

When a person is generally unwell and a dipstick is negative for leukocytes and nitrites, it is unlikely that the person has a UTI. In this situation, the dipstick result helps to rule out UTI as a possible cause of symptoms (Devillé et al 2004; Bafna et al 2020).

When a person is generally unwell but has no symptoms of a UTI, a positive dipstick can cause diagnostic confusion (up to half of people living in ARC have leukocytes and nitrites in their urine that cause no symptoms (Best Practice Advocacy Centre New Zealand 2015; Givler and Givler 2022)) and delay a thorough investigation for the true cause of symptoms.

Therefore, the Commission (2020) recommends that dipstick testing should not be used to diagnose UTI in the ARC setting.

## Urine collection, storage and reporting

### Intervention

- Timely access to and follow-up of laboratory report.

Timely access to laboratory results helps nursing staff initiate timely prescriber review of treatment. Facilities are encouraged to work with the responsible clinician general practitioner/nurse practitioner to develop an agreed process to send samples to the laboratory for analysis and review. They need to work with laboratory service providers and hospitals to implement or improve systems to access and/or retrieve laboratory results in a timely manner.

## Prescribing antibiotics

### Intervention

- Request or initiate empiric treatment only when diagnostic criteria are met.
- Prescriber reviews treatment once MC&S results are available.

Discussion between the registered nurse and nurse practitioner/general practitioner is important when using antibiotics for suspected UTI. During the assessment, if the resident is showing clinical signs and symptoms of UTI as defined in the decision-support tool, nursing staff need to inform the prescriber. Depending on the resident's condition, the prescriber may either initiate empiric treatment or wait for the laboratory results.

Once the laboratory results are available, the prescriber reviews the results to ensure the prescribed antibiotics match the culture and sensitivity result. The prescriber should follow the ARC facility's communication process to follow up laboratory results and collaborate with the nursing team to make any necessary changes to the antibiotic prescription. These changes should be captured in the resident's notes. Facility teams are also encouraged to review the laboratory result and check that the prescribed antibiotics match the MC&S result. If a change is required, the facility team should follow the agreed process with the general practitioner/nurse practitioner.

Any communication and related outcomes should be captured in the resident management system. This data will help in monitoring adherence to the agreed process.

## Education and awareness of infection prevention and control (IPC) and antimicrobial stewardship

To standardise practice, we recommend all staff within facilities are trained to use the decision-support tool and understand the effects of overuse of antibiotics on residents and the prevention and management of UTI. A presentation, '[Use of AB for UTI awareness presentation](#)', to facilitate teaching and coaching in facilities is available to download.

An [AB and UTI staff knowledge and confidence survey](#) has also been developed to capture and understand current knowledge around antibiotics/UTIs. Facility teams are encouraged to complete this survey before implementing the interventions to capture the baseline knowledge, then complete the same survey again after the implementation to measure the improvement in knowledge and awareness of staff.

## Governance and surveillance

### Interventions

- Capture data related to the use of the decision-support tool, prescribing details and related outcomes.
- Align the programme with existing governance structure.
- Regularly report antibiotic use and UTI.

To sustain the improvements made, this work needs to align with the facility's IPC programme and be reported to the IPC governance body, such as the facility IPC committee.

## Process surveillance

Process measures capture the effects of your quality improvement efforts on the inputs or steps that contribute to system outcomes. For this project, process measures were developed based on the interventions identified, including symptom identification, urine sample collection, treatment decision, prescriber review and resident's outcomes. Some electronic care patient management systems may already collect and report on some or all of this data. Manual systems may collect and store this information in different places. [A template for process surveillance is available to download.](#)

Process surveillance is key to measuring both baseline and practice improvement success. Adherence to an agreed diagnosis and treatment pathway should be captured at least monthly and progress reported.

Process surveillance supports all the recommended improvement ideas, namely:

- identifying signs and symptoms of UTI
- identifying when dipsticks are used to diagnose
- identifying when urine samples are sent to the laboratory
- identifying when antibiotics are prescribed and whether/when treatment is reviewed.

Pulling this information together shines a light on practices that drive the use of antibiotics for residents whose symptoms do not meet the diagnostic criteria for UTI.



## Measurement | Aromatawai

---

To be able to know whether the practice improvements have been successful, we encourage facilities to create a measurement plan that includes a set of measures and how the data for the measure will be collected and calculated. The document '[UTI measurement plan](#)' is available to download and outlines the measures that can be used to capture improvement.

To understand the improvement in the process steps and the overall outcome, the following measures are recommended.

### Outcome

- Total number of urinary antibiotic prescriptions for UTI
- Total number of UTI
- Percentage of hospital emergency department presentations related to complications of UTI

### Process

1. Percentage of urine specimens sent to the laboratory for MC&S testing that meet criteria
2. Percentage of urinary antibiotic prescriptions where signs and symptoms meet the criteria for UTI according to the decision-support tool
3. Percentage of suspected UTI cases where the decision-support tool was used
4. Percentage of suspected UTI cases where dipstick was not used to diagnose
5. Percentage of cases where treatment was reviewed by the prescriber after the laboratory result became available
6. Percentage increase in staff antibiotic/UTI knowledge and awareness

It is recommended that facilities use measures 3 to 6 during the implementation phase to ensure the process steps are followed. Once the team is confident that the interventions are embedded in the system and it has become business as usual, facilities can stop collecting data on these measures.

### Data collection

A [UTI data collection template](#) has been developed in Microsoft Excel for facilities to capture the outcome- and process-related data and is available to download. Facilities need to ensure they collect information related to ethnicity to understand the impact on equity in care.

### Data analysis

When analysing data, plotting and observing the data over a period will provide the facility with more useful information. Where possible, use a time series (line) graph to see and understand the patterns within the data.

## Reporting

Each facility is encouraged to incorporate these graphs into their current reporting structures and share the information with their teams.

## Equity

As mentioned above, facilities implementing the interventions need to ensure they capture the ethnicity of residents with suspected UTI. Data should be analysed using residents' ethnicity to understand the impact of the interventions on various ethnicities. Breakdown of any report by ethnicity will further improve the visibility of inequities in the care provided.

## Additional optional measures

Facilities interested in understanding more about the performance of the process and associated outcomes in detail may use these additional optional measures. Details of these measures are provided in the [Measurement plan document](#) available for download.

### Outcome measure

- Urinary antibiotic prescriptions for UTI per 1,000 resident days
- UTI per 1,000 resident days
- Total number of urine samples sent to the laboratory for suspected UTI

### Process measure

- Time to antibiotic use from onset of symptoms

### Unintended impact of new interventions (balancing measure)

- Number of residents whose health has deteriorated as a result of waiting for MC&S laboratory results

## Data collection for optional measures

To support the optional measures, a [UTI detailed data collection template](#) has been developed and is available to download. This template is designed to capture more information related to various steps in the process.

Facilities that capture data in electronic format may explore the possibilities of incorporating the additional data field related to process steps in their system. Creating an electronic report will support the ongoing monitoring and enhance the capability of the facility to detect improvements.

Additional areas where teams can gather more information include:

- whether a decision-support tool was used
- whether symptoms were identified
- whether urine samples were collected and sent to the laboratory
- whether the antibiotic was started empirically
- whether the regimen was reviewed when the MC&S results were finalised
- whether the UTI was resolved.

## Implementation of the strategies | Te whakarite rautaki

---

To achieve the desired outcomes, the interventions need to be implemented in a structured and coordinated approach. A [UTI implementation checklist](#) has been developed to support the roll-out of the interventions mentioned in this guide. Individual facilities or organisations may customise this checklist to accommodate local requirements.

Changes recommended in this guide will have varying degrees of impact on the staff and people who are part of this process. This may include changes in roles, responsibilities, practice and the way care is provided. A multidisciplinary approach to implementation is highly recommended.

Facilities are encouraged to test the interventions on a few residents in whom UTI is suspected before rolling it out across the facility or organisation. Testing is an opportunity for teams to identify any gaps in the process. Teams can make necessary changes based on the situation unique to their facility.

Success of this project depends on both facility staff and prescribers. A letter, '[Use of ABs for UTI letter to prescriber](#)' to inform the prescriber and gain their support is available for download. It is editable and can be customised for local requirements. We recommend that, as part of the implementation, facility teams share this letter with their prescribers.

## Sustaining improvement | Hei ukauka i te whakapai

---

To continue to improve and sustain the improvements made, facilities are encouraged to have a plan in place to monitor and review the process. Some of the strategies to sustain the improvements are to:

- continue monthly reporting on UTI and antibiotic use
- include ways to track the process in everyday systems (process surveillance)
- include the topic as an agenda item for quality or IPC meetings
- update policies and procedures
- update staff orientation
- appoint antimicrobial stewardship 'champions'
- update staff and resident education/awareness resources.

## Supporting resources and tools | Ngā rauemi

---

The tools and resources listed below are all available to download here:

[www.hqsc.govt.nz/resources/resource-library/ARC-UTI-guide](http://www.hqsc.govt.nz/resources/resource-library/ARC-UTI-guide)

- UTI decision-support tool
- Antibiotic/UTI PowerPoint presentation
- Measurement plan
- Implementation checklist
- Staff knowledge and confidence survey
- Prescriber letter
- Data collection template
- Detailed data collection template

## References | He tohutoro

---

- Bafna P, Deepanjali S, Mandal J, et al. 2020. Reevaluating the true diagnostic accuracy of dipstick tests to diagnose urinary tract infection using Bayesian latent class analysis. *PLoS ONE* 15(12): e0244870. DOI: 10.1371/journal.pone.0244870.
- Best Practice Advocacy Centre New Zealand. 2015. A pragmatic guide to asymptomatic bacteriuria and testing for urinary tract infections (UTIs) in people aged over 65 years. *Best Practice Journal* July: 14-25. URL: <https://bpac.org.nz/BT/2015/July/guide.aspx>.
- D'Agata E, Loeb MB, Mitchell SL. 2013. Challenges in assessing nursing home residents with advanced dementia for suspected urinary tract infections. *Journal of the American Geriatrics Society* 61(1): 62-6. DOI: 10.1111/jgs.12070.
- Devillé WLJM, Yzermans JC, van Duijn NP, et al. 2004. The urine dipstick test useful to rule out infections. A meta-analysis of the accuracy. *BMC Urology* 4: 4. DOI: 10.1186/1471-2490-4-4.
- Givler DN, Givler A. 2022. *Asymptomatic Bacteriuria*. Treasure Island (FL): StatPearls Publishing. URL: <https://www.ncbi.nlm.nih.gov/books/NBK441848> (accessed 13 June 2022).
- Grabe M, Bartoletti R, Bjerklund Johansen T, et al. 2021. *Guidelines on Urological Infections*. European Association of Urology. URL: <http://uroweb.org/guideline/urological-infections/> (accessed 2021).
- Health Quality & Safety Commission. 2020. *Appropriate Medication Use in Aged Residential Care: Optimising the use of antibiotics, antipsychotics and fentanyl*. Wellington: Health Quality & Safety Commission. URL: [www.hqsc.govt.nz/assets/ARC/PR/ARC\\_polypharmacy\\_final\\_April2020.pdf](http://www.hqsc.govt.nz/assets/ARC/PR/ARC_polypharmacy_final_April2020.pdf).
- Jump RLP, Crnich CJ, Nace DA, et al. 2016. Cloudy, foul-smelling urine not a criteria for diagnosis of urinary tract infection in older adults. *Journal of the American Medical Directors Association* 17(8): 754. DOI: 10.1016/j.jamda.2016.04.009.
- Jump RLP, Crnich CJ, Mody L, et al. 2018. Infectious diseases in older adults of long-term care facilities: update on approach to diagnosis and management. *Journal of the American Geriatrics Society* 66(4): 789-803. DOI: 10.1111/jgs.15248.
- Leduc A. 2014. Reducing the treatment of asymptomatic bacteriuria in seniors in a long-term care facility. *Canadian Nurse* 111(7): 25-30.
- Nace DA, Perera SK, Hanlon JT, et al. 2018. The improving outcomes of UTI management in long-term care project (IOU) consensus guidelines for the diagnosis of uncomplicated cystitis in nursing home residents. *Journal of the American Medical Directors Association* 19(9): 765-9.e3. DOI: 10.1016/j.jamda.2018.05.030.

- Ninan S, Walton C, Barlow G. 2014. Investigation of suspected urinary tract infection in older people. *BMJ* 349: g4070. DOI: 10.136/bmj.g4070.
- Nicolle LE. 2016. Urinary tract infections in the older adult. *Clinics in Geriatric Medicine* 32(3): 523–38. DOI: 10.1016/j.cger.2016.03.002.
- Orr PH, Nicolle LE, Duckworth H, et al. 1996. Febrile urinary infection in the institutionalized elderly. *American Journal of Medicine* 100(1): 71–7. DOI: 10.1016/s0002-9343(96)90014-5
- Public Health Ontario. 2018. *Urinary Tract Infection (UTI) Program: Implementation guide, second edition. Reducing antibiotic harms in long-term care*. URL: [www.publichealthontario.ca/-/media/documents/uti-implementation-guide.pdf?la=en](http://www.publichealthontario.ca/-/media/documents/uti-implementation-guide.pdf?la=en).
- Public Health Ontario. 2019. Urinary Tract Infection (UTI) Program: Process surveillance form. URL: [www.publichealthontario.ca/-/media/documents/u/2016/uti-process-surveillance-form.pdf?sc\\_lang=en&hash=BE0642F774DBFDD1C64AD65468FFC0A2](http://www.publichealthontario.ca/-/media/documents/u/2016/uti-process-surveillance-form.pdf?sc_lang=en&hash=BE0642F774DBFDD1C64AD65468FFC0A2) (accessed June 2021).
- Stone ND, Ashraf MS, Calder J, et al. 2012. Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria. *Infection Control & Hospital Epidemiology* 33(10): 965–77. DOI: 10.1086/667743.
- Wilson A, Kelly M, Henderson E, et al. 2019. Reducing inappropriate urine testing at Hutt Valley District Health Board using Choosing Wisely principles. *New Zealand Medical Journal* 132(1488): 11–20.