

Welcome!

This issue of the TARGET newsletter focusses on our research and development. This includes our work stream to develop a suite of UTI resources, from diagnostic reference guides to patient facing materials, and preliminary findings on two surveys, the CCG AMS Implementation survey and the GP Survey, that ran during 2017. We want to say a massive thank you to all of you who gave up some of your valuable time to complete these surveys. And finally, we are delighted to share with you some of our recent peer reviewed publications highlighting research that is now closed but that we use to inform future TARGET development. Click on the hyperlinks in any of the sections below to find out more or access abstracts on each of the topics.

TARGET Resource Development and Updates

We are developing and updating our current suite of resources, particularly in the area of UTI. Click on the links below to see updates:

- ◆ [The Diagnosis of UTI quick reference guides for primary care](#)
- ◆ [Treating Your Infection UTI leaflet for older adults and those who care for them.](#)
- ◆ [Dedicated UTI section on the website](#)
- ◆ [Management and treatment of common infections: A review](#)

TARGET Research Updates

Three of our main studies have come to an end and we are in the process of analysing the data. You can read some of the preliminary findings by clicking on the links below:

- ◆ [CCG AMS Implementation Study](#) assessing local implementation of national antimicrobial stewardship initiatives
- ◆ [A systematic review](#): Effectiveness of interventions to reduce Urinary Tract Infections and *E. coli* bacteraemia for older adults across all care settings.
- ◆ [CRP qualitative study](#) exploring the views of general practice staff on the use of point-of-care C-reactive protein (CRP) testing.

Recent TARGET publications

1. McNulty CAM, Hawking MKS, Lecky DM, Jones LF, Owens R, Charlet A, Butler C, Moore P, Francis NA. [Effects of a Primary care antimicrobial stewardship outreach on antibiotic use by general practice staff: Pragmatic Randomised Controlled Trial of the TARGET Antibiotics workshop.](#) *J Antimicro Chemo.*
2. Jones LF, Hawking MKD, Owens R, Lecky DM, Francis NA, Butler C, Gal M, McNulty CAM. [An evaluation of the TARGET Antibiotics Toolkit \(Treat Antibiotics Responsibly; Guidance, Education, Tools\) to improve antimicrobial stewardship in primary care – is it fit for purpose?](#) *Family Practice* 2017, 1–7.
3. Owens R, Jones LF, Moore M, Pilat D, McNulty C: [Self-Assessment of Antimicrobial Stewardship in Primary Care: Self-Reported Practice Using the TARGET Primary Care Self-Assessment Tool.](#) *Antibiotics (Basel)* 2017, 6(3).
4. Lecky DM, Dhillon H, Verlander NQ, McNulty CAM: [Animations designed to raise patient awareness of prudent antibiotic use: patient recall of key messages and their immediate effect on patient attitude.](#) *BMC Res Notes* 2017, 10(1):701.

To remove your name from our mailing list, please [click here](#).
Questions or comments? E-mail us at TARGETantibiotics@phe.gov.uk

Come meet the team

Meetings / Conferences

Click on any of the links below to see what presence TARGET will have at the events below.

- ◆ Public Health Research and Science conference
([posters and presentation](#))
Warwick Uni, 20-21 Mar '18
- ◆ BJGP Research Conference,
([posters and presentation](#))
RCGP, London. 23rd Mar '18

[Mail us](#) if you are attending any of these events and would like to have a chat about the presentations, TARGET or just to say hi.

Campaign Support

TARGET supports the following antibiotic awareness and public health campaigns


- ◆ [Antibiotic Guardian](#)
- ◆ [Keep Antibiotics Working](#)

Your TARGET Showcase

We would like to see how you use the TARGET resources. Please send us information and photographs of how and where you use the resources and what you think of them.

We look forward to showcasing the fantastic work being carried out in Northern Ireland in our May 2018 newsletter.

Follow us

 [Twitter](#) @TARGETabx

TARGET Resource Development and Updates

Diagnosis of UTI quick reference guides for primary care

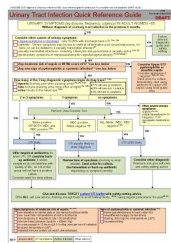
The [Diagnosis of UTI quick reference guides for primary care](#) are currently being reviewed. We aim to provide

- ♦ an updated flowchart for uncomplicated UTIs in women <65
- ♦ a new flowchart for older adults with suspected UTI
- ♦ an updated flowchart for children. The new flow charts will be released for external consultation in February.

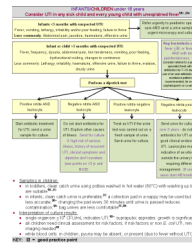
Please note that the flow charts below are currently in DRAFT format, click on the links below each image to see the full size version. If you would like to be notified about the external consultation but are not currently on our mailing list then please [click here](#).



[Over 65yrs](#)



[Women Under 65yrs](#)



[Children Under 16yrs](#)

UTI Leaflet for older adults and those who care for them

The Target team has been working with partners to develop a Treating Your Infection UTI leaflet for older adults and those who care for them. We received excellent feedback from the public consultation and our expert working group and plan to publish the leaflet in February/March. If you would like to be notified when this leaflet is launched then please [click here](#).



Dedicated UTI section on the TARGET antibiotics website

We are in the process of developing a new section on the TARGET website dedicated to UTIs, including

- ♦ Both patient facing Treating your Infection UTI leaflets, the leaflet for uncomplicated UTIs and the leaflet for UTIs in the older frail population, and all associated translations.
- ♦ Links to the UTI training module, MUTS (**M**anaging **U**rinary **T**ract **I**nfection**S**) and UTI webinar
- ♦ The updated UTI Quick Reference Diagnostic Guides for Primary Care

Management and treatment of common infections: A Review

The review of the [Management and treatment of common infections: "a quick reference template for primary care"](#) (formerly: "antibiotic guidance for primary care") was conducted and published in September 2017. Following feedback from this update we have published some minor updates/clarifications; a tracked changes version with notes is available upon request. The PHE PCU team will publish further updates based on the joint PHE/NICE antibiotic guidelines as they are published over the next 3 years. We will email CCG leads to confirm when these updates are posted.

TARGET Research Updates

CCG AMS Implementation Study

The NHS English Quality Premium recommends that inappropriate antibiotic prescribing is reduced; there are a range of national antimicrobial stewardship (AMS) initiatives to support this. The aim of this study is to assess AMS activities in primary care across England. The findings will be used to inform how the RCGP, PHE and NHS can help optimise stewardship activities.

Methods

Questionnaire: informed by previous qualitative research, sent to all 209 CCGs in England in 2017.

Results and Implications

11 AMS leads were interviewed and 187/209 (89%) of CCGs returned a questionnaire. Activities reported:

- ♦ 99% (184/186) actively promoted the TARGET Antibiotics Toolkit.
- ♦ 94% (175/187) actively promoted TARGET patient leaflets; 92% The Treating Your Infection (TYI) leaflet. 65/161 (40%) had integrated the TYI-RTI leaflet into clinical systems - there is an opportunity to improve this to increase uptake of use.
- ♦ 90% (166/185) used the PHE managing common infections guidance: 81% (149/185) modify or localise; 41/185 (22%) signpost directly to it.
- ♦ All but 2 had delivered AMS education in the last 2 years: 131 face-to-face; 120 e-learning.
- ♦ 85% (142/168) fed back antimicrobial prescribing data to the CCG/CSU board; 100% (169/169) to general practices and 33% (56/169) to out of hours providers.
- ♦ 86 used CCG audit tools and 82 used TARGET's audit tools.
- ♦ Although CCGs reported promoting these AMS activities, there was little evaluation of uptake. Future work should focus on measuring AMS uptake.

Effectiveness of Interventions to Reduce Urinary Tract Infections and *E. coli* Bacteraemia for Older Adults Across all Care Settings: A Systematic Review

Surveillance has indicated an alarming rise in rates of *E. coli* bacteraemia with the highest rates observed amongst older adults. Previous Urinary Tract Infections (UTI) and catheterisation are key risk factors. This systematic review aims to examine the effectiveness of existing interventions to reduce rates of *E. coli* bacteraemia and/or reduce symptomatic UTIs for older adults in care settings.

Methods

The search strategy was developed using the PICO framework. Titles and/or abstracts were scanned for relevance. Studies were graded for quality using CASP guidelines and evidence graded using the SIGN grading system. Due to the heterogeneity of the studies, a narrative synthesis was approach was used.

Results and Implications

26 studies were included in the final review.

- ♦ 7/26 evaluations were in care homes and the community, and all but one study lacked methodological quality.
- ♦ 7 low quality multi-faceted intervention studies including education with audit, feedback or reminders provided some evidence of effectiveness.
- ♦ Low quality evaluations of teaching on general infection or catheter management showed no significant effect on UTI and CAUTI rates; complementary online training on catheter insertion and care decreased UTIs.
- ♦ Increasing nursing staff ratios or using specific continence nurses appeared effective in reducing infection rates but again evidence was of low quality. A low quality RCT study of hospital catheter removal protocols evaluated had no effect, but some effect was shown in other low quality before and after studies of catheter removal reminder stickers and implementation of removal criteria.
- ♦ It is difficult to conduct high quality studies of psychological interventions due to the nature of these interventions. Increasing nursing or continence staff, or a multi-faceted intervention including education covering catheter insertion and care, audit and feedback or catheter removal protocols should be considered to reduce CAUTI. Further robust evaluations of these interventions are needed.

TARGET Research Updates

C-reactive Protein Point of Care testing (CRP POCT) Qualitative Study as part of service evaluation in general practice.

Objective

To explore the knowledge, skills, attitudes and beliefs of general practice staff about C-reactive protein Point of Care Testing (CRP POCT) in general practice. To explore associated barriers and facilitators to implement CRP POCT for the management of LRTI's and improving antibiotic prescribing.

Design

A qualitative study using the Com-B behavioural framework to understand individuals' capability, opportunity and motivation to implement CRP POCT in general practice.

Setting

A CRP POCT service evaluation in a high prescribing NHS CCG in England was being conducted in eight practices that had been offered CRP POCT machines to trial over 6 months. All eight practices were invited to participate in qualitative interviews; seven consented. A further twelve randomly selected control practices, which had not used CRP POCT previously, were invited to interview; five consented.

Participants

Twenty six general practice staff participated; fifteen GP's, five Practice Managers, three Practice Nurses, one Prescribing Pharmacist, one Community Matron and one Healthcare Assistant.

Results

Qualitative data from 11 interviews, 3 focus-groups and 1 hand written response was collected. CRP POCT is believed to increase diagnostic certainty, help target appropriate treatments, help manage patient expectations and patient demand for antibiotics, support patient education, and improve appropriate antibiotic prescribing. Barriers to implementing CRP POCT include; financial support, time, access to the CRP POCT machine, and the effects on clinical workflow.

Conclusions

CRP POCT is well received by many general practice staff as an additional diagnostic "tool in your armoury" to support clinical decision making in the management of LRTI. To see an increase in the implementation of CRP POCT, further research into machine development is required, to overcome time, cost and access barriers. Further evidence of the impact of CRP POCT on appropriate antimicrobial prescribing is required to inform future guidance which will be the initial facilitator for behaviour change.

Recent TARGET Publications

Effects of a Primary care antimicrobial stewardship outreach on antibiotic use by general practice staff: Pragmatic Randomised Controlled Trial of the TARGET Antibiotics workshop.

McNulty CAM, Hawking MKS, Lecky DM, Jones LF, Owens R, Charlet A, Butler C, Moore P, Francis NA.

doi.org/10.1093/jac/dky004

Objectives: To determine whether local trainer led “TARGET” antibiotic interactive workshops improve antibiotic dispensing in general practice.

Results: In the Intention To Treat (ITT) analysis total antibiotic dispensing was 2.7% lower in intervention practices compared to controls. Dispensing in intervention practices was 4.4% lower for amoxicillin/ampicillin, 5.6% lower for trimethoprim; and a non-significant 7.1% higher for nitrofurantoin. The Complier Average Causal Effect (CACE) analysis, which estimates impact in those that comply with assigned intervention, indicated 6.1% lower total antibiotic dispensing in intervention practices and 11% lower trimethoprim dispensing.

Conclusions: This study within usual service provision found that TARGET antibiotic workshops can help improve antibiotic use, and therefore should be considered as part of any national antimicrobial stewardship initiatives. Additional local facilitation will be needed to encourage all general practices to participate.

Implications for our work

- ◆ Work closely with CCGs to facilitate the local implementation of TARGET workshops across England
- ◆ Work closely with the Public Health Agency in Northern Ireland to implement a TARGET train the trainer workshop in 2018

An evaluation of the TARGET (Treat Antibiotics Responsibly; Guidance, Education, Tools) Antibiotics Toolkit to improve antimicrobial stewardship in primary care—is it fit for purpose?

Jones LF, Hawking MKD, Owens R, Lecky DM, Francis NA, Butler C, Gal M, McNulty CAM. doi: [10.1093/fampra/cmz131](https://doi.org/10.1093/fampra/cmz131)

Objective. To explore GPs’, nurses’ and other stakeholders’ views of the TARGET toolkit.

Results. GP staffs were aware of the issues around antimicrobial resistance (AMR) and how it related to their prescribing. Most participants stated that TARGET as a whole was useful. Participants suggested the workshop needed less background on AMR, be centred around clinical cases and allow more action planning time. Participants particularly valued comparison of their practice antibiotic prescribing with others and the TARGET Treating Your Infection leaflet. The leaflet needed greater accessibility via GP computer systems. Due to time, cost, accessibility and competing priorities, many GP staff had not fully utilized all resources, especially the audit and educational materials.

Conclusions. We found evidence that the workshop is likely to be more acceptable and engaging if based around clinical scenarios, with less on AMR and more time on action planning. Greater promotion of TARGET, through Clinical Commissioning Group’s (CCG’s) and professional bodies, may improve uptake. Patient facing resources should be made accessible through computer shortcuts built into general practice software.

Implications for our work

- ◆ We have modified the TARGET workshop presentation to be more clinical scenario based and include more positive action planning
- ◆ We have developed a quarterly newsletter and twitter pages facilitate improved communication with CCGs and professional bodies
- ◆ We are in negotiations with EMIS and TPP to embed all TARGET leaflets into GP systems

Recent TARGET Publications

Self-Assessment of Antimicrobial Stewardship in Primary Care: Self-Reported Practice Using the TARGET Primary Care Self-Assessment Tool.

Owens R, Jones LF, Moore M, Pilat D, McNulty CAM. doi: [10.3390/antibiotics6030016](https://doi.org/10.3390/antibiotics6030016)

Objectives: The study aimed to measure the self-reported AMS activity of staff completing a self-assessment tool (SAT). The Royal College of General Practitioners (RCGP)/Public Health England (PHE) SAT enables participants considering an AMS eLearning course to answer 12 short questions about their AMS activities. Questions cover guidance, audit, and reflection about antibiotic use, patient facing materials, and education.

Results: Between November 2014 and June 2016, 1415 users completed the SAT. Ninety eight percent reported that they used antibiotic guidance for treating common infections and 63% knew this was available to all prescribers. Ninety four percent of GP respondents reported having used delayed prescribing when appropriate, 25% were not using Read codes, and 62% reported undertaking a practice-wide antibiotic audit in the last two years, of which, 77% developed an audit action plan. Twenty nine percent had undertaken other antibiotic-related clinical courses. Fifty six percent reported sharing patient leaflets covering infection. Many prescribers reported undertaking a range of AMS activities.

Conclusions: GP practice managers should ensure that all clinicians have access to prescribing guidance. Antibiotic audits should be encouraged to enable GP staff to understand their prescribing behaviour and address gaps in good practice. Prescribers are not making full use of antibiotic prescribing-related training opportunities. Read coding facilitates more accurate auditing and its use by all clinicians should be encouraged.

Implications for our work

- ◆ Liaise to CCGs to ensure they have the most up to date guidance available for dissemination to general practice
- ◆ Continue to promote and develop TARGET prescribing audits for general practice
- ◆ Encourage Read coding in general practice through all TARGET training materials
- ◆ Redesign the SAT to encourage future use

Animations designed to raise patient awareness of prudent antibiotic use: patient recall of key messages and their immediate effect on patient attitude.

Lecky DM, Dhillon H, Verlander NQ, McNulty CAM. doi: [10.1186/s13104-017-3048-0](https://doi.org/10.1186/s13104-017-3048-0)

Objectives: This study aimed to determine if patients recalled key messages from antibiotic animations shown on digital displays in General Practice waiting rooms, and if watching them changed patients' immediate intentions to consult their GP for upper respiratory tract infections, seek antibiotics and self-care.

Results: The pre intervention focus group found the animations intergenerational, informative and educational. 3119 patients were observed in 3 GP practices during project team visits; 145 (4.6%) were observed watching the animations; 132 (91%) remembered seeing them; the key messages were retained by 47-55% of patients. Significant positive differences were observed for questions related to intended antibiotic related behaviours.

Conclusions:

Findings demonstrate that a simple and relatively inexpensive intervention was successful in positively influencing a patient's immediate intention to use antibiotics although as a stand-alone resource, the impact may be less than the reach. However, as part of a multifaceted intervention to improve antibiotic use with a focus on reducing the risk of adverse health outcomes, the animations could play a part in facilitating actual behaviour change

Implications for our work

- ◆ Continue to promote the animations through the TARGET antibiotics website
- ◆ Research the possibility of modifying the TARGET leaflets into resources for digital display in general practice waiting rooms.

Come meet the team: Meetings and Conferences

Public Health Research and Science Conference For full programme [click here](#)



Presenter: Charlotte Eley will be giving an oral presentation.

Presentation title: A qualitative study to explore the views of general practice staff on the use of point-of-care C-reactive protein testing for the management of lower respiratory tract infections and in improving antibiotic prescribing.

When: 2:40pm, Tuesday 20th March 2018. Infectious diseases: Evaluation and Implementation of interventions

Where: Warwick University.

Abstract: [See here](#)



Presenter: Rosie Allison will be presenting an e-Poster.

Presentation title: Local implementation of national AMS initiatives across CCGs: a mixed-methods study

When: 1:20pm, Tuesday 20th March 2018. ePoster Presentation 2: Infectious Diseases

Abstract: [See here](#)



Presenter: Charlotte Eley will be presenting an e-Poster.

Presentation title: Patient education on appropriate treatment for common RTIs using the TARGET Treating your Infection RTI leaflet: What the public needs to know about antibiotics?

When: 1:20pm, Wednesday 21st March 2018. ePoster Presentation 13: Implementation of research findings into practice.

Abstract: The TARGET Treating Your Infection leaflet for RTIs (TYI-RTI) aims to facilitate patient/clinician conversation about management choices and encourage appropriate use of antibiotics. Sharing information with patients on the usual length of illness and 'the time difference antibiotics make to the duration of an RTI' may increase understanding of the limited value of antibiotics and enable patients to make an informed decision about the value of self-care versus antibiotics. The study aimed to explore whether information on 'the time difference antibiotics make to the duration of your illness' should be shared with the public and considered including in the leaflet.

Methods: The TYI-RTI leaflet was adapted to include a column on "the time difference antibiotics make to the duration of your illness". The modified leaflet was shown to patients and health professionals to explore their views, understanding and acceptability of the new column. Qualitative interviews were carried out with 40 patients in a general practice waiting room. Quantitative questionnaires were returned by 43 Infection Control professionals.

Results:

- ◆ 70% of health professionals welcomed inclusion of the column and suggested it may decrease patient demand for antibiotics (65%)
- ◆ A third of patients (34%) understood the new column's message correctly: antibiotics only reduce the infection by a few hours, therefore antibiotics are not appropriate for this infection
- ◆ A quarter of patients (26%) reported understanding the wording: perceived antibiotics would help RTIs
- ◆ 40% of patients did not understand the new column at all

Conclusions: Although health professionals felt the column should be added, the information provided in a stand alone leaflet is not currently understood by most (66%) patients. Further discussions with prescribers are required to understand how the information could be better worded/presented to patients.

Come meet the team: Meetings and Conferences

BJGP Research Conference For full programme [click here](#)



Presenter: Leah Jones will be giving an oral presentation.

Presentation title: 'How to prevent urine infections (UTIs), and what to do if you have one', the development of a UTI leaflet for older adults

When: Friday 23rd March 2018.

Where: RCGP, London.

Abstract: Escherichia coli bacteraemia rates are rising with highest rates in older adults. Mandatory surveillance identifies previous Urinary Tract Infections (UTI) and catheterisation as risk factors. To help control bacteraemia in older frail patients we developed a patient leaflet around the prevention and self-care of UTIs informed by the Theoretical Domains Framework (TDF).

Method: Focus groups or interviews were held with care home staff, residents and relatives, GP staff and an out of hours service, public panels and stakeholders. Questions explored diagnosis, management, prevention of UTIs and antibiotic use in older adults. The leaflet was modified iteratively. Discussions were transcribed and analysed using Nvivo.

Results: Carers of older adults reported their important role in identifying when older adults might have a UTI, as they usually flag symptoms to nurses or primary care providers. Information on UTIs needs to be presented so residents can follow; larger text and coloured sections were suggested. Carers were optimistic that the leaflet could impact on the way UTIs are managed. Older adults and relatives liked that it provided new information to them. Staff welcomed that diagnostic guidance for UTIs was being developed in parallel; promoting consistent messages. Participants welcomed and helped to word sections on describing asymptomatic bacteriuria simply, preventing UTIs, causes of confusion and when to contact a doctor or nurse.

Conclusion: A final UTI leaflet for older adults has been developed informed by the TDF.



Presenter: Rosie Allison will be presenting an ePoster.

Presentation title: Local implementation of national AMS initiatives across CCGs: a mixed-methods study.

When: Friday 23rd March 2018.

Where: RCGP, London.

Abstract: [See here](#).



Presenter: Charlotte Eley will be presenting an ePoster.

Presentation title: Patient education on appropriate treatment for common RTIs using the TARGET Treating your Infection RTI leaflet: But what the public needs to know about antibiotics?

When: Friday 23rd March 2018.

Where: RCGP, London.

Abstract: [See here](#).

TARGET antibiotics Newsletter

Treat Antibiotics Responsibly, Guidance, Education, Tools.

www.rcgp.org.uk/TARGETantibiotics/

Antibiotic Awareness Campaigns

Antibiotic Guardian



The Antibiotic Guardian campaign asks you to become antibiotic guardians by choosing one simple pledge about how you'll make better use of antibiotics to help save these vital medicines from becoming obsolete.

Pre-worded pledges are available in the following categories

- ◆ Health or social care professional or leader
- ◆ Member of the public
- ◆ Student, educator or scientist

Or alternatively, you can make your own pledge.

Antibiotic Guardian supports the UK antimicrobial strategy, European Antibiotic Awareness Day (18th November) and World Antibiotic Awareness Week (13—19 November 2017).

Keep Antibiotics Working



Support the new campaign *Keep Antibiotics Working* launched in England on October 23rd to raise public awareness and understanding of the dangers antibiotic resistance.

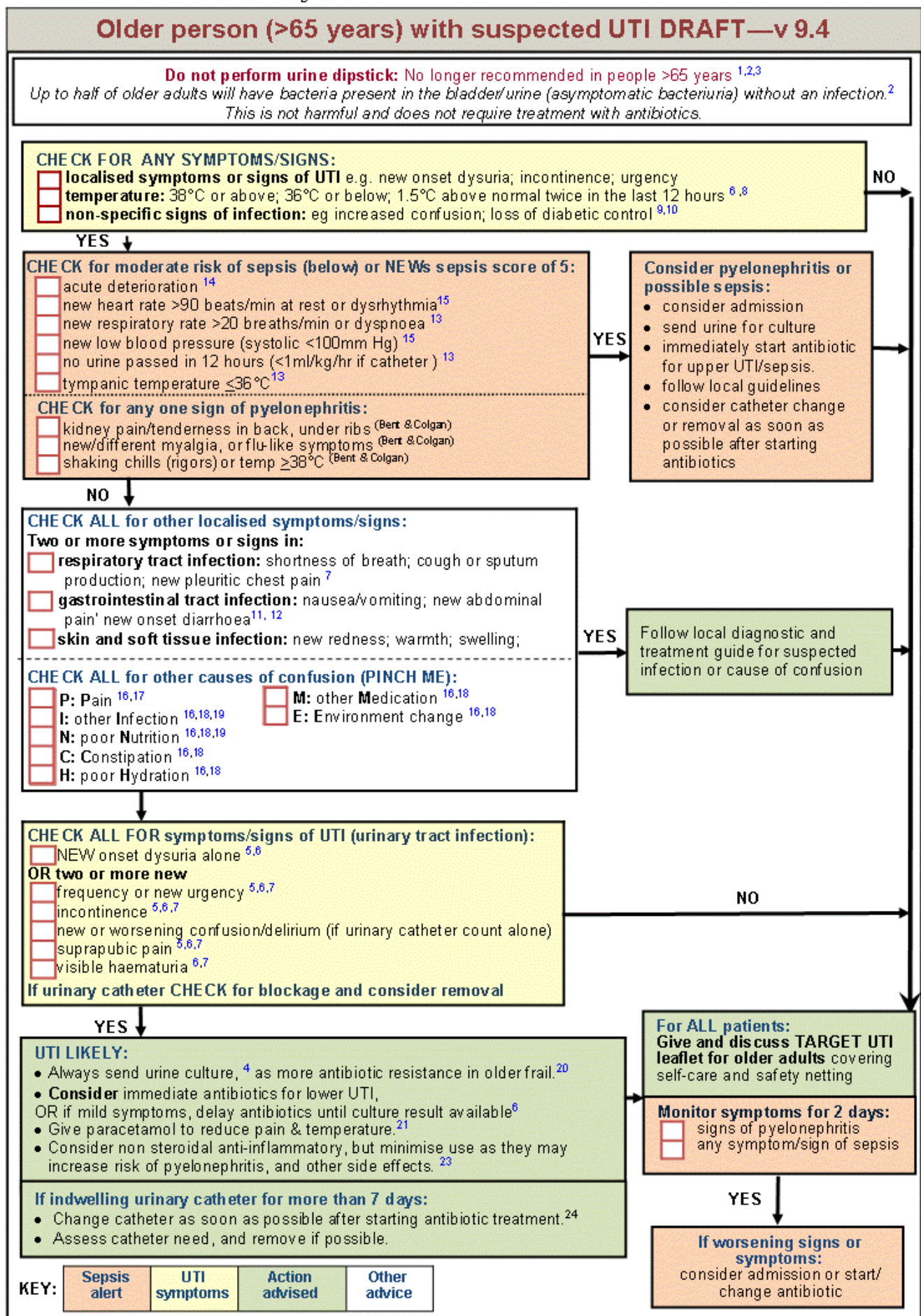
The campaign delivers a simple messages that resonate with the public: **Taking antibiotics when you don't need them puts you and your family at risk.** Taking antibiotics encourages harmful bacteria that live inside you to become resistant. That means that antibiotics may not work when you really need them. This puts you and your family at risk of a more severe or longer illness

By increasing the public's awareness of the risks of taking antibiotics when they don't need them, the campaign supports the efforts of local doctors, nurses and other healthcare practitioners in reducing inappropriate prescribing due to patient pressure. The campaign encourages those who typically ask for antibiotics to take their doctor or nurse's advice.

If you don't already have campaign materials on display and wish to *Keep Antibiotics Working* you can order resources free of charge from the [PHE Campaign Resource Centre](#)

DRAFT VERSION— Older person (>65 years) with suspected UTI

V9.4 2018.03.02- Flow chart Older adult diagnostic



DRAFT VERSION— Adult Women (<65 years) with urinary symptoms

14/03/2018 21:00 Diagnosis of urinary tract infections (UTIs) - Quick reference guide for primary care: For consultation and local adaptation (DRAFT-V13.9)

V13.9

flowchart under 65 2 Mar 18

Urinary Tract Infection Quick Reference Guide

DRAFT

URINARY SYMPTOMS (eg dysuria, frequency, urgency) IN ADULT WOMEN <65
Without diagnosis of a urinary tract infection in the previous 6 months

YES

Consider other causes of urinary symptoms:

- ☐ vaginal symptoms or discharge - only 15-20% with discharge have UTI ^{1A+, 2A+}
- ☐ urethritis - Urinary symptoms may be due to urethral inflammation post sexual intercourse, irritants, or can be related to a sexually transmitted infection ^{3D}
- ☐ sexually transmitted infections - including Chlamydia and gonorrhoea in sexually active ^{2A+, 3D}
- ☐ genitourinary symptoms of menopause/atrophic vaginitis/vaginal atrophy (A, B:Portman)

YES

Follow relevant diagnostic guide and safety netting

NO

- ☐ Any moderate risk of sepsis or NEWS score of 5? *see box below
- ☐ Any new sign of pyelonephritis or systemic infection? *see box below

YES

Consider Upper UTI/ pyelonephritis or possible sepsis

Consider admission if required ^{10D, 11C, 12A-}
Send urine for culture, Immediately start using antibiotic for upper UTI/ sepsis using local guidelines

NO

How many of the 3 key diagnostic symptoms/signs do they have? ^{13B+}

- ☐ dysuria (burning pain when passing urine) ^{1A+, 2A+, 13B+}
- ☐ new nocturia (passing urine more often at night) ^{1A+, 13B+}
- ☐ urine cloudy to the naked eye ^{13B+}

- 71% will have ≥2 symptoms
- 25% will have only 1 symptom
- 4% will have no symptoms

2 or 3 symptoms

1 symptom

no symptoms

YES

YES

Perform Urine Dipstick Test

YES

Nitrite positive
OR BOTH WBC and
RBC positive ^{13B+}

YES

UTI likely

WBC positive
Nitrite negative ^{13B+}

YES

UTI equally likely to
other diagnosis

ALL Nitrite, WBC, RBC
negative ^{13B+}

YES

UTI LESS likely

Other severe urinary
symptoms:
urgency ^{1A+, 2A+}
visible haematuria ^{1A+, 2A+}
frequency ^{1A+, 2A+}
suprapubic tenderness ^{16B+}

NO

Consider other diagnosis
Reassure and give self-care
and safety netting advice

Offer empirical antibiotics for
lower UTI, OR consider back-
up antibiotic if milder
symptoms do not interfere with
quality of life, as 1/4 of this
group will not have a positive
culture.
Consider need for urine culture.

Review time of specimen (morning is most
reliable). Send urine for culture,
Use Immediate or back-up antibiotic
depending on symptom severity

Give and discuss TARGET patient UTI leaflet with safety netting advice

Offer ALL self-care advice, drinking enough fluids to avoid feeling thirsty; ^{4D, 5C} taking regular paracetamol for pain ^{6D, 7A}

Signs/symptoms of moderate risk of sepsis: ^{11C, 12A-}

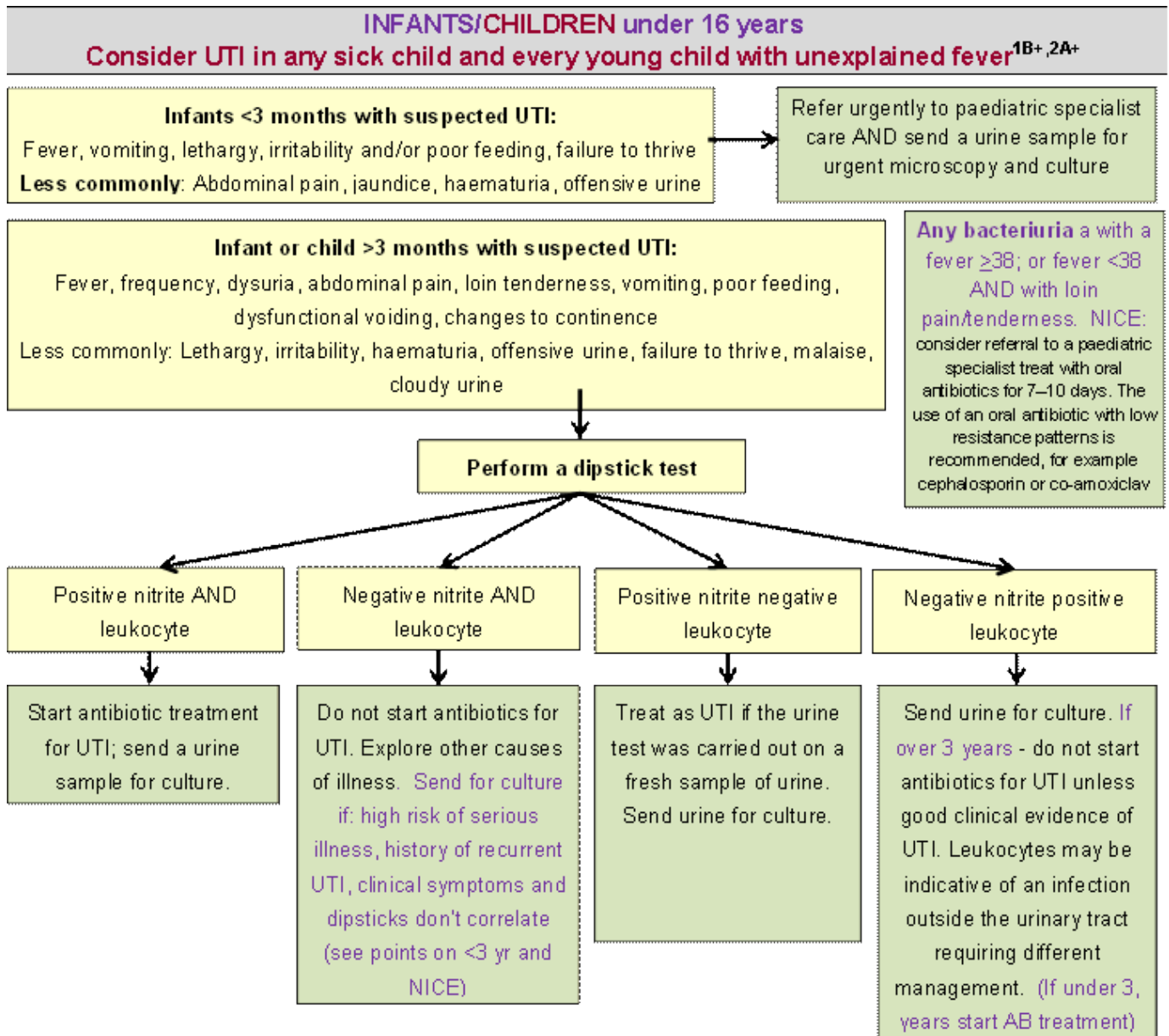
- ☐ new alteration in mental state or decreased functional ability
- ☐ new heart rate >90 beats/min at rest or dysthymia
- ☐ new dyspnoea or respiratory rate >20 breaths/min
- ☐ new low blood pressure (systolic <100mm Hg)
- ☐ no urine passed in 12 hours (≤0.5-1ml/kg urine per hour if catheter)
- ☐ tympanic temperature ≤36°C
- ☐ impaired immune system (except if chemotherapy)

Signs of pyelonephritis or systemic infection ^{11C}:

- ☐ kidney pain/tenderness in back under ribs
- ☐ new/different myalgia, flu like illness
- ☐ shaking chills (rigors) or temperature ≥38°C
- ☐ nausea/vomiting

KEY Sepsis alert UTI symptoms Action Advised Other advice

DRAFT VERSION— Children (<16) with suspected UTI



- Sampling in children:
 - in toddlers, clean catch urine using potties washed in hot water (60°C) with washing up liquid are suitable^{1B-, 2C}
 - in infants, clean catch urine is preferable,^{2C} a collection pad in a nappy may be used but is less accurate;^{3B+} changing the pad every 30 minutes until urine is passed reduces contamination;^{4A-} bag urines are less comfortable^{2C, 3B-}
- Interpretation of culture results:
 - single organism $\geq 10^4$ CFU/mL indicates UTI;^{1B+} suprapubic aspirates: growth is significant
 - all children need clinical assessment for risk factors; if risk factors or non *E. coli* UTI, renal imaging needed^{1D}
 - white blood cells: in children, pyuria may be absent, or present (due to fever without UTI)^{3C}

KEY: ☑ = good practice point