Exploring the implementation of interventions to reduce catheter-associated urinary tract infections (ENACT)

Appendix X: Full list of barriers and facilitators identified in the CAUTI report

Table 1. Full list of barriers and facilitators identified in the CAUTI report

COM-B component	TDF domain	Theme	Behavioural phase	Care settings	Frequency (maximum possible is 24 studies)	Barrier, Facilitator or Mixed	Example quote(s) [Setting; Study ID]
Capability (psychological)	Knowledge	Lack of knowledge of clinical guidelines and local procedural documents	All	Secondary, Tertiary	3	Barrier	‘‘Nurses lack of knowledge of evidence based guidelines for: routine catheter maintenance; urinary catheter indications; bladder scanning; and intermittent catheterization.’’ [Secondary Care; S2] ‘‘Forty per cent of the Burn ICU nursing staff was not aware of the nurse-driven catheter removal protocol that exists within our hospital.’’ [Secondary Care; S19]
Capability (psychological)	Knowledge	Lack of information regarding placement and duration of catheter insertion	Insertion, Post-insertion maintenance	Secondary, Tertiary	2	Barrier	‘‘Physicians are often unaware that urinary catheterization has been excessively prolonged in their patients.’’ [Secondary Care; S11] ‘‘Physicians were often not aware that patients had an indwelling catheter.’’ [Tertiary Care; T1]
Capability (psychological)	Knowledge	Lack of awareness of the risks associated with use of urinary catheters	All	Secondary	2	Barrier	‘‘Several participants stated that they were unaware of the risks associated with catheter duration.’’ [Secondary care; S9]
Capability (psychological)	Knowledge	Lack of awareness of the link between UTIs and the use of urinary catheters	All	Secondary	1	Barrier	‘‘… so it’s just making them [nurses] understand that there is a relationship between bladder infections and urinary tract infections and [urinary] catheter days…” [Secondary Care; S1]
Capability (psychological)	Knowledge	Lack of standardised CAUTI education	All	Secondary	1	Barrier	‘‘Lack of standardized CAUTI education.’’ [Secondary Care; S12]
Capability (psychological)	Knowledge	Lack of knowledge of how to manage patients without catheterisation	Pre-insertion	Secondary	1	Barrier	‘‘Not knowing how to manage critically ill patients in ICU without using indwelling urinary catheter.’’ [Secondary Care; S15]
Capability (psychological)	Knowledge	Knowledge of how to manage bacterial infections resulting from urinary catheterisation	Post-insertion maintenance	Tertiary	1	Facilitator	‘‘Knowledge of how to manage catheter-associated bacteriuria: The mean knowledge score was 57.5%, or slightly more than 1 half of the questions answered correctly. The mean knowledge score was 57.5%, or slightly more than 1 half of the questions answered correctly.” [Tertiary Care; T3]
Capability (psychological)	Knowledge	Awareness of different types of urinary catheters available	Pre-insertion	Secondary, Primary and Community	1	Barrier	‘‘20% of respondents did not realise re-usable catheters were used at all in the UK, or that re-use was more common in some countries.’’ [Secondary Care; Community Care; SC20]

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Capability (psychological)	Knowledge	Not attributing urinary infections to catheterisation due to the delay between infection onset and catheterisation	Post-insertion	Secondary	1	Barrier	‘‘We even track UTI associated with a [urinary] catheter post hospital… We’re trying to get some [infections] to show people, See? There it is, a UTI occurring. It just didn’t happen quick enough for you to see it in the hospital.’’ [Secondary Care; SC1]
Capability (psychological)	Memory, Attention, Decision making	Pre-empting subsequent urinary catheterisation	Insertion	Secondary	3	Barrier	‘‘Also I think at the back of my mind is the likelihood is that they’re going to get catheterised in the near future any way when they hit the wards for a management reason.’’ [Secondary Care; S17]
Capability (psychological)	Memory, Attention, Decision making	Providing metrics increases day-to-day awareness of CAUTI	All	Secondary	1	Facilitator	‘‘Nurse leaders made it a priority to actively share ED CAUTI metrics with clinical nurses, with 1 nurse manager reasoning, "If it's not brought to the forefront, people tend to forget about it" "Shift huddles every day they [staff] were hearing the information we did dashboards and graphs and things like that keep it in front of them and let them see the target going down that worked really well.’’ [Secondary Care; S7]
Capability (psychological)	Memory, Attention, Decision making	Catheterisation decisions based on non-medical criteria	Pre-insertion	Secondary	1	Barrier	‘‘Nonmedical criteria often determined urinary catheter placement decisions, with catheters being used to manage patients with incontinence.’’ [Secondary Care; S6]
Capability (psychological)	Memory, Attention, Decision making	Reminders and prompts	Removal	Secondary	1	Facilitator	‘‘Hospital epidemiologist in post was significantly and positively associated with: i) urinary catheter reminder or stop-order and nurse initiated catheter discontinuation.’’ [Secondary Care; S4]
Capability (psychological)	Memory, Attention, Decision making	Patient symptoms prompt investigation and treatment of possible CAUTI	Post-insertion maintenance	Tertiary	1	Facilitator	‘‘I usually order a urine culture on catheterized patients when there is a change in urine colour, cloudiness, or odour.’’ [Tertiary care; T3]
Capability (psychological)	Memory, Attention, Decision making	Cognitive biases: Patient age	Pre-insertion	Tertiary	1	Barrier	‘‘I am more likely to treat catheter-associated asymptomatic bacteriuria in older patients than in younger patients.’’ [Tertiary Care; T3]
Capability (psychological)	Memory, Attention, Decision making	Variation in urinary catheterisation decision making across wards	Pre-insertion	Secondary	1	Barrier	‘‘Compared with the wards, clinicians in the ED (and to a lesser extent, the medical assessment unit) were more likely to make the decision to place an IUC at a lower threshold.’’ (S17)

COM-B component	TDF domain	Theme	Behavioural phase	Care settings	Frequency (maximum possible is 24 studies)	Barrier, Facilitator or Mixed	Example quote(s) [Setting; Study ID]
Capability (psychological)	Memory, Attention, Decision making	Absence of standardised CAUTI diagnostic criteria to help decision-making	Post-insertion maintenance	Primary and Community	1	Barrier	‘‘Lack of clear, standardised criteria used to define CAUTI, to distinguish between symptomatic and asymptomatic CAUTI and to report outcomes.’’ [Primary Care; p1]
Capability (psychological)	Behavioural regulation	Audit and feedback on CAUTI metrics	All	Secondary	2	Facilitator	‘‘One hospital even made it a point to collect urinary tract infection (UTI) data on patients 7 days post discharge to use as evidence for their staff that urinary catheters (and hence their actions related to the use of urinary catheters) do cause infections.’’ [Secondary Care; S1]
Capability (psychological)	Behavioural regulation	Inconsistent monitoring of compliance with guidelines	All	Secondary	1	Barrier	‘‘Inconsistent monitoring of compliance with evidence based guidelines.’’ [Secondary Care; S2]
Capability (physical)	Skills	Poor urinary catheter insertion technique	Insertion	Secondary	2	Barrier	‘‘Urinary catheters were being inserted by nursing staff that did not demonstrate proper insertion technique and by medical students and residents who were untrained in catheter placement’.’ [Secondary Care; S6]
Opportunity (physical)	Environmental context and resources	Limited and inconsistent documentation and records	All	Secondary, Primary and Community,	6	Barrier	‘‘Lack of medical documentation for use of urinary catheters was significantly associated with inappropriate catheter use.’’ [Secondary Care; S8] ‘‘The level of detail recorded was variable both within and between service groups. Of the patients with a CAUTI, the date diagnosed, method of diagnosis (for example, urine culture) and antibiotic treatment given were recorded in over 85% of cases, although the causative organism was reported in less than 40%. However, it was rarely possible to confirm whether the CAUTI was symptomatic or asymptomatic.’’ [Primary Care; P1]
Opportunity (physical)	Environmental context and resources	Transitions of care	All	Secondary, Tertiary, Care homes	5	Barrier	‘‘Transferences to ward from intensive care unit accounted for 6% of inappropriate catheterisations’’ [Secondary Care; S13] ‘‘Staff turnover barrier to implementation of CAUTI reduction program.’’ [Care homes; C1]
Opportunity (physical)	Environmental context and resources	Lack of time to perform alternatives to urinary catheterisation	Pre-insertion	Secondary, Care homes	3	Barrier	‘‘Being too busy to be able to assist a patient to the bathroom.’’ [Secondary Care; S1]

COM-B component	TDF domain	Theme	Behavioural phase	Care settings	Frequency (maximum possible is 24 studies)	Barrier, Facilitator or Mixed	Example quote(s) [Setting; Study ID]
Opportunity (physical)	Environmental context and resources	Lack of staff	All	Secondary, Care homes	2	Barrier	‘‘Facilities insufficiently staffed to implement the program.’’ [Care Homes, C1]
Opportunity (physical)	Environmental context and resources	Unavailability of medical alternatives to urinary catheterisation	Pre-insertion	Secondary	2	Barrier	‘‘Lack of medical alternatives, (for example, a bladder scanner that could help determine the need for a catheter) that may be contributing to these decisions.’’ [Secondary Care; S1]
Opportunity (physical)	Environmental context and resources	Cost of alternatives to urinary catheterisation	Pre-insertion	Secondary	2	Barrier	‘‘Expense incurred by use of diapers.’’ [Secondary Care; S15]
Opportunity (physical)	Environmental context and resources	Choice and availability of urinary catheters	Pre-insertion	Secondary, Primary and community	2	Mixed	‘‘Supply of urinary catheters being available in bedside supply carts added convenience and may have influenced their decision to insert one.’’ [Secondary Care; S18] ‘‘In acute care catheter availability was often limited to samples supplied by company representatives or the limited supply held in hospital pharmacies. In the community availability could be limited by a formulary. Of the prescribing nurses, 54% had unlimited choice of catheters, while 43% were restricted in their choice.’’ [Secondary care; Community Care; SC20]
Opportunity (physical)	Environmental context and resources	Lack of resources (general)	All	Secondary	1	Barrier	‘‘Healthcare workers complain of limited resources to help them do the right thing.’’ [Secondary Care; S14]
Opportunity (social)	Social influences	Requests from patients and their carers	Pre-insertion	Secondary, Tertiary	5	Barrier	‘‘Pressure of requests by the patient or the family for catheters: ‘‘The family says, Well, my mum really needs it in…Mum can’t get up, mum can’t walk, she’s incontinent [of urine].’’ [Secondary Care; S1]
Opportunity (social)	Social influences	Lack of peer support and buy-in	All	Secondary, Care homes	4	Barrier	‘‘Facility leads new to their positions often found it hard to gain buy-in, mainly due to a lack of relationship with the staff.’’ [Care Homes; C1] ’’As a charge nurse explained: “If you don’t have the doctors on board you’re just going to be beating your head against the wall.’’’ [Secondary Care; S1]

COM-B component	TDF domain	Theme	Behavioural phase	Care settings	Frequency (maximum possible is 24 studies)	Barrier, Facilitator or Mixed	Example quote(s) [Setting; Study ID]
Opportunity (social)	Social influences	Physicians dictate nurses' practice	All	Secondary, Tertiary	3	Barrier	‘‘My supervising physician generally prefers to treat positive urine cultures in catheterized patients.’’ [Tertiary Care; T3] [Nurse:]‘‘…You can keep asking, ‘’Can I pull the Foley?’ and they'll [physicians] just say, ‘’Leave it in…’” [Secondary Care; S1]
Opportunity (social)	Social influences	Cultural norms regarding standard catheterisation practice for specific patient groups	Pre-insertion, Insertion	Secondary, Tertiary	3	Barrier	‘‘The biggest challenge was changing the culture of practice of inserting indwelling urinary catheter in all ICU patients.’’ [Secondary Care; S15]
Opportunity (social)	Social influences	Local champions	All	Secondary, Tertiary	2	Facilitator	‘‘Presence of an emergency physician champion to establish indications for urinary catheter placement resulted in fewer orders for catheters.’’ [Tertiary Care; T1]
Opportunity (social)	Social influences	Challenging unnecessary urinary catheterisation requests	Pre-insertion	Secondary	1	Facilitator	‘‘Empowering clinical nurses to speak up to physicians if they believed a patient was unnecessarily ordered for a urinary catheter.’’ [Secondary Care; S7]
Opportunity (social)	Social professional role and identity	Having a Hospital Epidemiologist in post	Removal	Secondary	2	Facilitator	‘‘Hospital epidemiologist in post was significantly and positively associated with: i) Urinary catheter reminder or stop-order and nurse initiated catheter discontinuation.’’ [Secondary Care; S4]
Opportunity (social)	Social professional role and identity	Acceptance of responsibility for urinary catheterisation decision making	Pre-insertion	Secondary, Tertiary	2	Barrier	‘‘Nurses felt that the decision to maintain an indwelling catheter was up to the physician, and did not consider it within their scope of practice.’’ [Tertiary Care; T2]
Opportunity (social)	Social professional role and identity	CAUTI guidelines not perceived as relevant across Hospital departments	All	Secondary	1	Barrier	‘‘I looked at the criteria set forward indications for [urinary] catheter use. I think my gut reaction was that perhaps some of those were not as applicable in the Emergency Department setting…that maybe they were more devised for the inpatient setting.’’ [Secondary Care; S1]
Opportunity (social)	Social professional role and identity	Nurses leading change in urinary catheterisation practice	All	Secondary	1	Facilitator	‘‘We're] really changing it [practice] from the bottom up, which I think is a great idea. We're the ones doing the work so we're the ones that make that change.’’ [Secondary Care; S7]

COM-B component	TDF domain	Theme	Behavioural phase	Care settings	Frequency (maximum possible is 24 studies)	Barrier, Facilitator or Mixed	Example quote(s) [Setting; Study ID]
Motivation (reflective)	Beliefs about consequences	Convenience and ease of monitoring	All	Secondary	5	Mixed	‘‘Catheters inserted for convenience purposes, for example, to accurately measure a patient’s urine output or to avoid frequent transfers to a bedpan or a bedside commode.’’ [Secondary Care; S18] ‘‘Perception that urinary catheters are a potential source of harm not convenient and benign’’ [Secondary Care; S7]
Motivation (reflective)	Beliefs about consequences	Perceived severity of CAUTI	All	Secondary	2	Mixed	‘‘Perception by nursing staff of urinary catheters and urinary tract infections as benign was quite common.’’ [Secondary care; S1] ‘‘Perception that urinary catheters are a potential source of harm not convenient and benign.’’ [Secondary care; S7]
Motivation (reflective)	Beliefs about consequences	Lack of perceived benefits to interventions targeting CAUTI	All	Tertiary, Care homes	2	Barrier	‘‘Physicians did not realize the value or benefits of supporting program implementation.’’ [Care Homes; C1]
Motivation (reflective)	Beliefs about consequences	Patient safety and injury	All	Secondary	1	Mixed	‘‘Patients keep forgetting that the Foley is there and they keep feeling like they have to urinate. The catheter will get pulled out by the patient or they are going to try and get out of bed and injure themselves…We have taken them [Foleys] out for patient safety.’’ [Secondary Care; S1] ‘‘Well, do I really want this person hopping out of bed [to go to the bathroom] and can I really be sure that they’re going to call me to help them? We don’t want there to be any falls.’’ [Secondary Care; S1]
Motivation (reflective)	Beliefs about consequences	Improved patient hygiene	Pre-insertion	Secondary	1	Facilitator	‘‘You don’t want them lying in their own urine…It’s not a great for someone who’s wet with potential pressure areas and lying in their own wee.” (ED consultant physician) [Secondary Care; S17]
Motivation (reflective)	Beliefs about consequences	Avoiding damage to medical equipment	Pre-insertion	Secondary	1	Facilitator	‘‘If you’re transferring someone that’s critically ill to CT, I would be more likely to catheterise someone than not simply because you’ve got a patient who is potentially going to wet themselves in the CT scanner and that’s going to cause problems for the CT scanners.’’ [Secondary Care; S17]

COM-B component	TDF domain	Theme	Behavioural phase	Care settings	Frequency (maximum possible is 24 studies)	Barrier, Facilitator or Mixed	Example quote(s) [Setting; Study ID]
Motivation (reflective)	Beliefs about consequences	Adhering to guidelines improve patient care	All	Tertiary	1	Facilitator	‘‘My clinical colleagues believe that following clinical practice guidelines improves patient care.’’ [Tertiary Care; T3]
Motivation (reflective)	Beliefs about consequences	Certain types of infections are more harmful than others in catheterised patients	Post-insertion maintenance	Tertiary	1	Facilitator	‘‘Gram-negative organisms in the urine of a catheterized patient are more harmful than gram-positive organisms.’’ [Tertiary Care; T3]
Motivation (reflective)	Beliefs about consequences	Pros and cons of reusable catheters	Pre-insertion, Insertion	Secondary, Primary and Community	1	Mixed	‘‘Major concerns included the perceived increased risk of urinary tract infection and increased patient burden. Potential advantages included increased patient choice, cost savings and reducing the fear or likelihood of running out of catheters.’’ [Secondary Care; Community care; SC20]
Motivation (reflective)	Beliefs about capabilities	Nurse empowerment	All	Secondary	1	Facilitator	‘‘Empowering nurses to identify and address CAUTI improvement opportunities: [We”re] really changing it [practice] from the bottom up, which I think is a great idea. We”re the ones doing the work so we”re the ones that make that change.’’ [Secondary Care; S7]
Motivation (reflective)	Beliefs about capabilities	Confidence in investigating and managing CAUTI	Post-insertion maintenance	Tertiary	1	Facilitator	‘‘I feel confident in knowing when to order a urine culture on catheterised patients…how to manage bacteriuria in catheterised patients…and that I can apply asymptomatic bacteriuria guidelines to my patients.’’ [Tertiary Care; T3]
Motivation (reflective)	Goals	CAUTI is not a priority	All	Secondary	2	Barrier	‘‘… it’s difficult to find people that are excited about getting Foleys out of patients; other things take higher priority like central lines and VAP.’’ [Secondary Care; S1]