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Evaluating the effectiveness of behaviour change theory-based training for reducing antibiotic prescribing by NHS dentists working in NHS primary care dental practices

Submission date 23/04/2020	**Recruitment status** No longer recruiting	[X] Prospectively registered [X] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 18/06/2020	**Overall study status** Ongoing	
Last Edited 03/07/2025	**Condition category** Oral Health	

Plain English summary of protocol

Background and study aims

Antimicrobial resistance is an increasingly serious threat to global public health and patient safety. In Scotland, about 8% of antibiotics dispensed in community pharmacies are prescribed by dentists. However, despite national clinical guidance to support dentists make appropriate prescribing decisions, findings from surveys and audits suggest that dentists often prescribe antibiotics unnecessarily in the absence of clinical need. It is known from earlier work that providing dentists with graphical audit and feedback about their antibiotic prescribing rate can lead to a substantial reduction in the number of antibiotics prescribed. One way to potentially enhance the effect of audit and feedback is to also provide in-practice training. In Scotland, all NHS dental practices must undertake in-practice infection control training at least once every 3 years. The team providing this training have developed a new component (TiPTAP) focusing on antibiotic prescribing for addition to the standard training package. This study aims to compare the effectiveness of TiPTAP training plus individualised audit and feedback compared with individualised audit and feedback only for reducing antibiotic prescribing in NHS dentists working in the NHS primary care dental practices.

Who can participate?

All eligible NHS dental practices that arrange infection control in-practice training in the 12 months following the start date of this study.

What does the study involve?

NHS dental practices will be randomly allocated to one of two groups: standard infection control training plus individualised audit and feedback; or standard infection control training plus antibiotic prescribing training plus individualised audit and feedback. To produce the graphical feedback, information from the Prescribing Information System for Scotland (PRISMS) will be combined with information from the Management Information and Dental Accounting System (MIDAS), which contains information on all courses of NHS dental treatment provided in Scotland. The initial feedback will contain prescribing activity taken from the most recently

available 24 months of information prior to a practice's infection control in-practice training. Further graphical feedback will be provided at 6 months after training. At 6 and 12 months the antibiotic prescribing rates of the two groups will be compared with each other. An integrated process evaluation will be carried out to gain a fuller understanding of the results of the trial.

What are the possible benefits and risks of participating?
Dentists may increase awareness of their antibiotic prescribing patterns and practices may develop team approaches to improve antibiotic prescribing. There is a low risk of participating for dental practice staff. Dentists receiving individualised feedback will not be given information about the prescribing rates of the other dentists in their practice and it will not be possible to identify any other dentists from the feedback given. No patients are involved in the study and no patient identifiable information will be used.

Where is the study run from?
TRiaDS Programme Office, Dundee Dental Education Centre (UK), NHS Education for Scotland (UK), Smalls Wynd, Dundee (UK), supported by the Health Services Research Unit, University of Aberdeen (UK)

When is the study starting and how long is it expected to run for?
June 2020 to December 2025

Who is funding the study?
NHS Education for Scotland (UK)

Who is the main contact?
Claire Scott
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Contact information

Type(s)
Public

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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
Nil known

Study information

Scientific Title
Training in Practice Targeting Antibiotic Prescribing (TiPTAP): a randomised controlled trial

Acronym
TiPTAP

Study objectives
The aim is to compare the effectiveness of Training in Practice Targeting Antibiotic Prescribing (TiPTAP) in addition to individualised audit and feedback, with individualised audit and feedback only for reducing antibiotic prescribing by NHS dentists working in NHS primary care dental practices.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 18/05/2020, University of Dundee Schools of Nursing & Health Sciences and Dentistry Research Ethics Committee (University of Dundee, Dundee, DD1 4HN, UK; 44 (0)1382 383000; SREC-SNHS-SDEN@dundee.ac.uk), ref: UOD\SDEN\2020\011_Clarkson

Study design
Cluster randomized controlled trial with process evaluation

Primary study design
Interventional

Secondary study design
Cluster randomised trial

Study setting(s)
Other

Study type(s)
Treatment

Participant information sheet
Not available in web format, please use the contact details to request a participant information sheet

Health condition(s) or problem(s) studied
Antibiotic prescribing in dental primary care

Interventions
Current interventions as of 30/04/2024:

Participating practices will be randomised to either the control group (standard infection control training and individualised audit and feedback) or the intervention group (standard infection control training, individualised audit and feedback and TiPTAP antibiotic prescribing training). Allocation will be via random number assignment and centralised computer allocation.

Control group
Practices allocated to the control group will receive the standard Quality Improvement in Practice Training (QIiPT) infection control training and individualised audit and feedback. QIiPT infection control training is delivered virtually to the whole practice team (including dentists, dental nurses, reception staff and practice managers). The QIiPT infection control training aims to enable practices to reflect on existing processes and to consider any changes required for improvement and guideline compliance. Its 3-hour standardised content includes PowerPoint presentation, practical demonstration and discussion. Action plans are set with the practice on the day of the training and followed up after 8 weeks to provide advice and support if the action plans have not been achieved. The topics covered are hand hygiene, cleaning instruments, environmental cleaning and the testing and maintenance of decontamination equipment.
After the training session, each dentist in the practice will be provided with individualised audit and feedback comprising their own antibiotic prescribing rate presented in graphical format alongside a Health Board comparator. To produce the graphical feedback, data from the Prescribing Information System for Scotland (PRISMS) and the Management Information and Dental Accounting System (MIDAS), which contains information on all courses of NHS dental treatment provided in Scotland will be used. The feedback will be generated through linkage of PRISMS prescribing data and MIDAS treatment claim data via the Prescriber reference in PRISMS and the List Number in MIDAS. The calculation used to generate monthly individual prescribing rates is (total number of antibiotic items prescribed / total number of treatment claims)*100. Feedback charts will be generated in Stata version 16.

Intervention group
Practices allocated to the intervention group will receive the standard QIiPT infection control training, individualised audit and feedback and TiPTAP antibiotic prescribing training. The TiPTAP antibiotic prescribing training is a 30-minute theory-based training component. This additional training component comprises a presentation, problem solving discussion, setting and recording action plans and feedback of practice level antibiotic prescribing data. The content of the TiPTAP antibiotic prescribing training was informed by behaviour change theory and designed using behaviour change techniques (BCTs) from the behaviour change techniques taxonomy v1 (BCTTv1). The BCTs included in the TiPTAP training are: 1.2 Problem solving, 1.4 Action planning, 1.6 Discrepancy between current behaviour and goal, 2.2 Feedback on behaviour, 4.1 Instruction on how to perform the behaviour, 5.1 Information about health consequences, 5.2 Salience of consequences, 5.3 Information about social and environmental

consequences, 5.5 Anticipated regret, 9.1 Credible source and 12.1 Restructuring the physical environment. Each dentist in the intervention group will also receive individualised audit and feedback as in the control group.

Process evaluation
The trial includes and integrated process evaluation. It will be based on the Medical Research Council (MRC) guidance for conducting process evaluations of complex interventions and will be underpinned by the US National Institute of Health Behaviour Change Consortium's (BCC) fidelity framework. A mixed methods approach will be used for data collection including trial data, a post training questionnaire, training session observations, and participant and trainer interviews. Qualitative and quantitative data will be evaluated to gain a fuller understanding of the results of the TiPTAP trial.

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Previous interventions as of 18/06/2021:

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Control group
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Practices allocated to the intervention group will receive the standard QIiPT infection control training, individualised audit and feedback and TiPTAP antibiotic prescribing training. The TiPTAP antibiotic prescribing training is a 30-minute theory-based training component. This additional training component comprises a presentation, problem solving discussion, setting and recording action plans and feedback of practice level antibiotic prescribing data. The content of the TiPTAP antibiotic prescribing training was informed by behaviour change theory and designed using behaviour change techniques (BCTs) from the behaviour change techniques

taxonomy v1 (BCTTv1). The BCTs included in the TiPTAP training are: 1.2 Problem solving, 1.4 Action planning, 1.6 Discrepancy between current behaviour and goal, 2.2 Feedback on behaviour, 4.1 Instruction on how to perform the behaviour, 5.1 Information about health consequences, 5.2 Salience of consequences, 5.3 Information about social and environmental consequences, 5.5 Anticipated regret, 9.1 Credible source and 12.1 Restructuring the physical environment. Each dentist in the intervention group will also receive individualised audit and feedback as in the control group.

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Practices allocated to the intervention group will receive the standard QIiPT infection control training, individualised audit and feedback and TiPTAP antibiotic prescribing training. The TiPTAP antibiotic prescribing training is a 30-minute theory-based training component. This additional training component comprises a presentation, problem solving discussion, setting and recording action plans and feedback of practice level antibiotic prescribing data. The content of the TiPTAP antibiotic prescribing training was informed by behaviour change theory and designed using behaviour change techniques (BCTs) from the behaviour change techniques taxonomy v1 (BCTTv1). The BCTs included in the TiPTAP training are: 1.2 Problem solving, 1.4 Action planning, 1.6 Discrepancy between current behaviour and goal, 2.2 Feedback on behaviour, 4.1 Instruction on how to perform the behaviour, 5.1 Information about health consequences, 5.2 Salience of consequences, 5.3 Information about social and environmental consequences, 5.5 Anticipated regret, 9.1 Credible source, 12.1 Restructuring the physical

environment and 12.5 Adding objects to the environment. Each dentist in the intervention group will also receive individualised audit and feedback as in the control group.

Intervention Type
Behavioural

Primary outcome measure
The number of antibiotic items per 100 NHS treatment claims: PRISMS prescribing data and MIDAS treatment claim data will be linked via the Prescriber reference in PRISMS and the List Number in MIDAS. This linked database will be used to measure both the primary and secondary outcomes. The calculation used to generate monthly individual prescribing rates is (total number of antibiotic items prescribed / total number of treatment claims)*100. Measured over a 1-year period post-randomisation per dentist (with specific timepoints of interest being 6- and 12-months post-randomisation).

Secondary outcome measures
Current secondary outcome measures as of 30/04/2024:

1. Total number of amoxicillin 3 g items per 100 NHS treatment claims
2. Total number of “second-line” antibiotic items (Clindamycin, Co-amoxiclav, Clarithromycin, Cefalexin, and Cefradine) per 100 claims
3. Defined daily doses of antibiotics per 100 claims
4. Defined daily doses of amoxicillin 3 g per 100 claims
5. Defined daily doses of “second-line” antibiotics (Clindamycin, Co-amoxiclav, Clarithromycin, Cefalexin and Cefradine) per 100 claims

PRISMS prescribing data and MIDAS treatment claim data will be linked via the Prescriber reference in PRISMS and the List Number in MIDAS. This linked database will be used to measure both the primary and secondary outcomes. The calculation used to generate monthly individual prescribing rates is (total number of antibiotic items prescribed / total number of treatment claims)*100. Measured over a 1-year period post-randomisation per dentist (with specific timepoints of interest being 6- and 12-months post-randomisation).

Process measures
A post training questionnaire will assess fidelity, knowledge and confidence. Training session observations and QIiPT team records will detail whether the practices received the intervention as intended. Interviews will take place with participants and trainers in order to further examine the implementation and impact of the trial.

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Previous secondary outcome measures:

1. Total number of amoxicillin 3 g items per 100 NHS treatment claims
2. Total number of “second-line” antibiotic items (Clindamycin, Co-amoxiclav, Clarithromycin, Cefalexin, and Cefradine) per 100 claims
3. Defined daily doses of antibiotics per 100 claims
4. Defined daily doses of amoxicillin 3 g per 100 claims
5. Defined daily doses of “second-line” antibiotics (Clindamycin, Co-amoxiclav, Clarithromycin, Cefalexin and Cefradine) per 100 claims

PRISMS prescribing data and MIDAS treatment claim data will be linked via the Prescriber reference in PRISMS and the List Number in MIDAS. This linked database will be used to measure

both the primary and secondary outcomes. The calculation used to generate monthly individual prescribing rates is (total number of antibiotic items prescribed / total number of treatment claims)*100. Measured over a 1-year period post-randomisation per dentist (with specific timepoints of interest being 6- and 12-months post-randomisation).

Overall study start date
01/06/2020

Completion date
31/12/2025

Eligibility

Key inclusion criteria
Dental practices:
NHS General Dental Practices across the 14 Health Boards in Scotland booked to receive QIiPT infection control training

Dentists:
Dentists working in a practice which has booked QIiPT infection control training and has agreed to take part in TiPTAP
Dentists in eligible and participating practices with an ordinary list number recorded in MIDAS

Participant type(s)
Health professional

Age group
Adult

Sex
Both

Target number of participants
228

Key exclusion criteria
Current participant exclusion criteria as of 18/06/2021:
Dental practices:
1. Practices which have not received QIiPT IC training in the past 5 years
2. Practices in mainland Health Boards in which any dentists are salaried. Salaried dentists are used as a proxy to identify community and emergency dental services). Predominantly due to geography, the majority of dental services in the Island Health Boards are provided by the NHS salaried service. For this reason, practices with salaried dentists in the Island Health Boards are not excluded
3. Practices where no ordinary list claims are made in more than 6 months out of the most recently available 24 months of MIDAS data at the time of baseline
4. Practices where no antibiotic items have been prescribed in more than 6 months out of the most recently available 24 months of PRISMS data at the time of baseline

Dentists:
1. Dentists not working in a practice which has booked QIiPT IC training and has agreed to take part in TiPTAP
2. Dentists in eligible and participating practices who do not have an ordinary list number recorded in MIDAS

Previous participant exclusion criteria:
Dental practices:
1. Practices which have not received QIiPT IC training in the past 4 years
2. Practices which participated in TiPTAP feasibility and acceptability work
3. Practices which have previously received TiPTAP training
4. Practices in mainland Health Boards in which any dentists are salaried. Salaried dentists are used as a proxy to identify community and emergency dental services). Predominantly due to geography, the majority of dental services in the Island Health Boards are provided by the NHS salaried service. For this reason, practices with salaried dentists in the Island Health Boards are not excluded
5. Practices where no ordinary list claims are made in more than 6 months out of the most recently available 12 months of MIDAS data at the time of baseline
6. Practices where no antibiotic items have been prescribed in more than 6 months out of the most recently available 12 months of PRISMS data at the time of baseline

Dentists:
1. Dentists not working in a practice which has booked QIiPT IC training and has agreed to take part in TiPTAP
2. Dentists in eligible and participating practices who do not have an ordinary list number recorded in MIDAS

Date of first enrolment
21/06/2021

Date of final enrolment
08/01/2024

Locations

Countries of recruitment
Scotland

United Kingdom

Study participating centre
TRiaDS, NHS Education for Scotland, Dundee Dental Education Centre
Frankland Building, Small's Wynd
Dundee
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Sponsor information

Organisation
NHS Education for Scotland

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TRiaDS@nes.scot.nhs.uk

Sponsor type
Government

Website
http://www.nes.scot.nhs.uk

ROR
https://ror.org/011ye7p58

Funder(s)

Funder type
Government

Funder Name
NHS Education for Scotland

Alternative Name(s)

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
United Kingdom

Results and Publications

Publication and dissemination plan
The researchers plan to publish the protocol in a peer-reviewed journal. The results of the study will be reported first to study collaborators. A summary of the findings will be sent to all participating practices and Health Boards, the Office of the Chief Dental Officer and the Dental Executive Team at NHS Education for Scotland. It is anticipated that several peer-reviewed publications and conference presentations will result from the study. Decisions on authorship will be guided by the TRiaDS's authorship policy.

Intention to publish date
01/02/2026

Individual participant data (IPD) sharing plan
The data-sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary
Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article		30/03/2021	18/06/2021	Yes	No
Protocol (preprint)	process evaluation protocol	10/06/2024	18/06/2024	No	No