TheAHSNNetwork

NHS Business Services Authority

# Medicines Optimisation

## Polypharmacy Prescribing Comparators

## Version: July 2017

## Comparator Descriptions and Specifications

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**Contents**



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## Background

Polypharmacy has been described as the use of multiple medications by a patient generally, but not exclusively, older adults aged 65 and over. Polypharmacy is a key issue in health and social care, as evidence suggests that being on multiple medications increases the individuals' risk of harm and contributes to hospital admissions and poor therapeutic outcomes. [(1)] Indeed, patients on 10 or more medicines are over 300% more likely to be admitted to hospital. [(2)]

As part of the efforts to address polypharmacy, Wessex Academic Health Science Network (AHSN) led a small working group consisting of members of North East and North Cumbria AHSN, NHS BSA, NHS Digital, local GPs, Pharmacists, prescribing analysts and clinical specialists in the development of prescribing comparators (see Appendix 1). An initial suite of nationally available prescribing comparators at CCG and GP Practice level was developed to highlight the variation in prescribing activity with respect to polypharmacy.

The polypharmacy prescribing comparators were then reviewed at a workshop that was open to all AHSNs in England and the Royal Pharmaceutical Society. Modifications were made in light of comments and suggestions made during this all-day workshop.

## Purpose

The purpose of the polypharmacy prescribing comparators is to allow GP Practices and CCGs to:

- see the variation in prescribing across GP practices, within a CCG and across CCGs
- identify if polypharmacy is an area to be investigated
- to help prioritise potential areas of activity
- demonstrate the impact of initiatives to address polypharmacy

The intention behind the publication of these prescribing comparators is to support local interventions to help patients to get the most from their medicines in line with the principles of medicines optimisation.

These polypharmacy prescribing comparators have been designed to be easy to understand, easy to interpret and easy to navigate.

**These comparators are not targets; we have not defined "good" or "poor" practice and we have not offered solutions to address high levels of polypharmacy. Solutions and change programmes should be developed locally and collaboratively.**

**Medication reviews to address polypharmacy must be carried out with the patient and/or carer, and include full discussions about their life style, their needs in relation to medicines, their values, as well as the relative risks and benefits of continuing and stopping medicines and in line with NICE guidance on Medication Review.**

**https://www.nice.org.uk/guidance/cg76/chapter/1-Guidance#reviewing-medicines**

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## Limitations

Historically, primary care prescribing information was derived from the reimbursement processes for dispensed medicines. However, the NHSBSA is now able to capture extra information that undoubtedly adds value to prescribing measures. The NHS number of the recipient of a medicine prescribed in primary care can now be linked to items prescribed. This development enables the data to show how many patients are prescribed a medicine or group of medicines (rather than presentation of drugs prescribed by each GP practice). In this way, we are able to demonstrate much better the quality of prescribing in key areas.

NHS number is routinely captured through the Electronic Prescription Service (EPS) with complete accuracy. Therefore, CCGs are encouraged to drive up the uptake of EPS. To support this improvement, EPS levels will be included alongside the comparators.

Information governance is very important and in the preparation of these Polypharmacy Prescribing Comparators all data protection legislation and patient confidentiality has been carefully considered and adhered to. While the Polypharmacy Prescribing Comparators are derived from patient level records, personal identifiable data will not be included within the reports.

Each comparator has a full specification outlining the evidence base behind the comparator; the rationale for inclusion and the data source (see Table 1 for list of comparators).

These prescribing comparators should be viewed as developmental and the specifications will be reviewed over time. Once launched, it is hoped that we will be able to conduct a full evaluation to establish if these measures do indeed identify groups of patients at the highest risk of inappropriate polypharmacy.

**These comparators are NOT the solution to problematic polypharmacy.**

**This comparator specification document is NOT a prescribing guideline. It simply shows how the comparators were developed and the rationale behind each comparator.**

## Table 1: List of comparators

| Comparator Title |
|---|
| Average number of unique medicines per patient |
| Percentage of patients prescribed 8/10/15/20 or more unique medicines |
| Percentage of patients with an anticholinergic burden score of 6/9/12 or greater |
| Multiple prescribing of anticoagulant and antiplatelet medicines |
| Percentage of patients prescribed two or more unique medicines likely to cause kidney injury (DAMN medicines) |
| Percentage of patients prescribed two or more unique medicines likely to cause kidney injury (DAMN medicines), one of which is an NSAID |

## Prescribing data used in these comparators

Users of these polypharmacy prescribing comparators must be aware of the following parameters:

- Covers all items prescribed in primary care by practices and cost centres linked to CCGs. It includes acute and repeat items. However, over 77% of all items dispensed are for repeated medicines. [(3)]

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- Is derived from the ePACT BNF chapters 1, 2, 3, 4, 6, 7, 8, 9 and 10. Therefore, the data does not include items such as creams, vaccines, appliances, eye drops or antimicrobials. The rationale for the selection of BNF chapters is that the comparators are intended to help practices to focus on mostly orally taken medicines, prescribed for long term conditions. In general, these are the medicines that have been found in studies to increase the risks associated with taking multiple medicines. It is understood that eye drops for example, which are not included in the polypharmacy prescribing comparators, can be used for the management of long term conditions and can be problematic when multiple medicines are used in this way. However, for the purposes of this first iteration of the polypharmacy prescribing comparators, it was agreed that the focus would be kept on the BNF chapters listed.
- Does not include hospital prescribing. Therefore, medicines supplied via Home Care or HIV medicines or medicines supplied by the hospital pharmacy such as oncology treatments are not included.
- Does not include medicines supplied over the counter.
- Does not include medicines supplied by NHS community services.

Each comparator is derived using prescribing data for a single month. Historic data is available to allow CCGs and Practices to chart their progress in addressing a particular comparator area.

All of the comparators show monthly data at GP Practice level (aggregated to CCG, Local Office, AHSN, STP, Similar 10 CCGs, CCG demographic clusters, NHS England Area, Regional and England level) and are available for all patients, patients aged 65 and over, aged 75 and over, and aged 85 and over and are aggregated to Area, Local Office, AHSN, STP, Similar 10 CCGs, CCG demographic cluster, Region and England).

**Unique patient:** This has been determined from prescriptions where the NHSBSA has been able to obtain details regarding patient NHS number and age at practice location. The maximum age of the patient has been used during the reporting period e.g. where a patient has been flagged as both age 56 and 57 then 57 has been used. Where the same patient appears in the data for more than one practice location they will be counted as one patient for each of the practice locations they appear in.

NB: While NHS numbers are used to formulate these comparators, no personal identifiable data will be released through these comparators.

**Unique medicine:** A unique medicine is measured as one or more medicines prescribed as the same chemical substance whether it be different formulations (presentations) or different strengths. Medicines with the same chemical substance (i.e. ePACT 9 character BNF code) are counted as one (single) unique medicine e.g. warfarin 1mg, 3mg and 5mg tablets are counted as one unique medicine.

## How to use these comparators

We envisage that the comparators will be used by CCGs in collaboration with local GP practices and with the relevant and appropriate education and training support in place.

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The comparators have been designed to be the stimulus for debate and change.[4] This facilitates an approach of taking a population perspective to trigger the search for unwarranted variation in care.

Clearly, in addressing outlying practice and unwarranted variation, Pharmacists working in GP practices will play an important role in supporting practices to identify and manage patients who are deemed at risk of problematic polypharmacy and who require thorough medication review as a priority.

During the development of these comparators, a number of CCGs expressed a desire to see historic data in order that they could assess the impact of any polypharmacy activity to date.

## Definitions of polypharmacy [5]

Appropriate polypharmacy: 'Prescribing for an individual for complex conditions or for multiple conditions in circumstances where medicines use has been optimised and where the medicines are prescribed according to best evidence.'

Problematic polypharmacy: 'The prescribing of multiple medicines inappropriately, or where the intended benefit of the medicines are not realised.'

**Contextual Content:** The following additional information will be included alongside the polypharmacy prescribing comparators to provide context to the content and the data. This data will be available at Practice, CCG and England level.

- EPS item volumes
- Repeat Dispensing item volumes
- Total Prescription item volumes
- Total Prescription item volumes for BNF Chapters 1 to 4 and 6 to 10
- Total Prescription item volumes where NHS number and patient age have been identified
- Total Prescription item volumes for BNF Chapters 1 to 4 and 6 to 10 where NHS number and patient age have been identified

**Data Source:** NHS Business Services Authority - based on data from the NHSBSA's prescription processing system which contains all NHS prescription data, with the exception of prescriptions which are dispensed in prisons, hospitals and private prescriptions.

Analysis is based on drugs that were reimbursed by the NHSBSA. It excludes items not dispensed and disallowed. If a prescription was issued, but not presented for dispensing or was not submitted to NHS Prescription Services by the dispenser, then it is not included in the data provided.

**Data owner & contact details:** nhsbsa@nhs.net

**Time Frame:** Refreshed monthly

## Data quality assurance

NHS Prescription Services have their own internal quality process to assure the data they provide matches what was originally submitted as part of the prescription processing activity. Some processes are complex and manual therefore there may be random inaccuracies in capturing

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prescription information which are then reflected in the data but checks are in place to reduce the chance of issues occurring. The processes operate to a number of key performance indicators, one of which is the percentage Prescription Information Accuracy, the target being 99.3% and as at February 2017 the accuracy level achieved over the latest 12 month rolling period was 99.56%.

The polypharmacy prescribing comparators are the first suite of measures to take advantage of the development linking the NHS number to prescription items. Currently, nearly 95% of all paper prescription items can be linked to an NHS number with an accuracy of over 99%. Age and date of birth can be linked to 73% of paper prescription items with an accuracy of 97%. As the utilisation of EPS increases, the coverage and accuracy of this data will increase.

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## Polypharmacy Comparator Specifications

### Average number of unique medicines

<table>
<tr><th colspan="3">Section 1: Introduction / Overview</th></tr>
<tr><td>1.1</td><td>Title</td><td>Average number of unique medicines per patient</td></tr>
<tr><td>1.2</td><td>MO Theme</td><td>POLYPHARMACY</td></tr>
<tr><td>1.3</td><td>Definition</td><td>Average number of unique medicines prescribed per patient (all, 65 and over, 75 and over, 85 and over).</td></tr>
<tr><td>1.4</td><td>Reporting Level</td><td>Practice level (aggregated to CCG, Area, Local Office, AHSN, STP, Similar 10 CCGs, CCG demographic cluster, Region and England).</td></tr>
<tr><td>1.5</td><td>Numerator</td><td>Total number of unique medicines prescribed for patients (all, 65 and over, 75 and over, 85 and over) from one or more of the following BNF chapters, during a single month.<br><br>
<table>
<tr><th>BNF Name</th><th>BNF Code</th></tr>
<tr><td>Gastro-Intestinal System</td><td>01</td></tr>
<tr><td>Cardiovascular System</td><td>02</td></tr>
<tr><td>Respiratory System</td><td>03</td></tr>
<tr><td>Central Nervous System</td><td>04</td></tr>
<tr><td>Endocrine System</td><td>06</td></tr>
<tr><td>Obstetrics,Gynae+Urinary Tract Disorders</td><td>07</td></tr>
<tr><td>Malignant Disease & Immunosuppression</td><td>08</td></tr>
<tr><td>Nutrition And Blood</td><td>09</td></tr>
<tr><td>Musculoskeletal & Joint Diseases</td><td>10</td></tr>
</table>
</td></tr>
<tr><td>1.6</td><td>Denominator</td><td>Total number of patients (all, 65 and over, 75 and over, 85 and over) prescribed one or more medicines within BNF chapters 1 to 4 and 6 to 10 during same time period as numerator.<br><br>Note: BNF chapters 1 to 4 and 6 to 10 have been selected for this denominator and throughout the Polypharmacy comparators to focus on patients that could be within a higher risk category.<br><br>Using Patient list size as the denominator was discounted for this comparator as the focus here is on those patients that have received a medicine.</td></tr>
<tr><td>1.7</td><td>Methodology</td><td>Numerator divided by denominator<br><br>Note: BNF chapters 1 to 4 and 6 to 10 have been selected for this comparator and throughout the Polypharmacy comparators to focus on patients that could be within a higher risk category associated with taking multiple medicines.</td></tr>
<tr><th colspan="3">Section 2: Rationale</th></tr>
<tr><td>2.1</td><td>Purpose</td><td>This comparator shows the average number of unique medicines prescribed per patient (all, 65 and over, 75 and over, 85 and over)<br><br>This allows practices and CCGs to:<br>• see the variation across practices within a CCG and across CCGs<br>• identify if polypharmacy is an area to be investigated<br>• demonstrate the impact of initiatives to address polypharmacy</td></tr>
<tr><td>2.2</td><td>Evidence and Policy Base</td><td>The average number of prescription items issued per head of the population has increased steadily since 2005, from 14.3 to 19.8 per head in 2015. [6]</td></tr>
</table>

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**Percentage of patients prescribed 8/10/15/20 or more unique medicines**

<table>
<tr><th colspan="3">Section 1: Introduction / Overview</th></tr>
<tr><td>1.1</td><td>Title</td><td>Percentage of patients prescribed 8/10/15/20 or more unique medicines</td></tr>
<tr><td>1.2</td><td>MO Theme</td><td>POLYPHARMACY</td></tr>
<tr><td>1.3</td><td>Definition</td><td>Number of patients (all, 65 and over, 75 and over, 85 and over) prescribed 8/10/15/20 or more unique medicines as a percentage of the number of patients prescribed one or more medicines</td></tr>
<tr><td>1.4</td><td>Reporting Level</td><td>Practice level (aggregated to CCG, Area, Local Office, AHSN, STP, Similar 10 CCGs, CCG demographic cluster, Region and England).</td></tr>
<tr><td>1.5</td><td>Numerator</td><td>Number of patients (all, 65 and over, 75 and over, 85 and over) prescribed 8/10/15/20 or more unique medicines from one or more of the following BNF Chapters in a single month.
<table>
<tr><th>BNF Name</th><th>BNF Code</th></tr>
<tr><td>Gastro-Intestinal System</td><td>01</td></tr>
<tr><td>Cardiovascular System</td><td>02</td></tr>
<tr><td>Respiratory System</td><td>03</td></tr>
<tr><td>Central Nervous System</td><td>04</td></tr>
<tr><td>Endocrine System</td><td>06</td></tr>
<tr><td>Obstetrics,Gynae+Urinary Tract Disorders</td><td>07</td></tr>
<tr><td>Malignant Disease & Immunosuppression</td><td>08</td></tr>
<tr><td>Nutrition And Blood</td><td>09</td></tr>
<tr><td>Musculoskeletal & Joint Diseases</td><td>10</td></tr>
</table></td></tr>
<tr><td>1.6</td><td>Denominator</td><td>Total number of patients (all, 65 and over, 75 and over, 85 and over) prescribed one or more medicines within BNF chapters 1 to 4 and 6 to 10 during same time period as numerator.<br><br>Note: BNF chapters 1 to 4 and 6 to 10 have been selected for this denominator and throughout the Polypharmacy comparators to focus on patients that could be within a higher risk category.<br><br>Using Patient list size as the denominator was discounted for this comparator as the focus here is on those patients that have received a medicine.</td></tr>
<tr><td>1.7</td><td>Methodology</td><td>Numerator divided by denominator<br>Presented as a percentage<br><br>Note: BNF chapters 1 to 4 and 6 to 10 have been selected for this comparator and throughout the Polypharmacy comparators to focus on patients that could be within a higher risk category associated with taking multiple medicines.</td></tr>
<tr><th colspan="3">Section 2: Rationale</th></tr>
<tr><td>2.1</td><td>Purpose</td><td>This comparator shows the number of patients prescribed 8/10/15/20 unique medicines as a percentage of the number of patients prescribed one or more medicines.<br><br>This allows practices and CCGs to:<br>• see the variation across practices within a CCG and across CCGs<br>• identify if polypharmacy is an area to be investigated<br>• to help prioritise potential areas of activity<br>• demonstrate the impact of initiatives to address polypharmacy</td></tr>
<tr><td>2.2</td><td>Evidence and Policy Base</td><td>The average number of prescription items issued per head of the population has increased steadily since 2005, from 14.3 to 19.8 per head in 2015. (6)<br><br>A person taking ten or more medicines is 300% more likely to be admitted to hospital. (2)<br><br>The more medicines a person takes, the more likely they are to have an adverse event from one of their medicines. A study found that 80% of patients aged 65 and over who were dispensed 15 or more medicines had a potentially serious interaction on their prescription. The same study found that individuals taking multiple medicines were more likely to receive a medicine with anticholinergic activity. (7)</td></tr>
</table>

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**Percentage of patients with an anticholinergic burden score of 6/9/12 or greater**

<table>
<tr><th colspan="3">Section 1: Introduction / Overview</th></tr>
<tr><td>1.1</td><td>Title</td><td>Percentage of patients with an anticholinergic burden score of 6/9/12 or greater</td></tr>
<tr><td>1.2</td><td>MO Theme</td><td>POLYPHARMACY</td></tr>
<tr><td>1.3</td><td>Definition</td><td>Number of patients (all, 65 and over, 75 and over, 85 and over) with an anticholinergic burden score of 6/9/12 or greater as a percentage of the number of patients prescribed one or more medicines.</td></tr>
<tr><td>1.4</td><td>Reporting Level</td><td>Practice level (aggregated to CCG, Area, Local Office, AHSN, STP, Similar 10 CCGs, CCG demographic cluster, Region and England).</td></tr>
<tr><td>1.5</td><td>Numerator</td><td>Number of patients (all, 65 and over, 75 and over, 85 and over) prescribed one or more anticholinergic medicines with a combined anticholinergic burden (ACB) score of 6 or greater, 9 or greater, 12 or greater within a single month.<br><br>See Appendix 2 for the list of ACB medicines with BNF Codes</td></tr>
<tr><td>1.6</td><td>Denominator</td><td>Total number of patients (all, 65 and over, 75 and over, 85 and over) prescribed one or more medicines within BNF chapters 1 to 4 and 6 to 10 during same period as numerator
<table>
<tr><th>BNF Name</th><th>BNF Code</th></tr>
<tr><td>Gastro-Intestinal System</td><td>01</td></tr>
<tr><td>Cardiovascular System</td><td>02</td></tr>
<tr><td>Respiratory System</td><td>03</td></tr>
<tr><td>Central Nervous System</td><td>04</td></tr>
<tr><td>Endocrine System</td><td>06</td></tr>
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<tr><td>Nutrition And Blood</td><td>09</td></tr>
<tr><td>Musculoskeletal & Joint Diseases</td><td>10</td></tr>
</table></td></tr>
<tr><td>1.7</td><td>Methodology</td><td>Numerator divided by denominator<br>Presented as a percentage<br><br>ACB scores are derived from Anticholinergic Cognitive Burden Scale developed by the Aging Brain Program of the Indiana University Centre for Aging Research available at:<br>http://www.agingbraincare.org/uploads/products/ACB_scale_-_legal_size.pdf<br><br>See Appendix 2 for the list of ACB medicines with BNF Codes</td></tr>
<tr><th colspan="3">Section 2: Rationale</th></tr>
<tr><td>2.1</td><td>Purpose</td><td>This comparator shows the number of patients prescribed anticholinergic medicines with a combined anticholinergic burden score of 6 or greater, 9 or greater, 12 or greater as a percentage of the number of patients prescribed one or more medicines.<br><br>This allows practices and CCGs to:<br>• see the variation across practices within a CCG and across CCGs<br>• identify if this polypharmacy topic is an area to be investigated<br>• to help prioritise potential areas of activity<br>• demonstrate the impact of initiatives to address this polypharmacy topic<br>• identify the number of patients at risk of anticholinergic side effects which can be especially harmful in those over 65<br>• raise awareness amongst prescribers of the problems associated with anticholinergic burden</td></tr>
<tr><td>2.2</td><td>Evidence and Policy Base</td><td>Each definitive anticholinergic may increase the risk of cognitive decline by 46% over 6 years.<br>For each one point increase in the ACB total score, a decline in Mini Mental State Exam (MMSE) score of 0.33 points over 2 years has been suggested.<br>Additionally, each one point increase in the ACB total score has been correlated with a 26% increase in the risk of death.</td></tr>
</table>

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| | | |
|---|---|---|
| | | ACB scores are derived from Anticholinergic Cognitive Burden Scale developed by the Aging Brain Program of the Indiana University Centre for Aging Research available at : http://www.agingbraincare.org/uploads/products/ACB_scale_-_legal_size.pdf<br><br>Anticholinergic medicines should be prescribed with caution as elderly patients are more likely to experience side effects such as constipation, urinary retention, dry mouth/ eyes, sedation, delirium, falls and reduced cognition (which may be wrongly diagnosed as dementia). Research also suggests a link to increased mortality with the number and potency of anticholinergic agents prescribed. ( Ref NHS Scotland Polypharmacy Guidance http://www.sign.ac.uk/pdf/polypharmacy_guidance.pdf) |

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**Multiple prescribing of anticoagulants and antiplatelet medicines**

<table>
<tr><th colspan="3">Section 1: Introduction / Overview</th></tr>
<tr><td>1.1</td><td>Title</td><td>Multiple prescribing of anticoagulants and antiplatelet medicine</td></tr>
<tr><td>1.2</td><td>MO Theme</td><td>POLYPHARMACY</td></tr>
<tr><td>1.3</td><td>Definition</td><td>Patients (all, 65 and over, 75 and over, 85 and over) prescribed three or more unique medicines that have an anticoagulant or antiplatelet action as a percentage of patients prescribed one or more unique medicines that have an anticoagulant or antiplatelet action during the same reporting period.</td></tr>
<tr><td>1.4</td><td>Reporting Level</td><td>Practice level (aggregated to CCG, Area, Local Office, AHSN, STP, Similar 10 CCGs, CCG demographic cluster, Region and England).</td></tr>
<tr><td>1.5</td><td>Numerator</td><td>Number of patients (all, 65 and over, 75 and over, 85 and over) prescribed three or more unique medicines within a single month that have an anticoagulant or antiplatelet action and are included in one or more of the following BNF codes.<br><br>
<table>
<tr><th>BNF Name</th><th>BNF Code</th></tr>
<tr><td>Oral Anticoagulants<br>excluding INR Blood Testing Reagents</td><td>0208020<br>0208020W0</td></tr>
<tr><td>Antiplatelet Drugs</td><td>0209000</td></tr>
</table>
<br>Only aspirin 75mg presentations (BNF 2.9) are included in the numerator (BNF 209000). Whilst prescribers should be aware that other aspirin containing presentations (BNF 4.7.1 which includes aspirin 300mg) and Non-Steroidal Anti-inflammatory Drugs exert antiplatelet activity, they have been excluded from the numerator. These prescribing comparators should be viewed as developmental and the specifications will be reviewed over time.<br><br>Parenteral anticoagulants have also been excluded on the basis that they may be prescribed prior to commencing oral treatment and potentially captured in the same reporting period.</td></tr>
<tr><td>1.6</td><td>Denominator</td><td>Number of patients (all, 65 and over, 75 and over, 85 and over) prescribed one or more medicines that have an anticoagulant or antiplatelet action within same BNF areas as numerator during same time period as numerator.</td></tr>
<tr><td>1.7</td><td>Methodology</td><td>Numerator divided by denominator<br>Presented as a percentage</td></tr>
<tr><th colspan="3">Section 2: Rationale</th></tr>
<tr><td>2.1</td><td>Purpose</td><td>To identify the number of patients prescribed multiple medicines that have the same or a similar anticoagulant or antiplatelet pharmacological action resulting in a reduction in the ability of their blood to clot.<br><br>This allows practices and CCGs to:<br>• see the variation across practices within a CCG and across CCGs<br>• identify if this polypharmacy topic is an area to be investigated<br>• identify the number of patients at risk from combinations of anticoagulants and antiplatelet medicines<br>• demonstrate the impact of initiatives to address this polypharmacy topic<br>•</td></tr>
<tr><td>2.2</td><td>Evidence and Policy Base</td><td>Whilst some patients with AF and other heart conditions such as acute coronary syndrome may clinically require multiple anticoagulants or antiplatelet, prescribers should be aware of the increased risks posed by these combinations and extra care should be taken of these patients for the duration of therapy.<br><br>https://academic.oup.com/eurheartj/article/35/45/3155/2481294/Management-of-antithrombotic-therapy-in-atrial</td></tr>
</table>

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| | | |
|---|---|---|
| | | Supporting Evidence<br>https://www.nice.org.uk/advice/ktt16/chapter/Evidence-context#safety-issues-with-anticoagulants<br><br>Arch Intern Med. 2010 Sep 13;170(16):1433-41. doi: 10.1001/archinternmed.2010.271.<br><br>Risk of bleeding with single, dual, or triple therapy with warfarin, aspirin, and clopidogrel in patients with atrial fibrillation.<br><br>https://www.ncbi.nlm.nih.gov/pubmed/?term=Clausen%20MT%5BAuthor%5D&cauthor=true&cauthor_uid=20837828 |

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**Patients prescribed two or more medicines likely to cause Kidney injury (DAMN drugs)**

<table>
<tr><th colspan="3">Section 1: Introduction / Overview</th></tr>
<tr><td>1.1</td><td>Title</td><td>Percentage of patients prescribed two or more unique medicines likely to cause kidney injury (DAMN medicines)</td></tr>
<tr><td>1.2</td><td>MO Theme</td><td>POLYPHARMACY</td></tr>
<tr><td>1.3</td><td>Definition</td><td>Percentage of patients (all, 65 and over, 75 and over, 85 and over) prescribed two or more unique medicines likely to induce, exacerbate or complicate acute kidney injury (DAMN medicines)<br><br>NB:<br>This comparator may identify patients on two or more unique medicines from the same DAMN medicines BNF class (eg. two diuretics) however these patients are within the minority but may still be at increased risk.</td></tr>
<tr><td>1.4</td><td>Reporting Level</td><td>Practice level (aggregated to CCG, Area, Local Office, AHSN, STP, Similar 10 CCGs, CCG demographic cluster, Region and England).</td></tr>
<tr><td>1.5</td><td>Numerator</td><td>Number of patients (all, 65 and over, 75 and over, 85 and over) prescribed two or more unique medicines during a single month that are likely to induce, exacerbate or complicate acute kidney injury (DAMN medicines).
<table>
<tr><th>DAMN medicines BNF class (BNF code)</th><th>DAMN medicines (BNF Name)</th><th>DAMN medicines (BNF Code)</th></tr>
<tr><td>0202</td><td>Diuretics</td><td>0202</td></tr>
<tr><td rowspan="2">020505</td><td>Angiotensin-Converting Enzyme Inhibitors</td><td>0205051</td></tr>
<tr><td>Angiotensin-II Receptor Antagonists</td><td>0205052</td></tr>
<tr><td rowspan="11">060102</td><td>Metformin Hydrochloride</td><td>0601022B0</td></tr>
<tr><td>Metformin Hydrochloride/Sitagliptin</td><td>0601023AD</td></tr>
<tr><td>Linagliptin/Metformin</td><td>0601023AF</td></tr>
<tr><td>Saxagliptin/Metformin</td><td>0601023AH</td></tr>
<tr><td>Alogliptin/Metformin</td><td>0601023AJ</td></tr>
<tr><td>Dapagliflozin/Metformin</td><td>0601023AL</td></tr>
<tr><td>Canagliflozin/Metformin</td><td>0601023AP</td></tr>
<tr><td>Empagliflozin/Metformin</td><td>0601023AR</td></tr>
<tr><td>Metformin Hydrochloride/Rosiglitazone</td><td>0601023V0</td></tr>
<tr><td>Metformin Hydrochloride/Pioglitazone</td><td>0601023W0</td></tr>
<tr><td>Metformin Hydrochloride/Vildagliptin</td><td>0601023Z0</td></tr>
<tr><td>100101</td><td>Non-Steroidal Anti-Inflammatory Drugs</td><td>100101</td></tr>
</table>
</td></tr>
</table>

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| | | |
|---|---|---|
| 1.6 | **Denominator** | Total number of patients (all, 65 and over, 75 and over, 85 and over) prescribed one or more DAMN medicines during same time period as numerator. |
| 1.7 | **Methodology** | Numerator divided by denominator<br>Presented as a percentage |
| **Section 2: Rationale** | | |
| 2.1 | **Purpose** | To identify the number of patients prescribed medicines that may put them at a higher risk of community acquired acute kidney injury if they develop an illness associated with hypovolaemia or hypotension.<br><br>This allows practices and CCGs to:<br>• see the variation across practices within a CCG and across CCGs<br>• identify if this polypharmacy topic is an area to be investigated demonstrate the impact of initiatives to address this polypharmacy topic<br>• raise awareness amongst prescribers of the problems associated with certain medicines that increase risk of AKI<br><br>*Prescribers are reminded that whilst this comparator focuses on two or more DAMN medicines it is important to emphasise that a single DAMN drug may be a problem in some patients.* |
| 2.2 | **Evidence and Policy Base** | Patients in the community with Chronic Kidney Disease and patients with normal renal function who are treated with an ACE inhibitor (ACEi) or angiotensin receptor blocker (ARB) are at increased risk of AKI if they develop an illness associated with hypovolaemia and hypotension. Such patients can be identified, educated and issued with a Kidney Care Card or equivalent. This provides instructions for temporary cessation of certain medications, which may in this setting, induce, exacerbate and complicate AKI. These drugs can be remembered by the mnemonic DAMN (diuretics, ACEi/ ARBs, metformin, NSAIDs).<br><br>*Patients should be advised about how to minimise their risk of AKI in accordance with the Guidance for Medicines Optimisation for patients with AKI*<br>*https://www.thinkkidneys.nhs.uk/aki/wp-content/uploads/sites/2/2016/03/Guidelines-for-Medicines-optimisation-in-patients-with-AKI-final.pdf*<br><br>Supporting Evidence<br>http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4255835/<br><br>https://www.thinkkidneys.nhs.uk/aki/wp-content/uploads/sites/2/2016/03/Guidelines-for-Medicines-optimisation-in-patients-with-AKI-final.pdf<br><br>http://www.scottishpatientsafetyprogramme.scot.nhs.uk/programmes/primary-care/medicine-sick-day-rules-card |

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**Patients prescribed a NSAID and one or more other medicines likely to cause kidney injury (DAMN medicines)**

<table>
<tr><th colspan="3">Section 1: Introduction / Overview</th></tr>
<tr><td>1.1</td><td>Title</td><td>Percentage of patients prescribed a NSAID and one or more other medicines likely to cause kidney injury (DAMN medicines).</td></tr>
<tr><td>1.2</td><td>MO Theme</td><td>POLYPHARMACY</td></tr>
<tr><td>1.3</td><td>Definition</td><td>Percentage of patients (all, 65 and over, 75 and over, 85 and over) prescribed a NSAID and one or more other medicines likely to induce, exacerbate or complicate acute kidney injury (DAMN medicines).</td></tr>
<tr><td>1.4</td><td>Reporting Level</td><td>Practice level (aggregated to CCG, Area, Local Office, AHSN, STP, Similar 10 CCGs, CCG demographic cluster, Region and England).</td></tr>
<tr><td>1.5</td><td>Numerator</td><td>Number of patients (all, 65 and over, 75 and over, 85 and over) prescribed a NSAID and one or more other medicines, during a single month that are likely to induce, exacerbate or complicate acute kidney injury (DAMN medicines).
<table>
<tr><th>DAMN medicines BNF class (BNF code)</th><th>DAMN medicines (BNF Name)</th><th>DAMN medicines (BNF Code)</th></tr>
<tr><td>100101</td><td>Non-Steroidal Anti-Inflammatory Drugs</td><td>100101</td></tr>
<tr><td colspan="3">Plus one or more medicines (BNF codes) from the following</td></tr>
<tr><td>0202</td><td>Diuretics</td><td>0202</td></tr>
<tr><td rowspan="2">020505</td><td>Angiotensin-Converting Enzyme Inhibitors</td><td>0205051</td></tr>
<tr><td>Angiotensin-II Receptor Antagonists</td><td>0205052</td></tr>
<tr><td rowspan="11">060102</td><td>Metformin Hydrochloride</td><td>0601022B0</td></tr>
<tr><td>Metformin Hydrochloride/Sitagliptin</td><td>0601023AD</td></tr>
<tr><td>Linagliptin/Metformin</td><td>0601023AF</td></tr>
<tr><td>Saxagliptin/Metformin</td><td>0601023AH</td></tr>
<tr><td>Alogliptin/Metformin</td><td>0601023AJ</td></tr>
<tr><td>Dapagliflozin/Metformin</td><td>0601023AL</td></tr>
<tr><td>Canagliflozin/Metformin</td><td>0601023AP</td></tr>
<tr><td>Empagliflozin/Metformin</td><td>0601023AR</td></tr>
<tr><td>Metformin Hydrochloride/Rosiglitazone</td><td>0601023V0</td></tr>
<tr><td>Metformin Hydrochloride/Pioglitazone</td><td>0601023W0</td></tr>
<tr><td>Metformin Hydrochloride/Vildagliptin</td><td>0601023Z0</td></tr>
</table>
</td></tr>
</table>

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| | | |
|---|---|---|
| 1.6 | **Denominator** | Total number of patients (all, 65 and over, 75 and over, 85 and over) prescribed one or more DAMN medicines during same time period as numerator. |
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## Appendix 1: Polypharmacy Prescribing Comparator

**Working group:**

| Name | Role/Organisation |
|---|---|
| **Clare Howard** | Clinical Lead, Medicines Optimisation, Wessex Academic Health Science Network (Chair) |
| **Graham Mitchell** | Information Services Manager, NHS Business Service Authority |
| **Paul Brown** | Senior Pharmaceutical Adviser, NHS Digital |
| **Neil Watson** | Clinical Director of Pharmacy and Medicines Management, Newcastle Hospitals NHS Foundation Trust |
| **Vicki Rowse** | Programme Lead, Medicines Optimisation Wessex Academic Health Science Network |
| **Julia Blagburn** | Senior Lead Clinical Pharmacist for Older People's Medicine and Community Health, Newcastle Hospitals NHS Foundation Trust. |
| **Michelle Trevett** | Senior Pharmacist NHS Dorset Clinical Commissioning Group |
| **Dr Paul Mason** | GP and Prescribing Lead NHS Dorset Clinical Commissioning Group |
| **Dr Lawrence Brad** | GP and RCGP Lead for clinical pharmacists in GP practices |
| **Dr Simon Flack** | GP and Locality Lead NHS Dorset Clinical Commissioning Group |
| **Simon Cooper** | Head of Prescribing Support Portsmouth Clinical Commissioning Group |
| **Katie Griffiths** | Medicines Safety Officer Dorset Healthcare University NHS FT |
| **Catherine Armstrong** | Lead Pharmacist – Pharmicus, English Pharmacy Board Royal Pharmaceutical Society |
| **Helen Kennedy** | Prescribing Analyst, Dorset Clinical Commissioning Group |
| **Jacqueline Johnson** | Data Analyst, NHS Business Service Authority |

**Expert input provided by:**

| Name | Role/Organisation |
|---|---|
| **Nina Barnett** | Consultant Pharmacist and Pharmacy Adviser for Older People West London Hospitals Trust and Pharmacy Adviser for Older People for East & South East England Specialist Pharmacy Services |
| **Dr Suren Kanagsundaram** | Consultant Nephrologist NUHT |
| **Sotiris Antoniou** | Consultant Pharmacist, Cardiovascular Medicine, Barts Health NHS Trust |
| **Helen Williams** | Consultant Pharmacist Cardiovascular Medicine |
| **Sharon Gordon** | Wessex AHSN Clinical Lead AF Programme |

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## Appendix 2: List of Anticholinergic medicines with BNF Codes

**ACB score = 1**

| BNF Name | BNF Code |
|---|---|
| Alverine Citrate | 0102000A0 |
| Alverine Citrate Compound Preparations | 0102000C0 |
| Cimetidine | 0103010D0 |
| Cimetidine With Alginate | 0103010E0 |
| Ranitidine Bismuth Citrate | 0103010S0 |
| Ranitidine Hydrochloride | 0103010T0 |
| Codeine Phosphate Compound Mixtures | 0104020D0 |
| Loperamide Hydrochloride | 0104020L0 |
| Loperamide Hydrochloride & Simeticone | 0104020P0 |
| Hydrocortisone Acetate | 0105020B0 |
| Hydrocortisone | 0105020C0 |
| Prednisolone Sodium Metasulphobenzoate | 0105020D0 |
| Prednisolone Sodium Phosphate | 0105020E0 |
| Prednisolone | 0105020F0 |
| Isosorbide Mononitrate | 0107010AB |
| Isosorbide Dinitrate | 0107010L0 |
| Hydrocortisone | 0107020J0 |
| Prednisolone | 0107020P0 |
| Nifedipine | 0107040B0 |
| Digoxin | 0201010F0 |
| Chlortalidone | 0202010F0 |
| Furosemide | 0202020L0 |
| Triamterene | 0202030W0 |
| Triamterene With Loop Diuretics | 0202040U0 |
| Triamterene With Thiazides | 0202040V0 |
| Chlortalidone/Potassium | 0202080E0 |
| Furosemide/Potassium | 0202080K0 |
| Disopyramide | 0203020F0 |
| Disopyramide Phosphate | 0203020G0 |
| Quinidine Bisulfate | 0203020T0 |
| Quinidine Sulfate | 0203020U0 |
| Atenolol with Thiazides | 0204000A0 |
| Atenolol | 0204000E0 |
| Atenolol With Diuretic | 0204000F0 |
| Metoprolol Fumarate | 0204000J0 |
| Metoprolol Tartrate | 0204000K0 |
| Atenolol With Calcium Channel Blocker | 0204000U0 |
| Metoprolol Tartrate With Diuretic | 0204000W0 |
| Hydralazine Hydrochloride | 0205010J0 |

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| | |
|---|---|
| Captopril | 0205051F0 |
| Isosorbide Dinitrate | 0206010I0 |
| Isosorbide Mononitrate | 0206010K0 |
| Isosorbide Mononitrate with Aspirin | 0206010W0 |
| Nifedipine | 0206020R0 |
| Warfarin Sodium | 0208020V0 |
| Dipyridamole | 0209000L0 |
| Dipyridamole & Aspirin | 0209000V0 |
| Theophylline | 0301030S0 |
| Desloratadine | 0304010AB |
| Levocetirizine | 0304010AC |
| Loratadine | 0304010D0 |
| Cetirizine Hydrochloride | 0304010I0 |
| Alimemazine Tartrate | 0304010Y0 |
| Codeine Phosphate | 0309010C0 |
| Alprazolam | 0401020A0 |
| Diazepam | 0401020K0 |
| Clorazepate Dipotassium | 0401020V0 |
| Risperidone | 040201030 |
| Aripiprazole | 0402010AD |
| Paliperidone | 0402010AE |
| Haloperidol | 0402010J0 |
| Risperidone | 0402020AA |
| Paliperidone | 0402020AB |
| Aripiprazole | 0402020AD |
| Haloperidol Decanoate | 0402020T0 |
| Asenapine | 0402030R0 |
| Trazodone Hydrochloride | 0403010X0 |
| Fluvoxamine Maleate | 0403030L0 |
| Bupropion Hydrochloride | 0403040B0 |
| Venlafaxine | 0403040W0 |
| Morphine Anhydrous | 040702010 |
| Morphine Tartrate & Cyclizine Tartrate | 040702020 |
| Fentanyl | 0407020A0 |
| Codeine Phosphate | 0407020C0 |
| Morphine | 0407020N0 |
| Morphine Hydrochloride | 0407020P0 |
| Morphine Sulfate | 0407020Q0 |
| Bupropion Hydrochloride | 0410020A0 |
| Hydrocortisone | 0603020J0 |
| Hydrocortisone Sodium Phosphate | 0603020L0 |
| Hydrocortisone Sodium Succinate | 0603020M0 |
| Hydrocortisone Cipionate | 0603020N0 |

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| | |
|---|---|
| Prednisolone Sodium Metasulfobenzoate | 0603020Q0 |
| Prednisolone | 0603020T0 |
| Prednisolone Sodium Phosphate | 0603020V0 |
| Prednisolone Steaglate | 0603020W0 |
| Prednisone | 0603020X0 |
| Hydrocortisone Acetate | 1001022G0 |
| Prednisolone Acetate | 1001022N0 |
| Colchicine | 1001040G0 |

**ACB score = 2**

| BNF Name | BNF Code |
|---|---|
| Belladonna Alkaloids | 0102000H0 |
| Cyproheptadine Hydrochloride | 0304010K0 |
| Belladonna & Ipecacuanha | 0309020C0 |
| Loxapine Succinate | 0402010M0 |
| Pimozide | 0402010R0 |
| Nefopam Hydrochloride | 0407010P0 |
| Carbamazepine | 0408010C0 |
| Oxcarbazepine | 0408010D0 |
| Amantadine Hydrochloride | 0409010B0 |
| Cyclobenzaprine Hydrochloride | 1002020H0 |
| Belladonna Root | 1003020D0 |

**ACB score = 3**

| BNF Name | BNF Code |
|---|---|
| Trospium Chloride | 010200030 |
| Hyoscyamine Sulfate | 0102000AB |
| Atropine Sulfate | 0102000AC |
| Atropine Methonitrate | 0102000F0 |
| Dicycloverine Hydrochloride | 0102000J0 |
| Dicycloverine HCl Compound Preparations | 0102000K0 |
| Oxybutynin | 0102000Q0 |
| Propantheline Bromide | 0102000Y0 |
| Atropine Methonitrate | 0301020A0 |
| Atropine Sulfate | 0301020B0 |
| Hydroxyzine Embonate | 030401020 |
| Brompheniramine Maleate | 0304010F0 |
| Chlorphenamine Maleate | 0304010G0 |
| Clemastine Fumarate | 0304010H0 |
| Hydroxyzine Hydrochloride | 0304010J0 |
| Diphenhydramine Hydrochloride | 0304010N0 |

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| | |
|---|---|
| Promethazine Hydrochloride | 0304010W0 |
| Diphenhydramine Hydrochloride | 030902040 |
| Carbinoxamine Maleate | 030902050 |
| Promethazine Hydrochloride | 030902060 |
| Diphenhydramine HCl/Pholcodine | 0309020AB |
| Brompheniramine Maleate Combinations | 0309020U0 |
| Olanzapine | 040201060 |
| Quetiapine | 0402010AB |
| Clozapine | 0402010C0 |
| Chlorpromazine Hydrochloride | 0402010D0 |
| Perphenazine | 0402010Q0 |
| Thioridazine | 0402010W0 |
| Trifluoperazine | 0402010X0 |
| Olanzapine Embonate | 0402020AC |
| Amitriptyline Hydrochloride | 0403010B0 |
| Amoxapine | 0403010C0 |
| Amitriptyline Embonate | 0403010E0 |
| Clomipramine Hydrochloride | 0403010F0 |
| Desipramine Hydrochloride | 0403010H0 |
| Doxepin | 0403010L0 |
| Imipramine Hydrochloride | 0403010N0 |
| Nortriptyline | 0403010V0 |
| Trimipramine Maleate | 0403010Y0 |
| Paroxetine Hydrochloride | 0403030P0 |
| Doxylamine Succinate/Pyridoxine HCl | 0406000AA |
| Dimenhydrinate/Cinnarizine | 0406000AC |
| Dimenhydrinate | 0406000H0 |
| Promethazine Teoclate | 0406000V0 |
| Trihexyphenidyl Hydrochloride | 0409020C0 |
| Orphenadrine Hydrochloride | 0409020N0 |
| Solifenacin/Tamsulosin | 0704010W0 |
| Solifenacin | 0704020AB |
| Darifenacin Hydrobromide | 0704020AC |
| Fesoterodine Fumarate | 0704020AD |
| Flavoxate Hydrochloride | 0704020G0 |
| Oxybutynin | 0704020J0 |
| Tolterodine | 0704020N0 |
| Propiverine Hydrochloride | 0704020P0 |
| Trospium Chloride | 0704020Z0 |
| Oxybutynin Hydrochloride | 0704040G0 |
| Methocarbamol | 1002020S0 |
| Orphenadrine Citrate | 1002020V0 |

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