NHS Business Services Authority

NHS Digital

Medication Safety - Indicators Specification

Rel 2b (February 2019)

Information and technology
for better health and care

Contents

Introduction

A set of prescribing indicators have been developed as part of a programme of work to reduce medication error and promote safer use of medicines, including prescribing, dispensing, administration and monitoring. The programme of work is in response to the World Health Organisation (WHO) global challenge – Medication without Harm. More information can be found in the report of the Short Life Working Group.

The analysis is an experimental piece of work. This is the first-time prescribing data has been linked to admissions data at a national level.

The purpose of the indicators is to identify hospital admissions that may be associated with prescribing that potentially increases the risk of harm, and to quantify patients at potentially increased risk.

The aim of the indicators is to:

- support local reviews of prescribing, alongside other risk factors for potential harm
- minimise the use of medicines that are unnecessary and where harm may outweigh benefits
- identify where the risk of harm can be reduced or mitigated including prescribing of alternative medicines or medicines that mitigate risk e.g. gastro-protective agents
- reduce the number of hospital admissions that may be associated with medicines
- reduce the number of patients that are potentially at increased risk of hospital admission that may be associated with medicines.

Where an admission has been recorded that is linked to a patient currently taking medicines that may increase the risk of harm it is still possible that the cause of admission (e.g. GI Bleed, AKI) may be due to other external factors. The analysis only highlights the potential risk of harm and possible association with hospital admission. Any review of benefits and risks of prescribing should be undertaken on an individual patient basis.

Data

Data Sources

Prescribing data - data from the NHS Business Services Authority (NHSBSA) prescription processing system which includes all NHS prescriptions dispensed 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.

Users of these indicators must be aware of the following parameters:

- Only covers items prescribed in primary care by GP practices linked to CCGs. It includes acute and repeat items. Therefore does NOT include:
    - Hospital prescribing. Therefore, medicines supplied via Home Care or HIV medicines or medicines supplied by a hospital pharmacy
    - Medicines supplied over the counter.
    - Medicines supplied by NHS community services.
- Prescribing data where the patient's NHS number could be identified from the prescription form. All NHS numbers have been verified by the Personal Demographics Service (PDS). Patient NHS numbers cannot be captured from every prescription and in general are available for around 95% of prescription forms (as of June 2017). However, this proportion can differ for individual drugs and prescribing organisations.
- Patients identified as aged 18 and over. The patient age has been calculated based on a combination of the data available on the prescription forms and the information available from the Personal Demographics Service (PDS).

The prescribing dataset is comprised of retrospective data from April 2015 onwards as patient identifiable information is only available for prescribing data from April 2015 onwards.

Hospital admissions data – data from NHS Digital Hospital Episodes Statistics Admitted Patient Care (HESAPC) which contains details of all admissions at NHS hospitals in England. It includes private patients treated in NHS hospitals, patients who were resident outside of England and care delivered by treatment centres (including those in the independent sector) funded by the NHS.

The admissions data is based on latest HES data available. Final HES data is available c.6 months after fiscal year end, until then data is provisional.

Data Linkage Algorithm

Under a Direction NHS BSA prescribing data was linked to NHS Digital's HESAPC data using a bespoke algorithm. The algorithm used patient NHS number, date of birth and gender. A match rank was given per record; rank of 1 presents all variables matching between the two datasets, rank of 2 where two variables matched and so on. The table below shows the match percentage for each match rank.

Match Rank	Fields Matched	Match Percentage
1	NHS Number, Date of Birth & Gender	>99.90%

2	NHS Number & Date of Birth	<0.01%
3	NHS Number & Gender	<0.04%
4	NHS Number only	<0.01%

Contact Details for data sources

Prescribing data: NHS Business Services Authority, nhsbsa@nhs.net

Hospital admissions data: NHS Digital, enquiries@nhs.net

List of Indicators

Indicator 1 – GIB01	Patients 65 years old or over admitted to hospital with a gastro-intestinal bleed prescribed a non-steroidal anti-inflammatory drug (NSAID) and NOT concurrently prescribed a gastro-protective medicine
Indicator 2 – GIB02	Patients 18 years old or over admitted to hospital with a gastro-intestinal bleed prescribed a non-steroidal anti-inflammatory drug (NSAID) and concurrently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC))
Indicator 3 – GIB03	Patients 18 years old or over admitted to hospital with a gastro-intestinal bleed prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) with an anti-platelet and NOT concurrently prescribed a gastro-protective medicine
Indicator 4 – GIB04	Patients 18 years old or over admitted to hospital with a gastro-intestinal bleed prescribed aspirin and another anti-platelet and NOT concurrently prescribed a gastro-protective medicine.
Indicator 5 – AKI01	Patients 18 years old or over admitted to hospital with acute kidney injury concurrently prescribed a non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug, and a diuretic
Indicator 6 – GIBCI	Composite Gastro Intestinal Bleeds comprising of unique patients from indicators 1 to 4
Indicator 7 – PAIN01	Patients 18 years old or over admitted to hospital with respiratory depression, overdose or confusion concurrently prescribed an oral or transdermal opioid and a benzodiazepine, Z-drug, pregabalin or gabapentin
Indicator 8 – PAIN02	Patients 18 years old or over admitted to hospital with constipation prescribed an oral or transdermal opioid and NOT prescribed a laxative
Indicator 9 – PAIN03	Patients 18 years old or over admitted to hospital with respiratory depression, overdose (accidental poisoning) or confusion currently prescribed an oral or transdermal opioid for more than 3 months
Indicator 10 – FRAC01a	Patients 65 years old or over admitted to hospital as a result of a fall prescribed a Z-drug for more than one month
Indicator 11 – FRAC01b	Patients 65 years old or over admitted to hospital with a fracture (hip, colles or humerus) as a result of a fall prescribed a Z-drug for more than one month
Indicator 12 – FRAC02a	Patients 65 years old or over admitted to hospital as a result of a fall prescribed a benzodiazepine for more than one month
Indicator 13 – FRAC02b	Patients 65 years old or over admitted to hospital with a fracture (hip, colles or humerus) as a result of a fall prescribed a benzodiazepine for more than one month

Indicator 14 – FRAC03a	Patients 65 years old or over admitted to hospital as a result of a fall prescribed a benzodiazepine and a Z-drug (not concurrently) for more than one month
Indicator 15 – FRAC03b	Patients 65 years old or over admitted to hospital with a fracture (hip, colles or humerus) as a result of a fall prescribed a benzodiazepine or a Z-drug (not concurrently) for more than one month
Indicator 16 – RESP01	Patients admitted to hospital as an emergency for an exacerbation of asthma prescribed an inhaled Long Acting Beta-agonist (LABA) without an inhaled corticosteroid (ICS)

Methodology

General

Admissions Criteria

Analysis is based on records in the HESAPC data with the following criteria

- **ICD 10 codes –** Advice taken from NHS Digitals Information Standards team on selection of ICD10 codes as well as literature review of previous studies for relevant admissions per indicator. The list of ICD10 codes used per indicator is defined in section: Indicator Specifications.
- **Primary diagnosis –** identified using ICD-10 codes.
- **Cause codes** – Advice taken from NHS Digital Information Standards team on selection of cause codes for relevant admissions per indicator. List of Cause codes used per indicator is defined in section: Indicator Specifications.
- **Finished Admissions Episodes (FAEs) –** only admissions where an episode was recorded as complete were included.
- **Emergency admissions –** only admissions recorded as emergency were included.

More information on above can be found at HES Information.

The admission indicators count admissions, reported quarterly based on the admission date, where the patients are prescribed medicines specific to the indicator within the same month and/or up to three months prior to the hospital admission dependent on the indicator. Patients with multiple admissions on the same day are counted once. Patients with multiple admissions within the quarter are counted as multiple admissions.

The admission figure presents admissions based on the diagnosis and cause specified in each indicator for patients at increased risk of harm.

NB: Due to patient identifiable prescribing data only being available for April 2015 onwards the first quarter (1516 Q1) is expected to be lower than all other quarters.

Prescribing Criteria

The list of British National Formulary (BNF) codes used per indicator is specified in Indicator Specifications.

The increased risk indicators count patients, reported quarterly based on the prescription dispensed date. Patients with multiple prescriptions for the medicines specific to the indicator within the reporting quarter are counted once.

The indicator figure presents patients at increased risk of harm based on the combination of medicines specified in each indicator and/or how long the medicines were prescribed for.

NB: Due to patient identifiable prescribing data only being available for April 2015 onwards the first quarter (1516 Q1) is not published for those indicators which look for historic prescribing trends.

Disclosure Rules

In order to protect patient confidentiality, '*' or ‘supressed’ is used for all sub-national breakdowns, where there is a value between 1 and 7 from the data presented. All other sub-national data has been rounded to the nearest 5.

If the national total is between 1 and 7 (inclusive), no sub-national breakdown will be provided.

If the national total is greater than or equal to 8;

- Sub-national counts between 1 and 7 (inclusive) will be displayed as '*' or 'supressed'.
- Zeroes will remain unchanged.
- All other counts will be rounded to the nearest 5.

Indicator Specifications

Gastro Intestinal (GI) Bleed

Admission Indicator

Title	**GIB01** Patients 65 years or over admitted to hospital with a gastro-intestinal bleed and currently prescribed a non-steroidal anti-inflammatory drug (NSAID) and NOT concurrently prescribed a gastro-protective medicine. **GIB02** Patients 18 years old or over admitted to hospital with a gastro-intestinal bleed and currently prescribed a non-steroidal anti-inflammatory drug (NSAID) and concurrently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) **GIB03** Patients 18 years old or over prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) with an anti-platelet and not concurrently prescribed a gastro-protective medicine and admitted to hospital with a gastro-intestinal bleed. **GIB04** Patients 18 years old or over prescribed aspirin and another anti-platelet and not concurrently prescribed a gastro-protective medicine and admitted to hospital with a gastro-intestinal bleed.
Definition	**GIB01** Number of admissions for gastric bleed per 10,000 patients aged 65 or over in the month of prescription currently prescribed a non-steroidal anti-inflammatory drug (NSAID) without a gastro protective medicine. **GIB02** Number of admissions for gastric bleed per 10,000 patients aged 18 or over in the month of prescription currently prescribed a non-steroidal anti-inflammatory Drug (NSAID) and concurrently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)). **GIB03** Number of admissions for gastric bleed per 10,000 patients aged 18 or over in the month of prescription currently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) with an anti-platelet and not concurrently prescribed a gastro-protective medicine. **GIB04** Number of admissions for gastric bleed per 10,000 patients aged 18 or over in the month of prescription prescribed aspirin and another anti-platelet and not concurrently prescribed a gastro-protective medicine.
Reporting level	Quarterly aggregate results at National and Regional level.
Numerator	Number of admissions where 1. Patients are taking the medicines as specified in the denominator

2. A primary diagnosis (ICD10 code) has been recorded as a Gastro Intestinal bleed (full list of ICD 10 codes below)
3. Admission episode recorded as complete
4. Emergency admission recorded

ICD 10	ICD 10 description
K226	Gastro-oesophageal laceration-haemorrhage syndrome
K228	Haemorrhage of oesophagus
K250	Gastric ulcer acute with haemorrhage
K252	Gastric ulcer acute with both haemorrhage and perforation
K254	Gastric ulcer chronic or unspecified with haemorrhage
K256	Gastric ulcer acute with chronic or unspecified with both haemorrhage and perforation
K260	Duodenal ulcer acute with haemorrhage
K262	Duodenal ulcer acute with both haemorrhage and perforation
K264	Duodenal ulcer chronic or unspecified with haemorrhage
K266	Duodenal ulcer chronic or unspecified with haemorrhage
K270	Peptic ulcer acute with haemorrhage
K272	Peptic ulcer, site unspecified
K274	Peptic ulcer chronic or unspecified with both haemorrhage and perforation
K276	Peptic ulcer chronic or unspecified with haemorrhage
K280	Gastrojejunal ulcer acute with haemorrhage
K282	Gastrojejunal ulcer with both haemorrhage and perforation
K284	Gastrojejunal ulcer chronic or unspecified with haemorrhage
K286	Gastrojejunal ulcer chronic or unspecified with haemorrhage
K290	Acute haemorrhagic gastritis
K920	Haematemesis
K921	Melaena
K922	Gastrointestinal haemorrhage unspecified
I850	Oesophageal varices with bleeding

Denominator

GIB01

Patients aged 65 or over in the prescription month prescribed a non-steroidal anti-Inflammatory drug (NSAID) without a gastro protective medicine

Non-steroidal anti-inflammatory drugs (NSAID) and gastro protective medicines are specified below

Group	BNF Description	BNF Code
Non-steroidal anti-Inflammatory drugs (NSAIDs)	Non-steroidal anti-inflammatory Drugs	100101
	Excluding the following medicines that contain a NSAID and also a gastro-protective medicine that may reduce the risk of GI bleed.	
	Arthrotec	1001010C0BL
	Axorid	1001010L0BQ
	Diclof Sod E/C /Misopros_Tab 50mg/200mcg	1001010C0AAAMAM
	Diclof Sod E/C /Misopros_Tab 75mg/200mcg	1001010C0AAAXAX
	Ketoprofen/Omeprazole_Cap 100mg/20mg M/R	1001010L0AAAMAM
	Ketoprofen/Omeprazole_Cap 200mg/20mg M/R	1001010L0AAANAN
	Misofen	1001010C0CN
	Napratec	1001010P0BK
	Naproxen/Esomeprazole_Tab 500mg/20mg M/R	1001010P0AABBBB
	Naproxen/Misoprost_C/Pk Tab 500mg/200mcg	1001010P0AAALAL
	Naproxen/Misoprostol_Tab 500mg/200mcg	1001010P0AAAUAU
	Vimovo	1001010P0BU
Gastro-protective medicines	H2-Receptor Antagonists	0103010
	Misoprostol	0103040M0
	Proton Pump Inhibitors	0103050

GIB02

Patients aged 18 or over in the prescription month prescribed a non-steroidal anti-inflammatory drug (NSAID) and concurrently prescribed an oral anticoagulant (warfarin or a non-vitamin K antagonist oral anticoagulant) (NOAC)).

Non-steroidal anti-inflammatory drugs (NSAID), warfarin and non-vitamin K antagonist oral anticoagulant (NOAC) medicines are specified below

Group	BNF Description	BNF Code
Non-Steroidal Anti-Inflammatory Drugs	Non-steroidal anti-inflammatory drugs	100101
Oral anticoagulants	Apixaban	0208020Z0
	Dabigatran Etexile	0208020X0
	Edoxaban	0208020AA
	Rivaroxaban	0208020Y0
	Warfarin Sodium	0208020V0

GIB03

Patients aged 18 or over in the prescription month prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) with an anti-platelet and not concurrently prescribed a gastro-protective medicine.

Warfarin, direct oral anticoagulants (DOACs), antiplatelets, and gastro-protective medicines are specified below

Group	BNF Description	BNF Code
Oral anticoagulants	Apixaban	0208020Z0
	Dabigatran Etexile	0208020X0
	Edoxaban	0208020AA
	Rivaroxaban	0208020Y0
	Warfarin Sodium	0208020V0
Anti-platelets (including analgesics containing aspirin)	Aspirin	0209000A0
	Clopidogrel	0209000C0
	Dipyridamole	0209000L0
	Dipyridamole & Aspirin	0209000V0
	Prasugrel	0209000Y0
	Ticagrelor	0209000Z0
	Aspirin	0407010B0
	Aspirin & Caffeine	0407010AA
	Aspirin & Papaveretum	0407010A0
	Aspirin & Paracetamol	0407010S0
	Aspirin Combined Preparations	0407010W0
	Aspirin, Paracetamol & Codeine	0407010T0
	Aspirin, Phenacetin & Codeine (Codeine Co)	0407010R0
	Lysine Aspirin	040701010
Gastro-protective medicines	H2-Receptor Antagonists	0103010
	Misoprostol	0103040M0
	Proton Pump Inhibitors	0103050

GIB04

Patients aged 18 or over in the prescription month prescribed aspirin and another anti-platelet and not concurrently prescribed a gastro-protective medicine.

Aspirin, other anti-platelet and gastro protective medicines are specified below

	<table><tr><th>Group</th><th>BNF Description</th><th>BNF Code</th></tr><tr><td rowspan="9">Aspirin</td><td>Aspirin</td><td>0209000A0</td></tr><tr><td>Aspirin</td><td>0407010B0</td></tr><tr><td>Aspirin & Caffeine</td><td>0407010AA</td></tr><tr><td>Aspirin & Papaveretum</td><td>0407010A0</td></tr><tr><td>Aspirin & Paracetamol</td><td>0407010S0</td></tr><tr><td>Aspirin Combined Preparations</td><td>0407010W0</td></tr><tr><td>Aspirin, Paracetamol & Codeine</td><td>0407010T0</td></tr><tr><td>Aspirin, Phenacetin & Codeine (Codeine Co)</td><td>0407010R0</td></tr><tr><td>Lysine Aspirin</td><td>040701010</td></tr><tr><td rowspan="5">Other anti-platelets</td><td>Clopidogrel</td><td>0209000C0</td></tr><tr><td>Dipyridamole</td><td>0209000L0</td></tr><tr><td>Dipyridamole & Aspirin</td><td>0209000V0</td></tr><tr><td>Prasugrel</td><td>0209000Y0</td></tr><tr><td>Ticagrelor</td><td>0209000Z0</td></tr><tr><td rowspan="3">Gastro protective medicines</td><td>H2-Receptor Antagonists</td><td>0103010</td></tr><tr><td>Misoprostol</td><td>0103040M0</td></tr><tr><td>Proton Pump Inhibitors</td><td>0103050</td></tr></table>
Methodology	Numerator divided by denominator, presented as admissions per 10,000 patients at increased risk.
Purpose	The purpose of the indicator is to measure and monitor the rate of hospital admissions for GI bleeds that may be associated with prescribing that potentially increases the risk of a GI bleed.
Rationale	**GIB01** A non-steroidal anti-inflammatory drug (NSAID) prescribed without a gastro-protective medicine may increase the risk of a gastro-intestinal bleed. **GIB02** A non-steroidal anti-inflammatory drug (NSAID) prescribed together with an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) may increase the risk of a gastro-intestinal bleed. **GIB03** An oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) and an anti-platelet prescribed together without a gastro-protective medicine may increase the risk of a gastro-intestinal bleed. **GIB04** Aspirin and another anti-platelet prescribed together without a gastro-protective medicine may increase the risk of a gastro-intestinal bleed.

Increased Risk Indicator

Title	**GIB01** Patients aged 65 or over currently prescribed a non-steroidal anti-inflammatory drug (NSAID) without a gastro protective medicine and therefore potentially at increased risk of admission to hospital with a GI bleed. **GIB02** Patients aged 18 or over currently prescribed a non-steroidal anti-inflammatory drug (NSAID) and concurrently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) and therefore potentially at increased risk of admission to hospital with a GI bleed. **GIB03** Patients aged 18 or over currently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) with an anti-platelet and not concurrently prescribed a gastro-protective medicine and therefore potentially at increased risk of admission to hospital with a GI bleed. **GIB04** Patients 18 years old or over prescribed aspirin and another anti-platelet and not concurrently prescribed a gastro-protective medicine and therefore potentially at increased risk of admission to hospital with a GI bleed.
Definition	**GIB01** Number of patients aged 65 or over in the month of prescription currently prescribed a non-steroidal anti-inflammatory drug (NSAID) without a gastro protective medicine per 10,000 patients currently prescribed a NSAID (with or without a gastro-protective) **GIB02** Number of patients aged 18 or over in the month of prescription currently prescribed a non-steroidal anti-inflammatory drug (NSAID) and concurrently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) per 10,000 patients currently prescribed a NSAID or an oral anticoagulant. **GIB03** Number of patients aged 18 or over in the month of prescription currently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (NOAC)) with an anti-platelet and not concurrently prescribed a gastro-protective medicine per 10,000 patients currently prescribed an oral anticoagulant with an anti-platelet (with or without a gastro-protective medicine) **GIB04** Number of patients aged 18 or over in the month of prescription currently prescribed aspirin and another anti-platelet and not concurrently prescribed a gastro-protective medicine per 10,000 patients currently prescribed aspirin and an anti-platelet (with or without a gastro-protective medicine).
Reporting level	Quarterly aggregate results at National, Regional and CCG level.

Numerator	**GIB01** Patients aged 65 or over in the prescription month prescribed a non-steroidal anti-inflammatory drug (NSAID) without a gastro protective medicine **GIB02** Patients aged 18 or over in the prescription month prescribed a non-steroidal anti-inflammatory drug (NSAID) and concurrently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant) (DOAC)). **GIB03** Patients aged 18 or over currently prescribed an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) with an anti-platelet and not concurrently prescribed a gastro-protective medicine. **GIB04** Patients 18 years old or over prescribed aspirin and another anti-platelet and not concurrently prescribed a gastro-protective medicine. See admission rate indicator (denominator) for specifications of patient age group, non-steroidal anti-inflammatory drugs (NSAIDs) and gastro protective medicines.
Denominator	**GIB01** Patients aged 65 or over in the prescription month prescribed a non-steroidal anti-inflammatory drug (NSAID) with or without a gastro protective medicine). **GIB02** Patients aged 18 or over in the prescription month prescribed a non-steroidal anti-inflammatory drug (NSAID) or an oral anticoagulant (warfarin or a direct oral anticoagulant) (DOAC)). **GIB03** Patients aged 18 or over in the prescription month prescribed an oral anticoagulant with an anti-platelet (with or without a gastro-protective medicine). **GIB04** Patients aged 18 or over in the prescription month prescribed aspirin and another anti-platelet (with or without a gastro-protective medicine). See admission rate indicator (denominator) for specifications of patient age group and non-steroidal anti-inflammatory drugs (NSAIDs).
Methodology	Numerator divided by denominator, presented per 10,000 patients.
Purpose	**GIB01** The purpose of the indicator is to quantify the number of patients who are prescribed a non-steroidal anti-inflammatory drug (NSAID) without a gastro-protective medicine, and therefore potentially having an increased risk of a GI bleed, presented as a proportion (per 10,000) of patients taking a NSAID with or without a gastro protective medicine. **GIB02** The purpose of the indicator is to quantify the number of patients taking a non-steroidal anti-inflammatory drug (NSAID) and concurrently taking an oral anticoagulant (warfarin or a direct oral anticoagulant) (DOAC)), and

	therefore potentially having an increased risk of a GI bleed, presented as a proportion (per 10,000) of patients taking a NSAID or an oral anticoagulant. **GIB03** The purpose of the indicator is to quantify the number of patients taking an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) with an anti-platelet and not concurrently taking a gastro-protective medicine (and therefore potentially having an increased risk of a GI bleed), presented as a proportion (per 10,000) of patients taking an oral anticoagulant with an anti-platelet (with or without a gastro-protective medicine) **GIB04** The purpose of the indicator is to quantify the number of patients taking aspirin with another anti-platelet and not concurrently taking a gastro-protective medicine, and therefore potentially have an increased risk of a GI bleed, presented as a proportion (per 10,000) of patients taking aspirin with another anti-platelet (i.e. with or without a gastro-protective medicine).
Rationale	**GIB01** A non-steroidal anti-inflammatory drug (NSAID) prescribed without a gastro-protective medicine may increase the risk of a gastro-intestinal bleed. **GIB02** A non-steroidal anti-inflammatory drug (NSAID) prescribed together with an oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) may increase the risk of a gastro-intestinal bleed. **GIB03** An oral anticoagulant (warfarin or a direct oral anticoagulant (DOAC)) and an anti-platelet prescribed together without a gastro-protective medicine may increase the risk of a gastro-intestinal bleed. **GIB04** Aspirin and another anti-platelet prescribed together without a gastro-protective medicine may increase the risk of a gastro-intestinal bleed.

Composite Admission Indicator

Title	Composite Gastro Intestinal Bleed.
Definition	The composite indicator includes unique patients from indicators 1 to 4.
Reporting level	Rolling 12 months aggregate results (most recent four quarters) at National, Regional and CCG level.
Numerator	Unique admissions from numerators of all four gastro intestinal bleed indicators.
Denominator	Unique patients from denominators of all four gastro intestinal bleed indicators.
Methodology	Numerator divided by denominator, presented as admissions per 10,000 patients at increased risk.
Purpose	See indicators GIB01 to GIB04

Composite Increased Risk Indicator

Title	Composite Gastro Intestinal Bleed.
Definition	The composite indicator includes unique patients from indicators 1 to 4.
Reporting level	Rolling 12 months aggregate results (most recent four quarters) at National, Regional and CCG level.
Numerator	Unique patients from numerators of all four gastro intestinal bleed indicators.
Denominator	Unique patients from denominators of all four gastro intestinal bleed indicators.
Methodology	Numerator divided by denominator, presented per 10,000 patients.
Purpose	See indicators GIB01 to GIB04

Acute Kidney Injury (AKI)

Admission Indicator

<table>
<tr><td>Title</td><td>AKI01

Patients 18 years old or over admitted to hospital with acute kidney injury prescribed a non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug and a diuretic</td></tr>
<tr><td>Definition</td><td>AKI01

Number of admissions for acute kidney injury per 10,000 patients aged 18 or over in the month of prescription, prescribed a non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug and a diuretic.</td></tr>
<tr><td>Reporting level</td><td>Quarterly aggregate results at National and Regional level.</td></tr>
<tr><td>Numerator</td><td>Number of admissions where

1. Patients are taking the medicines as specified in the denominator
2. A primary diagnosis has been recorded as Acute Kidney Injury (full list of ICD 10 codes below)
3. Admission episode recorded as complete
4. Emergency admission recorded

<table>
<tr><th>ICD 10</th><th>ICD 10 description</th></tr>
<tr><td>N170</td><td>Acute renal failure with tubular necrosis</td></tr>
<tr><td>N171</td><td>Acute renal failure with acute cortical necrosis</td></tr>
<tr><td>N172</td><td>Acute renal failure with medullary necrosis</td></tr>
<tr><td>N178</td><td>Other acute renal failure</td></tr>
<tr><td>N179</td><td>Acute renal failure, unspecified</td></tr>
<tr><td>O904</td><td>Postpartum acute renal failure</td></tr>
</table></td></tr>
<tr><td>Denominator</td><td>AKI01

Patients aged 18 or over in the prescription month prescribed a non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug and a diuretic.

Non-steroidal anti-inflammatory drugs (NSAID), renin-angiotensin system (RAS) drugs and diuretics are specified below.
<table>
<tr><th>Group</th><th>BNF Description</th><th>BNF Code</th></tr>
<tr><td>Non-steroidal anti-inflammatory drugs</td><td>Non-steroidal anti-inflammatory drugs</td><td>100101</td></tr>
<tr><td>Diuretics</td><td>Diuretics</td><td>0202</td></tr>
<tr><td rowspan="2">Renin Angiotensin System (RAS) drugs</td><td>Angiotensin-converting enzyme Inhibitors</td><td>0205051</td></tr>
<tr><td>Angiotensin-II receptor antagonists</td><td>0205052</td></tr>
</table></td></tr>
</table>

Methodology	Numerator divided by denominator, presented as admissions per 10,000 patients at increased risk.
Purpose	The purpose of the indicator is to measure and monitor the rate of hospital admissions for acute kidney injury (AKI) associated with prescribing that potentially increases the risk of AKI.
Rationale	A non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug, and a diuretic prescribed together may increase the risk of acute kidney injury.

Increased Risk Indicator

Title	**AKI01** Patients prescribed a non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug and a diuretic and therefore potentially at increased risk of admission to hospital with acute kidney injury (AKI)
Definition	**AKI01** Number of patients aged 18 or over in the month of prescription currently prescribed a non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug and a diuretic per 10,000 patients currently prescribed a non-steroidal anti-inflammatory drug (NSAID) or a renin-angiotensin system (RAS) drug or a diuretic.
Reporting level	Quarterly aggregate results at National, Regional and CCG level.
Numerator	**AKI01** Patients prescribed a non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug and a diuretic See admission rate indicator (denominator) for specifications for non-steroidal anti-inflammatory drugs (NSAIDs), renin-angiotensin system (RAS) drugs and diuretics.
Denominator	**AKI01** Patients aged 18 or over in the prescription month prescribed a non-steroidal anti-inflammatory drug (NSAID) or a renin-angiotensin system (RAS) drug or a diuretic. See admission rate indicator (denominator) for specifications for non-steroidal anti-inflammatory drugs (NSAIDs), renin-angiotensin system (RAS) drugs and diuretics.
Methodology	Numerator divided by denominator, presented per 10,000 patients.
Purpose	**AKI01** The purpose of the indicator is to quantify the number of patients taking a non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug and a diuretic, and therefore potentially have an increased risk of AKI, presented as a proportion (per 10,000) of patients taking a non-steroidal anti-inflammatory drug (NSAID) or a renin-angiotensin system (RAS) drug or a diuretic.
Rationale	A non-steroidal anti-inflammatory drug (NSAID), a renin-angiotensin system (RAS) drug, and a diuretic prescribed together may increase the risk of acute kidney injury.

Pain

Admission Indicator

<table>
<tr><td>Title</td><td>PAIN01

Patients 18 years old or over admitted to hospital for respiratory depression, overdose (accidental) or confusion concurrently prescribed an oral or transdermal opioid and a benzodiazepine, Z-drug, pregabalin or gabapentin.

PAIN02

Patients 18 years old or over admitted to hospital for constipation and prescribed an oral or transdermal opioid and NOT prescribed a laxative.

PAIN03

Patients 18 years old or over admitted to hospital with respiratory depression, overdose (accidental) or confusion currently prescribed an oral or transdermal opioid for more than 3 months</td></tr>
<tr><td>Definition</td><td>PAIN01

Number of admissions for respiratory depression, overdose or confusion per 10,000 patients aged 18 or over in the month of prescription concurrently prescribed an oral or transdermal opioid and a benzodiazepine, Z-drug, pregabalin or gabapentin.

PAIN02

Number of admissions for constipation per 10,000 patients aged 18 or over in the month of prescription currently prescribed an oral or transdermal opioid and NOT prescribed a laxative.

PAIN03

Number of admissions for respiratory depression, overdose or confusion per 10,000 patients aged 18 or over in the month of prescription currently prescribed an oral or transdermal opioid for more than 3 months</td></tr>
<tr><td>Reporting level</td><td>Quarterly aggregate results at National and Regional level.</td></tr>
<tr><td>Numerator</td><td>PAIN01, PAIN03

Number of admissions where
1. Patients are taking the medicines as specified in the denominator
2. A primary diagnosis or cause code has been recorded as below
3. Admission episode recorded as complete and as an emergency

<table>
<tr><th>Primary diagnosis code</th><th>Primary diagnosis description</th></tr>
<tr><td>R068</td><td>Other and unspecified abnormalities of breathing</td></tr>
<tr><td>R230</td><td>Cyanosis</td></tr>
<tr><td>R060</td><td>Dyspnoea</td></tr>
<tr><td>T406</td><td>Other and unspecified narcotics poisoning by narcotics and psychodysleptics [hallucinogens]</td></tr>
<tr><td>T402</td><td>Other opioids poisoning by narcotics and psychodysleptics [hallucinogens]</td></tr>
</table>
</td></tr>
</table>

R410	Disorientation, unspecified
R42X	Dizziness and giddiness
R451	Restlessness and agitation
F067	Mild cognitive disorder
R418	Other and unspecified symptoms and signs involving cognitive functions and awareness

Cause code	Cause code description
X42	Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified
Y12	Poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified, undetermined intent

PAIN02

Number of admissions where
1. Patients are taking the medicines as specified in the denominator
2. A primary diagnosis has been recorded as below
3. Admission episode recorded as complete
4. Emergency admission recorded

ICD 10	ICD 10 description
K590	Constipation

Denominator

PAIN01

Patients aged 18 or over in the month of prescription concurrently prescribed an oral or transdermal opioid and a benzodiazepine, Z-drug, pregabalin or gabapentin.

Group	BNF Description	BNF Code
Oral medicines containing 15mg or more of codeine or 10mg or more of dihydrocodeine	Non-Opioid Analgesics And Compound Prep (sub-set)	040701
Oral or transdermal opioids	Opioid analgesics (sub-set)	040702
Benzodiazepines	Flunitrazepam	0401010I0
	Flurazepam Hydrochloride	0401010L0
	Loprazolam Mesilate	0401010N0
	Lormetazepam	0401010P0

	Nitrazepam	0401010R0
	Temazepam	0401010T0
	Triazolam	0401010V0
	Alprazolam	0401020A0
	Bromazepam	0401020G0
	Buspirone Hydrochloride	0401020B0
	Chlordiazepoxide	0401020D0
	Chlordiazepoxide Hydrochloride	0401020E0
	Clorazepate Dipotassium	0401020V0
	Clotiazepam	0401020C0
	Diazepam	0401020K0
	Ketazolam	0401020L0
	Lorazepam	0401020P0
	Medazepam	0401020Q0
	Oxazepam	0401020T0
	Prazepam	0401020U0
Z-drugs	Zaleplon	0401010W0
	Zolpidem Tartrate	0401010Y0
	Zopiclone	0401010Z0
Gabapentin	Gabapentin (Neuropathic Pain)	0407030AD
	Gabapentin	0408010G0
Pregabalin	Pregabalin	0408010AE

PAIN02

Patients aged 18 or over in the month of prescription currently prescribed an oral or transdermal opioid and NOT prescribed a laxative.

Group	BNF Description	BNF Code
Oral medicines containing 15mg or more of codeine or 10mg or more of dihydrocodeine	Non-Opioid Analgesics And Compound Prep (sub-set)	040701
Oral or transdermal opioid	Opioid Analgesics (sub-set)	040702
Laxatives	Ispaghula Husk	0106010E0

Methylcellulose	0106010H0
Sterculia	0106010N0
Bisacodyl	0106020C0
Co-Danthramer (Dantron/Poloxamer 188)	0106020B0
Co-Danthrusate (Dantron/Docusate Sod)	0106020J0
Docusate Sodium	0106020I0
Senna	0106020M0
Lactulose	0106040G0
Macrogol 3350	0106040M0
Macrogol 4000	0106040X0
Naloxegol	0106060B0

PAIN03

Patients aged 18 or over in the month of prescription currently prescribed an oral or transdermal opioid for more than 3 months

Group	BNF Description	BNF Code
Oral medicines containing 15mg or more of codeine or 10mg or more of dihydrocodeine	Non-Opioid Analgesics And Compound Prep (sub-set)	040701
Oral or transdermal opioids	Opioid Analgesics (sub-set)	040702

Methodology	Numerator divided by denominator, presented as admissions per 10,000 patients at increased risk.
Purpose	The purpose of the indicator is to measure and monitor the rate of hospital admissions associated with prescribing that increases the risk of harm.
Rationale	**PAIN01** An oral or transdermal opioid concurrently prescribed with a benzodiazepine, Z-drug, pregabalin or gabapentin may increase the risk of respiratory depression, overdose (accidental) or confusion. **PAIN02** An oral or transdermal opioid prescribed without a laxative may increase the risk of constipation. **PAIN03**

	An oral or transdermal opioid prescribed for more than 3 months may increase the risk of respiratory depression, overdose (accidental) or confusion.

Increased Risk Indicator

Title	**PAIN01** Number of patients concurrently prescribed an oral or transdermal opioid and a benzodiazepine, Z-drug, pregabalin or gabapentin and therefore potentially at increased risk of admission to hospital for respiratory depression, overdose (accidental) or confusion. **PAIN02** Number of patients prescribed an oral or transdermal opioid and NOT prescribed a laxative and therefore potentially at increased risk of admission to hospital for constipation. **PAIN03** Number of patients currently prescribed an oral or transdermal opioid for more than 3 months and therefore potentially at increased risk of admission to hospital for respiratory depression, overdose (accidental) or confusion.
Definition	**PAIN01** Number of patients (as stated in Admission Indicators) in the month of prescription concurrently prescribed an oral or transdermal opioid and a benzodiazepine, Z-drug, pregabalin or gabapentin per 10,000 patients currently prescribed an oral or transdermal opioid. **PAIN02** Number of patients (as stated in Admission Indicators) in the month of prescription prescribed an oral or transdermal opioid and NOT prescribed a laxative per 10,000 patients currently prescribed an oral or transdermal opioid (with or without a laxative) **PAIN03** Number of patients in the month of prescription prescribed an oral or transdermal opioid for more than 3 months per 10,000 patients prescribed an oral or transdermal opioid.
Reporting level	Quarterly aggregate results at National, Regional and CCG level
Numerator	**PAIN01** The number of patients in the prescription month concurrently prescribed an oral or transdermal opioid and a benzodiazepine, Z-drug, pregabalin or gabapentin. See PAIN01 admission rate indicator (denominator) for specifications of patient age group, oral or transdermal opioids, benzodiazepines, Z-drugs, pregabalin and gabapentin. **PAIN02** The number of patients in the prescription month currently prescribed an oral or transdermal opioid and NOT prescribed a laxative. See PAIN02 admission rate indicator (denominator) for specifications of patient age group, oral or transdermal opioids and laxatives. **PAIN03**

	The number of patients in the prescription month currently prescribed an oral or transdermal opioid for more than 3 months. See PAIN03 admission rate indicator (denominator) for specifications of patient age group and oral or transdermal opioids
Denominator	The number of patients in the prescription month prescribed an oral or transdermal opioid. See PAIN admission rate indicators (denominators) for specifications of patient age group and oral or transdermal opioids.
Methodology	Numerator divided by denominator, presented per 10,000 patients.
Purpose	**PAIN01** The purpose of the indicator is to quantify the number of patients who are concurrently prescribed an oral or transdermal opioid and a benzodiazepine, Z-drug, pregabalin or gabapentin and therefore potentially having an increased risk of respiratory depression, overdose (accidental) or confusion. **PAIN02** The purpose of the indicator is to quantify the number of patients who are prescribed an oral or transdermal opioid and not prescribed a laxative and therefore potentially having an increased risk of constipation. **PAIN03** The purpose of the indicator is to quantify the number of patients who are prescribed an oral or transdermal opioid for more than 3 months and therefore potentially having an increased risk of respiratory depression, overdose (accidental) or confusion.
Rationale	**PAIN01** An oral or transdermal opioid concurrently prescribed with a benzodiazepine, Z-drug, pregabalin or gabapentin may increase the risk of respiratory depression, overdose (accidental) or confusion. **PAIN02** An oral or transdermal opioid prescribed without a laxative may increase the risk of constipation. **PAIN03** An oral or transdermal opioid prescribed for more than 3 months may increase the risk of respiratory depression, overdose (accidental) or confusion.

Fractures

Admission Indicator

Title	**FRAC01a** Patients 65 years old or over admitted to hospital as a result of a fall currently prescribed a Z-drug for more than 1 month. **FRAC01b** Patients 65 years old or over admitted to hospital with a diagnosis of a fracture (hip, colles or humerus) as a result of a fall currently prescribed a Z-drug for more than 1 month. **FRAC02a** Patients 65 years old or over admitted to hospital as a result of a fall currently prescribed a benzodiazepine for more than 1 month. **FRAC02b** Patients 65 years old or over admitted to hospital with a diagnosis of a fracture (hip, colles or humerus) as a result of a fall currently prescribed a benzodiazepine for more than 1 month. **FRAC03a** Patients 65 years old or over admitted to hospital as a result of a fall currently prescribed a benzodiazepine and a Z-drug (not concurrently) for more than 1 month. **FRAC03b** Patients 65 years old or over admitted to hospital with a diagnosis of a fracture (hip, colles or humerus) as a result of a fall currently prescribed a benzodiazepine and a Z-drug (not concurrently i.e. alternately prescribed a benzodiazepine and then a Z-drug or prescribed a Z-drug then prescribed a benzodiazepine) for more than 1 month.
Definition	**FRAC01a** Number of hospital admissions as a result of a fall per 10,000 patients aged 65 or over in the month of prescription currently prescribed a Z-drug for more than 1 month. **FRAC01b** Number of hospital admissions with a fracture (hip, colles or humerus) as a result of a fall per 10,000 patients aged 65 or over in the month of prescription currently prescribed a Z-drug for more than 1 month. **FRAC02a** Number of hospital admissions as a result of a fall per 10,000 patients aged 65 or over in the month of prescription currently prescribed a benzodiazepine for more than 1 month. **FRAC02b** Number of hospital admissions with a fracture (hip, colles or humerus) as a result of a fall per 10,000 patients aged 65 or over in the month of prescription currently prescribed a benzodiazepine for more than 1 month. **FRAC03a**

<table>
<tr><td></td><td>Number of hospital admissions as a result of a fall per 10,000 patients aged 65 or over in the month of prescription currently prescribed a benzodiazepine and a Z-drug (not concurrently) for more than 1 month.

FRAC03b

Number of hospital admissions with a fracture (hip, colles or humerus) as a result of a fall per 10,000 patients aged 65 or over in the month of prescription currently prescribed a benzodiazepine and a Z-drug (not concurrently) for more than 1 month.</td></tr>
<tr><td>Reporting level</td><td>Quarterly aggregate by month of prescriptions dispensed at National and Regional level.</td></tr>
<tr><td>Numerator</td><td>Number of admissions where:

1. Patients are taking the medicines as specified in the denominator

2. A primary diagnosis (ICD10 code) and/or Cause code has been recorded (full list of ICD 10 codes and Cause codes below)

3. Admission episode recorded as complete and as an emergency

<table>
<tr><th>Description</th><th>Diagnosis code (ICD10)</th></tr>
<tr><td>Fracture of neck of femur</td><td>S720</td></tr>
<tr><td>Fracture of navicular [scaphoid] bone of hand</td><td>S620</td></tr>
<tr><td>Fracture of lower end of radius</td><td>S525</td></tr>
<tr><td>Fracture of lower end of both ulna and radius</td><td>S526</td></tr>
<tr><td>Fracture of forearm unspecified</td><td>S529</td></tr>
<tr><td>Fracture of upper end of humerus</td><td>S422</td></tr>
<tr><td>Fracture of shaft of humerus</td><td>S423</td></tr>
<tr><td>Fracture of lower end of humerus</td><td>S424</td></tr>
</table>

<table>
<tr><th>Description</th><th>Cause code</th></tr>
<tr><td>Fall on same level from slipping, tripping and stumbling</td><td>W01</td></tr>
<tr><td>Fall while being carried or supported by other persons</td><td>W04</td></tr>
<tr><td>Fall involving wheelchair</td><td>W05</td></tr>
<tr><td>Fall involving bed</td><td>W06</td></tr>
<tr><td>Fall involving chair</td><td>W07</td></tr>
<tr><td>Fall involving other furniture</td><td>W08</td></tr>
<tr><td>Fall on and from stairs</td><td>W10</td></tr>
<tr><td>Other fall from one level to another</td><td>W17</td></tr>
<tr><td>Other fall on same level</td><td>W18</td></tr>
<tr><td>Unspecified fall</td><td>W19</td></tr>
</table>
</td></tr>
<tr><td>Denominator</td><td>FRAC01

Patients aged 65 or over in the prescription month prescribed a Z-drug for more than 1 month</td></tr>
</table>

<table>
<tr><td></td><td>
FRAC02

Patients aged 65 or over in the prescription month prescribed a benzodiazepine for more than 1 month

FRAC03

Patients aged 65 or over prescribed a benzodiazepine and a Z-drug for more than 1 month (not concurrently)
<table>
<tr><th>Group</th><th>BNF description</th><th>BNF code</th></tr>
<tr><td rowspan="3">Z-drugs</td><td>Zaleplon</td><td>0401010W0</td></tr>
<tr><td>Zolpidem Tartrate</td><td>0401010Y0</td></tr>
<tr><td>Zopiclone</td><td>0401010Z0</td></tr>
<tr><td rowspan="14">Benzodiazepines</td><td>Flunitrazepam</td><td>0401010I0</td></tr>
<tr><td>Flurazepam Hydrochloride</td><td>0401010L0</td></tr>
<tr><td>Loprazolam Mesilate</td><td>0401010N0</td></tr>
<tr><td>Lormetazepam</td><td>0401010P0</td></tr>
<tr><td>Nitrazepam</td><td>0401010R0</td></tr>
<tr><td>Temazepam</td><td>0401010T0</td></tr>
<tr><td>Alprazolam</td><td>0401020A0</td></tr>
<tr><td>Bromazepam</td><td>0401020G0</td></tr>
<tr><td>Chlordiazepoxide</td><td>0401020D0</td></tr>
<tr><td>Chlordiazepoxide Hydrochloride</td><td>0401020E0</td></tr>
<tr><td>Diazepam</td><td>0401020K0</td></tr>
<tr><td>Lorazepam</td><td>0401020P0</td></tr>
<tr><td>Oxazepam</td><td>0401020T0</td></tr>
<tr><td>Prazepam</td><td>0401020U0</td></tr>
</table>
</td></tr>
<tr><td>Methodology</td><td>Numerator divided by denominator, presented as admissions per 10,000 patients at increased risk.</td></tr>
<tr><td>Purpose</td><td>The purpose of the indicator is to measure and monitor the rate of hospital admissions with a fracture as a result of a fall that may be associated with prescribing that potentially increases the risk of a fall.</td></tr>
<tr><td>Rationale</td><td>
FRAC01

Z-drugs prescribed for more than a month may increase the risk of a fall.

FRAC02

Benzodiazepines prescribed for more than a month may increase the risk of a fall.

FRAC03
</td></tr>
</table>

	Benzodiazepines and Z-drugs (not concurrently) for more than a month may increase the risk of a fall.

Increased Risk Indicator

Title	**FRAC01a** Number of patients currently prescribed a Z-drug and therefore potentially at increased risk of admission to hospital as a result of a fall **FRAC01b** Number of patients currently prescribed a Z-drug and therefore potentially at increased risk of admission to hospital with a fracture as a result of a fall **FRAC02a** Number of patients currently prescribed a benzodiazepine and therefore potentially at increased risk of admission to hospital as a result of a fall **FRAC02b** Number of patients currently prescribed a benzodiazepine and therefore potentially at increased risk of admission to hospital with a fracture as a result of a fall **FRAC03a** Number of patients currently prescribed a benzodiazepine and a Z-drug (not concurrently) and therefore potentially at increased risk of admission to hospital as a result of a fall **FRAC03b** Number of patients currently prescribed a benzodiazepine and a Z-drug (not concurrently) and therefore potentially at increased risk of admission to hospital with a fracture as a result of a fall.
Definition	**FRAC01** Number of patients in the month of prescription currently prescribed a Z-drug for more than 1 month per 10,000 patients currently prescribed a Z-drug in reporting month. **FRAC02** Number of patients in the month of prescription currently prescribed a benzodiazepine for more than 1 month per 10,000 patients currently prescribed a benzodiazepine in reporting month. **FRAC03** Number of patients in the month of prescription currently prescribed benzodiazepines and Z-drugs (not concurrently) for more than 1 month per 10,000 patients currently prescribed benzodiazepines or Z-drugs in reporting month.
Reporting level	Quarterly aggregate results at National, Regional and CCG level
Numerator	**FRAC01** The number of patients in the reporting month currently prescribed a Z-drug for more than 1 month. **FRAC02** The number of patients in the reporting month currently prescribed a benzodiazepine for more than 1 month.

	FRAC03 The number of patients in the reporting month currently prescribed a benzodiazepine and a Z-drug (not concurrently) for more than 1 month. See FRAC admission rate indicator (denominator) for specifications of patient age group, Z-drugs and benzodiazepines
Denominator	**FRAC01** The number of patients in the prescription month prescribed a Z-drug. **FRAC02** The number of patients in the prescription month prescribed a benzodiazepine. **FRAC03** The number of patients in the prescription month prescribed either a benzodiazepine or a Z-drug See FRAC admission rate indicator (denominator) for specifications of patient age group, Z-drugs and benzodiazepines.
Methodology	Numerator divided by denominator, presented per 10,000 patients.
Purpose	The purpose of the indicator is to quantify the number of patients who are prescribed benzodiazepines and/or Z-drugs for more than 1 month and therefore potentially having an increased risk of a fall and/or a fracture as a result of a fall.
Rationale	Benzodiazepine and/or Z-drugs prescribed for more than 1 month may increase the risk of a fall and/or a fracture as a result of a fall.

Respiratory

Admission Indicator

<table>
<tr><td>Title</td><td>RESP01

Patients admitted to hospital as an emergency for exacerbation of asthma prescribed an inhaled Long Acting Beta-agonist (LABA) without an inhaled corticosteroid (ICS).</td></tr>
<tr><td>Definition</td><td>RESP01

Number of hospital admission for exacerbation of asthma per 10,000 patients currently prescribed an inhaled Long Acting Beta-agonist (LABA) without an inhaled corticosteroid (ICS) either within the same month or the month prior to when the LABA inhaler was prescribed.</td></tr>
<tr><td>Reporting level</td><td>Quarterly aggregate by month of prescriptions dispensed at National and Regional level.</td></tr>
<tr><td>Numerator</td><td>Number of admissions where:

1. Patients are taking the medicines as specified in the denominator
2. A primary diagnosis (ICD10 code) has been recorded (full list of ICD 10 codes below)
3. Admission episode recorded as complete and as an emergency

<table><tr><th>Description</th><th>Diagnosis code (ICD10)</th></tr><tr><td>Predominantly allergic asthma</td><td>J450</td></tr><tr><td>Nonallergic asthma</td><td>J451</td></tr><tr><td>Mixed asthma</td><td>J458</td></tr><tr><td>Asthma, unspecified</td><td>J459</td></tr><tr><td>Status asthmaticus</td><td>J46X</td></tr></table></td></tr>
<tr><td>Denominator</td><td>RESP01

Patients prescribed an inhaled Long Acting Beta-agonist (LABA) without an inhaled corticosteroid (ICS) either within the same month or the month prior to when the LABA inhaler was prescribed.

<table><tr><th>Group</th><th>BNF description</th><th>BNF code</th></tr><tr><td>LABA inhalers</td><td>Formoterol Fumarate</td><td>0301011E0</td></tr><tr><td></td><td>Salmeterol</td><td>0301011U0</td></tr><tr><td>ICS inhalers</td><td>Beclometasone Dipropionate</td><td>0302000C0</td></tr><tr><td></td><td>Budesonide</td><td>0302000K0</td></tr><tr><td></td><td>Ciclesonide</td><td>0302000U0</td></tr><tr><td></td><td>Fluticasone Fuorate (Inh)</td><td>0302000V0</td></tr><tr><td></td><td>Fluticasone Propionate (Inh)</td><td>0302000N0</td></tr><tr><td></td><td>Mometasone Furoate</td><td>0302000R0</td></tr></table></td></tr>
</table>

Methodology	Numerator divided by denominator, presented as admissions per 10,000 patients at increased risk.
Purpose	The purpose of the indicator is to measure and monitor the rate of hospital admissions as an emergency for exacerbation of asthma that may be associated with prescribing that potentially increases the risk of exacerbation of asthma.
Rationale	**RESP01** Inhaled Long Acting Beta-agonist (LABA) prescribed without an inhaled corticosteroid (ICS) may increase the risk of exacerbation of asthma.

Increased Risk Indicator

Title	**RESP01** Number of patients currently prescribed an inhaled Long Acting Beta-Agonist (LABA) without an inhaled corticosteroid (ICS) and therefore potentially at increased risk of admission to hospital in an emergency for an exacerbation of asthma.
Definition	**RESP01** Number of patients in the month of prescription currently prescribed an inhaled Long Acting Beta-Agonist (LABA) without an inhaled corticosteroid (ICS) either within the same month or the month prior to when the LABA inhaler was prescribed per 10,000 patients currently prescribed an inhaled Long Acting Beta-Agonist (LABA).
Reporting level	Quarterly aggregate results at National, Regional and CCG level
Numerator	**RESP01** The number of patients in the prescription month currently prescribed an inhaled Long Acting Beta-Agonist (LABA) without an inhaled corticosteroid (ICS) either within the same month or the month prior to when the LABA inhaler was prescribed.
Denominator	**RESP01** The number of patients in the prescription month prescribed an inhaled Long Acting Beta-Agonist (LABA).
Methodology	Numerator divided by denominator, presented per 10,000 patients.
Purpose	To quantify the number of patients who are prescribed inhaled Long Acting Beta-Agonist (LABA) without an inhaled corticosteroid (ICS) and therefore potentially having an increased risk of an exacerbation of asthma.
Rationale	Inhaled Long Acting Beta-Agonist (LABA) prescribed without an inhaled corticosteroid (ICS) may increase the risk of an exacerbation of asthma.

Evidence base

Gastro Intestinal (GI) Bleeds

The indicator is based on a prescribing query included the PINCER interventional studies and included in the latest PROTECT programme. The evidence base for the indicator is detailed in the Revised PINCER Query Library 2015 Evidence Based Summaries – see embedded document (will also be available at the following link - https://www.nottingham.ac.uk/pincer)

Evidence-based summaries for Healt

The combination of medicines is also referenced in Polypharmacy Guidance for Prescribing (All Wales Medicine Strategy Group, July 2014) as a high-risk combination to avoid. Link to report.

The combination of medicines is rated as high risk (score of 3) in a list of indicators rated as appropriate for assessing the safety of prescribing in general practice. Link to Report

The indicator is similar to a comparator included in the Polypharmacy Comparators developed by Wessex AHSN / NHSBSA. https://www.nhsbsa.nhs.uk/epact2/epact2-dashboardsspecifications/medicines-optimisation-polypharmacy

Tables 3 and 4 in appendix 1 (Interactions) in the British National Formulary BNF lists medicines that have anticoagulant (table3) and antiplatelet (table 4) effects. The BNF advises that prescribing 2 or more medicines from those listed might increase the risk of bleeding.

NB: If gastro-protection is required avoid the concurrent use of clopidogrel and omeprazole/esomeprazole. See https://www.gov.uk/drug-safety-update/clopidogrel-and-proton-pump-inhibitors-interaction-updated-advice

Further supporting information can be found in:

- Clinical Knowledge Summary – NSAIDs - Prescribing issues (July 2015) produced by NICE https://cks.nice.org.uk/nsaids-prescribing-issues
- Drug and Therapeutic Bulletin Volume 49 issue 2 http://dtb.bmj.com/content/dtb/49/2/18.full.pdf

The indicator is also referenced in:

- Polypharmacy guidance (NHS Scotland, March 2015) under:

a) Potentially unnecessary medicines (NSAID)

b) Safety: High risk clinical scenario (NSAID without PPI in >75)

c) A high-risk prescribing indicator (> 75 years old)

http://www.polypharmacy.scot.nhs.uk/

http://www.sehd.scot.nhs.uk/publications/DC20150415polypharmacy.pdf

- Polypharmacy guidance for prescribing (All Wales Medicine Strategy Group, July 2014) As a high-risk combination to avoid without PPI (>75 yrs old)

http://www.awmsg.org/docs/awmsg/medman/Polypharmacy%20-%20Guidance%20for%20Prescribing.pdf

Acute Kidney Injury

The potential causes of acute kidney injury include conditions leading to dehydration (for example, diarrhoea and vomiting) and drugs that have nephrotoxic potential. Predisposing risk factors are listed in NICE Clinical Guideline (CG169) https://www.nice.org.uk/guidance/cg169**).**

The guideline states that the use of drugs with nephrotoxic potential such as non-steroidal anti-inflammatory drugs [NSAIDs], angiotensin-converting enzyme [ACE] inhibitors, angiotensin II receptor antagonists [ARBs] and diuretics within the past week, especially if hypovolaemic, should be considered when assessing the risk of AKI.

- Non-steroidal anti-inflammatory drugs impair renal autoregulation by inhibiting prostaglandin-mediated vasodilatation of the afferent arteriole and may increase the risk of AKI.
- Drugs that lower blood pressure, or cause volume contraction, might increase the risk of AKI by reducing glomerular perfusion. These drugs include ACE inhibitors (ACEI) and Angiotensin Receptor Blockers (ARBs), which reduce systemic blood pressure and also cause vasodilatation of the efferent arteriole, further reducing glomerular perfusion pressure. Diuretics can cause a reduction in GFR if their use results in hypovolaemia.

See also Key Therapeutic Topic (KTT17), published by NICE (February 2018) for further information and links to other references and resources. https://www.nice.org.uk/advice/ktt17

The indicator was included in the DQIP interventional studies
http://www.nejm.org/doi/full/10.1056/NEJMsa1508955?af=R&rss=currentIssue

and also listed as a “high risk combination to avoid” (“triple Whammy combo”) in Polypharmacy: Guidance for Prescribing (All Wales Medicines Strategy Group).
http://www.awmsg.org/docs/awmsg/medman/Polypharmacy%20-%20Guidance%20for%20Prescribing.pdf

The indicator is similar to comparators included in the Polypharmacy Comparators developed by Wessex AHSN / NHSBSA. https://www.nhsbsa.nhs.uk/epact2/epact2-dashboardsspecifications/medicines-optimisation-polypharmacy

Other references/resources:

Think Kidneys (NHS)
https://www.thinkkidneys.nhs.uk

Patient Safety Alert (NHS Improvement)
https://nhsicorporatesite.blob.core.windows.net/blue/uploads/documents/Patient_Safety_Alert_Stage_2_-_AKI_resources.pdf

NICE Clinical Knowledge Summary (CKS)
https://cks.nice.org.uk/acute-kidney-injury#!scenario:1

Pain

Pain01

Summary

The co-prescribing of certain *combinations of medicines with an opioid increases the risk of adverse events experienced by patients*. Safety concerns around co-prescribing of these agents are highlighted in multiple sources. For example, an analysis of the association between "*overdose and prescription opioids plus benzodiazepines"*, reported significantly higher risks of emergency room visits or inpatient admissions for opioid overdose (2.42% vs. 1.16%). The authors estimated that eliminating concurrent use could reduce the population risk for an opioid related overdose by 15%. **This indicator identifies patients at risk of hospital admissions due to the co-prescribing of opioids with selected medicines and patients whose hospital admission is likely attributable to this.** The indicator highlights the need for caution with such co-prescriptions due to the risk of adverse events.

Key Messages

- Opioids are co-prescribed with benzodiazepines, GABA analogues or z-drugs for pain or associated symptoms caused by a variety of conditions.
- Adverse events associated with these high-risk combinations can be minimised with effective review, monitoring and optimisation.
- Patients taking high risk combinations should be identified and have their therapies optimised or changed to appropriate alternatives to reduce the number of associated adverse events and possible hospital admissions.

Caveats and Limitations

Evidence suggested that both the rapid withdrawal of benzodiazepines and the concomitant use of benzodiazepines with opioids are associated with increased risk of suicide. Withdrawal or dose reduction of these therapies should be undertaken with a clearly defined and structured patient management plan to mitigate these risks.

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Pain02

Summary

Opioid-induced constipation is the *most common and well characterised adverse event associated with prolonged use of opioids*, although it can occur if opioids have been taken for any length of time. The evidence highlights that it occurs in around 40% to 80% of patients taking opioids and that it is often not recognised and under treated.

This indicator identifies patients at risk of hospital admissions where opioids have been prescribed without a laxative and patients whose hospital admission is likely attributable to this. The indicator highlights the need for laxatives to be prescribed appropriately with opioids when clinically indicated.

Conditions associated with constipation and opioid-induced constipation that may lead to hospital admission include; congestive heart failure, myocardial infarction, transient ischemic attacks, syncopal episodes, megacolon, bowel obstruction, anal fissures, stercoral ulceration and bowel perforation.
Elderly patients with chronic opioid-induced constipation may also be at risk of and other comorbidities such as depression and mood disorders, iron deficiency anaemia and hypothyroidism.

Key Messages

- Opioid-induced constipation is highly prevalent among opioid users at a rate of 40-80%
- Opioid-induced constipation can be managed in a large proportion of cases by the addition of laxatives.
- Patients taking opioids without co-prescribed laxatives should be identified and have their supportive therapies optimised as needed to reduce the number of associated hospital admissions.

Caveats and Limitations

The “at risk” section of the indicator assumes opiates are being used for pain control and so may highlight patients in whom the omission of laxatives is appropriate such as those patients using opioids for control of stoma output. Thus investigations need to take place at a local level to distinguish between these types of patients and those requiring review.

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Pain03

Summary

The chronic use of opioids is defined as *use for three months or longer* and is associated with an increased risk of adverse events in various studies. For example the Cochrane review "*Adverse events associated with medium- and long-term use of opioids for chronic non-cancer pain"* identified that the incidence of all adverse events with chronic opioid use in trials was 78%, with an event rate of 7.5% for serious adverse events.

Opioids are an effective source of pain relief in many clinical situations, but their chronic use poses risks to patients which can outweigh the pain relieving benefits. **This indicator shows the number of patients who have received chronic opioid treatment and identifies if they have been admitted to hospital due to adverse events associated with chronic opioid use.**

The Opioids Aware resource is a key resource supporting this indicator. It is endorsed by the Faculty of Pain Medicine, Royal College of Anaesthetists and Public Health England. The resource advises **review of patients on long term opioids to evaluate the ongoing risks and benefits.**

Key Messages

- Opioids are prescribed long term for pain caused by a variety of conditions.
- Adverse events associated with long term opioid use can be managed by the addition of side-effect preventing medicines and by ensuring that patients are reviewed routinely.
- 22% of patients experience adverse effects which outweigh the benefit from opioids beyond 6 months of treatment.
- Patients taking opioids for longer than 3 months should be identified and reviewed to determine if the opioid is still necessary, and if so, they should have their supportive therapies optimised to reduce the number of associated side effects.

Caveats and Limitations

The indicator assumes that opioids prescribed in three consecutive months are for regular use although some patients may take these on an "as required" basis.

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Fractures

Summary

The risks associated with the long-term use of benzodiazepines and Z-drugs are well recognised. These risks include falls and fractures as a result of a fall and also accidents, cognitive impairment, dependence, withdrawal symptoms and an increased risk of dementia. They should be prescribed for short-term use, ideally used intermittently, and for no more than 4 weeks in line with their licenced indications.

Key Messages

- Falls and fractures resulting from a fall are associated with the use of benzodiazepines and Z-drugs.
- For conditions such as anxiety and insomnia, a benzodiazepine or Z-drug should be prescribed only if other psychological and behaviour treatments have proved inadequate and the symptoms are severe.
- For the treatment of anxiety and insomnia, a benzodiazepine or Z-drug should be given for about two week and a maximum of four weeks.

Caveats and Limitations

Evidence suggested that both the rapid withdrawal of benzodiazepines and the concomitant use of benzodiazepines with opioids are associated with increased risk of suicide. Withdrawal or dose reduction of these therapies should be undertaken with a clearly defined and structured patient management plan to mitigate these risks.

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Respiratory

Summary

Evidence indicates that LABAs should not be used without also taking regular corticosteroids in asthmatic patients. When used alone, LABAs have been associated with a worsening of asthma in some patients. NICE technology appraisal guidance on inhaled corticosteroids for the treatment of chronic asthma in adults and in children aged 12 years and over recommends a combination inhaler, within its marketing authorisation, as an option if treatment with an ICS and a LABA is considered appropriate.

Key Messages

- LABA's when used alone are associated with worsening (sometimes severe worsening) of asthma.
- If asthma patients are managed effectively and their routine respiratory inhalers are prescribed and used optimally, the likelihood of an exacerbation is usually reduced.
- Asthma patients with prescriptions for LABA inhalers, without ICS inhalers should be urgently reviewed with a view to ***identifying*** reasons for this, and ***optimising*** their inhaled therapy to try and ***reduce*** future exacerbations and admissions.

Caveats and Limitations

Due to the limitations of the respiratory data that is captured, it is not possible to differentiate asthma and COPD patients (or those with a component of asthma as part of their inherent disease). Specialist clinical opinion and the nature by which one gets COPD, indicates that most patients aged 35 years and below are likely to be asthmatic patients.
Patients aged over 35 years could have asthma or COPD or a combination of both. The actual diagnosis in this case can only be determined at local level through the GP practices.

The identified admissions are associated with exacerbation of asthma. Therefore, the indicator identifies patients with asthma who are prescribed a LABA without ICS and are admitted for asthma related problems. However, the "at risk" patients identified in the indicator will also identify patients where the use of a LABA inhaler (without an ICS inhaler) may be for other conditions and/or be appropriate (for example in COPD).

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Limitations

Clinical limitations

The analysis does not take into account the following clinical factors:

- other medication the patient may be taking that may cause or contribute to the same harm,
- strength, relative potency or differences in the potential to cause harm,
- the patients' medical condition(s),
- assumption that the patient is taking the medicines that have been dispensed,
- other factors that may cause or contribute to the same harm.

The indicators and supporting evidence highlight the potential for increased harm. Individual patients should be reviewed with reference to the benefits of treatment versus the risk of harm and also other relevant circumstances.

Data limitations

The analysis has the following data limitations

Overlapping medicines

The analysis potentially has included a small portion of patients who should possibly be excluded due to overlap of supply of the combination of medicines between ages 64 and 65 or 17 and 18.

For example, if a patient was prescribed a gastro protective agent at age 17 years and 11 months and prescribed NSAID and antiplatelet at age 18. The patient is most likely taking these medicines at age 18 years and 1 month. The prescribing data covers patient's prescriptions from age 18 and above, this patient therefore would have been included in the analysis (i.e. not taking a gastro-protective medicine) who should have been excluded.

Overlapping patients

There are overlapping patients that are included in more than one indicator. This has been reviewed by the composite indicator.

The indicators look at current and two months lag – a numerator quarter could potentially be looking at some patients from different denominator quarters.

Prescription month and admission date linkage

When linking patients at increased risk to their admissions the current prescribing month and up to two months prescribing lag was used. The prescribing data is based on the year and month as the data is not available down to individual date of prescribing. Therefore, the analysis may have counted patients who have been admitted before the prescribing date when looking in the same month. However, it is unlikely that patients will have been prescribed a first prescription after admission to hospital.

Medicines prescribing date

In the definition 'concurrently taking' means each medicine prescribed in the same month. However, the below scenarios are examples where patients fulfil the purpose but will be excluded from the indicator.

- One medicine dispensed at the end of a month and the other medicine at the start of next month (NSAID month 1, Warfarin the following month).
- Quantity prescribed covers more than one months supply for one medicine in the indicator. For example patient prescribed one months supply of NSAID and two months supply of warfarin.

Therefore, in the following month this is likely to result in a supply of NSAID and no supply of warfarin. This patient will be excluded.

- Change of prescriptions – medication changed/stopped mid-month. This patient will be included when they should be excluded.
- Patient is prescribed more than one months supply of all the medicines in the indicator but in separate months

All the above scenarios, with the exception of the last, are resolved if the patient has been prescribed the medicines for more than one month and/or resolved by analysing the current and previous 2 months data.

Proposals for further development

- Explore extending the HES admission codes (numerator) to include relevant secondary diagnosis. NB: Primary diagnosis codes record the first condition treated on admission.
- Explore the development of supplementary indicators such as
    - "Comparator" groups i.e. admission rates for patients at potentially lower risk. For example:
        - patients taking warfarin/NOAC OR antiplatelet and admitted to hospital with a GI bleed
        - patients taking a NSAID and a gastro-protective agent and admitted to hospital with a GI bleed
- Identifying sub-sets of patients within each indicator that are at greater potential risk of admission e.g.
    - Specific medicines or strengths of the medicines included in the indicator medicines
    - Length of treatment prior to admission
- Further analysis of data for current indicators to explore and potentially refine the methodology for identifying patients currently and concurrently taking the medicines at the time of admission.
- Further analysis of the data to identify patients that are included in more than one indicator for the same admission cause e.g. concurrently taking a NSAID, warfarin, aspirin and anti-platelet without gastro-protection.
- Development of further indicators to include other potentially increased risk prescribing scenarios involving other types of medicines associated with other causes of hospital admission.
- Being able to trust the quality of information used by both commissioners and providers of health and care services to benefit patients is important. We are planning to submit these Indicators through a formal assurance process to validate that they are based on good data and transparent methodologies. Our aim is to have them approved for inclusion in the National Library of Quality Assured Indicators which provides users with the confidence that they can be considered a trusted source of information.

Process for development and selection of indicators

The indicators included in this first publication were approved by the Department of Health & Social Care Short Life Working Group. The indicators were developed and proposed by NHS Digital following advice and input from medicines safety researchers and medicines information experts.

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