

Polypharmacy Guidance

October 2012



Developed by The Model of Care Polypharmacy Working Group

**Quality and Efficiency Support Team
Scottish Government Health and Social Care Directorates**

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Foreword

We are pleased to present the Polypharmacy Guidance for 2012. This is the first iteration of a national approach to address the issues resulting from the use of multiple medicines in the frail and elderly population. The aim is to improve therapeutic care by reducing the risk of adverse drug reactions associated with polypharmacy.

The story of Pat provided by the Health and Social care alliance illustrates the problems that can be faced by patients taking multiple medications and can be found at :
<http://www.youtube.com/watch?v=ysfkHjvPYb4&feature=plcp>

NHS Scotland has a very good track record in delivering high standards of care and the safe, effective and efficient use of medication is no exception.

It is important to highlight that this report contains both **management information** for boards to use locally and **guidance information for clinicians** to undertake the review.

Management information included is the evidence based rationale behind this approach to addressing polypharmacy. In addition there is included a set of tools that can be used by NHS Boards to **form the guidance documents to allow clinicians to** implement change.

It is recommended that the Polypharmacy Report 2012 is considered by boards for Prescribing Action Plans.

We commend the information within this report to you, please use wisely and efficiently

Kind regards

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Section 1: General Principles

1.1. Why is reviewing polypharmacy important?

Medication is by far the most common form of medical intervention. Four out of five people aged over 75 years take a prescription medicine and 36 per cent are taking four or more¹. However, it is suggested that up to 50 per cent of drugs are not taken as prescribed, many drugs in common use can cause problems and that adverse reactions to medicines are implicated in 5 - 17 per cent of hospital admissions².

Research has demonstrated that patients on multiple medications are more likely to suffer drug side effects and that this is more related to the number of co-morbidities a patient has than age². There is a clear and steady increase in the number of patients admitted to hospital with drug side effects³. Patients admitted with one drug side effect are more than twice as likely to be admitted with another³. This can lead to a situation where adults may be suffering side effects (that may even lead to hospital admission) from drugs that they derive little or no benefit from, or where the harm of the drug outweighs any possible benefit.

Prescribers and pharmacists receive extensive guidance on the indications for starting drugs, particularly drugs used in primary prevention. However, these guidelines are usually based on evidence from narrow and often atypical populations, and almost exclusively focus on single conditions.

In contrast, clinical care frequently involves balancing the recommendations of multiple guidelines in people who have many different conditions⁴. These recommendations, often focussed on starting treatment, are not balanced by comprehensive policy or guidance on when it might be appropriate to stop medication. This may be especially relevant in people with multiple morbidities prescribed large numbers of medications, in people particularly vulnerable to adverse events or in those who are unlikely to obtain benefit in long-term prevention due to life expectancy.

Before now, little guidance existed to assist prescribers in balancing the recommendations of multiple (and potentially conflicting) guidelines⁵. This guidance aims to support primary care practitioners undertaking comprehensive face-to-face medication reviews (defined as Level 3 Reviews) with patients and where appropriate carers/welfare proxies, particularly for patients with cognitive impairment.

The general principles of what should be covered in a medication review are covered in [Section 1](#) but decision making always needs to be tailored to an individual's circumstances and preferences. Clinical tools and information that may help these decisions are included in [Section 2](#) of the guidance. In [Section 3](#), you will find further information that assists in the planning and implementation of this guidance.

¹ Quality and Outwork framework 2012

http://www.nhsemployers.org/Aboutus/Publications/Documents/QOF_2012-13.pdf

² Co-morbidity and repeat admission to hospital for adverse drug reactions in older adults: retrospective cohort study M Zhang et al BMJ 2009;338:a275

³ Adverse drug reactions as cause of admission to hospital: prospective analysis of 18 820 patients M Pirmohamed et al, BMJ 2004;329:15-19

⁴ Epidemiology of multiple morbidity and implications for healthcare, research, and medical education: a cross-sectional study. Quality, safety and Informatics Research Group, University of Dundee. May10, 2012 DOI;10.1016/s0140-6736(12)60240-2

⁵ Patterson SM, Hughes C, Kerse N, Cardwell CR, Bradley MC. Interventions to improve the appropriate use of polypharmacy for older people. *Cochrane Database of Systematic Reviews* 2012, Issue 5. Art. No.: CD008165. DOI:10.1002/14651858.CD008165.pub2

It is the clinical responsibility of the prescriber to assess the appropriateness of making changes to a patient's prescribed therapy. Prescribers need to be aware that patients with frailty and/or multiple co-morbidities are often excluded from clinical trials and as such the benefit/risk results may not be generalisable.

What should be happening under QOF?

As part of the GP contract, medication review is covered under medicines indicator 11 and 12, detail is shown below:

Medicines 11 A medication review is recorded in the notes in the preceding 15 months for all patients being prescribed four or more repeat medicines (Standard 80%)

Medicines 12 A medication review is recorded in the notes in the preceding 15 months for all patients being prescribed repeat medicines (Standard 80%)

The detailed guidance can be found in [section 3.1](#).

For frail adults, a level 3 medication review is recommended.

What is the aim of this guidance?

A multidisciplinary group from NHS Boards across Scotland, has developed guidance to address polypharmacy. For membership, see [section 3.7](#). [Section 3.6](#) covers key learning from NHS Boards that have started to deliver polypharmacy reviews.

Prescribers are often faced with two often overlapping situations where extra thought and consideration is needed:

1. When faced with a patient who is either on or has indications to be on multiple medications.
2. When a patient is 'frail' in a medical sense. 'Frailty' in this guideline is taken to describe a state where a patient has a reduced ability to withstand illness without loss of function.⁶

This guidance aims to:

1. Provide information about patient groups that NHS Boards should consider as a higher priority for polypharmacy review.
2. Outline of a robust and pragmatic process of medication review in these patient groups.
3. Provide NHS Boards with tools that can then be adapted for local use as guidance for clinicians undertaking the reviews; where possible relevant documentation and guidance has also been provided. It should be stressed to clinicians that this guidance should be read before carrying out reviews, rather than to be used as a checklist during reviews. It aims to provide background information to help clinicians conduct this level of medication review.

⁶ Rockwood *CMAJ* 1994; 150:489-495.

When applying the tools, particular attention is drawn to high risk drug combinations and medications that are known to be high risk in frail adults. It should be emphasised that reducing doses and or frequency of high risk medicines may be useful where these cannot be stopped completely. Patient safety is the core concern.

The frail elderly are a unique subgroup of patients within a subgroup. They probably represent a phenotype at the extreme end of variability in the dose–concentration–response relationship of a drug. Not surprisingly, elderly frail individuals may display profound changes in the pharmacokinetics and pharmacodynamics of a drug. From Shah 2004 BJCP.

1.2. Which patients should be targeted?

There are many different ways of identifying patients who might benefit from a targeted medication review, including by:

- Age
- Counts of numbers of repeat drugs
- Numbers of co-morbidities
- Care home residence or being housebound
- Functional status
- A combination of these

A key priority was to select patients in a way that was easily implementable across Scotland, and for that reason it was decided to use iSPARRA version 3 data since mechanisms already exist for data extraction and dissemination of identifiable lists. Other methods may be equally feasible within particular Boards.

The Model of Care Group recommended targeting patients with 40-60% risk of emergency hospital admission in the next 12 months who were also dispensed a large number of different drugs in the previous year. would provide the greatest patient benefit for level 3 medication reviews; those in higher risk categories were deemed to be at higher risk of admission due to other factors. those in higher risk categories were deemed of less relevance since they will already be receiving a high level of management/monitoring.

The group recommends that Boards should prioritise patients on multiple medications, from 10 or more particular BNF sections, and/or high risk medicines. Reviews should start with patients aged 75 years and over patients aged 65 to 75 years, as resources allow. Further research is needed to determine which patients will realise greatest benefit.

Boards should identify the individual within the NHS Board to whom they would like SPARRA lists based on the above criteria to be released. The confidential data release form in see [section 3.2](#) should be completed for this individual and returned to ISD, since this is patient-identifiable data. For more detailed information on the derivation of the above table and further data providing the numbers in other risk / BNF Section bandings see [section 3.2](#).

Individuals within the July 2012 SPARRA Cohort¹ with a risk score of 40-60% and dispensed items in 10 or more BNF sections²

| NHS Board | Age 75+ | | | | | Age 65+ | | | | |
|---------------------------|--------------------|--|------------------------------------|--|-----------------------------------|--------------------|--|------------------------------------|--|-----------------------------------|
| | Number of patients | Number with high risk medicines ³ | Number in a care home ⁴ | Number with high risk medicines and in a care home | Number with dementia ⁵ | Number of patients | Number with high risk medicines ³ | Number in a care home ⁴ | Number with high risk medicines and in a care home | Number with dementia ⁵ |
| Ayrshire and Arran | 3,219 | 3,162 | 616 | 602 | 441 | 4,129 | 4,059 | 660 | 646 | 476 |
| Borders | 854 | 832 | 146 | 139 | 101 | 1,046 | 1,013 | 152 | 145 | 106 |
| Dumfries and Galloway | 1,255 | 1,233 | 217 | 212 | 189 | 1,593 | 1,564 | 225 | 220 | 203 |
| Fife | 2,366 | 2,326 | 508 | 497 | 430 | 2,914 | 2,865 | 544 | 532 | 468 |
| Forth Valley | 1,757 | 1,719 | 303 | 294 | 211 | 2,216 | 2,172 | 323 | 314 | 228 |
| Grampian | 3,085 | 3,038 | 662 | 650 | 544 | 3,730 | 3,672 | 690 | 676 | 570 |
| Greater Glasgow and Clyde | 9,583 | 9,392 | 1,681 | 1,641 | 1,347 | 12,307 | 12,061 | 1,820 | 1,777 | 1,466 |
| Highland | 2,072 | 2,018 | 367 | 350 | 296 | 2,572 | 2,505 | 391 | 373 | 319 |
| Lanarkshire | 4,001 | 3,929 | 679 | 666 | 559 | 5,195 | 5,103 | 719 | 706 | 620 |
| Lothian | 4,800 | 4,698 | 949 | 925 | 910 | 5,965 | 5,826 | 1,005 | 977 | 968 |
| Orkney | 102 | 101 | 16 | 15 | 18 | 130 | 127 | 16 | 15 | 18 |
| Shetland | 140 | 138 | 24 | 24 | 14 | 173 | 170 | 27 | 27 | 14 |
| Tayside | 2,865 | 2,801 | 581 | 560 | 414 | 3,498 | 3,415 | 606 | 585 | 433 |
| Western Isles | 256 | 256 | 44 | 44 | 36 | 328 | 327 | 47 | 47 | 41 |
| Total | 36,355 | 35,643 | 6,793 | 6,619 | 5,510 | 45,796 | 44,879 | 7,225 | 7,040 | 5,930 |

¹ SPARRA Version 3 estimates the risk of emergency admission in the next 12 months for approximately 3.2m individuals.

For the July 2012 release, this is the risk of emergency admission in the period 1st July 2012 to 30th June 2013.

² The number of different BNF Sections in which an individual's dispensed items fall.

Note that SPARRA Version 3 uses the most recent 12 months prescribing data available prior to the start of the risk year.

³ Defined as medications in any of the following BNF Sections: 2.1, 2.2, 2.4, 2.5, 2.8, 2.9, 4.1, 4.2, 4.3 and 10.1.

⁴ Identified by a CHI institution code of 93 or 98.

⁵ Evidence of Dementia has been determined either by Prescribing history (dispensed items within BNF Section 4.11) or previous inpatient admission to hospital where diagnosis at discharge includes ICD10 codes (F00-F03, F051); ICD9 (2900, 2901, 2902, 2904, 2908, 2909)

1.3. Data collection and evaluation

Minimum data requirement for follow-up and evaluation.

NHS Boards will be asked to report back on the following data for both local and national evaluation:

- **Number of patients reviewed from the list given and CHI numbers and date of review**

The national database of dispensed items held at ISD Scotland (New_PIS: the new Prescribing Information System) will allow monitoring of pre-review dispensing patterns and follow-up of post-review dispensing patterns.

Using the CHI identifier recorded at the point of review, the patient pathway can be traced post-review. At a specified point in time after the review, which is yet to be confirmed, e.g. one year, information about the patient admission history, the associated, pattern in GP appointments or primary care contacts, outpatient attendance, A&E attendance, length of stay, regular prescription at post-review date can be obtained.

For further details of the recommended data collection and evaluation, see [section 3.4](#).

Reviewers can use the code “**polypharmacy**” in READ codes until a specific READ code for “polypharmacy review” is established (this may take up to 6 months).

1.4. Ongoing work and timescales

These can be summarised below:

1. Guidance document will be reviewed after 6 months for revisions from feedback and updated in September 2013
2. Development of iSPARRA to track changes in medication and potentially other health outcomes
3. Development of indicators to understand risks and benefits of tackling polypharmacy.
4. Analysis of Scotland wide data for polypharmacy
5. Development of patient tools to help them actively take a role in polypharmacy reviews
6. Development of tools for the clinicians undertaking polypharmacy reviews

Section 2: Clinical Guidance

2.1 Drug review process

This review should be undertaken in the context of holistic care considering each medication and its impact on the individual clinical circumstances of each patient. As part of this it is important to consider the cumulative effects of medications.

| Number | CRITERIA / CONSIDERATIONS | PROCESS/GUIDANCE | | References / Further reading or Examples |
|--------|---|--|-------------------------------|---|
| 1 | Is there a valid and current indication? Is the dose appropriate? | Identify medicine and check that it does have a valid and current indication in this patient with reference to local formulary. Check the dose is appropriate (over/under dosing?) | | e.g. PPIs- use minimum dose to control GI symptoms - risk of <i>c.difficile</i> and fracture e.g. quinine use- see MHRA advice re safety e.g. long term antibiotics |
| 2 | Is the medicine preventing rapid symptomatic deterioration? | Is the medicine important/essential in preventing rapid symptomatic deterioration? If so, it should usually be continued or only be discontinued following specialist advice. | | e.g. Medications for Heart failure, medications for Parkinson's Disease are of high day to day benefit and require specialist input if being altered. review of doses may be appropriate e.g. digoxin |
| 3 | Is the medicine fulfilling an essential replacement function? | If the medicine is serving a vital replacement function, it should continue. | | e.g. thyroxine and other hormones |
| 4 | Consider medication safety Is the medicine causing: -Any actual or potential ADRs? -Any actual or potentially serious drug interactions? | Contraindicated drug or high risk drugs group | Strongly consider stopping | See High risk medications section e.g. is the patient on a high risk combination "triple Whammy" Ref. "STOPP" List BNF sections to target |
| | | Poorly tolerated in frail patients? For guidance on frailty see Gold National Framework | Consider stopping | |
| | | Particular side effects? | May need to consider stopping | |
| 5 | Consider drug effectiveness in this group/person? | For medicines not covered by steps 1 to 4 above, compare the medicine to the 'Drug Effectiveness Summary' which aims to estimate effectiveness. | | Ref. Drug Effectiveness Summary Ref NNT/NNH Medication used for dementia patients - see Gold SF |
| 6 | Are the form of medicine and the dosing schedule appropriate? Is there a more cost effective alternative with no detriment to patient care? | Is the medicine in a form that the patient can take supplied in the most appropriate way and the least burdensome dosing strategy? Is the patient prepared to take the medication? UKMI Guidance on choosing medicines for patients unable to swallow solid oral dosage forms should be followed. | | Consideration should be given to the stability of medications. Ensure changes are communicated to the patients' Pharmacist: <i>Would this patient benefit from Chronic medication Service?</i> |
| 7 | Do you have the informed agreement of the patient/carer/welfare proxy? | Once all the medicines have been through steps 1 to 6, decide with the patient/carer/or welfare proxies what medicines have an effect of sufficient magnitude to consider continuation/discontinuation. | | |

2.2 Risk benefits of medication: 'numbers needed to treat' and numbers 'needed to harm'

The 'number needed to treat' (NNT) is a measure used in assessing the effectiveness of a particular medication, often in relation to a reduction in risk over a period of time. The NNT is the *average* number of patients who require to be treated for one to benefit to be realised compared with a control in a *clinical trial*. It is defined as the inverse of the absolute risk reduction. So if treatment with a medicine for one year reduces the death rate over five years from 5% to 1% (a very effective treatment), the absolute risk reduction is 4% (5 minus 1), and the NNT is $100/4 = 25$.

In other words, the number needed to treat with that medicine for one year to prevent one death is 25. The ideal NNT is 1 where everyone improves with treatment. The higher the NNT, the less effective the treatment. There is always need to consider:

- What is the outcome being avoided? Death is more significant than a vertebral fracture, but different outcomes will be more or less significant to individual patients.
- Over what period does the benefit accrue? Two drugs may have the same NNT to avoid one death, but the drug that achieves that over 6 months is more effective than the drug which takes 10 years to. You can put NNTs on the same timescale by multiplying or dividing the NNT appropriately, but there is an assumption that benefit accrues consistently over time (a not unreasonable assumption, but one that is difficult to test).
- What are the TRUE costs of the drug? This will include monetary costs, but also costs associated with treatment burden, and harm/side effects. A medicine might save the life of one of the 25 people who take it, but if it led to all 25 suffering a debilitating side effect, its costs may outweigh its benefits.

NNTs are only estimates of average benefit, and it is rarely possible to know precisely what the likely benefit will be in a particular patient.

The 'uncertainty' in the number should be acknowledged since the construction of confidence intervals around NNT does not generally give a valid interval.

'Number needed to harm' (NNH) is a related measure which is the *average* number of people exposed to a medication for one person to suffer an adverse event. Again, a defined end point (e.g. GI bleeding or renal failure) requires to be specified and confounders may require correction of the raw data i.e. in very elderly patients the risk of particular side effects such as confusion and falls may be higher than on average. In discussion, the overall benefit – risk ratio (NNT / NNH) requires to be 'weighed' in the individual patient and may vary considerably in people with polypharmacy depending on absolute risk, life expectancy and vulnerability to adverse drug events.

Example:

The reference below illustrates that for benzodiazepines for night sedation NNT is 13 but the NNH is 6

Glass, J. et al. Sedative hypnotics in older people with insomnia: a meta-analysis of risks and benefits. *BMJ* 2005; 331: 1169

http://www.bmj.com/highwire/filestream/394884/field_highwire_article_pdf/0.pdf

2.3 Numbers needed to treat drug effectiveness summary (see references for additional information)

ACE INHIBITORS

| Indication | NNT per annum | To do what | Notes |
|--|--|--|---|
| Elevated Vascular Risk [Normal LV] | 280 | Prevent one death [all causes] | Trial ran for 5 years |
| Impaired LV Function-mild/moderate | 30 | Prevent one death [all causes] | Likely symptomatic benefit |
| Combination Therapy including ACE | | | |
| ACE + Indapamide | 55 | Prevent one stroke | Trial ran for 5 years |
| Secondary Prevention post MI > 80 yrs [ACE+ BB +ASP+ STAT] | 33 | Prevent one Death | |
| ACE + Beta blocker for impaired LV | 14 | Prevent one death | Likely symptomatic benefit |
| Impaired LV Mild /moderate ACE + BB | 15 | Prevent one Death | Likely symptomatic benefit |
| Impaired LV Severe ACE + BB + Spiro | 7 | Prevent one Death | Likely symptomatic benefit |
| ASPIRIN Primary Prevention | Enormous | No longer recommended | |
| ASPIRIN Post Stroke/ TIA | 100 | Prevent one stroke or MI or Vascular Death | |
| DYPYRIDAMOLE In addition to ASPIRIN post stroke/TIA | 100 | Prevent one vascular event | BNF caution in cardiac disease |
| | Equivalent to Dypridamole + Aspirin | Prevent one vascular event | |
| CLOPIDOGREL post stroke or TIA | | | |
| ATRIAL FIBRILLATION | | | |
| AF + another risk factor WARFARIN v ASPIRIN | 40 | Prevent one Stroke- no difference in mortality | |
| AF (Secondary Prevention after Stroke) WARFARIN v ASPIRIN | 16 | Prevent one stroke | |
| ASPIRIN | No effect | | BP > 140/90 trial predominantly systolic hypertension |
| HYPERTENSION | | | |
| Cardiovascular morbidity and mortality >80 yrs | | | |
| Low Risk | 80 | Avoid one cardiovascular event | 2 years for effect |
| High Risk [Diabetes, vascular disease] | 32 | Avoid one cardiovascular event | 2 years for effect |
| Cerebrovascular morbidity and mortality > 80 yrs | | | |
| | 122 | Avoid one cerebrovascular event | 2 years for effect |
| Cardiovascular morbidity and mortality > 60yrs | | | |
| Low Risk | 107 | Avoid one cardiovascular event | 4.5 years for effect |
| High Risk [Diabetes, vascular disease] | 40 | Avoid one cardiovascular event | 4.5 years for effect |
| HYPERTENSION (Tayside Day Hospital cohort) | 36 | Prevent one death | NNT 30 if also Cardiovascular Disease |

NNT are a guide; they do not give exact figures for individuals patients Older people have increased absolute event rates, thus NNT to prevent one event may be lower in older people – conversely NNH are likely to be higher – see weighing the benefit / risk in NNT [section 2.2](#)

| STATINS | NNT per annum | To do what | |
|---|---------------------------|---|----------------------------------|
| MI or Angina | 80 to 170 | Major Coronary Event. | No difference in Mort to 5 years |
| Post Stroke [Atrova 80 v Placebo] | 165 | One Cardiovascular Event | No difference in Mort to 5 years |
| Tight HbA1c Control Strategies | | | |
| <i>Microvascular Risk</i> | | | |
| ADVANCE [HbA1c7.3% v 6.5%] | 333 | One microvascular event [predominantly retinal] | Trial ran 5 years |
| UKPDS [HbA1C 7.9% v 7%] | 200 | One microvascular event [predominantly retinal] | Trial ran 10 years |
| <i>Macrovascular Risk</i> | | | |
| | No difference at 10 years | | |
| Metformin | | | |
| Overweight /obese Diabetic | 50 | One MI or Diabetes event or Death | 10 year follow up |
| Standard < 140 BP control in diabetes any means | 57 | One Stroke or major diabetes event or death | 8 year follow up |
| Tight BP control in diabetes | | | |
| BP 120 v BP 134 | 500 | Prevent one stroke | 4 years minimum for effect |
| Number needed to harm for this strategy | 50 | | |

| Osteoporosis [Alendronate + Calcium/VitD] | 2y Prevention Vertebral # | 2y Prevention Hip # | Notes for Osteoporosis |
|---|---------------------------|---------------------|---|
| 70 -74 years | 65 | 430 | NNT per annum to prevent further # |
| 75 - 79 years | 45 | 180 | Potential symptomatic benefit re Vertebral # |
| 80 - 84 years | 60 | 105 | Normally 2 years needed to see effect. |
| 85 - 89 years | 55 | 45 | |
| 90+years | 40 | 40 | |

| | | | |
|---|--|--|---|
| <p>High Risk Combinations These combinations are noted to be particularly high risk and should be looked for and stopped at every drug review. NSAID +ACE or ARB + Diuretic ['Triple Whammy' combo] +eGFR <60 +diagnosis heart failure +Warfarin +age >75 without PPI Heart Failure +Glitazone +NSAID +Tricyclic antidepressant</p> | <p>Warfarin + another antiplatelet. +NSAID +Macrolide +Quinolone +Metronidazole +azole antifungal</p> <p>Drugs for which specialist advice is strongly advised before altering include:</p> <ul style="list-style-type: none"> • anticonvulsants for epilepsy • antidepressant, antipsychotic and mood stabilising drugs (eg lithium) • drugs for the management of Parkinson's Disease • amiodarone • disease-modifying antirheumatic drugs. | <p>Drugs that are tolerated poorly in frail patients It is particularly important to clarify if patients on the following have a Valid and Current Indication and are still felt to be effective.</p> <ul style="list-style-type: none"> • Digoxin in higher doses 250 microgram + • Antipsychotics • Tricyclic antidepressants • Benzodiazepines particularly long term • Anticholinergics • Phenothiazines [eg prochlorperazine] • Combinations painkillers [eg cocodamol v paracetamol] | <p>STOP if dehydrated</p> <ul style="list-style-type: none"> • ACE inhibitors • Angiotensin 2 Receptor Blockers • NSAIDs • Diuretics • Spironolactone , Eplerenone • Metformin <p style="text-align: center;">In Dehydrated Adults</p> <p>For example those suffering from more than minor vomiting/diarrhoea. Restart when well (eg 24 to 48 hrs eating and drinking normally). Adults with advanced heart failure can decompensate rapidly off drugs and adults with more than minor dehydration in this group need urgent specialist advice.</p> |
|---|--|--|---|

NNT are a guide; they do not give exact figures for individuals patients Older people have increased absolute event rates, thus NNT to prevent one event may be lower in older people – conversely NNH are likely to be higher – see weighing the benefit / risk in NNT [section 2.2](#)

2.4 Indications of shortened life expectancy

We suggest that following guidance contained in the prognostic indicators guidance from the Gold Standards Framework incorporated into the 'Living Well/ Dying Well' strategy enables better identification of patients who may need supportive/ palliative care. A full copy of this is available at:

<http://www.goldstandardsframework.org.uk/Resources/Gold%20Standards%20Framework/General/Prognostic%20Indicator%20Guidance%20October%202011.pdf>

Triggers which can be used to identify main patients include:

1. Where the answer to the question 'would you be surprised if this person were to die in the next 6 to 12 months?' is 'no'.
2. Choice/ need – where a patient with advanced disease is making a choice for comfort care rather than 'curative' treatment.
3. One clinical indicator often associated is patients requiring help with multiple activities of daily living either at home or in care home due to:
 - a. Advanced organ failure
 - b. Multiple co-morbidity giving significant impairment in day to day function
 - c. Advanced dementia

The Gold Standards Framework gives specific information as to what tends to indicate poor prognosis in a number of conditions, for example frailty.

Frailty

Frailty is well defined as a 'reduced ability to withstand illness without loss of function'.

The Gold Standards Framework defines this further as:

- Multiple co-morbidities with signs of impairment in day to day functioning
- Combination of at least three of:
 - weakness
 - slow walking speed
 - low physical activity
 - weight loss
 - self-reported exhaustion

2.5 High risk medication

The following section outlines common medication issues. It includes advice on

- high risk combinations to avoid
- information on providing medication during intercurrent illness.
- medicines which, if stopped, can result in rapid symptomatic decline and
- medicines where specialist advice should be sought before changes are made.

Lists of medications considered not advisable in frail adults are available e.g. the STOPP tool but these lists can be unwieldy to use in routine practice. The BNF sections to target is a modified version of the STOPP tool developed in Tayside.

[Please see the BNF sections to target](#)

Medication most associated with admission due to adverse drug reaction

In a 2004 UK study the most common drug groups associated with admission due to adverse drug reaction ('ADR') were:

| | | |
|-----|-----------------|-------|
| 1. | NSAIDs | 29.6% |
| 2. | Diuretics | 27.3% |
| 3. | Warfarin | 10.5% |
| 4. | ACE | 7.7% |
| 5. | Antidepressants | 7.1% |
| 6. | Beta blockers | 6.8% |
| 7. | Opiates | 6.0% |
| 8. | Digoxin | 2.9% |
| 9. | Prednisolone | 2.5% |
| 10. | Clopidogrel | 2.4% |

Adverse drug reactions as cause of admission to hospital: prospective analysis of 18 820 patients M Pirmohamed et al, BMJ 2004;329:15-19

High risk drug combinations to avoid

The following are highlighted as being particularly high risk combinations and should be avoided where possible and clearly justified when considered necessary. This list is **NOT exhaustive**, and the safety of other medication has to be considered depending on individual circumstances. The list is supported by recent research looking at what combinations are commonly found when analysing prescribing databases in Scotland.

- **NSAID**
+ ACE inhibitor or A2RA + Diuretic + diagnosis heart failure
+ eGFR < 60 ml/min + Warfarin
+ age > 75 years without PPI
- **Heart Failure**
+ NSAID + Glitazone + NSAID
+ Tricyclic antidepressant
- **Warfarin**
+ Other antiplatelet(s) +NSAID
+ Macrolide +Quinolone

+ Metronidazole

+Azole antifungal

High risk prescribing in primary care patients particularly vulnerable to adverse drug events: cross sectional population database analysis in Scottish general practice. Guthrie B, McCowan C, Simpson CR, Dreischulte T, Barnett K. BMJ 2011; 342:3514 doi: 10.1136/bmj.d3514

Drugs poorly tolerated in frail adults

- Digoxin in doses of 250 micrograms or greater
- Antipsychotics
- Tricyclic antidepressants
- Benzodiazepines
- Anticholinergics
- Phenothiazines
- Combinations analgesics

Anticipatory care during intercurrent illness: drugs and dehydration

Medicines to stop in dehydrated patients

For example, patients suffering from more than minor vomiting and/or diarrhoea:

- ACE inhibitors
- A2RAs
- NSAIDs
- Diuretics
- Spironolactone or eplerenone
- Metformin

Restart when well (eg after 24 to 48 hours of eating and drinking normally). Adults with advanced heart failure can decompensate rapidly and urgent specialist advice should be sought.

Drugs that can be associated with rapid symptomatic decline if stopped

Drugs in this group may require review but commonly will require specialist advice or cautious stepwise withdrawal:

- ACE inhibitors in heart failure (left ventricular impairment)
- Diuretics in heart failure
- Steroids
- Drugs for heart rate or rhythm control (beta-blockers; digoxin).

Drugs for which specialist advice is strongly advised before altering include:

- Anticonvulsants for epilepsy
- Antidepressant, antipsychotic and mood stabilising drugs (eg lithium)
- Drugs for the management of Parkinson's Disease
- Amiodarone
- Disease-modifying antirheumatic drugs

2.6 Areas for specific consideration

Combination Antiplatelet + Warfarin therapy

There are very few indications for the long term use of Warfarin with an antiplatelet drug. It is however easy for a patient to end up on both if an indication for Warfarin develops while on an antiplatelet drug. The bleeding risk of this combination is high.

Taking **warfarin** as baseline i.e. odds ratio of 1 risk of bleeding in a recent large study is as follows

| | | |
|----------------------------------|---------------------|--------------------------|
| Aspirin | 0.93 [0.88 to 0.98] | |
| Clopidogrel | 1.06 [0.87 to 1.29] | |
| Aspirin + Clopidogrel | 1.66 [1.34 to 2.04] | |
| Warfarin + Aspirin | 1.83 [1.72 to 1.96] | |
| Warfarin + Clopidogrel | 3.08 [2.32 to 3.91] | 13.9% bleed/patient year |
| Warfarin + Aspirin + Clopidogrel | 3.70 [2.89 to 4.76] | 15.7% bleed/patient year |

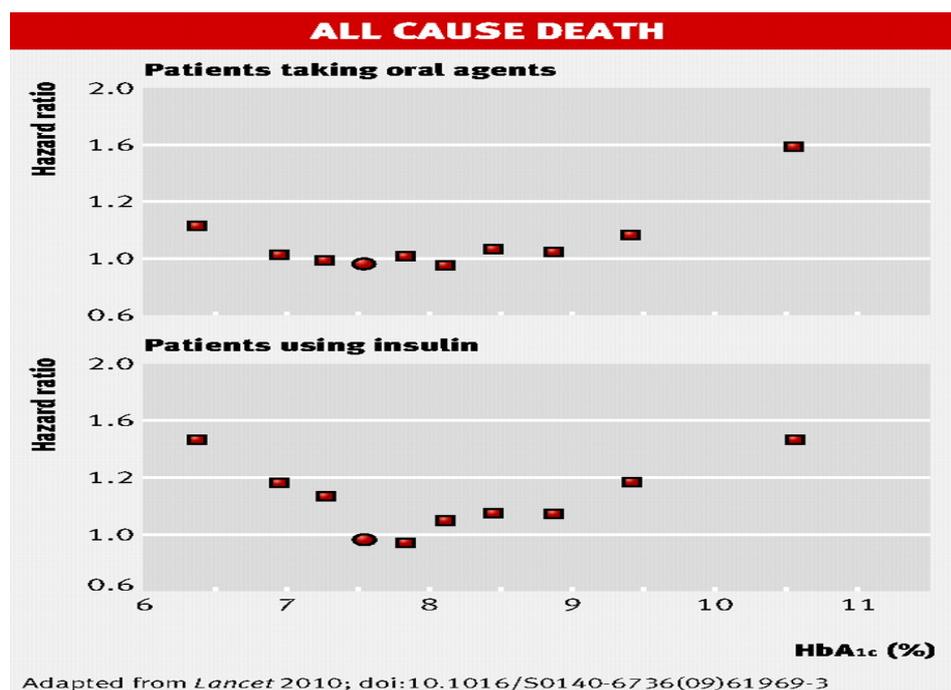
Bleeding defined as: admission to hospital with bleeding related episode or death with bleed. Average Age in trial 70; data from 82 854 patients surviving hospitalisation with atrial fibrillation. Stroke occurrence was lowest in warfarin only group.

[Risk of bleeding with single, dual, or triple therapy with warfarin, aspirin, and clopidogrel in patients with atrial fibrillation Hansen ML, Sorensen R, Clausen MT, et al. Arch Intern Med. 2010 Sep 13;170 (16):1433-41.]

Management of blood glucose control - effects of intensifying control

The evidence from four key randomised controlled trials (UKPDS 33, ACCORD, ADVANCE and VAT shows that whilst intensive control can have benefits in reducing microvascular events, there are also harms, in particular increase in hypoglycaemia (increase 42 events per 1000 treated patients over 4.4 years (CI 25.8-61.7)). The study from Currie et al described below shows that optimal level of 7.5% was associated with lowest all cause mortality.

Potential dangers in lower Hb A1Cs



Researchers analysed data from nearly 48,000 primary care patients who had stepped up their hypoglycaemic treatment. Hb A1c around 7.5% had the lowest mortality. Risk of death rose significantly on both sides of this reference group, reaching a hazard ratio of 1.52 (1.32 to 1.76) for patients in the bottom 10th of HbA1c concentration (median 6.4%), and 1.79 (1.56 to 2.06) for patients in the top 10th (median 10.5%).

The study does have limitations as it was an observational study and that hypoglycaemia was not to be the only factor contributing to increase death in all patients, However, older people were identified as being at greatest risk. These results are of particular concern for the frailer groups of patients covered by the Polypharmacy Guideline who given the long lead time to obtain any supposed benefits from low Hb A1c, may nonetheless suffer adverse outcomes.

[Survival as a function of HbA1c in people with type 2 diabetes: a retrospective cohort study *The Lancet*, 2010 Volume 375, Issue 9713, Pages 481-489C. Currie, et al.]

In addition patients who suffer from hypoglycaemia are at increase risk of falls

Newer oral hypoglycaemics and heart failure

Although the newer agents are effective at reducing HbA1c levels data are lacking to support any reduction in microvascular or macrovascular events, especially concerning cardiovascular effects and long term safety. For example, pioglitazone should not be used in people with heart failure or a history of heart failure or those with a history of fractures (especially postmenopausal), or bladder cancer. MHRA has therefore advised caution in initiating and using such treatment in older people and advised that it should be reviewed regularly .

There is a group of commonly prescribed effective drugs in which particular caution is needed should an adult develop an intercurrent illness while taking them. For the duration of

illness (particularly if dehydrated and especially if also frail) the following advice should be given. This applies to the duration of the illness and is separate from decisions relating to the long term use of these drugs.

Anticholinergic effects of commonly prescribed medication.

Anticholinergics are well recognised as being problematic in frail adults. Predominantly the concern has been around impaired cognition and falls risk. Recent research however also points to a link to mortality increasing with the number and potency of anticholinergic agents prescribed .

As well as the well known anticholinergic medication several commonly prescribed medication that may not be thought of as anticholinergic have significant anticholinergic effects.

The following table shows anticholinergic weighting of a number of common drugs. **The higher the number the stronger the effect.** The chart is intended to enlighten regarding anticholinergic effects rather being used as a day to day tool.

Anticholinergic risk scale

| 1 Point | 2 Points | 3 Points |
|----------------|---------------------|---------------------|
| a. Haloperidol | a. Clozapine | a. Chlorpromazine |
| b. Quetiapine | b. Nortryptiline | b. Amitriptyline |
| c. Mirtazapine | c. Baclofen | c. Imipramine |
| d. Paroxetine | d. Cetirizine | d. Chlorpheniramine |
| e. Trazodone | e. Loratadine | e. Hydroxyzine |
| f. Ranitidine | f. Cimetidine | f. Oxybutinin |
| | g. Loperamide | |
| | h. Prochlorperazine | |
| | i. Tolteridone ? | |

The Anticholinergic Risk Scale and Anticholinergic Adverse Effects in Older Persons. Rudolph JI et al *Arch Intern Med.* 2008;168(5):508-513

Results from further MRC study can be found on link below:

<http://www.uea.ac.uk/mac/comm/media/press/2011/June/Anticholinergics+study+drug+list>

2.7 Specific consideration for patients with dementia



Protocol for Review of Anti-dementia Med
Flow-chart for the Review of Anti-Deme

A best practice guide for optimising treatment and care for behavioural and psychological symptoms of dementia is available from Alzheimer's Society at:

http://alzheimers.org.uk/site/scripts/download_info.php?downloadID=609

Rationalisation of antipsychotics in patients with dementia - good practice guide for deduction/ cessation of treatment

Patients who have dementia and who have been on **antipsychotics for more than 3 months and have stable symptoms** should be reviewed with a view to reducing or stopping antipsychotic medication. Antipsychotics are associated with an increased risk of falls, delirium, cerebrovascular events and all-cause death

Priority groups for reducing antipsychotic medication include:

- People in care homes- the prescription of antipsychotics for BPSD is most common in these people, who are also more frail than other populations
- People with vascular dementia- the risk of cerebrovascular events associated with antipsychotic medication may be higher in this population
- People with dementia who also have a history of cardiovascular disease, cerebrovascular disease or vascular risk factors. The risk of cerebrovascular events associated with antipsychotic medication may be higher in this population

When *not* to stop antipsychotic medication:

- Patients who have a co-morbid mental illness that is treated with antipsychotic medication, such as schizophrenia, persistent delusional disorder, psychotic depression or bipolar affective disorder should not have antipsychotic medication reduced without specialist advice.

Reduction of antipsychotics:

- As with initiation of medication, reduction should be carried out slowly with monitoring of effect.
- Start with a reduction of 25% of the total daily dose.
- If the current dose is low, e.g. at the suggested starting dose, the medication may be stopped without tapering the dose.

Review the effect after one week to assess for:

- The re-emergence of the initial "target" symptoms
- Discontinuation symptoms such as nausea, vomiting, anorexia, diarrhoea, rhinorrhoea, sweating, myalgia, paraesthesia, insomnia, restlessness, anxiety and agitation. These symptoms are more common with abrupt withdrawal of antipsychotic

medication, and generally begin within 1 to 4 days of withdrawal and abate within 7 to 14 days.

- If either of the above occurs the clinician should make an assessment of the risks and benefits of re-instating the previous dose of antipsychotic. Further attempts to reduce the antipsychotic should be made one month later with smaller decrements, for example 10% of the total daily dose.
- If there are no particular problems after week 1 then the dose should remain the same with further review after week 4 (for risperidone and haloperidol) or fortnightly (for Quetiapine).
- If the reduction has been tolerated without any of the effects described above then reduce by a further 25% and repeat the process.
- There will be practical issues when reducing the dose, for example the availability and form of small doses of medication. It is recommended that this is discussed with a pharmacist.
- It is suggested that once the total daily dose is reduced to the recommended starting dose for the individual antipsychotic, it may be stopped.

2.8 BNF sections to target and other factors to consider when conducting a review

Gastrointestinal system

- Proton pump inhibitors and H2 antagonists - consider reducing the dose or stopping, especially if antibiotics are required (remember increase in risk of *C. difficile*) . Consider co-prescribing of PPIs with clopidogrel.
- Long-term laxatives- check compliance, check effectiveness- check dose and choice, check safety- reduce overuse of laxatives if possible. Advice regarding non-pharmacological management is available on <http://www.cks.nhs.uk/constipation>

Cardiovascular system in general

- Anticoagulants - do patients on anticoagulants have an active indication for anticoagulant therapy? Is monitoring robust? Is the INR within the recommended therapeutic range? Are there frequent falls (>1 per week)?
- Antiplatelets- does the patient have a history of coronary, cerebral or peripheral symptoms/ events?- If not – consider stopping antiplatelets. Ensure aspirin/clopidogrel combination reviewed as per cardiology advice. Reduce aspirin to evidence-based doses.
- Diuretics for dependent ankle oedema - consider alternative ways of managing oedema, consider medication causes e.g. calcium channel blockers
- Digoxin in the presence of CKD - consider reducing the dose, or stopping
- AF - is the patient prescribed warfarin or aspirin (use beta blocker, digoxin or amiodarone as a marker of AF).
- Review long-term quinine use- see MHRA advice
- Angina - is the patient prescribed aspirin (use beta blocker, or long-acting nitrates or calcium channel blocker as a marker of angina)
- Consider reducing anti-anginal medication particularly if mobility has decreased with less need for medication

Some guidance on NNT for various indications can be found in [section 2.2](#)

Central nervous system and psychotropic medication

- Hypnotics and anxiolytics - discuss reducing long-term therapy with the aim of stopping
- Antipsychotics for BPSD (Behavioural and Psychological Symptoms of Dementia). in dementia - review the continued need, consider reducing the dose or stopping in line with local guidance
- Cognitive enhancers - Is the cognitive enhancer still effective/ tolerated - What is the most recent MMSE? Contact specialist services for advice.
- Review combinations of antidepressants such as tricyclic antidepressants for analgesia used in combination with other antidepressants for depression
- In general SSRIs are better tolerated in people with dementia who also have depression
- Metoclopramide - review long-term use
- Antihistamines for vertigo - review long-term use
- Consider cumulative GI effects when co-prescribing SSRI's+NSAID's/ aspirin

Analgesic medication

- Long term use of strong opioids for mild-moderate pain – review diagnosis (is pain neuropathic or otherwise not responsive to opiates) and effectiveness - discuss stepping down therapy
- Consider non-pharmacological treatment such as gentle exercise, relaxation or TENS
- Consider topical agents
- Check compliance with long-term analgesia
- Check effectiveness- step up or step down analgesia using the WHO analgesic ladder available on <http://www.palliativecareguidelines.scot.nhs.uk/documents/PainManagement.pdf>
- for non malignant pain see Fife guidance <http://www.fifeadtc.scot.nhs.uk/formulary/sections/FF%20appendix%204C.pdf>
- Check safety - reduce use of NSAIDs and opioids and amitriptyline if possible. Prescribe laxatives with opioids.
- Check labelling includes minimum interval between doses and maximum dose/ day
- Reduce likelihood of paracetamol overdose from concurrent use of more than one paracetamol product.
- Consider paracetamol dose reduction where low body weight or significant reduction in renal or hepatic function

Endocrine system

- Metformin – use with caution in renal impairment and avoid if eGFR < 30ml/min
- Oral corticosteroids for long term use – maintenance dose should be kept as low as possible with withdrawal considered where feasible. When possible local treatments e.g. inhalations, creams etc should be used in preference to systemic treatment

Urogenital system

- Alpha-blockers for more than 2 months for benign prostatic hypertrophy in men with long term urinary catheters - consider stopping
- Finasteride in men with long term urinary catheters- discuss with urology team re: stopping

Musculoskeletal system

- NSAIDs - is the patient on a long-term NSAID for non-inflammatory pain - discuss stopping
- Bone health - has the risk of osteoporosis been assessed? Can the patient take bisphosphonates or calcium as prescribed? Consider local guidelines around management of osteoporosis and bisphosphonate holidays
- DMARD - does the patient have moderate-severe rheumatoid disease lasting for >12 weeks. Consider referral to rheumatology

Other

- Review the need for long-term antibiotic prophylaxis-
- Review the need for long term antibiotic/ antifungal/ steroid creams and ointments

Cost effective prescribing

Refer to the full range of local prescribing indicators to support cost effective prescribing. Consider issues such as :

- Can dose schedules be optimised e.g. use higher strength formulations of pregabalin, quetiapine or lower strength formulations of gabapentin 600/800mg tablets and fluoxetine 60mg caps
- Are any drugs of limited value being prescribed e.g. naftidrofuryl, quinine - review
- Are any non formulary medicines prescribed – review
- Therapeutic duplication- are two drugs from the same class prescribed? e.g. Lactulose and Laxido- stop one and titrate the dose of the other.
- "As required" medicines that are on repeat but not needed (e.g. Paracetamol)
- Other prescribed items which are no longer needed e.g. Test strips due to change in advice regarding frequency of monitoring blood glucose in type II diabetes.

Prescribing for symptoms or in particular conditions

Falls

Review the need for:

- Any long-acting or long-term hypnotic or anxiolytic. It is useful to reduce the dose if the medication cannot be stopped completely. Specific information on the reduction of benzodiazepines and Z drugs can be found as a NHS Clinical Knowledge Summary, http://www.cks.nhs.uk/benzodiazepine_and_z_drug_withdrawal and insomnia guidance at <http://www.cks.nhs.uk/insomnia>
- Antihypertensives/diuretics. Stopping or reducing the dose of Calcium Channel Blockers may be indicated if the patient has ankle swelling resistant to diuretics. For people on combinations of antihypertensives, consider reducing the doses or stopping some of the drugs if signs of postural hypotension are evident. If diuretics are for dependent ankle oedema consider other management strategies. Optimise antihypertensive therapy bearing in mind the falls risk, mobility and postural hypotension.
- Other CNS medication- review the need for antidepressants and antipsychotics, and anti-epileptic medication especially if used for atypical pain
- First generation (sedating) antihistamines
- Review any anticholinergic drugs for bladder spasm or other drugs with anticholinergic side effects e.g. tricyclic antidepressants, digoxin.

2.9 References

Trials used to complete drug effectiveness summary

Cardiac trials

Effect of enalapril on survival in patients with reduced left ventricular ejection fractions and congestive heart failure. The SOLVD Investigators NEJM Volume 325:293-302 August 1, 1991 Number 5

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The Cardiac Insufficiency Bisoprolol Study II (CIBIS-II): a randomised trial. *Lancet*. 1999 Jan 2;353(9146):9-13.

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Setoguchi et al Improvements in Long Term Mortality after Myocardial Infarction *J of AM College of Cardiology Vol. 51, No. 13, 2008 April*

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Antithrombotic Trialists' Collaboration. Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. *BMJ* 2002;324:71–86.

PROGRESS Collaborative Group. Randomised trial of a perindopril-based blood pressure-lowering regimen among 6105 individuals with previous stroke or transient ischaemic attack. *Lancet* 2001;358:1033–1041.

10-Year Follow-up of Intensive Glucose Control in Type 2 Diabetes Rury R Holman, Sanjoy K Paul, M Angelyn Bethel, David R Matthews, H Andrew W Neil. *The New England Journal of Medicine*. Boston: Oct 9, 2008. Vol. 359, Iss. 15; pg. 1577

Halkes et al Dipyridamole plus aspirin versus aspirin alone in secondary prevention after TIA or stroke: a metaanalysis by risk *J. Neurol. Neurosurg. Psychiatry* 2008;79:1218-1223

Rashid P, Leonardi-Bee J, Bath P. Blood pressure reduction and secondary prevention of stroke and other vascular events. A systematic review. *Stroke* 2003;34:2741–2749.

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Warfarin

Warfarin versus aspirin for stroke prevention in an elderly community population with atrial fibrillation (the Birmingham Atrial Fibrillation Treatment of the Aged Study, BAFTA): a randomised controlled trial *Lancet* 2007; 370: 493–503.

Hypertension

Pharmacotherapy for hypertension in the elderly. *Cochrane Database of Systematic Reviews* 2009, Musini VM, Tejani AM, Bassett K, Wright JM Issue 4. Art. No.: CD000028. DOI: 10.1002/14651858.CD000028.pub2.

Statins

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Renal Function and requirement for dialysis in chronic nephropathy patients on long term ramipril: REIN follow-up trial. Gisen Group Lancet 1998;352:1252-56.

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Bleeding risk and antiplatelet strategies

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Aspirin in secondary prevention

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High Risk Prescribing in primary care patients particularly vulnerable to adverse drug events: cross sectional population database analysis in Scottish general practice. Guthrie B, McCowan C, Simpson CR, Dreischulte T, Barnett K. BMJ 2011; 342:3514 doi: 10.1136/bmj.d3514 *Source of high risk drug group information.*

Section 3: Administrative Considerations

3.1 What should be happening under QOF to address medication reviews?

As part of the GP contract, medication review is covered under medicines indicator 11 and 12- detail is shown below:

Medicines 11 A medication review is recorded in the notes in the preceding 15 months for all patients being prescribed four or more repeat medicines (Standard 80%)

Medicines 12 A medication review is recorded in the notes in the preceding 15 months for all patients being prescribed repeat medicines (Standard 80%)

The detailed guidance states:

Medicines 11.1 practice guidance

Medication is by far the most common form of medical intervention. Four out of five people aged over 75 years take a prescription medicine and 36 per cent are taking four or more. However, we also know that up to 50 per cent of medicines are not taken as prescribed, many medicines in common use can cause problems and that adverse reactions to medicines are implicated in 5 - 17 per cent of hospital admissions.

Involving patients in prescribing decisions and supporting them in taking their medicines is a key part of improving patient safety, health outcomes and satisfaction with care. Medication review is increasingly recognised as a cornerstone of medicines management. It is expected that at least a Level 2 medication review will occur, as described in the briefing paper linked below:

http://www.npc.nhs.uk/review_medicines/intro/resources/agtmr_web1.pdf

The underlying principles of any medication review, whether using the patient's full notes or face to face are:

1. All patients should have the chance to raise questions and highlight problems about their medicines
2. Medication review seeks to improve or optimise impact of treatment for an individual patient
3. The review is undertaken in a systematic way by a competent person
4. Any changes resulting from the review are agreed with the patient
5. The review is documented in the patient's notes
6. The impact of any change is monitored

Guidance is given in the document as to how this might be evaluated

Please see the below link to QOF guidance 2012/13

<http://bma.org.uk/practical-support-at-work/contracts/independent-contractors/gof-guidance>

3.2 SPARRA data for all risk categories and authority for access to data Polypharmacy analysis



SLWG

Polypharmacy-July 2012

SPARRA (Scottish Patients at Risk of Readmission and Admission) is a risk prediction tool developed by ISD which predicts an individual's risk of being admitted to hospital as an emergency inpatient within the next twelve months. Each quarter, risk scores are calculated for approximately 3.2 million individuals aged 16 and over (approximately 62% of the Scottish population) and details of those whose score indicates that they may be at increased risk of emergency hospital admission are distributed to NHS Boards, CHPs and other health agencies.

The SPARRA risk score is the percentage likelihood that the individual will have an emergency hospital admission in the next twelve months. The current SPARRA algorithm, SPARRA Version 3, calculates the risk of admission using a statistical model based on each individual's history of hospital admission, A&E attendance, outpatient attendance and psychiatric inpatient admission. The model also takes account of the medication dispensed to an individual in the most recent 12 months of data available. For further details please see: <http://www.isdscotland.org/Health-Topics/Health-and-Social-Community-Care/SPARRA/SPARRA-Version-3/>.

This analysis makes use of data from the January 2012 SPARRA release to look at the number of older adults in each NHS Board area in various risk score and polypharmacy categories. The purpose of the analysis is to provide data to support the decision regarding which group of patients to target for medications review.

SPARRA Risk Score: The risk scores presented relate to the estimated risk of emergency hospital admission for the period 1st July 2012 to 30th June 2013. Patients have been grouped by risk scores into 20-40%, 40-60% and 60-80% - i.e. low to moderate, moderate and high risk of emergency admission.

Polypharmacy: The polypharmacy measure used in this analysis is the number of different BNF Sections dispensed to each individual in the twelve month period from 1st June 2011 to 31st May 2012.. Figures are presented for 5-9 and 10+ BNF Sections.

Age: Age as at 1st July 2012. Figures are presented for individuals aged 65 and over and for those aged 75 and over.

The tables show the number of individuals in each NHS Board area who are in each of the above risk score, polypharmacy and age categories. The numbers taking high risk medications, who are in a care home and who have prescriptions and/or previous hospital admissions which indicate dementia are also shown. High risk medications are defined as medications in any of the following BNF Sections:

- 2.1 – Positive inotropic medication
- 2.2 – Diuretics
- 2.4 – Beta-adrenoceptor blocking medication (beta-blockers)
- 2.5 – Hypertension and heart-failure
- 2.8 – Anticoagulants and protamine
- 2.9 – Antiplatelets
- 4.1 – Hypnotics and anxiolytics

4.2 – Medication used in psychoses and related (Antipsychotics)

4.3 – Antidepressants

10.1 – Medication used in rheumatic diseases and gout

Please note that cells with small values have been suppressed to avoid the risk of disclosure.

It is proposed that a sensible target group for medications review might be individuals with a 40-60% risk of admission - i.e. older patients with high levels of polypharmacy and moderate risk of admission. The rationale for this is that individuals in the lower risk strata (20-40%) taking multiple medications are likely to be relatively stable in their condition and those in the higher risk group (60-80%) may already be receiving a high level of management/support.

Examination of the analysis will allow this group of patients to be broken down further with a view to identifying selection criteria which balances numbers of patients and the likely benefit to these patients of medications review. For example there are just over 35,000 individuals in the age 75+, 40-60% risk and 10+ BNF sections category. This equates to approximately 35 patients who would be eligible for review in an average practice. The analysis also shows that 98% of individuals in this category are taking one or more high risk medications, 19% are in a care home and 15% have prescriptions and/or previous hospital admissions which indicate dementia. Reducing the age threshold to 65 increases the average number of patients per practice to 44.

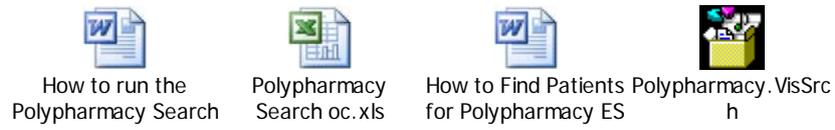


SPARRA Confidential
Data Release Form (F



SPARRA Reporting
(PSLWG)

3.3 Searches for GP prescribing systems: VISION and EMIS



Thanks to Oliver Campbell and Barry Melia, NHS Lothian for VISION searches and to NHS Borders for EMIS searches.

3.4 Data and evaluation

Minimum data requirement for follow-up and evaluation.

NHS Boards will be asked to report back on the following data for both local and national evaluation:

- **Number of patients reviewed from the list given and CHI numbers and date of review**

The national database of dispensed items held at ISD Scotland (New_PIS: the new Prescribing Information System) will allow monitoring of pre-review dispensing patterns and follow-up of post-review dispensing patterns.

Such monitoring and follow-up of dispensing at patient level depends upon CHI number being present in New_PIS for a sufficient proportion of dispensed items. CHI completeness on New_PIS is currently running at around 95% overall and is slightly higher than this for prescriptions issued within GP surgeries. Thus dispensing histories can be assessed with a reasonable level of accuracy.

Post review – data collection

Using the CHI identifier recorded at the point of review, the patient pathway can be traced post-review. At a specified point in time after the review, which is yet to be confirmed, e.g. one year, information about the patient admission history, e.g. length of stay, regular prescription at post-review date can be obtained.

Thus if we know the CHI number and date of each review, we will be able to ascertain in whatever detail is necessary, the level and pattern of dispensing for each patient in a given period before and after the review. This will enable evaluation of the impact of the reviews in terms of, for example, number of items dispensed, specific items dispensed and cost.

To assist implementation of the guidance, work will continue to develop GP IT templates for VISION and EMIS, that will assist clinicians follow the drug review process within their consultations. An example of such a template is shown in [section 3.5](#)

If boards want to collect more detailed data, then the collection tool provided in [section 3.5](#) may be useful for this purpose.

Recommended method of evaluation

Given the data and information that is likely to be available at the point of review, the most feasible form of health economic evaluation would be a cost consequence analysis (CCA). This is a form of cost effectiveness analysis comparing alternative interventions or alternative states in which the components of incremental costs (e.g., pharmaceutical reviews, hospitalisation) and consequences (e.g., health outcomes, adverse effects) are converted into a cost-effectiveness ratio.

In the case of polypharmacy reviews CCA would measure the direct (and indirect) costs associated with the intervention, recording physical changes that happen directly and indirectly after intervention.

This method was selected because it avoids issues associated with sample selection, including sample selection bias, ethical difficulties with dividing the patient sample into review/non-review and regression to the mean, which would complicate this type of analysis.

Preliminary estimates of direct cost avoidance from medications stopped

The following table gives a potential overview of the scale and range of **potential costs avoided** (potential savings) from stopping medications as a consequence of a scheduled review. These estimates are purely for **illustrative purposes** and are not to be seen as set target against which outcomes should be measured.

The table makes use of estimates of the number high risk patients which fall into the relevant SPARRA selection criteria. Note that the age group 65+ includes the group of 75+ patients, however, the two segments of 5-9 BNF and 10+ BNF sections are independent.

In the event that one or two items are stopped per review respectively and applying an average cost per item of £10.93 (BNF 2010/11 published statistics), this would give a range of one-off cost avoided of between roughly £72k and £944k respectively. If it is assumed that each of these items can be stopped on an ongoing basis, then annual costs reduction over one year (average of 6 prescriptions), would be between approximately **£433k and £5.66m**

Estimated cost avoidance from medications stopped through polypharmacy review

| | 10+ BNF sections | | 5-9 BNF sections | |
|---|-------------------------|------------|-------------------------|------------|
| | Age 75+ | Age 65+ | Age 75+ | Age 65+ |
| Number of patients ¹ with high risk medicines ² | 34,454 | 43,190 | 6,610 | 7,832 |
| | | | | |
| Average cost per item from BNF 2010/11 | £10.93 | £10.93 | £10.93 | £10.93 |
| | | | | |
| Assumed cost avoidance if 1 item stopped once | £376,422 | £471,866 | £72,217 | £85,567 |
| Assumed cost avoidance if 2 items stopped once | £752,845 | £943,733 | £144,433 | £171,135 |
| Assumed number of repeats stopped per item over one year | 6 | 6 | 6 | 6 |
| Assumed cost avoidance if 1 item stopped repeatedly for one year | £2,258,535 | £2,831,198 | £433,300 | £513,405 |
| Assumed cost avoidance if 2 items stopped repeatedly for one year | £4,517,069 | £5,662,397 | £866,600 | £1,026,809 |

¹Individuals within the January 2012 SPARRA Cohort¹ with a risk score of 40-60% and dispensed items in 10 or more BNF sections, age 65+ category includes age 75+ category

²Defined as medications in any of the following BNF Sections: 2.1, 2.2, 2.4, 2.5, 2.8, 2.9, 4.1, 4.2, 4.3 and 10.1.

It is to note, however, that these estimates **do not** take into consideration the **indirect costs avoided** (indirect savings) through wider changes in the patients' pathway, the **costs of implementing the review**, and most importantly, a monetisation of the **wider health benefits** received by the patients, as outlined above.

3.5 Data collection tools

Quantitative

Polypharmacy review template



\\scotland.gov.uk\
dc2\F56_Home\Z603'

Qualitative

Post review questionnaire, thanks to Rhona Gould, NHS Tayside



post review
questionnaire May 20

VISION/ EMIS systems template



Polypharmacy
template v3.0.doc

National therapeutic indicators- currently available

Currently national therapeutic indicators have been developed and three of these currently focus on areas highlighted under polypharmacy.

- Quinine
- Antibiotics
- PPI

[http://www.sehd.scot.nhs.uk/pca/PCA2012\(M\)08report.pdf](http://www.sehd.scot.nhs.uk/pca/PCA2012(M)08report.pdf)

There are other areas that may be developed in the future:

- Analgesia
- Antimuscarinic medication for urinary infrequency
- Polypharmacy indicator

3.6 Key learning from models of care that have been used in Scotland

NHS Highland

Reviews were carried out in GP practices with support from primary care pharmacists and Geriatrician.

Preliminary ESCRO data to the end of March 2011 (approximately six months into project) for North, Mid and South East Highland CHPs have demonstrated that 3,836 patients (1.83% of all patients) were placed on polypharmacy registers in GP practices. Of these patients:

- 3,741 (98%) received a polypharmacy medication review
- 859 (20%) were resident in a care home
- 1,748 (46%) had an anticipatory care patient alert (ACPA)
- 1,078 (25%) had at least one medicine stopped (the total number of medicines stopped was 2289)
- The majority of patients therefore had no medications stopped
- Patients who had medication stopped had an average of 2.5 medications stopped
- 365 (8%) had at least one drug modified or changed (the total number of medicines modified or changed was 490)

The reasons for medication review being conducted were as follows:

| Reason | Count (more than one reason may have applied to individual patients) |
|---|--|
| Patient on > 10 prescribed items and needs number of medicines reviewed | 1,400 |
| Patient has suffered a side effect of medication | 150 |
| Patient has an indication of shortened life expectancy | 272 |
| No Reason Given | 824 |
| Guidelines indicate need for Polypharmacy Review | 1,484 |

The medicines most commonly stopped were medicines that are most commonly prescribed. Most of these are low cost medicines. Estimated Approx £5.50 per drug per month saved. Cost of reviews as to March 2011. [£60 per review * 3741 = £224 460; £5.50 for each drug stopped for a year = £151, 000]

22.1% drugs stopped in Chapter 4 BNF (e.g. analgesics, hypnotics, antidepressants, etc) however, drugs were stopped across a huge range. The top 13 stopped (50% of drugs stopped are in this group). The other 50% are across 140 different BNF codes. Creams, dressings, etc excluded.

| | |
|--------|----------------------|
| 11.60% | Cholesterol lowering |
| 9.20% | Aspirin |
| 4.30% | Etidronates |
| 3.40% | PPI |
| 3.20% | ACE |
| 3.00% | Thiazides |
| 2.70% | Osmotic Laxatives |
| 2.70% | Loop diuretics |
| 2.40% | Beta blockers |
| 2.10% | Opioid Analgesics |
| 2.10% | Oral Iron |
| 2.00% | Oral Anticoagulants |
| 1.90% | SSRIs |

The figures for drugs stopped is felt to be an underestimate. There were software difficulties in that if a GP removed drugs from a repeat prescribing list as part of a review then went back to fill in the data on drugs stopped for the Enhanced Service payment at a later date.

Relationship to QOF

In order to avoid concerns over an increase in QOF exemptions it was agreed across Highland that if a QOF indicated drug was stopped as part of a Polypharmacy review following the NHS Highland Guideline that the exemption would be coded as 'Polypharmacy'. This allowed uniform coding across Highland.

National Level Data

ISD has been involved in trying to track any changes in prescribing patterns across NHS Highland in older adults following the guidelines introduction. At present there seems to be a flattening of the increase (and a small dip in some age groups) versus a previous trend of steady increase in the number of adults on > 10 medications.

To be useful this data will need to be compared to national trends.

NHS Tayside

Various models of care have been tested in Tayside. All of these involved face-to-face level 3 medication reviews with the patient (and carer/ welfare proxy where appropriate)

Models included reviews by:

- GP as a single professional
- Locality (practice) pharmacist as a single professional
- Medicine for the elderly consultant with specialist pharmacist
- GP with locality pharmacist and a medicine for the elderly consultant

Patients reviewed depended on the model used and the remuneration available, and groups targeted included:

- Those in care homes
- Those over 75 years old on more than 6 medicines and with a long term condition
- Those over 75 years old on more than 12 medicines

Outcomes

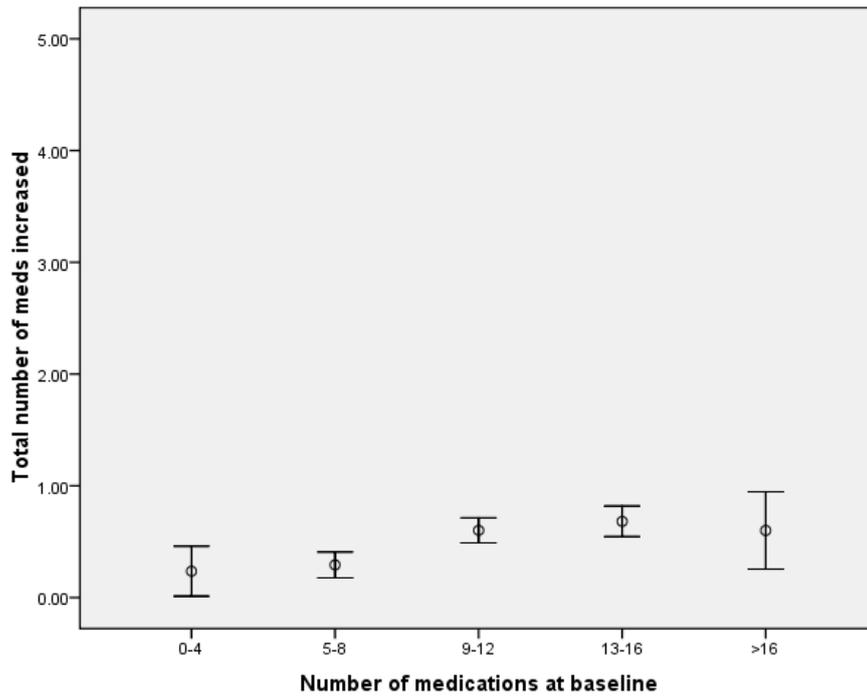
Quantitative and qualitative data were collected. One of the main aims of the workstream was to involve GP practices in some model of polypharmacy medication review. After 1 year more than 50% of GP practices had participated in at least one project. The multidisciplinary model (GP with pharmacist and medicine for the elderly consultant) with access to both primary care and secondary care medical records resulted in more changes to medication than a single professional model. Patients were generally positive about the reviews: Patient quote after review: "its revolutionised my breathing".

Number of medication changes – comparison of single profession vs MDT

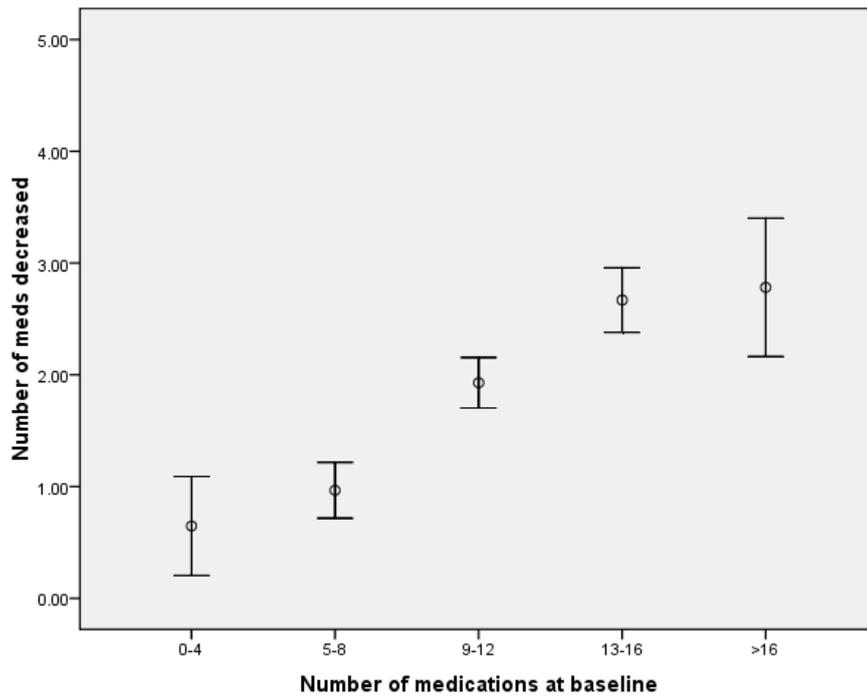
| | MDT (n=409) | Single prof (n=86) | p |
|----------------------|-------------|--------------------|--------|
| Meds started | 0.44 | 0.36 | 0.37 |
| Meds stopped | 1.82 | 0.97 | <0.001 |
| Meds increased | 0.13 | 0.16 | 0.52 |
| Meds decreased | 0.37 | 0.31 | 0.43 |
| | | | |
| Total meds increased | 0.57 | 0.52 | 0.62 |
| Total meds decreased | 2.19 | 1.28 | <0.001 |
| Total changes | 2.76 | 1.80 | <0.001 |
| Net decrease | 1.62 | 0.75 | <0.001 |

NB. Means given, although significant skew. Medians for most groups = 0

Relationship of number of changes to number of medications prescribed:



R=0.16, p for trend: <0.001



R=0.37, p for trend: <0.001

Key learning

Some of the staff learning from the multidisciplinary model includes:

- Paper reviews are not as good as having the patient/ carer present. e.g. for housebound patients we may do a paper review but we can't ask questions about analgesia, or when they take medicines
- The combined review is much more effective than an individual doing a review
- Quality improvements- we are picking up people who have fallen through the net and referring them
- Primary care (GP and pharmacist) have learned from the consultant and vice versa

NHS Lothian

In Lothian all GP practices were invited to take part in polypharmacy reviews. The practices were asked to link the reviews with patient Anticipatory Care Plans (ACP's) and can be categorised into two arms:

- Practices were asked to review all patients resident in nursing homes
- Review patients living in the community, aged 75 years and over and taking 10 or more medicines

Lead practices for each nursing home in Lothian were identified through the primary care contracts team and VISION/ EMIS searches developed which practices were asked to run in order to identify appropriate community patients for review. The reviews were jointly undertaken with clinical pharmacists and the GP after initial preparation by the pharmacist. A geriatrician was available for the reviews if the GP wanted additional support either face to face, telephone or email.

Regular peer review amongst clinical pharmacists occurred and geriatricians attended to speak about decision making for specific drug groups e.g. dementia therapies.

Clinical guidelines shared with all practices, and used at the joint reviews had been peer reviewed by local consultants, specialist pharmacists, GP leads and approved for use through the appropriate medicines governance committees of Lothian.

Initial findings from the pilot study

There were 69 GP practices participating in the pilot project from January 2012 – end April 2012. Reviews are ongoing and as at end June 2012 pharmacists have undertaken or are in progress of completing over 1290 patient reviews (of these 829 patients were resident in nursing homes and 461 resident in the community).

Detailed analysis of GP returns following implementation of the agreed prescribing actions has been undertaken on **186 patients** – analysis continues on an ongoing basis for all other patients.

The number of medicines stopped were: 135
Of which 33% were high risk medicines

The number of medicines reduced were: 29
Of which 48% were high risk medicines

Examples of high risk medicines stopped were as follows (expressed as a percentage of all **high risk medicines stopped** (n=44))

| | |
|------------------------------|-----|
| Aspirin / clopidogrel | 43% |
| Diuretics | 29% |
| Hypnotics | 7% |
| Antipsychotics | 7% |
| Antidepressant / Anxiolytics | 5% |
| Anticholinergics | 5% |

Examples of high risk medicines with doses reduced were as follows (expressed as a percentage of all **high risk medicines reduced** (n=14))

| | |
|-------------------------------|-----|
| Antidepressants / Anxiolytics | 29% |
| Ace inhibitors | 14% |
| Anticholinergics | 14% |
| Diuretics | 14% |
| Opiates | 14% |

A primary care pharmacy technician undertook detailed analysis of medicines stopped and reduced. The financial efficiency saving from the holistic level 3 medication review demonstrated an average **saving of £135 per annum per patient reviewed by the clinical pharmacist and GP.**

In addition an identified **£10.6K of annual cost avoidance** was identified from the 186 analysed reviews and accounts for duplicate prescriptions, identified over ordering and inactive repeats / as required medications.

NHS Forth Valley

In Forth Valley as part of their QOF QP programme practices were asked to review 4 patients per 1000 as per NHS Highland guidance. Results are shown below:

Forth Valley

| | |
|--------------------------|-------|
| Total Patients Reviewed: | 1,243 |
| Total Meds Stopped: | 1,456 |
| Total Meds Restarted: | 93 |

| NSAIDs | | | |
|---------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 67 | ADR/not tolerated | 2 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 9 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 41 | Other |
| | In High Risk Combination | 0 | |
| | Other | 6 | |
| | | 8 | |

| Diuretics | | | |
|-----------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 145 | ADR/not tolerated | 19 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 11 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 94 | Other |
| | In High Risk Combination | 0 | |
| | Other | 11 | |
| | | 21 | |

| Warfarin | | | |
|----------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 10 | ADR/not tolerated | 0 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 1 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 3 | Other |
| | In High Risk Combination | 0 | |
| | Other | 1 | |
| | | 4 | |

| ACE/ARB | | | |
|---------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 85 | ADR/not tolerated | 5 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 10 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 42 | Other |
| | In High Risk Combination | 0 | |
| | Other | 6 | |
| | | 17 | |

| Antidepressants | | | |
|-----------------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 115 | ADR/not tolerated | 16 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 3 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 78 | Other |
| | In High Risk Combination | 0 | |
| | Other | 1 | |
| | | 29 | |

| Betablockers | | | |
|--------------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 42 | ADR/not tolerated | 1 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 6 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 25 | Other |
| | In High Risk Combination | 0 | |
| | Other | 1 | |
| | | 6 | |

| Opiates | | | |
|---------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 81 | ADR/not tolerated | 8 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 10 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 54 | Other |
| | In High Risk Combination | 0 | |
| | Other | 1 | |
| | | 13 | |

| Statins/ezetimibe | | | |
|-------------------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 224 | ADR/not tolerated | 10 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 7 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 174 | Other |
| | In High Risk Combination | 0 | |
| | Other | 0 | |
| | | 34 | |

| Benzodiazepines | | | |
|-----------------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 61 | ADR/not tolerated | 4 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 3 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 37 | Other |
| | In High Risk Combination | 0 | |
| | Other | 3 | |
| | | 16 | |

| Other | | | |
|---------|--------------------------|-----------|------------------------------|
| Stopped | Reason | Restarted | Reason |
| 626 | ADR/not tolerated | 28 | Recurrence of Symptoms/Signs |
| | Compliance Issues | 22 | Patient felt unwell |
| | No Longer Indicated | 0 | Patient wished to restart |
| | Interaction | 455 | Other |
| | In High Risk Combination | 0 | |
| | Other | 9 | |
| | | 80 | |

3.7 Polypharmacy Short Life Working Group membership

| | |
|----------------------|---|
| Henry Simmons | Patient Representative, Alzheimer's Scotland |
| Steve Gilbert | National Clinical Lead, Healthcare Improvement Scotland |
| Neil Houston | Clinical Lead, SPSP, Healthcare Improvement Scotland |
| Steve Kendrick | Information Consultant, ISD, NHS National Services Scotland |
| Mark Sanderson | Principal Information Analyst, ISD, NHS National Services Scotland |
| Nancy Grieg | Patient Representative Liaison, LTCAS |
| Shazia Ahktar | Patient Representative, LTCAS |
| Joyce Mitchell | Pharmacist, NHS Ayrshire and Arran |
| Rosemarie Parr | Director of Pharmacy, NHS Education for Scotland |
| Anthea Lints | GP, NHS Education for Scotland |
| Fiona Love | Practice Nurse, NHS Education for Scotland |
| Noreen Downes | Lead for Prescribing and Clinical Pharmacy, NHS Greater Glasgow and Clyde |
| Stella Clark | Associate Medical Director, NHS Fife |
| Evelyn McPhail | Director of Pharmacy, NHS Fife |
| Graeme Macphee | Consultant Geriatrician, NHS Greater Glasgow and Clyde |
| Jill Gilles | Programme Manager, Health Improvement Scotland |
| Martin Wilson | Consultant Geriatrician, NHS Highland |
| Thomas Ross | CHP Pharmacist, NHS Highland |
| John Cromarty | Director of Pharmacy, NHS Highland |
| Graham Kramer | GP Lead Self Management and Health Literacy, Scottish Government |
| David Oxenham | Palliative Care Consultant, NHS Lothian |
| Alex Joyce | Staff Side, NHS Lothian |
| Libby Morris | eHealth, NHS Lothian/ Scottish Government |
| Kate Wood | Lead Clinical Pharmacist (Elderly), NHS Tayside |
| Michelle Watts | Associate Medical Director, NHS Tayside |
| Bruce Guthrie | Professor in Primary Care, University of Dundee |
| Miles Witham | Senior Lecturer in Ageing and Health, University of Dundee |
| John Gillies | Chair, RCGP/ |
| John Duncan | Vice Chair, RCGP |
| George Romanes | Community Pharmacist, Romanes Pharmacy |
| Alex Mackinnon | Director, RPS |
| Anna Marie McGregor | Professional Support Pharmacist, RPS |
| Alpana Mair (Chair) | Prescribing Advisor/ Therapeutic Partnership Lead Scottish Government |
| Sheena Macdonald | GP Lead, Scottish Government |
| Nils Michael | Health Economist, Scottish Government |
| Gregor Smith (Chair) | Associate Medical Director, NHS Lanarkshire |
| Carol Sinclair | Programme Director, Better Together, Scottish Government |
| Stuart Keys | Programme Manager, QuEST, Scottish Government |
| Jane Harris | Improvement Advisor, QuEST, Scottish Government |