

# Design Guidance

## Medications List

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*Prepared by*  
**Microsoft**

## PREFACE

### Documents replaced by this document

Document Title	Version
Design Guidance – Medications Management – Medications Views	2.0.0.0

### Documents to be read in conjunction with this document

Document Title	Version
Design Guidance – Medication Line	2.0.0.0
Design Guidance – Patient Banner	3.0.0.0
Design Guidance – Displaying Graphs and Tables	2.0.0.0

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# 1 INTRODUCTION

This document provides guidance for the display of a list of medications for one patient in a user interface (UI). It describes what is meant by a list of medications, defines the scope, lists mandatory and recommended guidance points with usage examples, and explains the rationale behind the guidance.

This document replaces the previously published document *Design Guidance – Medications Management – Medication Views {R1}*. A significant number of the changes to the guidance are designed to allow flexibility and encourage innovation. The guidance has been amended to ensure that it is relevant to lists of medications that may have different structures and content, and it has been extended to provide specific guidance where a standard is needed to mitigate patient safety hazards.

Table 1 describes the changes made since the previous release of this guidance:

Change	IDs	Change Description
Deleted	MEDv-001 to MEDv-015	Deleted to remove constraints that relate to specific views other than a medication list, navigation between views and guidance relating to a framework of views
	MEDv-016 to MEDv-018	Removed because they are general versions of the more specific guidance in the sections on Current and Past (MEDv-063), Past Filters (MEDv-066) and Grouping (MEDv-084) respectively
	MEDv-019	Removed as further research is being carried out that may inform the production of guidance for the display of and navigation between different sets of medications information (Levels of Detail)
	MEDv-033	Removed because decision support alerts need to be considered as part of a larger framework
	MEDv-034 MEDv-040	Superseded by more detailed guidance in the document <i>Design Guidance – Medication Line {R2}</i> guidance document, section 3.3.4 'Wrapping'
	MEDv-039	Replaced by MEDi-001 in the document <i>Design Guidance – Medication Line {R2}</i>
	MEDv-041	Replaced by MEDi-018 in the document <i>Design Guidance – Medication Line {R2}</i>
	MEDv-026	Removed because the formatting defined in MEDv-024 and MEDv-025 is sufficient to distinguish medications with a different status
	MEDv-046	Replaced by MEDv-179, MEDv-180 and MEDv-181 as the look-ahead scroll bar (LASB) is now displayed in a reserved space
	MEDv-047	Replaced by the more specific MEDv-181
	MEDv-057	Deleted because medication lines are no longer shown within a recent past notification
	MEDv-060 MEDv-061	Superseded by MEDv-182 because the LASB is no longer recommended as a navigation tool
	MEDv-073	Removed because this is covered by MEDv-068
	MEDv-076 MEDv-078 to MEDv-082	Removed to mitigate UI design and technical issues associated with the display of recent past medications within the current medications list
	MEDv-088	Removed to allow the user to control the grouping and group states (expanded or collapsed) in each of Current and Past medications respectively and independently
	MEDv-093 to MEDv-098	Relate to the duplication of medications that belong in more than one group. Removed as this approach is no longer recommended since guidance cannot effectively mitigate the risks that it has been found to introduce
	MEDv-106	This sorting restriction (do not allow sorting by hidden attributes) has been removed to allow the provision of mechanisms that can support sorting other than by clicking on visible column headings

Change	IDs	Change Description
	MEDv-107 to MEDv-121	Relate to the control and display of Levels of Detail. Removed because guidance can only assess risks by defining the whole view (all of the information displayed for one level of detail). By removing the guidance rather than extending it, we hope to encourage innovation in this area
	MEDv-134	Removed to avoid the implication that the context menu should be used to display information about the selected medications
	MEDv-137 to MEDv-140	Relate to display of detailed information about a single medication. These guidance points have been removed because further work is needed to identify guidance in this area. If all details for one medication are displayed in such a way that occludes the information in the list, there is a risk that the partially visible medications information may be used to inform clinical judgement. This risk needs further assessment, and further design exploration is needed to explore the provision of information without occluding the medications in the list. These risks are best addressed as part of a more comprehensive design for the display of all details for one medication
Modified	MEDv-020	Rephrased and extended to clarify that each line represents one medication
	MEDv-025	Rephrased to remove the potential for it to be interpreted as supporting the display of current and past medications concurrently in the same list
	MEDv-028 to MEDv-032 MEDv-034 to MEDv-038	Replaced with new guidance that provides principles for the ordering and formatting of columns, and for wrapping rather than requiring the display of specific columns in a set order
	MEDv-049	Rephrased to clarify that the order of drugs in the look-ahead notifications must be consistent with the order of medications in the list
	MEDv-056	Rephrased to clarify that the black dot in the look-ahead scroll bar notifications should have a space either side
	MEDv-067	Rephrased to clarify that a 'show all past' (or equivalent) option should be available in the list of filters for past medications
	MEDv-068	Rephrased to differentiate it from MEDv-070, and to clarify that it refers specifically to the presence and location of a control for removing a filter
	MEDv-072	Conformance rating changed from Mandatory to Recommended to allow for brevity in filter notification messages
	MEDv-083	Conformance rating changed from Mandatory to Recommended to allow for the default presentation of grouping to support users focused solely on a specific task
	MEDv-084	Rephrased to replace the 'combo-box' with the more accurate 'drop-down box'
	MEDv-089	Changed so that it only requires counts to be shown in group headings for groups that are collapsed
	MEDv-090	Conformance rating changed from mandatory to recommended in order to allow for the display of group headings for empty groups when the grouping scheme has few groups, and is used for specific tasks that require explicit confirmation of empty groups
	MEDv-099 MEDv-100	Rephrased to clarify that 'start date' and 'end date' are not necessarily the correct definitions or column labels for the dates to which the default sorts are applied
	MEDv-103	Conformance rating changed from Mandatory to Recommended since it is supplementary to the use of an icon to indicate the sort order in a column heading
	MEDv-104	Rephrased to clarify that a text symbol, such as a triangle, could be used instead of an icon
	MEDv-105	Rephrased to refer to the default sort rather than referencing an explicit sort order
	MEDv-127	Extended to describe the keyboard shortcuts explicitly

Change	IDs	Change Description
	MEDv-022 MEDv-059 MEDv-064 MEDv-074	Wording revised for clarity, without altering the meaning
Added	MEDv-141 to MEDv-201	These guidance points have been added

Table 1: Changes since the Previous Release of the Guidance

**Note**

In this document, the words 'generic' and 'brand', when associated with drug names, are used with very specific meanings that may differ from their accepted meanings in other contexts. Refer to section 4.2 for definitions of the specific terminology used in this document.

## 1.1 Customer Need

An electronic system for managing a patient's medications must be able to support the complex needs of a wide range of health care professions and health care settings. A successful display solution must therefore balance those complex information needs with safety concerns, and ensure consistency across views and between systems.

**Medications Incidents** – For example, in the UK, the National Patient Safety Agency (NPSA) reports that the majority of medication incidents reported between January 2005 and June 2006 (59,802 in total) related to the administration of medicines (59.3 percent), followed by incidents related to the preparation and dispensing of medications (17.8 percent) and the prescribing of medications (15.7 percent). Their findings, documented in *Safety in doses: medication safety incidents in the NHS*<sup>1</sup>, also state that the most common types of medication incidents reported to the NPSA included incorrect dose, incorrect strength or frequency, omitted medicine and wrong medicine.

**Existing Systems** – In-patient hospital care settings currently use multiple kinds of medications documents, both paper-based and electronic. As care professionals move between hospitals and are faced with new information groupings while working in stressful environments, the differences in the designs of the documents they use may well already impact patient safety. Differences in display formats for medicines impact both the review and management of those medications and will become a safety concern as electronic systems become more widely available in the next few years. The challenge for designers developing electronic systems in this area is particularly great as there are no universally-accepted paper-based standards to reference.

Research in which extensive studies of medication-related errors were reviewed, suggests that the most powerful means of preventing medication-related errors are computerised order entry and administration management, along with standards for processes and for the writing of prescriptions (see *Medication Errors: Causes, Prevention, and Risk Management* {R4}, *To Err Is Human – Building a Safer Health System* {R5} and *Understanding Patient Safety* {R6}).

Within the UK healthcare industry, emerging standards and guidelines designed to improve medicines management have drawn attention to the need for active review of long term medications in the primary care environment (for instance, see *Room for Review*<sup>2</sup> and

<sup>1</sup> NHS National Patient Safety Agency, *Safety in doses: medication safety incidents in the NHS* {R3}: <http://www.npsa.nhs.uk/nrls/alerts-and-directives/directives-guidance/safety-in-doses/>

<sup>2</sup>Healthcare Commission Patient Survey, *Room for Review: a Guide to Medication Review* {R7}: [http://www.npc.co.uk/med\\_partnership/medication-review/room-for-review/downloads.html](http://www.npc.co.uk/med_partnership/medication-review/room-for-review/downloads.html)

*National Service Framework for Older People (NHS)*<sup>3</sup>. For in-patient settings however, medication reviews are carried out as part of regular and often daily reviews of treatment. Medications are reviewed to assess whether they are achieving the desired therapeutic intent, to ensure that there are no more medications prescribed than is necessary, and to monitor for adverse effects.

An in-patient review of medications may form only part of a more comprehensive review that depends on other information such as observations, test results and clinical notes (including diagnoses and plans). The information required for a medication review will vary for different contexts so it is unlikely that the needs for all kinds of medications review would be met by the design of one, specific UI. However, there are needs that are common to all kinds of medications review. Guidance for these areas can help to mitigate errors caused or heightened by inconsistencies of core medications information between systems.

## 1.2 Scope

This guidance has been designed for the display of medications for a single patient in a hospital ward environment. The guidance applies to the display of information about medications in a list that is organised using columns and rows, and specifically to the way that the information is organised and can be manipulated by the clinical user.

### 1.2.1 In Scope

Guidance Areas	Details
Users	Hospital-based doctors, nurses and pharmacists
Care settings	In-patient, hospital ward environment only
Tasks	Reviewing medications that have been prescribed for a single patient and checking the accuracy of scripts
Medications	<ul style="list-style-type: none"> <li>■ Oral solids and liquids</li> <li>■ Inhalers and sprays</li> <li>■ Eye, ear and nose drops</li> <li>■ Topical liquids</li> <li>■ Creams, ointments and gels</li> <li>■ Enemas and rectal solutions</li> <li>■ Granules and powders</li> <li>■ Insulin</li> <li>■ Suppositories and pessaries</li> <li>■ Topical patches</li> <li>■ Nebuliser solutions</li> <li>■ Simple infusions (by example only)</li> <li>■ Injections (insulin example only)</li> <li>■ Unlicensed medications</li> </ul>
Grouping	Controls for applying and changing sorting and grouping respectively. The display of group headers, expanding and collapsing groups and handling medications that belong in more than one group
Notifications	General notifications, such as 'Patient nil by mouth' and recent past medications
Look-ahead scroll bars	Generic guidance for the display of a LASB in any view and guidance that is specific to the display of current medications and past medications. See section 3.3.20 for a description of the LASB
List structure	Structure and layout of a list of medications
Filtering	Filtering to display current or past medications respectively, and filters to display subsets of past medications

Table 2: In Scope

<sup>3</sup> Department of Health, National service framework for older people {R8}:  
[http://www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/DH\\_4003066](http://www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/DH_4003066)



## 1.2.2 Out of Scope

Table 3 defines areas that are not covered in this guidance. Although there may be specific risks associated with these areas that are not addressed in this guidance, it is likely that the principles in this guidance will extend to the display of medication information in many of the areas listed below.

The patient is indicated as out of scope in so far as not being a user of clinical software; the guidance is designed to support user interfaces used by clinicians. As such, it will therefore present information in formats that are designed to support health care professionals. The display of medication information in views that are designed for patients is not addressed in this guidance.

The care settings listed in Table 3 are out of scope because they have not been studied in depth in our research. The Medication List guidance is likely to be relevant to all of these care settings, but there may be specific risks associated with each that have not been considered and therefore mitigated in this guidance.

Guidance Areas	Details
Users	Non-clinical staff, patients and other health care professionals not listed in the In Scope section (that is, only hospital-based doctors, nurses and pharmacists are in scope).
Care settings	Care settings other than in-patient, hospital ward environments, including: outpatients, clinics, pharmacies, emergency services and departments, intensive care, high dependency unit (HDU), primary care, including general practice, community and home visits, ward management, multi-patient tasks.
Tasks	<ul style="list-style-type: none"> <li>■ Reviewing administration events to gain an understanding of the degree to which the medication has been successfully administered</li> <li>■ Relating medications to information elsewhere in the patient record, including the linking of information in a plan or notes to medications</li> <li>■ Medications reconciliation</li> </ul>
Medications	<ul style="list-style-type: none"> <li>■ Enteral feeds</li> <li>■ Dressings and devices</li> <li>■ Implants and sticks</li> <li>■ Intrauterine devices (IUDs)</li> <li>■ Cements</li> <li>■ Homeopathic products (including complementary and alternative therapies)</li> <li>■ Dialysis solutions</li> <li>■ Injections (except by specific example)</li> <li>■ Infusions and fluids (except by specific examples)</li> <li>■ Combination infusions</li> <li>■ Total Parental Nutrition (TPN)</li> <li>■ Gases</li> <li>■ Blood and platelet products</li> <li>■ Radio-pharmacy</li> <li>■ Variable dose medications</li> <li>■ Foams</li> <li>■ Radioactive agents</li> <li>■ Regimens and order sets</li> <li>■ Advisory Committee on Borderline Substances (ACBS) products</li> <li>■ Over the counter (OTC) medications</li> <li>■ Recreational drugs</li> <li>■ Medications with titrating doses</li> <li>■ Discharge medications – to take out (TTO)</li> <li>■ Patient's own drugs (PODs)</li> <li>■ Epidurals and patient controlled analgesia</li> <li>■ Extemporaneous prescriptions</li> <li>■ Medication prescribed by supplementary prescribers</li> </ul>
Although these medications can be displayed in the List view defined by this guidance, they may have additional requirements or introduce specific risks that are not explicitly addressed by the guidance.	
Identity of a medication	Definition of which attributes can be changed without the need for a new medication line to be represented (in the UI).
All details for one medication	The layout and structure for the presentation of all information about one medication from the selection of a medication anywhere in a clinical application. This includes the selection of a medication to present a separate window or area with more detailed information about that medication.

Guidance Areas	Details
Specific Properties of Individual Medications	Guidance for the indication (as text or as an icon) of specific attributes of a medication, including: <ul style="list-style-type: none"> <li>■ Indicating medications that were added when they were already 'past' medications in order to complete missing information in a past medical history</li> <li>■ Indicating an owner for each medication (for within multi-disciplinary cross boundary records)</li> </ul>
Decision and knowledge support	All forms of decision support, including alerting for allergies and drug-to-drug interactions. Knowledge support such as browsing drugs by classification and looking up information about medications.
Allergies	The display and recording of allergy information and adverse drug reaction risks is covered in a separate guidance document.
Patient consent and preference	Patient preference, such as for a particular drug form. Patient consent, particularly in a mental health context.
Other	<ul style="list-style-type: none"> <li>■ Sealed envelopes</li> <li>■ Supply and dispensing</li> <li>■ Guidance (other than notifications) that might be needed for when a patient is 'Nil by Mouth'</li> </ul>

Table 3: Out of Scope

### 1.3 Dependencies

ID	Dependency
D1	This guidance is informed by the NHS CFH <i>Secondary Care Prescribing Model for Electronic Systems</i> <sup>4</sup>
D2	This guidance is informed by the NHS NPfIT <i>ePrescribing Functional Specification</i> <sup>5</sup> .
D3	This guidance uses the concepts 'generic drug' and 'brand name' and depends on access to, or creation of, a database or dictionary, that can support these concepts, such as the <i>Dictionary of Medicines and Devices</i> (known as 'dm+d') <sup>6</sup> .
D4	This guidance includes guidance points for filtering, sorting and grouping that are expected to be included in a separate guidance document for this area. Availability of such a document may trigger changes to this guidance.
D5	This guidance assumes that a list of medications is provided as part of a larger framework of medications that collectively provide enough information to support a review of the current and past medications of a single patient. A comprehensive understanding of the current status of a patient's medications is expected to be gained from the use of more than one Medications view.

Table 4: Dependencies

<sup>4</sup> NHS CFH – Secondary Care Prescribing Model for Electronic Systems {R9}:  
[http://www.npc.co.uk/med\\_partnership/medication-review/room-for-review/downloads.html](http://www.npc.co.uk/med_partnership/medication-review/room-for-review/downloads.html)

<sup>5</sup> NHS NPfIT, ePrescribing Functional Specification {R10}:  
<http://www.connectingforhealth.nhs.uk/newsroom/news-stories/eprescfunctspec>

<sup>6</sup> Dictionary of Medicines and Devices {R11}: <http://www.dmd.nhs.uk/>

## 2 GUIDANCE OVERVIEW

### Important

The visual representations used within this document to display the guidance are illustrative only. They are simplified in order to support understanding of the guidance points in each section respectively, so some details that are included in usage examples are excluded from the summary. Stylistic choices such as colours, fonts or icons, are not part of the guidance and, unless otherwise specified, are therefore not mandatory requirements for compliance with the guidance in this document.

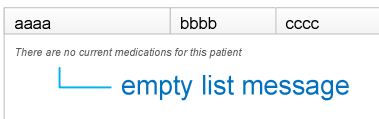

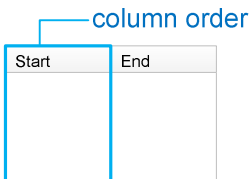

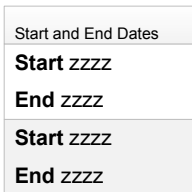

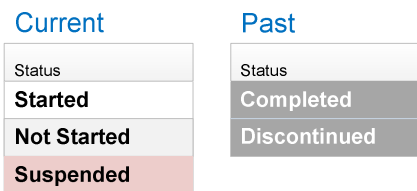
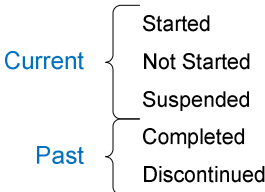
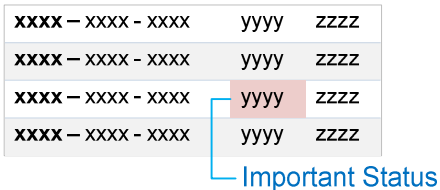

### 2.1 Summary of Guidance

Detailed guidance and rationale for all guidance points is in sections 3.3.1 to 3.3.38. Refer to APPENDIX A for a reference list of all the guidance descriptions. Table 5 provides a summary of the guidance.

### Note

In the **Visual Summary** column, items highlighted in blue indicate correct usage and those in red indicate incorrect usage.

Reference	Section	Visual Summary
MEDv-020 MEDv-141	3.3.1 Tabular Layout	
MEDv-142	3.3.2 Indicating List Length	
MEDv-021	3.3.3 Gridlines	
MEDv-022 MEDv-143 to MEDv-145	3.3.4 Row Formatting Alternate row shading and lines between rows.	
MEDv-023	3.3.5 Displaying Icons for Drug Details	

Reference	Section	Visual Summary
MEDv-146	3.3.6 Empty Lists	
MEDv-147 to MEDv-150	3.3.7 Mandatory Columns	
MEDv-151 to MEDv-154	3.3.8 Date Columns Relative placement of date columns, column widths and recommended date columns to include.	
MEDv-155 to MEDv-157	3.3.9 Column Headings How to label columns appropriately.	
MEDv-027 MEDv-158	3.3.10 Composite Columns How to combine information into a single column.	
MEDv-159 to MEDv-161	3.3.11 Constraining Dimensions How to ensure appropriate column and overall list widths.	
MEDv-162 to MEDv-165	3.3.12 Displaying Status How to display status for medications in the list.	
MEDv-166 to MEDv-173	3.3.13 Specific Status Values Recommended values to use for status.	
MEDv-024 MEDv-025 MEDv-042	3.3.14 Formatting Status How to format the display of status.	
MEDv-062 to MEDv-067 MEDv-174	3.3.15 Controls for Displaying Current and Past Medications	

Reference	Section	Visual Summary
MEDv-099 MEDv-173	3.3.16 Displaying Current Medications	<p><b>Current</b></p>
MEDv-074 MEDv-075 MEDv-077 MEDv-174	3.3.17 Displaying Recent Past Notifications How to present a notification for recently past medications.	<p><b>Current</b></p>
MEDv-100 MEDv-175	3.3.18 Displaying Past Medications Sort order and column placement for past medications.	<p><b>Past</b></p>
MEDv-068 to MEDv-073 MEDv-176	3.3.19 Filtering Past Medications How to support filtering for past medications.	<p><b>Past</b></p>
MEDv-177 to MEDv-181	3.3.20 Displaying a Look-Ahead Scroll B How to present a look-ahead scroll bar.	<p><b>look-ahead notification</b></p>
MEDv-058 MEDv-059 MEDv-182	3.3.21 Defining Look-Ahead Scroll Bar Interactions How a look-ahead scroll bar should behave.	
MEDv-043 to MEDv-045	3.3.22 Displaying Look-Ahead Scroll Bar Notifications How to present look-ahead scroll bar notifications.	

Reference	Section	Visual Summary
MEDv-049 MEDv-183	3.3.23 Selecting Look-Ahead Scroll Bar Contents  How to determine what the contents of a look-ahead scroll bar notification should be.	
MEDv-048 MEDv-052 MEDv-053 MEDv-055	3.3.24 Displaying Look-Ahead Scroll Bar Contents  How to display the contents of a look-ahead scroll bar notification.	
MEDv-056 MEDv-184 MEDv-185	0 Formatting Look-Ahead Scroll Bar Contents  How to format the contents of a look-ahead scroll bar notification.	
MEDv-050 MEDv-051	3.3.26 Drug Names in the Look-Ahead Scroll B  How to present drug names in the look-ahead scroll bar notification.	
MEDv-186 to MEDv-189	3.3.27 Formatting Look-Ahead Scroll Bar Notifications  How to format the look-ahead scroll bar notifications.	
MEDv-054	3.3.28 Displaying a Look-Ahead Scroll Bar for Past Medications  How to display a look-ahead scroll bar in past medications.	
MEDv-084 MEDv-085 MEDv-190	3.3.29 Providing a Grouping Control  How to provide a control to support grouping and the display of the currently selected group.	
MEDv-083 MEDv-087 MEDv-191 to MEDv-193	3.3.30 Supporting Grouping  How to support grouping within the list.	

Reference	Section	Visual Summary
MEDv-086 MEDv-090 MEDv-091 MEDv-194 MEDv-195	3.3.31 Displaying Group Headings  How to display headings for groups.	
MEDv-089 MEDv-092 MEDv-093 MEDv-196	3.3.32 Collapsing Groups  How to support expanding and collapsing of groups.	
MEDv-197 to MEDv-200	3.3.33 Combining Groups to Avoid Duplication  How to combine groups for medications that belong to more than one group.	
MEDv-101 to MEDv-105	3.3.34 Supporting Sorting  How to support changing the sort order.	
MEDv-201	3.3.35 Supporting Levels of Detail  How to support access to medication lists that display different details.	
MEDv-122 to MEDv-127 MEDv-202 MEDv-203	3.3.36 Supporting Selection and Action  How to support selection of list items and access relevant actions.	
MEDv-128 to MEDv-133	3.3.37 Providing Context Menus  How to present a context menu.	
MEDv-135 MEDv-136	3.3.38 Providing Access to Medication Details  How to support access to detailed information about a selected medication.	

Table 5: Summary of Guidance

## 3 GUIDANCE DETAILS

### 3.1 Introduction

This section contains detailed guidance for the display of a list of medications that have been prescribed for a single patient. A list of medications is expected to be one of many ways of displaying medications information for a single patient. This list of medications forms only part of the Medications Management views and tools that would be available in a clinical application.

A full framework for Medications Management in a clinical application might include:

- The definition of a set of views, each of which has a different focus and presentation style
  - The definition of specialist views that combine information in a particular way for use in specific contexts. For example, a monitoring chart for tracking medication doses, observations and test results in a high dependency unit, or a Timeline view for long term management of diabetes
  - Mechanisms for accessing Medications Management tools and navigating between Medications views. These may be dependent on the application architecture
  - The degree to which, and means by which, medications information is integrated into other parts of a clinical application
  - The dimensions of each of the Medications views and the way in which they integrate into the surrounding application. This includes whether views are panels, separate windows or full-screen views, and defines how the user navigates between and interacts with them.
- Figure 1 shows an example of a full width Medications view and Figure 2 shows a Medications view displayed alongside another view

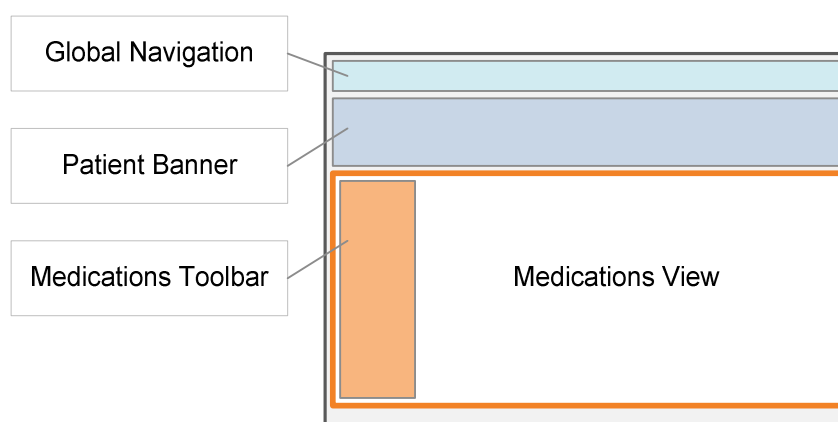


Figure 1: A Medications View within a Clinical Application

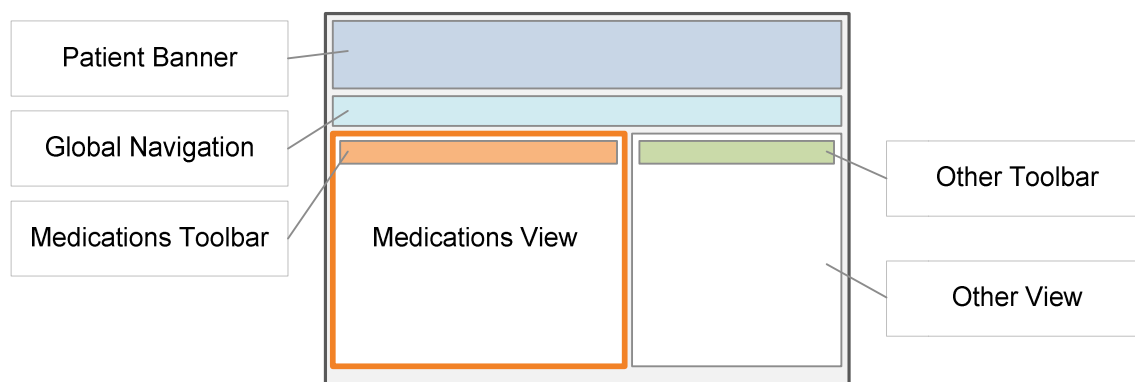


Figure 2: A Medications View Displayed Alongside another View



The Microsoft Health Common User Interface (CUI) program provides design guidance for selected Medications views that are expected to be commonly used, and that would provide more benefit to the user by being consistent between clinical applications.

A common set of Medications views is expected to include:

- A Medications List biew, in line with the guidance in this document
- A Drug Administration view, in line with the document *Design Guidance – Drug Administration {R12}*
- A Timeline view, in which medications and associated events are plotted along a vertical timescale. A Timeline view could be designed to support users reviewing sequences of medications-related events and allow users to review medications being taken on a specific day or within a date range
- A view in which medication doses can be tracked alongside related test results and recorded observations

Medications information is not only displayed in views that are dedicated to Medications Management. The document *Design Guidance – Medication Line {R2}* defines display rules that remain consistent wherever a medication is displayed. Figure 3 shows medications information displayed in a view that focuses on other (non-medications) information:

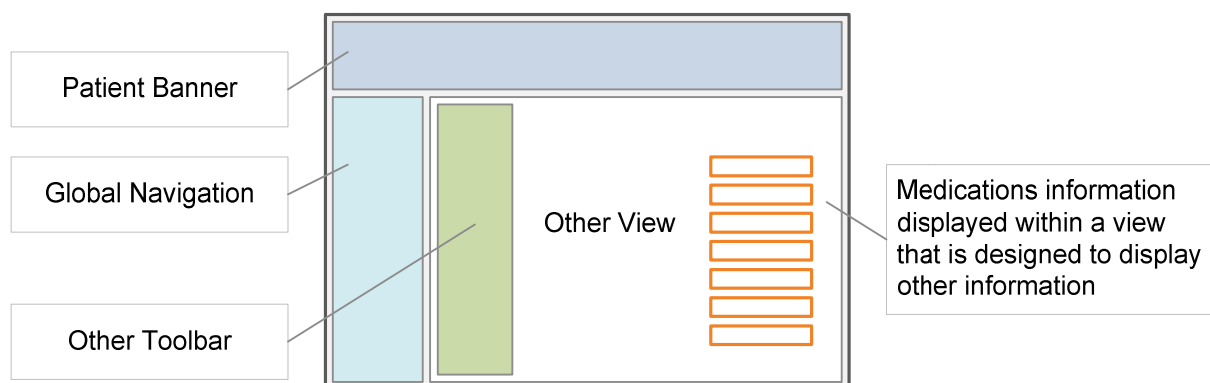


Figure 3: Medications Information Displayed as Part of a View Designed to Display Other Information

Although not displayed within a Medications List view, Drug Administration view or Timeline view, the medications information must still conform to the guidance provided in the document *Design Guidance – Medication Line {R2}*.

## 3.2 Principles

The following key principles inform the guidance in this section:

- Provide the information required to make a high-level clinical assessment of the patient's medications
- Restrict the display of unnecessary information to reduce clutter and prioritise information most likely to require action
- Provide access in context to further details on demand
- Mitigate the potential for action to be taken without sufficient information by presenting carefully selected information by default, avoiding occlusion and providing clear signposts to further information
- Describe inclusion criteria clearly by providing explicit labels to clarify what information is displayed and the extent to which it is complete

### 3.3 Guidelines

Figure 4 is a simplified diagram that shows how some of the areas of guidance fit together in a Medications List view:

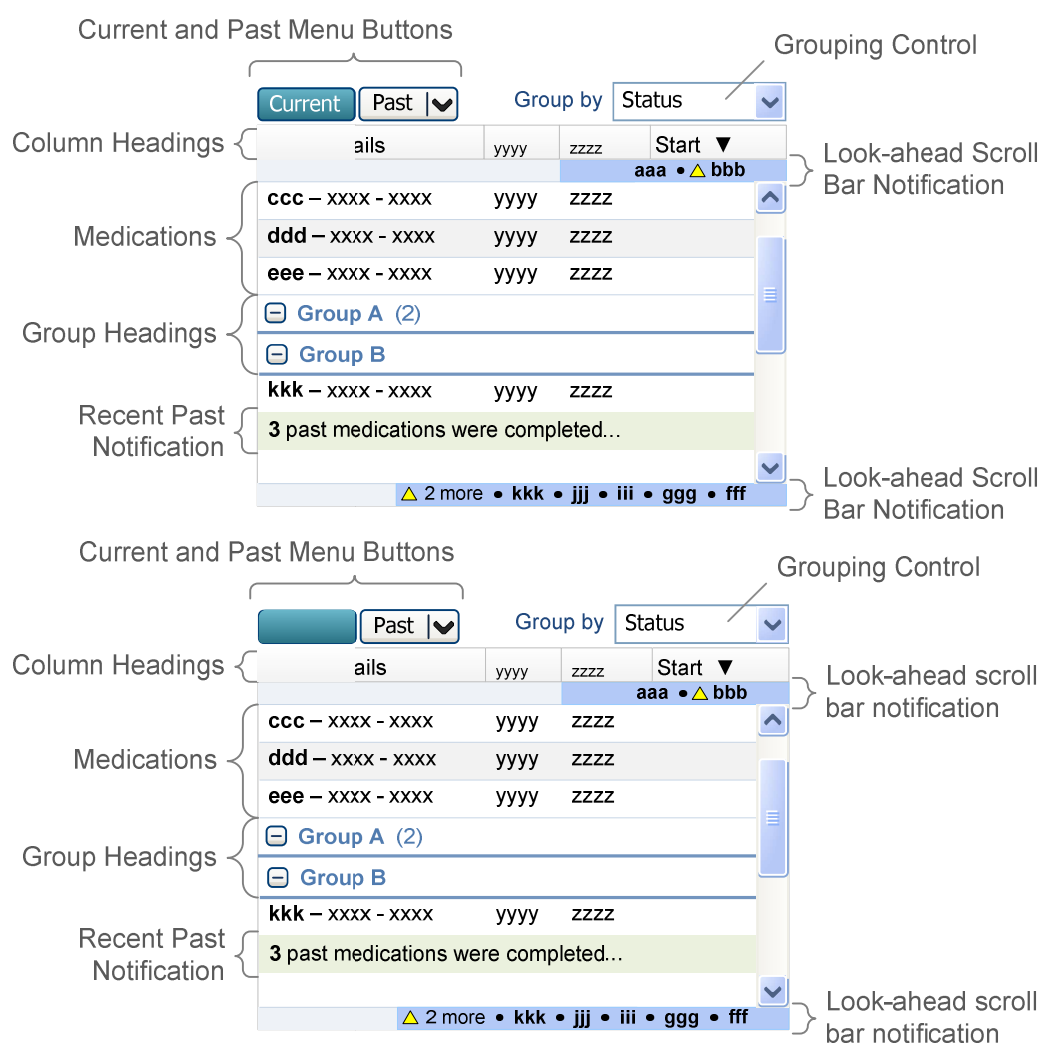


Figure 4: Key Parts of a Medications List View

### 3.3.1 Tabular Layout

ID	Description	Conformance	Evidence Rating												
MEDv-020	Present medications as lines of text within rows in a tabular format, where each row represents one medication	Mandatory	Medium												
MEDv-141	Use composite columns to minimise the display of blank cells for some rows (that is, avoid placing each individual data point in a separate column)	Recommended	Medium												
Usage Examples															
<table><tr><td>temazepam – tablet – DOSE 20 mg – oral – at night</td><td>Started</td><td>26-May-2010</td></tr><tr><td>oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag</td><td>Started</td><td>25-May-2010</td></tr><tr><td>co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day</td><td>Started</td><td>24-May-2010</td></tr><tr><td>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required</td><td>Started</td><td>24-May-2010</td></tr></table>		temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010	oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010	co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010	salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010		In this correct usage example, medications are presented as lines of text within rows in a tabular format.
temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010													
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010													
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010													
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010													
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temazepam – tablet – DOSE 20 mg – oral – at night Started 26-May-2010	oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag Started 25-May-2010														
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day Started 24-May-2010	salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required Started 24-May-2010														
<table><tr><td>temazepam</td><td>tablet</td><td>DOSE 20 mg</td></tr><tr><td>oxygen</td><td>60%</td><td>inhalation gas</td></tr><tr><td>co-amilofruse</td><td>5 mg and 40 mg in 5 mL</td><td>solution</td></tr><tr><td>salbutamol</td><td>100 micrograms per dose</td><td>metered dose inhaler</td></tr></table>		temazepam	tablet	DOSE 20 mg	oxygen	60%	inhalation gas	co-amilofruse	5 mg and 40 mg in 5 mL	solution	salbutamol	100 micrograms per dose	metered dose inhaler		This example is incorrect because each individual data point has been placed in a separate column.
temazepam	tablet	DOSE 20 mg													
oxygen	60%	inhalation gas													
co-amilofruse	5 mg and 40 mg in 5 mL	solution													
salbutamol	100 micrograms per dose	metered dose inhaler													
Rationale															
Hazard Risk Analysis Summary:															
From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risk:															
<ul style="list-style-type: none"><li>The layout of the medication line is difficult to scan for specific information, and this increases the chances of missing important information</li></ul>															
Mitigation: The information in the Drug Details column is presented in sentence style as part of a safety trade-off that balances the need to scan the contents of a single row (one medication) with the need to scan and compare a specific attribute across many rows (medications in the list). The design analysis below describes this trade-off in detail.															
Design Analysis:															
The guidance is also informed by comparative analysis and user research into two ways of structuring a list of medications. The first is a tabular layout, like a spreadsheet, in which each medication is shown in one row with each attribute displayed in a separate column. The second is a more flexible layout that has rows and columns but allows more than one attributes to be displayed in a single column. Selection of one of these two layouts is primarily informed by their ability to support the display of different types of medications in one list. Different types of medications require the display of different sets of attributes. For example, an oral medication can be safely described in fewer (and different) attributes than an intravenous infusion over 24 hours. Simultaneous display of different types of medications requires that different attributes are displayed for each. Thus, a spreadsheet style layout would need many columns in order to support the display of different types of medication in one list.															

The other significant trade-off between a tabular and flexible layout is that of reading across rows. When attributes are displayed in separate columns, it is easy to scan across rows (scan a single column) in order to identify a medication with a specific attribute. The flexible layout combines attributes into a sentence-like layout, thus placing more emphasis on the need to read the details of one medication (reading a row) than the need to compare single attributes between medications (reading a column).

Benefits of the flexible layout include:

- Information can be grouped (into a single cell) and the groupings are flexible, such that a different grouping could be used for each row
- More horizontal space is available as a result of combining attributes to reduce the number of columns
- The overall height of each row can be more easily controlled when long data values are combined into a single cell
- There can be clear inter-relationships between sets of data items and these relationships are easier to make apparent when using a screen reader
- Grouping can be applied to the whole list more effectively. (It is more difficult to achieve an effective layout for grouping within a standard table.)
- Empty cells are less likely since any cell that is likely to be empty for some drugs may be combined with other information in a column
- Expansion inline (of a single row) and other composite row styles can be effectively applied to all or to just one list item

Disadvantages of the flexible layout include:










- Labels may be needed to mark important information within a combined column, and those labels must be differentiated from the information
- Formatting must be used to draw attention to important information when it has been combined with less important information
- Combined columns cause an inconsistent reading pattern between rows since each data value may be positioned differently in each row
- Large horizontal white spaces may be present if one medication has a much wider set of combined values than other rows
- The need to sort on an attribute that is part of a composite cell can be met by grouping and may not be intuitive

#### **User Research**

The guidance is informed by a user research study in which 14 health care staff including four secondary care doctors, three pharmacists and three general practitioners (GPs) were interviewed in one to two hour sessions. It is also informed by a further six user studies of similar structure that included a flexible layout list of medications as part of a wider study agenda.

### 3.3.2 Indicating List Length

For the sake of brevity, the usage examples in this section omit LASB notifications. Refer to sections 3.3.21 to 3.3.28 for guidance on the LASB, and to sections 3.3.20 and 3.3.22 for specific guidance on reserving space for, and displaying, the LASB notifications.

ID	Description	Conformance	Evidence Rating													
MEDv-142	When the list is scrolled to the end, display a space at the bottom of the list with a height equivalent to a line of text	Recommended	Low													
<b>Usage Examples</b>																
<table border="1"> <tr> <td>temazepam – tablet – DOSE 20 mg – oral – at night</td> <td>Started</td> <td>26-May-2010</td> <td rowspan="4">  <p>In this correct example, there is a space at the end of the list with a height equivalent to one line of text.</p> </td> </tr> <tr> <td>oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag</td> <td>Started</td> <td>25-May-2010</td> </tr> <tr> <td>co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day</td> <td>Started</td> <td>24-May-2010</td> </tr> <tr> <td>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required</td> <td>Started</td> <td>24-May-2010</td> </tr> </table>				temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010	 <p>In this correct example, there is a space at the end of the list with a height equivalent to one line of text.</p>	oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010	co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010	salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010
temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010	 <p>In this correct example, there is a space at the end of the list with a height equivalent to one line of text.</p>													
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010														
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010														
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010														
<table border="1"> <tr> <td>temazepam – tablet – DOSE 20 mg – oral – at night</td> <td>Started</td> <td>26-May-2010</td> <td rowspan="4">  <p>This example is not recommended because there is no space at the end of the list.</p> </td> </tr> <tr> <td>oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag</td> <td>Started</td> <td>25-May-2010</td> </tr> <tr> <td>co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day</td> <td>Started</td> <td>24-May-2010</td> </tr> <tr> <td>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required</td> <td>Started</td> <td>24-May-2010</td> </tr> </table>				temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010	 <p>This example is not recommended because there is no space at the end of the list.</p>	oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010	co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010	salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010
temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010	 <p>This example is not recommended because there is no space at the end of the list.</p>													
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010														
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010														
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010														
<table border="1"> <tr> <td>temazepam – tablet – DOSE 20 mg – oral – at night</td> <td>Started</td> <td>26-May-2010</td> <td rowspan="4">  <p>This example is not recommended because the space at the end of the list is greater than the height equivalent of one line of text.</p> </td> </tr> <tr> <td>oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag</td> <td>Started</td> <td>25-May-2010</td> </tr> <tr> <td>co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day</td> <td>Started</td> <td>24-May-2010</td> </tr> <tr> <td>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required</td> <td>Started</td> <td>24-May-2010</td> </tr> </table>				temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010	 <p>This example is not recommended because the space at the end of the list is greater than the height equivalent of one line of text.</p>	oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010	co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010	salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010
temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010	 <p>This example is not recommended because the space at the end of the list is greater than the height equivalent of one line of text.</p>													
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010														
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010														
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010														
<b>Rationale</b>																
<p><b>Design Analysis:</b></p> <p>When using the scroll bar to scroll to the end of a long list of medications, the scroll bar itself provides the most immediate feedback that the end of the list has been reached. The absence of a LASB notification at the end of the list and the presence of a LASB notification at the beginning of the list are more passive indicators of the current position.</p> <p>The display of a fixed height space at the end of the list supplements the feedback from the scroll bar itself, and is a more positive form of feedback than the absence of LASB notifications. Unlike the scroll bar and notifications, this space provides feedback in the context of the list, and is thus closer to the focus of attention during the task of scanning a list.</p>																

### 3.3.3 Gridlines

ID	Description	Conformance	Evidence Rating
MEDv-021	Avoid the use of strong grids and strong vertical lines (use subtle methods to support distinguishing between rows in the list)	Mandatory	High
Usage Examples			
temazepam – tablet – DOSE 20 mg – oral – at night		Started	26-May-2010
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag		Started	25-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day		Started	24-May-2010
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required		Started	24-May-2010
In this correct usage example, there are no vertical gridlines and the horizontal grid lines are thin and pale.			
temazepam – tablet – DOSE 20 mg – oral – at night		Started	26-May-2010
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag		Started	25-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day		Started	24-May-2010
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required		Started	24-May-2010
This example is incorrect because a strong grid has been used.			
temazepam – tablet – DOSE 20 mg – oral – at night		Started	26-May-2010
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required		Started	24-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day		Started	24-May-2010
This example is incorrect because strong vertical lines have been used.			
Rationale			
Desk Research:			
The visual design principle 'data to ink ratio', coined by Edward Tufte (R13), is informed by Tufte's analysis of many examples of visual design in artefacts considered to be exemplary at efficient and effective communication. His principle holds that the quantity of ink (in a printing metaphor) needed for the display of information should exceed that which is used to display supporting visual structures and embellishments. Applied in this context, the principle implies that the display of a grid structure using thick dark lines detracts attention from the information, thus creating more of a cognitive load and ultimately impacting efficient reading.			
Design Analysis:			
The rationale for mandating a flexible layout of the list (as described in section 3.3.11) emphasises readability of the attributes for one medication across the columns of one row. Strong vertical lines or strong gridlines break up the information into columns or individual cells and break the reading flow across a row.			

### 3.3.4 Row Formatting

ID	Description	Conformance	Evidence Rating
MEDv-143	Use at least alternate row shading or lines between rows	Mandatory	Medium
MEDv-022	Use subtle alternate row shading	Recommended	Low
MEDv-144	When using alternate row shading, ensure that colour and brightness of the background does not interfere with the readability of the foreground text	Mandatory	Medium
MEDv-145	Supplement alternate shading with 1 point pale lines between rows	Recommended	Low

### Usage Examples

temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010

In this correct usage example, alternate row shading and 1 point pale lines have been used.

temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010

This example is incorrect because the alternate row shading is dark enough to affect readability of the foreground text.

### Rationale

**Desk Research:**

Web Content Accessibility Guidelines<sup>7</sup> from the World Wide Web Consortium (W3C) include a checkpoint (2.2) for ensuring that colour and contrast differences are still effective when viewed on a black and white screen. The recommended W3C colour and contrast algorithm defines an acceptable range for brightness and colour difference between a foreground (text) and a background colour <sup>8</sup>.

**Design Analysis:**

Alternate row shading and lines between the rows are both methods of supporting accurate reading along a row and mitigating the risk of mixing information from more than one row. Both are recommended and supported by user feedback and existing standards. Successful implementation of this guidance depends on the selection of appropriate text and background colours such that the shading supports reading across the row without adversely affecting legibility of the foreground text {R13}.

**User Research:**

The use of alternate row shading is supported by user feedback findings in a study with 15 interviewees. The study assessed various aspects of medications lists that were presented with alternate row shading and lines between the rows. The study did not find any issues with legibility or clutter that could be attributed to the alternate row shading or lines.


<sup>7</sup>World Wide Web Consortium, Web Content Accessibility Guidelines 1.0 {R14}: <http://www.w3.org/TR/WAI-WEBCONTENT/>

<sup>8</sup>World Wide Web Consortium, Techniques for Accessibility Evaluation and Repair Tools – Technique 2.2.1{R15}: <http://www.w3.org/TR/AERT#color-contrast>

### 3.3.5 Displaying Icons for Drug Details

ID	Description	Conformance	Evidence Rating
MEDv-023	Support the display of icons following the text of the Drug Details column in the Medications List view	Mandatory	Low
Usage Examples			
<div><div><div>glyceryl trinitrate – 400 micrograms per dose – sublingual spray – DOSE 1 to 2 puffs – sublingual – as required – maximum 3 doses in 15 minutes B</div><div>Started28-May-2010</div></div><div><div>lansoprazole – orodispersible tablet – DOSE 30 mg – oral – once a day A B</div><div>Started27-May-2010</div></div><div><div>dalteparin – 10,000 units per 1 mL – injection – DOSE 10,000 units – subcutaneous – twice a day A</div><div>Started27-May-2010</div></div></div>		<div>In this correct example of current medications, icons have been appended to the text of the Drug Details column.</div> <div>Note</div> <div>Lettered squares have been used to represent icons.</div>	
Rationale			
Design Analysis:			
This guidance point ensures that the clinical system does not enforce the display of icons in separate columns when they might be more effectively incorporated into the Drug Details column. A single column can contain more than one data value (such as drug name and route in a Drug Details column). If one of those data values can more appropriately be displayed as an icon, it should be possible for the icon to be displayed within a composite column.			

### 3.3.6 Empty Lists

ID	Description	Conformance	Evidence Rating
MEDv-146	Display a message when a list is empty (for example, when there are no current medications)	Mandatory	Low
Usage Examples			
<div><div></div><div>Status</div></div> <div>There are no current medications for this patient</div>			In this correct example of current medications, a message is displayed because the list is empty.
Rationale			
<b>Design Analysis:</b> When there are no current or past medications to display for a patient, some feedback is needed to reassure the user that the lack of information is an accurate display of the data in the system and not the result of a system failure.			



### 3.3.7 Mandatory Columns

ID	Description	Conformance	Evidence Rating
MEDv-147	Provide a column that contains status information, including information that defines whether the medication is 'current' or 'past'	Mandatory	High
MEDv-148	Provide a column that contains drug details according to Medication Line guidance	Mandatory	Medium
MEDv-149	When displaying current medications, provide a column that contains an initiation date (such as the date of the first planned administration). The examples in this document show a Start Date column	Mandatory	Medium
MEDv-150	When displaying past medications, provide a column that contains a stop date (such as the date of the last administration, or the date that the medication was discontinued). The examples in this document show an End Date column	Mandatory	Medium

#### Usage Examples

	Status	Start Date ▼
6 more • metformin • glicazide • glyceryl trinitrate • dalteparin • aspirin • isosorbide mononitrate		
temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010
co-amlofruse – 5 mg and 40 mg in 5 ml – solution –	Started	24-May-2010

In this correct example of current medications, the list includes Start Date and Drug Details columns. It also includes a Status column that contains a status that is only relevant to current medications.

#### Rationale

##### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risk:

- The system default view settings are inappropriately set, leading to incomplete information, or overwhelming information that impacts the quality of decisions

##### Mitigation:

- Guidance mandates the presence of certain columns
- Guidance sets limitations on dimensions to ensure that important information, such as Drug Details, is given enough space

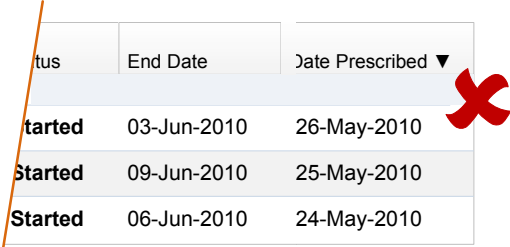
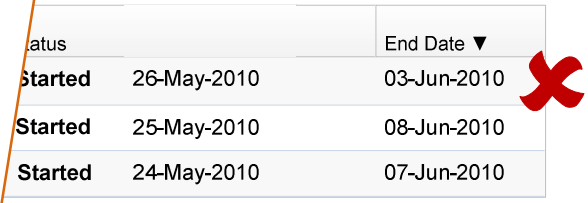
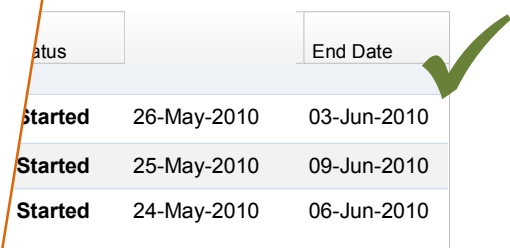
##### Design Analysis:

The guidance in this section ensures that the key attributes for identifying a medication are always visible. Other information may be added to a medications list and displayed in additional columns, but these three columns must remain since they are essential for correct identification of a medication, its status and where it fits into the sequence of medications in the list.

### 3.3.8 Date Columns

The guidance in this section refers to date columns. The specific information to display in these columns is not part of guidance because needs differ between tasks and contexts. Guidance is provided for the relative placement of date columns when there are columns such as 'Date Prescribed' or 'First Administration' that include date and time information.

In what follows, columns that contain date and time information for the start or initiation of a medication are referred to as 'start date'. Columns that contain date and time information for an end or completion of a medication are referred to as 'end date'. The guidance does not refer to the relative placement of any other date columns (such as 'Review Date') that may be present.

ID	Description	Conformance	Evidence Rating
MEDv-151	When an end date column is displayed, place a start date column before (to the left of) the end date column	Mandatory	Low
MEDv-152	When an end date column is displayed, and there is no duration column, place a start date column adjacent to the end date column	Recommended	Medium
MEDv-153	Use fixed width columns for dates	Mandatory	Low
MEDv-154	Maintain consistent placement of date columns relative to one another and relative to the Drug Details column in both current and past medications	Mandatory	Low
<b>Usage Examples</b>			
<div>  <p>This example is incorrect because the start date column has not been placed before the end date column.</p> </div>			
<div>  <p>This example is incorrect because the start date column is wider than it needs to be (it is not a fixed width).</p> </div>			
<div>  <p>In this correct example, the start date column is before the end date column, and both the date columns have an appropriate fixed width.</p> </div>			

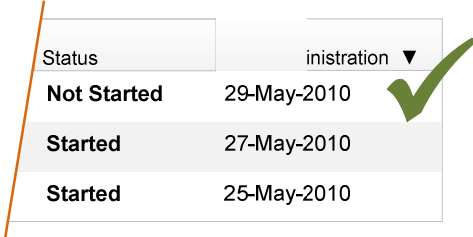


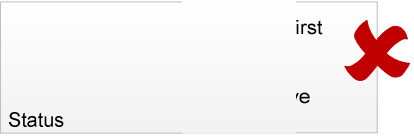
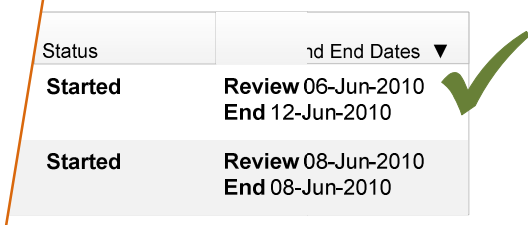
## Rationale

### Design Analysis:

The relative placement of start and end date columns (or equivalents) is designed to support the calculation of duration when duration is not shown as a separate column.

Whilst the display of dates in adjacent columns introduces the risks of reading dates from more than one line and attributing them to the same line, it also mitigates the risk that a date at one side of the screen may be mistakenly related to a date at the other side of the screen that is actually on a different line. In other words, the two risks that must be balanced both relate to misreading: one as a result of dates being displayed adjacent to one another, and the other as a result of dates being displayed too far apart. Guidance aims to ensure that dates are displayed adjacently when they are likely to be referenced for the same task (such as calculating duration).

## 3.3.9 Column Headings

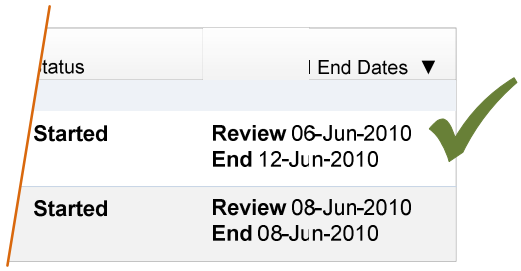
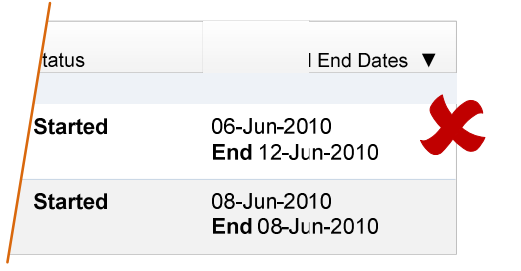
ID	Description	Conformance	Evidence Rating
MEDv-155	Label columns with text that describes the contents unambiguously and succinctly (such as, 'Status', 'Date Prescribed' or 'First Administration')	Recommended	Medium
MEDv-156	Use a unique heading for each column	Mandatory	Low
MEDv-157	When combining two attributes that have the same data type (such as dates), include labels for both attributes in the column heading	Mandatory	Low
<b>Usage Examples</b>			
		In this example of current medications, the column heading is labelled with text that describes the date appropriately and succinctly.	
		In this example, the column heading is labelled with text that describes the date appropriately and succinctly.	
		This example is not recommended because the Date column does not have a label that describes the contents unambiguously.	
		This example is not recommended because the date column does not have a label that describes the date succinctly.	
		In this correct example, two dates have been combined in a column and both dates are described in the column heading.	

## Rationale

### User Research:

This guidance is informed by a user research study, in which 14 health care staff were interviewed, and by an online survey, completed by 22 health care staff. The study identified a risk that the column heading 'Start Date' could cause the date to be interpreted as either the date on which the prescription was created, or the date on which the first administration was recorded. The risk embodies a principle that has been extrapolated to all column headings.

## 3.3.10 Composite Columns

ID	Description	Conformance	Evidence Rating
MEDv-027	Allow columns to contain more than one attribute for a single medication	Mandatory	Low
MEDv-158	When combining two attributes that have the same data types (such as dates), include labels for both attributes within the cell	Mandatory	Medium
Usage Examples			
		In this correct example, two dates have been combined in a column and both dates are labelled in each cell.	
		This example is incorrect because two dates have been combined in a column but only one of those dates is labelled within each cell.	
Rationale			
<b>Design Analysis:</b> The display of multiple attributes in a column allows the design of a grid layout to be flexible enough for additional attributes to be introduced into the view without the need to introduce a new column. With limited horizontal space, the display of a new column is likely to take the place of an existing column. By combining multiple attributes in a single column, the need for a new column is avoided. Composite columns are particularly useful for grouping sets of attributes that are interrelated and should always be shown together (in a single cell).			
<b>User Research:</b> The guidance on allowing multiple attributes in table-like columns is also informed by user feedback described in section 3.3.1 on the advantages of flexible tables when representing different medications within the same list.			

### 3.3.11 Constraining Dimensions

ID	Description	Conformance	Evidence Rating
MEDv-159	Maintain the relative proportions of columns such that the Drug Details column is the widest	Mandatory	Low
MEDv-160	Avoid the need for horizontal scrolling by limiting the number of columns visible at any one time	Mandatory	Medium
MEDv-161	Define minimum widths for all columns	Recommended	Low

### Usage Examples

	Status	Start Date ▼
6 more • metformin • glicazide • glyceryl trinitrate • dalteparin • aspirin • isosorbide mononitrate		
temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution –	Started	24-May-2010

In this correct example, the Drug Details column is the widest and it is wider than the remaining columns collectively.

Drug Details	s	First Admin
glyceryl trinitrate – 400 micrograms per dose – sublingual spray – DOSE 1 to 2 puffs – sublingual – as required – maximum 3 doses in 15 minutes	Suspended on 30-May-2008	26-May-20
lansoprazole – orodispersible tablet – DOSE 30 mg – oral – once a day	Started	25-May-20

This example is not recommended because the Drug Details column is narrower than the other columns collectively.

	Status	First Admin
glyceryl trinitrate – 400 micrograms per dose – sublingual spray – DOSE 1 to 2 puffs – sublingual – as required – maximum 3 doses in 15 minutes	Suspended on 30-May-2008	26-May-20
lansoprazole – orodispersible tablet – DOSE 30 mg – oral – once a day	Started	25-May-20
dalteparin – 10,000 units per 1 mL – injection – DOSE 10,000 units – subcutaneous – twice a day	Started	24-May-20

This example is incorrect because a horizontal scroll bar has been used to accommodate more columns.

## Rationale

### Design Analysis:

Guidance in this section aims to preserve the relative importance of the Drug Details column in relation to other columns, whilst allowing enough flexibility for the list to be used in different application contexts.

The guidance that refers to horizontal scrolling helps (along with the LASB) to mitigate the risk that hidden information, or information that is off screen, is overlooked. Specifically, in the context of a list of current medications, the presence of a scroll bar is not considered to be a strong enough cue to draw attention to the hidden information. The rationale for guidance in section 3.3.11 also supports this guidance relating to horizontal scrolling in lists of medications.

If horizontal scrolling is present in a list of current medications, supporting a user reading along a single row becomes more difficult. Horizontal scrolling necessarily means that some information will be lost from view as more information is brought into view. This introduces the risk that information at one end of the medication line (such as the drug name and dose) is wrongly associated with information on the line above or below as a result of scrolling right (that is, so that the drug name is no longer in view).

Horizontal scrolling is a useful navigation tool when the type of list allows mitigation of the associated risks. However, the critical Drug Details column is wider and its information must be preserved intact. These characteristics are a significant barrier to effective use of horizontal scrolling in a list of medications for a single patient.

When a column is resized until it is only a few characters wide:

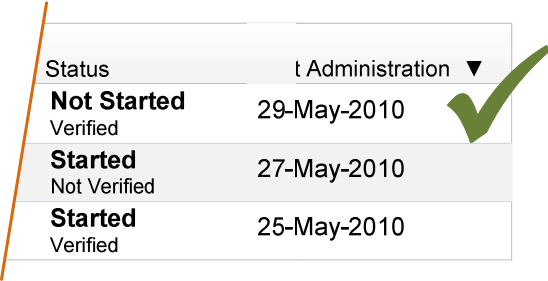
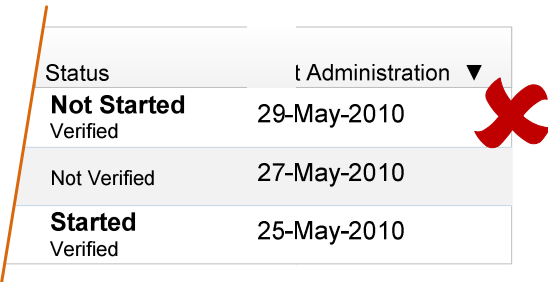
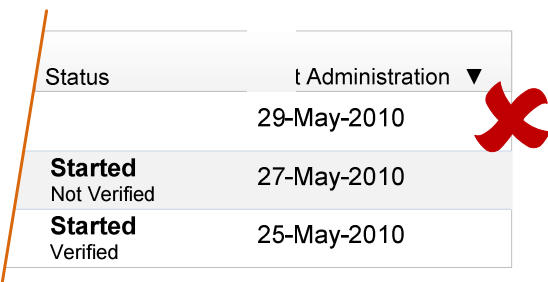
- The content of that column wraps many times and is difficult to read
- Each row is deeper so there are fewer medications visible in the list
- The ability to compare across rows is reduced as a result of the increased row height and reduced number of rows that are visible

The guidance aims to mitigate these risks by:

- Promoting the use of fewer columns in a view so that when there is less space available, fewer columns can be displayed
- Mandating the relative size of the Drug Details column to ensure that important information is not unnecessarily wrapped
- Recommending the use of fixed-width columns where relevant to avoid the display of unnecessary white space within columns that are wider than they need to be
- Supporting flexibility so that the display of unnecessary white space can be avoided. For example, a list of oral medications may have much less information in the Drug Details column so the space can be used to display more of the information in other columns whose contents have wrapped

An interactive prototype revealed a number of risks associated with a UI that allows resizing of columns such that their contents wrap excessively (or are truncated).

### 3.3.12 Displaying Status

ID	Description	Conformance	Evidence Rating
MEDv-162	Ensure that all medications have a status value and the status cannot be blank	Mandatory	High
MEDv-163	Limit status descriptions to short phrases, preferably no more than two words	Recommended	Low
MEDv-164	Allow status to be supplemented with additional information (such as pharmacy verified)	Recommended	Low
MEDv-165	Use the status description to differentiate between medications that have no recorded administration events and those that have	Mandatory	High
<b>Usage Examples</b>			
		<p>In this correct example, the status is supplemented with additional information.</p> <p>This example also shows a status that differentiates between medications that have no recorded administration events (<b>Not Started</b>) and those that have (<b>Started</b>).</p>	
		<p>This example is incorrect because one of the medications has a status that does not differentiate it as 'current' or 'past'.</p>	
		<p>This example is incorrect because one of the medications does not have a status value displayed.</p>	

## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following key risks which are mitigated by the design:

- Medications with scheduled administrations that have not been given are not flagged in the Medications List view and a prescriber assumes the medications have been given according to the administration schedule. This could lead to possible duplication of treatment and overdose

#### Mitigations:

- Administration events that have not been given can be flagged in the Medications List view (guidance does not preclude the display of this information) and could form part of a different view with more focus on administration information than is available through the Level of Detail control (see section 3.3.35)
- Details about administration events may be accessible by selecting a medication and accessing more details (see sections 3.3.36 and 3.3.38)
- The Medications List (for secondary care) is part of a framework of Medications views, including a Drug Administration view, in which the status of administration events can be reviewed
- When the Medications List view is used to inform prescribing decisions, an assumption is made that the presence of a medication in the list of current medications means that administration has commenced

#### Mitigations:

- Guidance mandates the use of the Status property to differentiate between medications that do and do not have recorded administration events
- Status can be supplemented with additional information
- Guidance for the Levels of Detail control allows additional information to be added (as text or icons) into existing columns, such as the Drug Details column, or into additional columns

### Design Analysis:

The display of status in current medications supports recognition of medications that have very different implications for administration or for medication review. Current medications contains medications that are not actively being administered either because they have not been started yet (their first administrative event is in the future) or because they are suspended. Past medications include those that were completed according to the plan of scheduled administration events, and those that were stopped before the last scheduled administration event. These implications are important enough that the status needs to be easy to pick out from a view. This can be supported by using a limited set of succinct phrases that will ultimately be committed to memory.

Since the status of a medication also defines whether it is 'current' or 'past', and it is possible to switch between these two views, the status is also important in supporting recognition of which of those two lists is displayed.

## 3.3.13 Specific Status Values

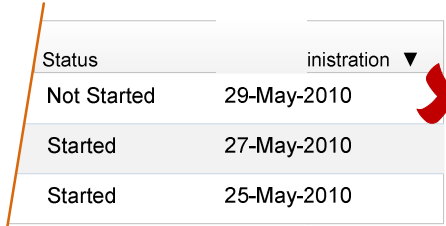
ID	Description	Conformance	Evidence Rating
MEDv-166	Support a status of 'suspended' and include medications with this status in current medications	Mandatory	Medium
MEDv-167	Assign a status of 'Started' to medications that have an administration event recorded and have further scheduled administrations	Recommended	Medium
MEDv-168	Assign a status of 'Not Started' to medications that have administration scheduled and a start date in the future	Recommended	Medium
MEDv-169	Assign a status of 'Suspended' to medications that are marked as not to be administered, but which are intended to be resumed at a later date	Recommended	Medium
MEDv-170	Assign a status of 'Completed' to medications that have administration events recorded according to their schedule (within tolerances) and have an end date in the past	Recommended	High






MEDv-171	Assign a status of 'Discontinued' to medications that were stopped on a date that preceded one or more of the scheduled administrations	Recommended	High
MEDv-172	Define medications with a status of either 'Started', 'Not Started' or 'Suspended' as current medications	Recommended	Medium
MEDv-173	Define medications with a status of either 'Completed' or 'Discontinued' as past medications	Recommended	High
<b>Usage Examples</b>			
There are no usage examples for this section.			
<b>Rationale</b>			
<p><b>Desk Research:</b></p> <p>Our research into current practice (both paper-based and electronic) has neither the breadth nor the depth that would be needed to mandate a specific set of status values. Guidance recommends a set of status values that are supported through limited testing to encourage consistency wherever it is appropriate to adopt them.</p> <p>The <i>ePrescribing Functional Specification {R10}</i> defines a set of statuses, some of which are the same as the status values defined here (Suspended, Completed, Discontinued). The remainder can be supplemented to the status 'Not Started' (Not fully specified, Awaiting confirmation, Verified) and some of those can also be supplemented to the status 'Started' (Authorised for supply or administration, Verified).</p> <p><b>Hazard Risk Analysis Summary:</b></p> <p>From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risk:</p> <ul style="list-style-type: none"> <li>■ The term 'suspended' may not be recognised where it is not in use in practice</li> </ul> <p>Mitigation: When reviewed by a group of clinicians in a Risk Assessment workshop, the group considered the use of the term 'suspended' to be safer than current practice. This view is supported by the <i>ePrescribing Functional Specification {R10}</i></p> <ul style="list-style-type: none"> <li>■ If a medication has scheduled administration events that are all recorded as not given and that medication is given a status of 'Completed', it will be displayed in past medications. This may give an inaccurate picture of medications that the patient has received</li> </ul> <p>Mitigations:</p> <ul style="list-style-type: none"> <li>■ Guidance requires at least one administration event to have been recorded as successful for the medication to be able to have a status of 'Completed'</li> <li>■ Status can be supplemented with additional information</li> <li>■ Guidance for the Levels of Detail control allows additional information to be added (as text or icons) into existing columns, such as the Drug Details column, or into additional columns</li> </ul> <p><b>Design Analysis:</b></p> <p>This guidance aims to introduce a set of status values that:</p> <ul style="list-style-type: none"> <li>■ Are more detailed than simply 'current' and 'past'</li> <li>■ Are relevant to all care settings and can be supplemented to add granularity</li> <li>■ Can be used in conjunction with other, more granular sets of status values</li> </ul>			





### 3.3.14 Formatting Status

ID	Description	Conformance	Evidence Rating									
MEDv-024	Use visual design to draw attention to suspended medications	Mandatory	Medium									
MEDv-025	Use visual design to distinguish a list of current medications from a list of past medications	Mandatory	Medium									
MEDv-042	Display the status of each medication in bold	Mandatory	Low									
Usage Examples												
<div><table><tr><td>programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes</td><td><b>Suspended on</b> 30-May-2008</td><td>28-May-2010</td></tr><tr><td>persible tablet – - once a day</td><td><b>Started</b></td><td>27-May-2010</td></tr><tr><td>er 1 mL – injection – taneous – twice a day</td><td><b>Started</b></td><td>27-May-2010</td></tr></table></div>		programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes	<b>Suspended on</b> 30-May-2008	28-May-2010	persible tablet – - once a day	<b>Started</b>	27-May-2010	er 1 mL – injection – taneous – twice a day	<b>Started</b>	27-May-2010	<div>In this correct example of current medications, visual design has been used to draw attention to the medication with a different status. In this example, the visual design is applied to a single cell.</div>	
programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes	<b>Suspended on</b> 30-May-2008	28-May-2010										
persible tablet – - once a day	<b>Started</b>	27-May-2010										
er 1 mL – injection – taneous – twice a day	<b>Started</b>	27-May-2010										
<div><table><tr><td>programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes</td><td><b>Suspended on</b> 30-May-2008</td><td>28-May-2010</td></tr></table></div>		programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes	<b>Suspended on</b> 30-May-2008	28-May-2010	<div>In this correct example of a suspended medication, visual design has been used to draw attention to the suspended medication. In this example, there is visual design applied to a single cell and other visual design applied to the whole row.</div>							
programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes	<b>Suspended on</b> 30-May-2008	28-May-2010										
<div><table><tr><td>programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes</td><td><b>Suspended on</b> 30-May-2008</td><td>28-May-2010</td></tr></table></div>		programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes	<b>Suspended on</b> 30-May-2008	28-May-2010	<div>This example of a suspended medication is incorrect because visual design has not been used to draw attention to the suspended medication.</div>							
programs per dose – <b>2 puffs</b> – sublingual – ses in 15 minutes	<b>Suspended on</b> 30-May-2008	28-May-2010										
<div><table><tr><td>Status</td><td>ministration ▼</td></tr><tr><td><b>Not Started</b></td><td>29-May-2010</td></tr><tr><td><b>Started</b></td><td>27-May-2010</td></tr><tr><td><b>Started</b></td><td>25-May-2010</td></tr></table></div>		Status	ministration ▼	<b>Not Started</b>	29-May-2010	<b>Started</b>	27-May-2010	<b>Started</b>	25-May-2010	<div>In this correct example of current medications, each medication has a status that is displayed in bold.</div>		
Status	ministration ▼											
<b>Not Started</b>	29-May-2010											
<b>Started</b>	27-May-2010											
<b>Started</b>	25-May-2010											
<div><table><tr><td>Status</td><td></td></tr><tr><td><b>Completed</b></td><td>hydrochlor</td></tr><tr><td><b>Discontinued</b></td><td>methyldop</td></tr><tr><td><b>Completed</b></td><td>furosemic</td></tr></table></div>		Status		<b>Completed</b>	hydrochlor	<b>Discontinued</b>	methyldop	<b>Completed</b>	furosemic	<div>In this correct example of past medications, each medication has a status that is displayed in bold and visual design is used (the formatting of the status values) to distinguish this list of past medications from a list of current medications.</div>		
Status												
<b>Completed</b>	hydrochlor											
<b>Discontinued</b>	methyldop											
<b>Completed</b>	furosemic											

	<p>This example is incorrect because the status values are not displayed in bold.</p>
<b>Rationale</b>	
<p><b>Design Analysis:</b></p> <p>Visual design is recommended to differentiate between medications of different statuses, and to enhance a sense of place when switching between a list of 'current' medications and a list of 'past' medications. A list of current medications is expected to contain mostly medications that are actively being administered ('Started'). When the list includes medications that are not yet being actively administered ('Not Started'), they are more likely to appear at the top of the list. It is likely that those with a status of 'Suspended' are an exception.</p> <p>When a list of current medications contains a medication that was suspended recently, there is a risk that familiarity with the list could lead to the change in status going unnoticed by a frequent user. Even though the list is not used for reviewing or recording detailed administration information, it is important that the change and the exception are noticed.</p> <p><b>User Research:</b></p> <p>Guidance for the extra distinction of the 'Suspended' status is supported by findings from two user research studies involving 15 interviews with health care staff based primarily in hospitals and a further six online survey respondents.</p>	

### 3.3.15 Controls for Displaying Current and Past Medications

ID	Description	Conformance	Evidence Rating
MEDv-063	Provide buttons for displaying current and past medications respectively in the Medications List view and label the buttons 'Current' and 'Past'	Mandatory	Medium
MEDv-062	Present the Medications List view with <b>Current</b> selected by default	Mandatory	High
MEDv-064	Use the visual formatting of the <b>Current</b> and <b>Past</b> buttons to indicate which is currently selected	Mandatory	High
MEDv-065	Do not allow <b>Current</b> and <b>Past</b> buttons to be selected simultaneously	Mandatory	Medium
MEDv-174	Ensure that either the <b>Current</b> or the <b>Past</b> button is selected at any one time	Mandatory	Medium
MEDv-066	Supplement the <b>Past</b> button in the Medications List view with a drop-down control for displaying, selecting and applying a filter on the past medications view	Mandatory	Medium
MEDv-067	Include an option for displaying all past medications in the drop-down control	Mandatory	High
Usage Examples			
<div><div>Current</div><div>Past</div><div>▼</div></div> <div><div>Current</div><div>Past</div><div>▼</div></div>		In these two correct examples, <b>Current</b> and <b>Past</b> buttons are provided, and the <b>Current</b> button is used to indicate that it is currently selected.	
<div><div>Current</div><div>Past</div><div>▼</div></div>			

	<p>This example is incorrect because the <b>Current</b> and <b>Past</b> buttons have been selected simultaneously.</p>
	<p>This example is incorrect because the <b>Past</b> button has not been supplemented with a drop-down control for past filters.</p>
	<p>This example is incorrect because buttons have not been provided for displaying current and past medications respectively.</p>
	<p>In this correct example, filter options for past medications are displayed in a drop-down control, and include an option to show all past medications.</p>
<h2>Rationale</h2>	
<p><b>Design Analysis:</b></p> <p>This guidance is informed by an assessment of the relative merits of tabs versus buttons as controls for switching between current and past medications.</p> <p>Benefits of using buttons include:</p> <ul style="list-style-type: none"> <li>Current and past buttons, the past filters and the grouping controls can all be displayed on one line</li> <li>There is a clear association between the grouping control and the currently visible list that allows each list to retain its own grouping state and this can be extended to other controls, such as a level of detail control</li> <li>The filters for past medications take up an absolute minimum of screen space and are clearly only available for past medications</li> <li>There is no need to reserve screen space for past filters within the list area (or within a tab) for past medications</li> </ul> <p>Disadvantages of using buttons include:</p> <ul style="list-style-type: none"> <li>Comparatively less familiar as a metaphor for mutually exclusive sets of information</li> </ul> <p>Expert reviews, comparative analysis of alternative designs, user feedback sessions and patient safety risk assessments have provided extensive input to the guidance for filtering medications into lists for current and past respectively. The guidance is based on the following findings:</p> <ul style="list-style-type: none"> <li>A separate page for current medications provides the required unambiguous indication of what is currently prescribed</li> <li>Separate current and past views match user mental models and support the most common filtering needs</li> <li>Separate current and past views support the more common task of reviewing current medications without past medications appearing at the same time</li> <li>More advanced filters are relevant for past medications since the list of past medications is more likely to be very long, and the clinician is less likely to need to review medications further in the past</li> <li>A mixture of current and past medications in a single list creates issues relating to sorting, grouping, the display of common attributes, and the easy distinction of medications with different states. These issues are considered to outweigh the benefits of a mixed list</li> <li>Separation of current and past medications allows different default sort orders to be applied to each (such as 'reverse chronologically by start date' for current and 'by end date' for past). User feedback suggests that current and past do have different optimum sort orders</li> <li>The use of tabs to display current and past medications has been ruled out since it takes up more screen space</li> </ul> <p>This type of control (menu buttons) reflects the relative priorities of the use cases associated with the Medications List view. The default view of current medications supports tasks that are associated with, and supported by, a list of medications.</p>	

The guidance assumes the following order of priority for actions associated with the need to filter medications:

1. A list of current medications: to see what is currently prescribed
2. A list of past medications: to begin a review of historic medications
3. A list of past medications filtered to show a specific interval: to review of historic medications with a specific question in mind

The control supports these actions and places appropriate emphasis according to those priorities. The controls support quick switching between current and past medications and provide immediate feedback for the current selection. The past filter is associated with the **Past** button to match a mental model of refining or 'drilling-down'.

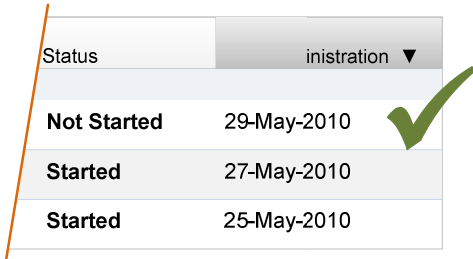
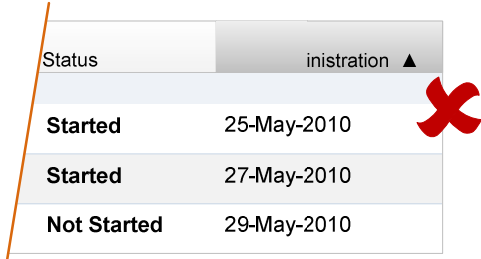
#### User Research:

This guidance is supported by three user research studies involving interviews with a total of 35 health care staff, the majority of whom were based in hospitals. The user research studies found that the labels 'Current' and 'Past' as status filters, and as calls to action, were clear. Two of the three studies (involving 23 interviewees) supported the guidance that, when switching between current and past, both buttons should remain visible. The third study did not cover this topic.

#### Important

User research did not rule out the use of an additional view in which 'All' medications (both current and past) could be combined in a single list. If such a view were provided, in addition to the separate current and past views, the risks mitigated by guidance relating to the display of current medications and past medications, sort orders and column orders should be carefully considered.

### 3.3.16 Displaying Current Medications

ID	Description	Conformance	Evidence Rating
MEDv-099	By default, present current medications sorted reverse chronologically by a starting date, such that the most recent is first (top) in the list	Mandatory	High
MEDv-173	When displaying current medications, place the drug details in the first (furthest left) column	Mandatory	Low
<b>Usage Examples</b>			
 <p>A screenshot of a medication list interface. It has a header with 'Status' and 'Administration' (with a dropdown arrow). The list contains three rows: 'Not Started' with date '29-May-2010', 'Started' with date '27-May-2010', and 'Started' with date '25-May-2010'. A large green checkmark is placed to the right of the list.</p>		<p>In this correct example of current medications, the default sort order is reverse chronologically by start date equivalent (in this case, First Administration).</p>	
 <p>A screenshot of a medication list interface. It has a header with 'Status' and 'Administration' (with an upward arrow). The list contains three rows: 'Started' with date '25-May-2010', 'Started' with date '27-May-2010', and 'Not Started' with date '29-May-2010'. A large red X is placed to the right of the list.</p>		<p>This example of current medications is incorrect because the default sort is chronological by start date equivalent (in this case, First Administration).</p>	

Status	
	<b>glyceryl trinitrate</b> – 400 micrograms per dose – sublingual spray – <b>DOSE 1 to 2 puffs</b> – sublingual – as required – maximum 3 doses in 15 minutes
	<b>lansoprazole</b> – orodispersible tablet – <b>DOSE 30 mg</b> – oral – once a day
	<b>dalteparin</b> – 10,000 units per 1 mL – injection – <b>DOSE 10,000 units</b> – subcutaneous – twice a day



In this correct example of current medications, the first column (furthest left) is the drug details column.

Status	
<b>Not Started</b>	<b>glyceryl trinitrate</b> – sublingual spray – as required – maximum 3 doses in 15 minutes
<b>Started</b>	<b>lansoprazole</b> – orodispersible tablet – <b>DOSE 30 mg</b> – oral – once a day
<b>Started</b>	<b>dalteparin</b> – 10,000 units per 1 mL – injection – <b>DOSE 10,000 units</b> – subcutaneous – twice a day



This example of current medications is incorrect because the drug details column is not displayed in the first (furthest left) column.

## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risk:

- The system default view settings are inappropriately set, leading to incomplete information or overwhelming information, leading to lower quality decisions

Mitigation: The Medication List view is presented with grouping inactive by default (MEDv-083), and with a default sort order (MEDv-099).

### User Research:

Five user feedback sessions involving a total of 47 health care staff found that the majority of users either actively supported, or did not contest, the order of current medications sorted chronologically by start date with the most recent at the top. This was despite the acknowledgement that the current paper drug charts were ordered chronologically, with the oldest at the top based on prescription written date.

Placement of the Drug Details column on the far left of the list is informed by user feedback sessions. Findings from these sessions include the identification of a risk that a single column placed before the Drug Details column could be overlooked. It is assumed that placing the Drug Details column farthest left facilitates scanning of that column (without visual interference from a column on the left) and provides what is likely to be the most important information first. The primary purpose of this guidance is to introduce consistency whilst mitigating the risk that a narrower column on the far left would be overlooked since the Drug Details column is likely to contain the information that is needed first.

### 3.3.17 Displaying Recent Past Notifications

ID	Description	Conformance	Evidence Rating
MEDv-074	When displaying current medications, display a notification for medications that have been completed or discontinued within a specified time interval from the current time	Mandatory	Medium
MEDv-075	Clearly display the time interval within the recent past notification	Mandatory	Medium
MEDv-077	Display a count of the number of recently past medications within the recent past notification in the medication list	Mandatory	Medium
MEDv-174	Use formatting to distinguish the recent past notifications from medications in the list	Recommended	Low

#### Usage Examples

oxygen 60% – inhalation gas – <b>RATE 15 L per minute</b> –	Started	25-May-201
continuous – with non re-breather bag		
co-amilofruse – 5 mg and 40 mg in 5 mL – solution –	Started	24-May-20
<b>DOSE 5 mL</b> – oral – once a day		
salbutamol – 100 micrograms per dose – metered dose	Started	24-May-2
inhaler – <b>DOSE 2 puffs</b> – inhaled –		
four times a day as required		
2 past medications were completed or discontinued in the last 48 hours		



In this correct example, a recent past notification is displayed at the end of the list of current medications. The notification clearly displays the time interval and a count of the recent past medications.

4 past medications were recently completed or discontinued



This example of a recent past notification is incorrect because it does not display the time interval.

Medications were completed or discontinued in the last 48 hours



This example of a recent past notification is incorrect because it does not display a count of the recent past medications.

#### Rationale

##### Design Analysis:

Since medications are selected for presentation in the current view according to their status, there is a very clear cut-off point at which a medication becomes past and is thus no longer visible in the current medications list. This could mean that a medication that was completed five minutes ago is no longer visible in the list of current medications. The guidance provides a recent past notification to mitigate the risk that recent events are missed. It supports the configuration of a time interval that is relevant for the context of use.

This is a pragmatic way of alerting a user to medications which might still be pharmacologically active within the patient's body, even though they are no longer prescribed to the patient. A genuine measure of the pharmacological activity of a medication is considered to be too difficult to accurately accomplish without significant data input to the system (such as renal function).

If a medication has been assigned a stop date after which it can no longer be administered, then it may move from current medications to past medications automatically. In this case, the recent past notification serves as a warning that medications have 'moved' from current to past and may prompt a review of those medications.

The display of the recent past medications within a notification has been replaced with this simpler approach for the following reasons:

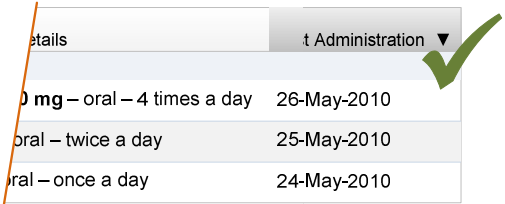
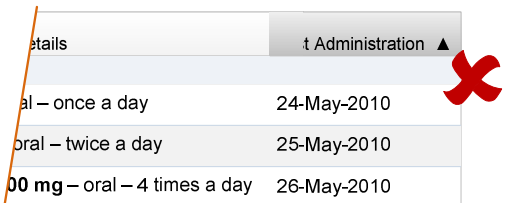
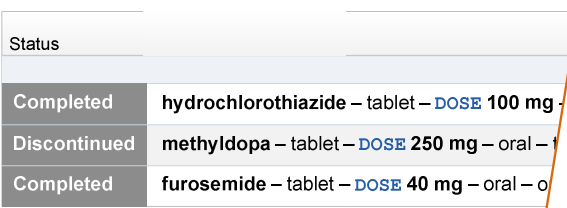
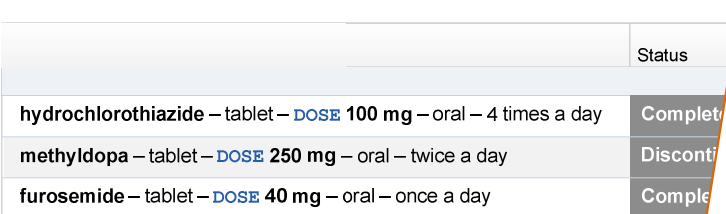
- Past medications have a different column order and sort order
- If past medications adhere to the column order and sort order of the current medications list, there is a small risk that they will be mistaken as still current. The risk is significantly reduced as the visual treatment of the status column is highly effective at differentiating past from current medications
- The past button makes it quick and easy to switch to past medications

- The display of recent past medications within the list of current medications would introduce the potential for confusion when sorting or grouping is applied to the list of current medications

#### User Research:

Two rounds of user feedback found strong support for the idea of 'Recent Past' notification associated with current medications.

### 3.3.18 Displaying Past Medications

ID	Description	Conformance	Evidence Rating
MEDv-100	By default, sort medications reverse chronologically by end date (or equivalent) such that the most recent is first (top) when the filter is set to 'Past' in the Medications List view	Recommended	Medium
MEDv-175	When displaying past medications, place the status column first (furthest left) and the Drug Details column second	Mandatory	Low
<b>Usage Examples</b>			
		In this correct example of past medications, the list is sorted reverse chronologically by end date (or equivalent) by default.	
		This example of past medications is not recommended because the list is sorted chronologically by end date (or equivalent) by default.	
		In this correct example of past medications, the Status column is displayed first and the Drug Details column second.	
		This example of past medications is incorrect because the Status column is displayed after the Drug Details column.	



## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risk:

- The status of items in a list of past medications is hard to see (and could be mistaken to be current medications) and to cross-reference with drug names, leading to misinterpretation of status and errors

Mitigation: The status for past medications is placed next to the drug name and formatted differently from the status for current medications.

### Design Analysis:

This guidance aims to enhance the different 'sense of place' between current and past lists of medications by:

- Changing the placement of the Status column (in which a status that is classed as 'past' is formatted differently from a status that is classed as 'current')
- Displacing the Drug Details column so that it is no longer the first column
- Mitigating the risk that the information in the Drug Details column is read without awareness that the list is of past medications and not current medications

### User Research:

This guidance is informed by a user research study, in which 14 health care staff were interviewed, and by an online survey, which was completed by 22 health care staff. The study found that the **Current** and **Past** buttons alone were not enough for the user to notice whether they were reviewing a list of current medications or a list of past medications.

User feedback suggested that past medications should be ordered reverse chronologically by end date. This was so that more recently ended medication would be more obvious to the user. It is expected that a Timeline view of medications would provide the most effective means for clinicians to view the history of medications, as it would be more effective at communicating sequences of events and relationships between start and end dates of the various courses of medication.

## 3.3.19 Filtering Past Medications

ID	Description	Conformance	Evidence Rating
MEDv-069	When a filter is applied to past medications in Medications List view, the <b>Past</b> button should indicate that it is currently selected	Mandatory	High
MEDv-070	When a filter is applied to past medications in the Medications List view, display a filter notification at the top of the list below the column headings and above the scroll bar (thus 'pushing' the list of medications down a line)	Mandatory	Medium
MEDv-068	When a filter notification is displayed, include a control for removing the filter within that notification	Mandatory	High
MEDv-071	Display a description of the filter in use within the filter notification in the Medications List view	Mandatory	Medium
MEDv-072	Include a count of the number of medications displayed and a count of the total (unfiltered) number of past medications in a filter notification	Recommended	Low
MEDv-176	Clearly label the counts (number of medications displayed and total unfiltered number) with text that allows them to be differentiated	Recommended	Medium

## Usage Examples

Current

Past

▼

Status

This list is filtered to show: Past 2 months

Remove Filter

Completed


hydrochlorothiazide – tablet – DOSE 100 mg

Discontinued

methyldopa – tablet – DOSE 250 mg – oral –

Completed

furosemide – tablet – DOSE 40 mg – oral –



In this correct example:

- Past medications are filtered to show the past two months
- The past button indicates that it is currently selected
- A filter notification is displayed at the top of the list below the column headings and above the LASB notification

This list is filtered to show: Past 2 months

Remove Filter

Status

Completed

hydrochlorothiazide – tablet – DOSE 100 mg

Discontinued

methyldopa – tablet – DOSE 250 mg – oral –



This example is incorrect because the filter notification is displayed above the column headings.

Remove Filter

Status

This list is filtered to show: Past 2 months

Completed

hydrochlorothiazide – tablet – DOSE 100 mg

Discontinued

methyldopa – tablet – DOSE 250 mg – oral –



This example is incorrect because the control for removing the filter is not positioned within the filter notification.

The total list (54) is filtered to show: Past 2 months (3)



In this correct example, the filter notification includes a count of the medications displayed and the total number of past medications and both counts are clearly labelled.

This list is filtered

er



This example of a filter notification is incorrect because it does not include a description of the filter.

## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risks:

- If the two counts (total unfiltered and count of those in the filtered list) are displayed without clear labelling for each, they may be misinterpreted. For example, the phrase 'Past month (10 of 24)' may be interpreted to mean that there are 24 medications in the past month, of which 10 are currently shown.

Mitigation: When counts are displayed, each number must be clearly associated with a description of the count.

**Design Analysis:**

When a list of medications is filtered, there is a risk that medications filtered out (and thus hidden from view) may be missed. Filtering is nonetheless needed for past medications because the list may be very long. The primary filters for 'current' and 'past' have prominent controls and significant differences within the list to clearly communicate which is the active filter. A similar, though less prominent, communication is needed when the past medications are filtered further. The filter notification provides this feedback within the context of the filtered list to minimise the risk that it may be missed, whilst also causing as little disruption to the task of reviewing the list as possible.

For consistency, the past filter can be changed in the same way that it was applied: by using the filter control to choose a different filter or selecting the 'all past' from the drop-down list.

Quick removal of the current filter is supported by the control displayed within the filter notification. This avoids the need to access the drop-down list from the past filter control above. By providing a 'remove filter' control within the context of the filter, it is readily available when the notification has been read.

### 3.3.20 Displaying a Look-Ahead Scroll Bar

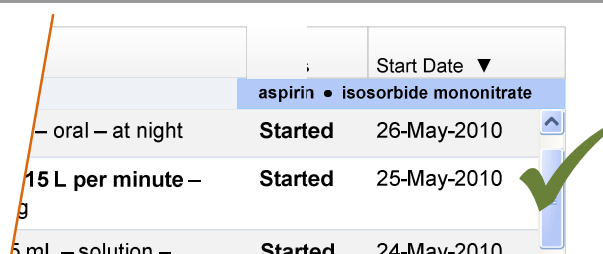
Sections 3.3.20 to 3.3.28 include guidance for LASBs. A LASB is a standard scroll bar that is supplemented with notifications at the top and bottom to indicate that there are items in the list that are not currently visible. Figure 5 shows a diagram of a Medications List view with the LASB and notifications marked:



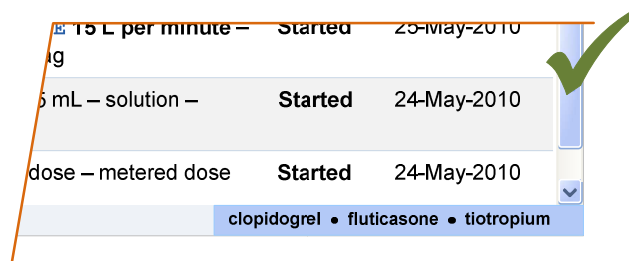
Figure 5: Diagram of a Medication List View with Look-ahead Scroll Bars

ID	Description	Conformance	Evidence Rating
MEDv-177	When displaying a list of current or past medications, and the scroll bar is active because the list is longer than the space available to display them, provide a clear indication that there are medications out of view	Mandatory	High
MEDv-178	When displaying current medications, supplement the standard scroll bar with notifications that display the names of drugs that are out of view. This document refers to this kind of scroll bar as a look-ahead scroll bar (LASB)	Recommended	Medium
MEDv-179	When displaying a LASB, reserve a space at the top and bottom of the list for look-ahead notifications	Mandatory	Medium
MEDv-180	Use a pale solid background colour for the space reserved for look-ahead notifications that is sufficient to distinguish the space from the background of the list	Recommended	Medium
MEDv-181	When grouping is applied, and there is a collapsed group out of view, display drug names in the look-ahead scroll bar for any drug that is out of view, irrespective of whether it is within a collapsed group or an expanded group	Recommended	Low

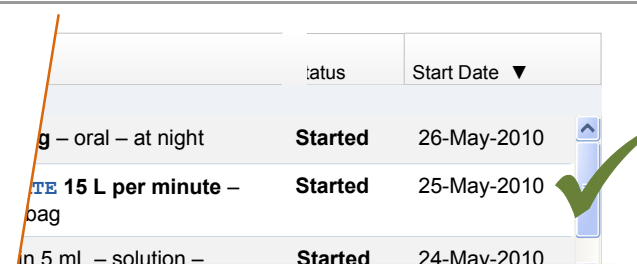
### Usage Examples



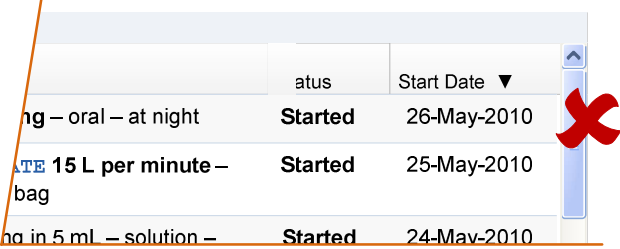
In this correct example, the standard scroll bar has been supplemented with notifications that display the names of drugs that are out of view. This example shows the drug names of two medications that are above the visible list.



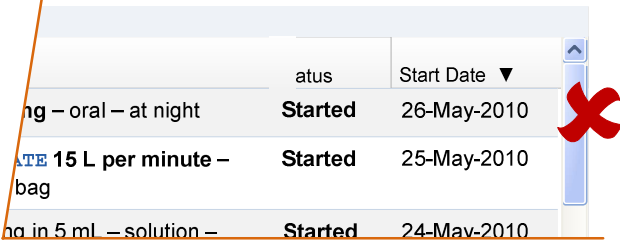
In this correct example, the standard scroll bar has been supplemented with notifications that display the names of drugs that are out of view. This example shows the drug names of three medications that are below the visible list.



In this correct example, a space has been reserved at the top of the list for the look-ahead notifications.



This example is incorrect because the space reserved for the look-ahead notification is above the column headings.



This example is incorrect because a space has not been reserved at the top of the list for the look-ahead notifications.

## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following key risks which are mitigated by the design:

- Medications that are out of view may be overlooked if the scroll bar is not enough to draw attention to them:
 

Mitigations:

  - The scroll bar is supplemented with 'look-ahead' notifications that change in response to scrolling to allow more drug names to be visible and provide a stronger visual cue that there are medications out of view
  - Drug names are displayed to increase the chances that an important medication is noticed, and to encourage the more detailed review of those medications that are out of view
- The purpose of the LASB may not be immediately understood and correctly interpreted:
 

Mitigations:

  - This risk was raised in response to a review of static screenshots. However, the dynamic nature of the LASB makes it much easier to interpret
  - This issue would also be mitigated by training
- When collapsed groups are scrolled out of view and the look-ahead notifications display drug names, this may cause some confusion

### Design Analysis:

When displaying a list of medications within the context of a patient record, it is important to communicate clearly where that list begins and ends. It is especially important to show if there are items hidden from view, particularly in current medications. Whilst the size of a standard scroll bar can indicate that other items are available, this is not a particularly strong cue and could potentially be missed, especially in busy or high stress conditions.

The LASB is designed to mitigate the risk that medications currently out of view are overlooked. It is considered especially important that the UI does everything it can to ensure a list of current medications for a single patient is reviewed in its entirety.

The LASB notifications display drug names for medications in collapsed groups that are out of view. This is part of a safety trade-off that balances the risk that there are drugs out of view with the risk that the resulting visual cues may be confusing for the uninitiated user. Since there may be both collapsed and expanded groups out of view, and to maintain consistency of the look-ahead notifications, mitigation of the risks above has been given priority.

A LASB is relevant for use in any view where an understanding of the extent and contents of a full list are a safety concern.

Alternative approaches to the design of a LASB that have been precluded on the basis of findings from user testing, user interface standards and patient safety risks include:

- A look-ahead notification that occludes medications in the list. This approach is precluded because it can cause text in the notification to be read as part of the text in the medication line that it occludes. It can therefore cause the occluded medication to be misread or missed altogether.
- Avoiding occlusion by enforcing a scrolling action that never excludes a line (both at the top and the bottom of the list). This approach is precluded because it introduces white space at the top or bottom of a list that may be misinterpreted as an indication that the end (or beginning) of the list has been reached. It is also non-standard scrolling behaviour and is difficult to implement effectively since each medication line may be a different height depending on its contents (and line wrapping).
- The reservation of white space at the top and bottom of a list in which to display look-ahead notifications. This approach may cause the white space to be misinterpreted as an indication that the end (or beginning) of the list has been reached.
- Dynamic display of space for a look-ahead notification only when one is needed. Whilst this approach maximises the space available for the display of list items, it is precluded because it dynamically changes the position of list items as a look-ahead notification appears or disappears. If the scroll bar is joined to the notification in the way that guidance mandates here, the dynamic appearance of a notification also changes the overall height of the scroll bar. Finally, the preserved space for a look-ahead notification is a positive indication that there are no medications out of view whilst the absence of a notification is a passive indication.

The display of a message such as 'start of the list' or 'end of the list' when there are no medications in the list that are out of view. This approach does provide a positive indication that there are no medications out of view and it effectively communicates the purpose of the spaces reserved for look-ahead notifications. However, there is a risk that the prominence of such a message to column headings may cause the message in the notification to be misinterpreted. For example, the phrase 'start of the list' might appear under a column heading of 'start date'.

Reserving space for the LASB achieves the following:

- The scroll bar and look-ahead notifications have fixed positions so there is no impact from the resizing or repositioning of the scroll bar or the contents of the list as the notifications appear and disappear
- The look-ahead notification cannot overlap a medication in the list, so some of the risks associated with occlusion are mitigated
- A clearer definition of when a medication should appear in the notification can be achieved

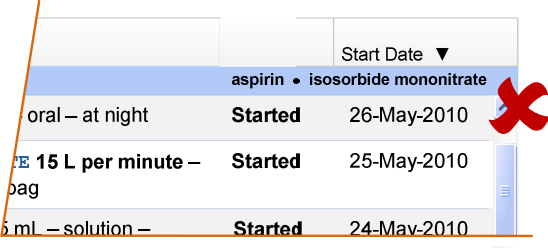
#### User Feedback:

The guidance is supported by a user feedback study with nine health care staff that showed strong support for a mechanism of indicating that there are medications out of view. The LASB is the example mechanism that was used in this study. The guidance is also supported by an iterative assessment of an interactive prototype.

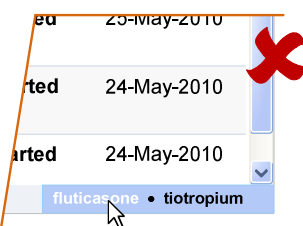
### 3.3.21 Defining Look-Ahead Scroll Bar Interactions

ID	Description	Conformance	Evidence Rating
MEDv-058	Update the look-ahead notifications dynamically in response to scrolling	Mandatory	Low
MEDv-059	Allow the look-ahead notification to change width dynamically to accommodate its contents up to the available width	Mandatory	Medium
MEDv-182	Do not allow the look-ahead notification to be used for navigation by clicking on areas of the notification, such as drug names or counts	Mandatory	Medium

#### Usage Examples



This example is incorrect because the look-ahead notification is wider than it needs to be to display the two drug names.



This example is incorrect because the look-ahead notification is being used for navigation by clicking on a drug name to navigate to that drug in the list.

### Rationale

**Design Analysis:**

The following issues are associated with the use of a look-ahead notification for navigation:

- Encourages a 'jumping' style of navigation in which it is possible to navigate from the top to the bottom of a long list very quickly without any visibility of the medications in the remainder of the list
- Raises design challenges relating to where within the vertical list space to display the drug that was selected in the look-ahead notification
- Adding too much functionality to the LASB encourages its use and increases dependency on the (low level of) information within it
- Introduces the need for different types of formatting (such as highlighting on a hover-over) that may conflict with formatting mandated in the document *Design Guidance – Medications Management – Drug Administration {R12}*
- Implies the need for this functionality to be either intuitive or clearly communicated through the UI, which is likely to require further messages, notifications and embellishments to the LASB and look-ahead notifications
- Introduces unnecessary complexity, especially when grouping is applied to the list. (For example, a group has been collapsed and scrolled out of view and the drug names for that group are visible on the look-ahead notification. When a drug name from that group is clicked, the group will move into view and will need to be expanded in order to show the drug that was selected in the look-ahead notification.)

The purpose of the LASB as defined in this guidance is to ensure that medications off screen (higher and lower in the list than the currently visible list items) are not overlooked.

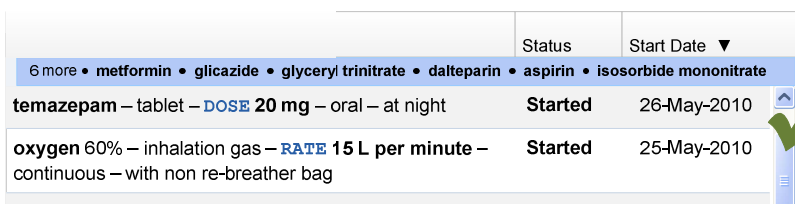
**User Research:**

The use of look-ahead notifications to support navigation has been explored extensively in user research studies, including a study with an interactive prototype. It has also been explored extensively through the assessment of design alternatives.

### 3.3.22 Displaying Look-Ahead Scroll Bar Notifications

ID	Description	Conformance	Evidence Rating
MEDv-044	Restrict the look-ahead notifications to a single line each	Mandatory	Medium
MEDv-043	The look-ahead notifications should be clearly joined to the 'up' and 'down' arrow controls of the scroll bar respectively	Mandatory	Medium
MEDv-045	Do not place controls or other notifications such that they separate the look-ahead notification from the medications in the Medications List view	Mandatory	Medium

### Usage Examples



In this correct example of current medications, the look-ahead notification is limited to a single line and the look-ahead notification is clearly joined to the 'up' arrow control of the scroll bar.

	Status	Start Date ▼
2 more • benzydamine • lactulose • metoclopramide • morphine • metformin • glicazide • glyceryl trinitrate • dalteparin • aspirin • isosorbide mononitrate		
temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution –	Started	24-May-2010

This example is incorrect because the look-ahead notification is not limited to a single line.

	Status	Start Date ▼
aspirin • isosorbide mononitrate		
g – oral – at night	Started	26-May-2010
ATE 15 L per minute – r bag	Started	25-May-2010
in 5 mL – solution –	Started	24-May-2010

This example is incorrect because the look-ahead notification is not joined to the up arrow of the scroll bar.

	Status	Start Date ▼
aspirin • isosorbide mononitrate		
temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution –	Started	24-May-2010

This example is incorrect because the LASB has been separated from the medications in the list by the column headings.

### Rationale

**Design Analysis:**

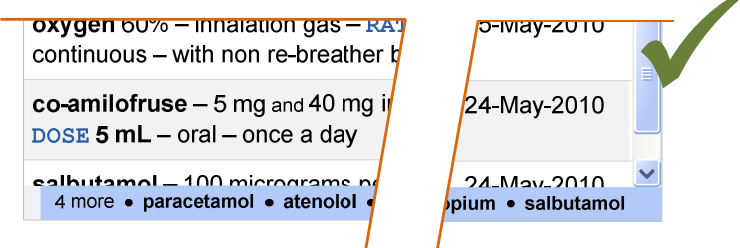
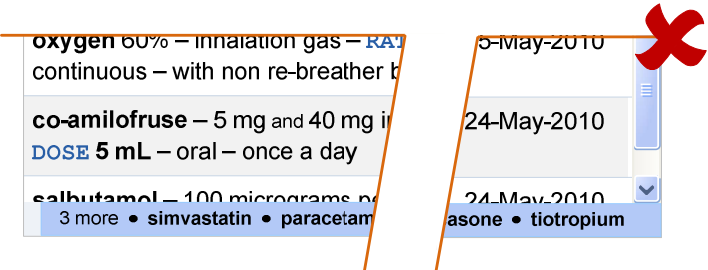
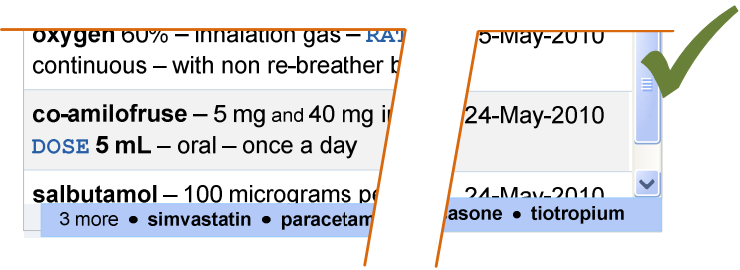
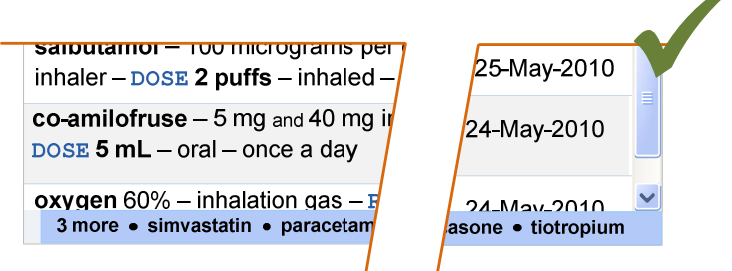
The look-ahead notifications are a means of extending the visible section of the list. If the notifications are too far removed from the scroll bar (for example, by placing controls or other notifications that separate them from the scroll bar) they are less likely to be noticed when the focus of attention is the contents of the list. If they are not noticed, they do not successfully mitigate the risk that the presence of medications off screen is missed.

If the look-ahead notification is not clearly joined to the scroll bar, it may initially be interpreted as serving an unrelated function (until the user interacts with the scroll bar).

The presentation of a look-ahead notification reduces the amount of space available to display the list of medications and for this reason it is restricted to a single line.



### 3.3.23 Selecting Look-Ahead Scroll Bar Contents

ID	Description	Conformance	Evidence Rating
MEDv-049	The order of both the items in the look-ahead notification and the medications list should always be the same	Mandatory	Medium
MEDv-183	If any of the drug name text (other than letter ascenders and descenders) is obscured by the boundaries of the list, include that drug in the look-ahead notification	Recommended	Low
<b>Usage Examples</b>			
			In this correct example, the drug name 'salbutamol' is obscured so it is included in the look-ahead notification.
			This example is not recommended because the drug name 'salbutamol' is obscured but it has not been included in the look-ahead notification.
			In this correct example, the drug name 'salbutamol' is not obscured therefore it is not included in the look-ahead notification.
			In this correct example, only the descenders of the letters 'y' and 'g' in the drug name are obscured so the drug name does not appear in the look-ahead notification.

## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risk:

- If the name of a drug at the top or bottom of the visible section of the list is visible and also displayed in the LASB notification, the user may assume that this medication has been prescribed twice

Mitigation: A drug name only appears in a LASB notification if the drug name is significantly obscured.

### Design Analysis:

When a standard scroll bar is used to scroll down a list, the list items at the beginning and end of the list may be partially obscured by the top and bottom boundaries of the list. The look-ahead notifications display the names of any medications that are not currently visible, and this can apply to medications that are sufficiently obscured by the top and bottom boundaries of the list.

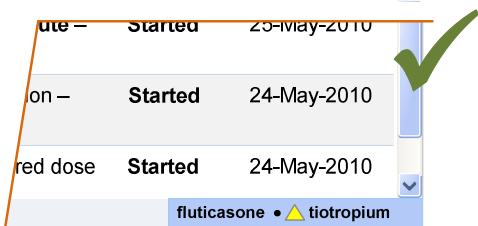
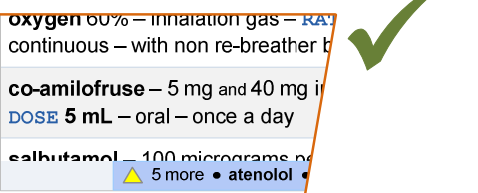
It is necessary to define a threshold for when a medication is sufficiently occluded for it to appear in the look-ahead notification. This mitigates the risk that a medication may be visible in both the list and a look-ahead notification, and thus be interpreted as two prescriptions for the same drug. The guidance therefore aims to provide a measurable means of defining when to display an obscured medication in the look-ahead notification. This measure aims to identify when the drug name is sufficiently obscured to make it not easily readable.

The definition of the threshold must refer specifically to the text of the drug name because a medication can be wrapped onto a new line. If it thus appears at the bottom of the list, it may be obscured at the second line but the drug name itself remains fully visible.

## 3.3.24 Displaying Look-Ahead Scroll Bar Contents

ID	Description	Conformance	Evidence Rating
MEDv-048	The look-ahead notification is populated from right to left such that the next drug in the list appears closest to the scroll bar	Mandatory	Medium
MEDv-052	When there are more items than can be displayed in the look-ahead notification for current medications, display as many as possible and end the list with a count of the remaining items that could not be displayed	Mandatory	Medium
MEDv-053	When a count is displayed in a look-ahead notification and one or more of the medications included in that count have decision support alerts, display a decision support alert icon next to the count	Mandatory	Medium
MEDv-055	When displaying current medications only, show drug names and decision support alert icons in the look-ahead notification	Mandatory	Medium

### Usage Examples

	<p>In this correct example, a (notional) alert icon is displayed next to a drug name in the look-ahead notification for a list of current medications.</p>
	<p>In this correct example, a count is displayed for the remaining drug names that could not be displayed in the look-ahead notification. Also, a (notional) alert icon is displayed next to the count in the look-ahead notification for a list of current medications.</p>

## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risks:

- If the patient is on more medications than the LASB can handle, there may be drugs that are out of view and not displayed in the look-ahead notifications that are missed

Mitigation: The LASB displays as many drugs as possible in the look-ahead notifications and then displays a count of the number of additional medications that are out of view in that direction (up or down).

- If the LASB only shows the number of medications that are out of view for a list of current medications, an important medication may be overlooked

Mitigation: Drug names are displayed in the look-ahead notification for a list of current medications as part of a safety trade-off that prioritises as much mitigation as possible of the risk that one or more important medications are missed because they are out of view.

- If the look-ahead notification contains 8 drug names and a count of 8 more medications, the user might assume that the count refers to the 8 medications that are listed in the look-ahead notification and not realise that there are actually a total of 16 medications out of view

Mitigation: The LASB notifications change dynamically as the list is scrolled up or down so that the counts, the number of drug names and the drug names themselves change as soon as the list is moved.

### Design Analysis:

The purpose of the LASB, as defined in this guidance, is to ensure that medications off screen (higher and lower in the list than the currently visible list items) are not overlooked. The look-ahead notifications effectively extend 'visibility' of the list of medications by displaying the names of the drugs that are immediately above and below the visible area of the list. To use an analogy:

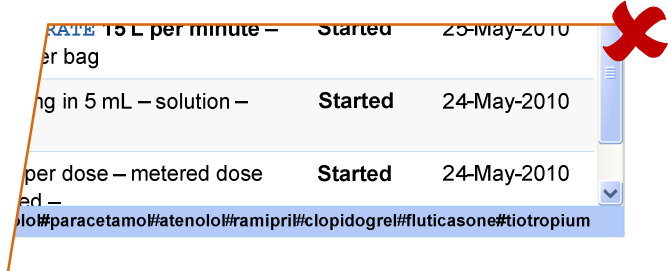
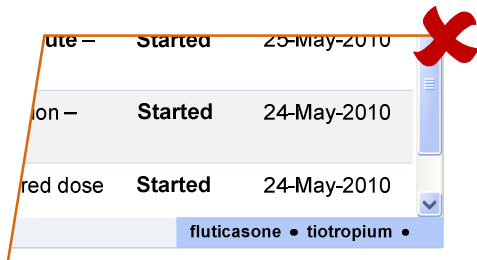
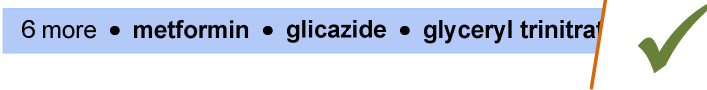
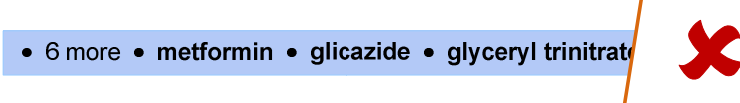
- The visible list is 'in focus'
- The medications just outside of the visible list are 'in peripheral vision' and can be seen in less detail in the look-ahead notifications
- The medications beyond peripheral vision are represented by a count in the notifications that simply marks their presence

The LASB draws attention to the presence of medications that are off screen to help ensure that important information is not missed. Important medications cannot always be displayed at the top of the list without causing further risks as a result of an unclear list order and unexpected behaviour in relation to sorting, grouping and filtering. Thus where decision support alert icons are present, it is important that they can still be seen when the medications in question are off screen.

Displaying drug names in the LASB achieves the following:

- Increases the likelihood that an important drug is noticed, even when it is out of view
- The width of the look-ahead notification increases and decreases as the list is scrolled, thus introducing movement and significantly increasing the likelihood that the notifications will be noticed
- Contributes to the differentiation between a list of current medications and a list of past medications
- Gives some indication of how far down the list to scroll in order to find the medications whose drug names are listed in the look-ahead notification
- Contributes to getting an overview of a whole list of one patient's current medications









### 3.3.25 Formatting Look-Ahead Scroll Bar Contents

ID	Description	Conformance	Evidence Rating
MEDv-056	Use a delimiter that is unlikely to be interpreted as a character or number (such as a black dot '●'), with a space either side to separate drug names and to separate the count from drug names	Mandatory	Medium
MEDv-184	Do not use leading or trailing delimiters	Mandatory	Low
MEDv-185	Do not include additional text or formatting to indicate grouping in the look-ahead notifications	Mandatory	Low
Usage Examples			
		This example is incorrect because the drug names in the look-ahead notification have not been separated with a clear delimiter with spaces either side.	
		This example is incorrect because there is a trailing black dot (●) after the drug name on the far right.	
		In this correct example of a look-ahead notification, the medications are separated with clear delimiters with a space either side and there are no leading or trailing delimiters.	
		This example of a look-ahead notification is incorrect because there is a delimiter to the left of the count.	
Rationale			
Design Analysis:			
This guidance aims to ensure that drug names are presented clearly and separated to minimise reading error.			

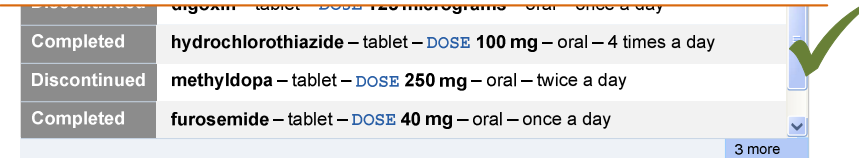
### 3.3.26 Drug Names in the Look-Ahead Scroll Bar

ID	Description	Conformance	Evidence Rating
MEDv-050	Where exceptionally long drug names require more space than is available in a look-ahead notification, display a count instead (as for past medications)	Mandatory	High
MEDv-051	Do not truncate or abbreviate drug names in the look-ahead notification	Mandatory	High
Usage Examples			
<div><div><div><div><div>oxygen 60% – inhaled gas – RATE 15 L per minute – Started 25-May-2010</div><div>continuous – with non re-breather bag</div></div><div><div>co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day</div><div>Started 24-May-2010</div></div><div><div>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – 3 more • atenolol • ramipril • clopidogrel • fluticasone • tiotropium</div><div>Started 24-May-2010</div></div></div></div><div></div></div> <td colspan="2">In this correct example, the look-ahead notification is much shorter than the width of the Medications List view because a long drug name was displayed as part of the count.</td>		In this correct example, the look-ahead notification is much shorter than the width of the Medications List view because a long drug name was displayed as part of the count.	
<div><div>3 more • atenolol • ramipril • clopidogrel • fluticasone • tiotropium</div><div></div></div>		This is a closer view of the correct notification in the previous usage example.	
<div><div><div><div><div>oxygen 60% – inhaled gas – RATE 15 L per minute – Started 25-May-2010</div><div>continuous – with non re-breather bag</div></div><div><div>co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day</div><div>Started 24-May-2010</div></div><div><div>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – 2 more • brompheniramine + pseudo... • atenolol • ramipril • clopidogrel • fluticasone • tiotropium</div><div>Started 24-May-2010</div></div></div></div><div></div></div> <td colspan="2">This example is incorrect because a long drug name has been truncated in the look-ahead notification.</td>		This example is incorrect because a long drug name has been truncated in the look-ahead notification.	
<div><div>2 more • brompheniramine + pseudo... • atenolol • ramipril • clopidogrel • fluticasone • tiotropium</div><div></div></div>		This is a closer view of the incorrect notification in the previous usage example.	
Rationale			
Hazard Risk Analysis Summary:			
From our Patient Safety Risk Assessment analyses we identified a number of potential hazards, including the following key risks which are mitigated by the design:			
<ul style="list-style-type: none"><li>Using the LASB, the user selects a drug to prescribe based on the information in the look-ahead notification. The prescribing decision is informed by a truncated drug name that appears in the look-ahead notification. The drug was in fact a combination of two drugs, the second of which was not visible in the truncation.</li></ul>			
Mitigation:			
<ul style="list-style-type: none"><li>Drug names cannot be truncated (MEDv-051)</li><li>The look-ahead notifications cannot be used for navigation by clicking on areas of the notification, such as drug names or counts (MEDv-180)</li></ul>			
Design Analysis:			
The display of partial or truncated drug names introduces the risk that the truncated drug name is misread or misinterpreted by making assumptions about the missing part the drug name. Since the purpose of the LASB is to ensure that medications off screen are not overlooked, the display of a count supports this need without introducing the risks associated with truncation.			

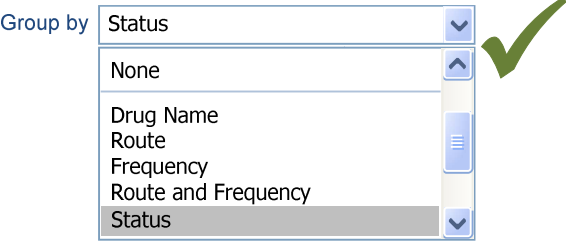
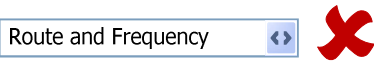
### 3.3.27 Formatting Look-Ahead Scroll Bar Notifications

ID	Description	Conformance	Evidence Rating
MEDv-186	Display drug names in bold and in black text by default	Mandatory	Medium
MEDv-187	Display counts and descriptive text (such as 'more') in normal weight font	Mandatory	Medium
MEDv-188	Use a light solid background colour for the notifications that is both sufficiently different from the colour in the space reserved for notifications and sufficiently different from the black text in the notification	Recommended	Medium
MEDv-189	Do not use a border in a dark colour or with a weight greater than 1 point for a look-ahead notification	Recommended	Low
Usage Examples			
<div>3 more</div> 		This correct example of a look-ahead notification in past medications displays the count in black text.	
<div>aspirin • isosorbide mononitrate</div> 		This correct example of a look-ahead notification in current medications displays the drug names in black text.	
<div>3 more</div> 		This example from past medications is incorrect because the count is not displayed in black by default and because the count is in bold text.	
<div>aspirin • isosorbide mononitrate</div> 		This example from current medications is incorrect because the drug names are not displayed in black by default.	
<div>atenolol • fluoxetine • naproxen</div> 		This example from current medications is not recommended because the background colour for the notification is dark.	
<div>ropium</div> 		This example from current medications is not recommended because a gradient has been used in the background of the notification.	
<div>aspirin • isosorbide mononitrate</div> 		In these correct examples from current medications, one has no border, one has a grey border and one has a pale blue border. All borders are subtle and less than 1 point wide.	
<div>aspirin • isosorbide mononitrate</div>			
<div>aspirin • isosorbide mononitrate</div>			
<div>aspirin • isosorbide mononitrate</div> 		This example from current medications is not recommended because a strong and dark border has been used around the notification.	
Rationale			
Design Analysis:			
This guidance aims to ensure that drug names are presented clearly and separated to minimise reading error. It makes specific recommendations in order to introduce consistency between systems.			

### 3.3.28 Displaying a Look-Ahead Scroll Bar for Past Medications

ID	Description	Conformance	Evidence Rating
MEDv-054	When displaying past medications only, display counts in the look-ahead notification and not drug names	Mandatory	Low
<b>Usage Examples</b>			
 <p>In this correct example of past medications, the look-ahead notification displays a count only.</p>			
<b>Rationale</b>			
<b>Design Analysis:</b> There are a number of reasons for treating the LASB differently in a list of past medications and in a list of current medications: <ul style="list-style-type: none"> <li>■ A list of past medications is not as critical as the list of current medications for informing day-to-day care and decision making</li> <li>■ A list of past medications is expected to be longer than a list of current medications in most cases based on the assumption that the list can contain medications from other contexts and other episodes of care</li> <li>■ Different treatment of the look-ahead notification further enhances the visual differences between a list of current medications and past medications, thus reducing the risk of mistaking one for another</li> </ul>			

### 3.3.29 Providing a Grouping Control

ID	Description	Conformance	Evidence Rating
MEDv-084	Provide a standard drop-down list for displaying, selecting and applying grouping to the medications list	Mandatory	High
MEDv-085	Label the grouping control 'Group by'	Mandatory	Medium
MEDv-190	Include an option in the drop-down list to set the grouping to 'None'	Mandatory	High
<b>Usage Examples</b>			
 <p>In this correct example, a drop-down list is provided for displaying, selecting and applying a grouping to the list and is labelled 'Group by'.</p>			
 <p>This example of a control for displaying, selecting and applying a grouping to the list is incorrect because it is not a standard drop-down list.</p>			

☐ Drug Name   ☒ Route   ☐ Status 

This example of a control for displaying, selecting and applying a grouping to the list is incorrect because it is not a standard drop-down list.

## Rationale

### Design Analysis:


The options for grouping a list of medications should be pre-defined and carefully considered, especially in relation to the display of groupings that may not be mutually exclusive (see section 3.3.33 for guidance on combining groups to avoid duplicates). Since a limited number of grouping options will be available from which only one can be selected, a drop-down list is the most appropriate standard control to use.

## 3.3.30 Supporting Grouping

ID	Description	Conformance	Evidence Rating
MEDv-083	Present the Medications List view with no grouping active by default	Recommended	Medium
MEDv-087	Retain the column sort order in the Medications List view when grouping is applied	Mandatory	High
MEDv-191	Display groups expanded by default	Mandatory	Medium
MEDv-192	Re-start alternate row shading at the beginning of each group. (Alternate row shading is not needed if there is only one medication in each group)	Mandatory	Low
MEDv-193	When a grouping is selected in the grouping control, ensure that at least one group heading is visible in the newly grouped list	Mandatory	Low

## Usage Examples

### Oral

**temazepam** – tablet – **DOSE 20 mg** – oral – at night   **Started**   26-May-2010 


**co-amilofruse** – 5 mg and 40 mg in 5 mL – solution – **DOSE 5 mL** – oral – once a day   **Started**   24-May-2010

### Inhaled

**salbutamol** – 100 micrograms per dose – metered dose inhaler – **DOSE 2 puffs** – inhaled – four times a day as required   **Started**   24-May-2010

In this correct example, alternate row shading is not needed because there is only one medication in each of the two groups.

### Oral

**co-amilofruse** – 5 mg and 40 mg in 5 mL – solution – **DOSE 5 mL** – oral – once a day   **Started**   24-May-2010 

### Inhaled

**salbutamol** – 100 micrograms per dose – metered dose inhaler – **DOSE 2 puffs** – inhaled – four times a day as required   **Started**   24-May-2010

This example is incorrect because the alternate row shading has not been re-started at the beginning of each group (the first medication in each group should not have a shaded background).



## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following key risks which are mitigated by the design:

- If one group contains many medications, and the group heading has been scrolled out of view, the user may not notice that the medications list has been grouped:  
Mitigation: When grouping is first applied the list must be displayed such that at least one group heading is visible.
- The system default view settings are inappropriately set, leading to incomplete information or overwhelming information, leading to lower quality decisions:  
Mitigation: The Medications List view is presented with grouping inactive by default (MEDv-083) and with a default sort order (MEDv-099).

### Design Analysis:

The decision to use grouping is based primarily on the perceived risks associated with presenting a filtered view. Both grouping and filtering were evaluated as solutions for breaking lists of medications into meaningful sets and for displaying medications with particular attributes in common. This evaluation informs the choice of grouping over filtering.

The following assumptions are made:

- It is more important to mitigate risks associated with hiding information from view by applying a filter than mitigate risks associated with scrolling long lists once medications have been grouped
- Some attributes will create a large number of sets (for example, if there are a great number of prescribers in a list of medications) and these are better handled by grouping within a list rather than providing a large number of filters that present a series of lists
- The advantages of filtering are outweighed by the risks associated with hiding information by presenting a filtered list. This is true when filtering on set of values that are mutually exclusive and when filtering on sets of values from more than one topology
- There is more space for descriptive text labels for group headings than for filters if filters are presented as tabs. This assumes that sets of filters are expected to be always visible and thus displayed outside of the list, whilst group headings can be presented within the list and revealed by scrolling
- The need for visibility of the full set (of groups or filters) is less important than being able to support descriptive labels for sets and presenting sets in the context of the whole list, rather than using a filter to hide some medications from view

Displaying grouping by default is recommended rather than mandatory to allow for exceptional contexts in which a user may be focused entirely on one very specific task, and that task is best supported by a display with a specific grouping.

#### Important

Unlike past medications, it is important that a full list of current medications is always displayed. Thus, current medications cannot be filtered. It is still possible to 'hide' information in a list of current medications by applying grouping and collapsing to one or more groups. When a group is collapsed, there are clear indicators (expand buttons) in context to show that information has been hidden, and the group name gives some indication of the nature of the hidden information. The list of current medications should not support filters that hide information from view without clear signposting.

### User Research:

Grouping and filtering were explored at some length over successive user feedback sessions involving a total of 54 interviews with health care staff and a further 22 survey respondents. These sessions identified requirements, advantages and disadvantages of design alternatives. The ability to reorganise the list of medications into different sets in some way was consistently supported.

More than one of these user feedback sessions also found that secondary care users were very familiar with having medication grouped into the kinds of categories on their paper drug charts. Though these vary, common categories are Regular, One-off, As Required and Infusions.

Users in all rounds confirmed that they would like to be able to organise medication by 'type'. However, user feedback also showed that the majority of users in several feedback rounds would prefer the medications not to be grouped by type by default, with the caveat that certain key differences between medications should clearly be indicated (for example, whether a medication was 'As Required').

### 3.3.31 Displaying Group Headings

ID	Description	Conformance	Evidence Rating
MEDv-086	Display clear and prominent headings for each group category	Mandatory	Medium
MEDv-090	Do not display group headings for empty groups	Recommended	Medium
MEDv-091	Provide 'null' groups where necessary to support the display of medications that do not have a value for the attribute being used to group the medications	Mandatory	Medium
MEDv-194	Display the label for a 'null' group heading in brackets	Mandatory	Low
MEDv-195	Display 'null' groups at the top of the list of groups	Recommended	Medium

### Usage Examples

Oral

temazepam – tablet – DOSE 20 mg – oral – at night

Started

26-May-2010

co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day

Started

24-May-2010

Inhaled

salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required

Started

24-May-2010

Oral

temazepam – tablet – DOSE 20 mg – oral – at night

Started

26-May-2010

co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day

Started

24-May-2010

Rectal

Intravenous

Inhaled

salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required

Started

24-May-2010

Tablet

temazepam – tablet – DOSE 20 mg – oral – at night

Started

26-May-2010

Solution

co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day

Started

24-May-2010

(No Form Specified)

clopidogrel – DOSE 75 mg – oral – once a day

In this correct example of current medications, clear and prominent group headings are displayed for each group category.

This example is incorrect because group headings are displayed for groups that are empty.

In this correct example, a null group is provided to display medications that do not have a value for form.

<input type="checkbox"/> Tablet	<b>temazepam</b> – tablet – <b>DOSE 20 mg</b> – oral – at night	<b>Started</b>	26-May-2010	This example is incorrect because the group headings are not prominent enough (they are in the same font size and weight as the text in the medication lines).
<input type="checkbox"/> Solution	<b>co-amilofruse</b> – 5 mg and 40 mg in 5 mL – solution – <b>DOSE 5 mL</b> – oral – once a day	<b>Started</b>	24-May-2010	

**Rationale**

**Hazard Risk Analysis Summary:**

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risks:

- If grouping is applied on an attribute such as 'form' and the 'null' group appears at the bottom of the list, medications in this group may be more important and may be more likely to be missed as a result of being at the bottom of the list

Mitigation: Guidance recommends the prioritisation of 'null' groups to allow this risk to be mitigated. Whilst it is important to mitigate this risk, this guidance point is not mandatory because it is recognised that, in some cases, depending on the nature of the attribute by which the list is grouped, it may be appropriate to place a null group at the end of the list.

**Design Analysis:**





Effective group headings will assist a user scanning group headings to find a specific group as well as reading the contents of the list with minimum distraction from the group headings.

Some grouping schemes may be based on attributes that are not mandatory for all medications. Where this is the case, the grouping scheme must still display the medications that do not have any information for the attribute that the grouping is based on. In this case, a null group is necessary and must be clearly communicated.

When grouping is based on an attribute that can have many values, there may be a large number of group headings to display. If the group headings are based on a limited set of possible values (such as route or form), the display of a group heading for every possible value could result in a list that contains primarily group headings and only shows medications in a few of those groups. In this case, the list becomes saturated with group headings and it becomes difficult to find and focus on the medications. It is therefore recommended that empty groups are omitted so that only those groups containing medications are displayed.

A possible exception to this rule exists for the presentation of a grouping scheme with a small number of groups that is designed to support a specific task and is used very regularly. For example, a grouping scheme familiar from paper drug charts could include groups for 'Regular', 'As Required', 'Once Only' and 'Infusions'. In this specific instance, positive confirmation that there are no medications in one of these groups is useful and relevant. The guidance for the omission of empty groups is thus recommended rather than mandatory to allow for these exceptions.

### 3.3.32 Collapsing Groups

ID	Description	Conformance	Evidence Rating
MEDv-092	Provide controls for expanding and collapsing individual groups. Place these controls at the beginning of the group heading	Mandatory	High
MEDv-089	When a group is collapsed, supplement the group heading with a number representing a count of medications within that group	Mandatory	Medium
MEDv-196	Support the selection of group headings and the display of a context menu that includes options for collapsing and expanding all columns	Mandatory	Medium
<b>Usage Examples</b>			
<div> <div> <div>+</div> <div>Oral (2)</div> </div> <div> <div>-</div> <div>Inhaled</div> </div> <div> <div>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required</div> <div>Started</div> <div>24-May-2010</div> </div> </div> <div>  <p>In this correct example, a count of the medications in the collapsed group is displayed in the group heading.</p> </div>			
<div> <div> <div>-</div> <div>Oral (2)</div> </div> <div> <div>temazepam – tablet – DOSE 20 mg – oral – at night</div> <div>Started</div> <div>26-May-2010</div> </div> <div> <div>co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day</div> <div>Started</div> <div>24-May-2010</div> </div> <div> <div>-</div> <div>Inhaled (1)</div> </div> <div> <div>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required</div> <div>Started</div> <div>24-May-2010</div> </div> </div> <div>  <p>This example is incorrect because the group headings have been supplemented with counts for groups that are expanded.</p> </div>			
<div> <div>Oral</div> <div> <div>temazepam – tablet – DOSE 20 mg – oral – at night</div> <div>Started</div> <div>26-May-2010</div> </div> <div> <div>co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day</div> <div>Started</div> <div>24-May-2010</div> </div> <div>Inhaled</div> <div> <div>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required</div> <div>Started</div> <div>24-May-2010</div> </div> </div> <div>  <p>This example is incorrect because the group headings do not have expand and collapse controls for each heading.</p> </div>			
<div> <div>Oral</div> <div>Expand</div> <div>Inhaled</div> <div>Use</div> <div> <div>salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required</div> <div>Started</div> <div>24-May-2010</div> </div> </div> <div>  <p>This example is incorrect because the controls for expanding and collapsing each group are not displayed at the beginning of the group heading.</p> </div>			

### 3.3.33 Combining Groups to Avoid Duplication

**Microsoft®** Design Guidance – Medications List  
Prepared by Microsoft, Version 1.0.0.0  
Last modified on 25 March 2009

## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risk:

- If the list is grouped by an attribute (such as reason or drug classification) for which a medication can have more than one value, and the attributes are listed in the combined group heading in no specific order, then it is harder to find a specific attribute within the group headings

Mitigation: Combined group names are listed in the same order that they would be displayed if a sort were applied to that attribute. This order could be alpha-numeric or it could be a logically defined order that is specific to that attribute.

### Design Analysis:

This guidance is based on the assumption that the clinical application will necessarily need to support some grouping schemes that are not mutually exclusive. The guidance has established three approaches for handling grouping of a list using non-mutually exclusive groups:

- Duplicate items that appear in more than one group
- Define a primary group for every list item
- Combine values to create new groups

The guidance makes the assumption that it is not necessarily possible to define a 'primary' group for each medication that belongs to more than one group in a non-mutually exclusive grouping scheme.

The following risks associated with duplicating medications were identified and are mitigated by this guidance:

- Duplicate items may be interpreted as separate medications
- Medications that are duplicated may appear in unexpected groups and therefore may not be found where expected
- Duplication of medications increases the length of the list, potentially causing confusion about the number of medications that a patient is taking
- Medications may be missed because sorting and grouping don't behave as expected

### User Research:

Designs, in which medications were duplicated so that they could appear in more than one group, were tested in user feedback interviews with six hospital-based clinical health care staff. A further nine completed an online survey.

## 3.3.34 Supporting Sorting

Section 3.3.15 includes guidance on the default sort order of a list of current medications and section 3.3.18 includes guidance on the default sort order of past medications.

ID	Description	Conformance	Evidence Rating
MEDv-101	Allow the sort order of a list in the medications list to be changed by clicking on a column heading	Mandatory	High
MEDv-102	Allow the sort order of a list in the Medications List view to be reversed by clicking on the column heading for the column with the active sort applied	Mandatory	High
MEDv-103	Use formatting of the column heading to clearly indicate the column to which the sort order is currently applied	Recommended	Medium
MEDv-104	Use an icon or symbol in the column heading to indicate the column by which the data is sorted and the direction of the sort	Mandatory	Medium
MEDv-105	When the sort order is changed from the default to another attribute in the Medications List view, retain the default as a secondary sort order	Mandatory	Medium

### Usage Examples

Status	Administration
Not Started	29-May-2010
Started	27-May-2010
Started	25-May-2010

In this correct example, the sort order is indicated in the column heading of the sorted column using a triangular symbol. The column heading is also formatted to clearly indicate the column to which the sort order is currently applied.

### Rationale

#### User Research:

Five user feedback sessions involving a total of 47 health care staff found that a large majority of users either actively supported, or did not contest, the order of current medications sorted chronologically by start date with the most recent at the top. This was despite the acknowledgement that the current paper drug charts were ordered chronologically with the oldest at the top based on prescription written date.

In contrast to current paper drug charts, user feedback suggested that past medications should be ordered reverse chronologically by end date. This was so that more recently ended medication would be more obvious to the user. It is expected that a Timeline view of medications (in which events are plotted along a chronological scale) would provide the most effective means for clinicians to view the history of medications, as it would be more effective at communicating sequences of events and relationships between start and end dates of the various courses of medication.

## 3.3.35 Supporting Levels of Detail

ID	Description	Conformance	Evidence Rating
MEDv-201	Provide a control that allows the type and quantity of information displayed to be changed, such that the rows and columns may change in number and be presented with a different layout	Recommended	Medium
<b>Usage Examples</b>			
There are no usage examples for this section.			
<b>Rationale</b>			
<b>Hazard Risk Analysis Summary:</b>			
From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following key risks which are mitigated by the design:			
<ul style="list-style-type: none"> <li>The Level of Detail settings and defaults are misused by organisations leading to misinterpretation or confusion</li> </ul>			
<b>Mitigations:</b>			
<ul style="list-style-type: none"> <li>Guidance in section 3.3.7 mandates the display of Drug Details, Status and a date column so this information cannot be inappropriately hidden</li> <li>Guidance in section 3.3.11 constrains dimensions that effectively limit the number of additional columns that might be displayed</li> <li>The Medications List view is presented with grouping inactive by default (MEDv-083) and with a default sort order (MEDv-099)</li> </ul>			

**Design Analysis:**

A list of medications in text format is useful for the support of many different tasks, and each of those tasks is best supported with a different set of information about the medications in the list. A 'Levels of Detail' control was defined in previous iterations of guidance to support changing between sets of information in order to support different tasks by exposing more or less information respectively.

The medication list should include a control that provides the opportunity to reveal extra information as and when it is needed. For example, if the information in a 'First Administration Date' column is presented as a date without a time, a higher level of detail could be used to reveal the time as well as the date in that column.

In addition to supporting 'greater' or 'lesser' levels of detail, the control could reveal or hide different sets of information that are designed to support specific tasks but that are not necessarily supersets or subsets of one another. For example, the levels of detail from which a user can select could be different depending on their role and context. The scope of this guidance does not extend to the identification of these many tasks and the information that may be best to support them.


**User Feedback:**

User feedback supported the idea that even with the presence of other medications views (such as a Drug Administration view), being able to provide one level of detail for medications that would satisfy all clinical roles in all contexts would be unlikely. Therefore, it should be possible to access different amounts of detail on request. Feedback indicated that access to many of these details would be useful across all the medications in the list at the same time, as well as for one at a time.


### 3.3.36 Supporting Selection and Action


ID	Description	Conformance	Evidence Rating
MEDv-202	Ensure that there are no medications selected by default when a list is opened	Mandatory	High
MEDv-122	Support click (or keyboard selection using the spacebar) to select a medication in the list	Mandatory	Medium
MEDv-123	Clearly highlight selected medications in the medication list	Mandatory	High
MEDv-124	Maintain the selection of a medication when switching between views of a patient's medications (such that a medication selected in a Medication List view is automatically selected when switching to the Drug Administration view)	Recommended	Low
MEDv-125	Maintain the selection of a medication when applying or changing a grouping or a sort order and ensure that the selection remains visible	Mandatory	Medium
MEDv-126	Support the selection of multiple items using CTRL and click for discrete selections, and SHIFT and click for contiguous selections	Mandatory	High
MEDv-127	Support keyboard-only equivalents such as SHIFT and arrow key for contiguous selection and the CTRL and SPACEBAR to toggle select and deselect when making non-continuous selections	Mandatory	High
MEDv-203	When an action is applied to more than one medication, display a summary of the selected medications before allowing the user to complete the action	Mandatory	High

Usage Examples			
temazepam – tablet – <b>DOSE 20 mg</b> – oral – at night	Started	26-May-2010	 <p>In this correct example, the selected medication is clearly highlighted. The difference in colour and brightness of the background colour from black text in this example meets the W3C recommendations {R15}.</p>
oxygen 60% – inhalation gas – <b>RATE 15 L per minute</b> – continuous – with non re-breather bag	Started	25-May-2010	
co-amilorfruse – 5 mg and 40 mg in 5 mL – solution – <b>DOSE 5 mL</b> – oral – once a day	Started	24-May-2010	
salbutamol – 100 micrograms per dose – metered dose inhaler – <b>DOSE 2 puffs</b> – inhaled – four times a day as required	Started	24-May-2010	



temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010		This example is incorrect because the selected medication is not clearly highlighted.
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010		
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010		
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010		

temazepam – tablet – DOSE 20 mg – oral – at night	Started	26-May-2010		In this correct example, more than one medication is selected and has been clearly highlighted.
oxygen 60% – inhalation gas – RATE 15 L per minute – continuous – with non re-breather bag	Started	25-May-2010		
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – DOSE 5 mL – oral – once a day	Started	24-May-2010		
salbutamol – 100 micrograms per dose – metered dose inhaler – DOSE 2 puffs – inhaled – four times a day as required	Started	24-May-2010		

## Rationale

### Hazard Risk Analysis Summary:

From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risks:

- If more than one medication is selected, and only one of those selected is currently visible (the others are lower in the list and have been scrolled off screen), the user may forget about the other selected medications and chose an action that is clinically inappropriate

#### Mitigations:

- The enabling or disabling of valid actions in the context menu partially mitigates this risk (see section 3.3.37)
- Guidance mandates that the selected medications are (at least) summarised before the user can complete those actions

### Design Analysis:

The guidance in this section is informed by user interface standards that are in common use and are consistently followed in client software and web applications across many platforms. The guidance ensures that a medication can be selected and then maintained in view as grouping is applied or the sort order changed.

A set of medications views can be used to switch between different sets of information about a single medication presented in ways that emphasise different qualities. A well designed framework of views will allow the user to switch rapidly between views as a method of building up a rich picture of one or more medications. In some cases, it may be faster to find a medication from within a simple view such as a list view before switching to a more complex or visually rich view. This behaviour can only be well supported if the selection is maintained when switching views. It is possible to design a medications view that is so specific to a task or context that it is not relevant to maintain a selection when switching from another view. The guidance for maintaining a selection is therefore recommended and not mandatory.

When a medication is selected, it may be possible to trigger actions or make changes using an input device (a keyboard or mouse). The guidance points that relate to clear communication of selection are designed to mitigate the risk that inputs are made without realising that a medication is selected.

### 3.3.37 Providing Context Menus

ID	Description	Conformance	Evidence Rating
MEDv-128	Support the display of a context menu for selected medications in the Medications List view (for example, by right-clicking)	Mandatory	Medium
MEDv-129	In the context menu, provide appropriate actions and options	Mandatory	Medium
MEDv-130	In the context menu, support actions with icons where appropriate	Recommended	Medium
MEDv-131	In the context menu, grey out actions that are unavailable or disallowed for one or more of the current selections	Mandatory	Medium
MEDv-132	In the context menu, define a consistent and static order of menu items in which frequently used actions are prioritised by placing them higher in the list	Mandatory	Medium
MEDv-133	In the context menu, group similar options so that direct actions, actions that permit addition of information, and actions that display more information, are each grouped together	Mandatory	Medium

#### Usage Examples

temazepam – tablet – <b>DOSE 20 mg</b> – oral – at night	Started	26-May-2010
oxygen 60% – inhalation gas – <b>RATE 15 L per minute</b> – continuous – with non re-breather bag	Started	25-May-2010
co-amilofruse – 5 mg and 40 mg in 5 mL – solution – <b>DOSE 5 mL</b> – oral – once a day	Started	24-May-2010
salbutamol – 100 micrograms per dose – metered dose inhaler – <b>DOSE 2 puffs</b> – inhaled – four times a day as required		

Action 1  
Action 2  
Action 3  
Action 4  
Action 5  
Action 6  
Action 7

In this correct example, a context menu is displayed for the selected medication. The options in the context menu that do not apply to this medication are greyed out.

#### Rationale

##### Design Analysis:

The display of a context menu for selected medications allows actions to be displayed alongside the medication to which they will be applied. This guidance follows usability principles relating to the provision of actions in context and the clear relationship between actions and the items to which they relate.

Context menus may contain actions that are appropriate for some selections and not others. In some contexts, it may be appropriate for the list of actions to be dynamic and thus different for some selections than for others. For a list of medications, the clear display of actions that are disabled supports consistent placement of actions in the list and provides positive feedback that an action is disabled for this medication, thus communicating a potentially important property of the medication.

### 3.3.38 Providing Access to Medication Details

ID	Description	Conformance	Evidence Rating
MEDv-136	Include an option to access all details for one medication in the context menu	Mandatory	Medium
MEDv-135	In the context menu for selections in the Medications List view, provide an option for displaying all details for the selected medication	Mandatory	Medium
<b>Usage Examples</b>			
There are no usage examples for this section.			
<b>Rationale</b>			
<p><b>Hazard Risk Analysis Summary:</b></p> <p>From our Patient Safety Risk Assessment analyses, we identified a number of potential hazards, including the following risks:</p> <ul style="list-style-type: none"> <li>■ If a medication is suspended, and there is no additional information available, this could contribute to prescribing decisions being made without understanding the reason for the suspension</li> </ul> <p>Mitigation: The guidance in this section ensures that access to additional information, when available, is provided within the context of the selected medication.</p> <p><b>User Research:</b></p> <p>Two rounds of user feedback indicated that the method for accessing all the details of a medication was familiar and expected.</p>			

## 3.4 Rationale Summary

This section summarises the principles behind the rationale for all guidance points in this document.

General Principles:

- Provide support for legibility
- Mitigate risks of incorrect selection and misinterpretation

Usability Principles:

- Minimise the use of embellishments (for example, bold, colour, fonts, font sizes, italics, separators and symbols)
- Minimise instances of each type of embellishment within a reading unit
- Consistent use of specific embellishments within and preferably between user-interface contexts or 'views'
- Use words instead of symbols where it is important for removing ambiguity

Existing Standards:

- NHS NPfIT – *ePrescribing Functional Specification* **{R10}**
- NHS NPfIT – *Guidelines for the Design and Presentation of Medication Elements Required in Electronic Prescribing or Medication Ordering Systems* **{R16}**
- Institute for Safe Medication Practices (ISMP) (US) – *Draft Guidelines for Safe Electronic Communication of Medication Orders*<sup>9</sup>

Evolving Standards:

- Standard set of information needed to safely describe a medication

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<sup>9</sup> The Institute of Safe Medication Practices, ISMP MedicationSafetyAlert! It's Time for Standards to Improve Safety with Electronic Communication of Medication Orders, Draft Guidelines for Safe Electronic Communication of Medication Orders **{R17}**: <http://www.ismp.org/Newsletters/acutecare/articles/20030220.asp>

## 4 DOCUMENT INFORMATION

### 4.1 Terms and Abbreviations

Abbreviation	Definition
ACBS	Advisory Committee on Borderline Substances
AMP	Actual Medicinal Product
CUI	Common User Interface
dm+d	Dictionary of Medicines and Devices
HDU	High Dependency Unit
ISMP	The Institute for Safe Medication Practices
IUD	Intrauterine Device
LASB	Look-Ahead Scroll Bar
NHS	National Health Service
NHS CFH	NHS Connecting for Health
NPfIT	National Programme for IT
NPSA	National Patient Safety Agency
OTC	Over the Counter
PGD	Patient Group Direction
PODs	Patient's Own Drugs
TFN	Trade Family Name
TPN	Total Parental Nutrition
TTO	To Take Out
UI	User Interface
VTM	Virtual Therapeutic Moiety
W3C	World Wide Web Consortium

Table 6: Terms and Abbreviations

### 4.2 Definitions

Term	Definition
Current best practice	Current best practice is used rather than best practice, as over time best practice guidance may change or be revised due to changes to products, changes in technology, or simply the additional field deployment experience that comes over time.
Generic drug name	This can be a single drug name that refers to a single active ingredient or it can be multiple active ingredients that are prescribed as one drug. In the structure of the dm+d {R11}, this generally equates to a Virtual Therapeutic Moiety (VTM).
Brand name	A brand name for a product containing medication. A brand name may be associated with many products. In some cases, the same brand name may be associated with different generic drugs. Future versions of the dm+d {R11} are expected to include a separate entity for brand name, known as Trade Family Name (TFN). In the meantime, the brand name is part of the Actual Medicinal Product (AMP)

Table 7: Definitions

## 4.3 Nomenclature

This section shows how to interpret the different styles used in this document to denote various types of information.

### 4.3.1 Body Text

Text	Style
Code	Monospace
Script	
Other markup languages	
Interface dialog names	Bold
Field names	
Controls	
Folder names	Title Case
File names	

Table 8: Body Text Styles

### 4.3.2 Cross References

Reference	Style
Current document – sections	Section number only
Current document – figures/tables	Caption number only
Other project documents	<i>Italics</i> and possibly a footnote
Publicly available documents	<i>Italics</i> with a footnote
External Web-based content	<i>Italics</i> and a <a href="#">hyperlinked footnote</a>

Table 9: Cross Reference Styles

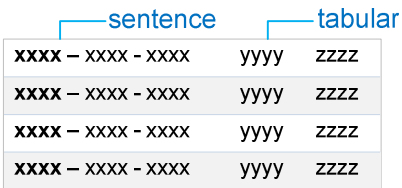

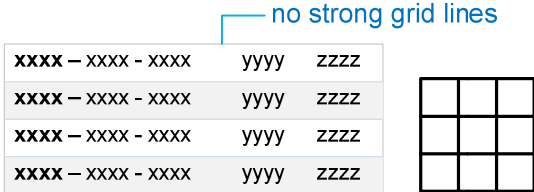
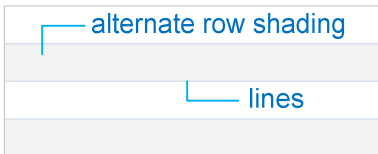
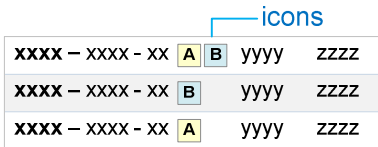
## 4.4 References

Reference	Document	Version
R1.	Design Guidance – Medications Management – Medication Views	2.0.0.0
R2.	Design Guidance – Medication Line	2.0.0.0
R3.	Safety in doses: medication safety incidents in the NHS – NHS National Patient Safety Agency <a href="http://www.npsa.nhs.uk/nrls/alerts-and-directives/directives-guidance/safety-in-doses/">http://www.npsa.nhs.uk/nrls/alerts-and-directives/directives-guidance/safety-in-doses/</a>	2007
R4.	Medication Errors: Causes, Prevention, and Risk Management – Cohen M R (Ed) – Jones and Bartlett Publishers	2004
R5.	To Err is Human – Building a Safer Health System – Kohn L, Corrigan J, Donaldson M – Washington, DC: National Academy Press	2000
R6.	Understanding Patient Safety – Wachter R M – The McGraw-Hill Companies, Inc	2008
R7.	Room for Review: a Guide to Medication Review – Healthcare Commission Patient Survey <a href="http://www.npc.co.uk/med_partnership/medication-review/room-for-review/downloads.html">http://www.npc.co.uk/med_partnership/medication-review/room-for-review/downloads.html</a>	2004
R8.	National service framework for older people – Department of Health <a href="http://www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/DH_4003066">http://www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/DH_4003066</a>	2001

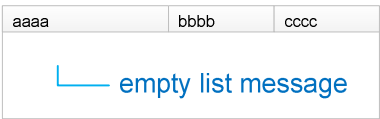

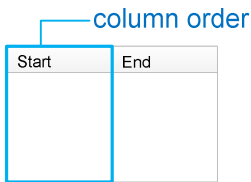

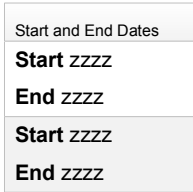
Reference	Document	Version
R9.	NHS CUI – Secondary Care Prescribing Model for Electronic Systems <a href="http://www.connectingforhealth.nhs.uk/systemsandservices/eprescribing/refdocs/index_html">http://www.connectingforhealth.nhs.uk/systemsandservices/eprescribing/refdocs/index_html</a>	2009
R10.	ePrescribing Functional Specification – NHS NPfIT <a href="http://www.connectingforhealth.nhs.uk/newsroom/news-stories/eprescfunctspec">http://www.connectingforhealth.nhs.uk/newsroom/news-stories/eprescfunctspec</a>	1.0
R11.	dictionary of medicines + devices – NHS <a href="http://www.dmd.nhs.uk/">http://www.dmd.nhs.uk/</a>	Release 2.3
R12.	Design Guidance – Medications Management – Drug Administration	3.0.0.0
R13.	The Visual Display of Quantitative Information – Tufte E, Cheshire, CT – Graphics Press	Second Edition 2001
R14.	Web Content Accessibility Guidelines 1.0 – W3C Recommendation 5-May-1999 <a href="http://www.w3.org/TR/WAI-WEBCONTENT/">http://www.w3.org/TR/WAI-WEBCONTENT/</a>	1999
R15.	Techniques for Accessibility Evaluation and Repair Tools – Technique 2.2.1 [priority 3] Test the colour attributes of the following elements for visibility – W3C Working Draft – 26 April 2000 <a href="http://www.w3.org/TR/AERT#color-contrast">http://www.w3.org/TR/AERT#color-contrast</a>	2000
R16.	Guidelines for the Design and Presentation of Medication Elements Required in Electronic Prescribing or Medication Ordering Systems – NHS NPfIT – NPfIT-EP-DB-0003.01 <a href="http://www.dmd.nhs.uk/documentation/item_8_guidelines_for_the_design_and_presentation_of_medication_elements_in_ep_0.1_2.pdf">http://www.dmd.nhs.uk/documentation/item_8_guidelines_for_the_design_and_presentation_of_medication_elements_in_ep_0.1_2.pdf</a>	2005
R17.	It's Time for Standards to Improve Safety with Electronic Communication of Medication Orders – Draft Guidelines for Safe Electronic Communication of Medication Orders – The Institute for Safe Medication Practices – ISMP MedicationSafetyAlert! – February 20, 2003 issue <a href="http://www.ismp.org/Newsletters/acute/articles/20030220.asp">http://www.ismp.org/Newsletters/acute/articles/20030220.asp</a>	2003

Table 10: References

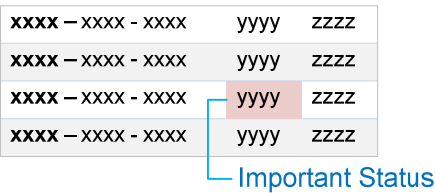

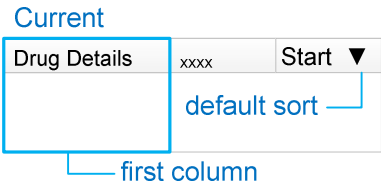
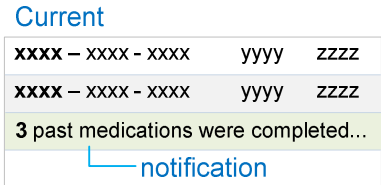
## APPENDIX A REFERENCE SUMMARY OF GUIDANCE

Reference	Section	Description
<b>MEDv-020</b> <b>MEDv-141</b> <b>Visual Summary:</b>		
MEDv-020	3.3.1	Present medications as lines of text within rows in a tabular format where each row represents one medication
MEDv-141	3.3.1	Use composite columns to minimise the display of blank cells for some rows (that is, avoid placing each individual data point in a separate column)
<b>MEDv-142</b> <b>Visual Summary:</b>		
MEDv-142	3.3.2	When the list is scrolled to the end, display a space at the bottom of the list with a height equivalent to a line of text
<b>MEDv-021</b> <b>Visual Summary:</b>		
MEDv-021	3.3.3	Avoid the use of strong grids and strong vertical lines. (Use subtle methods to support distinguishing between rows in the list)
<b>MEDv-022,</b> <b>MEDv-142 to MEDv-145</b> <b>Visual Summary:</b>		
MEDv-143	3.3.4	Use at least alternate row shading or lines between rows
MEDv-022	3.3.4	Use subtle alternate row shading
MEDv-144	3.3.4	When using alternate row shading, ensure that colour and brightness of the background does not interfere with the readability of the foreground text
MEDv-145	3.3.4	Supplement alternate shading with 1 point pale lines between rows
<b>MEDv-023</b> <b>Visual Summary:</b>		
MEDv-023	3.3.5	Support the display of icons following the text of the Drug Details column in the Medications List view



Reference	Section	Description
<b>MEDv-146</b> <b>Visual Summary:</b>		
MEDv-146	3.3.6	Display a message when a list is empty (for example, when there are no current medications)
<b>MEDv-147 to MEDv-150</b> <b>Visual Summary:</b>		
MEDv-147	3.3.7	Provide a column that contains status information including information that defines whether the medication is 'current' or 'past'
MEDv-148	3.3.7	Provide a column that contains drug details according to Medication Line guidance
MEDv-149	3.3.7	When displaying current medications, provide a column that contains an initiation date (such as the date of the first planned administration). The examples in this document show a Start Date column.
MEDv-150	3.3.7	When displaying past medications, provide a column that contains a stop date (such as the date of the last administration or the date that the medication was discontinued). The examples in this document show an End Date column.
<b>MEDv-151 to MEDv-154</b> <b>Visual Summary:</b>		
MEDv-151	3.3.8	When an end date column is displayed, place a start date column before (to the left of) the end date column
MEDv-152	3.3.8	When an end date column is displayed, and there is no duration column, place a start date column adjacent to the end date column
MEDv-153	3.3.8	Use fixed width columns for dates
MEDv-154	3.3.8	Maintain consistent placement of date columns relative to one another and relative to the Drug Details column in both current and past medications
<b>MEDv-150 to MED-152</b> <b>Visual Summary:</b>		
MEDv-155	3.3.9	Label columns with text that describes the contents unambiguously and succinctly (such as, 'Status', 'Date Prescribed' or 'First Administration')
MEDv-156	3.3.9	Use a unique heading for each column
MEDv-157	3.3.9	When combining two attributes that have the same data type (such as dates), include labels for both attributes in the column heading
<b>MEDv-027, MEDv-158</b> <b>Visual Summary:</b>		
MEDv-027	3.3.10	Allow columns to contain more than one attribute for a single medication

Reference	Section	Description						
MEDv-158	3.3.10	When combining two attributes that have the same data types (such as dates), include labels for both attributes within the cell						
<div>MEDv-159 to MEDv-161 Visual Summary:</div> <div><table><tr><td>aaaa</td><td>bbbb</td><td>cccc</td></tr></table><p>relative widths</p></div>			aaaa	bbbb	cccc			
aaaa	bbbb	cccc						
MEDv-159	3.3.11	Maintain the relative proportions of columns such that the Drug Details column is the widest						
MEDv-160	3.3.11	Avoid the need for horizontal scrolling by limiting the number of columns visible at any one time						
MEDv-161	3.3.11	Define minimum widths for all columns						
<div>MEDv-162 to MEDv-165 Visual Summary:</div> <div><div>Current</div><table><tr><td>Status</td></tr><tr><td>Started</td></tr><tr><td>Not Started</td></tr><tr><td>Suspended</td></tr></table><div>Past</div><table><tr><td>Completed</td></tr><tr><td>Discontinued</td></tr></table></div>			Status	Started	Not Started	Suspended	Completed	Discontinued
Status								
Started								
Not Started								
Suspended								
Completed								
Discontinued								
MEDv-162	3.3.12	Ensure that all medications have a status value and the status cannot be blank						
MEDv-163	3.3.12	Limit status descriptions to short phrases, preferably no more than two words						
MEDv-164	3.3.12	Allow status to be supplemented with additional information (such as pharmacy verified)						
MEDv-165	3.3.12	Use the status description to differentiate between medications that have no recorded administration events and those that have						
<div>MEDv-166 to MEDv-172 Visual Summary:</div> <div><div>Current</div><div>Past</div><div>Started</div><div>Not Started</div><div>Suspended</div><div>Completed</div><div>Discontinued</div></div>								
MEDv-166	3.3.13	Support a status of 'suspended' and include medications with this status in current medications						
MEDv-167	3.3.13	Assign a status of 'Started' to medications that have an administration event recorded and have further scheduled administrations						
MEDv-168	3.3.13	Assign a status of 'Not Started' to medications that have administration scheduled and a start date in the future						
MEDv-169	3.3.13	Assign a status of 'Suspended' to medications that are marked as not to be administered but which are intended to be resumed at a later date						
MEDv-170	3.3.13	Assign a status of 'Completed' to medications that have administration events recorded according to their schedule (within tolerances) and have an end date in the past						
MEDv-171	3.3.13	Assign a status of 'Discontinued' to medications that were stopped on a date that preceded one or more of the scheduled administrations						
MEDv-172	3.3.13	Define medications with a status of either 'Started', 'Not Started' or 'Suspended' as current medications						
MEDv-173	3.3.13	Define medications with a status of either 'Completed' or 'Discontinued' as past medications						

Reference	Section	Description
MEDv-024, MEDv-025, MEDv-042 Visual Summary:		
	MEDv-024	3.3.14 Use visual design to draw attention to suspended medications
	MEDv-025	3.3.14 Use visual design to distinguish a list of current medications from a list of past medications
	MEDv-042	3.3.14 Display the status of each medication in bold
MEDv-062 to MEDv-067, MEDv-172 Visual Summary:		
	MEDv-063	3.3.15 Provide buttons for displaying current and past medications respectively in the Medications List view and label the buttons 'Current' and 'Past'
	MEDv-062	3.3.15 Present the Medications List view with <b>Current</b> selected by default
	MEDv-064	3.3.15 Use the visual formatting of the <b>Current</b> and <b>Past</b> buttons to indicate which is currently selected
	MEDv-065	3.3.15 Do not allow <b>Current</b> and <b>Past</b> buttons to be selected simultaneously
	MEDv-174	3.3.15 Ensure that either the <b>Current</b> or the <b>Past</b> button is selected at any one time
	MEDv-066	3.3.15 Supplement the <b>Past</b> button in the Medications List view with a drop-down control for displaying, selecting and applying a filter on the past medications view
	MEDv-067	3.3.15 Include an option for displaying all past medications in the drop-down control
MEDV-099, MEDV-173 Visual Summary:		
	MEDv-099	3.3.16 By default, present current medications sorted reverse chronologically by a starting date such that the most recent is first (top) in the list
MEDv-173	3.3.16	When displaying current medications, place the drug details in the first (furthest left) column
MEDv-074, MEDv-075, MEDv-077, MEDv-175 Visual Summary:		
	MEDv-074	3.3.17 When displaying current medications, display a notification for medications that have been completed or discontinued within a specified time interval from the current time
	MEDv-075	3.3.17 Clearly display the time interval within the recent past notification
	MEDv-077	3.3.17 Display a count of the number of recently past medications within the recent past notification in the medication list
MEDv-174	3.3.17	Use formatting to distinguish the recent past notifications from medications in the list

Reference	Section	Description
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**MEDv-100, MEDv-173**  
**Visual Summary:**

MEDv-100	3.3.18	By default, sort medications reverse chronologically by end date (or equivalent) such that the most recent is first (top) when the filter is set to 'Past' in the Medications List view
MEDv-175	3.3.18	When displaying past medications, place the status column first (furthest left) and the Drug Details column second

**MEDv-068 to MEDv-073**  
**Visual Summary:**

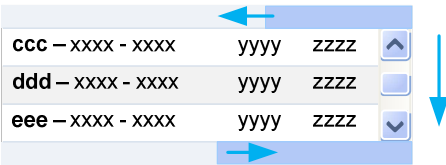
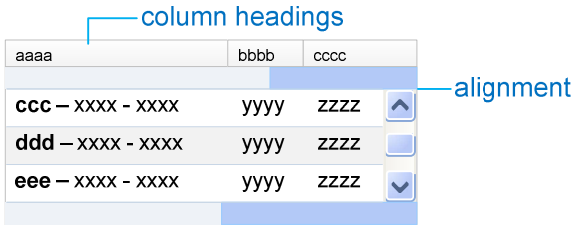
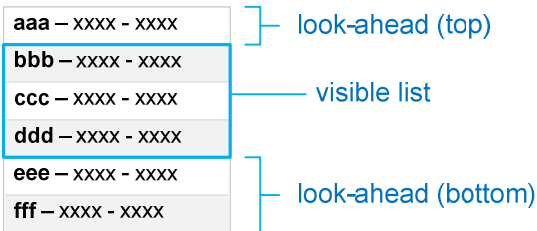

MEDv-069	3.3.19	When a filter is applied to past medications in the Medications List view, the <b>Past</b> button should indicate that it is currently selected
MEDv-070	3.3.19	When a filter is applied to past medications in the Medications List view, display a filter notification at the top of the list below the column headings and above the scroll bar (thus 'pushing' the list of medications down a line)
MEDv-068	3.3.19	When a filter notification is displayed, include a control for removing the filter within that notification
MEDv-071	3.3.19	Display a description of the filter in use within the filter notification in the medications list
MEDv-072	3.3.19	Include a count of the number of medications displayed and a count of the total (unfiltered) number of past medications in a filter notification
MEDv-073	3.3.19	Clearly label the counts (number of medications displayed and total unfiltered number) with text that allows them to be differentiated
MEDv-176	3.3.19	When a filter is applied to past medications in the Medications List view, the <b>Past</b> button should indicate that it is currently selected


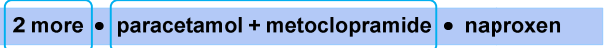
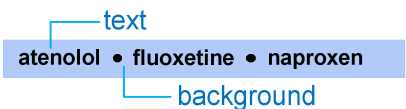
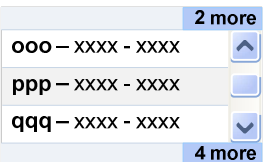
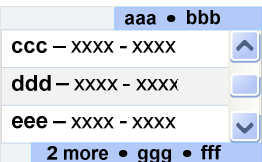

  

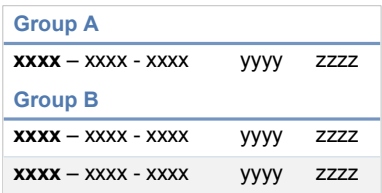
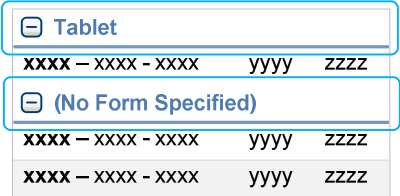
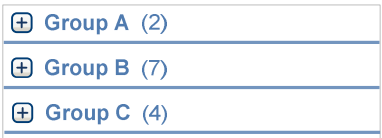
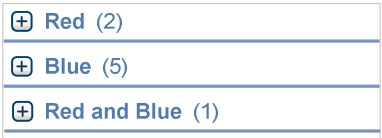
**MEDv-177 to MEDv-179**  
**Visual Summary:**

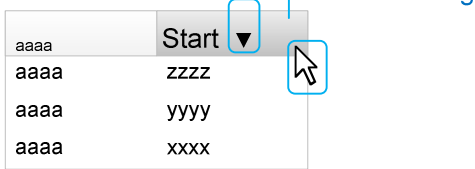
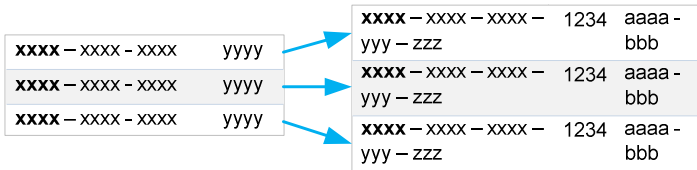

  

MEDv-177	3.3.20	When displaying a list of (current or past) medications and the scroll bar is active because the list is longer than the space available to display them, provide a clear indication that there are medications out of view
MEDv-178	3.3.20	When displaying current medications, supplement the standard scroll bar with notifications that display the names of drugs that are out of view. This document refers to this kind of scroll bar as a look-ahead scroll bar (LASB)
MEDv-179	3.3.20	When displaying a LASB, reserve a space at the top and bottom of the list for look-ahead notifications
MEDv-180	3.3.20	Use a pale solid background colour for the space reserved for look-ahead notifications that is sufficient to distinguish the space from the background of the list

Reference	Section	Description
MEDv-181	3.3.20	When grouping is applied and there is a collapsed group out of view, display drug names in the LASB for any drug that is out of view irrespective of whether it is within a collapsed group or an expanded group
MEDv-058, MEDv-059, MEDv-177 Visual Summary:		
MEDv-058	3.3.21	Update the look-ahead notifications dynamically in response to scrolling
MEDv-059	3.3.21	Allow the look-ahead notification to change width dynamically to accommodate its contents up to the available width
MEDv-182	3.3.21	Do not allow the look-ahead notification to be used for navigation by clicking on areas of the notification, such as drug names or counts
MEDv-043 to MEDv045 Visual Summary:		
MEDv-044	3.3.22	Restrict the look-ahead notifications to a single line each
MEDv-043	3.3.22	The look-ahead notifications should be clearly joined to the 'up' and 'down' arrow controls of the scroll bar respectively
MEDv-045	3.3.22	Do not place controls or other notifications such that they separate the look-ahead notification from the medications in the Medications List view
MEDv-049, MEDv-181 Visual Summary:		
MEDv-049	3.3.23	The order of both the items in the look-ahead notification and the Medications List view should always be the same
MEDv-183	3.3.23	If any of the drug name text (other than letter ascenders and descenders) is obscured by the boundaries of the list, include that drug in the look-ahead notification
MEDv-048, MEDv-052, MEDv-053, MEDv-055 Visual Summary:		
MEDv-048	3.3.24	The look-ahead notification is populated from right to left, such that the next drug in the list appears closest to the scroll bar
MEDv-052	3.3.24	When there are more items than can be displayed in the look-ahead notification for current medications, display as many as possible and end the list with a count of the remaining items that could not be displayed

Reference	Section	Description
MEDv-053	3.3.24	When a count is displayed in a look-ahead notification and one or more of the medications included in that count have decision support alerts, display a decision support alert icon next to the count
MEDv-055	3.3.24	When displaying current medications only, show drug names and decision support alert icons in the look-ahead notification
<b>MEDv-056, MEDv-179, MEDv-180</b> <b>Visual Summary:</b> 		
MEDv-056	0	Use a delimiter that is unlikely to be interpreted as a character or number (such as a black dot '•'), with a space either side to separate drug names and to separate the count from drug names
MEDv-184	0	Do not use leading or trailing delimiters
MEDv-185	0	Do not include additional text or formatting to indicate grouping in the look-ahead notifications
<b>MEDv-050, MEDv-051</b> <b>Visual Summary:</b> 		
MEDv-050	3.3.26	Where exceptionally long drug names require more space than is available in a look-ahead notification, display a count (as for past medications) instead
MEDv-051	3.3.26	Do not truncate or abbreviate drug names in the look-ahead notification
<b>MEDv-184 to MEDv-186</b> <b>Visual Summary:</b> 		
MEDv-186	3.3.27	Display drug names in bold and in black text by default
MEDv-187	3.3.27	Display counts and descriptive text (such as 'more') in normal weight font
MEDv-188	3.3.27	Use a light solid background colour for the notifications that is both sufficiently different from the colour in the space reserved for notifications and sufficiently different from the black text in the notification
MEDv-189	3.3.27	Do not use a border in a dark colour or with a weight greater than 1 point for a look-ahead notification
<b>MEDv-054</b> <b>Visual Summary:</b> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <b>Past</b>   </div> <div style="text-align: center;"> <b>Current</b>   </div> </div>		
MEDv-054	3.3.28	When displaying past medications only, display counts in the look-ahead notification and not drug names
<b>MEDv-084, MEDv-085, MEDv185</b> <b>Visual Summary:</b> 		
MEDv-084	3.3.29	Provide a drop-down list for displaying, selecting and applying a grouping to the medications list
MEDv-085	3.3.29	Label the grouping control 'Group by'
MEDv-190	3.3.29	Include an option in the drop-down list to set the grouping to 'None'

Reference	Section	Description
MEDv-083, MEDv-087, MEDv-188 to MEDv-190 Visual Summary:		
	MEDv-083	3.3.30 Present the Medications List view with no grouping active by default
	MEDv-087	3.3.30 Retain the column sort order in the Medications List view when grouping is applied
	MEDv-191	3.3.30 Display groups expanded by default
MEDv-192	3.3.30	Re-start alternate row shading at the beginning of each group. (Alternate row shading is not needed if there is only one medication in each group)
MEDv-193	3.3.30	When a grouping is selected in the grouping control, ensure that at least one group heading is visible in the newly grouped list
MEDv-086, MEDv088, MEDv-090, MEDv-091 Visual Summary:		
	MEDv-086	3.3.31 Display clear and prominent headings for each group category
	MEDv-090	3.3.31 Do not display group headings for empty groups
	MEDv-091	3.3.31 Provide 'null' groups where necessary to support the display of medications that do not have a value for the attribute being used to group the medications
MEDv-194	3.3.31	Display the label for a 'null' group heading in brackets
MEDv-195	3.3.31	Display 'null' groups at the top of the list of groups
MEDv-092, MEDv-089, MEDv-092 Visual Summary:		
	MEDv-092	3.3.32 Provide controls for expanding and collapsing individual groups. Place these controls at the beginning of the group heading
	MEDv-089	3.3.32 When a group is collapsed, supplement the group heading with a number representing a count of medications within that group
	MEDv-196	3.3.32 Support the selection of group headings and the display of a context menu that includes options for collapsing and expanding all columns
MEDv-193, MEDv-194 Visual Summary:		
	MEDv-197	3.3.33 When one or more medications belong to more than one group (such as analgesic and non-steroidal anti-inflammatory), create a new group and label it with the group names combined (such as 'Analgesic, Non-steroidal Anti-inflammatory')
	MEDv-198	3.3.33 Display each medication in only one group (do not duplicate medications so that they can be displayed in more than one group)

Reference	Section	Description
MEDv-199	3.3.33	When combining group names, display the names in the same order that they would appear in a list that is sorted by that attribute
MEDv-200	3.3.33	When combining group names, separate the labels with a semi-colon
<div> <div>MEDv-101 to MEDv-106 Visual Summary:</div>  </div>		
MEDv-101	3.3.34	Allow the sort order of a list in the medications list to be changed by clicking on a column heading
MEDv-102	3.3.34	Allow the sort order of a list in the Medications List view to be reversed by clicking on the column heading for the column with the active sort applied
MEDv-103	3.3.34	Use formatting of the column heading to clearly indicate the column to which the sort order is currently applied
MEDv-104	3.3.34	Use an icon or symbol in the column heading to indicate the column by which the data is sorted and the direction of the sort
MEDv-105	3.3.34	When the sort order is changed from the default to another attribute in the Medications List view, retain the default as a secondary sort order
<div> <div>MEDv-195 Visual Summary:</div>  </div>		
MEDv-201	3.3.35	Provide a control that allows the type and quantity of information displayed to be changed, such that the rows and columns may change in number and be presented with a different layout
<div> <div>MEDv-122 to MEDv-127 Visual Summary:</div>  </div>		
MEDv-202	3.3.36	Ensure that there are no medications selected by default when a list is opened
MEDv-122	3.3.36	Support click (or keyboard selection using the spacebar) to select a medication in the list
MEDv-123	3.3.36	Clearly highlight selected medications in the medication list
MEDv-124	3.3.36	Maintain the selection of a medication when switching between views of a patient's medications (such that a medication selected in a medication list is automatically selected when switching to the Drug Administration view)
MEDv-125	3.3.36	Maintain the selection of a medication when applying or changing a grouping or a sort order and ensure that the selection remains visible
MEDv-126	3.3.36	Support the selection of multiple items using CTRL and click for discrete selections, and SHIFT and click for contiguous selections
MEDv-127	3.3.36	Support keyboard-only equivalents such as SHIFT and arrow key for contiguous selection and the CTRL and SPACEBAR to toggle select and deselect when making non-continuous selections
MEDv-203	3.3.36	When an action is applied to more than one medication, display a summary of the selected medications before allowing the user to complete the action



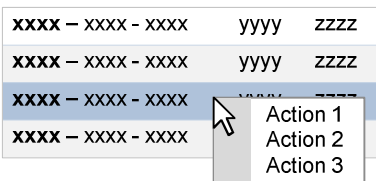
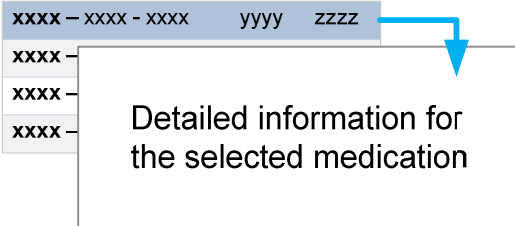
Reference	Section	Description
MEDv-128 to MEDv133 Visual Summary:		
	MEDv-128	3.3.37 Support the display of a context menu for selected medications in the Medications List view (for example, by right-clicking)
	MEDv-129	3.3.37 In the context menu for selections in the Medications List view, provide appropriate actions and options
	MEDv-130	3.3.37 In the context menu for selections in the Medications List view, support actions with icons where appropriate
	MEDv-131	3.3.37 In the context menu for selections in the Medications List view, grey out actions that are unavailable or disallowed for one or more of the current selections
	MEDv-132	3.3.37 In the context menu for selections in the Medications List view, prioritise frequently used actions by placing them higher in the list
MEDv-135, MEDv-136 Visual Summary:	MEDv-133	3.3.37 In the context menu for selections in the Medications List view, group similar options so that direct actions, actions that permit addition of information, and actions that display more information, are each grouped together
		
MEDv-135	3.3.38	In the context menu for selections in the Medications List view, provide an option for displaying all details for the selected medication
MEDv-136	3.3.38	Support accessing all details for one medication by double-clicking the medication line in the Medications List view

Table 11: Reference Summary of Guidance