

# Design Guidance

## Patient List View

**Tuesday, 26 January 2010**  
**Version 1.0.0.0**

*Prepared by*  
**Microsoft**

**Microsoft®**

## PREFACE

### Documents replaced by this document

Document Title	Version
None	

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

Document Title	Version
Design Guidance – Patient Banner	4.0.0.0
Design Guidance – Displaying Graphs and Tables	2.0.0.0
Design Guidance – Filtering, Sorting and Grouping	1.0.0.0

This document and/or software ("this Content") has been created in partnership with the National Health Service (NHS) in England. Intellectual Property Rights to this Content are jointly owned by Microsoft and the NHS in England, although both Microsoft and the NHS are entitled to independently exercise their rights of ownership. Microsoft acknowledges the contribution of the NHS in England through their Common User Interface programme to this Content. Readers are referred to [www.cui.nhs.uk](http://www.cui.nhs.uk) for further information on the NHS CUI Programme.

All trademarks are the property of their respective companies. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

© Microsoft Corporation 2010. All rights reserved.



## TABLE OF CONTENTS

<b>1</b>	<b><i>Introduction</i></b>	<b>1</b>
1.1	Customer Need	1
1.2	Scope	3
1.2.1	In Scope	3
1.2.2	Out of Scope	4
1.3	Assumptions	6
1.4	Dependencies	6
<b>2</b>	<b><i>Guidance Overview</i></b>	<b>7</b>
2.1	Rationale Summary	7
2.2	Summary of Guidance	8
<b>3</b>	<b><i>Guidance Details for Patient List Layout</i></b>	<b>12</b>
3.1	Introduction	12
3.2	Guidelines	12
3.2.1	Patient List Header	12
3.2.2	Column Headers	14
3.2.3	Columns	17
3.2.4	Rows and Cells	23
3.2.5	Sublists	27
3.2.6	Patient Identification	30
3.2.7	Row Key Identifiers	35
<b>4</b>	<b><i>Guidance Details for Managing the Information Displayed</i></b>	<b>41</b>
4.1	Introduction	41
4.2	Guidelines	41
4.2.1	Managing the Columns Displayed	41
4.2.2	Refresh Options and Update Indication	46
4.2.3	Displaying Historical Patient List Information	52
4.2.4	Displaying Further Information	54
<b>5</b>	<b><i>Document Information</i></b>	<b>58</b>
5.1	Terms and Abbreviations	58
5.2	Definitions	58
5.3	Nomenclature	59
5.3.1	Body Text	59
5.3.2	Cross References	60
5.4	References	60
<b>APPENDIX A</b>	<b><i>Usability Principles</i></b>	<b>61</b>
<b>APPENDIX B</b>	<b><i>Study ID 77: Executive Summary</i></b>	<b>62</b>



# 1 INTRODUCTION

This document provides guidance for the design of Patient Lists. It describes the area of focus, lists mandatory and recommended guidance points with usage examples and explains the rationale behind the guidance.

To indicate their relative importance, each guideline in this document is ranked by **Conformance** and by **Evidence Rating**. Table 1 defines those terms:

Term	Definition
Conformance	<p>Indicates the extent to which you should follow the guideline when defining your User Interface (UI) implementation. There are two levels:</p> <ul style="list-style-type: none"> <li>■ <b>Mandatory</b> – An implementation should follow the guideline</li> <li>■ <b>Recommended</b> – An implementation is advised to follow the guideline</li> </ul>
Evidence Rating	<p>Summarises the strength of the research defining the guideline and the extent to which it mitigates patient safety hazards. There are three ratings (with example factors used to determine the appropriate rating):</p> <ul style="list-style-type: none"> <li>■ <b>Low:</b> <ul style="list-style-type: none"> <li>■ Does not mitigate specific patient safety hazards</li> <li>■ User research findings unclear and with few participants</li> <li>■ Unreferenced usability principles indicate the design is not significantly better than alternatives</li> </ul> </li> <li>■ <b>Medium:</b> <ul style="list-style-type: none"> <li>■ Mitigates specific patient safety hazards</li> <li>■ User research findings clear but with few participants</li> <li>■ References old authoritative guidance (for example, from the UK National Patient Safety Agency (NPSA), Institute for Safe Medication Practices (ISMP) or World Health Organization (WHO)) that is potentially soon to be superseded</li> <li>■ Referenced usability principles indicate the design is significantly better than alternatives</li> </ul> </li> <li>■ <b>High:</b> <ul style="list-style-type: none"> <li>■ Mitigates specific patient safety hazards</li> <li>■ User research findings clear and with a significant number of participants</li> <li>■ References recent authoritative guidance (for example, from NPSA, ISMP or WHO)</li> <li>■ Referenced usability principles indicate the design is significantly better than alternatives</li> </ul> </li> </ul>

Table 1: Conformance and Evidence Rating Definitions

## Note

Refer to section 5.2 for definitions of the specific terminology used in this document.

## 1.1 Customer Need

Patient Lists are used in a wide range of clinical contexts within both primary and hospital and acute care settings.

A Patient List comprises a structured list of patients specific to a service, a location or a care provider. For each patient, the list contains unique identification information and a subset of the patient's health record appropriate to the use of the list.

Uses of Patient Lists include:

- Reviewing information about a set of patients
- Gaining an overview of their clinical situation
- Managing tasks

Figure 1 illustrates a Patient List that follows the guidance in this document:

Patient List for: <b>Maxhurst, John (Dr)</b> Location: <b>Elkington ward</b>						<b>14:32 25-Sep-2009</b>
<b>Columns...</b>		<b>Action 1</b>	<b>Action 2</b>	Updates: <b>None</b>	<b>Unmark all</b>	
						<b>columns out of view – scroll left or right</b>
<b>Location</b>	<b>Patient Identification</b>	<b>Presenting complaint</b>	<b>Past medical history</b>	<b>Problems and Test Results</b>	<b>Tasks</b>	
<b>Start of list</b>						
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review	
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA	
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later	
A6	<b>THORP, Justin (Mr)</b> Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction  Abdominal x-ray - dilated small bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas  Nasogastric tube	
B1	<b>SMITH, Ben (Mr)</b> Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD  Left sided pleural effusion	COPD - on home O2  Hypertension  Chronic renal failure  Osteoarthritis	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap  Chest x-ray post chest drain removal  Repeat Arterial blood gas	

Figure 1: Example Patient List Conformant to This Guidance, Populated with Fictitious Data

### 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. Stylistic choices, such as colours, fonts or icons are not part of the guidance and unless otherwise specified are not mandatory requirements for compliance with the guidance in this document.

Some examples within this document are based on the requirements for the NHS within the UK. You should consider how your clinical application will need to handle information, such as patient identification numbers (shown with the label 'NHS No.' in some images in this guidance), within the country of use.

Patient Lists may be used by an individual clinician (for example, consultant) or a team (for example, nursing team). The lists are typically used for a specific time period (for example, a shift) and are updated during this period if changes to the patient information occur.

During the research and collation of data for this document no guidance was found for a common presentation of Patient Lists as defined above.

During the development of this document, potential patient safety hazards around the display of patient data within a list were identified and recorded. The guidance within this document helps mitigate these recorded hazards and is determined by three key considerations:

- Users must be able to easily access the Patient List information they need
- Users must be able to quickly and easily familiarise themselves with the Patient List layout on first use
- Users must be able to quickly understand how to manage the display of Patient List information

This guidance covers the safe display of information for multiple patients in a Patient List format.

During research, the majority of identified potential patient safety hazards concerning Patient Lists applied to hospital and acute care contexts, where teams of clinicians are caring for multiple patients in a single location (for example, a medical ward in a hospital). For this reason, the majority of examples provided throughout this document are based on a hospital and acute care scenario, specifically a hospital respiratory ward. The medical information shown in these examples is fictitious but is based on the experiences of medical professionals who work or have recently worked on respiratory wards.

## 1.2 Scope

This section sets out the items that are in and out of scope for this design guidance.

### 1.2.1 In Scope

Areas	Details
Datatype (format and layout)	<ul style="list-style-type: none"> <li>■ Structured text (for example, tasks) excluding associated metadata (for example, task status changes)</li> </ul>
Attribute (content and format)	<ul style="list-style-type: none"> <li>■ Patient identifiers (including layout and positioning)</li> <li>■ Location (static location)</li> <li>■ 'Appointment' times (including multiple times)</li> </ul>
Cells	<ul style="list-style-type: none"> <li>■ Cell padding</li> <li>■ Multiple entries per cell</li> <li>■ Multiple data types per cell</li> </ul>
List Header	<ul style="list-style-type: none"> <li>■ Label and inclusion criteria of list</li> </ul>
Row and Column	<ul style="list-style-type: none"> <li>■ Headers (for example, style, labels)</li> <li>■ Gridlines</li> <li>■ Style (for example, banding)</li> <li>■ Size and resizing (both user and system initiated)</li> </ul>
More Details	<ul style="list-style-type: none"> <li>■ Opening items (for example, patient care records)</li> <li>■ 'Opened' items in context with list</li> </ul>
Navigation	<ul style="list-style-type: none"> <li>■ Moving around a long or wide list (vertical and horizontal scrolling)</li> </ul>
No Data	<ul style="list-style-type: none"> <li>■ Empty rows (beds or timeslots)</li> <li>■ No results in list</li> </ul>
Out of View	<ul style="list-style-type: none"> <li>■ Indicating data out of view per cell and/or row (for example, truncation)</li> <li>■ Indicating items out of list view</li> <li>■ Use of out of view (that is, do you always show some datatypes and/or attributes)</li> <li>■ Fitting items on a page (for default views)</li> </ul>
Provenance	<ul style="list-style-type: none"> <li>■ Indication of refreshed list</li> <li>■ Refreshing the list</li> </ul>
Updates	<ul style="list-style-type: none"> <li>■ Indication of update (at list or 'cell' level, including 'new' items)</li> <li>■ Viewing update history</li> <li>■ Snapshot history (viewing, navigating, indication of past, and so on)</li> <li>■ Provenance -- when was data last updated</li> </ul>

Areas	Details
Datasets	<ul style="list-style-type: none"> <li>▪ Alter the visible dataset (for example, adding columns, including role specific views, list level of detail, and so on)</li> </ul>
Layout	<ul style="list-style-type: none"> <li>▪ Layout of data (for example, column order)</li> </ul>
Manipulation	<ul style="list-style-type: none"> <li>▪ Indication of filtered list</li> <li>▪ Filtering the list</li> <li>▪ Indication of grouping</li> </ul>
Similarity	<ul style="list-style-type: none"> <li>▪ Flagging similar names and similarity (indication of determining differential)</li> </ul>

Table 2: In Scope

## 1.2.2 Out of Scope

This section defines areas that are not covered by this guidance. Although there may be specific hazards associated with these areas that are not addressed in this guidance, it is likely that the principles in this guidance will extend to Patient Lists in many of the areas listed in Table 3:

Areas	Details
Alerts	<ul style="list-style-type: none"> <li>▪ Alerts of change in patient state (for example, change of Medical Early Warning Score (MEWS))</li> </ul>
Application	<ul style="list-style-type: none"> <li>▪ Location in window</li> <li>▪ Context of list</li> <li>▪ Window or port sizing</li> <li>▪ Simultaneous user considerations (for example, checkout, editing and so on)</li> <li>▪ Search in progress</li> <li>▪ Determining default row and column dimensions</li> </ul>
Attribute (content and format)	<ul style="list-style-type: none"> <li>▪ Mark for discharge</li> <li>▪ Resuscitation status</li> <li>▪ Clinical summary (or equivalent) and its structure</li> <li>▪ Association of goals with tasks, results and outcomes</li> <li>▪ Rationale for decisions</li> <li>▪ Sealed information</li> </ul>
Datasets	<ul style="list-style-type: none"> <li>▪ Specifying datasets for particular contexts</li> <li>▪ Handling 'exceptional data' (that is, important data but outside of the normal dataset)</li> <li>▪ Multi-user view (for example, viewing in a Multi-Disciplinary Team (MDT) meeting)</li> <li>▪ Alter level of detail shown within a column</li> </ul>
Datatype (format and layout)	<ul style="list-style-type: none"> <li>▪ Numerical data per cell</li> <li>▪ Free-text</li> <li>▪ Numerical series</li> <li>▪ Scoring (for example, MEWS)</li> <li>▪ Flagging potentially incorrect information</li> <li>▪ Personal notes</li> <li>▪ Highlighting information</li> <li>▪ Flagging and check of auto populated information</li> <li>▪ Flagging missing data</li> <li>▪ Graphing display</li> <li>▪ Data structured in contextually relevant handover information structures (for example, Mechanism Illness/Injury Signs/Symptoms Treatment (MIST))</li> <li>▪ Abbreviations</li> <li>▪ Misspellings</li> </ul>
Dual layout view	<ul style="list-style-type: none"> <li>▪ Ensuring equivalent patient information is presented consistently between the two views</li> <li>▪ Dealing with information that is only displayed in one of the views (for example, 'summary' not shown on a schematic view)</li> <li>▪ Consistent visual indication of selection</li> <li>▪ Selection behaviour (for example, selecting a Patient List row highlights location on a graphical schema)</li> <li>▪ Ensuring equivalent patient information is in view in a table when selected on a graphical schema</li> <li>▪ Method of switching between views (if viewed alternately)</li> </ul>
Form factor	<ul style="list-style-type: none"> <li>▪ Size and interaction modality</li> </ul>

Areas	Details
Graphical layout	<ul style="list-style-type: none"> <li>■ Schematic, architectural, layout, and so on</li> <li>■ Minimum information</li> <li>■ Information constraints</li> </ul> <ul style="list-style-type: none"> <li>■ Access to further information</li> <li>■ Area showing 'patient row' for selection</li> <li>■ Area showing Patient Banner for selected location</li> </ul>
Information Governance (IG)	<ul style="list-style-type: none"> <li>■ Showing and hiding data</li> <li>■ Screensaver or lockout</li> </ul> <ul style="list-style-type: none"> <li>■ Restrictions on history viewing</li> </ul>
Input	<ul style="list-style-type: none"> <li>■ Input of any data</li> </ul>
Layout	<ul style="list-style-type: none"> <li>■ Changing of layout (for example, column horizontal order)</li> </ul>
List actions	<p>The Patient List is not used to enter data into the system</p> <p>Access to actions (for example, through header and in-context including selection):</p> <ul style="list-style-type: none"> <li>■ Differing actions based on list and/or selection</li> </ul> <ul style="list-style-type: none"> <li>■ Find within a list</li> <li>■ Selection of rows, cells, data in cells, columns (navigation, visual confirmation, states, navigation, and so on)</li> </ul>
List header	<ul style="list-style-type: none"> <li>■ Ward level aggregated scores (for example, number of infections)</li> </ul>
List inclusion	<ul style="list-style-type: none"> <li>■ Patient's 'outside' the standard set (for example, those pending admission)</li> <li>■ View non-patient data (for example, ward level information)</li> <li>■ Data about patients not in the systems</li> </ul> <ul style="list-style-type: none"> <li>■ Lists with multiple instance of the same patient</li> <li>■ Specifying list criteria</li> <li>■ Multiple patients allocated to the same bed (next patient awaiting admission)</li> </ul>
Manipulation	<ul style="list-style-type: none"> <li>■ Indication of grouping</li> <li>■ Change view setting</li> <li>■ Use of sort order</li> </ul> <ul style="list-style-type: none"> <li>■ Sort on a key within multiple datatype cells</li> <li>■ Sorting items within a cell (for example, prioritising patients)</li> </ul>
Miscellaneous	<ul style="list-style-type: none"> <li>■ Handover status</li> <li>■ Colours</li> <li>■ Ambiguous information</li> </ul> <ul style="list-style-type: none"> <li>■ Remote view</li> <li>■ Patient List summary in the context of a single record</li> </ul>
Navigation	<ul style="list-style-type: none"> <li>■ Navigating to a Patient List</li> </ul> <ul style="list-style-type: none"> <li>■ Navigating from Patient List</li> </ul>
Printing	<ul style="list-style-type: none"> <li>■ Printing all or part of a Patient List</li> </ul>
Process	<ul style="list-style-type: none"> <li>■ Process of handover (for example, transfer of responsibility)</li> </ul>
Structured layout	<ul style="list-style-type: none"> <li>■ Structured lines (for example, stack of Patient Banners)</li> </ul>
Summary	<ul style="list-style-type: none"> <li>■ Indicating fallibility of summaries</li> </ul> <ul style="list-style-type: none"> <li>■ Usage of 'how much' data should be allowed 'in' a Patient List</li> </ul>
Tasks	<ul style="list-style-type: none"> <li>■ Basic task display layout and format</li> <li>■ Task status indicator per task</li> <li>■ Task status indicator per patient</li> <li>■ Hierarchical view of tasks</li> <li>■ Filtering tasks</li> <li>■ Display of completed tasks</li> <li>■ Colour coding</li> <li>■ Role specific mark-up</li> <li>■ View task assignment</li> <li>■ Indicate overdue tasks</li> </ul> <ul style="list-style-type: none"> <li>■ Task state transition model</li> <li>■ Viewing task priority</li> <li>■ Viewing tasks independence</li> <li>■ Viewing task time dependence</li> <li>■ Discharge with outstanding tasks</li> <li>■ Changing a task's status</li> <li>■ Allocation of tasks</li> <li>■ Setting task priority</li> <li>■ View tasks in relation to care pathway</li> </ul>

Table 3: Out of Scope

**Note**

Listing an item as out of scope does not classify it as unimportant. Project time and resource constraints inevitably restrict what can be in scope for a particular release. It is possible that items out of scope for this release may be considered for a future release.

## 1.3 Assumptions

ID	Assumption
A1	The quality (that is, provenance, accuracy, and completeness) of the data displayed in the Patient List is of an acceptable level. Data quality is particularly important in scenarios where there are multiple data sources (as the quality of data may vary between sources).
A2	Where the system supports the live update of Patient List information, the system performance and connectivity is of such a level that there is minimum delay between the update being entered and the Patient List being updated.
A3	The minimum screen resolution used by the clinician is 1024 x 768 pixels, although a higher resolution may be employed.
A4	The Patient List consists entirely of information that resides in and is accessible through other views, including views that represent the data as entered into the system.

Table 4: Assumptions

## 1.4 Dependencies

ID	Dependency
D1	Changes in the following documents may affect the guidance presented in this document: <ul style="list-style-type: none"> <li>■ Design Guidance – Patient Banner</li> <li>■ Design Guidance – Displaying Graphs and Tables</li> <li>■ Design Guidance – Filtering, Sorting and Grouping</li> </ul>

Table 5: Dependencies

## 2 GUIDANCE OVERVIEW

### 2.1 Rationale Summary

The rationale for the current guidance draws on several pieces of evidence:

Research:

- Primary Research:
  - Interviews with healthcare professionals, including doctors (see APPENDIX B)
  - Regular consultation with a panel of clinical experts
- Secondary Research:
  - Existing guidelines and standards
  - UI best practice

Usability Principles (see APPENDIX A for details on these principles):

- Nielsen's usability heuristics
- Shneiderman's eight golden rules of interface design
- International Organization for Standardization (ISO) 9241: Characteristics of presented information (taken from *BS EN ISO 9241-10: 1996 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 10: Dialogues principles {R1}*)

Existing Standards:

- *BS EN ISO 9241-10:1996 Ergonomic requirements for office work with visual display terminals (VDTs): Part 10: Dialogues principles {R1}*
- *BS 7581:1992 Guide to Presentation of tables and graphs {R2}*

Evolving Standards:

- *Design Guidance – Patient Banner {R3}*
- *Design Guidance – Displaying Graphs and Tables {R4}*
- *Design Guidance – Filtering, Sorting and Grouping {R5}*

## 2.2 Summary of Guidance

Table 6 summarises the content of this document by outlining each area of guidance (along with a cross reference to the relevant section) and providing a visual example to illustrate how it might be implemented:

### Areas of Guidance

### Visual Summary

Section 3 provides guidance on the layout of Patient Lists

Section 3.2.1 provides guidance on the Patient List header, which communicates the context of the Patient List

Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009					
Patient List header		Visual Summary			

Section 3.2.2 provides guidance on column headers, which provide the titles for each column

Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009					
Patient Identification		Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	LEVI, Steven (Mr) Preferred Name: Steve Born: 10-Nov-1981 NHS No: 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review
A4	GIBBINS, Phil (Mr) Born: 22-Jul-1991 NHS No: 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA

Section 3.2.3 provides guidance on columns, which contain the sets of information for the Patient List

Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009					
Columns					
A3	LEVI, Steven (Mr) Preferred Name: Steve Born: 10-Nov-1981 NHS No: 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review
A4	GIBBINS, Phil (Mr) Born: 22-Jul-1991 NHS No: 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born: 09-Mar-1931 NHS No: 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infarction Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea	Chase stool culture Urine microscopy culture and sensitivity Check fluid balance and review patient later

Section 3.2.4 provides guidance on rows and cells. Rows contain the information for each patient in the Patient List. Cells contain specific information for each patient

Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009					
Rows					
A4	GIBBINS, Phil (Mr) Born: 22-Jul-1991 NHS No: 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born: 09-Mar-1931 NHS No: 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infarction Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea Creatinine 150	Chase stool culture Urine microscopy culture and sensitivity Check fluid balance and review patient later
A6	THORP, Justin (Mr) Born: 22-Apr-1936 NHS No: 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction Abdominal x-ray - dilated small bowel loops	Refer to surgeons Repeat bloods Arterial blood gas Nasogastric tube
B1	SMITH, Ben (Mr)	Infective	COPD - on home O2	Chest x-ray - small	Chase pleural tap

## Areas of Guidance

Section 3.2.5 provides guidance on sublists, which are located within cells and contain information that is structured in a list format

## Visual Summary

A diagram illustrating a sublist. A callout box labeled "Sublist" points to a specific cell in a table. This cell contains a list of items: "Nil by mouth, CT head - no new infarction", "Chase stool culture", "Urine microscopy culture and sensitivity", "Check fluid balance and review patient later", "Refer to surgeons", "Repeat bloods", "Arterial blood gas", and "Nasogastric tube". The table itself has various rows and columns representing medical conditions and treatments.

Asthma Exacerbation	Asthma	White count 10.2. CRP 20	TTA
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
Pneumonia	Diverticulitis	Wednesday - on Potassium	Check fluid balance and review patient later
Infective		Diarrhoea	
		Creatinine 150	
		Small bowel obstruction	Refer to surgeons
		Abdominal x-ray - dilated small bowel loops	Repeat bloods
			Arterial blood gas
			Nasogastric tube
			Chase pleural tap
		COPD - on home O2	
		Chest x-ray - small	

Section 3.2.6 provides guidance on the display of patient identification information

## Patient identification

A diagram illustrating patient identification. A callout box labeled "Patient identification" points to a specific row in a table. This row contains the patient's name, date of birth, NHS number, and other demographic information. The table also includes columns for medical history and treatments.

A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis	Cystic Fibrosis
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia	Cerebrovascular accident

Section 3.2.7 provides guidance on row key identifiers, which uniquely identify each row from others in the Patient List

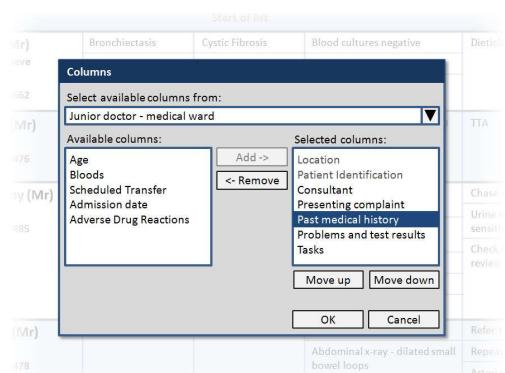
## Row key identifiers

A diagram illustrating row key identifiers. A callout box labeled "Row key identifiers" points to a specific row in a table. This row contains the patient's name, date of birth, NHS number, and other demographic information. The table also includes columns for medical history and treatments.

A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis	Cystic Fibrosis
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia	Cerebrovascular accident

Section 4 provides guidance on managing the information displayed in a Patient List

Section 4.2.1 provides guidance on how to manage the columns displayed in the Patient List



## Areas of Guidance

Section 4.2.2 provides guidance on notifying the user of updates to information displayed in the Patient List.

## Visual Summary

The diagram illustrates the 'Update notification field' and 'Updated content' areas of the Patient List view. The 'Update notification field' is represented by a yellow box at the top right of the screen, containing the date '25-Sep-2009' and a button 'Unmark all'. The 'Updated content' area is shown as a yellow box covering the last two rows of the patient list, indicating changes made since the last update.

Patient List for: Maxhurst, John (Dr) Location: Elkington ward					
Columns... Action 1 Action 2		Updates: 9 updates (2 currently out of view)			
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1981 NHS No 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infarction Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea Creatinine 150	Chase stool culture Urine microscopy culture and sensitivity Check fluid balance and review patient later
A6	<b>THORP, Justin (Mr)</b> Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction Abdominal x-ray - dilated small bowel loops	Refer to surgeons Repeat bloods Arterial blood gas Nasogastric tube
B1	<b>SMITH, Ben (Mr)</b> Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD Left sided pleural effusion	COPD - on home O2 Hypertension	Chest x-ray - small pneumothorax post aspiration Chest drain inserted Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap Chest x-ray post chest drain removal 2 items removed

Section 4.2.3 provides guidance on displaying historical patient information as a complete Patient List 'snapshot'.

The diagram shows the historical Patient List view for Maxhurst, John (Dr) on 08:00 23-Sep-2009. It displays the same patient list as the previous screenshot, but with a different header indicating the historical nature of the data.

HISTORICAL Patient List for: Maxhurst, John (Dr) Location: Elkington ward 08:00 23-Sep-2009					
Columns...		columns out of view – scroll left or right			
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1981 NHS No 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infarction Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea Creatinine 150	Chase stool culture Urine microscopy culture and sensitivity Check fluid balance and review patient later
A6	<b>THORP, Justin (Mr)</b> Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction Abdominal x-ray - dilated small bowel loops	Refer to surgeons Repeat bloods Arterial blood gas Nasogastric tube
B1	<b>SMITH, Ben (Mr)</b> Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD Left sided pleural effusion	COPD - on home O2 Hypertension	Chest x-ray - small pneumothorax post aspiration Chest drain inserted	Chase pleural tap Chest x-ray post chest drain removal
End of list					

## Areas of Guidance

## Visual Summary

Section 4.2.4 provides guidance on how to display further information that a user has opened

Patient List for: Maxhurst, John (Dr)		Location: Elkington ward		14:32 25-Sep-2009	
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born: 10-Nov-1981 NHS No: 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review
A4	<b>GIBBINS, Phil (Mr)</b> Born: 22-Jul-1991 NHS No: 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	<b>MADIGAN, Tony (Mr)</b> Born: 09-Mar-1991 NHS No: 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	NIL by mouth, CT head - no new infection Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea Creatinine 150	Chase stool culture Urine microscopy culture and sensitivity Check fluid balance and review patient later
A6	<b>THORP, Justin (Mr)</b> Born: 22-Apr-1996 NHS No: 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction Abdominal x-ray - dilated small bowel loops	Refer to surgeons Repeat bloods Arterial blood gas Nasogastric tube
B1	<b>SMITH, Ben (Mr)</b> Born: 09-Mar-1999 NHS No: 417 744 3757	Infective exacerbation COPD Left sided pleural effusion	COPD - on home O2 Hypertension Chronic renal failure Osteoarthritis	Chest x-ray - small pneumothorax cont aspiration Chest drain inserted Arterial blood gas: pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap Chest x-ray post chest drain removal Repeat Arterial blood gas

↓ User navigates to a patient record from the Patient List

(Patient Record)

Table 6: Summary of Guidance

## 3 GUIDANCE DETAILS FOR PATIENT LIST LAYOUT

### 3.1 Introduction

This section includes guidance for the layout of Patient Lists, specifically:

- Patient List headers
- Column headers
- Columns
- Rows and cells
- Sublists
- Patient identification
- Row key identifiers

### 3.2 Guidelines

#### 3.2.1 Patient List Header

This section provides guidance on the Patient List header. This communicates the context of the list to the user. Figure 2 illustrates that feature:

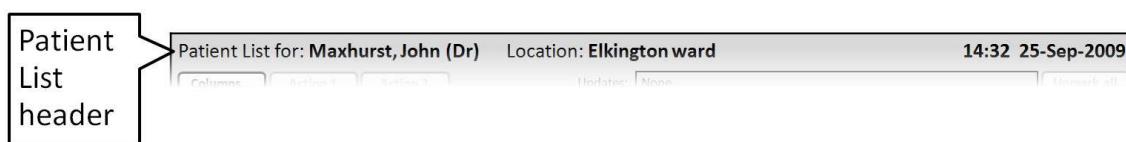


Figure 2: Patient List Header

ID	Guideline	Conformance	Evidence Rating
PAL-0010	Ensure that the Patient List header is always visible when the Patient List is displayed	Mandatory	High
PAL-0020	Locate the Patient List header at the top of the Patient List area and extend it across the entire width of the Patient List area	Mandatory	High
PAL-0030	Ensure that the Patient List header is displayed using a font size and weight that gives it greater visual prominence than neighbouring Patient List elements	Recommended	Medium
PAL-0040	In the Patient List header, display an appropriate combination of the following information: <ul style="list-style-type: none"> <li>■ Who the list is for</li> <li>■ The service provided</li> <li>■ The location to which the list applies</li> <li>■ The time and date at which the data was last updated or, if the system supports real-time updates, the current time</li> </ul>	Mandatory	High
PAL-0050	If the Patient List has been prepared for a single clinician, display the clinician's name in the Patient List header using family name, given name and salutation	Recommended	Medium
PAL-0060	If the Patient List has been prepared for several individuals, reflect this in the Patient List header (for example, display 'Patient List for: Mr Crossley, Mr Argos')	Recommended	Medium
PAL-0070	If the Patient List has been prepared for a team, reflect this in the Patient List header (for example, display 'Patient List for: Physiotherapists')	Recommended	Medium

Page 12

PAL-0080	In the Patient List header, provide sufficient location details to uniquely identify the location the Patient List applies to	Mandatory	High
PAL-0090	When a Patient List comprises patients in different locations (for example, multiple wards) reflect this in the Patient List header (for example, 'Elkington Ward, Remington Ward', 'All Wards')	Recommended	Medium
PAL-0100	In the Patient List header, display the current time and date in accordance with <i>Design Guidance – Time Display {R6}</i> and <i>Design Guidance – Date Display {R7}</i>	Mandatory	High

## Usage Examples

Patient List for: **Maxhurst, John (Dr)** Location: **Elkington ward** 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all

← columns out of view – scroll left or right →

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
----------	------------------------	----------------------	----------------------	---------------------------	-------



In this correct example, the Patient List header extends across the entire width of the Patient List area and the contents are displayed using a prominent font size and weight. The header information includes who the list is for (Dr Maxhurst), the location to which it applies (Elkington Ward) and the current time and date in the correct format (PAL-0020, PAL-0030, PAL-0040, PAL-0050, PAL-0100)

Patient List for: **Maxhurst, John (Dr)** 2.32pm

Columns... Action 1 Action 2 Updates: None Unmark all



In this incorrect example, there is no location information to set context for the Patient List. The date is also missing, and the time is not in the correct format. (PAL-0040, PAL-0080, PAL-0100)

Patient List for: **On-Call Surgical Team** Location: **Elkington ward** 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all



In this correct example, the Patient List shows that it is configured for use by the on-call surgical team. (PAL-0050)

Patient List for: **Kriss, Jared (Mr)** Location: **All wards** 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all



In this correct example, the Patient List shows that it is configured to display patients across all wards. (PAL-0090)

Patient List for: **On-Call Surgical Team** Location: **North wing, Ward 3** 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all



In this correct example, multiple 'Ward 3' locations exist in the same hospital so the additional detail 'North wing' has been added. (PAL-0080)

Patient List for: **Baby Clinic** 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all



In this correct example, the Patient List is for a 'Baby Clinic' service, for which a specific location is not required (PAL-0040)

## Rationale

As the Patient List header communicates the context of use of the list to the user, it is important that the information is presented in a clear, consistent and unambiguous form and has visual prominence at the top of the list. Such headers are particularly important when a variety of Patient Lists may be used within multi-disciplinary teams.

For example, Patient Lists such as these:

- Used by all clinicians on a ward with general information (such as patient location and infection control measures)
- Used for role-specific lists shared between a group of clinicians (such as junior doctors and nursing staff)
- Configured for use by individuals (such as consultants and occupational therapists)

### Hazard Risk Analysis Summary:

#### Potential Hazards:

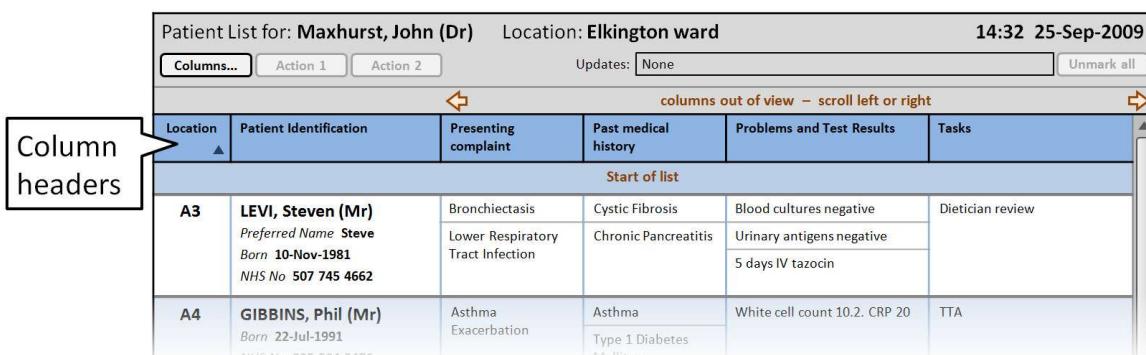
- PLI012 What if there is no clear header on the list?
- PLI109 What if the title does not have sufficient emphasis to identify the particular list shown?
- PLI112 What if the status of the list is not shown within close proximity to the list?
- PLI127 What happens if a clinician cannot distinguish which list is being viewed
- PLI128 What if the date and time fields are not closely situated
- PLI046 What if there is more than one consultant with the same name within the medical organization, the given name and prefix (or initial) is not on the list and ID numbers are not available?
- PLI283 What if the list presents patients from mixed locations (for example, more than one hospital ward in one view)?

#### Mitigations:

- PAL-0010, PAL-0020
- PAL-0030
- PAL-0010, PAL-0020, PAL-0080
- PAL-0040, PAL-0060, PAL-0080
- PAL-0100
- PAL-0050
- PAL-0090

### 3.2.2 Column Headers

This section provides guidance on column headers, which provide the titles for each column. Figure 3 illustrates that feature:

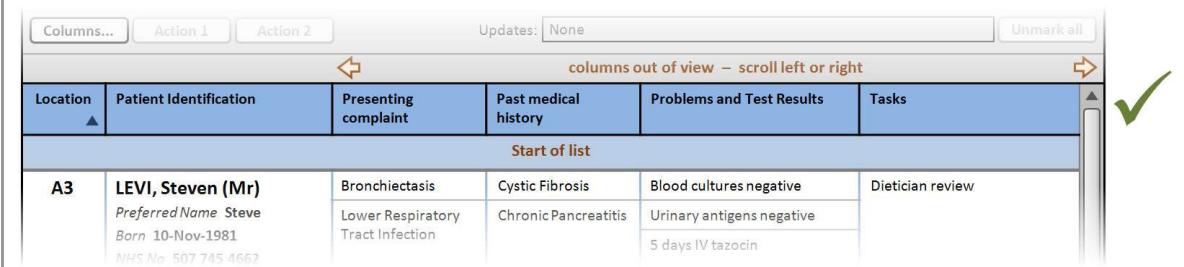


Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009					
<span>Columns...</span> <span>Action 1</span> <span>Action 2</span> <span>Updates: None</span> <span>Unmark all</span>					
columns out of view – scroll left or right					
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20  TTA	

Figure 3: Column Headers

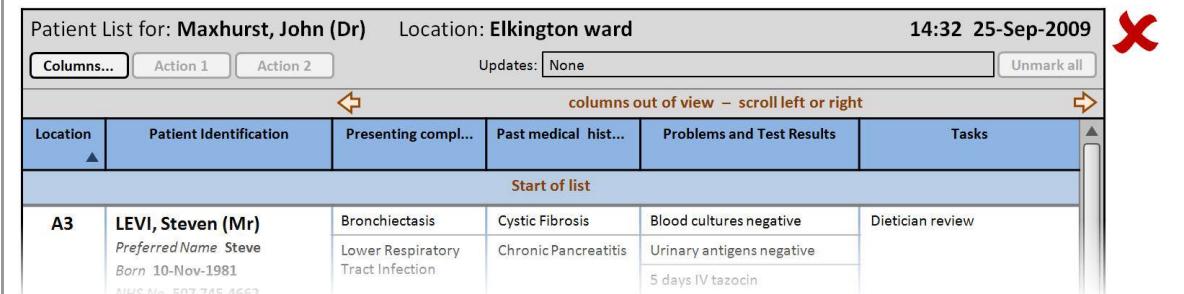
ID	Guideline	Conformance	Evidence Rating
PAL-0110	Vertically align all column header titles to the top of their text area	Recommended	Low
PAL-0120	Support wrapping of column header titles onto multiple lines	Recommended	High
PAL-0130	Match the left and right margins within each column header to that used by the data displayed in the column	Recommended	Medium
PAL-0140	Match the horizontal alignment of each column header title to that used by the data displayed in the column	Recommended	Medium
PAL-0150	Do not truncate the column header title	Recommended	High
PAL-0160	If the width of the column is insufficient to display the column header title on one line, display the title on multiple lines	Recommended	Medium
PAL-0170	If the Patient List content area requires vertical scrolling, ensure that the column header bar remains visible (that is, it does not scroll out of view)	Mandatory	High

## Usage Examples



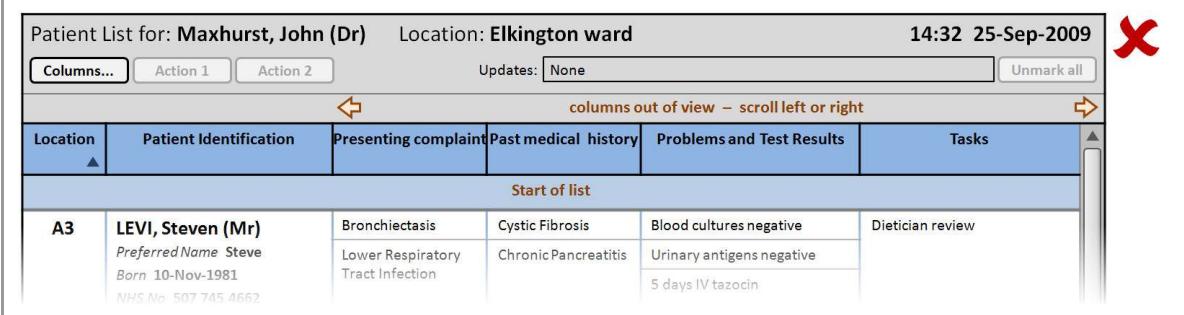
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No. 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review

In this correct example, the column header titles are vertically aligned to the top of their text area and use the same horizontal alignment as the column content (hence, 'Location' is centre aligned and the other fields left aligned.) The left and right margins within each column header title match those used for the content. 'Presenting complaint' and 'Past medical history' have wrapped onto the next line. (PAL-0110, PAL-0130, PAL-0140, PAL-0150, PAL-0160)



Location	Patient Identification	Presenting compl...	Past medical hist...	Problems and Test Results	Tasks
Start of list					
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No. 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review

In this incorrect example, the column header titles are middle aligned regardless of the horizontal alignment of the column content. 'Presenting complaint' and 'Past medical history' have been truncated. (PAL-0140, PAL-0150, PAL-0160)



Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No. 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review

In this incorrect example, in addition to mismatching horizontal alignment, the column header title left and right margins are not the same as the column content. This impedes visual scanning between title and content. The lack of separation between 'Presenting complaint' and 'Past medical history' impedes legibility. (PAL-0130, PAL-0140, PAL-0160)

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis	Cystic Fibrosis	Blood cultures negative	Dietician review
		Lower Respiratory Tract Infection	Chronic Pancreatitis	Urinary antigens negative	
				5 days IV tazocin	
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA

↓ User scrolls viewing area down

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A6	<b>THORP, Justin (Mr)</b> Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
				Abdominal x-ray - dilated small bowel loops	Repeat bloods
					Arterial blood gases
B1	<b>SMITH, Ben (Mr)</b> Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
			Hypertension		Chest x-ray post chest drain removal
		Left sided pleural effusion	Chronic renal failure	Chest drain inserted	
			Osteoarthritis	Arterial blood gases pO2 7.2, pCO2 5.7 on 28% oxygen	Repeat Arterial blood gases

In this correct example, when the user scrolls the viewing area down, the column headers remain visible. (PAL-0170)

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis	Cystic Fibrosis	Blood cultures negative	Dietician review
		Lower Respiratory Tract Infection	Chronic Pancreatitis	Urinary antigens negative	
				5 days IV tazocin	
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA

↓ User scrolls viewing area down

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A6	<b>THORP, Justin (Mr)</b> Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
				Abdominal x-ray - dilated small bowel loops	Repeat bloods
					Arterial blood gases
B1	<b>SMITH, Ben (Mr)</b> Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
			Hypertension		Chest x-ray post chest drain removal
		Left sided pleural effusion	Chronic renal failure	Chest drain inserted	
			Osteoarthritis	Arterial blood gases pO2 7.2, pCO2 5.7 on 28% oxygen	Repeat Arterial blood gases

In this incorrect example, when the user scrolls down, the column headers are scrolled off the top of the viewing area. (PAL-0170)

## Rationale

Correctly aligned and non-truncated column headers are particularly important for those Patient Lists that have a large number of columns. Such column headers assist the user in identifying the types of content displayed (for example, 'Presenting complaint' versus 'Past medical history'). Maintaining the visibility of the column headers for a scrolled list is particularly important for this reason.

Section 4.2.1 includes guidance and rationale on permitting users to choose which columns are displayed in the Patient List and the order in which they appear. Thereby, it is possible that users will position columns with similarly formatted content next to each other (for example, two or more columns containing times). For this reason, it is important that the user can readily view the identity of each column at all times.

### Hazard Risk Analysis Summary:

#### Potential Hazards:

- PLI246 What if you cannot see the labels for the data you are looking at?
- PAL-0150, PAL-0160, PAL-0170

#### Mitigations:

## 3.2.3 Columns

This section provides guidance on columns, which contain the sets of information for the Patient List. Figure 4 illustrates that feature:

Columns						
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review	
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA	
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later	

Figure 4: Columns

ID	Guideline	Conformance	Evidence Rating
PAL-0180	Separate columns with prominent vertical divider lines	Mandatory	High
PAL-0190	Use left and right margins within each column to ensure separation between adjacent content	Mandatory	High
PAL-0200	Allow the user to adjust the width of columns and persist the set column widths between the user's sessions	Mandatory	High
PAL-0210	To prevent truncation, by default limit the minimum width of a column to the widest element in its title and content (for example, the longest word) plus its left and right margins	Recommended	High
PAL-0220	When users change the width of a column, ensure that by default the widths of other columns are kept the same (even if this causes the combined column width to exceed the viewable area)	Recommended	Medium
PAL-0230	When the combined column width exceeds the viewable area, permit horizontal scrolling	Recommended	Medium

PAL-0240	When columns are out of view, by default display symbols (for example, left and right arrows) to indicate the direction the user will need to scroll to view those columns. Position the symbols immediately above and towards the left and right borders of the viewing area to avoid obscuring information	Mandatory	High
PAL-0250	Supplement out of view symbols with the message 'columns out of view – scroll left and right' or similar. Position this message in close proximity to the out of view symbols	Recommended	Low
PAL-0260	Provide users with the option to hide out of view notifications until the next user session	Recommended	Medium
PAL-0270	If, after an update of Patient List content, the elements in a column (for example, the longest word) become wider than the column width, automatically resize the column to prevent truncation.	Recommended	High

### Usage Examples

<table border="1"> <tr><td>Cystic Fibrosis</td><td>Blood cultures negative</td><td>Dietician review</td></tr> <tr><td rowspan="2">Chronic Pancreatitis</td><td>Urinary antigens negative</td><td></td></tr> <tr><td>5 days IV tazocin</td><td></td></tr> <tr><td>Asthma</td><td rowspan="2">White cell count 10.2. CRP 20</td><td rowspan="2">TTA</td></tr> <tr><td>Type 1 Diabetes Mellitus</td></tr> <tr><td>Cerebrovascular accident</td><td>Nil by mouth, CT head - no new infarction</td><td>Chase stool culture</td></tr> <tr><td rowspan="7">Epilepsy</td><td>Chest x-ray left upper lobe consolidation. Potassium 2.6</td><td>Urine microscopy culture and sensitivity</td></tr> </table>	Cystic Fibrosis	Blood cultures negative	Dietician review	Chronic Pancreatitis	Urinary antigens negative		5 days IV tazocin		Asthma	White cell count 10.2. CRP 20	TTA	Type 1 Diabetes Mellitus	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity	 In this correct example, columns are separated by prominent vertical lines and the margins within each column ensure separation of adjacent content. (PAL-0180, PAL-0190)
Cystic Fibrosis	Blood cultures negative	Dietician review																	
Chronic Pancreatitis	Urinary antigens negative																		
	5 days IV tazocin																		
Asthma	White cell count 10.2. CRP 20	TTA																	
Type 1 Diabetes Mellitus																			
Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture																	
Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity																	
<table border="1"> <tr><td>Cystic Fibrosis</td><td>Blood cultures negative</td><td>Dietician review</td></tr> <tr><td rowspan="2">Chronic Pancreatitis</td><td>Urinary antigens negative</td><td></td></tr> <tr><td>5 days IV tazocin</td><td></td></tr> <tr><td>Asthma</td><td rowspan="2">White cell count 10.2. CRP 20</td><td rowspan="2">TTA</td></tr> <tr><td>Type 1 Diabetes Mellitus</td></tr> <tr><td>Cerebrovascular accident</td><td>Nil by mouth, CT head - no new infarction</td><td>Chase stool culture</td></tr> <tr><td rowspan="7">Epilepsy</td><td>Chest x-ray left upper lobe consolidation. Potassium 2.6</td><td>Urine microscopy culture and sensitivity</td></tr> </table>	Cystic Fibrosis	Blood cultures negative	Dietician review	Chronic Pancreatitis	Urinary antigens negative		5 days IV tazocin		Asthma	White cell count 10.2. CRP 20	TTA	Type 1 Diabetes Mellitus	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity	 In this incorrect example, the column divider lines are not prominent enough and the margins inadequate to ensure separation between adjacent content. For example, 'Chronic Pancreatitis' and 'Urinary antigens negative' could be accidentally read as one sentence. (PAL-0180, PAL-0190)
Cystic Fibrosis	Blood cultures negative	Dietician review																	
Chronic Pancreatitis	Urinary antigens negative																		
	5 days IV tazocin																		
Asthma	White cell count 10.2. CRP 20	TTA																	
Type 1 Diabetes Mellitus																			
Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture																	
Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity																	



**↓ User resizes the middle column**

Bronchiectasis	Cystic Fibrosis	Blood cultures negative
Lower Respiratory Tract Infection	Chronic Pancreatitis	Urinary antigens negative 5 days IV tazocin
Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20
	Type 1 Diabetes Mellitus	
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea

Bronchiectasis	Fibrosis	Blood cultures negative
Lower Respiratory Tract Infection	Chronic Pancreatitis...	Urinary antigens negative 5 days IV tazocin
Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20
	Type 1 Diabetes Mellitus	
Aspiration pneumonia	Cerebrova... accident	Nil by mouth, CT head - no new infarction
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea

In this incorrect example, the user has been permitted to resize the middle column narrower than the widest elements resulting in the words 'Pancreatitis' and 'Cerebrovascular' being truncated. (PAL-0210)



Bronchiectasis	Cystic Fibrosis	Blood cultures negative	Dietician review
Lower Respiratory Tract Infection	Chronic Pancreatitis	Urinary antigens negative	
		5 days IV tazocin	
Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA
	Type 1 Diabetes Mellitus		
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture Urine microscopy culture and sensitivity
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Check fluid balance and review patient later
		Wednesday - on Potassium	
		Diarrhoea	

↓ User resizes first column

Bronchiectasis	Cystic Fibrosis	Blood cultures negative	Dietician review
Lower Respiratory Tract Infection	Chronic Pancreatitis	Urinary antigens negative	
		5 days IV tazocin	
Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA
	Type 1 Diabetes Mellitus		
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture Urine microscopy culture and sensitivity
			Check fluid balance and review patient later
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	

In this incorrect example, when the user resizes the first column, the other columns are automatically resized to maintain the overall width of the combined columns. As a consequence information has been relocated (for example, 'Wednesday – on Potassium' and 'Diarrhoea' are no longer in view). (This example assumes the user has not set a preference for this behaviour). (PAL-0220)



Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all

Location	Patient Identification	Presenting complaint	Problems and Test Results	Tasks
Start of list				
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later

↓ User resizes third column



Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all

columns out of view – scroll left or right

Location	Patient Identification	Presenting complaint	Problems and Test Results	Tasks
Start of list				
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Die
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later

In this correct example, when the user resizes the third column ('Presenting complaint') the columns to the right remain the same width. The overall width has increased beyond the viewable area, so a horizontal scrollbar is displayed. The out-of-view symbols and warning message are displayed by default immediately above the viewable area. (PAL-0200, PAL-0220, PAL-0230, PAL-0240, PAL-0250, PAL-0260)



CT pulmonary angiogram - Multiple filling defects	None	Tuesday INR
Started warfarin		
atypical screen-legionella pneumophilia, urinary antigen positive	Repeat blood cultures	Tuesday
CRP 100		
IV antibiotics switched to oral	None	
Nebulisers stopped		

## ↓ System updates content

CT pulmonary angiogram - Multiple filling defects	Echocardiogram	Tuesday INR
Started warfarin		
atypical screen-legionella pneumophilia, urinary antigen positive	Repeat blood cultures	Tuesday
CRP 100		
IV antibiotics switched to oral	None	
Nebulisers stopped		

In this correct example, the system updates the second column, replacing 'None' with 'Echocardiogram'. The width of the column is automatically adjusted so that the new content is not truncated. (PAL-0270)

See section 4.2.2 for guidance and rationale on information updates

### Rationale

The close positioning of information within columns has potential safety hazards if the boundaries of each column are not clearly delineated. If a user accidentally reads two adjacent lines of content as one sentence, at best they will be confused; at worst they will form a wrong interpretation. This guidance mitigates that hazard.

The ability to adjust the width of columns was considered desirable by the majority of participants (see APPENDIX B). Horizontal scrolling was considered unfamiliar as many existing Patient Lists are based on word processing documents, which are typically constrained to a fixed width. However, participants generally agreed that the benefits of an unrestricted list width (including the ability for users to adjust columns to a width appropriate for the content) outweighed the initial unfamiliarity.

This guidance mitigates the identified hazards that may arise when clinicians migrate from document-based Patient Lists, in particular with regard to horizontal scrolling and columns that are out of view.

#### Note

The following rationale regarding truncation also applies to sections 3.2.4 and 3.2.5.

The truncation of information within a Patient List was considered in several forms:

- Truncation caused by a set maximum character limit within a field
- Truncation of long words that exceed the width of the column they are located in
- Truncation of sublists (where a maximum number of entries has been exceeded.)

Design mock-ups for each of these types of truncation were shown to the user research and hazard assessment participants.

The majority of participants considered truncation to be a significant safety hazard, in particular with regard to truncated sublists (for example where only the first 10 entries are displayed) where users may wrongly assume the sublist is complete (see APPENDIX B). This guidance therefore recommends that truncation should be avoided in any form within Patient Lists.

#### Note

The quality of the source data is out of scope for this guidance, including the length of source data to display. However, hazard assessments did explore and record the hazards of displaying unlimited, non-truncated information (for example, displaying unnecessary or inappropriate detail for a given use) (see APPENDIX B). In the absence of guidance on the quality of source data, the discussion concluded that clinicians can help mitigate these hazards by:

- Managing the columns that are displayed in their Patient Lists (for example, to avoid unnecessarily verbose content)
- Managing the quantity and appropriateness of the content that they provide

#### Hazard Risk Analysis Summary:

##### Potential Hazards:

- PLI071 What if, when horizontally scrolling, there is no indication of data present to the left or right?
- PLI245 What if many similar columns are presented next to each other?
- PLI014 What if the column width is not flexible or set to useful sizes to accommodate the data clearly?

##### Mitigations:

- PAL-0240, PAL-0250, PAL-0260
- PAL-0180, PAL-0190
- PAL-0200, PAL-0210, PAL-0220, PAL-0230, PAL-0270

### 3.2.4 Rows and Cells

This section provides guidance on rows and cells. Rows contain the information for each patient in the Patient List. Cells contain individual content (and sublists, where required). Figure 5 illustrates those features:

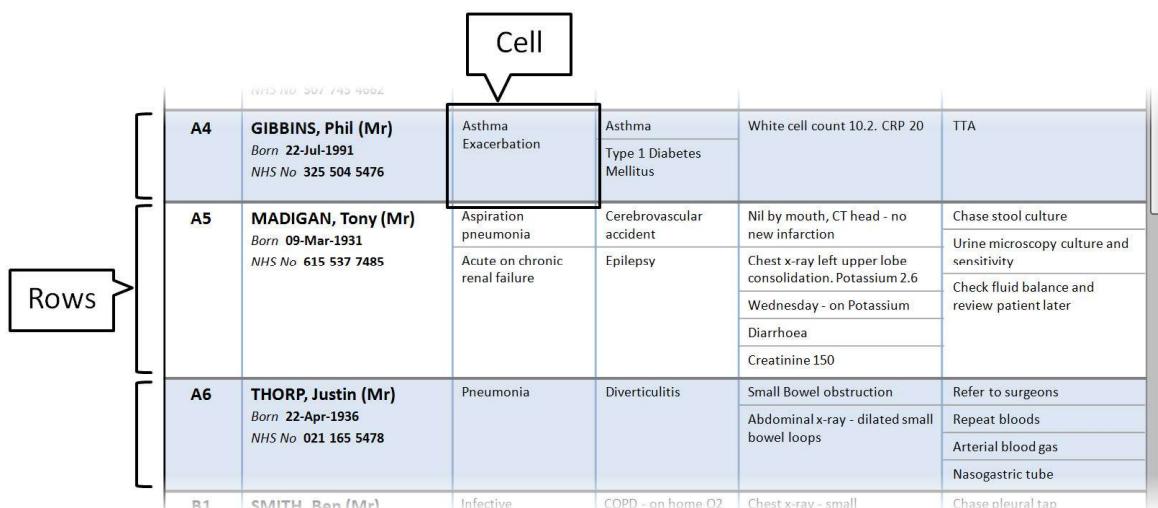


Figure 5: Rows and Cells

ID	Guideline	Conformance	Evidence Rating
PAL-0280	Orientate Patient List entries horizontally (that is, so the information for each patient is displayed across the viewing area.)	Mandatory	High
	<p><b>Note</b></p> <p>This guidance overrides GTAB-191 in <i>Design Guidance – Displaying Graphs and Tables {R4}</i> for Patient List contexts only</p>		
PAL-0290	Separate rows using prominent horizontal divider lines	Mandatory	High

PAL-0300	Visually delineate each row by using two alternating background colours	Recommended	Medium
PAL-0310	Choose row background colours that do not detract from the legibility of content within the list and the divider lines, and are unlikely to have semantic meaning in that context	Recommended	Medium
PAL-0320	Support wrapping of cell text content onto multiple lines	Recommended	High
PAL-0330	Content in Patient List cells should never be truncated	Recommended	High
PAL-0340	By default, the height of each patient row must be sufficient to avoid truncation of content	Recommended	High
PAL-0350	If, after an update of Patient List content, the content exceeds the row height, automatically resize the row to prevent truncation	Recommended	High
PAL-0360	When the Patient List is longer than the viewable area, allow access to the out of view part of the list with a vertical scrollbar	Recommended	Medium
PAL-0370	Provide an indicator at the top and across the full width of the Patient List to inform the user they are at the start of the list	Recommended	Medium
PAL-0380	Provide an indicator at the end and across the full width of the Patient List to inform the user they are at the end of the list	Recommended	Medium

### Usage Examples

Patient List View Example					
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later
A6	THORP, Justin (Mr) Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction  Abdominal x-ray - dilated small bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas  Nasogastric tube
B1	SMITH, Ben (Mr)	Infective	COPD - on home O2	Chest x-ray - small	Chase pleural tap

In this correct example, the Patient List is oriented horizontally and each row is separated by a prominent horizontal line. Each row is delineated using alternating background colours and the height of each row is sufficient to avoid truncation of content. (PAL-0280, PAL-0260, PAL-0300, PAL-0310, PAL-0330, PAL-0340)

Patient List View Example					
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later
A6	THORP, Justin (Mr) Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction  Abdominal x-ray - dilated small bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas  Nasogastric tube

In this incorrect example, the horizontal divider lines between rows are not prominent enough and there is no alternating background colour to delineate the rows. As a result, users would find it difficult to associate content with the row it belongs to. For example, it is not clear where the list of problems and test results in the fifth column for the second patient ends and the list for the third patient begins. (PAL-0290, PAL-0300, PAL-0310)



Incident			
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
		Wednesday - on Potassium	Check fluid balance and review patient later
		Diarrhoea	
Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
		Abdominal x-ray - dilated small bowel loops	Repeat bloods
			Arterial blood gas
Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
	Hypertension		Chest x-ray post chest drain removal
Left sided pleural effusion	Chronic renal failure	Chest drain inserted	
	Osteoarthritis	Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Repeat Arterial blood gas

## ↓ System updates content

Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
		Wednesday - on Potassium	Check fluid balance and review patient later
		Diarrhoea	
		Creatinine 150	
Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
		Abdominal x-ray - dilated small bowel loops	Repeat bloods
			Arterial blood gas
			Nasogastric tube
Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
	Hypertension		Chest x-ray post chest drain removal
Left sided pleural effusion	Chronic renal failure	Chest drain inserted	

In this correct example, new content is added to two of the rows as a result of an update. The height of each row has automatically increased to accommodate the new content and truncation is avoided. (PAL-0330, PAL-0340, PAL-0350)

See section 4.2.2 for guidance and rationale on information updates.



Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No. 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review

In this correct example, an indicator is displayed at the top of the Patient List informing the user they are at the start of the list. (PAL-0370)

C4	JACOBS, Andrew (Mr) Preferred Name Andy Born 09-Mar-1954 NHS No 842 204 7085	Pneumothorax	Asthma	Chest x-ray - left sided pneumothorax with partial collapse left lung. Left apical rim of air 2.5cm Chest drain inserted Chest x-ray - no pneumothorax	Remove chest drain TTA
<b>End of list</b>					

In this correct example, an indicator is displayed at the bottom of the Patient List informing the user they are at the end of the list. (PAL-0380)

## Rationale

All observed examples of existing Patient Lists orient the information horizontally (that is, information for a patient is displayed in a row across the screen). This orientation is particularly appropriate when the number of rows is likely to vary over time and for Patient Lists this occurs when patients are added or removed. During guidance research and design no significant benefits of vertically oriented lists were discovered (see APPENDIX B). Therefore, GTAB-191 in *Design Guidance – Displaying Graphs and Tables* {R4}, which recommends the facility for users to re-orient tables, is overridden for Patient List contexts only.

Emphasising horizontal rows by using prominent horizontal divider lines and alternating background colours facilitates reading across each row within the Patient List. Using more than two background colours may lead users to wrongly infer meaning from the row colour.

During hazard assessments, participants found the concept of vertically scrolling a single 'page' familiar due to their use of this navigation technique in other contexts (for example, browsing Web pages). Advantages of a single, scrollable page include:

- Improved speed of navigation (no need to click through multiple pages)
- List completeness (clear list beginning and end points)
- Avoiding patient information being spread over separate pages

See the rationale in section 3.2.3 for discussion of truncation issues.

### Note

Although the format and layout of data is out of scope for this guidance, during discussions it was noted that there are hazards associated with wrapping cell text content onto multiple lines. Examples of such hazards are:

- Fragmentation of structured data (for example, the label 'potassium' becomes separated from its value '2.6')
- Fragmentation of free text instructions (for example, the essential qualifier 'not' becomes separated from 'to go home')

## Hazard Risk Analysis Summary:

### Potential Hazards:

- PLI143 What if patients are not displayed as strict columns and rows?
- PLI131 What if clinician misinterprets colours used?
- PLI026 What if there is not enough space in the columns?
- PLI110 What if the text within a column is truncated?
- PLI025 What if a row is split over a page or fold boundary?
- PLI120 What if patients are listed on more than one tab?
- PLI147 What if all your patients are not on one page?
- PLI149 What if it is not clear that there are more patients out of view?
- PLI275 What if patient entries on the lists go out of view?
- PLI055 What if the data is displayed in too long a list, which may take the information off the page (particularly relevant to printing)?
- PLI056 What if you do not have a 'this is the top of the list' to match the 'this is the bottom of the list'?

### Mitigations:

- PAL-0280
- PAL-0310
- PAL-0330
- PAL-0330, PAL-0340, PAL-0350
- PAL-0360
- PAL-0370, PAL-0380

### 3.2.5 Sublists

This section provides guidance on sublists, which are located within cells and contain information that is structured in a list format. Figure 6 illustrates that feature:

			Sublist
Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA
	Type 1 Diabetes Mellitus		
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
		Wednesday - on Potassium	Check fluid balance and review patient later
		Diarrhoea	
		Creatinine 150	
Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
		Abdominal x-ray - dilated small bowel loops	Repeat bloods
			Arterial blood gas
			Nasogastric tube
Infective	COPD – on home O2	Chest x-ray - small	Chase pleural tap

Figure 6: Sublists

ID	Guideline	Conformance	Evidence Rating
PAL-0390	When content is structured in a list format (for example, tasks outstanding or results recorded), horizontally divide the Patient List cell into a sublist and display each content list item in a separate sublist row	Mandatory	High
PAL-0400	Separate sublist rows using horizontal divider lines that are prominent enough to be noticeable but less prominent than the row divider line.	Mandatory	High
PAL-0410	When cell content is structured in a list format, by default never display a subset of that content (for example, only five of eight items)	Recommended	Medium
PAL-0420	The height of each sublist row must be sufficient to avoid truncation of content	Recommended	High
PAL-0430	If, after an update of Patient List content, the content exceeds the sublist row height, automatically resize the sublist row to prevent truncation	Recommended	High
PAL-0440	If, after an update of Patient List content, the number of sublist rows required to display the content has changed, add or remove sublist rows accordingly	Recommended	High

## Usage Examples

Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA	
	Type 1 Diabetes Mellitus			
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture	
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity	
		Wednesday - on Potassium	Check fluid balance and review patient later	
		Diarrhoea		
		Creatinine 150		
Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons	
		Abdominal x-ray - dilated small bowel loops	Repeat bloods Arterial blood gas Nasogastric tube	
Infective	COPD - on home O2	Chest x-ray - small	Chase pleural tap	

In this correct example, content structured in a list format is presented in sublists and entries are separated by horizontal divider lines that are prominent enough to be noticeable but less prominent than the row divider lines. The height of each row is sufficient to display each sublist in its entirety. (PAL-0390, PAL-0400, PAL-0410)

Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA	
	Type 1 Diabetes Mellitus			
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture	
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity	
		2 more items...	Check fluid balance and review patient later	
		Small Bowel obstruction	Refer to surgeons	
		Abdominal x-ray - dilated small bowel loops	Repeat bloods 2 more items...	
Pneumonia	Diverticulitis	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap	
		Chest drain inserted	Chest x-ray post chest drain removal	
Infective exacerbation COPD	COPD - on home O2	Arterial blood gas pO2 7.2, nCO2 5.7 on 28% oxygen	Repeat Arterial blood gas	
	Hypertension			
Left sided pleural effusion	Chronic renal failure			
	Osteoarthritis			

In this incorrect example, the system has permitted the rows to have a height less than needed to display each complete sublist. (PAL-0410, PAL-0420)



Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA
	Type 1 Diabetes Mellitus		
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
		Wednesday - on Potassium	Check fluid balance and review patient later
		Diarrhoea	
Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
		Abdominal x-ray - dilated small bowel loops	Repeat bloods
			Arterial blood gas
Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
	Hypertension	Chest drain inserted	Chest x-ray post chest drain removal
Left sided pleural effusion	Chronic renal failure	Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Repeat Arterial blood gas
	Osteoarthritis		

## ↓ System updates content

Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA
	Type 1 Diabetes Mellitus		
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
		Wednesday - on Potassium	Check fluid balance and review patient later
		Diarrhoea	
		Creatinine 150	
Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
		Abdominal x-ray - dilated small bowel loops	Repeat bloods
			Arterial blood gas
Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
	Hypertension	Chest drain inserted	Chest x-ray post chest drain removal
	Chronic renal failure		

In this correct example, an update has added items to two of the sublists, which have increased in size accordingly. The rows containing the sublists have increased in height to avoid truncation. (PAL-0430, PAL-0440)

## Rationale

The majority of existing Patient Lists explored during guidance research included data that was structured in a list format. Common examples for in-patient scenarios include:

- Patient medical histories
- Problems and results
- Task lists (as reflected in the examples throughout this guidance).

Therefore it can be concluded that the provision of 'sublists' is desirable.

The sublist entry horizontal dividers, while important for delineating entries, must not compete with the row dividers: it is essential that users can identify where one row ends and another starts (as detailed in section 3.2.4)

During user research (see APPENDIX B) several exploratory design mock-ups for sublists were shown to participants, including mock-ups with a maximum sublist row count beyond which sublist entries were not displayed. Participants expressed concern that the display of incomplete sublists would not give them a full picture of a patient's clinical status. This guidance mitigates that concern.

Also see the rationale in section 3.2.3 for discussion of truncation issues.

### Hazard Risk Analysis Summary:

#### Potential Hazards:

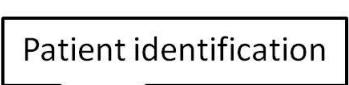
- PLI062 What if the task is not split into subtasks (each of which may have a status and be a different role's responsibility)?
- PLI137 What if multiple test results for the same patient are shown as separate, ungrouped items?
- PLI095 Not seeing the full picture of the patient's clinical status and/or summary, it is preferred to not see any of it than just some of it.
- PLI148 What if all your tasks per patient are not immediately visible?
- PLI079 What if you have too many jobs in one view?
- PLI110 What if the text within a column is truncated?
- PLI065 What if there are no consistent rules for when a completed job is removed from the view?

#### Mitigations:

- PAL-0390, PAL-0400
- PAL-0390
- PAL-0410
- PAL-0410
- PAL-0410
- PAL-0420, PAL-0430
- PAL-0440

## 3.2.6 Patient Identification

This section provides guidance on the display of patient identification information in a Patient List. Figure 7 illustrates that feature:



Patient identification			
A3	<b>LEVI, Steven (Mr)</b> <i>Preferred Name Steve</i> <i>Born 10-Nov-1981</i> <i>NHS No 507 745 4662</i>	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Panc
A4	<b>GIBBINS, Phil (Mr)</b> <i>Born 22-Jul-1991</i> <i>NHS No 325 504 5476</i>	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus
A5	<b>MADIGAN, Tony (Mr)</b> <i>Born 09-Mar-1931</i> <i>NHS No 615 537 7485</i>	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy

Figure 7: Patient Identification

ID	Guideline	Conformance	Evidence Rating
PAL-0450	Locate the patient name, date of birth and patient identification number in that order on separate lines in the same column	Mandatory	High
PAL-0460	When both the family name and given name of a patient are unknown, display the words 'UNKNOWN, Unknown' and the patient gender (if known)	Recommended	Medium
PAL-0470	When the family name of a patient is unknown and the given name is known, display the word 'UNKNOWN', the given name and the patient gender (if known)	Recommended	Medium
PAL-0480	When the family name of a patient is known and the given name is unknown, display the family name, the word 'Unknown' and the patient gender (if known).	Recommended	Medium
PAL-0490	When the date of birth of a patient is unknown display the word 'Unknown'	Recommended	Medium
PAL-0500	When a patient identification number is unknown, display the word 'Unknown'	Recommended	Medium
PAL-0510	For the duration that a patient identification number is unknown, display the temporary identification number used by the care setting to uniquely identify that patient. Use the same font style as the patient name field and the label 'Temporary Number' or similar	Recommended	Low
PAL-0520	Ensure that the display of the patient name conforms to all guidance points in section 2.6.1 of <i>Design Guidance – Patient Banner {R3}</i>	Mandatory	High
PAL-0530	Ensure that the display of the preferred name (if available), date of birth and patient identification number conforms to guidance points PAB-0033, PAB-0036, PAB-0037, PAB-0042, PAB-0043 and PAB-0046 in section 2.5.1 of <i>Design Guidance – Patient Banner {R3}</i>	Recommended	Medium
PAL-0540	When patients on a Patient List have identical names (including the family name) visually highlight these names and display a warning symbol next to the patients' names	Mandatory	High
PAL-0550	When patients on the same Patient List have identical names (including the family name), indicate the first element of patient identification information that differentiates the patients (for example, by underlining). This might be their given name or, if identical, their date of birth or, if identical, their patient identification number.	Mandatory	High
PAL-0560	If supported by the system, when patients on a Patient List have similar looking or sounding names (including the family name) visually highlight those names and display a warning symbol next to the patients' names	Recommended	Low
PAL-0570	If supported by the system, when patients on the same Patient List have similar looking or sounding names (including the family name), indicate the first element of patient identification information that differentiates the patients (for example, by underlining). This might be their given name or, if identical or similar, their date of birth or, if identical, their patient identification number	Recommended	Low

## Usage Examples

A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection		In this correct example, the patient identification information is provided in the order patient name, date of birth and patient identification number. Where a preferred name is available, this is displayed after the patient name. (PAL-0450, PAL-0520, PAL-0530)
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation		In this incorrect example, the patient identification information is not displayed in the required order. As a result, users will have difficulty reading the information quickly and safely (for example, Tony Madigan's day of birth may accidentally be read as part of the patient identification number.) (PAL-0450, PAL-0520, PAL-0530)
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia Acute on chronic renal failure		
A3	<b>Steve Levi, 507 745 4662, 10 Nov 1981</b>	Bronchiectasis Lower Respiratory Tract Infection		
A4	<b>Phil Gibbins, 325 504 5476, 22 Jul 1991</b>	Asthma Exacerbation		
A5	<b>Tony Madigan, 615 537 7485, 9 Mar 1931</b>	Aspiration pneumonia Acute on chronic renal failure		
C3	<b>UNKNOWN, Unknown, Male</b> Born Unknown NHS No Unknown Temporary No 341	Anaemia Right pleural effusion		In this correct example, a patient whose family name and given name are unknown is displayed using the words 'UNKNOWN', 'Unknown' plus his gender. His date of birth and patient identification number also have the word 'Unknown' displayed. While his patient identification number is unknown, the temporary number used by the care setting to uniquely identify him is displayed using the same font style as for the patient name field, and is labelled 'Temporary No' (PAL-0460, PAL-0490, PAL-0500, PAL-0510)
C4	<b>PARKER, Darren (Mr)</b> Born 22-Apr-1935 NHS No 404 481 1783	Aspiration pneumonia Acute on chronic renal failure		
C3	<b>UNKNOWN, Ben, Male</b> Born Unknown NHS No Unknown Temporary No 341	Anaemia Right pleural effusion		In this correct example, a patient whose family name is unknown and whose given name is known is displayed using his family name, the word 'Unknown' and his gender. (PAL-0460, PAL-0490, PAL-0500, PAL-0510)
C4	<b>PARKER, Darren (Mr)</b> Born 22-Apr-1935 NHS No 404 481 1783	Aspiration pneumonia Acute on chronic renal failure		
C3	<b>SMITH, Unknown, Male</b> Born Unknown NHS No Unknown Temporary No 341	Anaemia Right pleural effusion		In this correct example, a patient whose family name is known and whose given name is unknown is displayed using the word 'UNKNOWN', his given name and his gender. (PAL-0460, PAL-0490, PAL-0500, PAL-0510)
C4	<b>PARKER, Darren (Mr)</b> Born 22-Apr-1935 NHS No 404 481 1783	Aspiration pneumonia Acute on chronic renal failure		

	NHS No 507 745 4662		
B3	<b>SMITH, Ben (Mr)</b> Born <u>09-Mar-1949</u> NHS No <u>417 744 3757</u>	Infective exacerbation COPD  Left sided pleural effusion	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gases pO2 7.2, pCO2 5.7 on 28% oxygen
B4	<b>ROLAND, Alex (Mr)</b> Born <u>22-Nov-1939</u> NHS No <u>348 823 7138</u>	Pulmonary embolism	CT pulmonary angiogram - Multiple filling defects  Started warfarin
C1	<b>SMITH, Ben (Mr)</b> Born <u>10-Nov-1984</u> NHS No <u>603 366 2100</u>	Atypical pneumonia	atypical screen-legionella pneumophilia, urinary antigen positive  CRP 100
C2	<b>PELTON, David (Mr)</b>	Infective	COPD - on home O2

In this incorrect example, two patients in the list have the same names but this is not highlighted in any way, potentially leading to misidentification by users of the list. (PAL-0540, PAL-0550)

	NHS No 507 745 4662		
B3	<b>SMITH, Ben (Mr)</b> Born <u>09-Mar-1949</u> NHS No <u>417 744 3757</u>	Infective exacerbation COPD  Left sided pleural effusion	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gases pO2 7.2, pCO2 5.7 on 28% oxygen
B4	<b>ROLAND, Alex (Mr)</b> Born <u>22-Nov-1939</u> NHS No <u>348 823 7138</u>	Pulmonary embolism	CT pulmonary angiogram - Multiple filling defects  Started warfarin
C1	<b>SMITH, Ben (Mr)</b> Born <u>10-Nov-1984</u> NHS No <u>603 366 2100</u>	Atypical pneumonia	atypical screen-legionella pneumophilia, urinary antigen positive  CRP 100
C2	<b>PELTON, David (Mr)</b>	Infective	COPD - on home O2

In this correct example, two patients in the list have the same names. This is highlighted by a symbol next to the names and a changed font colour for the identical information. The first elements of patient identification information which differentiates the patients (their dates of birth) are underlined. (PAL-0540, PAL-0550)

	NHS No 507 745 4662		
B3	<b>MARTENS, Ben (Mr)</b> Born <u>09-Mar-1949</u> NHS No <u>417 744 3757</u>	Infective exacerbation COPD  Left sided pleural effusion	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gases pO2 7.2, pCO2 5.7 on 28% oxygen
B4	<b>ROLAND, Alex (Mr)</b> Born <u>22-Nov-1939</u> NHS No <u>348 823 7138</u>	Pulmonary embolism	CT pulmonary angiogram - Multiple filling defects  Started warfarin
C1	<b>MARTIN, Ben (Mr)</b> Born <u>10-Nov-1984</u> NHS No <u>603 366 2100</u>	Atypical pneumonia	atypical screen-legionella pneumophilia, urinary antigen positive  CRP 100
C2	<b>PELTON, David (Mr)</b>	Infective	COPD - on home O2

In this correct example, two patients in the list have similar sounding names. This is highlighted by a symbol next to the names and a changed font colour for the similar information. The first elements of patient identification information which differentiates the patients (their dates of birth) are underlined. (PAL-0560, PAL-0570)

## Rationale

The clear identification of patients is essential to any Patient List. The guidance in this section is consistent with that provided in *Design Guidance – Patient Banner {R3}* and extends that guidance by considering display of identification information for multiple patients at the same time.

In certain clinical scenarios (for example, emergency wards) the names of patients may be unknown. Guidance on the display of partially or completely unknown patient names was informed by the NPSA communication *Guidance on the standard for Patient Identifiers for Identity bands {R9}*.

Table 7 details the differences between the NPSA guidance and the Patient List guidance on unknown names:

Name Part Known/Unknown	NPSA Guidance	Patient List Guidance
Family name unknown, given name unknown	Unknown Male, Unknown Male	UNKNOWN, Unknown, Male
Family name unknown, given name known	Unknown Male, Ben	UNKNOWN, Ben, Male
Family name known, given name unknown	SMITH, Unknown Male	SMITH, Unknown, Male

Table 7: Differences Between NPSA and Patient List Unknown Name Guidance

The Patient List guidance has been adapted for the following reasons:

1. The family name and given name are displayed on the same line in the Patient List, so two 'Male' qualifiers are not required
2. The capitalisation of 'UNKNOWN' reflects the guidance for known names (that is, the family name is all capitals and the given name is only first capital)

Patient Lists in contexts where patient identification numbers may not be known need to be able to display those patients with a temporary identification number.

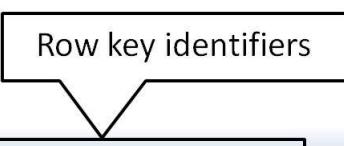
The hazards of misidentification of patients with the same name are documented by the WHO in an aide memoire entitled *Patient Identification {R8}*. The WHO recommends 'clear protocols for identifying patients who lack identification and for distinguishing the identity of patients with the same name'. This recommendation is particularly relevant to Patient Lists, which may frequently list two or more patients with the same family names.

## Hazard Risk Analysis Summary:

Potential Hazards:	Mitigations:
■ PLI028 What if the different attributes in the patient identification cell are not formatted differently?	■ PAL-0450, PAL-0520, PAL-0530
■ PLI038 What if labels are used within the Patient List (for example, born, patient identification number, gender)?	■ PAL-0530
■ PLI044 What if the 'Patient Identification number' is not displayed?	■ PAL-0450
■ PLI024 What if there is blank space in the list (for example, surname missing)? Solution: would want to confirm or action this rather than leave it blank	■ PAL-0460, PAL-0490
■ PLI034 What if the name prefix is not shown in the list?	■ PAL-0520
■ PLI153 What if multiple items in the list share similar details?	■ PAL-0540, PAL-0550
■ PLI030 What if the preferred name is not displayed on the list and staff refer to the patient by their given name?	■ PAL-0530

### 3.2.7 Row Key Identifiers

This section provides guidance on row key identifiers, which uniquely identify each row from others in the Patient List. Figure 8 illustrates that feature:



Row key identifiers			
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy

Figure 8: Row Key Identifiers

ID	Guideline	Conformance	Evidence Rating
PAL-0580	Each row must contain key identifier information that uniquely distinguishes it from the other rows in the Patient List	Mandatory	High
PAL-0590	The row key identifier information must include the patient identification information if a patient is assigned to that location or scheduled time	Mandatory	High
PAL-0600	Display row key identifier content using a font size and weight that gives it visual prominence over other Patient List content (for patient identification information cells, apply this guideline to the patient name only)	Mandatory	High
PAL-0610	Order the columns that contain the row key identifier information at the left side of the viewing area	Mandatory	High
PAL-0620	When horizontal scrolling is used, ensure that the columns that contain the row key identifier information remain in view (that is, do not include these columns in the scrollable area)	Mandatory	High
PAL-0630	For contexts where patients are managed using their physical locations (for example, ward beds), include the physical location in the key identifier information	Recommended	Medium
PAL-0640	When a Patient List comprises patients in different locations (for example multiple wards), include the location of each patient in their physical location cell (for example 'Remington Ward, bed B3')	Mandatory	High
PAL-0650	For contexts where patients are managed using their physical locations, by default set the physical location to be the first column and the default sort order to be on this column	Recommended	Medium
PAL-0660	For contexts where patients are managed using their physical locations, by default display physical locations that have no patients allocated to them. Display the text 'UNOCCUPIED' where patient identification information would be displayed	Recommended	Medium
PAL-0670	For contexts where patients are managed using their physical locations, provide an option to automatically hide rows for unoccupied locations and reveal them when patients are allocated there	Recommended	Medium

PAL-0680	For contexts where patients are managed using scheduled times (for example, on an appointment list) include the scheduled times in the key identifier information	Recommended	Medium
PAL-0690	For contexts where patients are managed using scheduled times, by default set scheduled times as the first column and the default sort order to be on this column	Recommended	Medium
PAL-0700	When the user has moved focus onto a Patient List cell, ensure that the row key identifiers and the column header for that cell are visually highlighted (for example, by changing the background colour)	Mandatory	High

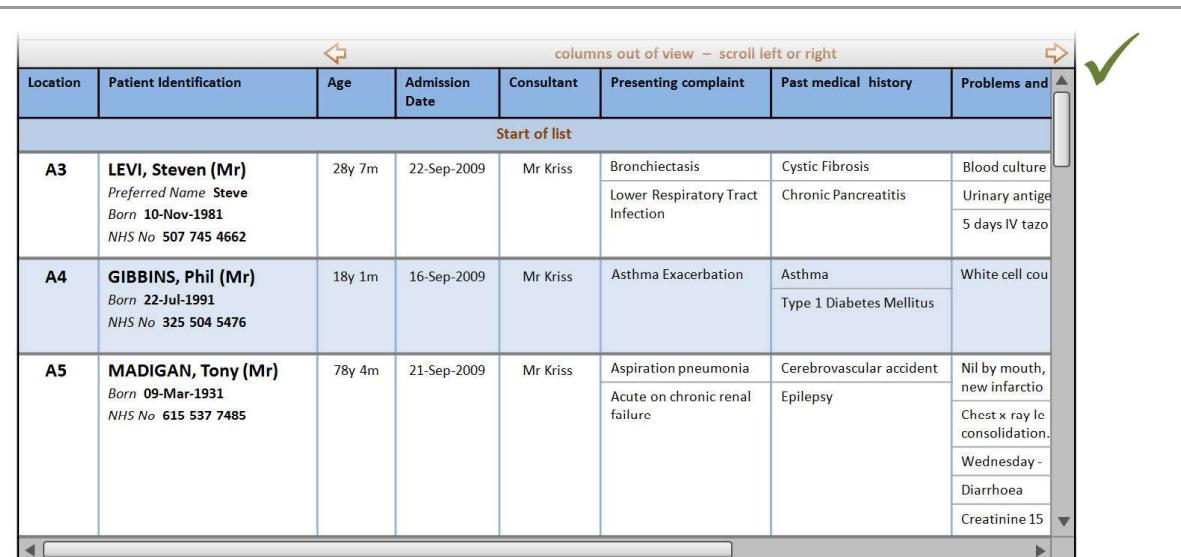
## Usage Examples

Patient List				
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 2
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infarction Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium

In this correct example, the row key identifiers (the first two columns) contain information that uniquely identifies each row (including patient identification information) and are ordered at the left side of the viewing area. As the Patient List where patients are managed using their physical locations, the row key identifiers include the physical locations (that is, the ward beds). The content of the row key identifiers uses a font and weight that gives it visual prominence over other Patient List content. (PAL-0580, PAL-0590, PAL-0600, PAL-0610, PAL-0630, PAL-0650)

LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	A3	
				A4	
GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	A4	
				A5	
MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infarction Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea Creatinine 150	A5	
				A6	

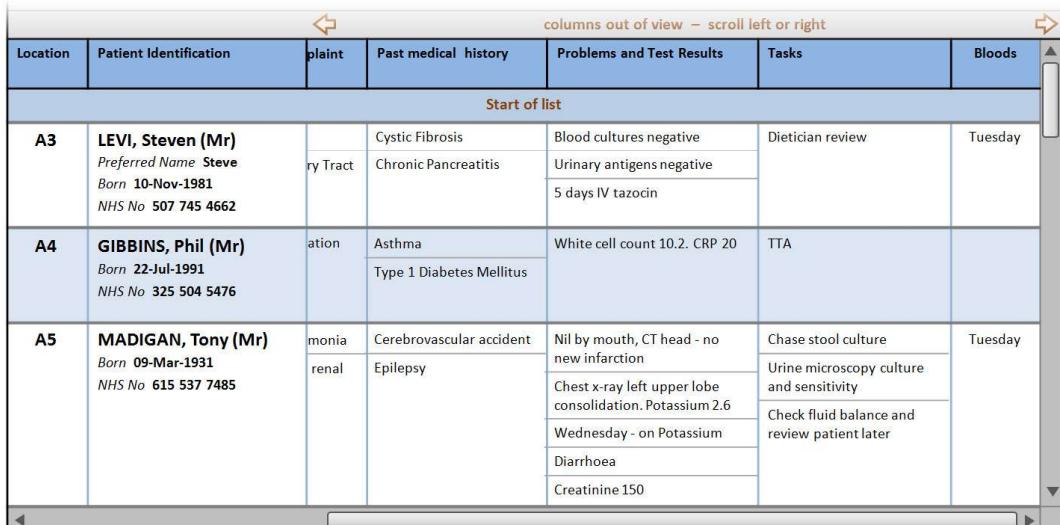
In this incorrect example, the patients' physical locations are not included in the row key identifiers and are not ordered at the left of the viewing area. The row key identifiers do not use an adequate font size to be sufficiently prominent over other Patient List content. (PAL-0600, PAL-0610, PAL-0630, PAL-0650)



columns out of view – scroll left or right

Location	Patient Identification	Age	Admission Date	Consultant	Presenting complaint	Past medical history	Problems and
Start of list							
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	28y 7m	22-Sep-2009	Mr Kriss	Bronchiectasis	Cystic Fibrosis	Blood culture
					Lower Respiratory Tract Infection	Chronic Pancreatitis	Urinary antigens 5 days IV tazo
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	18y 1m	16-Sep-2009	Mr Kriss	Asthma Exacerbation	Asthma	White cell count
						Type 1 Diabetes Mellitus	
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	78y 4m	21-Sep-2009	Mr Kriss	Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, new infarctio
					Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation.
							Wednesday -
							Diarrhoea
							Creatinine 15

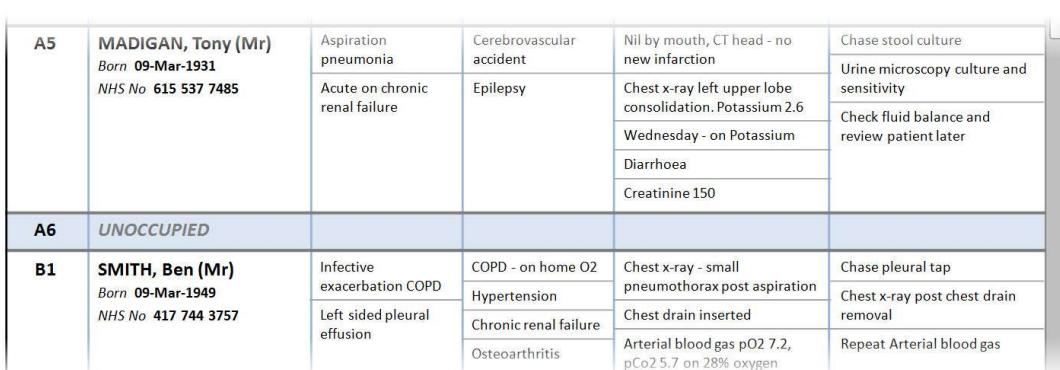
↓ User scrolls list horizontally



columns out of view – scroll left or right

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks	Bloods
Start of list						
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Cystic Fibrosis	Bronchiectasis	Blood cultures negative	Dietician review	Tuesday
			Chronic Pancreatitis	Urinary antigens negative		
				5 days IV tazocin		
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma		White cell count 10.2. CRP 20	TTA	
			Type 1 Diabetes Mellitus			
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture	Tuesday
			Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6		
				Wednesday - on Potassium		
				Diarrhoea		
				Creatinine 150		

In this correct example, the user horizontally scrolls the list. The row key identifiers remain visible (that is, the first two columns are ‘frozen’) while the other content scrolls. (PAL-0620)



A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
		Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
				Wednesday - on Potassium	Check fluid balance and review patient later
				Diarrhoea	
				Creatinine 150	
A6	<b>UNOCCUPIED</b>				
B1	<b>SMITH, Ben (Mr)</b> Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD Left sided pleural effusion	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
			Hypertension	Chest drain inserted	Chest x-ray post chest drain removal
			Chronic renal failure	Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Repeat Arterial blood gas
			Osteoarthritis		

In this correct example, an unoccupied bed is listed by default in the Patient List and the word ‘UNOCCUPIED’ is displayed in the patient identification column. (PAL-0660, PAL-0670)



In this correct example, the Patient List includes patients from two locations (Remington Ward and Elkenhurst Ward). The location for each patient includes the ward and the bed. (PAL-0640)

Location	Patient Identification
Remington B2	<b>GIBBINS, Phil (Mr)</b> <i>Born</i> 22-Jul-1991 <i>NHS No</i> 325 504 5476
Remington B5	<b>MADIGAN, Tony (Mr)</b> <i>Born</i> 09-Mar-1931 <i>NHS No</i> 615 537 7485
Elkenhurst A2	<b>THORP, Justin (Mr)</b> <i>Born</i> 22-Apr-1936 <i>NHS No</i> 021 165 5478
Elkenhurst C4	<b>SMITH, Ben (Mr)</b> <i>Born</i> 09-Mar-1949 <i>NHS No</i> 417 744 3757


In this correct example, patients are managed by appointments and the scheduled times are included in the row key identifier information. The list has by default been ordered by the scheduled times. (PAL-0680, PAL-0690)

Scheduled Appointment Start	Patient Identification
11:00	<b>GIBBINS, Phil (Mr)</b> <i>Born</i> 22-Jul-1991 <i>NHS No</i> 325 504 5476
11:20	<b>MADIGAN, Tony (Mr)</b> <i>Born</i> 09-Mar-1931 <i>NHS No</i> 615 537 7485
11:40	<b>THORP, Justin (Mr)</b> <i>Born</i> 22-Apr-1936 <i>NHS No</i> 021 165 5478
12:00	<b>SMITH, Ben (Mr)</b> <i>Born</i> 09-Mar-1949 <i>NHS No</i> 417 744 3757

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name <b>Steve</b> Born <b>10-Nov-1981</b> NHS No <b>507 745 4662</b>	Bronchiectasis	Cystic Fibrosis	Blood cultures negative	Dietician review
		Lower Respiratory Tract Infection	Chronic Pancreatitis	Urinary antigens negative	
				5 days IV tazocin	
A4	<b>GIBBINS, Phil (Mr)</b> Born <b>22-Jul-1991</b> NHS No <b>325 504 5476</b>	Asthma Exacerbation	Asthma	White cell count 10.2. CRP 20	TTA
			Type 1 Diabetes Mellitus		
A5	<b>MADIGAN, Tony (Mr)</b> Born <b>09-Mar-1931</b> NHS No <b>615 537 7485</b>	Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
		Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
				Wednesday - on Potassium	Check fluid balance and review patient later
				Diarrhoea	
A6	<b>THORP, Justin (Mr)</b> Born <b>22-Apr-1936</b> NHS No <b>021 165 5478</b>	Pneumonia	Diverticulitis	Creatinine 150	
				Small Bowel obstruction	Refer to surgeons
				Abdominal x-ray - dilated small bowel loops	Repeat bloods
					Arterial blood gas
					Nasogastric tube

In this correct example, the user has moved focus onto a sublist item ('Chest x-ray left...'). The row key identifier and column title corresponding to that sublist item has been visually highlighted using a background colour. (PAL-0700)

## Rationale

The constant visibility and visual prominence of row key identifiers is essential to avoid user confusion and patient misidentification. When horizontal scrolling is used, the 'freezing' of the row key identifiers ensures the user can always relate information in a row to the patient that information relates to.

### Note

During hazard assessment discussions it was noted that permitting column resizing and horizontal scrolling introduces the unmitigated hazard that columns can become partially obscured when they overlap a viewing area border. This hazard is illustrated in the third usage example in this section, where the column 'Presenting Complaint' is partially obscured by the border of the frozen column 'Patient Identification'.

During hazard assessment discussions (see APPENDIX B), it was noted that it may be desirable to view unoccupied locations (for example, ward beds) in the Patient List, as some tasks can relate to locations alone (for example, infectious disease or hygiene management). However, the option to hide unoccupied locations was considered desirable, particularly when the Patient List viewing area is to be optimised for patient information.

User research and hazard assessment participants (see APPENDIX B) with responsibilities which often span locations (such as community nurses and occupational therapists) expressed interest in multi-location lists, particularly with regard to the facility to sort all their patients by a given priority (for example, by Medical Early Warning Score (MEWS)). They highlighted the need for unambiguous location identifiers, as in their experience locations can share similar labels (for example, wards may all have bed locations identified as 'A1' or similar).

Highlighting the row key identifier and column header on cell focus provides the user with a clear indication of the type of information and the patient it pertains to. This is particularly important for Patient Lists displayed on large monitors where the distance between the focussed cell, the row key identifiers and the column title may be significant.

## Hazard Risk Analysis Summary:

### Potential Hazards:

- PLI146 What happens if the patient identifier details are not immediately obvious on the left hand side of the list?
  - PLI130 What if an unfamiliar user does not recognise the difference between patient and clinician?
  - PLI223 What if the patient location and/or identifier is hard to immediately identify (for example, the bed number is not in a scannable column)?
- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>■ PAL-0580, PAL-0610, PAL-0620</li> <li>■ PAL-0600</li> <li>■ PAL-0600, PAL-0630, PAL-0650</li> </ul> | <ul style="list-style-type: none"> <li>■ PAL-0600</li> </ul> |
|--|--|

### Mitigations:

- |   |            |
|---|------------|
| ■ PLI029 What if the 'main identifier' (probably the patient name) is not the most prominent attribute?                   | ■ PAL-0600 |
| ■ PLI283 What if the list presents patients from mixed locations (for example, more than one hospital ward in one view)?  | ■ PAL-0640 |
| ■ PLI030 What if preferred name is not displayed on the list and staff refer to the patient by his or her given name?     | ■ PAL-0590 |
| ■ PLI033 What if the name prefix is shown in the list?  | ■ PAL-0590 |
| ■ PLI044 What if the 'Patient identification number' is not displayed?  | ■ PAL-0590 |
| ■ PLI016 What if empty beds are not shown in the list?  | ■ PAL-0660 |
| ■ PLI017 What if empty beds are shown as completely blank lines (with no bed number)?                                     | ■ PAL-0660 |
| ■ PLI015 What if empty beds are shown in the list?  | ■ PAL-0670 |
| ■ PLI072 What if the visible view is horizontally long and you want to relate information from opposite ends of the line? | ■ PAL-0620 |

## 4 GUIDANCE DETAILS FOR MANAGING THE INFORMATION DISPLAYED

### 4.1 Introduction

This section includes guidance for managing the information displayed in Patient Lists, specifically:

- Managing the columns displayed
- Refresh options and update indication
- Displaying historical Patient List information
- Displaying further information

### 4.2 Guidelines

#### 4.2.1 Managing the Columns Displayed

This section provides guidance on how users should be able to manage the columns displayed in the Patient List. Figure 9 illustrates that feature:

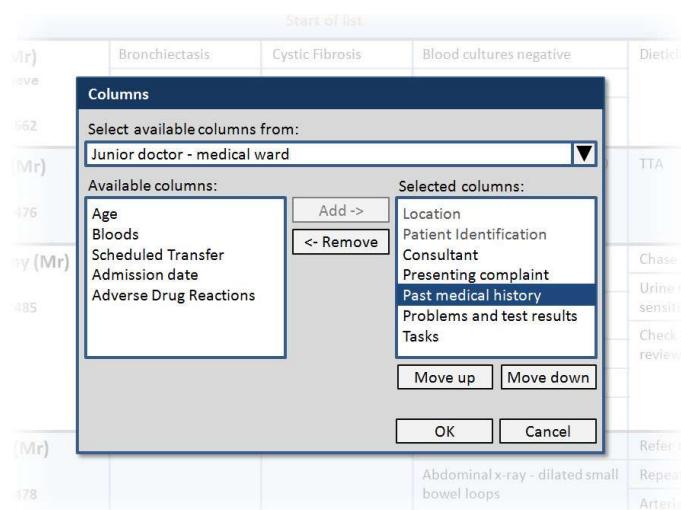
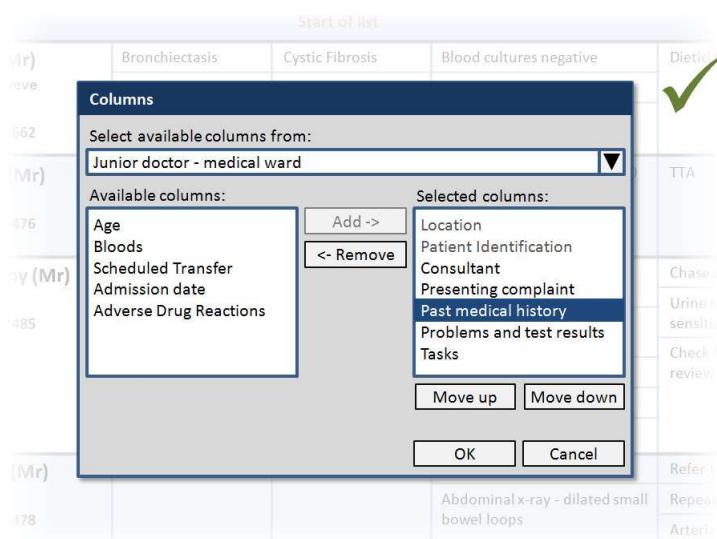


Figure 9: Managing the Columns Displayed

ID	Guideline	Conformance	Evidence Rating
PAL-0710	Allow individual users to manage the columns that are displayed in the Patient List, including the order they are displayed in (with the exception of those containing row key identifier information)	Recommended	Medium
PAL-0720	Do not permit the removal of columns that contain row key identifier information (for example, patient identification and ward location columns)	Mandatory	High
PAL-0730	Enable users to manage default column selections for different user types (for example, default column selections for junior doctors, paediatric nurses, occupational therapists, and so on)	Recommended	Medium
PAL-0740	On a user's first use of a default column selection, size the columns to fit the width of the viewing area so that none are out of view. If the combined minimum column widths exceed the width of the viewing area, use the minimum column widths	Recommended	Medium

PAL-0750	Enable users to filter the Patient List using the attributes displayed. Follow guidance in section 3.6 of <i>Design Guidance – Filtering Sorting and Grouping {R5}</i>	Recommended	Medium
PAL-0760	When a filter has been applied to the Patient List, ensure that the filter notification (as mandated in section 3.6 of <i>Design Guidance – Filtering Sorting and Grouping {R5}</i> ) is located above the viewing area and uses clear visual differentiation (for example, from a strong background colour)	Mandatory	High
PAL-0770	Enable users to sort the Patient List using the columns displayed. Follow guidance in section 3.7 of <i>Design Guidance – Filtering Sorting and Grouping {R5}</i>	Recommended	Medium
PAL-0780	Enable users to group the Patient List using the attributes displayed. Follow guidance in section 3.8 of <i>Design Guidance – Filtering Sorting and Grouping {R5}</i>	Recommended	Medium
PAL-0790	Persist the users column selection, sorting, grouping and filtering settings between user sessions	Recommended	Medium

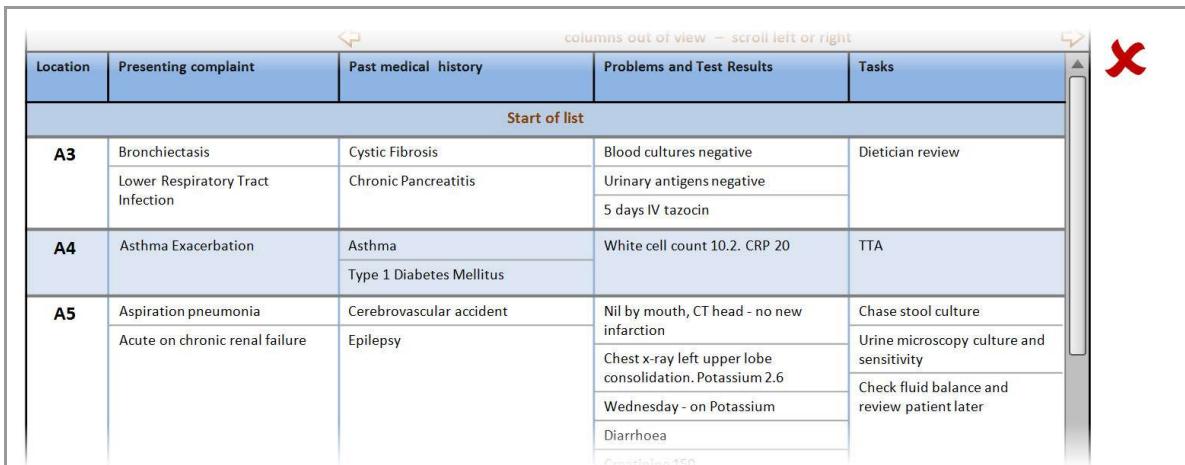
### Usage Examples



In this correct example, users can select a default column set which best matches their needs and can also adjust the columns and the order they will be displayed in. If the 'Location' or 'Patient Identification' column is selected, it cannot be removed as it is a row key identifier. (PAL-0710, PAL-0720, PAL-0730)

#### Note

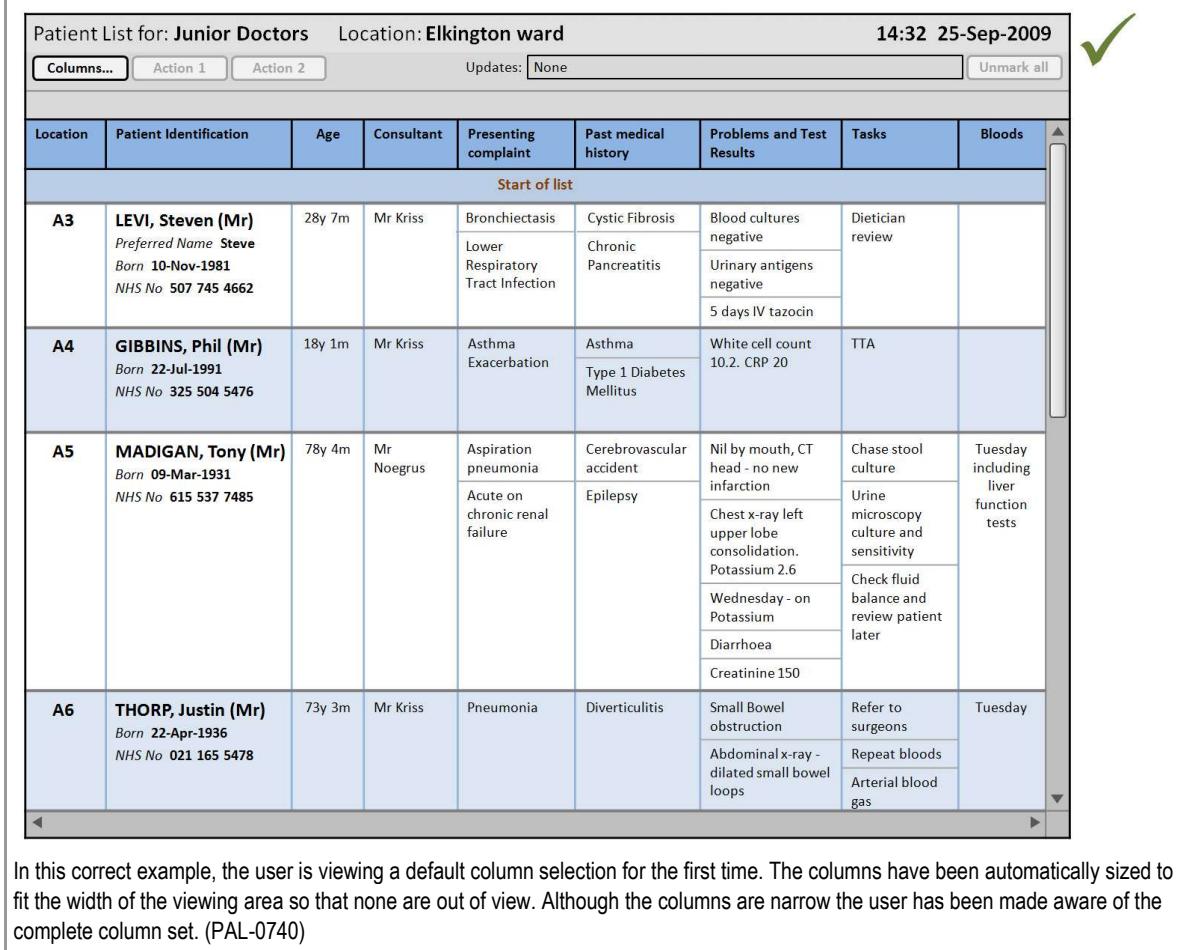
The method and interface for Patient List column selection and ordering is out of scope for this guidance. The interface shown in this example is used solely to convey column management concepts and should not be considered part of guidance.



columns out of view — scroll left or right

Location	Presenting complaint	Past medical history	Problems and Test Results	Tasks
<b>Start of list</b>				
A3	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review
A4	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infarction Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea <small>Creatinine 150</small>	Chase stool culture Urine microscopy culture and sensitivity Check fluid balance and review patient later

In this incorrect example, the user has been allowed to remove a row key identifier (the patient identification information) (PAL-0720)



Patient List for: **Junior Doctors** Location: **Elkington ward** 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all

Location	Patient Identification	Age	Consultant	Presenting complaint	Past medical history	Problems and Test Results	Tasks	Bloods
<b>Start of list</b>								
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	28y 7m	Mr Kriss	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin	Dietician review	
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	18y 1m	Mr Kriss	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA	
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	78y 4m	Mr Noegrus	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infarction Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea Creatinine 150	Chase stool culture Urine microscopy culture and sensitivity Check fluid balance and review patient later	Tuesday including liver function tests
A6	<b>THORP, Justin (Mr)</b> Born 22-Apr-1936 NHS No 021 165 5478	73y 3m	Mr Kriss	Pneumonia	Diverticulitis	Small Bowel obstruction Abdominal x-ray - dilated small bowel loops	Refer to surgeons Repeat bloods Arterial blood gas	Tuesday

In this correct example, the user is viewing a default column selection for the first time. The columns have been automatically sized to fit the width of the viewing area so that none are out of view. Although the columns are narrow the user has been made aware of the complete column set. (PAL-0740)



Patient List for: Junior Doctors		Location: Elkington ward		14:32 25-Sep-2009	
Columns...		Action 1	Action 2	Updates: None	Unmark all
List filtered to show all rows where: Consultant equals Mr Noegrus					
columns out of view – scroll left or right					
Location	Patient Identification	Consultant	Presenting complaint	Problems and Test Results	Tasks
Start of list					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Mr Noegrus	Bronchiectasis  Lower Respiratory Tract Infection	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Mr Noegrus	Asthma Exacerbation	White cell count 10.2. CRP 20	TTA
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1981 NHS No 615 537 7485	Mr Noegrus	Aspiration pneumonia  Acute on chronic renal failure	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and

In this correct example, the Patient List has been filtered with the filter notification area displayed above the viewing area using a strong visual differentiator. (PAL-0750, PAL-0760)



Location	Patient Identification	Age ▲ 2	Consultant ▲ 1	Presenting complaint	Past medical history	Problems and Test Results	Tasks	Bloods
Start of list								
B2	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	18y 1m	Mr Kriss	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review	
A4	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	28y 7m	Mr Kriss	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA	
C4	<b>MARTENS, Ben (Mr)</b> Born 10-Nov-1984 NHS No 603 366 2100	25y 7m	Mr Noegrus	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6	Chase stool culture  Urine microscopy culture and sensitivity	Tuesday including liver function tests
B1	<b>PELTON, David (Mr)</b> Born 22-Jul-1946 NHS No 138 853 1273	63y 1m	Mr Noegrus	Pneumonia	Diverticulitis	Small Bowel obstruction  Abdominal x-ray - dilated small bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas	Tuesday

In this correct example, the Patient List has been progressively sorted, firstly by the consultant name in ascending alphabetical order and secondly by the patient age in ascending order. (PAL-0770)

## Rationale

During user research and hazard assessments (see APPENDIX B), discussions concerning column management included the following design areas:

- Column sets (including default and group determined sets)
- Role-based column sets (for example, switching between a number of predefined sets such as 'Junior Doctor', 'Consultant', and so on)
- Mandatory content per role (for example, always displaying certain columns, such as 'Tasks', depending on the users role)
- Consistency between users' Patient Lists

Participants agreed that users should be given the flexibility to manage the columns displayed in their Patient Lists, so that they can optimise the information displayed to meet their individual needs. However, participants also thought that provision of 'default' column sets for role and working context (for example, 'Nursing staff – Respiratory Ward') would be a useful starting point for new users. From discussion around columns out of view (see section 3.2.3), it was recommended that at first display column widths should be sized to fit within the viewing area to ensure the user is fully aware of all columns in the set.

### Note

Although guidance on determining 'safe' sets of columns is out of scope, during discussions it was acknowledged that there are hazards associated with enabling users to manage the columns in their Patient List (for example, the risk that the user will choose not to display information that is essential for their role).

## Hazard Risk Analysis Summary:

### Potential Hazards:

- | Potential Hazards:  | Mitigations:                   |
|---|--------------------------------|
| ■ PLI006 What if a Multi-Disciplinary Team is sharing the list and all members' information is on one list?   | ■ PAL-0710                     |
| ■ PLI007 What if different roles have different views of the list?  | ■ PAL-0710, PAL-0730           |
| ■ PLI018 What if it is not possible to configure the list to suit the user?   | ■ PAL-0710, PAL-0790           |
| ■ PLI020 What if staff could not clearly and easily view a list that shows patients that are the doctor's or team's responsibility?   | ■ PAL-0710                     |
| ■ PLI072 What if the visible view is horizontally long and you want to relate information from opposite ends of the line?   | ■ PAL-0710, PAL-0740           |
| ■ PLI075 What if you are not able to filter jobs by role?   | ■ PAL-0710, PAL-0730, PAL-0790 |
| ■ PLI080 What if the clinician cannot lower the level of detail to the related task level for his or her role?  | ■ PAL-0710                     |
| ■ PLI215 What if one professional group find the data hard to read because the view contains data that is not appropriate to them?  | ■ PAL-0710, PAL-0730, PAL-0790 |
| ■ PLI216 What if data that would be relevant to all professional groups is missed because it is only contained in a view or area for one particular professional group (for example, important information is put in a nursing section which is not read by doctors)? | ■ PAL-0710, PAL-0730, PAL-0790 |
| ■ PLI222 What if the layout of the information is optimised for one professional group or task?   | ■ PAL-0710, PAL-0730, PAL-0790 |
| ■ PLI229 What if the clinician can only see some of the data per patient (for example, only some of the tasks, some of the problems, and so on)?  | ■ PAL-0710                     |
| ■ PLI094 What if you cannot view all the patients in the list in some summary form that minimises everything but the patient identifiers?   | ■ PAL-0710                     |
| ■ PLI091 What if you cannot see all the associated tasks for the patient in one view AND all tasks for all patients in one view?  | ■ PAL-0730                     |
| ■ PLI277 What if the default view of the list is configurable?  | ■ PAL-0790                     |
| ■ PLI148 What if all your tasks per patient are not immediately visible?  | ■ PAL-0740                     |
| ■ PLI265 What if user preferences are not persisted from session to session?  | ■ PAL-0790                     |

- |   |                      |
|---|----------------------|
| ■ PLI108 What if it is unclear that the list is filtered?   | ■ PAL-0750, PAL-0760 |
| ■ PLI082 What if a user cannot set up lists with different inclusion criteria (for example, all patients, all deteriorating patients)?          | ■ PAL-0750           |
| ■ PLI116 What if there is no indication what the list is ordered on?  | ■ PAL-0770           |
| ■ PLI134 What if it is unclear that the sort order is per group and the amount of groups mean the sort order is less useful than it might be?   | ■ PAL-0770, PAL-0780 |
| ■ PLI259 What if the list is only ever able to be sorted by one criterion?  | ■ PAL-0770           |
| ■ PLI274 What if there is only one sort order and the user is unable to change the view of the list depending on preference and context of use? | ■ PAL-0770           |
| ■ PLI022 What if in a list showing patients from multiple wards the patients are not grouped by ward?   | ■ PAL-0780           |

## 4.2.2 Refresh Options and Update Indication

This section provides guidance on notifying the user of updates to information displayed in the Patient List. Figure 10 illustrates those features:

The screenshot shows a Patient List interface with the following components:

- Update notification field:** Located at the top right, showing "25-Sep-2009" and a yellow button "Unmark all".
- Updated content:** A vertical column on the right side of the list table.
- Patient List header:** Shows "Patient List for: Maxhurst, John (Dr)" and "Location: Elkhurst Ward".
- Action buttons:** "Columns...", "Action 1", "Action 2".
- Updates status:** "Updates: 9 updates (2 currently out of view)".
- Table Headers:** Location, Patient Identification, Presenting complaint, Past medical history, Problems and Test Results, Tasks.
- Table Rows:**
  - A3:** Levi, Steven (Mr). Preferred Name Steve. Born 10-Nov-1981. NHS No 507 745 4662. Presenting complaint: Bronchiectasis. Past medical history: Cystic Fibrosis. Problems and Test Results: Blood cultures negative. Tasks: Dietician review.
  - A4:** Gibbins, Phil (Mr). Born 22-Jul-1991. NHS No 325 504 5476. Presenting complaint: Asthma Exacerbation. Past medical history: Type 1 Diabetes Mellitus. Problems and Test Results: White cell count 10.2. CRP 20. Tasks: TTA.
  - A5:** Madigan, Tony (Mr). Born 09-Mar-1931. NHS No 615 537 7485. Presenting complaint: Aspiration pneumonia. Past medical history: Cerebrovascular accident. Problems and Test Results: Nil by mouth, CT head - no new infarction. Tasks: Chase stool culture, Urine microscopy culture and sensitivity, Check fluid balance and review patient later.
  - A6:** Thorp, Justin (Mr). Born 22-Apr-1936. NHS No 021 165 5478. Presenting complaint: Pneumonia. Past medical history: Diverticulitis. Problems and Test Results: Small bowel obstruction. Tasks: Refer to surgeons, Repeat bloods, Arterial blood gas, Nasogastric tube.
  - B1:** Smith, Ben (Mr). Born 09-Mar-1949. NHS No 417 744 3757. Presenting complaint: Infective exacerbation COPD. Past medical history: Hypertension, Left-sided pleural effusion, Chronic renal failure, Osteoarthritis. Problems and Test Results: Chest x-ray - small pneumothorax post aspiration, Chest drain inserted, Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen. Tasks: Chase pleural tap, Chest x-ray post chest drain removal, 2 items removed.
- Navigation:** Horizontal scroll bars at the bottom of the table.

Figure 10: Refresh Options and Update Notification

ID	Guideline	Conformance	Evidence Rating
PAL-0800	Ensure that data displayed in the Patient List can be refreshed (that is, any updates to the source data can be reflected in the Patient List)	Mandatory	High
PAL-0810	Apply updates to Patient List data in real-time	Recommended	High
PAL-0820	If the system supports real-time update of data, ensure that updates to the source data are automatically reflected in the Patient List as soon as possible	Recommended	Medium

PAL-0830	If the system does not support real-time update of data, ensure that the system automatically refreshes the data displayed in the Patient List using an interval communicated to the users	Recommended	Medium
PAL-0840	Provide an update notification field to inform the user how many updates are currently marked for viewing in the Patient List. Locate this field above the viewing area	Recommended	Medium
PAL-0850	When the update notification field displays how many updates are currently marked for viewing, include advice on how many of these are currently out of view (that is, how many could be viewed if the user scrolled the viewing area horizontally and/or vertically)	Recommended	Medium
PAL-0860	If the system does not support real-time update of data, display the elapsed time since the last refresh in the update notification field	Recommended	Medium
PAL-0870	If the system does not support real-time update of data, provide an option for the user to manually trigger a refresh. Locate this option near to the update notification field	Recommended	Medium
PAL-0880	When content within a cell is updated, bring this to the user's attention by marking the cell with an update symbol and visually differentiating the cell (for example, by changing the cell background colour). Ensure that the update symbol does not obscure content and that the overall readability of the Patient List is not unduly disrupted	Mandatory	High
PAL-0890	If the Patient List is configured to be used by an individual clinician, do not mark updates that have been made by the clinician (if the system can detect this)	Recommended	Medium
PAL-0900	When a sublist entry has been updated (but not removed) visually differentiate the sublist entry (not the entire cell)	Mandatory	High
PAL-0910	When content has been removed by an update, display a notification in the list cell where the content was previously displayed (for example, the text 'item removed')	Recommended	Medium
PAL-0920	When one or more items in a sublist have been removed by an update, display a notification at the end of the sublist (for example, the text '3 items removed')	Recommended	Medium
PAL-0930	Provide the option for users to unmark each update individually for their Patient List	Recommended	Medium
PAL-0940	When a patient has been added to the list as a result of an update, mark the patient identification cell with an update symbol and visually differentiate the entire row (for example, by changing the row background colour). Provide the option for users to unmark this update as an entire row (rather than individual cells within the row)	Recommended	Medium
PAL-0950	When a patient has been removed from the list as a result of an update, mark the Patient Identification cell with an update symbol and visually differentiate the entire row (for example, by changing the row background colour). Provide the option for users to unmark this update as an entire row (rather than individual cells within the row)	Recommended	Low
PAL-0960	Provide an option to unmark all updates. Locate this option next to the update notification field	Recommended	Low
PAL-0970	When a user unmarks updates for their Patient List, ensure that other users' Patient Lists are unaffected	Recommended	Medium
PAL-0980	When a user selects the option to unmark all updates, by default alert them that they may not have seen all the updates on the list and require confirmation of the action. Provide an option to not show this alert and continue to display this option unless it is selected	Recommended	Medium

## Usage Examples

Location: Elkington ward      14:32 25-Sep-2009

Updates: 15 updates (8 currently out of view)      Unmark all

columns out of view – scroll left or right

Past medical history	Problems and Test Results	Tasks
----------------------	---------------------------	-------



In this correct example, the update notification field is displayed above the viewing area. It informs the users how many updates are currently marked on the Patient List and how many of these are currently out of view. An option to unmark all the updates is also provided next to the update notification field. (PAL-0840, PAL-0850, PAL-0960)

n (Dr) Location: Elkington ward      14:32 25-Sep-2009

Updates: 15 updates (8 currently out of view), 24 min since last refresh      Unmark all      Refresh

columns out of view – scroll left or right

Presenting complaint	Past medical history	Problems and Test Results	Tasks
----------------------	----------------------	---------------------------	-------



In this correct example, the system does not support the real-time update of data and so a manual refresh option is provide. The elapsed time since the last refresh is displayed in the update notification field (PAL-0860, PAL-0870)

PATIENT LIST			
Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
		Wednesday - on Potassium	Check fluid balance and review patient later
		Diarrhoea	
Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
		Abdominal x-ray - dilated small bowel loops	Repeat bloods
			Arterial blood gas
Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
Left sided pleural effusion	Hypertension	Chest drain inserted	Chest x-ray post chest drain removal
	Chronic renal failure	Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Repeat Arterial blood gas
	Osteoarthritis		



## ↓ System updates content

Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Urine microscopy culture and sensitivity
		Wednesday - on Potassium	Check fluid balance and review patient later
		Diarrhoea	
		Creatinine 150	
Pneumonia	Diverticulitis	Small Bowel obstruction	Refer to surgeons
		Abdominal x-ray - dilated small bowel loops	Repeat bloods
			Arterial blood gas
			Nasogastric tube
Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
Left sided pleural effusion	Hypertension	Chest drain inserted	Chest x-ray post chest drain removal
	Chronic renal failure		

In this correct example, the system has updated the content and two new sublist entries have been added. The new entries are visually highlighted using a background colour and a symbol (the corner triangle), which is positioned so that it does not obscure the content. (PAL-0880, PAL-0900)

Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture Urine microscopy culture and sensitivity	✓
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Check fluid balance and review patient later	
		Wednesday - on Potassium		
	Pneumonia	Diarrhoea		
		Small Bowel obstruction Abdominal x-ray - dilated small bowel loops	Refer to surgeons Repeat bloods Arterial blood gas	
Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap	
Left sided pleural effusion	Hypertension	Chest drain inserted	Chest x-ray post chest drain removal	
	Chronic renal failure			
	Osteoarthritis	Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Repeat Arterial blood gas	

## ↓ System updates content

Aspiration pneumonia	Cerebrovascular accident	Nil by mouth, CT head - no new infarction	Chase stool culture <b>2 items removed</b>
Acute on chronic renal failure	Epilepsy	Chest x-ray left upper lobe consolidation. Potassium 2.6	Chest x-ray post chest drain removal
		Wednesday - on Potassium	
Pneumonia	Diverticulitis	Diarrhoea	<b>1 item removed</b>
		Small Bowel obstruction Abdominal x-ray - dilated small bowel loops	
Infective exacerbation COPD	COPD - on home O2	Chest x-ray - small pneumothorax post aspiration	Chase pleural tap
Left sided pleural effusion	Hypertension	Chest drain inserted	Chest x-ray post chest drain removal
	Chronic renal failure		
	Osteoarthritis	Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Repeat Arterial blood gas

In this correct example, the system has updated the content and three entries have been removed from the sublists. The user is informed of this by the display of 'item removed' messages in the sublists. (PAL-0910, PAL-0920)

				Wednesday - on Potassium Diarrhoea <b>Creatinine 150</b>	review patient later	✓
A6	JENSEN, Henrik (Mr) Born 09-Mar-1973 NHS No 284 441 8787	Right pleural effusion	Nil, recent travel to India			
B1	SMITH, Ben (Mr) Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD Left sided pleural effusion	COPD - on home O2 Hypertension Chronic renal failure Osteoarthritis	Chest x-ray - small pneumothorax post aspiration Chest drain inserted Arterial blood gas pO2 7.2, <b>2 items removed</b>	Chase pleural tap Chest x-ray post chest drain removal	

In this correct example, the system has updated the content and a new patient has been added to the list. The entire row for the new patient is visually differentiated using the background colour and the patient identification cell has been marked with the update symbol. (PAL-0940)

A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later	
A6	UNOCCUPIED					
B1	SMITH, Ben (Mr) Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD  Left sided pleural effusion	COPD - on home O2  Hypertension  Chronic renal failure  Osteoarthritis	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap  Chest x-ray post chest drain removal  Repeat Arterial blood gas	

In this correct example, the system has updated the content and a patient has been removed from the list, leaving that location unoccupied. The entire row for the unoccupied location is visually differentiated using the background colour and the patient identification cell has been marked with the update symbol. (PAL-0950)

## Rationale

The 'live' update of information displayed in Patient Lists will be an unfamiliar concept to those users migrating from document or paper based lists. For such users, a Patient List will have typically been created at a defined point in time (for example, at the start of a shift) and updated by the users themselves during the period of usage (for example, throughout the shift). However, system-based Patient Lists could be updated continually, for example, for events such as:

- When the Pathology Department enter test results into the hospital system for a patient that is on the Patient List
- When a patient record is updated and the Patient List includes content sourced from that patient record
- When a new patient is admitted to a ward during a shift

Design mock-ups for marking updated information were shown to user research participants (see APPENDIX B), who particularly liked how live update mark-ups could mitigate the risk of missing changes in patient information including improvements and/or deteriorations.

Research found that the safest method of clearing update mark-ups is individually on each mark-up, as clinicians can then ensure that they have seen all updates (including those that may be out of view). However, this could be time consuming, particularly when updates occur frequently. It was also found that sporadic viewing of a Patient List may result in it being covered with numerous update mark-ups, which could potentially distract from the patient information. The guidance therefore includes recommendations on the provision of a 'clear all mark-up' option.

### Note

Determining when information should be removed from the Patient List (for example, when tasks are completed) is out of scope for this guidance. However, it was considered important for users to be made aware when information is removed from the Patient List and so guidance on update mark-up includes removed information.

Participants discussed whether users should be alerted about updates for columns they have chosen not to display but which may have been deemed important to their role (for example, by being in the default column set for that users role). On exploring how these alerts may be made, it was found that there was no clear way to convey this information in a clear and unambiguous manner. The benefits of displaying alerts about information the user had chosen not to display were therefore deemed not great enough to outweigh the potential interface complexity.

### Note

Indication of status (for example, task completion), responsibility (for example, task allocation) or acceptance (for example, acknowledgement of test results) is out of scope, therefore the guidance in this section should not be considered suitable for supporting mark-up for these purposes.

**Hazard Risk Analysis Summary:****Potential Hazards:**

- PLI001 What if entries are made into the Patient List that result in two or more versions of the same information in the record and in the Patient List?
- PLI097 What if the information underlying the view has changed (since it was opened) even though the refresh alert has not yet appeared?
- PLI098 What if the view is updated while open without manual refresh or indication of a change or what those changes are?
- PLI099 What if updates are not automatic (once the view is open) and there is no option for manual refresh?
- PLI100 What if the changes since the clinician's last view are not indicated?
- PLI103 Risk of not knowing whether it was worth refreshing or not
- PLI104 Misinterpretation of time associated with refresh action
- PLI107 Updates: what if there is no marker to show what is new or what has been updated and/or changed?
- PLI111 What if you do not realise that the status of the list has to be manually updated?
- PLI125 What if you are not aware of the status of the list because no time is shown?
- PLI129 What happens if you do not notice additional data which is appearing on screen?
- PLI220 What if data in the view (either the list of patients or the data per patient) is mistakenly interpreted to be current information when it is actually out of date?
- PLI279 What if the system allows you the ability to unmark all updates even if all updates have not been viewed?
- PLI152 What if you cannot see completed tasks?
- PLI066 What if completed jobs are removed too soon from the list?
- PLI270 What if results for unknown patient still show 'unknown' but live system has now updated patient's record with known demographics?

**Mitigations:**

- PAL-0800, PAL-0820, PAL-0830
- PAL-0870
- PAL-0840, PAL-0880
- PAL-0800, PAL-0870
- PAL-0800, PAL-0840, PAL-0880, PAL-0900
- PAL-0840, PAL-0860
- PAL-0840, PAL-0860
- PAL-0840, PAL-0880, PAL-0900
- PAL-0870
- PAL-0840, PAL-0860
- PAL-0840, PAL-0880, PAL-0900, PAL-0940
- PAL-0840, PAL-0860
- PAL-0850, PAL-0930, PAL-0980
- PAL-0910, PAL-0920
- PAL-0910, PAL-0920
- PAL-0820

### 4.2.3 Displaying Historical Patient List Information

This section provides guidance on displaying historical patient information as a complete Patient List 'snapshot'. Figure 11 illustrates those features:

HISTORICAL Patient List for: Maxhurst, John (Dr) Location: Elkington ward						08:00 23-Sep-2009
Columns...						
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks	
Start of list						
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review	
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA	
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later	
A6	<b>THORP, Justin (Mr)</b> Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction  Abdominal x-ray - dilated small bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas  Nasogastric tube	
B1	<b>SMITH, Ben (Mr)</b> Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD  Left sided pleural effusion	COPD - on home O2  Hypertension  Chronic renal failure  Osteoarthritis	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap  Chest x-ray post chest drain removal  Repeat Arterial blood gas	

Figure 11: Historical Patient List Information

ID	Guideline	Conformance	Evidence Rating
PAL-0990	Enable users to access historical Patient List information as a complete list for a specified point in time	Recommended	Medium
PAL-1000	When historical Patient List information is displayed as a complete list, ensure that it is displayed in a similar format to that used by the equivalent current Patient List.	Recommended	Medium
PAL-1010	When historical Patient List information is displayed as a complete list, visually emphasise the time and date to which it applies	Recommended	Medium
PAL-1020	When historical Patient List information is displayed as a complete list, ensure that there is clear visual differentiation between it and current Patient Lists (for example, by using a distinct colour scheme and including the word 'Historical' in the header)	Mandatory	High
PAL-1030	When historical Patient List information is displayed as a complete list, never display it and the equivalent current Patient List at the same time	Mandatory	High

## Usage Examples

**HISTORICAL Patient List for: Maxhurst, John (Dr) Location: Elkington ward 08:00 23-Sep-2009**



columns out of view – scroll left or right					
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later
A6	THORP, Justin (Mr) Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction  Abdominal x-ray - dilated small bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas  Nasogastric tube
B1	SMITH, Ben (Mr) Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD  Left sided pleural effusion	COPD - on home O2  Hypertension  Chronic renal failure  Osteoarthritis	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap  Chest x-ray post chest drain removal  Repeat Arterial blood gas

In this correct example, the historical Patient List is displayed with a different colour scheme to that used in other guidance examples, and the time and date are emphasised. The information is presented in a similar format to the current Patient List. (PAL-0990, PAL-1000, PAL-1010, PAL-1020)

**Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009**



columns out of view – scroll left or right					
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later
A6	THORP, Justin (Mr) Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction  Abdominal x-ray - dilated small bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas  Nasogastric tube
B1	SMITH, Ben (Mr) Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD  Left sided pleural effusion	COPD - on home O2  Hypertension  Chronic renal failure  Osteoarthritis	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap  Chest x-ray post chest drain removal  Repeat Arterial blood gas

In this incorrect example, the historical Patient List and the current Patient List are displayed at the same time. (PAL-1030)

## Rationale

When user research participants (see APPENDIX B) were shown design mock-ups of historical Patient Lists, they agreed that accessing historical information on current patients and on previous patients was useful.

Providing a historical 'snapshot' of all information across a Patient List has the advantages of providing clinicians with a familiar format in which to view the information. This is particularly useful if clinicians want to remind themselves of what their Patient List looked like at the end of their previous shift and to discover what happened to previous patients who may have been discharged since then.

Providing a historical Patient List with a similar format to the current Patient List could introduce hazards of misidentification, so specific guidelines are provided to mitigate this hazard.

### Hazard Risk Analysis Summary:

#### Potential Hazards:

- PLI151 What if you cannot see the details from the previous day?
- PLI205 Being unable to review previous information such as trends (which are not necessarily quantitative information), completed actions and patients who have now been discharged
- PLI219 What if 'snapshots' of the state of the list have to be taken manually?
- PLI240 What if you cannot access jobs that have been completed for a patient?
- PLI239 What if you cannot get access to patients who have been on the ward recently?

#### Mitigations:

- PAL-0990, PAL-1000, PAL-1010, PAL-1020, PAL-1030

## 4.2.4 Displaying Further Information

This section provides guidance on how to display further information that a user has opened from the Patient List. Figure 12 illustrates that feature:

Patient List for: Maxhurst, John (Dr) Location: Elkhington ward 14:32 25-Sep-2009				
Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results
Start of list				
A3	LEVI, Steven (Mr) Born: 10-Nov-1981 NHS No: S07 745 4662	Bronchiectasis Lower Respiratory Tract Infection	Cystic Fibrosis Chronic Pancreatitis	Blood cultures negative Urinary antigens negative 5 days IV tazocin
A4	GIBBINS, Phil (Mr) Born: 22-Jan-1991 NHS No: 325 504 5476	Asthma Exacerbation	Asthma Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20 TTA
A5	MADIGAN, Tony (Mr) Born: 09-Mar-1991 NHS No: 615 537 7485	Aspiration pneumonia Acute on chronic renal failure	Cerebrovascular accident Epilepsy	Nil by mouth, CT head - no new infection Chest x-ray left upper lobe consolidation. Potassium 2.6 Wednesday - on Potassium Diarrhoea Creatinine 150
A6	THORP, Justin (Mr) Born: 22-Apr-1996 NHS No: 021 165 5478	Pneumonia	Diverticulitis	Small bowel obstruction Abdominal x-ray - dilated small bowel loops
B1	SMITH, Ben (Mr) Born: 09-Mar-1989 NHS No: 417 744 3757	Infective exacerbation COPD Left sided pleural effusion	COPD - on home O2 Hypertension Chronic renal failure Osteoarthritis	Refer to surgeons Repeat bloods Arterial blood gas Nasogastric tube Chest x-ray - small pneumothorax post aspiration Chest drain inserted Arterial blood gas pCO2 7.2, pO2 5.7 on 28% oxygen

↓ User navigates to a patient record from the Patient List

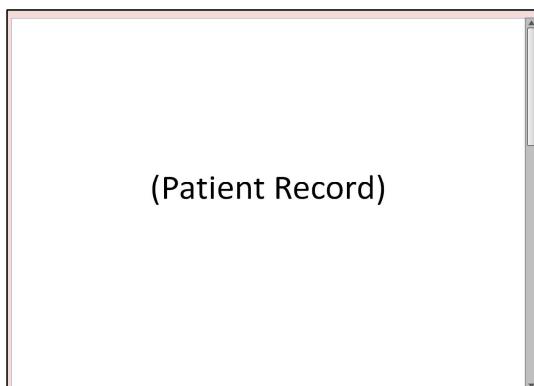


Figure 12: Displaying Further Information

ID	Guideline	Conformance	Evidence Rating
PAL-1040	Do not display the Patient List and individual patient information (for example, patient records) at the same time	Mandatory	High
PAL-1050	If the Patient List provides the facility for the user to navigate to other information, ensure that the Patient List and the other information is not viewable at the same time	Mandatory	High

### Usage Examples

Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all

columns out of view – scroll left or right

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
Start of list					
A3	LEVI, Steven (Mr) Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review
A4	GIBBINS, Phil (Mr) Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2. CRP 20	TTA
A5	MADIGAN, Tony (Mr) Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later
A6	THORP, Justin (Mr) Born 22-Apr-1936 NHS No 021 165 5478	Pneumonia	Diverticulitis	Small Bowel obstruction  Abdominal x-ray - dilated small bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas  Nasogastric tube
B1	SMITH, Ben (Mr) Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD  Left sided pleural effusion	COPD - on home O2  Hypertension  Chronic renal failure  Osteoarthritis	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap  Chest x-ray post chest drain removal  Repeat Arterial blood gas



↓ User navigates to a patient record from the Patient List

(Patient Record)

In this correct example, when the user navigates to further information, the Patient List is replaced by the new information. (PAL-1040, PAL-1050)

Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all

columns out of view – scroll left or right

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
<b>Start of list</b>					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative  5 days IV tazocin	Dietician review
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476	Asthma Exacerbation	Asthma  Type 1 Diabetes Mellitus	White cell count 10.2, CRP 20	TTA
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485	Aspiration pneumonia  Acute on chronic renal failure	Cerebrovascular accident  Epilepsy	Nil by mouth, CT head - no new infarction  Chest x-ray left upper lobe consolidation. Potassium 2.6  Wednesday - on Potassium  Diarrhoea  Creatinine 150	Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later

(Patient Record)

In this incorrect example, the Patient List and a patient record are displayed at the same time (PAL-1040, PAL-1050)

Patient List for: Maxhurst, John (Dr) Location: Elkington ward 14:32 25-Sep-2009

Columns... Action 1 Action 2 Updates: None Unmark all

columns out of view – scroll left or right

Location	Patient Identification	Presenting complaint	Past medical history	Problems and Test Results	Tasks
<b>Start of list</b>					
A3	<b>LEVI, Steven (Mr)</b> Preferred Name Steve Born 10-Nov-1981 NHS No 507 745 4662	Bronchiectasis  Lower Respiratory Tract Infection	Cystic Fibrosis  Chronic Pancreatitis	Blood cultures negative  Urinary antigens negative	Dietician review
A4	<b>GIBBINS, Phil (Mr)</b> Born 22-Jul-1991 NHS No 325 504 5476				TTA
A5	<b>MADIGAN, Tony (Mr)</b> Born 09-Mar-1931 NHS No 615 537 7485				Chase stool culture  Urine microscopy culture and sensitivity  Check fluid balance and review patient later
A6	<b>THORP, Justin (Mr)</b> Born 22-Apr-1996 NHS No 021 165 5478			bowel loops	Refer to surgeons  Repeat bloods  Arterial blood gas  Nasogastric tube
B1	<b>SMITH, Ben (Mr)</b> Born 09-Mar-1949 NHS No 417 744 3757	Infective exacerbation COPD  Left sided pleural effusion	COPD - on home O2  Hypertension  Chronic renal failure  Osteoarthritis	Chest x-ray - small pneumothorax post aspiration  Chest drain inserted  Arterial blood gas pO2 7.2, pCO2 5.7 on 28% oxygen	Chase pleural tap  Chest x-ray post chest drain removal  Repeat Arterial blood gas

(Patient Record)

In this incorrect example, the patient has navigated to further information, but it is being displayed at the same time as the Patient List. (PAL-1050)

## Rationale

During user research (see APPENDIX B) and hazard assessments, several design mock-ups of Patient Lists alongside individual patient information were shown to participants, as navigating from the Patient List to other views (for example, a patient's record) was considered important. Some participants expressed concern over potential safety hazards arising from patient misidentification (for example, if some details in the individual patient information are wrongly attributed to a different patient in the Patient List). A more general concern was raised over the practicality of displaying this quantity of information at the same time.

Having a clear separation between the Patient List and other views of information mitigates these hazards and concerns and will also assist in communicating the nature of the Patient List as a summary of information that exists elsewhere in the system (for example, patient records) and not as the key interface for that information.

### Hazard Risk Analysis Summary:

#### Potential Hazards:

- PLI087 What if the information pop-up covers patient information?
- PLI088 What if more information is presented in a pop-up that is not clearly associated with the patient it came from?
- PLI089 What if further information was opened up for more than one patient?
- PLI090 What if the clinician is unable to see relevant information such as the tasks alongside the additional information at the same time?
- PLI115 What if multiple records can be opened at once?
- PLI126 What happens if single patient data is presented to the side of a multi-Patient List and it is not clear to which patient it refers?

#### Mitigations:

- PAL-1040
- PAL-1040
- PAL-1040
- PAL-1040
- PAL-1040
- PAL-1040

## 5 DOCUMENT INFORMATION

### 5.1 Terms and Abbreviations

Abbreviation	Definition
CUI	Common User Interface
IG	Information Governance
ISMP	Institute for Safe Medication Practices
ISO	International Organization for Standardization
MDT	Multi-Disciplinary Team
MEWS	Medical Early Warning Score
MIST	Mechanism Illness/Injury Signs/Symptoms Treatment
NHS	National Health Service
NHS CFH	NHS Connecting for Health
NPSA	National Patient Safety Agency
UI	User Interface
VDT	Visual Display Terminal
WHO	World Health Organization

Table 8: Terms and Abbreviations

### 5.2 Definitions

Term	Definition
Conformance	In the guidance tables, indicates the extent to which you should follow the guideline when defining your UI implementation. There are two levels: <ul style="list-style-type: none"> <li>■ <b>Mandatory</b> – An implementation should follow the guideline</li> <li>■ <b>Recommended</b> – An implementation is advised to follow the guideline</li> </ul>
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.

Term	Definition
Evidence Rating	<p>In the guidance tables, summarises the strength of the research defining the guideline and the extent to which it mitigates patient safety hazards. There are three ratings (with example factors used to determine the appropriate rating):</p> <ul style="list-style-type: none"> <li>■ <b>Low:</b> <ul style="list-style-type: none"> <li>■ Does not mitigate specific patient safety hazards</li> <li>■ User research findings unclear and with few participants</li> <li>■ Unreferenced usability principles indicate the design is not significantly better than alternatives</li> </ul> </li> <li>■ <b>Medium:</b> <ul style="list-style-type: none"> <li>■ Mitigates specific patient safety hazards</li> <li>■ User research findings clear but with few participants</li> <li>■ References old authoritative guidance (for example, from the UK National Patient Safety Agency (NPSA), Institute for Safe Medication Practices (ISMP) or World Health Organization (WHO)) that is potentially soon to be superseded</li> <li>■ Referenced usability principles indicate the design is significantly better than alternatives</li> </ul> </li> <li>■ <b>High:</b> <ul style="list-style-type: none"> <li>■ Mitigates specific patient safety hazards</li> <li>■ User research findings clear and with a significant number of participants</li> <li>■ References recent authoritative guidance (for example, from NPSA, ISMP or WHO)</li> <li>■ Referenced usability principles indicate the design is significantly better than alternatives</li> </ul> </li> </ul>

Table 9: Definitions

## 5.3 Nomenclature

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

### 5.3.1 Body Text

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

Table 10: Body Text Styles

### 5.3.2 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 11: Cross Reference Styles

### 5.4 References

Reference	Document	Version
R1.	British Standards Institute – BS EN ISO 9241-10:1996 Ergonomic requirements for office work with visual display terminals (VDTs) – Part 10: Dialogues principles	1996
R2.	British Standards Institute – BS 7581:1992 Guide to Presentation of tables and graphs	1992
R3.	Design Guidance – Patient Banner	4.0.0.0
R4.	Design Guidance – Displaying Graphs and Tables	2.0.0.0
R5.	Design Guidance – Filtering, Sorting and Grouping	1.0.0.0
R6.	Design Guidance – Time Display	3.0.0.0
R7.	Design Guidance – Date Display	3.0.0.0
R8.	World Health Organization Collaborating Centre for Patient Safety Solutions – Aide Memoire – Volume 1, solution 2, May 2007 – Patient Identification	May 2007
R9.	National Patient Safety Agency National Reporting and Learning Service – DSCN 04/2009 – Guidance on the standard for Patient Identifiers for Identity bands	March 2009
R10.	Nielsen, J – Usability Engineering	1993
R11.	Shneiderman, B – Designing the User Interface: Strategies for Effective Human-Computer Interaction	Third Edition

Table 12: References

## APPENDIX A      USABILITY PRINCIPLES

### A.1 Nielsen's Usability Heuristics

See *Usability Engineering* {R10} for more information on these principles:

- Visibility of system status
- Match between system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help users recognise, diagnose, and recover from errors
- Help and documentation

### A.2 Shneiderman's Eight Golden Rules of Interface Design

See *Designing the User Interface – Strategies for Effective Human-Computer Interaction* {R11} for more information on these principles:

- Strive for consistency
- Enable frequent users to use shortcuts
- Offer informative feedback
- Design dialogs to yield closure
- Offer error prevention and simple error handling
- Permit easy reversal of actions
- Support internal locus of control
- Reduce short-term memory load

### A.3 ISO 9241: Characteristics of Presented Information

See *Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 10: Dialogues principles* {R1} for more information on these principles:

- Clarity (the information content is conveyed quickly and accurately)
- Discriminability (the displayed information can be distinguished accurately)
- Conciseness (users are given only the information necessary to accomplish the task)
- Consistency (the same information is presented in the same way throughout the application, according to the user's expectation)
- Detectability (the user's attention is directed towards information required)
- Legibility (information is easy to read)
- Comprehensibility (meaning is clearly understandable, unambiguous, interpretable and recognisable)

## APPENDIX B      STUDY ID 77: EXECUTIVE SUMMARY

### B.1 Abstract

The UK National Health Service (NHS) Common User Interface (CUI) programme is a partnership between Microsoft® and NHS Connecting for Health (NHS CFH), which is part the NHS National Programme for Information Technology (NPfIT).

As part of CUI, the Clinical Applications and Patient Safety (CAPS) project has the goal of ensuring that software applications used by the NHS enhance patient safety. To achieve this, CAPS provides software developers with user interface design guidelines derived through a user-centric development process that includes explicit patient-safety evaluations.

This summary describes key findings from user research carried out in November 2009 by the CUI CAPS team on Patient List Views. These findings are a subset of those in a larger internal report prepared for the CUI CAPS Patient List Views team.

**Purpose:**

To gain clinical feedback on designs for Patient List Views.

**Method:**

Interviews: structured interviews with 11 Health Care Professionals (HCPs) eliciting HCP preferences and qualitative feedback on designs.

**Key Results:**

Based on clinician preference and rationale:

- Truncating items in sublists is problematic and may hinder use of the view
- The option for end-user clinicians to be able to customise the dataset visible should be further explored
- Marking of updates was a popular feature, though unmarking was initially unclear
- A ‘snapshots’ feature was also liked, primarily in order to access patients no longer on the current list

### B.1 Research Objectives

To gather HCP preferences and qualitative feedback on, and to identify possible patient safety hazards with, CUI Patient List designs.

### B.2 Research Design

11 clinicians were interviewed across 11 structured 1 hour interviews, carried out in person. Participants were shown static designs of the Patient List View, with design alternatives per design area. Designs and example data used a secondary care inpatient scenario.

Participants were asked for preferences based on patient safety criteria. Other qualitative feedback was elicited covering:

- Rationale for preference
- Design fit with current and best practice
- Design understandability
- Any potential hazards resulting from the designs

Detailed notes from the interviews were qualitatively analysed using thematic coding.

## B.3 Results

### B.3.1 Participant Description

11 participants were interviewed in 11 sessions. Each had either volunteered through the NHS CFH Event Management System (EMS) signup or had been recruited by an HCP who had volunteered. 5 out of 11 participants had previously taken part in CUI clinical engagement for other work areas. Table 4 shows a summary of the participants' profiles:

Session	Job Role	Specialty	Level	Used Electronic Templates?	CUI Feedback before?
426	Doctor	Obstetrics and Gynaecology	Senior SpR	Labour board, handwritten list	No
427	Doctor	Obstetrics and Gynaecology	Junior SpR	Labour board, printed document	No
428	Doctor	Obstetrics and Gynaecology	SpR	Labour board, handwritten list	No
429	Doctor	Obstetrics and Gynaecology	SpR	Labour board, printed document	No
430	Doctor	GP Rotation (Obstetrics and Gynaecology)	SHO	Labour board, printed document (both personal and shared)	No
431	Nurse	Renal (outpatients)	? Consultant	Printed document (both personal and shared)	Yes
432	Nurse	Critical Care	Senior	Printed document (shared)	Yes
433	Pharmacist	ITU	?	Printed document (personal)	No
434	Doctor	GP Rotation / Military	? F2	Electronic systems at two trusts, printed document (personal)	Yes
435	Doctor	Surgery	SHO	Printed document (personal)	Yes
436	Pharmacist	Various	?	Electronic system, printed document (personal)	Yes

Table 13: Interview Participants

All participants were clinical staff who used patient lists as part of their role, generally for handover and supporting their work on the wards. The majority of the participants were junior doctors. Participants were from a number of different trusts around the UK.

The majority had had no experience of using electronic patient lists.

### B.3.2 Design Areas

Bullet text *in italics* represents researcher recommendations or comments in order to distinguish them from user feedback.

#### **Current Practice**

- Inpatient lists are used by junior doctors as “an aide memoire so you know where they are, who they are, what they are, and what you’ve done” (p435)
- Several participants described using old versions of the patient list (usually from the previous day) for:
  - Backup – Due to still-relevant information not being transferred to the new version
  - To see what had happened to patients no longer on the ward, in particular where they had been moved to
  - To track the responsible staff on duty on a particular day
  - To track infection risks

#### **Too Much Data**

- Participants were shown three designs for dealing with large numbers of items in a cell sublist (for example, tasks)
- The most serious risks were with the design that forced the clinician to scroll the list within the cell as this prevented them from comparing across patient’s tasks both within and between patients. They might forget to scroll, and they might mistakenly assume that the items were in order of importance (when it is likely they would not be as this is hard to reliably determine and varies depending on your clinical perspective)
- Advantages of showing all items in a sublist without truncation were that all items across all patients could (in theory) be seen in ‘one go’, though, as each patient row was likely to be much higher in this case, the clinician would have to do more scrolling and/or paging in order to see and compare items between patients
- *All current paper patient lists follow an untruncated model*
- Participants suggested that a short list of patients might be useful to get an overview of the location or as a way to select a patient

#### **Current Dataset Variation**

- As has been seen from analysis of current inpatient paper lists, participants described how different wards can have very different datasets (for example, a general medical ward compared to a labour ward) and some modelled in different ways (for example, organising data by the body system in the Intensive Therapy Unit (ITU)):
  - *Implying that a patient list design cannot ignore the issue of varying datasets between wards and/or contexts*

#### **Changing Dataset**

- Participants were shown different designs for user-variation of the visible dataset. Issues arising were:
  - Disorientating ‘jumping’ if datasets were presented on different pages (in that the clinician has to re-find the patient they were interested in)
  - Having to re-read information if datasets were presented on different pages

- The desire to be able to compare attributes for a given patient (difficult if attributes were always displayed on separate pages)
- The belief among junior doctors that a dataset would be determined by senior staff (and possibly even non-clinical staff) and would likely be inappropriate for the juniors' needs. Therefore, they would like the ability to vary the dataset themselves
- The desire for different roles to be able to access different datasets
- A desire to guide new staff to a recommended dataset for them in their context
- A desire to be able to vary the dataset visible dependant on patient or clinical situation
- All participants preferred a design where they could fully customise the visible dataset:
  - However, this may have been influenced by a desire to account for varying datasets per ward (*which does not necessarily imply that the end-user can vary the dataset*)
- Various risks were raised with the ability for the end-user to fully customise the visible dataset

## **Updates**

- All participants liked the idea of marking the updates since you last saw the list:
  - One participant pointed out this would be of most value in a larger team where many people were making updates to the same patients during a day (p437)
- It was not seen as necessary to indicate times of updates in this view
- Participants were unclear as to whether the update count included those updates on columns out of view
- The first five participants shown the design initially (mistakenly) assumed unmarking would clear all the updates from the whole team's view and didn't like this, preferring the update unmarking to be personal
- Other participants discussed the merits of using the updates as a kind of 'micro-handover' acknowledgement, in that the marking and unmarking could be shared between the team to indicate acceptance of information and tasks:
  - *Following internal CUI discussion, it was felt that this kind of functionality was both out of scope for this work and probably best left to a 'proper' communications feature*

## **Snapshots**

- All six participants asked confirmed that they did want to know about patients who had previously been on the ward (which is not possible from a continually updated patient list view)
- This was mainly seen as a learning opportunity, an aid in finding the patient, for checking tasks were done for patients now not on the ward and for quick access when writing the discharge summary
  - *A previous version of the patient list would mean that a clinician could find the patient's details without having to remember unique identifiers and searching for them in the Patient Administration System (PAS), which may be unsuccessful or error prone as patients' unique identifiers are hard to remember*

## **History**

- Response was generally ambivalent, with no strong opinions for or against viewing a per-patient history

### ***Opening More Details***

- The option to show more details for one patient at the same time as the patient list was only discussed with four participants but there were more risks elicited for having the option than not having it
- It was suggested that, given space constraints, there would in any case be a limit to how much extra information would be able to be usefully seen at the same time

### ***Multiple Wards***

- All six participants asked were initially confused by the 'mixed' list and all described the benefits of seeing the patients grouped or ordered by ward