

Design Guidance

Find a Patient

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Prepared by

Microsoft

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1 INTRODUCTION

This document describes the entry in the Design Guidance for Find a Patient. It describes the area of focus, provides guidance and recommendations, and explains the rationale behind these.

Prior to reading this guidance, please ensure you have read the following documents:

- *Design Guidance – Patient Banner {R1}*
- *Design Guidance – Date and Time Input {R2}*
- *Design Guidance – Date Display {R3}*
- *Design Guidance – Gender and Sex Display {R4}*
- *Design Guidance – Patient Identification Number Display {R5}*
- *Design Guidance – Address Information Display {R6}*

1.1 Overview

This document is intended for the use of anyone whose role includes screen design, implementation, or assessment of a clinical application. This document can therefore be used as guidance for the specification of a patient search user interface, the implementation of patient search within an application, and the assessment of a clinical application's user interface within the constraints noted.

1.2 Area of Focus Description

Patient search is a crucial but often neglected part of the user experience of clinical applications. As the number of health records that are stored centrally in national databases increases, the need for reliable, robust and usable national patient search functionality grows more apparent. However, whilst much attention is devoted to the contentious issues of confidentiality and security, relatively little is devoted to the issue of designing an effective search user experience.

Moreover, current approaches to the search user experience of national patient databases are based largely around the need to accommodate strict rules of information governance (IG), which place considerable constraints on the design to the point that user interaction becomes more 'system-led' than user-centred. Taken to an extreme, this could lead to a system that is demonstrably secure and robust, but characterised by a search user experience that is time-consuming, ineffective, and prone to error and frustration.

This document is concerned with the issues involved in designing an effective user experience for generic patient search applications but focuses most of its practical examples and illustrations on the dynamics of searching national patient databases. It provides guidance and recommendations that aim to:

- Facilitate rapid and effective searching of patient records
- Reduce the likelihood of failed or erroneous searches
- Support relevant information governance rules and policies within a usable and clear workflow
- Facilitate consistency with the design of other interface components (such as Patient Banner)

The scope of this document is focused on the requirements of national patient search applications which use national patient databases. The approach taken is to identify higher level principles that should apply across a broader range of scenarios and use cases. In addition, this document also aims to explore specific design issues such as:

- The use of a single input box for eliciting search criteria
- The visual design of query refinement forms and search results pages
- Repair strategies for failed searches

1.2.1 Out of Scope Areas

It should be noted that searching nationally-held patient records is just one of a number of possible use cases for patient search. Other important use cases could include:

- Searching patient records that are local to a particular organisation, facility or individual, for example:
 - “patients awaiting care/treatment”
 - “patients who we admitted recently”
 - “patients under the care of Dr Smith”
 - “patients who had a procedure/treatment between the dates of X and Y”
- Query-building functionality, such as that used by some General Practitioners (GPs), for example “find me all the patients who we treated in the last year who are diabetic and who did not have a medication review in the last 6 months”
- Integration of a local patient record with its national counterpart. This could occur, for example, when a patient has had a treatment or medication which was not given by their local GP practice – the GP then needs to search the national record for the relevant detail, and then update the local record accordingly (or vice versa)

However, these use cases go beyond the scope of this Deliverable and the user research conducted to inform it. There will be different IG and design criteria in each of these cases which cannot be included explicitly in this document, although some of the design principles may be applied to these situations. Since the requirements for such use cases are yet to be defined, any designs attempting to cover these scenarios would be speculative.

2 RECOMMENDATION AND GUIDANCE

The guidance provided throughout this document is derived from a combination of best practice guidelines, heuristics and user research aimed primarily at the area of patient identification, including the following patient search issues:

- Users' preferred criteria for patient search
- The context in which patient search is typically performed

The images used in this document are illustrative examples of the guidance.

2.1 The Application Context of Patient Search

The primary requirement addressed by this guidance is to provide an effective and usable patient search user experience. Part of this challenge is to design an appropriate workflow for the search process, that is, to define the content of each dialog box (or screen) and determine how the various screens interrelate within the context of the user's overall task. In the case of national patient databases, the context of such tasks could be:

- Commencement of patient encounter – for example, a GP or clinician uses the national patient database to retrieve a patient's details ahead of a pre-booked GP or out-patient appointment
- Communication with a patient – for example, a GP uses the national patient database to confirm a patient's correct contact details before contacting the patient
- Start and end of an in-patient treatment – for example, when a patient is admitted to an Accident and Emergency (A&E) department, a doctor uses the national patient database to identify the patient and access their core medical information
- Scheduling an event – for example, a GP uses the national patient database to verify a patient's address to confirm a booked radiology appointment for that patient

In addition, the task context will need to include both regular usage by administrative staff and occasional usage by non-specialist staff, and as such the guidance needs to support both the novice and experienced user.

An equally important aspect is to determine exactly how the search user experience will operate within the context of an overall clinical application. For example, some search functions could be discrete applications designed to operate within their own dedicated window. However, others may need to be incorporated within a broader clinical application, and in such cases some thought needs to be given to exactly how the search function will integrate with the overall application framework.

Figure 1 (below) illustrates an example, taken from the UK National Health Service (NHS), showing a prototypical 'home' screen for the user of a clinical application which provides access to a range of tools and information. The first question to address is: where, within this framework, is the appropriate place from which to invoke patient search? The options could include:

- A dedicated patient search box (for example, located in the top right hand corner of the application)
- A context sensitive right click menu (associated with an appropriate screen component)
- A toolbar or other application utility

In addition, patient search could also be triggered via a dedicated application, for instance, via the desktop. Each of these has its own merits and demerits depending of the context of the user and the task they are trying to achieve. This document treats them all as potential entry points into the search user experience, but entry points are outside the scope of the guidance and recommendations of this document.

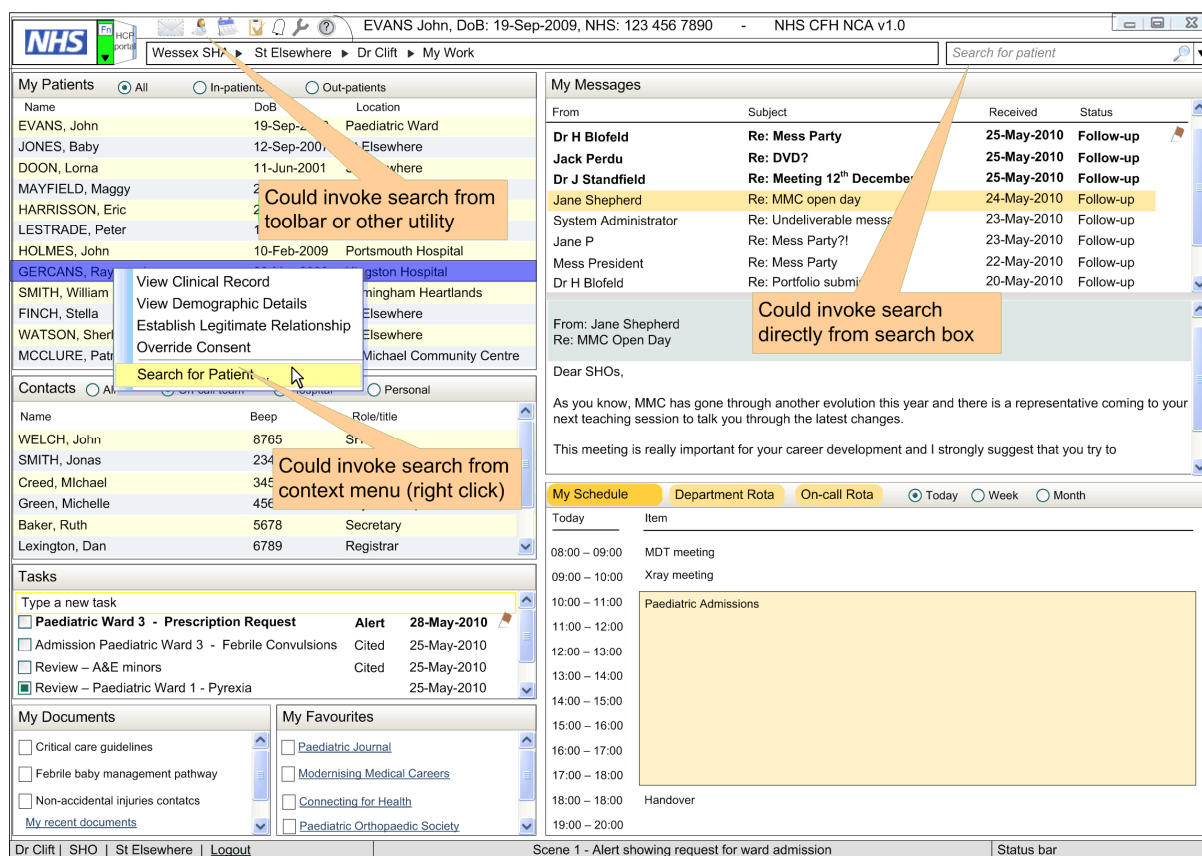


Figure 1: Example of a Clinical Application with Patient Search Functionality

2.1.1 Overall Search Workflow

As indicated above, a key issue in the design of an effective search user experience is the dynamics of the search process itself. The principle should be to create a workflow that is logical, coherent, and intuitive. However, in practice, that workflow is inevitably closely tied to a particular user's task context and the characteristics of the database being searched. For example, Figure 2 shows the workflow involved in searching patient records held at a national level in the NHS Clinical Spine Application (CSA). As can be seen, there are a number of steps in the workflow that are essentially generic (such as 'Simple search' and 'Search results'), but many steps are specific to CSA itself (such as the 'Audit message' and the various steps required to ensure that the certain CSA-specific search criteria have been entered).

This process flow is derived from analyses of documentation and discussion with clinical staff. Note that in principle the dialog boxes could be implemented in a variety of ways (such as Web pages or forms) – what matters are the design principles governing their content and behaviour, rather than their precise implementation. For simplicity, the designs shown in this document represent a typical Web application implementation.

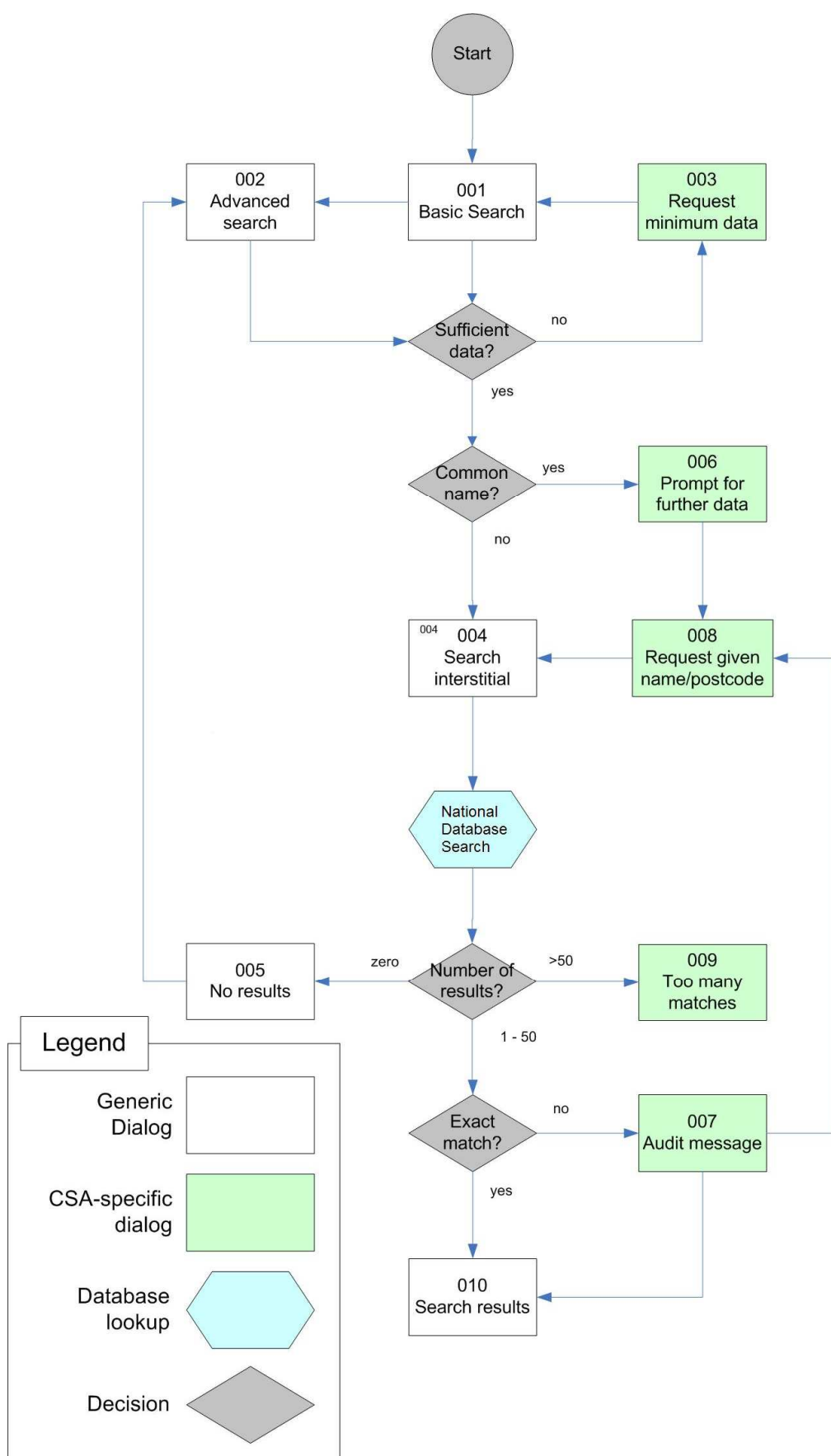


Figure 2: Example of an Overall Search Workflow

2.1.2 Information Governance Considerations

The process of finding a particular patient record will sometimes involve the need to browse among a set of candidate entries in a search results list. In this respect, granting access to patient search functionality can lead to the disclosure of patients' personal details, along with other data which may be confidential or even safety critical. Consequently, it is vital that the search process takes into account relevant governance rules and technical constraints. In the example shown in Figure 2, these rules are quite fundamental in shaping the workflow:

- If more than N matching records are found, an error message is displayed and the user must refine their search
- If 2–N matching records are found, the user is asked to refine their search or view the search results list, which would be audited
- If a single matching record is found, the search results page is displayed without further delay

N is currently assigned a value of 50 in the national patient database.

Separating these factors to identify precisely those areas in which to provide generic guidance is a complex issue. Consequently, the approach taken by this document is to focus where possible on the higher level principles that should apply to a range of clinical contexts and use cases. It is expected that IG rules such as those above will evolve over time.

2.2 How to Elicit Search Criteria

2.2.1 Search Input Forms

This section shows examples of how to elicit the data required in searching a patient database. Figure 3, Figure 4, Figure 5, Figure 6 and Figure 7 show examples, taken from the UK National Health Service, of how a basic search form should behave in various stages of completion. Figure 8 shows an advanced search which supports a wider range of input, such as date ranges for date of birth and date of death, and GP details. Figure 9 shows how to indicate that lookup of the database is currently in progress.

Evidently, the data required by any given search form will be dependent on the particular search application and the database being searched. The example search form consists of three mandatory fields (gender, family name and date of birth) and two optional fields (given name and postcode). There are a number of reasons why postcode is favoured over more general address details:

- Address data in the database may not be fully normalised (that is, regularised into pre-set fields, such as 'street', 'town' and 'county'), thus compromising the effectiveness of any matching algorithm based on such data
- The postcode can be entered into a single text entry box, requiring less screen space
- If the postcode is not known to the user, they can invoke a 'postcode finder' which performs a postcode lookup based on (partial) address data

Note

A patient identification number should ideally be corroborated by one or two other data items as a cross-check, unless obtained directly from a validated source such as a letter to the patient. This is to mitigate the risk of making a mistake when entering the number and to therefore unknowingly view the wrong patient details.

Despite these constraints, there are other principles behind the design of the form, such as the use of watermarks (see 'Family name' field in Figure 3), and the separation of mandatory and optional fields that are more generic. These and a number of other guidelines are outlined after Figure 3 through to Figure 9.

Find a Patient

Please search for a patient by either entering details below or using their NHS number.

Basic **Advanced**

You must enter all of this patient information: **Denotes required field*

*Gender ☐ Female ☐ Male

*Family name

*Date of Birth

Please try to enter at least one of these items:

Given name

Postcode [Postcode finder](#)

Find

OR find using NHS Number:

NHS number

Find

Figure 3: Example of a Basic Search Form

Find a Patient

Please search for a patient by either entering details below or using their NHS number.

Basic **Advanced**

You must enter all of this patient information: **Denotes required field*

*Gender ☐ Female ☒ Male

*Family name

*Date of Birth

Please try to enter at least one of these items:

Given name

Postcode [Postcode finder](#)

Find

OR find using NHS Number:

NHS Number

Find

Figure 4: Example of a Basic Search Form Showing Date Input Control

Find a Patient

Please search for a patient by either entering details below or using their NHS number.

Basic **Advanced**

You must enter all of this patient information: **Denotes required field*

*Gender ☐ Female ☒ Male

*Family name

*Date of birth

Please try to enter at least one of these items:

Given name

Postcode [Postcode finder](#)

Find

OR find using NHS Number:

NHS Number

Find

☐ **Postcode finder** ✕
 Please enter as much information as you can
 Address

 Town
 County
 Country **United Kingdom**
Find

Figure 5: Example of a Basic Search Form Showing Postcode Finder

Find a Patient

Please search for a patient by either entering details below or using their NHS number.

Basic **Advanced**

You must enter all of this patient information: **Denotes required field*

*Gender ☐ Female ☒ Male

*Family name

*Date of birth

Please try to enter at least one of these items:

Given name

Postcode [Postcode finder](#)

Find

OR find using NHS Number:

NHS Number

Find

☐ **Postcode finder results** ✕
 Click on the address to select postcode
22 matches for 124 Acacia Ave, Heathrow, London

124 Acacia Avenue, London.	W3 2TT	
124a Acacia Avenue, London.	W3 2TU	
126 Acacia Avenue, London.	W3 2TV	
126a Acacia Avenue, London.	W3 2TJ	
126b Acacia Avenue, London.	W3 2TL	
126c Acacia Avenue, London.	W3 2UA	
128 Acacia Avenue, London.	W3 2TZ	
Snuggle Down Cottage, Acacia Avenue, Eastbourne, Oxfordshire.	OX26 3NN	
126 Acacia Avenue, Eastbourne, Oxfordshire.	OX26 3NN	
126a Acacia Avenue, Eastbourne, Oxfordshire.	OX26 3NN	
128 Acacia Avenue, Eastbourne, Oxfordshire.	OX26 3NN	
129 Acacia Avenue, Eastbourne, Oxfordshire.	OX26 3NN	

Can't see the postcode you are looking for?
[\(Try entering less address information\)](#) OR [view search options](#)

Figure 6: Example of a Basic Search Form Showing Postcode Finder Results

Find a Patient

Please search for a patient by either entering details below or using their NHS number.

Basic **Advanced**

You must enter all of this patient information: **Denotes required field*

*Gender ☐ Female ☒ Male

*Family name

*Date of birth

Please try to enter at least one of these items:

Given name

Full postcode [Postcode finder](#)

Find

OR find using NHS Number:

NHS Number

Find

Figure 7: Example of a Populated Basic Search Form

Find a Patient - Advanced

Please search for a patient by entering details below.

Basic **Advanced**

You must enter all of this patient information: **Denotes required field*

*Gender ☐ Female ☐ Male ☐ Not known ☐ Not specified

*Family name

Date of birth *From to

Please try to enter at least one of these items:

Given name

Middle name(s)

Date of death From to

Postcode [Postcode finder](#)

GP details GP (GNC) code or Practice code

Find

Search options:

☐ Sounds like ([What is this?](#)) ☐ Include common mis-spellings of names

☐ Include deceased patients ☐ Include superseded patient details

☐ Include previous names or aliases ☐ Filter by legitimate relationship ([What is this?](#))

Figure 8: Example of an Advanced Search Form

Find a Patient

Please search for a patient by either entering details below or using their NHS number.

Basic Advanced

You must enter all of this patient information

Find a Patient

Searching for Patient Record

Family name: **CHANDRASEKHAR**

First name: **Subi**

Date of Birth: **14-Jul-1968**

Gender: **Male**

Postcode: **W3 2TU**

Cancel

OR find using NHS Number

NHS Number

Find

Figure 9: Example of an Interstitial Page

2.2.1.1 Guidance

- Users should be offered a choice of basic or advanced search
 - The basic search form should usually be presented by default
- The Date Input control should be used for input of dates, to allow either entry of date by free text or selection using the calendar control
- A title for the task that the user is performing should be displayed (such as 'Find a Patient'), along with prompts on what to enter (such as 'You must enter all of this patient information')
- The search button should not be enabled until mandatory data values have been entered
 - The search button should have an appropriate textual label, for example 'Search' or 'Find'
- If the database lookup is expected to exceed a certain length of time, an interstitial page showing progress should be displayed (see Figure 9)
 - The interstitial page should display the values entered by the user. Any mandatory data values should be differentiated visually (for example, by use of a bold font)
 - The user should be able to cancel the search at anytime and be returned to the original search page, with values pre-populated
- The form should allow the user to search using patient identification number
 - The patient identification number area should be visually distinct from the rest of the form, and the Find button should become enabled only upon completion of the patient identification number field
 - A patient identification number should ideally be corroborated by one or two other data items as a cross-check, unless obtained directly from a validated source, such as a letter to the patient

- The form should be divided both visually and logically into related groups of data (for example, mandatory versus non-mandatory data). These areas should be delimited by suitable separators and each group of data should have an associated caption
- Form controls should use watermarks to provide guidance on data entry (see 'Family name' field in Figure 3)
- Advanced search forms (see Figure 8) should support options such as:
 - 'Sounds like' name matching
 - Inclusion of deceased patients
 - Inclusion of previous names or aliases
 - Inclusion of common misspellings of names
 - Inclusion of superseded patient details
 - Filtering of results by patients with whom the user has a legitimate relationship

2.2.2 Using a Single Search Input Box

Most approaches to search user interface (UI) design involve the use of a conventional form in which individual input fields are provided for each of the various parameters. This has the benefit of familiarity, and the use of regularised form fields can aid the accuracy of the retrieval process. However, this is not the only approach to search UI design.

An alternative is to use a single search input box which is configured to accept any of the required parameters in any order. In this approach, instead of forcing the user to decide which data should go in which field, it is the responsibility of the system to classify each parameter and deal with it accordingly. This might sound ambitious, but it is not without precedent: EMIS, InPractice and FrontDesk all use a single field search.

One key advantage of this approach is of course that the search input box occupies very little screen space, and may thus be part of the global navigation, located (for example) in the top right hand corner of the parent application (as shown in Figure 1). The user could then enter their query as a combination of any of the accepted parameters, such as family name, given name, gender, date of birth, patient identification number, postcode, and so on. In this respect, it allows expert users to use fewer keystrokes and more flexible search strategies – an advantage that is particularly significant for administration and back-office staff who may have to use such systems on a regular basis. Once the user has entered such a query, the search results could then appear as a table overlaying the parent application, as shown in Figure 10.

One disadvantage with this approach is that the process by which the parameters are classified can never be totally accurate. Consequently, it would be beneficial to present to the user some progressive indication of the activity of the system as the query is being entered. This would serve the additional purpose of helping the user repair any wrongly recognised input. An example of this is illustrated (somewhat magnified) in Figure 11, in which the current interpretation of the input entered thus far is displayed in a drop-down panel.

Wessex SHA ▶ St Elsewhere ▶ Dr Clift ▶ My Work

Chandrasekar 14-Jul-1968 Male

Search Results

13 patients match 'Male, Chandrasek, 14-Jul-1968, W3 2TT'

Can't see patient you're looking for? [Broaden search](#) Start again? [New search](#)

Name	Address	Date of Birth	Gender	NHS Number	Postcode
Subi CHANDRASEKHAR	124 Acacia Avenue, London	14-Jul-1968	Male	123 456 7891	W3 2TT
Subraman CHANDRASEKHAR	Mid Terrace View, Pinesgate East, Lower Bristol...	14-Jul-1968	Male	123 098 7654	BA1 5AB
Subramanyan CHANDRASEKHAR	Laverstoke, Whitchurch, Hants	14-Jul-1968	Male	212 435 6565	RG45 7GH
Subramanyan CHANDRASEKHAR	Regal House, London Road, Twickenham	14-Jul-1968	Male	123 453 6574	TW1 3QB
Subramanyan CHANDRASEKHAR	79 Croham Road, South Croydon, Surrey	14-Jul-1968	Male	098 999 0000	CR2 6BN
Subramanyan CHANDRASEKHAR	Barrow School of Design/Media, Watford Road...	14-Jul-1968	Male	123 432 4567	HA1 3TP
Susanna CHANDRASEKHAR	Bromley Careers Centre, 27 London Road, Bromley	14-Jul-1968	Male	123 456 7859	BR1 1DG
Suliman CHANDRASEKHAR	Snuggle Down Cottage Farm, C/O East Street Centre...	14-Jul-1968	Male	123 543 8765	OX14 7TF
Sulyman CHANDRASEKHAR	215 University Road, Nottingham	14-Jul-1968	Male	098 765 8765	NG7 2GH
Subraman CHANDRASEKHAR	79 Crowshaw Raod, South Croydon, Surrey	14-Jul-1968	Male	123 555 7777	HA1 7HG
Sami CHANDRASEKHAR	Down Cottage Farm, West Street, London	14-Jul-1968	Male	098 543 1211	BR1 8JH
Sati CHANDRASEKHAR	62 Crowshaw Raod, South Croydon, Surrey	14-Jul-1968	Male	111 111 1132	CV3 7YG
Suliman CHANDRASEKHAR	43 Dunn Road, Croydon	14-Jul-1968	Male	315 692 6532	DE3 6TF

Dr Clift | SHO | St Elsewhere | Logout

Scene 1 - Alert showing request for ward admission

Status bar

Figure 10: Example of a Single Search Input Box with Results List

2009, NHS: 123 456 7890 - NHS CFH NCA v1.0

Subi Chandrasekhar W3 2TU Male

From	Subject	Date	Action
Dr H Blofeld	Re: Me		
Jack Perdu	Re: DV		
Dr J Standfield	Re: Me		
Jane Shepherd	Re: MMC open day	24-May-2010	Follow-up
System Administrator	Re: Undeliverable message	23-May-2010	Follow-up
Jane P	Re: Mess Party?!	23-May-2010	Follow-up
Mess President	Re: Mess Party	22-May-2010	Follow-up
Dr H Blofeld	Re: Portfolio submission	20-May-2010	Follow-up

From: Jane Shepherd
Re: MMC Open Day

Dear SHOs,

As you know, MMC has gone through another evolution this year and there is a representative coming to your next teaching session to talk you through the latest changes.

This meeting is really important for your career development and I strongly suggest that you try to

My Schedule Department Rota On-call Rota Today Week Month

Today Item

Figure 11: Example of a Single Search Input Box with Progressive Display

2.2.2.1 Guidance

A single search input box should be used when:

- The task is performed by expert users who have keyboards
- Users require more flexible search strategies that allow them to minimise keystrokes
- Screen space is limited
- The search parameters may need to be varied (without requiring redesign of the form UI)

2.2.3 Managing Common Search Terms

As indicated in section 2.1.1, *Search Input Forms*, there are a number of rules governing the ability of users to browse the results of a patient search. In particular, there is a limit on the total number of results that may be returned, and there is also a limit on the number of results that a user may view without being audited, due to IG restrictions. In both cases, it would be advantageous if there was some way to reduce the likelihood of this outcome, and instead to help the user in formulating a more precise query from the outset.

One such approach involves the use of some simple statistics applied to the distribution of family names. In the UK, as in most countries, family names tend to be distributed on a logarithmic scale, that is, there are a small number of names that are very common and a large number of names that are relatively rare. In particular, the nature of this distribution is such that a search based on just family name, gender, and date of birth is likely to produce more than one result (and hence trigger the audit rules described above) in around 23% of cases. This corresponds roughly to the 125 most common names in England and Wales.

Consequently, if the entry of such common names into a search form could be detected *before* the query was actually submitted, the user could be alerted to this possibility and given guidance on how to refine their search appropriately (for example by entering a postcode or given name). The consequence would be that a more refined query would be submitted and the probability of finding an exact match improved. Figure 12 shows an illustrative example of how such an alert could appear to the user.

The screenshot shows a web form titled "Find a Patient". Below the title is a instruction: "Please search for a patient by either entering details below or using their NHS number." There are two tabs: "Basic" (selected) and "Advanced". A red alert banner states: "Many patients match **Male, Smith, 14-Jul-1968**". Below this, a yellow warning icon is followed by the text: "'Smith' is a common family name which is likely to match too many patients. To refine your search, please enter additional information below." The form then lists required fields: "*Gender" (radio buttons for Female and Male, with Male selected), "*Family name" (text box containing "Smith"), and "*Date of birth" (text box containing "14-Jul-1968" with a calendar icon). A note says "You must enter all of this patient information:" and "*Denotes required field". Under "Additional information:", there are text boxes for "Given name" and "Postcode", with a "Postcode finder" link next to the postcode box. A "Find" button is at the bottom.

Figure 12: Example of Alerting the User when a Common Family Name is Entered

2.2.3.1 Guidance

The search form should:

- Detect the entry of common names before a query is submitted, rather than afterwards
- Display an alert to the user, and request further information to refine the query
- Highlight the additional fields requested

2.2.4 Confidence Level

■ High

- Users should be offered a choice of basic or advanced search
- The Date Input control should be used for input of dates
- If the database lookup is expected to exceed a certain length of time, an interstitial page showing progress should be displayed
- The form should allow the user to search using only patient identification number
 - A patient identification number should ideally be corroborated by one or two other data items as a cross-check, unless obtained directly from a validated source such as a letter to the patient
- The form should be divided both visually and logically into related groups of data
- The form should detect the entry of common names before a query is submitted, display an alert to the user, and request further information to refine the query

■ Medium

- A title for the task that the user is performing should be displayed along with prompts on what to enter
- The search button should not be enabled until mandatory data values have been entered
- The search button should be labelled appropriately, for example 'Search' or 'Find'
- The user should be able to cancel the search at any time and be returned to the original search page, with values pre-populated
- Form controls should use watermarks to provide guidance on data entry

■ Low

- A single search input box should be used when users require more flexible search strategies, or when the task is performed by expert users, or when screen space is limited

This guidance is currently classified as 'Initial Guidance'. Further usability testing is expected and potential updates to the guidance may be completed following this usability testing.

2.2.5 Benefits and Rationale

Using an effective search input form will:

- Facilitate rapid and accurate data entry
- Improve the likelihood of successful searches

A single search input box will:

- Allow the user to enter the search parameters in any order
- Allow expert users to use fewer keystrokes
- Often be quicker to complete than a regular form
- Occupy less screen space than a regular form
- Be usable within a variety of application contexts
- Allow the search parameters to be reconfigured without requiring redesign of the form UI

Managing common search terms will:

- Reduce the number of failed searches
- Reduce the number of events that need to be audited
- Reduce the number of steps in the user's workflow
- Reduce the load on the search engine
- Help the user learn more effective search strategies
- Improve the likelihood of successful searches

2.3 How to Incorporate Information Governance Rules

One of the key principles guiding the development of national patient search applications is that patient records should be maintained in a confidential and secure manner. One consequence of this is that access to those records should be restricted to authenticated users (who must log on with an individual smartcard and password). Moreover, once logged on, there are further rules that govern the ability of such users to search patient records, such as:

- If a single matching record is found, the results page is displayed without further delay
- If 2–N matching records are found, the user is asked to refine their search or view the results page through an audited dialogue
- If more than N matching records are found, an error message is displayed and the user must refine their search

N is currently assigned a value of 50 in the national patient database.

2.3.1 Viewing an Auditable List

Figure 13 shows an example of how an alert may be displayed when the user must either submit further information or view the patient list (an action which would be audited).

Find a Patient

Please search for a patient by either entering details below or using their NHS number.

Basic Advanced

29 patients match **Male, Chandrasekhar, 14-Jul-1968**

Please provide given name or full postcode.
If you cannot provide further information, you may view the list of patients. This action will be audited and may be investigated.

View Patient List

You must enter all of this patient information: *Denotes required field

*Gender ☐ Female ☒ Male

*Family name

*Date of birth

Please try to enter at least one of these items:

Given name

Postcode [Postcode finder](#)

OR find using NHS Number:

NHS Number

Figure 13: Example of Viewing an Auditable List

2.3.1.1 Guidance

- Any action that results in an auditable or reportable event (such as viewing a patient list) should be visually distinguished (for example, by use of a warning icon)
 - The control that invokes the action should be visually distinguished in the same manner
 - A confirmation dialog box should be presented to the user before proceeding
- The alert message should display the original data values that the user entered
- The form should be pre-populated with the original data values that the user entered
- The additional data fields requested to refine the search should be highlighted
- The search button should not be enabled until at least one of the additional data fields has been populated
- The consequences of viewing the patient list should be clearly stated

2.3.2 Too Many Matching Records

Figure 14 shows an example of how an error message may be displayed when too many matching records are found.

The screenshot shows a web form titled "Find a Patient". Below the title is a sub-header: "Please search for a patient by either entering details below or using the NHS number." There are two tabs: "Basic" (selected) and "Advanced". A red error message box with a red 'X' icon states: "Too many patients match **Male, Chandrasekhar, 14-Jul-1968**. For reasons of confidentiality and practicality, viewing large lists of patients is not permitted. Please provide more information below. ([Need help?](#))". Below this, a grey box says "You must enter all of this patient information:" followed by a legend "*Denotes required field". The form contains:

- *Gender: Radio buttons for Female and Male (Male is selected).
- *Family name: Text input field containing "Chandrasekhar".
- *Date of birth: Text input field containing "14-Jul-1968" with a calendar icon.

 Below these is a section "Please try to enter at least one of these items:" which is highlighted with a red border. It contains:

- Given name: Text input field.
- Postcode: Text input field with a "Postcode finder" link.
- A "Find" button.

 At the bottom, there is a section "OR find using NHS Number:" with an "NHS Number" text input field and a "Find" button.

Figure 14: Example of Too Many Matching Records

2.3.2.1 Guidance

- The error message should display the original data values that the user entered
- The form should be pre-populated with the original data values that the user entered
- The additional data fields requested to refine the search should be highlighted
- The search button should not be enabled until at least one of the additional data fields has been populated
- The reason why results cannot be displayed should be clearly stated

2.3.3 Confidence Level

- **Medium**
 - Any action that results in an auditable or reportable event should be visually distinguished
 - Alert and error messages should display the original data values that the user entered
 - Forms should be pre-populated with the original data values that the user entered
 - Any additional data fields required to refine the search should be highlighted
 - The search button should not be enabled until at least one of the additional data fields has been populated
 - The rationale behind alert and error messages should be clearly stated

This guidance is currently classified as 'Initial Guidance'. Further usability testing is expected and potential updates to the guidance may be completed following this usability testing.

2.3.4 Benefits and Rationale

Using the above approaches to information governance will:

- Present clear options to the user regarding their choices within the workflow
- Ensure that the user understands their rights and responsibilities when accessing patient records, particularly with regard to auditable or reportable events
- Help the user to understand which search criteria are mandatory and which are optional
- Help the user formulate more effective search strategies

2.4 How to Present Search Results

This section describes how to present the results of a patient search. There are two possible outcomes of a patient search:

- One or more results are found
- Zero results are found

Although the information governance rules for viewing results in may specify that a single matching record is treated differently from two or more matching records, for example, in the case of the NHS CSA, it is arguable whether this rule alone should have any bearing on the visual design of search results page per se. Perhaps more important is the relationship between the number of results and the level of detail displayed. For example:

- A large results list may benefit from using a relatively concise display, to minimise scrolling and reduce clutter
- A small results list may benefit from a more detailed display, making full use of the available screen space, and providing:
 - Further details to accurately identify the patient
 - Some indication of the status of the patient record (such as consent status)
 - Access to the tasks that can be performed on it immediately

Evidently, there is a trade-off between varying the level of detail and presenting the results list consistently, and an appropriate balance between these two considerations will need further investigation.

2.4.1 One or More Results Found

Figure 15 shows an example of a large results list, displayed in a concise manner using a core set of attributes. By contrast, Figure 16 and Figure 17 show examples of a small results list (just one entry), using a more extensive set of attributes which show the consent and legitimate relationship status, along with a context sensitive task menu for the selected record.

Search Results						
13 patients match Male, Chandrasek, 14-Jul-1968, W3 2TT						
Can't see patient you're looking for? Broaden search Start again? New search						
Name	Address	Date of Birth	Gender	NHS Number	Postcode	
Subi CHANDRASEKHAR	124 Acacia Avenue, London	14-Jul-1968	Male	123 456 7891	W3 2TT	
Subraman CHANDRASEKHAR	Mid Terrace View, Pinesgate East, Lower Bristol...	14-Jul-1968	Male	123 098 7654	BA1 5AB	
Subramanyan CHANDRASEKHAR	Laverstoke, Whitchurch, Hants	14-Jul-1968	Male	212 435 6565	RG4 7GH	
Subramanyan CHANDRASEKHAR	Regal House, London Road, Twickenham	14-Jul-1968	Male	123 453 6574	TW1 3QB	
Subramanyan CHANDRASEKHAR	79 Croham Road, South Croydon, Surrey	14-Jul-1968	Male	098 999 0000	CR2 6BN	
Subramanyan CHANDRASEKHAR	Barrow School of Design/Media, Watford Road...	14-Jul-1968	Male	123 432 4567	HA1 3TP	
Susanna CHANDRASEKHAR	Bromley Careers Centre, 27 London Road, Bromley	14-Jul-1968	Male	123 456 7859	BR1 1DG	
Suliman CHANDRASEKHAR	Snuggle Down Cottage Farm, C/O East Street Centre...	14-Jul-1968	Male	123 543 8765	OX14 7TF	
Sulyman CHANDRASEKHAR	215 University Road, Nottingham	14-Jul-1968	Male	098 765 8765	NG7 2GH	
Subraman CHANDRASEKHAR	79 Crowshaw Raod, South Croydon, Surrey	14-Jul-1968	Male	123 555 7777	HA1 7HG	
Sami CHANDRASEKHAR	Down Cottage Farm, West Street, London	14-Jul-1968	Male	098 543 1211	BR1 8JH	
Sati CHANDRASEKHAR	62 Crowshaw Raod, South Croydon, Surrey	14-Jul-1968	Male	111 111 1132	CV3 7YG	
Suliman CHANDRASEKHAR	43 Dunn Road, Croydon	14-Jul-1968	Male	315 692 6532	DE3 6TF	

Figure 15: Example of Long Results List with Minimal Detail

Search Results

1 patient matches **Male, Chandrasek, 14-Jul-1968, W3 2TT**

Can't see patient you're looking for? [Broaden search](#) Start again? [New search](#)

Name & address	Title	Date of Birth	Gender	NHS Number	Postc...	Consent	Legitimate Rel...
<div><div>Subi CHANDRASEKHAR</div><div><div>View Clinical Record</div><div>View Demographic Details</div><div>Establish Legitimate Relationship...</div><div>Override Consent</div></div></div>	Mr	14-Jul-1968	Male	123 456 7890	W3 2..	Implied	n/a

Figure 16: Example of Short Results List with Additional Detail

<

Figure 17: Example of Alternative Short Results List with Additional Detail

2.4.1.1 Guidance

The search results page should:

- Display the number of matching records found
- Display the user's original query
- Display a level of detail appropriate to the number of results
 - Where appropriate, offer access to tasks and actions, available for each patient record
- Offer options to refine the user's search (for example, by using the advanced search options) or to start a new search
- Allow column widths to be adjusted

- Allow the results to be sorted by column
 - The current sort order should be visually indicated

2.4.2 Zero Results Found

A failed search should present the user with more than just a 'dead-end'. Instead, the user should be offered practical options and guidance on how to refine their query and search more effectively. Figure 18 shows how to display the results of a failed search (with zero results).

<p>Search Results</p> <p>No patient matches: Male, Chandrasek, 14-Jul-1968, W3 2TT</p> <p>Can't see patient you're looking for? Broaden search Start again? New search</p>
<p>Tips on searching</p> <ul style="list-style-type: none"> • Try using the sounds like option in Advanced search • Remove criteria from your search • Try using a range for date of birth in Advanced search

Figure 18: Example of Zero Results Found

2.4.2.1 Guidance

The search results page should:

- Display the user's original query
- Clearly indicate the results of the user's search
- Present suitable options to the user, such as broadening the search or starting again
 - These options should link to an appropriate search form with the relevant fields pre-populated
- Give the user practical tips on how to refine their search, such as using 'sounds-like' or a date of birth range
 - These tips should be linked so that the user can navigate to the appropriate form with the relevant option pre-selected

2.4.3 Confidence Level

- **High**
 - Display the number of matching records found
 - Display the user's original query
 - Offer options to refine the search or to start a new search
- **Medium**
 - Display a level of detail appropriate to the number of results
 - Where appropriate, offer access to tasks and actions, available for each patient record
 - Clearly indicate the results of the user's search
 - Give the user practical tips on how to refine the search, such as using 'sounds-like' or a date of birth range

This guidance is currently classified as 'Initial Guidance'. Further usability testing is expected and potential updates to the guidance may be completed following this usability testing.

2.4.4 Benefits and Rationale

Using the above approach to the presentation of search results will:

- Facilitate rapid location of the correct patient record
- Reduce the likelihood of selecting an incorrect patient record
- Allow the search results to be more easily sorted and manipulated
- Improve the efficiency of patient searching and reduce the number of failed searches

3 DOCUMENT INFORMATION

3.1 Terms and Abbreviations

Abbreviation	Definition
A&E	Accident and Emergency
CSA	Clinical Spine Application
GP	General Practitioner
IG	Information Governance
NHS	National Health Service
UI	User Interface

Table 1: Terms and Abbreviations

3.2 Nomenclature

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

All content subject to completion, agreement or verification is denoted with **highlighting**.

3.2.1 Body Text

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

Table 2: Body Text Styles

3.2.2 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 hyperlinked footnote

Table 3: Cross Reference Styles

3.3 References

Reference	Document	Version
R1.	Design Guidance – Patient Banner	1.0.0.0
R2.	Design Guidance – Date and Time Input	1.0.0.0
R3.	Design Guidance – Date Display	1.0.0.0
R4.	Design Guidance – Gender and Sex Display	1.0.0.0
R5.	Design Guidance – Patient Identification Number Display	1.0.0.0
R6.	Design Guidance – Address Information Display	1.0.0.0

Table 4: References