

NHS CUI Design Guide Workstream

Design Guide Entry – Date Display

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PREFACE

Documents replaced by this document

Document Title	Version
Design Guide Entry – Date Display	4.0.0.0
Design Guide Entry – Date Display	3.0.0.0
Design Guide Entry – Time Display	2.0.0.0
Date Display	1.0.0.0
Date and Time Release 4 Summary	1.0.0.0

Documents to be read in conjunction with this document

Document Title	Version
Design Guide Entry – Time Display	4.0.0.0
Design Guide Entry – Date and Time Input	3.0.0.0
Accessibility Checkpoints for NHS Applications	1.0.0.0
Accessibility for Clinical Applications	1.0.0.0

This document was prepared for NHS Connecting for Health which ceased to exist on 31 March 2013. It may contain references to organisations, projects and other initiatives which also no longer exist. If you have any questions relating to any such references, or to any other aspect of the content, please contact custakeholder.mailbox@hscic.gov.uk

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PATIENT SAFETY PROCESS

The development lifecycle for this design guide includes an integrated patient / clinical safety risk assessment and management process.

Known patient safety incidents relevant to this design guidance area have been researched and reviewed as part of ongoing development. The resulting guidance points aim to support mitigation of these known patient safety risks. In addition, the developers of this design guide have undertaken a patient safety risk assessment to identify new risks that could potentially be introduced by the guidance points in this document. Any potential risks identified have been assessed and managed to support the ongoing clinical safety case for this design guide.

The Hazard Log records all the risks that have been identified during development and describes mitigatory actions that, in some cases, will need to be taken by users of this design guide. The Hazard Log is a live document that is updated as the design guide is developed and maintained. Until this design guide has received full Clinical Authority to Release (CATR) from the NHS Connecting for Health (NHS CFH) Clinical Safety Group (CSG) – based on an approved Clinical Safety Case – there may be outstanding patient safety risks yet to be identified and mitigated.

Additionally, users implementing applications that follow this design guide's guidelines (for example, healthcare system suppliers) are expected to undertake further clinical safety risk assessments of their specific systems within their specific context of use.

Refer to www.cui.nhs.uk for further information on the patient safety process and for the safety status and any relevant accompanying safety documentation for this design guide.

1 INTRODUCTION

This document provides the design guidance for date display. It describes the area of focus, provides guidance and recommendations, and explains the rationale behind the guidance and recommendations.

This document is intended for the use of anyone whose role includes screen design, or the implementation or assessment of NHS clinical applications. This document can be used as guidance for the specification of display of dates within the user interface of a clinical application.

Modified	Adjusted the text within rationale to reflect D+Ta-0005 (section 2.1.2)
D+Ta-0005	Removed reference to right alignment – recommending alignment only without specifying left or right
Deleted	Reference to Approximate Time as in scope (section 1.2.1)
Added	Reference to Approximate Time as out of scope (section 1.2.2)

Table 1: Changes Since the Last Baseline Version describes the changes made since the previous version of this guidance (Baseline version 4.0.0.0 dated 24-Jun-2009):

Change	IDs	Change Description
Modified	Adjusted the text within rationale to reflect D+Ta-0005 (section 2.1.2)	
D+Ta-0005	Removed reference to right alignment – recommending alignment only without specifying left or right	
Deleted	Reference to Approximate Time as in scope (section 1.2.1)	
Added	Reference to Approximate Time as out of scope (section 1.2.2)	

1.1 Table 1: Changes Since the Last Baseline Version Customer Need

Unambiguous date display enhances patient safety and application usability by eliminating confusion between day, month and year elements. Displaying unambiguous dates is a core element in ensuring effective patient care. It is vital that healthcare professionals correctly interpret dates relating to patient demographics, clinical episodes and planned treatments, among others. Dates have several forms; they can be precise, approximate or be a date range. Currently, inconsistency and ambiguity of date display exists within the NHS and existing standards.

Inconsistency across systems

Clinical systems used within the NHS in England, across all care settings, differ in the way they display dates. Inherent within this is the risk that healthcare professionals moving between clinical systems made by different developers can misinterpret dates, potentially leading to patient safety incidents.

Unambiguous guidance

None of the existing standards provide an entirely unambiguous date display (see the World Wide Web Consortium (W3C[®]) **{R1}** and the Organization for Standardization (ISO) **{R2}**). For example, ISO stipulates that the day and month elements of a date are pairs of numerical values. This presents a risk of date misinterpretation by confusing month for day and vice versa. W3C reduces this ambiguity by using letters for the month, but it does not specify a format for long dates to compliment the short date format. The guidance in this document builds on these standards.

Reduce ambiguity for people brought up in different locales

Date display is locale-specific. Some examples are provided by the W3C Internationalisation work:

“Visitors to a web site from varying locales may be confused by date formats. The format MM/DD/YY is unique to the United States. Most of Europe uses DD/MM/YY. Japan uses YY/MM/DD. The separators may be slashes, dashes or periods. Some locales print leading zeroes, others suppress them. If a native Japanese speaker is reading a US English web page from a web site in Germany that contains the date 03/04/02 how do they interpret it?” {R3}

Healthcare professionals working within the NHS have been brought up and educated in a wide variety of locales, and hence are used to seeing dates in a wide variety of formats. The proportion of healthcare professionals to whom this applies is increasing. Considering the mixed NHS workforce using clinical systems displaying dates, there is a patient-safety concern, and therefore a pressing need, for the unambiguous display of dates.

1.2 Scope

1.2.1 In Scope

The guidance provided has been developed for all care settings. The scope of this guidance includes the display of single and precise dates. In addition, the scope includes considerations of patient safety, clinical utility and patient administration, all of which have been incorporated in the development of this guidance. Furthermore, this guidance has been developed for use in applications using the English language only.

1.2.2 Out of Scope

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

The following subject areas are not included within this guidance:

- **Date entry** – Guidance on entering dates is described in *Design Guide Entry – Date and Time Input {R4}*
- **Display of Approximate Dates** – This guidance only relates to the presentation of single and precise dates
- **Default dates** – This guidance only relates to the input of data and not to any default dates assumed by developers
- **Time** – This document only applies to the display of dates. Guidance on displaying time is described in *Design Guide Entry – Time Display {R5}*, and entering time is described in *Design Guide Entry – Date and Time Input {R4}*
- **Multi-language applications** – Languages that use right-to-left writing, Cyrillic lettering or ideograms such as Arabic, Russian and Japanese
- **Other languages** – Languages that require more than three letters to identify the month uniquely, for example, French which requires a four-letter abbreviation to distinguish between Juin (June) and Juillet (July)
- **Labels** – In addition to the date format, an important factor for clarity is the display of unambiguous and consistent labels for dates
- **Display styles** – Choice of display font size, background and foreground text colour will affect the readability of dates, as it will with all other displayed text. This document does not address general rules for text display

- **Data storage** – This guidance relates only to the display layer of a software application, and does not prescribe the way in which data values should be stored. It is assumed that all clinical applications will be capable of transforming a date stored in a standard format (for example, ISO) into the format prescribed by this guidance for display purposes, without error

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 Key Principles

The follow key principles are reflected in the guidance discussed in this document:

- Eliminate confusion between the month and day values
- Minimise the space required to display dates on a screen
- Maintain a reading pattern that is natural to users
- Eliminate opportunities for misinterpreting the date as representing some other data
- Promote consistency across NHS applications by defining a set of two permissible date formats

2 RECOMMENDATION AND GUIDANCE

NHS applications can display dates in two formats, short and long, depending on the context. Figure 1 and Figure 2 show examples of the recommended short date format and long date format respectively.

09-Sep-2008

Figure 1: Short Date Format

09 September 2008

Figure 2: Long Date Format

General guidance which is applicable irrespective of the chosen format is presented first, followed by the specific guidance for each format.

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.

2.1 General Date Display

In this section, general guidance is listed followed by the supporting rationale. This rationale supports the additional guidance described later in this document.

2.1.1 Guidance

ID	Guideline	Status
D+Ta-0002	Display the month textually, not numerically	Mandatory
D+Ta-0003	Display the month with only the first letter in capitals	Mandatory
D+Ta-0004	Display the year value numerically using four digits	Mandatory
D+Ta-0005	Align dates when displaying dates in a vertical column, such as in a table	Recommended
D+Ta-0016	When displaying the day of the week, use one of the following abbreviations: Mon, Tue, Wed, Thu, Fri, Sat and Sun	Recommended
D+Ta-0017	Displaying the day of the week is optional, but when displayed, it must be placed immediately before the day value, with a single space separating the permitted abbreviated form of the day, from the day value	Recommended
D+Ta-0022	Display null date using an appropriate value (for example, 'Unknown' or 'Not recorded')	Mandatory

Table 2: Guidance – Date Formatting

2.1.2 Rationale

Errors in interpreting dates correctly occur when individual elements, such as the day, month and year values, are represented numerically. Additionally, errors can occur when one element is mistaken for another element, such as between the day and month values. The main factors that a date display format must address are certainty (or removal of ambiguity), clarity and readability. The guidance proposed in this document aims to meet those factors by:

- **Certainty**
 - Providing certainty for the year element by enforcing a four-digit format
 - Providing certainty for the day element by inclusion of a leading zero
 - Removing ambiguity between the day and month elements through the use of words to represent the month
 - Providing confirmation of the date by showing the day of the week alongside it
- **Clarity**
 - Providing a clear distinction between elements through the inclusion of a single hyphen as a separator
 - Increasing clarity through the use of words to represent the month
- **Readability**
 - Providing a more comfortable user experience:
 - Through a natural reading pattern, and
 - By displaying month names where only the first letter is capitalised (for example, April and May), as studies have shown this to be the best readable form and uppercase (for example, APRIL and MAY) to be the least readable form

Numerous organisations have existing standards for displaying date information in applications. During the creation of this guidance, the following sources were consulted:

- International Standards Organization (ISO), standard ISO 8601:2004 **{R6}**
- World Wide Web Consortium (W3C), Dates and Time **{R3 and R7}**
- The European Union
- UK Government Data Standards Catalogue **{R8}**
- Microsoft[®] Corporation, Microsoft Manual of Style for Technical Publications, Third Edition **{R9}**

We have not adopted the ISO standard because it presents date elements in an unfamiliar sequence for users brought up in the UK, and allows ambiguity between date and month elements as both are represented numerically. We have taken the W3C standard as the basis for this guidance, but extended it by requiring the day element to be two digits, and for a separator to be provided between date elements.

The day of the week can be a useful item to have in a range of scenarios (such as, when scheduling appointments, arranging handover and so on) as it is a natural way for people to think about, and order, their commitments. Knowing the day of the week can help reduce the likelihood of a date being mis-interpreted. Additionally, the day of the week is more easily remembered by many people. These factors can contribute to greater efficiencies, therefore, the use of the day of the week is encouraged where appropriate. Examples where the day of the week is not relevant, and should not be displayed, are when displaying a patient's date of birth or date of death.

Guidance recommending the alignment of dates displayed in a tabular form is included to encourage consistency of data presentation and enhance readability when a user scans for example a list of dates. No guidance is included mandating or recommending specific alignment to the left or right because there is a need to give developers of clinical applications some flexibility in the design of their systems. If right alignment was mandatory it is recognised that certain data, for example months may not be perfectly aligned. This would not be an issue were monospaced fonts used.

2.2 Short Date Format

In all instances of clinical usage affecting patient treatment, including patient identification, NHS applications must display dates as short dates in the form DD-MMM-YYYY, where:

- DD is the two-digit day
- MMM is the correctly abbreviated month name
- YYYY is the four-digit year

Figure 3 shows examples of the recommended short date format.

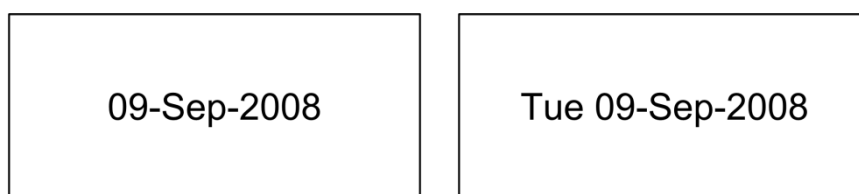


Figure 3: Short Date Format

2.2.1 Guidance

ID	Guideline	Status
D+Ta-0006	Display dates using the short date format in all instances of clinical usage affecting patient treatment, including patient identification	Mandatory
D+Ta-0018	Display the day value using two digits (values less than 10 should appear with a zero in the first position)	Mandatory
D+Ta-0007	Display the month as a three letter abbreviation: Jan, Feb, Mar, Apr, Jun, Jul, Aug, Sep, Oct, Nov, and Dec, with May being displayed in full	Mandatory
D+Ta-0008	When displaying the month, do not include any punctuation, such as a full stop	Mandatory
D+Ta-0009	Use a single hyphen to separate the day and month, and the month and year	Mandatory
D+Ta-0010	When using the short date format, ignore the user's regional settings	Mandatory

Table 3: Short Date Formatting Guidance

2.2.2 Examples of Correct Usage

Usage	Format	Examples	Comments
✓	DD-MMM-YYYY	01-Jan-2008 Tue 01-Jan-2008 28-Feb-2008 Thu 28-Feb-2008 05-Apr-2008 Sat 05-Apr-2008 31-Dec-2008 Wed 31-Dec-2008	The date is complete, clear, and unambiguous.

Table 4: Correct Date Formatting Examples

2.2.3 Examples of Incorrect Usage

Usage	Format	Examples	Comments
✗	D-MM-YY DD-MM-YYYY DD/MM/YYYY DD.MM.YYYY DD MM YYYY	8-04-08 08-04-2008 08/04/2008 08.04.2008 08 04 2008	Patient Safety Critical These examples lack certainty. The day and month elements are ambiguous causing confusion and a high chance of misinterpretation errors.
✗	D-MMM-YYYY DD-MMM-YY D-MMM-YY	8-Apr-2008 08-Apr-08 8-Apr-08	Lack of Completeness These examples lack clarity because the day and/or year elements do not display complete information.
✗	DD/MMM/YYYY DD.MMM.YYYY	08/Apr/2008 08.Apr.2008	Lack of Readability These examples lack readability because the separator is unlikely to be noticed.
✗	DD MMM YYYY	08 Apr 2008	Lack of Distinctiveness This example lacks clarity when displayed in a banner context with other data types, such as NHS Number. The following examples illustrate this issue: 401 023 2137 08 Apr 2008 08 Apr 2008 401 023 2137

Table 5: Incorrect Date Formatting Examples

2.2.4 Rationale

The short date format presents dates in a concise, easily readable and unambiguous form. This is achieved through inclusion of hyphen separators between day, month and year elements, and presentation of the month value as an abbreviated word except in the case of May. It must be used in all cases where the NHS application displays dates that affect patient treatment and identification. Examples of such dates are:

- Date of birth
- Medication 'start' and 'end' dates
- Appointment dates

Additionally, the short date format provides accessibility advantages:

- For screen magnification users, the short date format confers an advantage over the long date format by providing an unambiguous format within a smaller horizontal space
- For screen reader users, the format successfully distinguishes between day, month and year elements. The hyphen will cause no problems and may assist with the separation of the date elements. However, in the short date format, the majority of month names are read out in unambiguous syllables. Possible issues are caused by "Apr", because a clear syllable sound is not formed, while "Jun" and "Jul" generate similar sounds. Some screen readers (for example, JAWS) implement common pattern recognition to improve their renderings of standard date formats and understand Windows® settings for separators, but this behaviour is not standardised across readers and cannot be presumed

2.3 Long Date Format

NHS clinical applications must present dates in the long date format in all documents intended for a patient, such as, patient information leaflets, letters, consent forms, and appointment cards.

Figure 4 shows examples of the recommended long date format.



Figure 4: Long Date Format

2.3.1 Guidance

ID	Guideline	Status
D+Ta-0011	Use the long date format when communicating with the patient	Mandatory
D+Ta-0019	Display the day value using two digits (values less than 10 should appear with a zero in the first position, unless the day value is displayed in ordinal form)	Mandatory
D+Ta-0012	Display the month name in full	Mandatory
D+Ta-0013	Use a single whitespace to separate the day and month, and the month and year	Mandatory
D+Ta-0014	When using the long date format, follow the user's default regional settings ignoring any changes made by the user to these default settings	Mandatory
D+Ta-0015	Use the long date format when interacting with screen readers	Recommended
D+Ta-0020	When displaying the day value as an ordinal number, the suffix used must be one of the following: st, nd, rd, th	Mandatory
D+Ta-0021	When displaying the day value as an ordinal number, the two-letter suffix must be displayed in lower case and as a superscript immediately after the number	Mandatory

Table 6: Guidance – Long Date Formatting

2.3.2 Examples of Correct Usage

Usage	Format	Examples	Comments
✓	DD Month YYYY	01 January 2008 1 st January 2008 22 February 2008 22 nd February 2008 03 April 2008 3 rd April 2008 14 December 2008 14 th December 2008	The date is complete, clear, and unambiguous.

Table 7: Correct Date Formatting Examples

2.3.3 Examples of Incorrect Usage

Usage	Format	Examples	Comments
✗	DD MM YYYY DD-MM-YYYY DD/MM/YYYY DD.MM.YYYY DD MM YYYY	08 04 2008 08-04-2008 08/04/2008 08.04.2008 08 04 2008	Patient Safety Critical These examples lack certainty. The day and month elements are ambiguous causing confusion and a high chance of misinterpretation errors.
✗	D Month YYYY DD Month YY D Month YY	8 Apr 2008 08 April 08 8 Apr 08	Lack of Completeness These examples lack clarity because the day and/or year elements do not display complete information.
✗	DD/Month/YYYY DD.Month.YYYY	08/April/2008 08.April.2008	Lack of Readability These examples lack readability because the separator is unlikely to be noticed.
✗	DD MM YYYY	08th April 2008 2ND April 2008 1sT April 2008 23Rd April 2008	Patient Safety Critical These examples may be confused with medication. As the abbreviation is not in superscript form, the number may be misinterpreted as unit of measurement of a medication.

Table 8: Incorrect Date Formatting Examples

2.3.4 Rationale

In addition to the rationale described here, much of section 2.1.2 also applies.

When communicating with patients and other non-clinical readers, such as in notification letters for patients, a non-technical date format is appropriate. The need to eliminate ambiguity and maximise readability, remains. Furthermore, there is a need to ensure that the date format is understood correctly by people from all over the world. Regional settings may be used where, for example, a local community follows a language other than English. The long date format meets these requirements and must therefore be used in all communications with non-clinical readers.

The ordinal form of the date, in the long date format, is the form in which dates are spoken, and is commonly used when writing letters. It is also a format which modern word-processor software supports, for example, by automatically superscripting a suffix (such as “rd”) upon typing. We have considered whether or not the four suffixes used with numbers to create the ordinal form, can be confused for units of medications. The suffix “st” can be confused, as it can mean any of the following:

- ST – Sinus Tachycardia
- ST – Soft Tissue
- st - standing

However, this guidance mitigates the risk of misinterpretation, by requiring the suffix to be superscripted. Additionally, the ordinal will always be displayed alongside the name of a month, further minimising the risk of misinterpretation.

The long date format is the preferred format for screen reader users, because the month names are read out in their entirety. Screen readers may not read the ordinal number correctly, but their users are likely to be familiar with the form spoken by the reader, and will not be unduly confused.

3 DOCUMENT INFORMATION

3.1 Terms and Abbreviations

Abbreviation	Definition
CUI	Common User Interface
ISO	International Organization for Standardization
NHS	National Health Service
NHS CFH	NHS Connecting for Health
W3C	World Wide Web Consortium

Table 9: Terms and Abbreviations

3.2 Definitions

Term	Definition
NHS Entity	Within this document, defined as a single NHS organisation or group that is operated within a single technical infrastructure environment by a defined group of IT administrators.
The Authority	The organisation implementing the NHS National Programme for IT (currently NHS Connecting for Health).
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.

Table 10: Definitions

3.3 Nomenclature

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

3.3.1 Body Text

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

Table 11: Body Text Styles

3.3.2 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 hyperlinked footnote

Table 12: Cross Reference Styles

3.4 References

Reference	Document	Version
R1.	World Wide Web Consortium (W3C) http://www.w3.org	
R2.	International Organization for Standardization (ISO) http://www.iso.org	
R3.	World Wide Web Consortium (W3C) FAQ: Date formats http://www.w3.org/International/questions/qa-date-format	
R4.	NHS CUI Design Guide Workstream – Design Guide Entry – Date and Time Input	3.0.0.0
R5.	NHS CUI Design Guide Workstream – Design Guide Entry – Time Display	4.0.0.0
R6.	ISO 8601:2004 http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40874 (See also Numeric representation of Dates and Time – http://www.iso.org/iso/en/prods-services/popstds/datesandtime.html)	
R7.	World Wide Web Consortium (W3C): Dates and Time http://www.w3.org/International/O-time	
R8.	UK Government Data Standards Catalogue http://www.govtalk.gov.uk/gdsc/html/noframes/Date-1-0-Release.htm	
R9.	Microsoft Manual of Style for Technical Publications, Third Edition http://www.microsoft.com/mspress/books/6074.aspx	

Table 13: References

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