

# Truncation of Clinical Terms

## Design Consultation Document

*Prepared for*

**NHS Connecting for Health**

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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  
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# Executive Summary

## Problem

- Truncation of text is already widely used in information rich views in both non-clinical and clinical software
- Truncated clinical terms may be more prone to misinterpretation and mis-selection than terms displayed in full
- An assessment of the patient safety risks of alternatives to truncation is needed to inform future design decisions

## Scope

- This study focuses on truncation of the text of clinical terms displayed in a selection list, with a brief look at truncation of terms in a summary view

## Headline Findings

- Truncation of clinical terms should be avoided where possible
- Truncated clinical terms may introduce more patient safety risks than terms displayed in full
- In most cases, clinical terms should be displayed in full in a list with a vertical scroll bar
- Truncation may be relevant in specific contexts, types of information, tasks or views
- It is unlikely that a set of generic rules for truncation can be defined

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# Problem Statement

## Customer need

- Effectively display lists of clinical terms when UI space is limited
- Review the potential for generic guidance for the truncation of clinical terms in any context

## User experience goals

- Support the user task of selecting a clinical term from a list as part of the process of encoding
- Suggest mitigations for patient safety risks associated with hidden text and mis-selection in lists

# Scope Statement

## In Scope

- How to truncate coded clinical terms displayed in a selection list
  - Exploration and research limited to SNOMED CT®
- How to truncate coded clinical terms displayed in a list or table
  - Limited feedback based on evolving work in the Display of Clinical Statements Workstream
- How to access the full text of a truncated clinical term
  - Limited feedback based on evolving work in the Display of Clinical Statements Workstream

## Out of Scope

- Truncation of coded clinical terms in scenarios not listed above
- Truncation of user interface elements (such as menu items and window titles)
- Truncation of other information, such as medications (apart from those displayed as coded clinical terms), patient names and dates
- Truncation of non-encoded clinical terms
- Truncation of post coordinated coded clinical terms
- Using approved acronyms or abbreviations to shorten text
- Truncation of free text

# Process Overview

## Scoping and Research

- Review of *NHS CFH Rules for the Display of Coded Clinical Data*
- Review of truncation in a small number of clinical and non-clinical applications
- Review of NHS CFH analysis of SNOMED CT
- Review of UI principles for avoiding truncation

## Risk Assessments

- Preparation of scenario and design alternatives
- Reporting findings

## Design Exploration

- Design exploration for truncating in selection lists
- Design exploration for truncating in views that summarise clinical statements

## User Research

- Risk assessment of designs in interviews with six participants
- Reporting user research findings

# About this design consultation

The purpose of the document is to summarize the current learning that has been achieved in the design and research process to date. This is articulated primarily in terms of the features that comprise the preferred current design. These design features aggregate into seven themes.

For each theme we illustrate a few design points with images of the current design, plus an indication of some of the alternatives we have been considering. We then summarise the key design points, including some that haven't been illustrated, plus the rationale for choosing these points. We end each theme by outlining the proposed next steps and future exploration.

# Patient Safety Overview

The development lifecycle for this consultation document includes an integrated patient safety assessment and management process.

Known patient safety incidents relevant to this area have been researched and reviewed as part of ongoing development.

The Hazard Log records all the risks that have been identified during development and describes potential mitigatory actions that could be considered alongside future exploratory work in this area. The Hazard Log is a live document that will be updated as this area of work is developed further.

Until this work is progressed and developed to full design guide status it will not be in a position to achieve full Clinical Authority to Release (CATR) from the NHS Connecting for Health (CFH) Clinical Safety Group (CSG).

Please refer to [www.cui.nhs.uk](http://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 consultation document.

# **DESIGN EXPLORATION**

# Design Exploration

## Introduction

<b>Theme 1</b>	Avoiding the need for truncation
<b>Theme 2</b>	Truncation points
<b>Theme 3</b>	Fragmenting words
<b>Theme 4</b>	Dynamic versus static truncation
<b>Theme 5</b>	Truncation markers
<b>Theme 6</b>	Identical truncated terms
<b>Theme 7</b>	Access to full text for truncated terms

All illustrations use current SNOMED CT terms.

# Introduction – what is truncation?

In this document, the word ‘truncation’ is used to refer to the removal of a section of text in order to fit the remainder into a smaller space

Although this document focuses on truncation, the use of truncation must be compared to obscuring text and thus both are reviewed

## Truncated text

Emergency replacement of ... to common femoral artery  
Emergency replaceme... aorta to common femoral artery  
Emergency replacement of aneurysmal artery of leg b...  
Emergency replacement of aneurysmal art... common ...  
Emergency replacement of aneurysmal artery of ... artery

## Obscured text

Emergency replacement of aneurysmal artery of leg by a  
Emergency replacement of aneurysmal artery of leg by a  
Emergency replacement of aneurysmal artery of leg by a  
Emergency replacement of aneurysmal artery of leg by a  
Em.repl. of aneurysmal artery of leg by anastomosis of a  
Em.repl: aneurysmal artery (leg) by anastomosis of aorta  
Em.repl: aneurysmal artery (leg) by anastomosis of aorta

# Introduction – truncation in non-clinical applications

Truncation is widely used in both clinical and non-clinical applications  
Text is truncated at the end or in the (approximate or exact) ‘middle’  
depending on context

The image shows two side-by-side examples of truncation. On the left, a file explorer window displays a list of documents. Many file names are truncated in the middle, such as 'CAPS-R6-002 Desig...', 'Design Exploration List View 080924.pdf', and 'Design Guidance - Medication Line.pdf'. On the right, an email inbox shows a list of messages. The subject lines are truncated at the end, such as 'Truncation Kick Off Meeting ...', 'can you send me your deck s...', and 'RE: ORA for Truncation'.

From	Subject	Date	Size
chrock	Truncation Kick Off Meeting ...	Mon 26/10/2009 16:45	63 KB
chrock	can you send me your deck s...	Mon 26/10/2009 16:35	8 KB
inn-Pace (...)	RE: ORA for Truncation	Mon 26/10/2009 16:24	13 KB
chrock	ORA for Truncation	Mon 26/10/2009 16:16	11 KB
Grayson	RE: S&P - Wrapping behavio...	Mon 26/10/2009 14:49	214...
fiths (Intl ...)	RE: S&P - Wrapping behavio...	Mon 26/10/2009 14:47	210...
Grayson	RE: S&P - Wrapping behavio...	Mon 26/10/2009 14:18	192...
fiths (Intl ...)	S&P - Wrapping behaviour	Mon 26/10/2009 14:16	191...
rkham	Search and Prescribe sample...	Mon 26/10/2009 13:39	17 KB
fiths (Intl ...)	RE: S&P drug data - Is HPV ...	Mon 26/10/2009 13:32	45 KB

A list of files truncated in the ‘middle’

A list of emails truncated at the end

Truncation of text is generally used when text is limited to single lines in dynamic width spaces so the truncated text changes as the width is changed. Words are usually fragmented to make best use of the available space

# Introduction – truncation in clinical applications

Truncation is a popular solution to solving the need to display long terms in information-rich views, especially when that information is presented in tabular form

Truncated Text with an Ellipsis

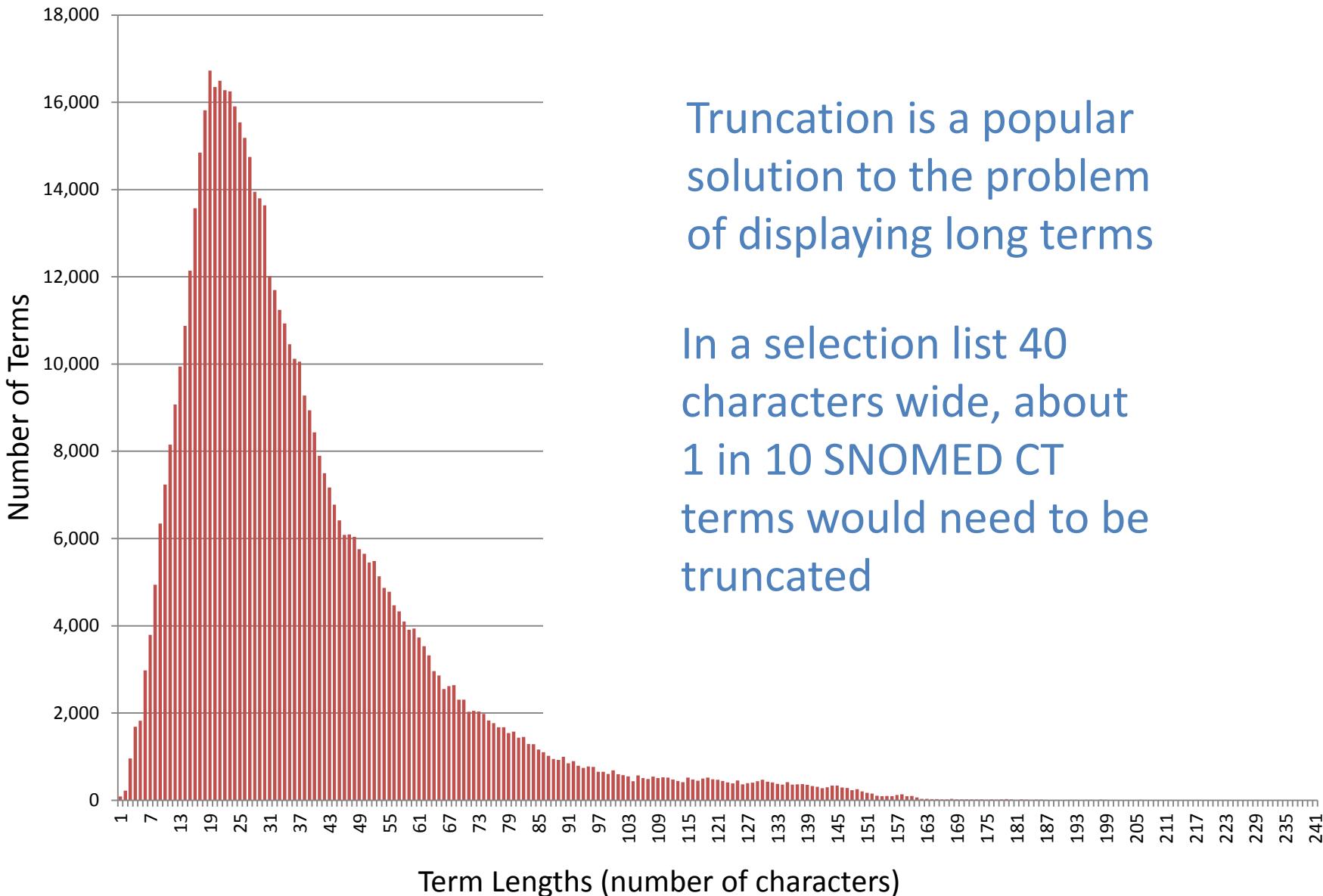
The screenshot illustrates a clinical application interface with several examples of truncation:

- Code List:** A table showing medical codes and descriptions. The description for code 11041 is truncated at the end.
- Result Status:** A table showing results with truncated subject names and status.
- Subject:** A list of diseases starting with "Diseases of the blood and blood-forming orga".
- Abnormal:** A list of diseases starting with "Endocrine, nutritional and metabolic diseases".
- Status:** A list of diseases starting with "Mental and behavioural disorders".
- Result Type:** A table showing results with truncated descriptions.
- Description:** A list of medications starting with "RANITIDINE 150 mg Tablets".

Annotations provide additional context:

- Terms cut short by the edge of the list:** Points to the truncated descriptions in the Result Type and Description tables.
- Horizontal and Vertical Scroll Bars:** Points to the scroll bars on the right and bottom of the disease lists.
- Truncation of medications:** Points to the truncated medication names in the Description table.

# Introduction – lengths of SNOMED CT terms



Truncation is a popular solution to the problem of displaying long terms

In a selection list 40 characters wide, about 1 in 10 SNOMED CT terms would need to be truncated

Theme 1

# **AVOIDING** the need for **TRUNCATION**

# Avoiding the need for truncation – wrapping

Wrapping ensures that all items are displayed in full. If each item in a list can be scrolled into view so that the whole term is visible, then each term can be reviewed easily before a selection is made

Subarachnoid haemorrhage following injury with open intracranial wound, with less than 1 hour loss of consciousness

Subarachnoid haemorrhage following injury with open intracranial wound, with more than 24 hours loss of consciousness and return to pre-existing conscious level

Subarachnoid haemorrhage following injury with open intracranial wound, with more than 24 hours loss of consciousness without return to pre-existing conscious

“ You could select from this list without needing to [click on one to] review the full term ”

User Comment

“ When SNOMED terms are long, there’s all the more reason to see them in full ”

User Comment

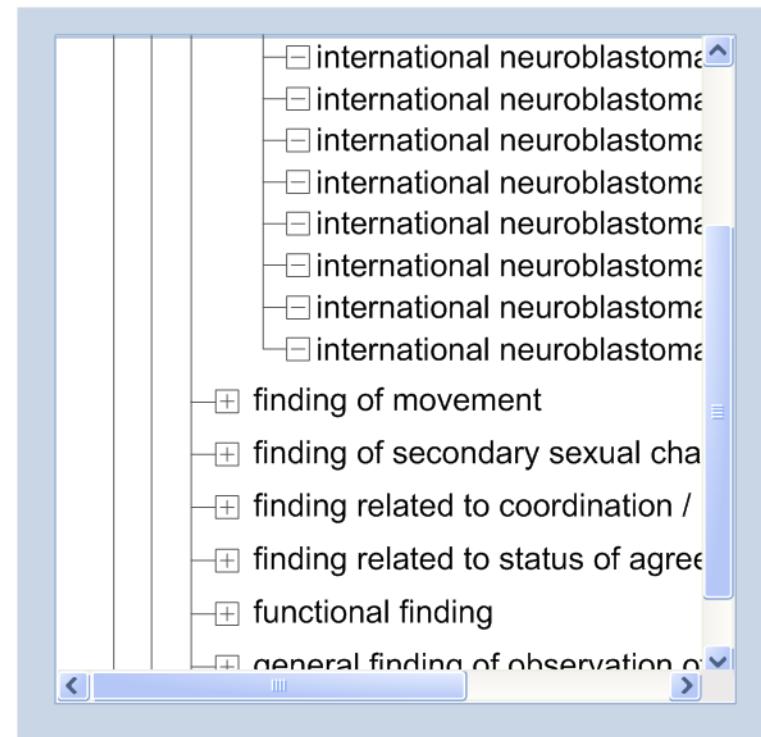
## Patient Safety Risks

Many of the patient safety risks that were recorded for truncation of terms in a selection list can be mitigated by wrapping text and providing a vertical scroll bar

# Avoiding the need for truncation – scrolling

Truncation of clinical terms may not be appropriate for some tasks. For example, when the task is browsing (rather than searching for a known term), the list may be presented as a tree

Truncation makes it difficult to browse items in a tree



When browsing a tree, a horizontal scroll bar may be more appropriate (than truncation) since it provides more immediate access to full terms

# Avoiding the need for truncation – grouping

Groups help to break the list down into smaller chunks and reduce the number of list items that need to be reviewed

Accidental poisoning

**Accidental Poisoning – Carbon Monoxide – Domestic**

by **carbon monoxide** from incomplete combustion of coal in domestic stove or fireplace

by **carbon monoxide** from incomplete combustion of coke in domestic stove or fireplace

by **carbon monoxide** from incomplete combustion of wood in domestic stove or fireplace

by **carbon monoxide** from incomplete combustion of kerosene or paraffin in domestic stove or fireplace

**Accidental Poisoning – Carbon Monoxide – Industrial**

by **carbon monoxide** from incomplete combustion of fuels in industrial use

by **carbon monoxide** from incomplete combustion of piped gas

When a group represents a matched phrase (in the search criteria), the group name can be omitted from the results so that differentiating phrases remain

diabetes monitoring

**Diabetes monitoring**

... deleted  
... default  
... invitation  
... call  
... check done  
... telephone invite  
... verbal invite  
... second letter  
... third letter  
... first letter  
Attends ...  
Refuses ...

**Diabetes self-monitoring**

... health education

# Avoiding the need for truncation

## Summary

1. Wrapping
  - a) Ensures that all items are displayed in full (with the help of a vertical scroll bar)
  - b) When long words wrap, it can create a lot of unused space on the right of the text
  - c) When wrapping, rules may be needed to keep associated elements such as numbers and units together
2. If summaries can be created that are meaningful, it may be possible to provide higher level summary views that can then be used to drill down a subset of the detail that can then be displayed in full (without truncation)
3. Approved acronyms and abbreviations can be used to shorten some structured text entries
4. Groups add structure and can be used to hide the text in each list item that is implied by the group it is in
5. Modifying search processes and supporting filtering may help users to work with shorter lists in which truncation is not necessary
6. Showing or hiding certain types of information (or labels in a chart view) may simplify the view and leave more room for other information to be displayed with minimum truncation

# Avoiding the need for truncation

Emerging Recommendations	Evidence
Use truncation as a last resort and only when truncated terms are the exception rather than the rule	<ul style="list-style-type: none"><li>• Tasks associated with both summary views and selection lists are not well supported when truncation of terms is a common occurrence</li><li>• There are many patient safety risks (such as misinterpretation and missing the presence of truncated text) associated with the interpretation of truncated terms</li></ul>
When wrapping encoded text ensure that elements such as labels, numbers, units and separators are kept together where necessary	<ul style="list-style-type: none"><li>• When wrapping separates quantities (100) from units (milligrams), there is a risk that, in skim reading, the wrapped text is guessed rather than actively read. Preserving them together mitigates this risk</li><li>• <i>The completion of further work in this area may generate a set of more specific recommendations</i></li></ul>

**Note:** Emerging recommendations are at many levels (some high level and generic, others more detailed) and include more than one (mutually exclusive) approach. They need significant further design, research and risk assessment before they can be considered as candidates for future guidance

# Avoiding the need for truncation

Emerging Recommendations	Evidence
Do not wrap mid-word (thus creating word fragments with or without hyphens)	<ul style="list-style-type: none"><li>Hyphenating words that are not usually hyphenated may create fragments that can be misinterpreted as whole words</li><li>As above, the wrapped part of a hyphenated word may be guessed by the user rather than actively read</li><li><i>The completion of further work in this area may identify the need for a technical solution to prevent applications from taking hyphens as wrapping points by default</i></li></ul>
If a list can include items that are too long to be displayed in full without scrolling, allow the list to be resized so that it is possible to see the longest term without scrolling	<ul style="list-style-type: none"><li>The task of selecting from a list is not well supported if rapid scrolling is needed and list items must be held in short term memory in order to compare between them and make an appropriate selection</li></ul>

# Avoiding the need for truncation

Emerging Recommendations	Evidence
Do not provide a horizontal scroll bar in selection lists unless the list can be resized to display all terms in full	<ul style="list-style-type: none"><li>The task of selecting from a list is not well supported if rapid scrolling is needed and list items must be held in short term memory in order to compare between them and make an appropriate selection</li><li>Horizontal scrolling does not allow a list to be scrolled so that a list item is visible in full</li><li>Comparing list items is more difficult with a horizontal scroll bar unless the differentiating text is at the end of each term</li><li>Horizontal scrolling is a more complex mechanical interaction than vertical scrolling when a mouse with a scroll wheel is used</li></ul>

## Areas / questions for further study

- If truncation is being considered, is the design solution the best way of supporting the user task?
  - For example, if truncation is being considered for selection lists of clinical terms, is a selection list the best mechanism for making that selection?
- In which contexts is truncated information sufficiently meaningful to support the tasks of searching and selecting an appropriate term or reviewing a patient using summary views?
- There may be some contexts in which truncation is appropriate only for expert users or certain roles and should be avoided for novice users or for other roles
- If groups are used in search results, more work is needed to determine whether the structure of the results should be manually-defined or influenced by the search criteria
- *Emerging recommendations can be used to inform further work on avoiding the need for truncation*

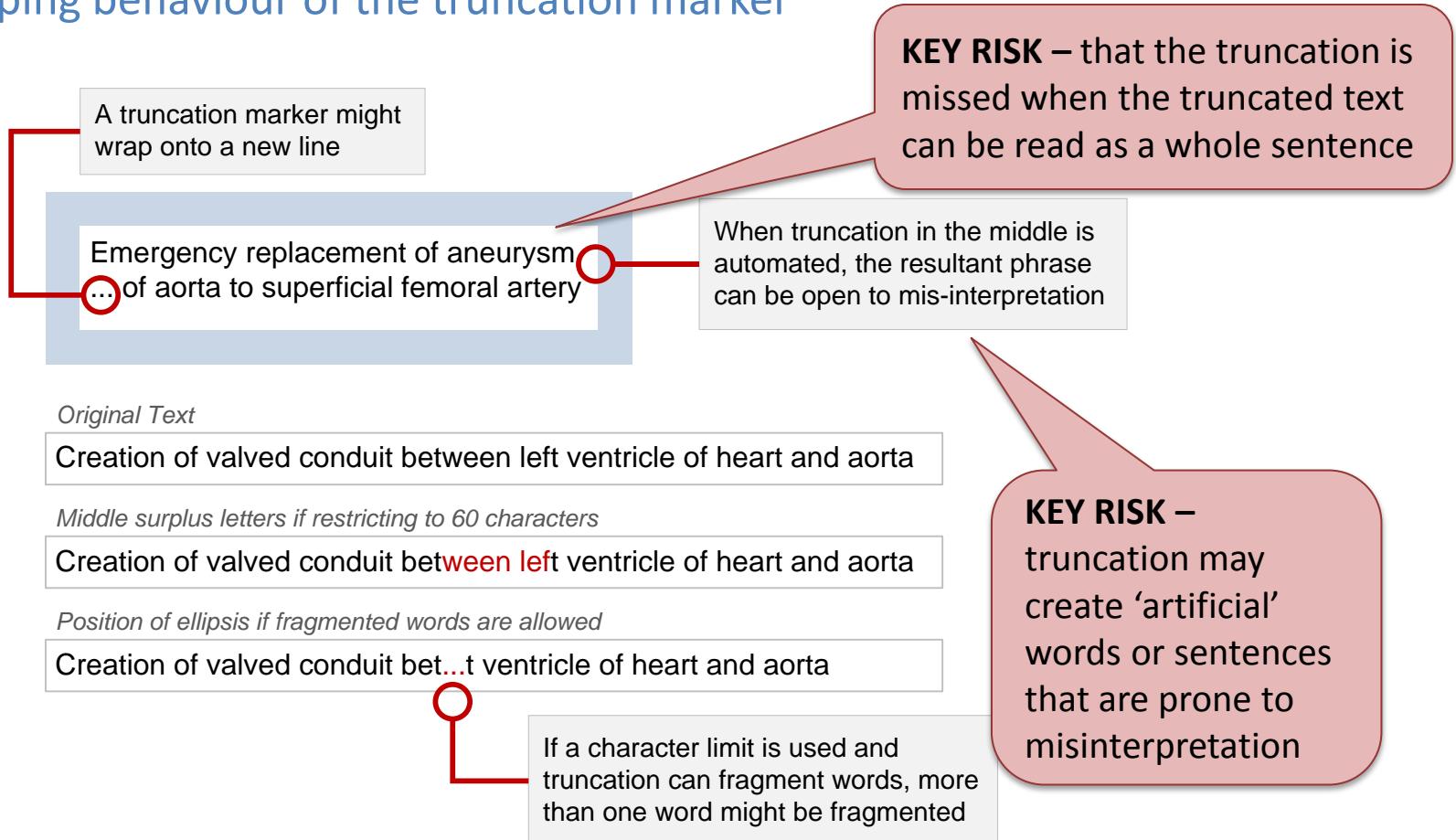
Theme 2

# TRUNCATION POINTS

If truncation cannot be avoided, where should text truncate?

# Truncation points – risks

Truncating in the ‘middle’ may create ‘artificially meaningful’ sentences, cause more than one fragmented word and / or affect the space and wrapping behaviour of the truncation marker



# Truncation points – visibility

Truncating at the end is potentially easier to notice and a truncation point at the end is more consistently placed (visually) than a truncation point in the ‘middle’. However, truncation in the ‘middle’ may be more effective and easier to notice when each item is limited to a single line

**KEY RISK** – the presence of truncation may be missed

Creation of valved cardiac conduit
Revision of valved cardiac conduit
Creation of valved cardiac conduit NOS
Other specified creation of valved cardiac conduit
Creation of valved cond... right atrium and pulmonary artery
Creation of valved conduit be... atrium and ventricle of heart
Correction of tetralogy of Fall...ht ventricular outflow conduit
Creation of valved conduit bet... ventricle of heart and aorta
Creation of valved conduit be...f heart and pulmonary artery

Creation of valved cardiac conduit
Revision of valved cardiac conduit
Creation of valved cardiac conduit NOS
Other specified creation of valved cardiac conduit
Creation of valved con... right atrium and pulmonary artery
Creation of valved conduit b... atrium and ventricle of heart
Correction of tetralogy of Fa...t ventricular outflow conduit
Creation of valved conduit be...ntricle of heart and aorta
Creation of valved conduit b... heart and pulmonary artery

# Truncation points – manually-defined truncation

A set of manually defined truncation points (defined for each term) could ensure that clinical terms are always truncated in acceptable places and that phrases are preserved where necessary

“ ...it may be appropriate to truncate the middle of some terms and the ends of others ”

User Comment

“ Consider using SNOMED’s hierarchy (or logical model) to determine what can and can’t be truncated and potentially where to truncate ”

User Comment

Emergency replacement of aneurysmal artery of leg ... to common femoral artery

Emergency replacement of aneurysmal artery...to superficial femoral artery

When these examples are created manually, it's natural to preserve phrases but how does a computer know where to truncate?

# Truncation points – summary views

A summary view (containing clinical terms) is not effective if the information within it is truncated

## History of Current Condition

Weight loss Weight loss 5 kilograms in 1 month

Diarrhoea Diarrhoea 5 times in one day. Liquid green. No ...

Shortness of breath Shortness of breath more than usual for ...

## Past Medical History

MI – Myocardial infarction – *known absent*, past; Stroke - ...

Epilepsy – *known absent*, past; Rheumatic fever – *known ...*

## Family History

Cancer – *known absent*, person in the family No cancer

MI – Myocardial infarction, father, died Father died of MI ...

## Past Surgical History

Joint injury, Open reduction, Internal fixation 1997 – L ...

“ Truncation is not effective when used in a view that is intended to be a summary”

User Comment

**KEY RISK** – that truncation leads to apparent duplication and is assumed to be an error

**KEY RISK** – that the missing information is interpreted as unimportant, or assumptions are made about the missing text

# Truncation points – numbers and units

Numbers may be separated from associated units when wrapping or truncation is used

When truncation allows numbers to be fragmented,  
a number may be missing one or more digits

Hind brain contusion with open intracranial wound, with 1-24 hours loss of consciousness

Hind brain contusion with open intracranial wound, with 1-2...

If numbers are fragmented, the result  
may be open to misinterpretation

**KEY RISK** – that  
truncating numbers or  
units could completely  
change the meaning

# Truncation points

## Summary

1. Preserving phrases is difficult to do automatically
2. Fixed character limit
  - a) Can create an artificially large space after the point of truncation
  - b) Not likely to make the best use of the available space
  - c) Could be used to ensure consistent truncation in different contexts but likely to introduce problems in a context where the character limit is less suitable
3. Truncating at the end
  - a) Is potentially easier to notice
  - b) A truncation point at the end is more consistently placed (visually) than a truncation point in the ‘middle’ (wrapping rules and whole word or fragmented words)
4. Truncating in the ‘middle’
  - a) May create ‘artificially meaningful’ sentences
  - b) May create more than one fragmented word and affects the space and wrapping behaviour of the truncation marker
  - c) May be more effective when limiting to a single line
5. More than one truncation point (in a single term or text item)
  - a) May allow phrases or differentiating words to be maintained in view
  - b) Requires sophisticated logic and is more difficult to achieve with a dynamic truncation point
6. A set of approved, manually-defined truncation points could ensure that terms are always truncated in acceptable (and expected) places

# Truncation points

Emerging Recommendations	Evidence
Do not truncate clinical terms when they appear in a list of fixed-width	<ul style="list-style-type: none"><li>When a width is fixed, a solution is needed to support access to the full text for truncated terms</li><li>A fixed-width list cannot be resized (even temporarily) to reveal the truncated text</li><li>Any solution for accessing the full text of a truncated term is likely to be even less direct (and effective) than scrolling</li></ul>
Only use truncation in a selection list of clinical terms if the choice of text to truncate is informed by the data structure or a manually defined means of selecting acceptable text to truncate is available	<ul style="list-style-type: none"><li>If truncation can be used in a way that supports accurate review of a list without accessing the full text, then some of the patient safety risks associated with truncated text are mitigated</li></ul>

# Truncation points

Emerging Recommendations	Evidence
Only use 'middle truncation' when text is limited to a single line	<ul style="list-style-type: none"><li>• 'Middle' truncation is used effectively in non-clinical contexts and is therefore likely to be effective in some clinical contexts (depending on the nature of the information)</li><li>• 'Middle' truncation may be the best approach for summary views that display information in which the end of the text is known to be the likely differentiator and no actions can be completed on the truncated text that are unsafe</li><li>• <i>The completion of further work in this area may generate exceptions to this rule, such as 'don't use 'middle' truncation for clinical terms'</i></li></ul>

## Areas / questions for further study

- Determining when to use truncation and where to truncate may be dependent on an analysis of the specific type of information subject to truncation
- *Emerging recommendations can be used to inform further work on truncation points*

Theme 3

# **FRAGMENTING WORDS**

# Fragmenting words – dynamic width

Fragmenting words works best with dynamic truncation – since the truncation point can move one letter at a time as a text area is resized

**KEY RISK** - that a word fragment is interpreted as a whole word

Peak expiratory flow rate monitoring usin...  
Peak expiratory flow rate before bronchod...  
Peak expiratory flow rate after bronchodil...  
Empey index  
Serial peak expiratory flow rate  
Peak expiratory flow rate

Fragmenting words works better when text is displayed in an area that can be resized and truncated at the end of a line

Peak expiratory flow rate mo...  
Peak expiratory flow rate bef...  
Peak expiratory flow rate aft...  
Empey index  
Serial peak expiratory flow r...  
Peak expiratory flow rate

Drag & Resize

A fragmented word may be more noticeable than truncated text in which whole words are preserved

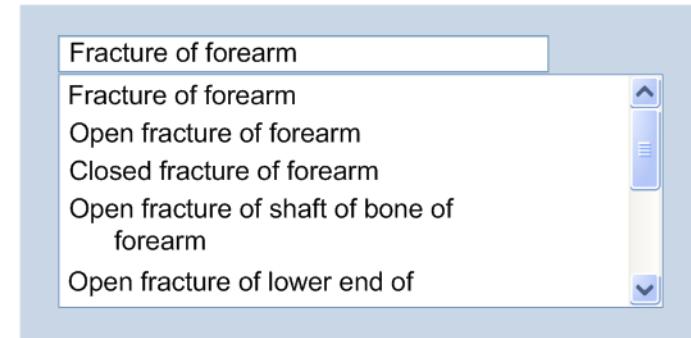
# Fragmenting words – contexts

Truncation rules may need to be different depending on the context since it may be acceptable or even necessary to fragment words in some contexts

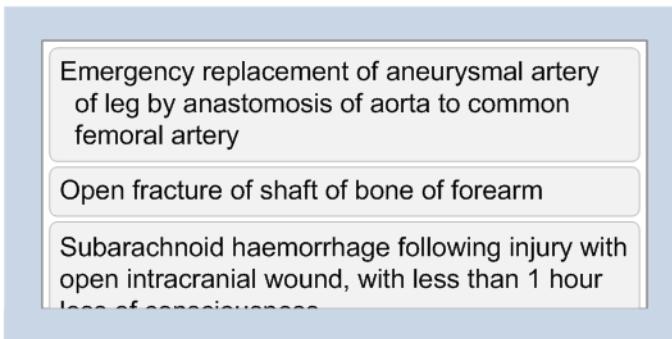
## Tables

Col 1	Col 2	Col 3
12-Oct-2009	Emergency replacement of aneurysmal artery of leg by ...	Dr JH
17-Jul-2005	Open fracture of shaft of bone of forearm	Dr PA
09-Jul-2005	Accidental poisoning by carbon monoxide from incomplete ...	Mr CJD

## Selection Boxes



## Text - Lists and Journals



## Timelines and Charts



# Fragmenting words

## Summary

1. Fragmenting words works best with dynamic truncation because the truncation point can move one letter at a time as a text area is resized and more of the text is visible than when a whole word is truncated at a time
2. A fragmented word may be more noticeable than truncated text in which whole words are preserved
3. A fragmented word might look like a whole word. Similarly, fragmented numbers may be interpreted as whole when it is missing one or more digits
4. Hyphenation can be used to maximise the quantity of text that can be displayed on each line but creates fragmented words
5. When words are preserved, there may be greater space at the end of truncated text
6. In views (such as a timeline, chart or graph) where text cannot wrap onto a new line, it may be more appropriate to truncate and to fragment words in order to preserve as much visible text as possible

# Fragmenting words

Emerging Recommendations	Evidence
Do not truncate such that characters or digits are missing from numbers or units	<ul style="list-style-type: none"><li>• Removal of digits from numbers creates new numbers</li><li>• Separation of numbers from units may lead to the units being guessed</li><li>• Truncation of a unit (such as millilitres) may create or imply a different unit (such as mill... or ...litres)</li></ul>
Do not fragment words when truncating text that is displayed in a fixed-width area	<ul style="list-style-type: none"><li>• For similar reasons that clinical terms should not be truncated in fixed-width lists. Ease of access to the full term is important here</li></ul>

## Areas / questions for further study

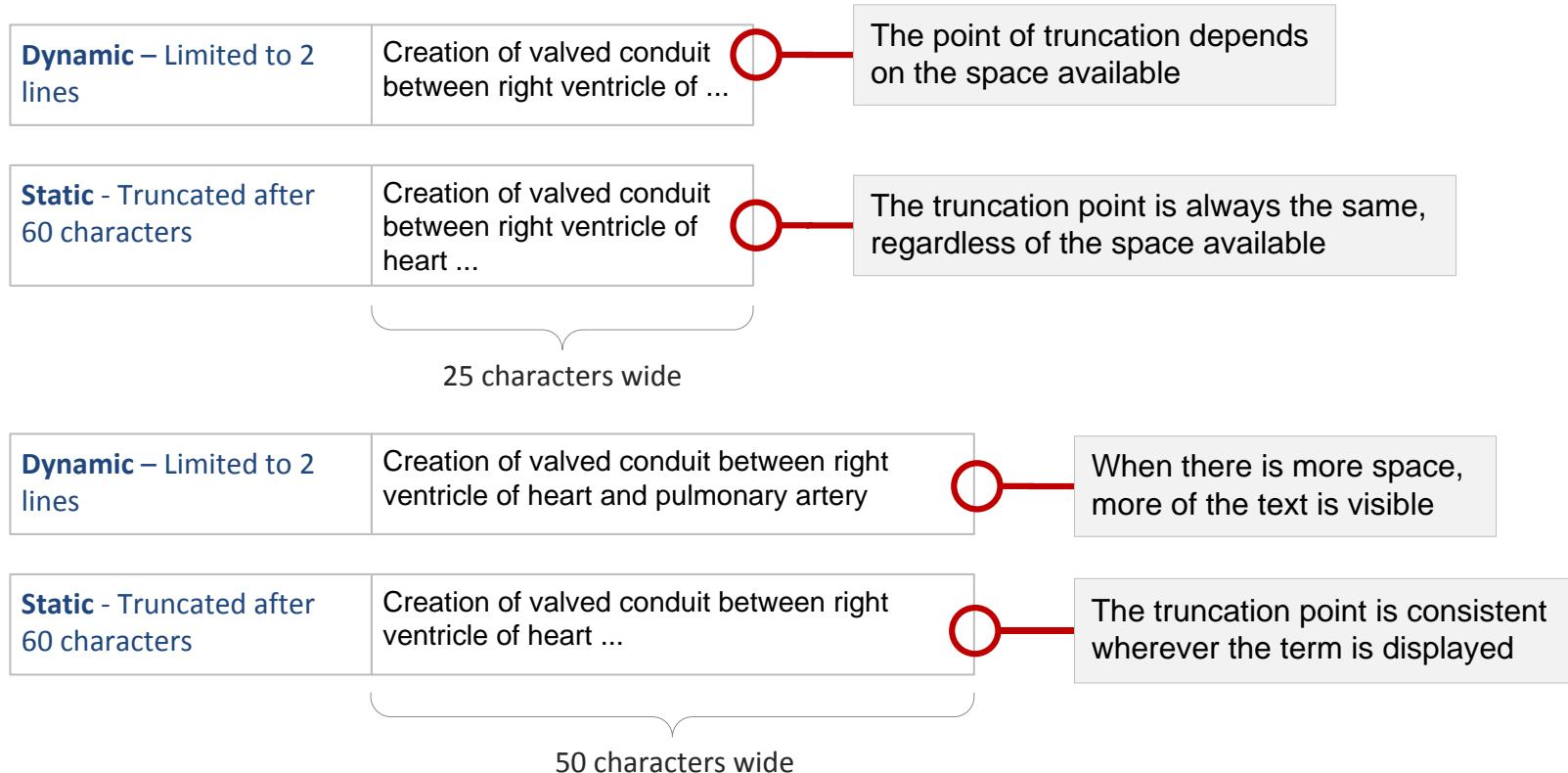
- *Emerging recommendations can be used to inform further work on fragmenting words*

Theme 4

# **DYNAMIC versus STATIC TRUNCATION**

# Dynamic versus static truncation

When truncation is dynamic, the truncation point depends on the space available to display the text. When truncation is static, each term is always truncated at the same point in the text, regardless of the space available



# Dynamic versus static truncation

When a space has fixed dimensions, the text will always be truncated at the same point

Creation of valved conduit  
between left ventricle of  
heart ...

Emergency replacement of  
aneurysmal artery of leg  
by ...

When text is truncated after a  
set number of characters, the  
same words are missing  
regardless of the space in  
which the text is displayed

Creation of valved conduit between left  
ventricle of heart ...

Emergency replacement of aneurysmal  
artery of leg by ...

**KEY RISK** - that a clinician familiar  
with truncation in a specific view,  
is disoriented when working with  
a different screen layout

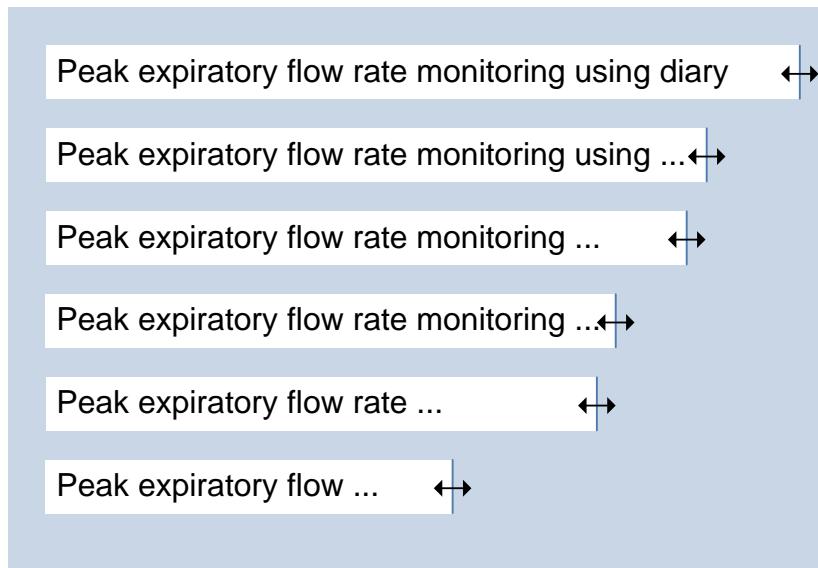
valved conduit

Creation of valved cardiac conduit  
Revision of valved cardiac conduit  
Creation of valved cardiac conduit NOS  
Other specified creation of valved  
cardiac conduit  
Creation of valved conduit between  
right atrium and pulmonary artery  
Creation of valved conduit between  
atrium and ventricle of heart  
Correction of tetralogy of Fallot using  
valved right ventricular outflow ...  
Creation of valved conduit between left  
ventricle of heart and aorta  
Creation of valved conduit between  
right ventricle of heart and ...

When text is displayed in a static width space,  
it will always be truncated in the same place

# Dynamic versus static truncation

If the width of a selection list can be changed, it may be possible to increase the width until none of the items are truncated. When words can be fragmented, resizing may appear smooth as the text is truncated one letter at a time. Truncating whilst preserving whole words causes whole words to disappear when a width is reduced



# Dynamic versus static truncation

## Summary

1. When using static truncation, such as truncating after a fixed number of characters
  - a) If an area is a set size, the truncation point will always be the same
  - b) Truncation after a set number of characters may leave a lot of white space (thus not making full use of the available space)
  - c) It may be easier to use more sophisticated methods of indicating truncation when the truncation point is static, since the location of the point at which the text is truncated is more predictable
2. When using dynamic truncation, such as number of lines to wrap in a variable width space
  - a) Truncating whole words might create a jerkiness as words are replaced with the truncation marker
  - b) It is more difficult to draw attention to apparent duplicates or text that is open to misinterpretation as a result of the truncation because the truncation point (and thus whether it is duplicated or not) changes
  - c) When truncating within cells, applying truncation to one column may not make best use of space if truncation is not also applied in other columns
  - d) Using a single line limit with a variable width makes it easier to scan a list but it is less effective for selecting from a list when a large number of list items are truncated

# Dynamic versus static truncation

Emerging Recommendations	Evidence
Do not use a set number of characters as a rule for determining an appropriate truncation point	<ul style="list-style-type: none"><li>A set number of characters is likely to be appropriate to a specific context. Since one of the benefits of using a set truncation point is consistency, it becomes irrelevant if the chosen point is not effective in all contexts</li></ul>
Do not provide a horizontal scroll bar for a view containing terms that are truncated at a set point	<ul style="list-style-type: none"><li>If it is possible to scroll so that the point of truncation is off screen, it is more likely that a truncated term is misinterpreted as being whole</li></ul>

# Dynamic versus static truncation

## Areas / questions for further study

- *Emerging recommendations can be used to inform further work on dynamic versus static truncation*

Theme 5

# **TRUNCATION MARKERS**

# Truncation markers

Text markers can be placed at the point of truncation and may be easier to implement than icons or images. Some text markers could be misread as letters or numbers

Creation of valved conduit between right atrium and pulmo /  
Creation of valved conduit between atrium and ventricle o /  
Correction of tetralogy of Fallot using valved right ventricul /  
Creation of valved conduit between left ventricle of heart a /

Text markers such as “/” or “>” may be easier to notice than an ellipsis but may also be misinterpreted as letters or numbers

Creation of valved conduit between right atrium and pulm...  
Creation of valved conduit between atrium and ventricle ...  
Correction of tetralogy of Fallot using valved right ventric...  
Creation of valved conduit between left ventricle of heart ...

Text markers, such as this ellipsis, can be placed at the point of truncation and will move with the text if the line wraps

**KEY RISK** - that lack of familiarity with the concept of truncation affects the term that is selected

# Truncation markers

A sequence of text characters, such as '... >>' or '\* ... /' may be easier to notice than a text marker such as an ellipsis '...'

Creation of valved conduit between left ventricle of ...
Creation of valved conduit between left ventricle of ...
Creation of valved conduit between left ventricle of ...
Creation of valved conduit between left ventricle of ... >>
Creation of valved conduit between left ventricle of ...
Creation of valved conduit between left ventricle of /
Creation of valved conduit between left ventricle of *...*
Creation of valved conduit between left ventricle of ... /
Creation of valved conduit between left ventricle of ... >>

" The greater than character is used in some SNOMED codes "

User Comment

**KEY RISK –** that some characters are misread as letters or numbers

**KEY RISK –** that the truncation is not noticed

valved conduit
Creation of valved cardiac conduit
Revision of valved cardiac conduit
Creation of valved cardiac conduit NOS
Other specified creation of valved cardiac conduit
Creation of valved conduit between right atrium and pulmonary artery
Creation of valved conduit between atrium and ventricle of heart
Correction of tetralogy of Fallot using valved right ventricular outflow ... /
Creation of valved conduit between left ventricle of heart and aorta
Creation of valved conduit between right ventricle of heart and ... /

Symbols, icons or controls may be more noticeable than an ellipsis  
They may also take up more space (so more text has to be truncated)

# Truncation markers

Icons or controls may distract too much from the text itself, especially if there are many of them in one view

13-Oct-2009	1 day diarrhoea. Liquid ... 	History of current condition ... 	13-Oct-2009 Dr Sophie Allen
	Shortness of breath ... 	History of current condition ... 	13-Oct-2009 Dr Sophie Allen
	No haemoptysis	History of current condition ... 	13-Oct-2009 Dr Sophie Allen
Past	No history of MI/ Stroke/ ... 	Past medical history Known absent: Epilepsy	13-Oct-2009 Dr Sophie Allen
	Mild aortic stenosis	Past medical history Aortic stenosis - Mild	13-Oct-2009 Dr Sophie Allen
	No cancer	Family history Known absent: ... 	13-Oct-2009 Dr Sophie Allen
2008 (calculated)	Father died of MI aged 55	Family history Known present: ... 	13-Oct-2009 Dr Sophie Allen
1997	L index finger, PIP joint ... 	Past surgical history Joint injury, Open ... 	02-Feb-2007 Dr Tim Smith

# Truncation markers

Markers can be placed at the point where text is truncated or in association with the text item

The ellipsis can be placed at the point where text is truncated

A marker may also be placed such that it is associated with the text but not part of it

13-Jun-2008	international neuroblastoma pathology classification: Favourable histology ...	13-Oct-2009 Dr Sophie Allen
13-Nov-1997	emergency replacement of aneurysmal bifurcation of aorta by anastomosis ...	16-Jan-1999 Dr Sophie Allen
13-Jan-1990	open fracture of forearm, lower end, unspecified	16-Jan-2009 Dr Sophie Allen
13-Oct-1987	pancreatic stone	13-Oct-1987 Dr Sophie Allen

# Truncation markers

## Summary

### 1. Text markers:

- a) Ellipses are used in typography to mark omission from speech or writing of a word or words that are superfluous or able to be understood from the context. It is also the term for a set of dots (...) used to indicate such an omission
- b) A text marker may be easier to implement and to place at the point of truncation than an icon or control
- c) Text markers, such as '>>' or '/', may be easier to notice than '...' but may also be misinterpreted or mistaken for text
- d) A sequence of text characters, such as '\*...\*' or '/ ... /', may be easier to notice than a single character such as the ellipsis '...'
- e) Bold or colourful truncation markers may draw attention away from the text
- f) Placing a space between the text and truncation marker may cause the marker to wrap to the beginning of a new line

### 2. Symbols, icons and controls:

- a) May be useful if a control for displaying the full text is to be placed near the truncated text
- b) May distract too much from the text itself
- c) A symbol or icon may be more noticeable than an ellipsis
- d) The use of larger markers or controls may take up more space and result in more text being truncated

# Truncation markers

Emerging Recommendations	Evidence
When text is truncated at the end, display (at least) an ellipsis at the point of truncation	<ul style="list-style-type: none"><li>• An ellipsis is more noticeable when displayed at the end of a line of truncated text (than in the ‘middle’)</li><li>• Truncation without a truncation marker is easily missed</li><li>• Without a truncation marker truncated text may not be noticed in a dynamic width list in which text is cut off by the right hand edge of the area. If the user does not realise that the area can be resized, the truncation may never be discovered.</li></ul>
If truncation is used in a selection list, supplement the ellipsis with a symbol for each truncated list item	<ul style="list-style-type: none"><li>• Positive feedback in user testing and risk assessments</li><li>• <i>The completion of further work in this area should include a review of this recommendation since it depends heavily on the contents of the list, the type of task it is designed to support, the type of truncation used and whether it can be resized. A guidance point would need to be more specific than this</i></li></ul>

# Truncation markers

Emerging Recommendations	Evidence
Do not support the use of the ellipsis as a control (such as a button) for accessing the full text of a truncated term	<ul style="list-style-type: none"><li>• Derived from the Windows Style Guide</li><li>• The ellipsis is not commonly used as a control so this function is not likely to be sufficiently discoverable</li></ul>

## Areas / questions for further study

- A more detailed study of revealing full text in selection lists containing other types of data is needed to determine whether there is a generic approach that can be used in other contexts
- *Emerging recommendations can be used to inform further work on truncation markers*

Theme 6

# **IDENTICAL TRUNCATED TERMS**

Where ‘identical terms’ are ‘apparent duplicates’ created by the truncation

# Identical truncated terms

When truncated, some terms may be identical. These apparently duplicate terms can be either marked, consolidated into one item or avoided altogether

A truncated term is selected (not shown). The selection is displayed at the top and all possible terms matching the truncated selection are displayed in full below.

The screenshot shows a search interface with a search bar containing "int neurob path". Below the search bar, a truncated term "international ... mitosis-karyorrhexis index" is listed. A red bracket highlights this term. To the left, a list of terms is shown, with the first term also being truncated. A red circle highlights the truncated part of the first term. A red bracket connects the highlighted truncated term to the list of terms on the left. A callout box at the bottom states: "Identical truncated terms are marked at the beginning of the line".

Search Bar:	Results:
int neurob path	international ... mitosis-karyorrhexis index
	international neuroblastoma pathology classification: Unfavourable histology group, patient of any age with undifferentiated neuroblastoma (Schwannian stroma-poor) and any mitosis-karyorrhexis index
	international neuroblastoma pathology classification: Unfavourable histology group, patient 5 years or older, with any subtype of neuroblastoma (Schwannian stroma-poor) and any mitosis-karyorrhexis index
	international neuroblastoma pathology classification: Unfavourable histology group, patient less than 1.5 yrs old, with poorly differentiated or differentiating

Subarachnoid haemorrhage following injury

[!] Subarachnoid haemorrhage following injury with open intracranial wound

Subarachnoid haemorrhage following injury without open intracranial wound

[!] Subarachnoid haemorrhage following injury with open intracranial wound ...

[!] Subarachnoid haemorrhage following injury with open intracranial wound ...

[!] Subarachnoid haemorrhage following injury with open intracranial wound ...

Identical truncated terms are marked at the beginning of the line

# Identical truncated terms

If the presence of identical truncated terms in the list is easily avoided by changing the search criteria, a system could suggest words that would reduce the number of duplicates in the search results. A similar approach could be used to avoid the need for truncation altogether

The screenshot shows a search interface with the query "eme art ana aor". A message at the top states: "This list contains apparent duplicates. For fewer results, consider: [common](#), [superficial](#)". Below this, a list of search results is displayed:

- emergency bypass of aorta by anastomosis of axillary artery to femoral artery
- emergency bypass of bifurcation of aorta by anastomosis of aorta to femoral artery
- emergency bypass of bifurcation of aorta by anastomosis of aorta to iliac artery
- emergency replacement of aneurysmal bifurcation of aorta by anastomosis of ...
- emergency replacement of aneurysmal iliac artery by anastomosis of aorta to ...
- emergency replacement of aneurysmal bifurcation of aorta by anastomosis of ...
- emergency replacement of aneurysmal common iliac artery by anastomosis of ...
- emergency replacement of aneurysmal

The screenshot shows a search interface with the query "eme art ana aor common". The results are as follows:

- emergency replacement of aneurysmal common iliac artery by anastomosis of ...
- emergency replacement of aneurysmal artery of leg by anastomosis of aorta to ...

A large blue callout bubble points from the bottom left towards the second result. It contains the text: "If there are only a few truncated results, could they automatically expand into the available space (such that they are not truncated)?". Below this, the text "User Comment" is displayed.

**Note:** Identical truncated terms do not necessarily appear next to one another in the list

# Identical truncated terms

## Summary

1. When truncation causes identical terms to be displayed in a selection list:
  - a) it may be necessary to draw attention to each
  - b) it may be possible to consolidate them so that they are only displayed once
2. If the presence of identical truncated terms is easily avoided by changing the search criteria, a system could provide prompts to support narrowing the search results
3. An improved search process can support access to shorter lists in which identical terms are much less likely
4. Progressive disclosure can help to mitigate apparent duplicates since they can be expanded in context
5. A rule that requires identical truncated terms to be expanded automatically would create a potentially confusing mixed list with some expanded and others truncated
6. When many terms are truncated, it is more likely that there are similar (truncated) terms in a list, thus increasing the risk of mis-selection even when they are not identical

# Identical truncated terms

Emerging Recommendations	Evidence
For fixed-width lists, when a list contains identical truncated terms (and when this can be determined) display the list without truncation by default	<ul style="list-style-type: none"><li>An expert user familiar with the list can choose to re-apply truncation (so this still allows truncation to be used but only in certain circumstances)</li><li><i>This recommendation is as close as possible to a rule stating that lists should never contain truncated text if they can contain duplicate items (without being unnecessarily restrictive). It should be tested further</i></li></ul>
For fixed-width lists, when it is not possible for the system to determine whether a list contains identical truncated terms, provide a notification warning of the presence of identical truncated terms	<ul style="list-style-type: none"><li><i>This recommendation is a reminder that when it is possible for identical truncated terms to appear in a list, a way of mitigating the associated risks is needed</i></li></ul>

## Areas / questions for further study

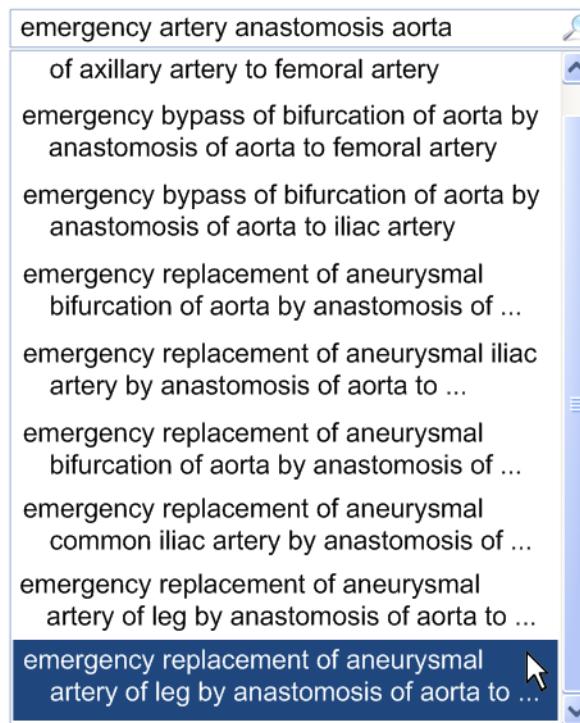
- Many of the recommendations refer specifically to fixed or dynamic-width lists. This repetition implies that further work is needed to clarify the priorities and the scenarios in which truncation must be excluded
- *Emerging recommendations can be used to inform further work on identical truncated terms*

Theme 7

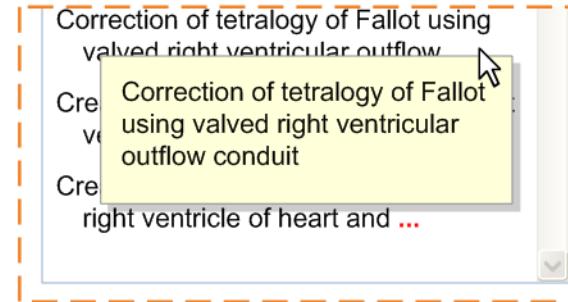
# **ACCESS to FULL TEXT** for truncated terms

# Access to full text for truncated terms

When a selection list contains truncated terms, the full term must be easily available to support the task of comparing and making a selection



## Full text in a pop-up tooltip



## Full text in a fly-out

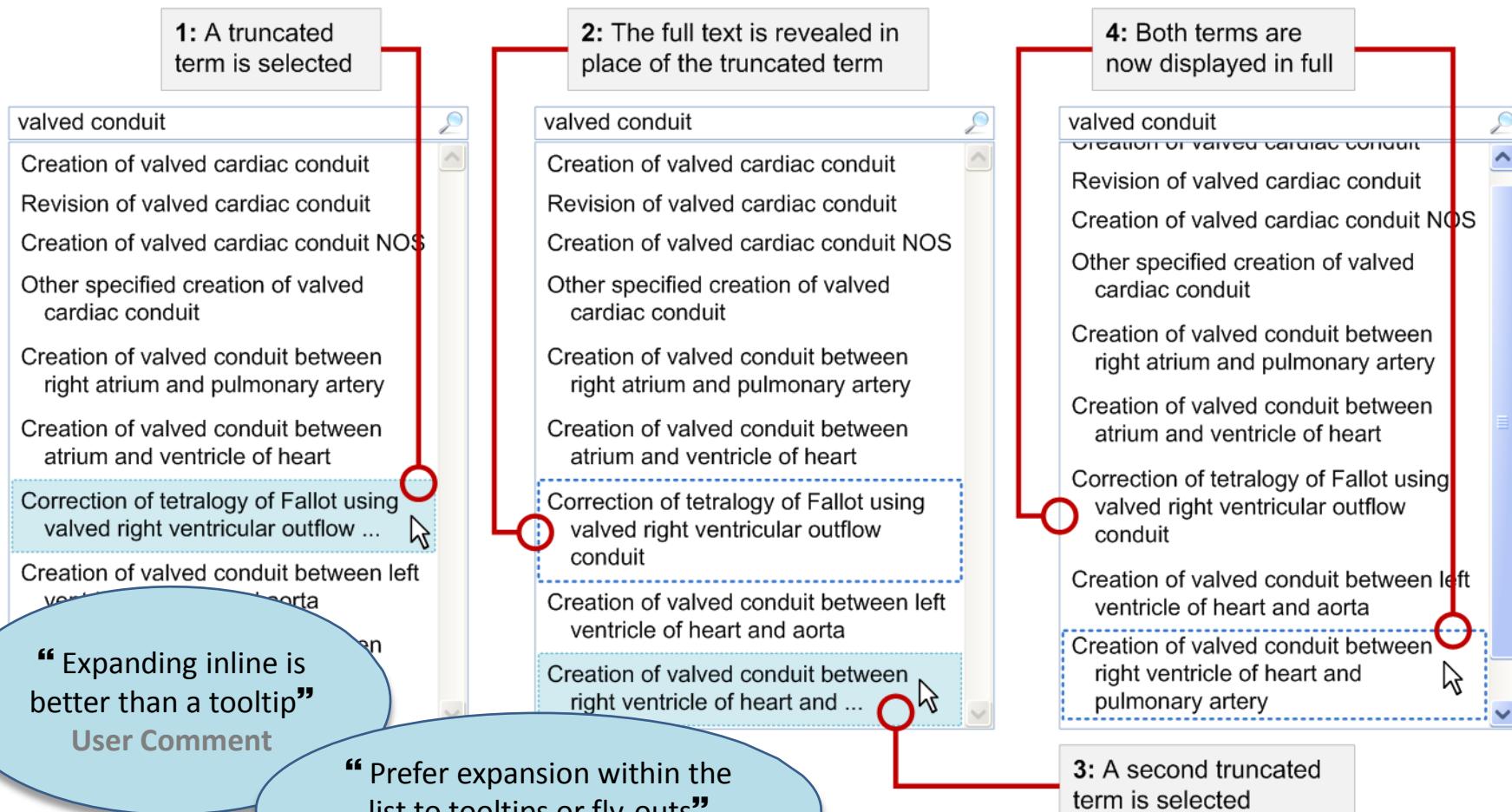
emergency replacement of aneurysmal artery of leg by anastomosis of aorta to superficial femoral artery  
is a replacement of aneurysmal iliac artery  
is a emergency replacement of aneurysm

**KEY RISK** - clinicians may select incorrect or sub-optimal entries, or stop encoding because they do not have time to hover over every possibly relevant item in the list

A fly-out for a selection list takes more space than a tooltip but does not obscure other information in the list

# Access to full text for truncated terms

Progressive disclosure can allow more than one truncated term to be displayed in full without obscuring other information



# Access to full text for truncated terms

A control could be provided that allows all truncated terms in the list to be revealed

A control could be provided that allows the list behaviour to be defined

If the default is for the list to truncate, a control could be provided that allows all terms to be expanded until the next search

Truncate after 2 lines

valved conduit	
Creation of valved cardiac conduit	
Revision of valved cardiac conduit	
Creation of valved cardiac conduit NOS	
Other specified creation of valved cardiac conduit	
Creation of valved conduit between right atrium and pulmonary artery	
Creation of valved conduit between atrium and ventricle of heart	
Correction of tetralogy of Fallot using valved right ventricular outflow ...	
Creation of valved conduit between left ventricle of heart and aorta	
Creation of valved conduit between right ventricle of heart and ...	

valved conduit	
Click here to expand all truncated terms »	
Creation of valved cardiac conduit	
Revision of valved cardiac conduit	
Creation of valved cardiac conduit NOS	
Other specified creation of valved cardiac conduit	
Creation of valved conduit between right atrium and pulmonary artery	
Creation of valved conduit between atrium and ventricle of heart	
Correction of tetralogy of Fallot using valved right ventricular outflow ...	
Creation of valved conduit between left ventricle of heart and aorta	
Creation of valved conduit between right ventricle of heart and ...	

valved conduit	
Creation of valved cardiac conduit	
Revision of valved cardiac conduit	
Creation of valved cardiac conduit NOS	
Other specified creation of valved cardiac conduit	
Creation of valved conduit between right atrium and pulmonary artery	
Creation of valved conduit between atrium and ventricle of heart	
Correction of tetralogy of Fallot using valved right ventricular outflow conduit	
Creation of valved conduit between left ventricle of heart and aorta	
Creation of valved conduit between right ventricle of heart and pulmonary artery	

## Summary

1. Fly-outs and pop-ups
  - a) Show the full text in place of or in close proximity to the truncated text
  - b) Hover is used to highlight an item in a selection list (immediately) and display a fly-out (with a delay)
  - c) A fly-out for a selection list takes more space but does not obscure other information in the list
  - d) A tooltip obscures other information in the same list or table
2. Expand inline
  - a) Allows more than one item to be displayed in full
  - b) Allows an item to be expanded in context without obscuring other information
3. Expand all truncated terms
  - a) A control could be provided that allows all truncated terms in the list to be expanded, either just this once or as a setting for the search results list

# Access to full text for truncated terms

Emerging Recommendations	Evidence
If it is possible that a list may contain truncated terms, allow the user to display the list without truncation	<ul style="list-style-type: none"><li>• If a list contains truncated terms, but the user is sufficiently familiar with those terms and they are truncated in places that allow them to be differentiated without revealing the full text, then it may be acceptable to work with the truncated list. If the user is not familiar with the terms, they may choose (and it is safer for them) to view the list without truncation</li></ul>
If it is possible that a list may contain truncated text, give the user control over the width of the list	<ul style="list-style-type: none"><li>• In many cases, this allows a simple and direct method of removing the truncation by resizing the list</li><li>• Larger lists may be appropriate when reviewing long terms</li><li>• When a list is resized, more text is displayed within them</li><li>• <i>This recommendation aims to encourage the provision of dynamic-width lists as far as possible until more work is completed that can generate more specific recommendations or guidance</i></li></ul>

# Access to full text for truncated terms

Emerging Recommendations	Evidence
<p>Ensure that the full text of a truncated term is displayed and acknowledged before an action can be carried out on the selected term</p>	<ul style="list-style-type: none"><li>This guidance aims to ensure that the full text of a term is reviewed actively before any action is carried out on the selection</li></ul>

## Areas / questions for further study

- Assuming that the need to access full text for a truncated term is expected to be infrequent, are the methods of accessing full text explored here too complex?
- When assessing design alternatives for accessing full text, consider the full process including the steps immediately before and after the display of truncated terms
- The primary purpose of accessing full text is to support the process of comparing and selecting so there should be a focus on considering mis-selection risks
- *Emerging recommendations can be used to inform further work on access to full text for truncated terms*

# Supporting Materials

The following additional supporting materials were used in the research of this area and creation of this document

- Working Documents
  - *Truncation Kick-off* ([PowerPoint](#))
  - Risk Assessment Presentation - *Truncation ORA 4<sup>th</sup>-Nov-2009* ([PowerPoint](#))
  - Risk Assessment Scenarios - *ORA Scenario* ([Visio](#))
  - Risk Assessment Design Alternatives - *ORA Design Alternatives* ([Visio](#))
  - Risk Assessment Findings - *ORA Findings* ([Visio](#))
  - Risk Assessment Findings (illustrations) - *Truncation ORA – Findings* ([PowerPoint](#))
  - *Truncation Design Log* ([Excel](#))
  - *Truncation Design Challenges* ([PowerPoint](#)) ([Visio](#))
  - *Truncation User Research Materials* ([PowerPoint](#)) ([Visio](#))
  - *User Research Notes* ([Word](#))
  - *Truncation Notes* ([Word](#))
  - User Research Findings - *NHS CUI CAPS Truncation user feedback Nov 2009 0.0.0.2* ([PowerPoint](#))
- NHS CFH Documents
  - *Truncation – Master Hazard Log – v0.5 – 13 Nov 2009* ([Excel](#))
  - *CFH\_Position-paper\_Rules-for-truncation-and-wrapping-of-coded-clinical-data\_v10\_27-Jun-2008* ([Word](#))
  - Analysis of SNOMED CT terms ([Excel](#))

To obtain any of these supporting materials please contact [cui-stakeholder.mailbox@nhs.net](mailto:cui-stakeholder.mailbox@nhs.net)

# Distribution

## Reviewers and Distribution

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Peter Johnson	Clinical Architect	0.2.0.0	17-Dec-2009
Frank Cross	Clinical Advisor	0.2.0.0	17-Dec-2009
Lindsey Butler	Clinical Safety Advisor	0.2.0.0	17-Dec-2009
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Priya Shah	Clinical Advisor	0.2.0.0	17-Dec-2009