MITRE / FLUX NOTES **CONCEPTS v15.2 - Medications & Note authoring concepts**

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1 MEDICATION RANGES

Assumptions:

There are three types of values available for the medication range graphic:

1) the prescribed value (always present)

2) a "typical value" (sometimes present)

3) a minimum and maximum value (sometimes present)

Furthermore, the min and max values may be no good when, say, the prescription is always 1 tablet.

Strategy:

Ignore the range values if:

- they are 0 and 1 and the typical value, if present, is equal to 0 or 1

Replace the range graphic with a simple line if:

- there is neither a typical value nor typical range
- all available values are 0 or 1, *or*
- there is no valid range and the typical value = prescribed value

Modify the range graphic to omit the bounds if:

- there is no valid range and the typical value is different from the prescribed value

Modify the medication visualization slightly to better accommodate missing range graphics.

Letrazole

2.5 mg qdr

reduced from 5 mg qd on 13 Nov '17

route	prescribed	prescribed by	refills
oral route	13 Dec 2017	Dr. YOsemite299a	

The dosage is moved below the medication name, to help break up awkward combinations.
Dosage amount is large and in body gray (or red), the units and frequency is small in body black.

Ibuprofen 200 mg tablets

1 tablet qdr

replaced Ibuprofen 400 mg tablet on 13 Nov '17

route	prescribed	prescribed by	refills
oral route	13 Dec 2017	Dr. YOsemite299a	

The range is recorded as 0-1 tablet and the typical value is 1, so the range is faulty. The prescription is also for 1 tablet, so we omit the graphic.

Ibuprofen 400 mg tablets

2 tablet qdr

replaced Ibuprofen 400 mg tablet on 13 Nov '17

route	prescribed	prescribed by	refills
oral route	13 Dec 2017	Dr. YOsemite299a	

The range is recorded as 0-1 tablet and the typical value is 1, so the range is faulty. The prescription is for 2, so we include a modified graphic,

Acetaminophen 325 mg tablets

2 tablet qdr

route	prescribed	prescribed by	refills
oral route	13 Dec 2017	Dr. YOsemite299a	

There is no range given. The typical value is 2 tablets, which matches the prescribed value, so the grpahic is omitted.

Medication design from Concepts v13.9 (as context)

Letrazole

2.5 mg qd

reduced from 5 mg qd on 13 Nov ‘17 history

oral route
2 refills left

prescribed: 13 Nov 2017
Dr Yosemite299a

Letrazole 2.5 mg qd

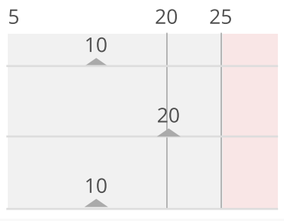
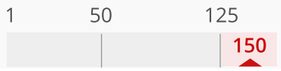
reduced to 2.5 mg qd on 13 Nov ‘17 (toxicity)

increased to 5 mg qd on 9 Oct ‘17 (ineffective)

prescribed at 1 mg qd on 1 Oct ‘17

Slight readjustment of route, refills, and prescription data. Addition of ‘history’ drop down to expose past medication changes.

Medication design from Concepts v14.9 (as context)

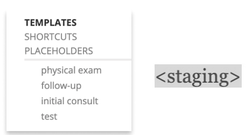
Active Medications	Dosage		Dates	Progress	Changes	More
MedicationMedA	10 mg qd		24 Feb 2018	*end: 12 Apr 2018*	reduced, toxicity	...
	20 mg qd		15 Feb 2018		increased, ineffective	...
	10 mg		10 Jan 2018	*start for 3 months*		...
ChemoBB	**150** mg/m2 q3weeks		2 Feb 2018	*3 of 5 cycles*		...

Before implementation, this graphic will need a slight revisit to accomodate missing or faulty ranges.

2 EXPLORATION OF DOCUMENTATION

Current Supported Documentation Workflow

When	Before Encounter	During Encounter	After Encounter
Activities/Interactions	Start the Note Choose a template Prepare placeholders	Tap in POC Type in note with text Voice capture	Confirm captured data Fill in missing data and narrative in note Remove extraneous placeholders
What's accomplished	narrative and layout is chosen expected data is identified	predefined data is captured quickly unexpected data is captured slowly	documentation is complete



A Documentation Workflow at the other extreme

When	Before Encounter	During Encounter	After Encounter
Activities/Interactions	None	Type short notes in a "notepad" Choose elements from a navigatable POC to insert into notepad Voice capture	Confirm captured data - notepad elements are converted to structured shortcuts Choose template and author narrative Insert data into template via post-hoc placeholders or by drag and drop from notebook
What's accomplished	type of appointment, domain, and chief complaint automatically identify a broad class of expected data.	All data is captured with medium ease	narrative of documentation is constructed documentation is complete

Documentation has two facets, Text and Data

They do NOT need to be bound together!

TEXT
Narrative & Layout

Determine the Layout, sections, headings, narrative glue → Retrieve and format old data → Record and format new data

Timing relative encounter isn't fixed! Narrative and layout can be worked before or after.

DATA Capture

Choose a domain of data → Identify particular expected elements → Change specificity of data scope → Capture expected elements, other elements within domain, and elements outside domain → Confirm data

	Before Encounter		During Encounter	During or After Encounter	
examples:	choose template, automated from appointment type, from last visit	placeholders by hand, placeholders already in template		typing in note, typing on notepad, POC, full tree menu POC, voice capture	selecting from notepad, editing in note

The Tradeoffs of Specificity in Expected Data

Narrow Data Set to Capture

Capture is restricted to small set of placeholders in template

Slow and inefficinet handling of data outside the set

A broad domain of elements are available in the tree POC. The NLP engine has more mistakes.

Slower and less efficinet capture of data inside set

Broad Data Set to Capture

Summary

There are two facets to documenting an encounter: capturing the data and writing/laying out the note. Our current workflow binds them very tightly, but we should consider freeing that bind to ease data capture in all workflows.

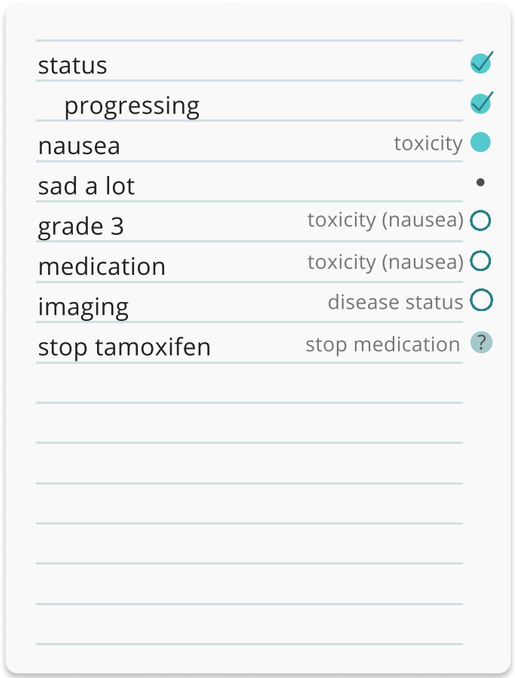
A key part of preparing an encounter is identifying expected data elements (placeholders) and the domain of other possible data to capture.

To support a range of workflows, Flux Notes should support easy data capture *aside* from placeholders. The clinician should be provided a range of tools close at hand to capture that data in ways convenient and comfortable for them.

3 BRAINSTORM OF NOTE AUTHORING INTERFACE IDEAS

“Notepad”

concept: The clinician quickly jots down notes on an empty sheet, quickly capturing data elements to be later injected into a note. The elements may be free text, identified as fill-ins for placeholders, or recognized as shortcuts to be drag-and-dropped into the note. The Notepad also serves as short term storage for data captured by other means, such as by voice, before inserting into the note.



indicators for:

- ● recognized as shortcut
- • free text, not recognized as shortcut
- ○ possible match to context
- ✓ included in note via placeholder
- ? possible shortcut

advantages: Very flexible. Natural digital extension of a pad and paper. Little distraction. NLP engine can more easily extract data as is knows there is no narrative or connecting text.

disadvantages: No guidance to ensure the notes are recognized as structured data or shortcuts. Requires a second pass in constructing note. May not be useful beyond simply typing into bottom of note itself.

challenges: Contexts may be difficult to handle. When and how does the user disambiguate to identify elements?

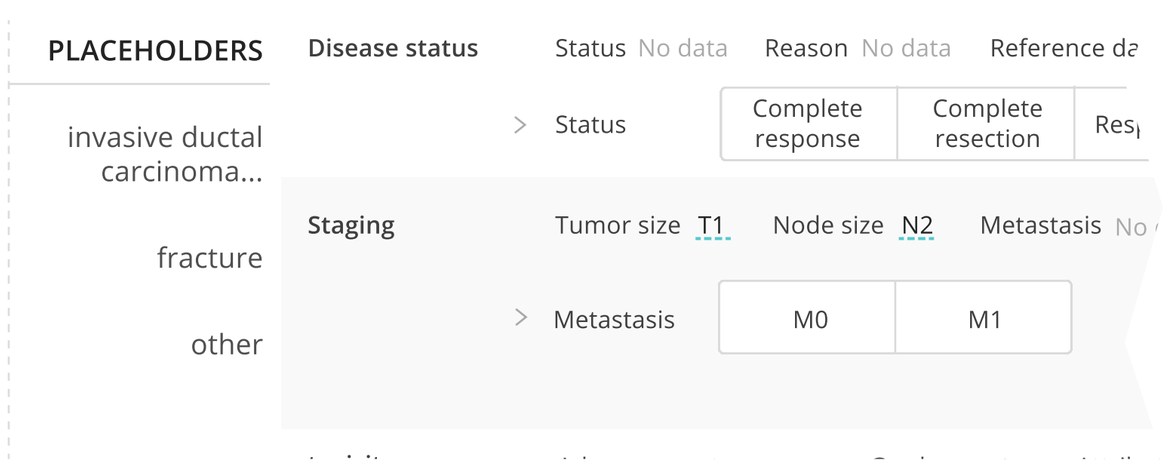
Navigatable POC

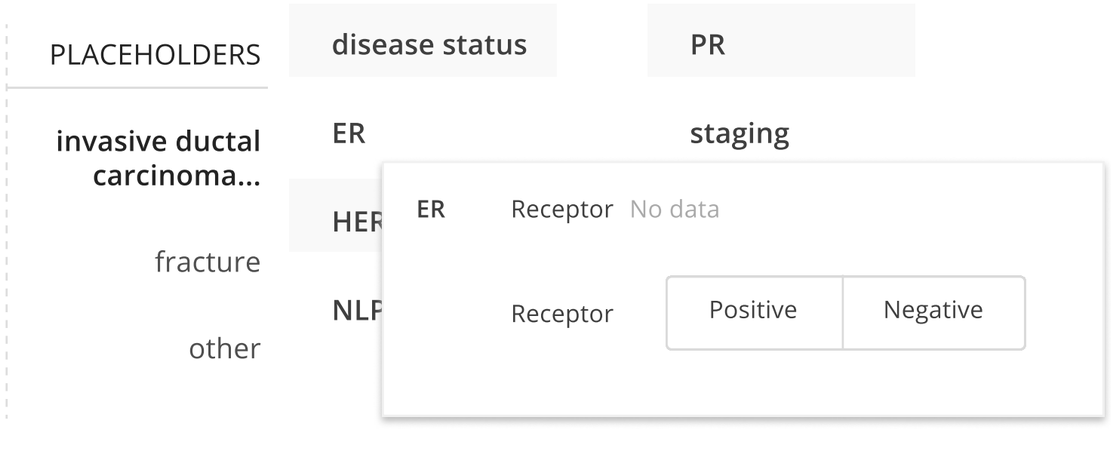
concept: A hybrid of the current POC and the right side shortcut tray. The user chooses a data element from a list of available elements, and is given the POC data entry interface. As they complete the data, the element is inserted into the "Notepad" for later insertion into the note.

Maybe a part of the current POC (as pictured below) or available within the Notepad.

Organization and Initial navigation of the data elements will depend on the scope of data for the encounter.

The most-likely elements will be prioritized.



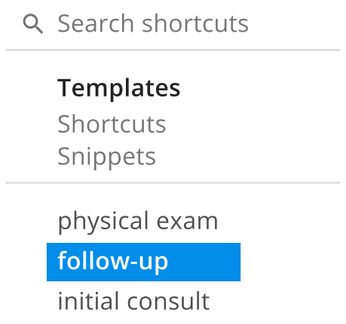


advantages: User does not need to commit to a location in the note, the data is stored ad-hoc. Flexible to capture anything.

disadvantages: Requires a second pass in constructing note. Can be a little distracting hunting a menu.

Template as “attribute”

concept: The template chosen for the note is an attribute of the note, and is not simply pasted. The template can then be swapped out later, while maintaining the data. Additionally, the template can be applied to a note after the encounter, thereby applying data stored in the “notepad”.

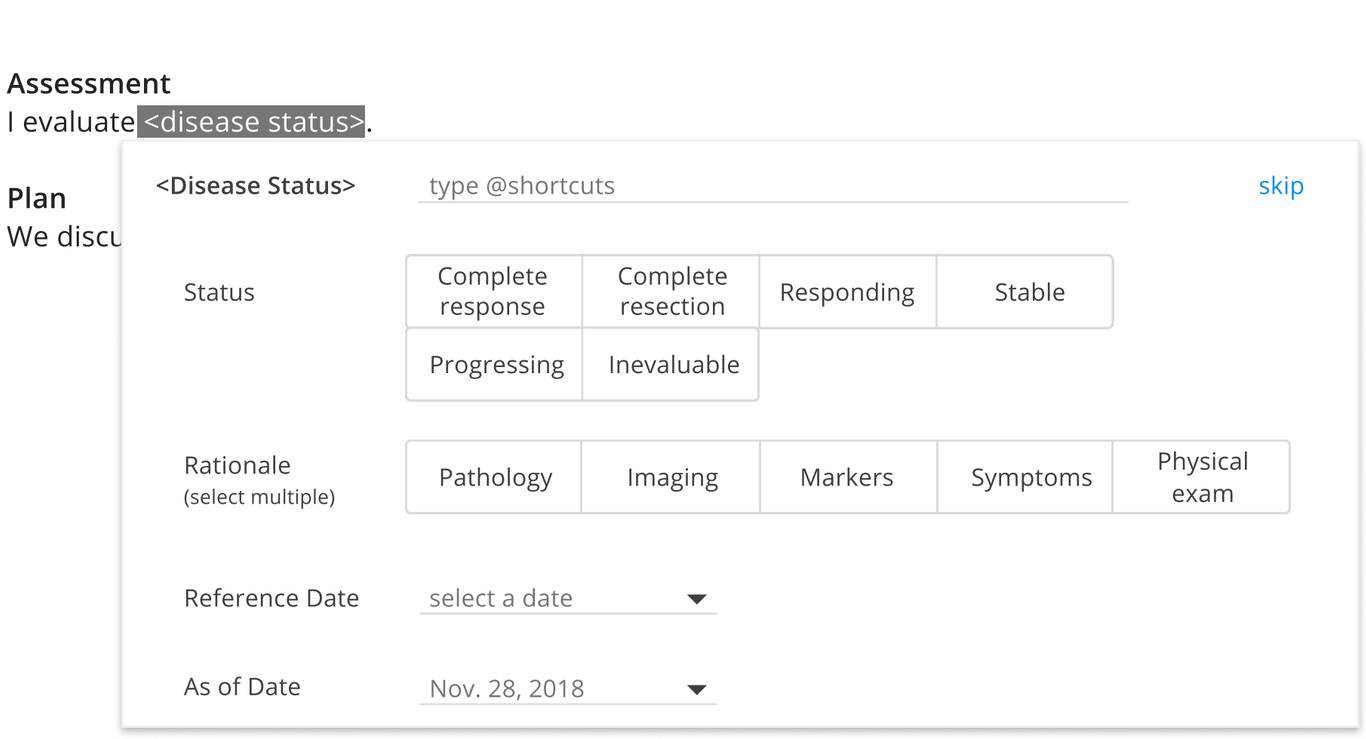


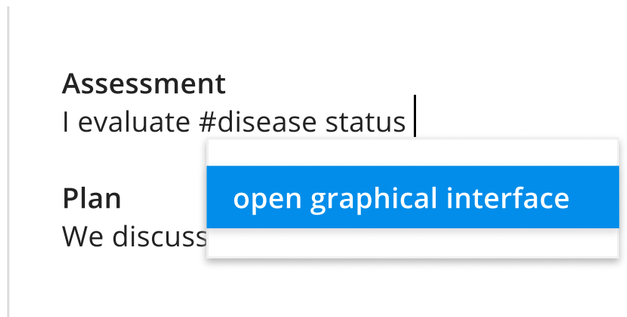
advantages: User is able to swap templates, should they discover the appointment is going/went differently than expected.

disadvantages: Not very useful without a large library of very specific templates.

Inline “POC” access

concept: The user can tap directly on placeholders in the note to popup a POC interface (concepts v15.1). This same interface is available for a #shortcut if applicable. Another possibility is displaying the POC style buttons in the right hand tray as explored in a previous Concepts document..





advantages: Access to POC elements from <placeholder> allows for GUI based data capture from the note, and prevents swapping back and forth between note authoring modes. Access to POC elements from #shortcuts gives the option for users who prefer the POC, applies the autoformatting, and better serves touch interfaces.

disadvantages: Slightly more clutter.

4 CHALLENGES

Interface Bloat

problem: Each of these additional interface ideas requires navigation to and from, and somewhere to live on the screen. We are quickly departing from the very simple, everything-is-exposed original designs of Flux Notes.

possible solutions More firmly separate note authoring from documentation viewing. Then note authoring tools can be exposed as a group, only when relevant.

Implementation

problem: My understanding is that contexts and data capture are currently tightly tied to the note itself. Some of these features and the new flexible note authoring concept requires data to be separated from the narrative.

possible solutions pend