

MITRE / FLUX NOTES **CONCEPTS v16** – Template flow, medications, capture guidance  
DANIEL REEVES, JUHAN SONIN, 7.Mar.2019 (edits 14.Mar.2019)



# I

## NEW NOTE WORKFLOW (edited)

Concepts:

1. Template Choice and preview
2. Indicating incomplete elements



Debra24 Hernandez98Aj



### Select a template

The user can tap a template to begin a note directly, or tap an icon (such as an eye) to open a preview. Hover over a template will also open a preview.

Summary

Imaging

Conditions

Labs

Disease Status

Medications

Pathology

Genetics

Allergies

Timeline

Treatment Options

Birth  
1967 (51)Admin. sex  
FemaleLocation  
Boston, MAROID  
12345432312  
Language  
EnglishCondition  
invasive ductal carcinoma of breast ▾24  
24  
24

Hernandez98Aj's primary care physician for 12 years.

### Summary



Ms. Debra24 Hernandez98Aj is a 51-year-old menopausal non hispanic or latino woman with invasive ductal carcinoma of the breast, diagnosed on 13 January 2012. Her most recent status, recorded on 15 May 2017, is of worsening, disease progression based on pathology, imaging, and symptoms.

She underwent a lumpectomy. She underwent a sentinel lymph node biopsy on 20 September 2012 which revealed infiltrating poorly differentiated ductal carcinoma, stage IV, estrogen receptor 0, etc. diagnostic mammogram on 4 October 2013 revealed a 2 cm mass in the right breast at 7 o'clock and an

Blank Note

Search templates

Clinical follow-up

designed by  
Dr. Free2 Will, Feb 2017

Initial Consult

designed by  
Dr. Free2 Will, Feb 2017

Clinical follow-up 2

designed by  
Dr. Free2 Will, Feb 2017

Initial Consult 2

designed by  
Dr. Free2 Will, Feb 2017

Symptom follow-up

designed by  
Dr. Free2 Will, Feb 2017

New Patient 2

designed by  
Dr. Free2 Will, Feb 2017

Sign note



## Preview

Preview is just a preview. All incomplete @ phrases are left incomplete. The lower notes shift down to make space for the preview pane, just like in google images.

R

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## Reason for Visit

Debra is a 51 year old Female following up on @condition on 6 Mar 2019.

## Oncology History

@oncohist

## &gt; Review of Systems

A complete 15 point ROS was done and was unremarkable except for alopecia, amenorrhea, and numbness...

## Allergies

no allergies

## &gt; Medications

imatinib 100 mg capsule QD started 10 Aug 2017...

choose this template

Sign note



**Incomplete @ phrases**

The note is started, and the user can begin writing and editing even with incomplete @ phrases. The incomplete phrase is underlined in **warning red**, and given an indicator in the margin.

When the indicator scrolls out of the page, it remains at the top or bottom, and enumerated.

Imaging

Cor

**Interactions**

Tapping on a dot moves the cursor to the corresponding missing data and opens the appropriate autocomplete.

Tapping on a “out of view” dot scrolls the window and moves the cursor.

Tapping “incomplete” at the bottom does the same.

worsening, disease progression based on pathology, imaging, and symptoms.

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Medications

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Allergies

Timeline

Treatment Options

**Progress note**

signed by: Dr. Bran24 Michel09A  
source: Dana Farber Cancer Institute

signed date: 10 April 2018

**Close**

Templates

Shortcuts

Placeholders

Search shortcuts

Patient

@patient

@age

@gender

@dateofbirth

@name

@age

@gender

@dateofbirth

@name

@age

@gender

@dateofbirth

@name

@age

@gender

@dateofbirth

@name

**Reason for Visit**

- Debra is a 51 year old Female following up on @condition on 6 Mar 2019.

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@oncohist

> **Review of Systems**

A complete 15 point ROS was done and was unremarkable except for alopecia, amen...

**Allergies**

no allergies

▼ **Medications**

imatinib 100 mg capsule QD started 10 Aug 2017  
 drug 2 100 mg capsule QD started 10 Aug 2017  
 drug 3 100 mg capsule QD started 10 Aug 2017  
 drug 4 100 mg capsule QD started 10 Aug 2017  
 imatinib 100 mg capsule QD started 10 Aug 2017  
 imatinib 100 mg capsule QD started 10 Aug 2017  
 imatinib 100 mg capsule QD started 10 Aug 2017  
 imatinib 100 mg capsule QD started 10 Aug 2017

**Assessment**

&lt; disease status &gt;

&lt; toxicity &gt;

1

Delete note



2 incomplete

2

Placeholder

Sign note

2

## MEDICATION REVISIONS

## Medication graphical view

The current implementation (right) brought several comments from the tester:

- inefficient use of space
- number of refills is missing, and of lower importance
- route is low importance if oral

Additional issues:

- svg becomes illegible in a browser
- partially due to implementation that shrinks the svg (maybe a bug)

## Medications Gastrointestinal stromal tumor

loperamide hydrochloride 2mg tablet 1 tablet 2 tablets after the first loose stool; 1 tablet after each subsequent loose stool. as needed



Route	Prescribed	Prescribed By	Number of Refills
Oral route	17 Jan 2019	Dr. Mona341 Brown483	

hydrocortisone 2.5% ointment 1 g BID as needed



Route	Prescribed	Prescribed By	Number of Refills
Topical route	19 Jan 2017	Dr. Mona341 Brown483	

Ibuprofen 200 mg tablet

**2 tablets**  
TID as needed



increased from 1 tablet TID on 13 Nov '17

2 refills remaining

prescribed: 13 Nov 2017  
Dr Yosemite299a

-- edits for readability --  
Increased type and line widths in graphic  
Soft line break after unit before timing info  
Unit is in same color as value  
Right align dosage/frequency data

PACLitaxel

**180 mg/m<sup>2</sup>**  
5 cycles



intravenous route

prescribed: 13 Nov 2017  
Dr Yosemite299a

-- edits to condense --  
Alternating backing allows for tighter packing  
Condense prescriber info  
Fix elements relative left. Do not fill horizontal space.

hydrocortisone 2.5% ointment

**1 g**  
BID as needed



topical route  
1 refill remaining

prescribed: 13 Nov 2017  
Dr Yosemite299a

-- Suggestions --  
Identify relevant elements.  
For example, discard route if tablet, refills if empty.  
List relevant items only.



common value: 1g

recommended range: 0g - 10g

comments and disclaimer with name of service.

use whatever language the service uses. So, maybe "typical value" instead of "common value"

NOTE: these text sizes assume headers are 16 px. The current implementation has headers at 0.9rem (where 1rem=16px).

medication name: 16 px, body black  
(or match size of header 0.9rem)

dosage: body grey or warning red, align right

dosage number: 16 px (again, match header size)

dosage units: 12 px

timing: 12 px, body black, align right

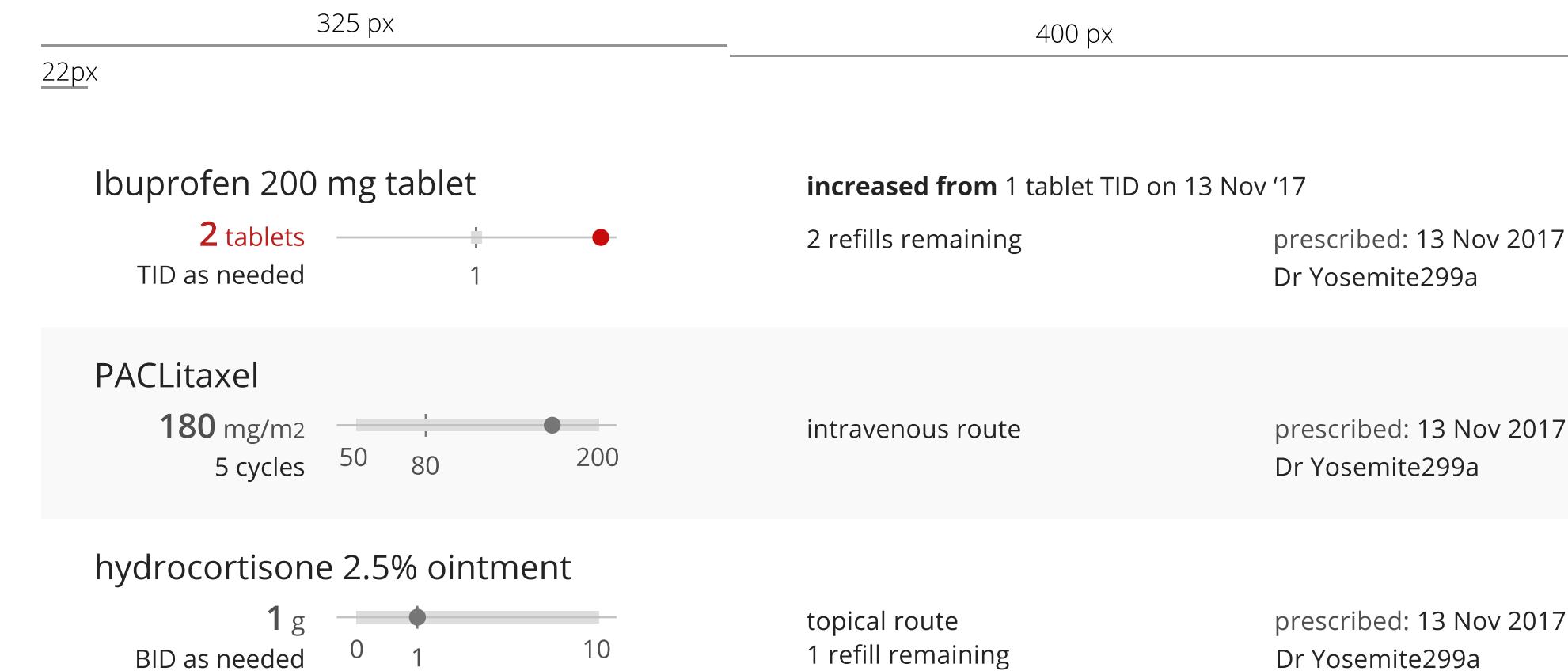
axis: 130 px x 1px, #C2C2C2

range bar: 6 px height, line gray

hash: 1 px x 10 px, #979797

placement: lowest element and  
highest element are 10 px from left  
and right edge of axis.

dot: 8 px diameter, state gray



## Medication table view

The current implementation (right) solves several of the complaints from the reviewer. But, it does not indicate out of range dosages.

The concept here highlights out of range values in red, and gives more information upon clicking on the dosage.

## Medications Invasive ductal carcinoma of breast



Medication	Change	Dosage	Timing	Start	End
PACLitaxel	Reduced on 20 Feb 2019 from 200mg/m2	180 mg/m2	5 cycles	20 Feb 2019	Missing Data
Trastuzumab		9 mg/kg	5 cycles	04 Nov 2018	20 Feb 2019
Tamoxifen		4 mg	6 cycles	27 Oct 2017	18 Oct 2018
Lisinopril 20mg tablet		1 tablet	QD	07 Mar 2017	Missing Data
ibuprofen 600mg					

Medication	Dosage
PACLitaxel	180 mg/m2
	Reduced on 2
Trastuzumab	9 mg/kg
Tamoxifen	4 mg

! outside recommended range

The maximum recommended dosage is 8 mg/kg

+ insert "Trastuzumab, 9 mg/kg"

open source note

Dr. Freedom Brown 31 Aug 2013

Start	End
20 Feb 2019	missing data
4 Nov 2018	20 Feb 2019
27 Oct 2017	18 Oct 2018

3

## USER GUIDANCE FOR # CAPTURES (edited)

## Highlight in shortcut menu

After a capture context is opened, such as #toxicity, the user is expected to add more capture shortcuts immediately. Cue the user by highlighting the expected attributes classes in the shortcuts menu.

**Progress note**

signed by: Dr. Bran24 Michel09A      signed date: 10 April 2018

source: Dana Farber Cancer Institute

B / U ≡ 1≡ 2≡ 3≡ | *Invasive ductal carcinoma of breast | toxicity*

**Allergies**  
no allergies

**Medications**  
imatinib 100 mg capsule QD started 10 Aug 2017...

**Assessment**  
Patient is experiencing #toxicity |

**Plan**

**Shortcuts**

- Toxicity - grade
  - #grade 2
  - #grade 3
  - #grade 4
- Toxicity - adverse event
  - #anemia
  - #diarrhea
  - #nausea
  - #fatigue
- Invasive ductal carcinoma
  - #staging
  - #disease status
  - @ONCOHIST
  - #toxicity

**Placeholders**

**Search shortcuts**

## Guidance prompt

Appears after a short delay if a # or @ phrase has not been started.

Considerations:

- does it go away if a different word is started after # phrase, such as "is"?
- I think NO. It stays.
- does it reappear after a # or @ is successfully captured?
- I think No. It does not return. But perhaps TAB always brings it up?
- To minimize intrusiveness, do not select the action by default. Require a keyboard down or tab.

keyboard down or tab to select help

## Progress note

signed by: Dr. Bran24 Michel09A signed date: 10 April 2018  
source: Dana Farber Cancer Institute

B / U ⌂ ⌂ | Invasive ductal carcinoma of breast | toxicity

### Allergies

no allergies

### Medications

imatinib 100 mg capsule QD started 10 Aug 2017...

### Assessment

Patient #disease status|

get help with disease status

### Plan

Close



Templates  
Shortcuts  
Placeholders

Search shortcuts

Toxicity - grade  
#grade 2  
#grade 3  
#grade 4  
Toxicity - adverse event  
#anemia  
#diarrhea  
#nausea  
#fatigue  
Invasive ductal carcinoma  
#staging  
#disease status

enter to open helper window

## Progress note

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B / U ⌂ ⌂ | Invasive ductal carcinoma of breast | toxicity

### Allergies

no allergies

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imatinib 100 mg capsule QD started 10 Aug 2017...

### Assessment

Patient #disease status is|

get help with disease status

### Plan

Close



Templates  
Shortcuts  
Placeholders

Toxicity - grade  
#grade 2  
#grade 3  
#grade 4  
Toxicity - adverse event  
#anemia  
#diarrhea  
#nausea  
#fatigue  
Invasive ductal carcinoma

## Helper Window

After selecting "get help", a window appears below.

Considerations:

- want to be able to type text to find what I'm looking for or to enter what I already see.
- want to minimize arrow presses.
- want to type attribute class name, like "status" to get all child attributes.

## Sorted by attribute class

- Each class of attribute with more than one shortcut has a section, separated by a line.
- Maximum of 3 shortcuts are shown per class.
- The class name is also selectable.
- Selecting a class name shows many shortcuts within that class.

## Typing

- As the user types, it uses the autocomplete rules to filter the shortcuts and show previously hidden shortcuts.
- Empty attribute classes are hidden, unless the string matches the class itself (e.g. "reason").

select "status"

## Good

- Well integrated with typing.
- Behaves a bit like current autocomplete, with a little extra help.
- Could be extended to navigate the entire shortcut menu? Almost removes the need for the shortcut menu at right...

## Bad

- Hides significant number of shortcuts
- Organization is a little cryptic
- Duplicates right hand side menu

### status

#complete response  
#responding  
#stable  
reason  
#pathology  
#imaging  
#symptoms  
#reference date  
#as of

## Progress note

signed by: Dr. Bran24 Michel09A signed date: 10 April 2018  
source: Dana Farber Cancer Institute

B / U ⌂ ⌂ | Invasive ductal carcinoma of breast | toxicity

### Allergies

no allergies

### Medications

imatinib 100 mg capsule QD started 10 Aug 2017...

### Assessment

Patient #disease status is|

up to #disease status

#complete response  
#responding  
#stable  
#complete resection  
#progressing  
#inevaluable

Close



Templates  
Shortcuts  
Placeholders

Toxicity - grade  
#grade 2  
#grade 3  
#grade 4  
Toxicity - adverse event  
#anemia  
#diarrhea  
#nausea  
#fatigue  
Invasive ductal carcinoma  
#staging  
#disease status  
@ONCOHIST  
#toxicity

## Experimental concept: color coding contexts

Is there some way we can use color to bring out the current context? This technique can also identify along the right hand side what groups of shortcuts are relevant.

The screenshot shows a digital note-taking application interface. At the top, it displays "Dr. Mona341 Brown483-20191403-0326" and "Created by: Dr. Mona341 Brown483" with a creation date of "14 Mar 2019". There are buttons for "Close", "Share", and "Edit". Below this, the text "Source: Dana Farber" is visible. The main content area contains the text "...tal carcinoma of breast | disease status". To the right of the text, a vertical sidebar lists various medical concepts and their associated hashtags. The listed items include:

- #Inevaluable
- Disease status - Reason
- #Pathology
- #Imaging
- #Symptoms
- #Physical exam
- #Markers
- Disease status - Reference Date
- #reference date
- Disease status - As Of Date
- #as of
- Invasive ductal carcinoma of breast
- #staging
- #disease status
- #toxicity
- #ER
- #PR
- #HER2
- @ONCOHIST