MITRE / FLUX NOTES **TREATMENT OPTIONS v4**

EDWIN CHOI, DANIEL REEVES, JUHAN SONIN, 20.NOV.2018

*go**invo***

Strategy

1. Identify audiences. They will have separate visualization designs.

2. Focus the use cases. 1 use case = 1 viz.

3. Prioritize uses. Identify those for Intermountain Pilot, future Flux Notes imlementations, and far vision.

4. Design navigation for and locate the various visualizations as they are implemented and included.

Clinician Use Cases

1. Given a complex patient with a treatment history, compare across treatment regiments to see which have most successful outcomes for this patient's cohort.

2. Identify promising treatment options or clinical trials the clinician has no history of utilizing.

3. Compare across treatment regiments to see which lead to side effects the patients has shown to be most susceptible to.

Clinician + Patient Use Cases

1. Inform patient about the pros and cons of a suggested treatment

2. Apply patient preferences to choose among clinician's suggested treatments.

3. Guide a conversation with patient to develop preferences regarding consequences of different treatments - diffrent survival rates, side effect severity, time and travel commitments.

Patient alone or Clinician + Patient

1. Educate self about different treatments that are available and what the different considerations are.

User Implications

Time available	Seconds or minutes or tens of minutes. Depends on user and setting.
Familiarity with measures	Is the user familiar with grades? Side effects? 1/3/5 yr rates? Different rates?
Familiarity with treatments	Is the user familiar with treatments? Standard expectations?
Repeat use	Can we allow any learning curve?

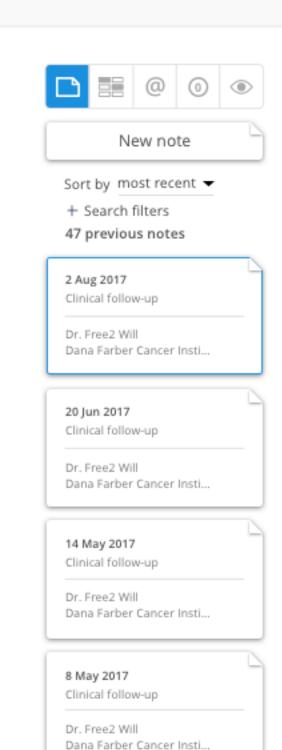## Use Case Implications

Depth supported	Do we need to see the 3rd most common side effect?
Comparison vs. single focus	Compare each metric across treatments or get full picture of one treatment.
Cohort selection	Size of cohort needed for each treatment option

Design Considerations

Availability of data	What data will be available for what implementation
Navigational flatness	Drill downs
Error and uncertainty	Our purpose is to surface data, not technically make recommendations so be careful. Indicate small populations that may imply error, but maybe do not claim equivalence or inequivalence, because that sounds too much like a recommendation. On the other hand, plain "surfaced data" requires basic statistics to be useful and meaningful. Designing that task to be done by the user leaves space for WRONG use and MISTAKES. **Good design will convey the correct and limited interpretation of the available data.**

Criteria selection is all manual.

We do not know initially whether it is best to start with all or none selected, so we provide "select all" and "select none".

Therefore, we also don't know whether it is best to list included or excluded criteria. Suggested to list shortest option. Then clear labelling is a challenge.

Date of birth
5 Apr 1966 (51)

Admin. sex
Female

Location
Boston, MA

Ductal carcinoma of the breast

Debra24 search...

Allergies

None

Summary

Timeline

Medication

Allergies

Treatment Options

Social

Disease status

New note

Sort by most recent ▼

+ Search filters

47 previous notes

2 Aug 2017
Clinical follow-up

Dr. Free2 Will
Dana Farber Cancer Insti...

20 Jun 2017
Clinical follow-up

Dr. Free2 Will
Dana Farber Cancer Insti...

14 May 2017
Clinical follow-up

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8 May 2017
Clinical follow-up

Dr. Free2 Will
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View 10 more clinical notes from 2015 - 2017

Treatment Options

Outcomes and criteria for 156,765 patients with Ductal carcinoma of the breast were collected by Cancer Link ...more

∨ **Similar patients**   156 patients

excluded criteria: race, sex, family history, surgery

select all   select none

∨ — **demographic** 1/3 active   > ✓ **pathology**   4/4 active

✓ age: 51-61 👤   > — **disease history**   1/3 active

☐ race: white 👥👥

☐ sex: male 👥

> ✓ **genetics** 4/4 active

> **Features**   cancer specific survival rate, severity of side effects

Criteria Selection - Future

Partially automate the cohort selection
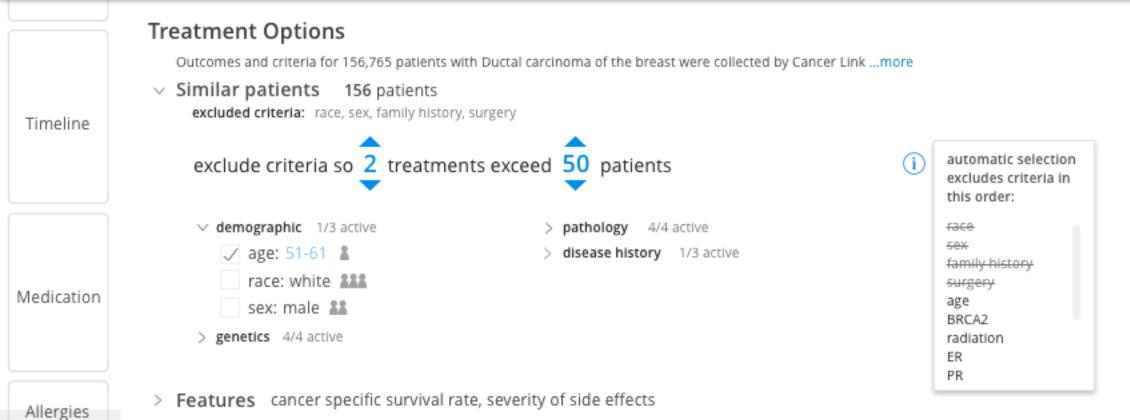
Current assumption: goal is to maximize specificity while maintaining a meaningfully large patient pool.
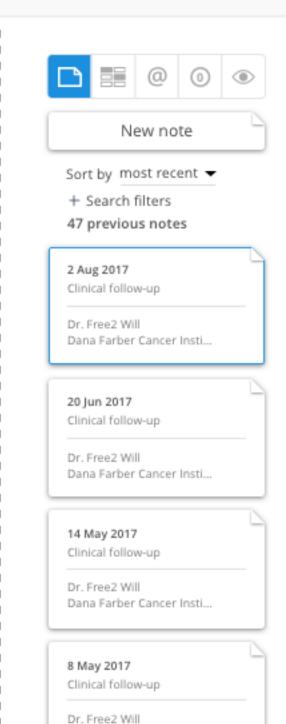
Alternative: maximize patient pool by applying only necessary criteria.

Determining which approach is appropriate requires both expert feedback as well as familiarity with available data.

Proposed future approach: Initially apply all criteria. The user (or default) identifies a target: T treatments with at least P patients. Criteria are excluded in a clinically relevant order to achieve that target.

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Hernandez98AJ

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Surgery

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exclude criteria so **2** treatments exceed **50** patients

ⓘ

automatic selection
excludes criteria in
this order:

~~race~~
~~sex~~
~~family history~~
~~surgery~~
age
BRCA2
radiation
ER
PR

∨ **demographic**   1/3 active   › **pathology**   4/4 active

✓ age: 51-61 👤   › **disease history**   1/3 active

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Features Selection & Filters selection

Features   relative survival rate, most common side effects, days expended

survival rates

- [x] **Relative survival rate**   textual description
- [ ] **Cancer specific survival rate**   textual description
- [ ] **Disease free survival rate**   textual description
- [ ] **Total survival rate**   textual description

quality of life indices

- [ ] **Quality of Life-Cancer Survivor**
- [ ] **ECOG Performance Status**   how does a single score represent a patient? How does that work? Is it the worst score reported by that patient?
- [ ] **Karnofsky Score**

side effects

- [x] **Most common side effects**
- [ ] **Most severe side effects**

costs

- [x] **Days expended**
- [ ] **Out-of-pocket cost**
- [ ] **Hospital stays**

Filter   all treatment types

Show by:	Surgery:	Radiation:
● All treatment types	○ must include	○ must include
○ Chemotherapy regimens	○ must NOT include	○ must NOT include
○ Hormonal therapy regimens	● all	● all

Flux Notes
Dr. Bran24 Michel09A

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› **Filter**   all treatment types

› **Features**   cancer specific survival rate, ECOG score

`%` `#`

select to compare	👤	Cancer specific survival rates			ECOG score (0 – 4)	Hospitalization due to side effects	
		1 yr	2 yr	5 yr		all	leading causes
surgery & radiation (64)		87%	74%	58%	2.3	32%	peripheral motor... (15%) blood clots (10%)
hormonal therapy (84)		77%	59%	49%	2.2	32%	peripheral motor... (15%) blood clots (10%)
chemotherapy (12)		68%	53%	41%	2.4	32%	peripheral motor... (15%) blood clots (10%)
none (actively monitoring) (3)		67%	54%	43%	2	32%	peripheral motor... (15%) blood clots (10%)

showing **4** of **9** treatments
most common 3 treatments + "none" ▾

○ **All treatments**

● **Most common treatments**
   ● 3   ● all time
   ○ 5   ○ past year
   ○ 10   ☑ include "none"

○ **All treatments with at least**
   [10] patients

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