Redesigning Enterprise Search

Phase 1

Background

In 2020, the Intranet UX team conducted research activities and discovered that users were dissatisfied with Enterprise Search.

> "I wish that the search option acted more like a google search. I find it very difficult to get what I need by searching the intranet site."
>
> — (Administration Office Manager, Revenue Strategy and Innovation)

> "The search function on the Mayo Clinic Intranet is not user friendly and rarely returns results that are relevant or helpful with regard to my problem / what I am searching for."
>
> — (Administrative Coordinator, Mayo Clinic Cancer Center)

Other high-level insights from that study:

Content returned is outdated.

You must know where something is before you can find it.

Localization continues to be a problem.

Results are irrelevant if it doesn't answer my question.

Search isn't the same everywhere.

Goals

In the summer of 2022, we had the green light to start fixing search. The Homepage of the Intranet needed a brand refresh, and part of that initiative included the redesign of the search box and the search engine results page (SERP).

September 2022 initial launch:

More user friendly and relevant intranet search

Updated design to match public and patient platforms

Early relevancy tuning working with vendor

2023 and beyond:

Improve search experience accounting for spell check, look ahead functionality and early enabling of personalization with single sign on and way to display recent searches or start expanding search coverage.

The UX Team

- Thomas Yung (UX Research and UI Design)
- Gianna Lapin-Pfister (UX Research)
- John Schultz (UI Design)
- Melissa Bisila (Product Manager)
- Richard Hurt (Product Owner)

The DEV Team

- Nik Coates (DEV Team Lead)
- Kalyan Kattamuri (Developer - Search Engine Results Page)
- Reilyn Campbell (Developer - Search Box on unibanner)

UX Approach

Given a three month deadline, the UX high level plan included:
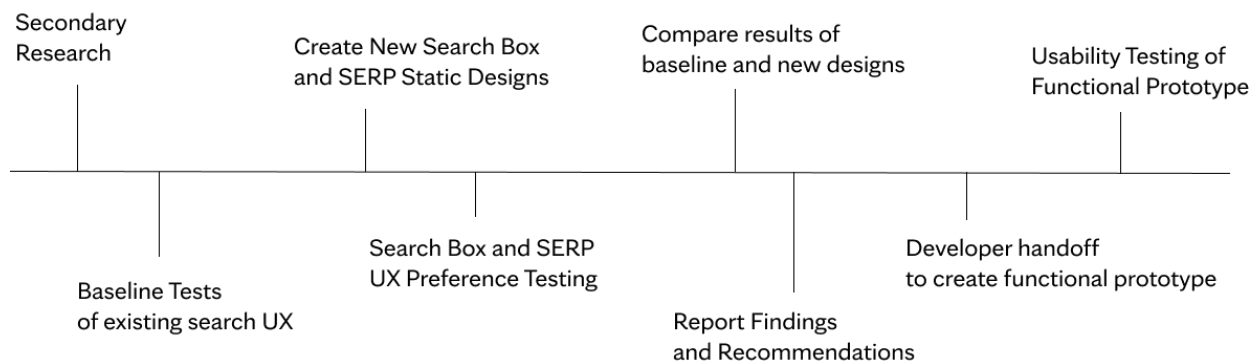
Note: We worked inside an Agile / Scrum framework, with a two week sprint cadence.

What We Knew

- We needed to upgrade to the current version of the vendor's search engine software.
- We cannot integrate all enterprise databases and platforms into our search engine results. For launch, we limited the result set to only WordPress sites.
- Based on Web Analytics, the top searches were related to: finding people, Human Resources, help desk, research, education, and parking.
- Secondary Research - Nielsen Norman Group published an article titled "Intranet Search Essentials" which served as a **best practices guide** for designing enterprise search.

What We Didn't Know

- How to quantitatively **measure** if our new design is actually an improvement?
- What users liked and disliked about the **current** search box and results page?
- What users liked and disliked about the **new** search box and results page?
- How would **mobile** and **tablet** (screen size constraints) affect our new design?

- How to **prioritize** the different UI elements on the page layout? E.g. People results, Intranet results, Filters, Search For 'term' On external sites.

How We Found Out

1. The UX Research team conducted a **baseline** UMUX survey of **current** search box and search engine results page design.
2. The UI Design team created **two different design concepts** for the **Search Box**.
3. The UX Research team conducted a **UMUX survey** and **preference test questions** to validate the two **new Search Box** designs.
4. The UI Design Team created **two different design concepts** for the **Search Engine Results Page**.
5. The UX Research team conducted a **UMUX survey** and **preference test** questions to validate the two **new Search Engine Results Page** designs.
6. The UX Research team conducted follow-up **1-1 user interviews** to clarify user preferences of the new Search Engine Results Page designs.

Baseline UMUX survey

The UMUX (Usability Metric for User Experience) is a simple 4-question assessment based on the System Usability Scale (SUS). We chose the UMUX as a standardized scale to measure a user's perception of usability and usefulness.

In an intercept survey, we showed (N=852) users the current search experience.
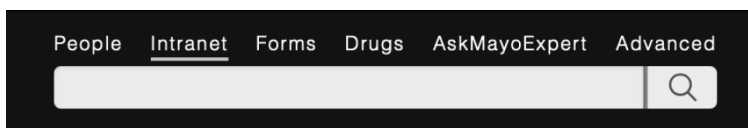

Figure 1 - Existing Global Search Box (desktop/tablet) located in banner on top right.
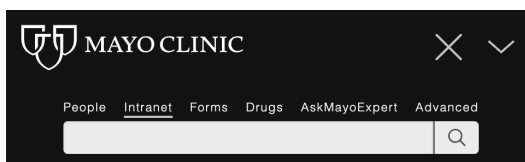

Figure 2 - Existing Search Box (mobile) - closed state
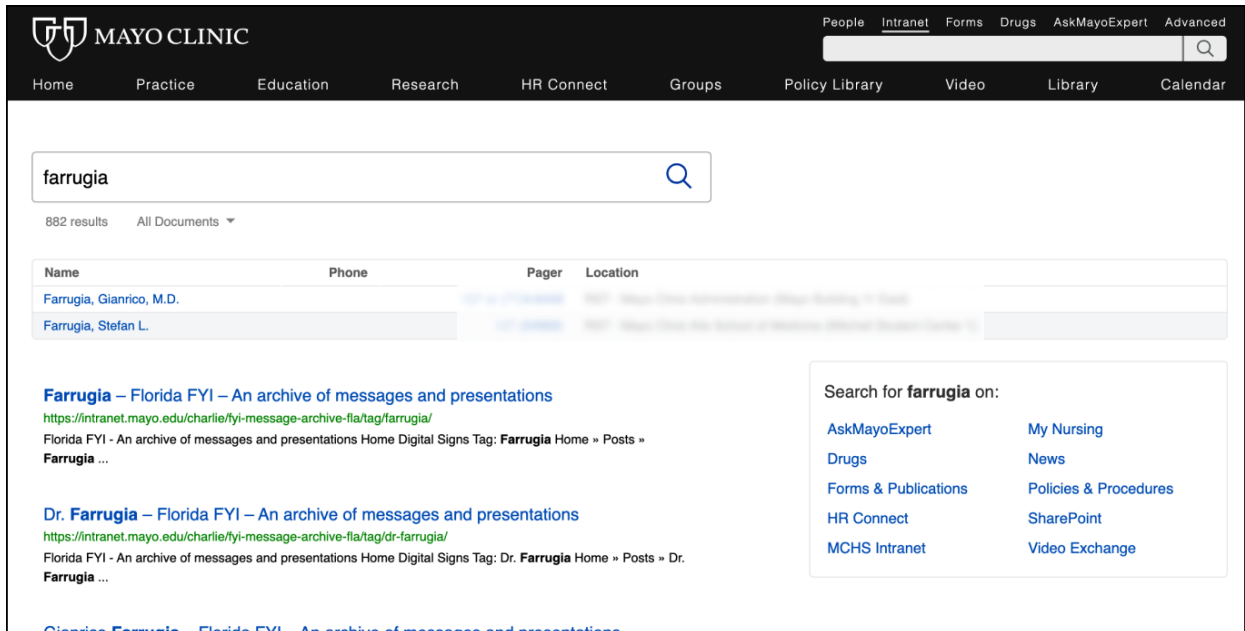

Figure 3 - Existing Search Box (mobile) - open state

Figure 4 - Existing Search Engine Results Page

Then, we asked the following four UMUX questions.

Figure 5 - UMUX questions
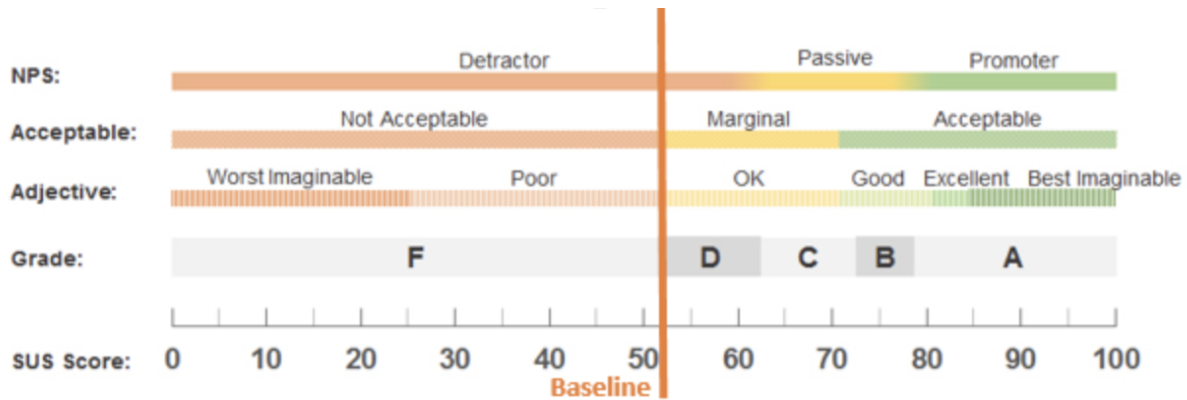
The results of the baseline UMUX study:

*Figure 6 - SUS-Equivalent Score: **52.10***

The score of 52.10 tells us that the existing Search experience was **not very good**. The goal moving forward is to have a higher score.

New Search Box - UMUX and Design Impressions

We showed (N=162) users the new search box designs.

Design 1a

Figure 7 - Search Box with categorized search dropdown options always visible to the user.

Design 1b

Figure 8 - Search Box with categorized search dropdown options initially hidden to the user until they click Search icon.

Design 2a

Figure 9 - Search Box without categorized search dropdown options always visible to the user.

Design 2b

Figure 10 - Search Box without categorized search dropdown options initially hidden to the user until they click Search icon.

After showing each design option, we asked each participant the four UMUX questions. The results of the UMUX study showed that **users preferred Design 1a** (*Search Box with categorized search dropdown options always visible*) over the other three options.
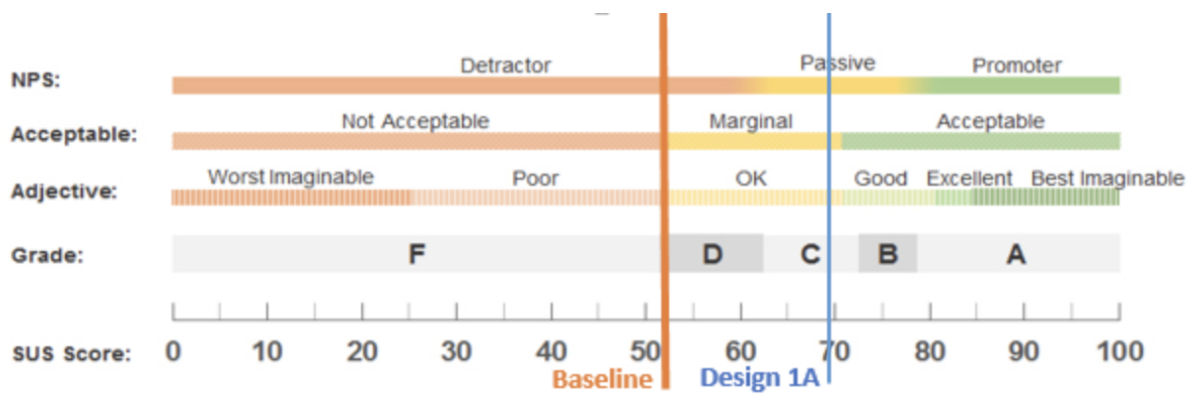

*Figure 11 - Design 1a SUS-Equivalent Score: **69.52***
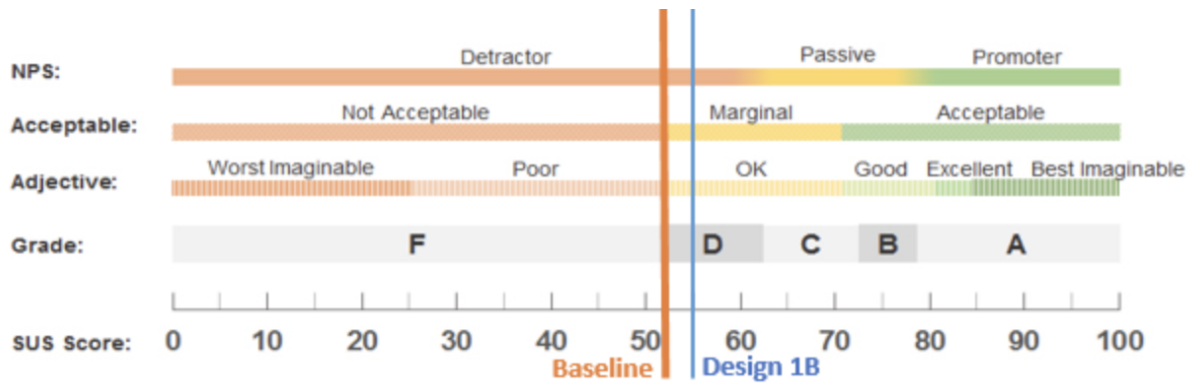
*Figure 12 - Design 1b SUS-Equivalent Score: **54.27***
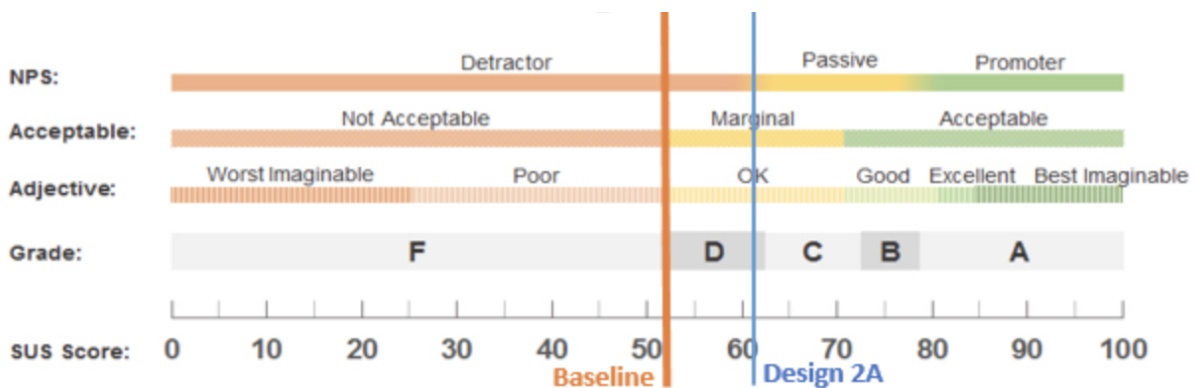
*Figure 13 - Design 2a SUS-Equivalent Score: **61.14***

*Figure 14 - Design 2b SUS-Equivalent Score: **48.75***

Creating the New Search Results Page

The UI Design team met with the Dev Team and discussed technical limitations of the search vendor's software and what can be implemented in the short timeframe of 3 months. We decided to **leave out several features** that were recommended by Nielsen Norman's best practices guide,

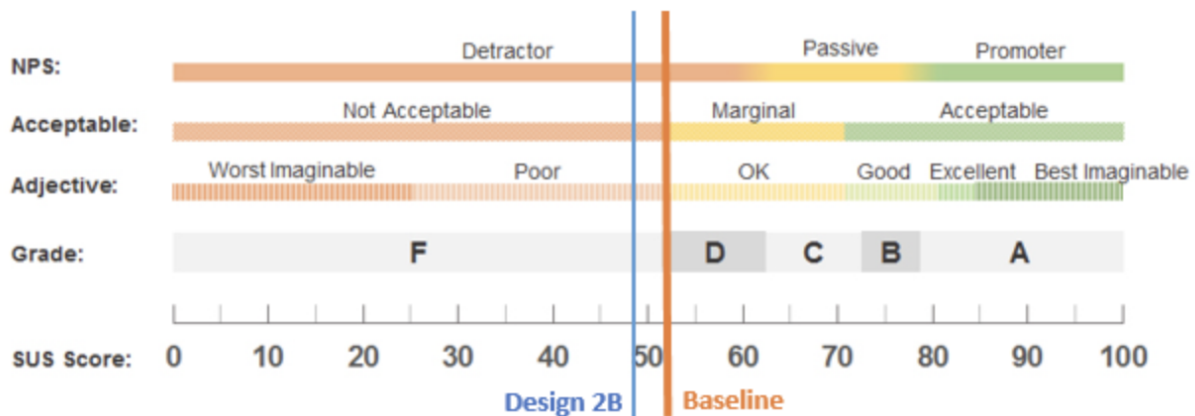including the ability to sort results by date/relevance, show last updated date with each result, type ahead search suggestions, and filter results by departments and locations. The UX Team recommended that these features would be implemented in future releases.

New design elements included a 'Feedback to Improve Search' link, and people's results with their photo.

The existing search results page had several UI elements under consideration for a new redesign.
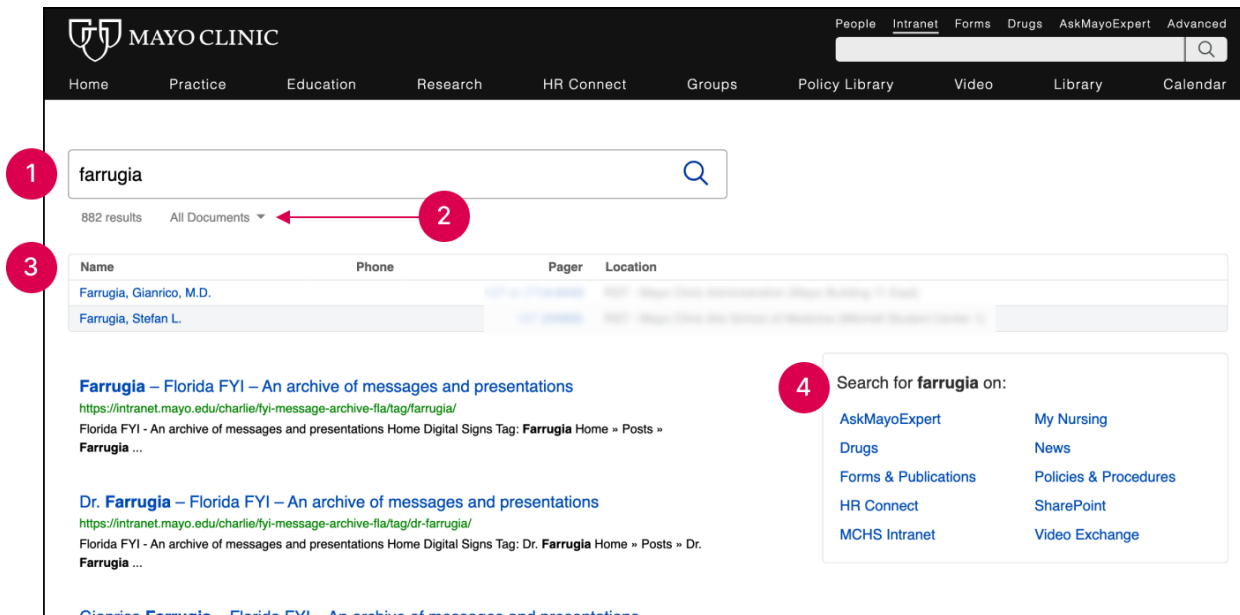
1 - Duplicate search box (which was removed in new designs)
2 - Content type filters hidden under dropdown
3 - People results in table format
4 - Search For 'term' On external sites using text-only styling

Refreshed Design Elements

Filter Results

We wanted to see if users preferred the pill style or the normal style checkboxes.
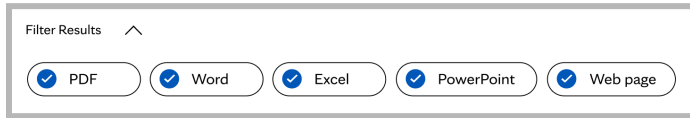
Design 1 - Pill style checkboxes
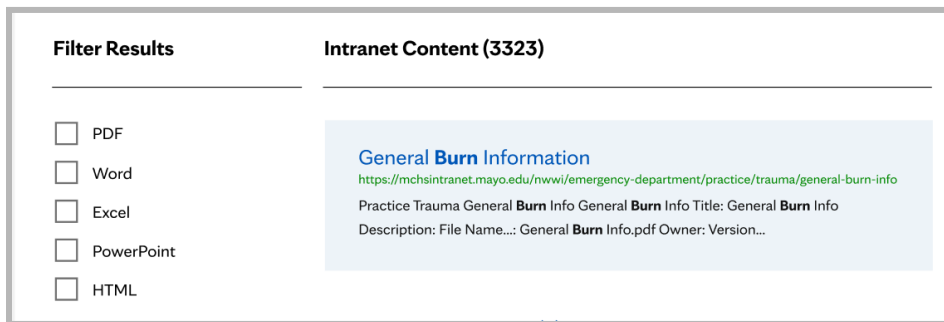
Design 2 - Standard style checkboxes

People Results

The people results were redesigned in a more modular card style that allowed us to fit the people results in all screen sizes (mobile/tablet/desktop).
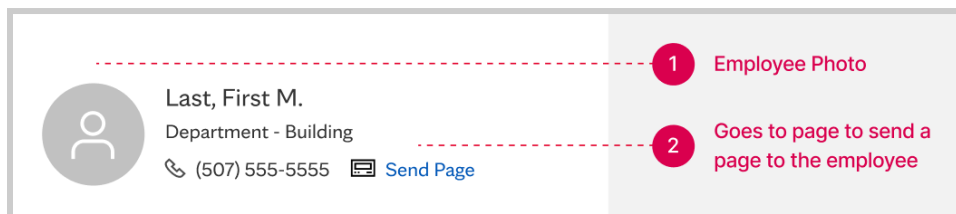
Search For 'term' On External Sites

The Search For 'term' On external sites section was redesigned to follow Mayo Clinic's new design language. **Design 1** features new icons from Mayo Clinic brand standards. **Design 2** has no icons.

AskMayoExpert	>
Drugs	>
Forms & Publications	>
HR Connect	>
MCHS Intranet	>
My Nursing	>
News	>
Policies & Procedures	>
SharePoint	>
Video Exchange	>

AskMayoExpert	>
Drugs	>
Forms & Publications	>
HR Connect	>
MCHS Intranet	>
My Nursing	>
News	>
Policies & Procedures	>
SharePoint	>
Video Exchange	>

Results with Document Type icons

For results that are documents (not web pages), we feature icons next to the result. This was considered a best practice according to Nielsen Norman. **Design 1** features document icons. **Design 2** does not include icons.

Ken **Burns** documentary (3) – Public Affairs Q&A Archive

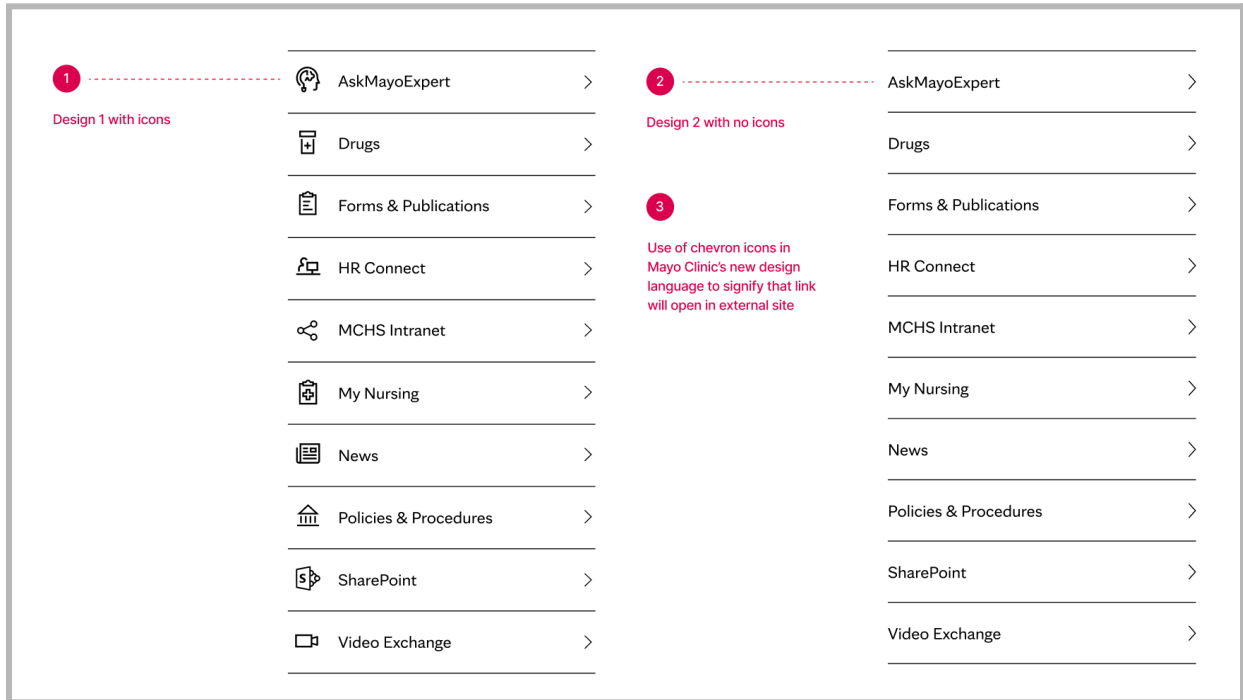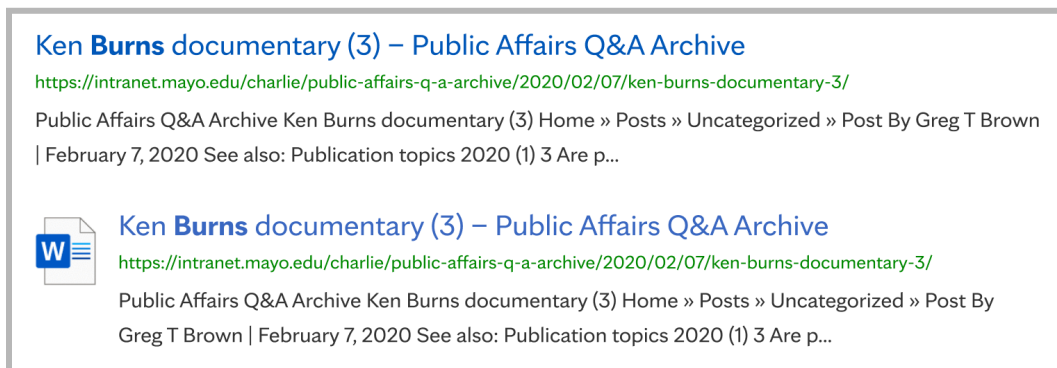https://intranet.mayo.edu/charlie/public-affairs-q-a-archive/2020/02/07/ken-burns-documentary-3/

Public Affairs Q&A Archive Ken Burns documentary (3) Home » Posts » Uncategorized » Post By Greg T Brown
| February 7, 2020 See also: Publication topics 2020 (1) 3 Are p...

Ken **Burns** documentary (3) – Public Affairs Q&A Archive

https://intranet.mayo.edu/charlie/public-affairs-q-a-archive/2020/02/07/ken-burns-documentary-3/

Public Affairs Q&A Archive Ken Burns documentary (3) Home » Posts » Uncategorized » Post By Greg T Brown | February 7, 2020 See also: Publication topics 2020 (1) 3 Are p...
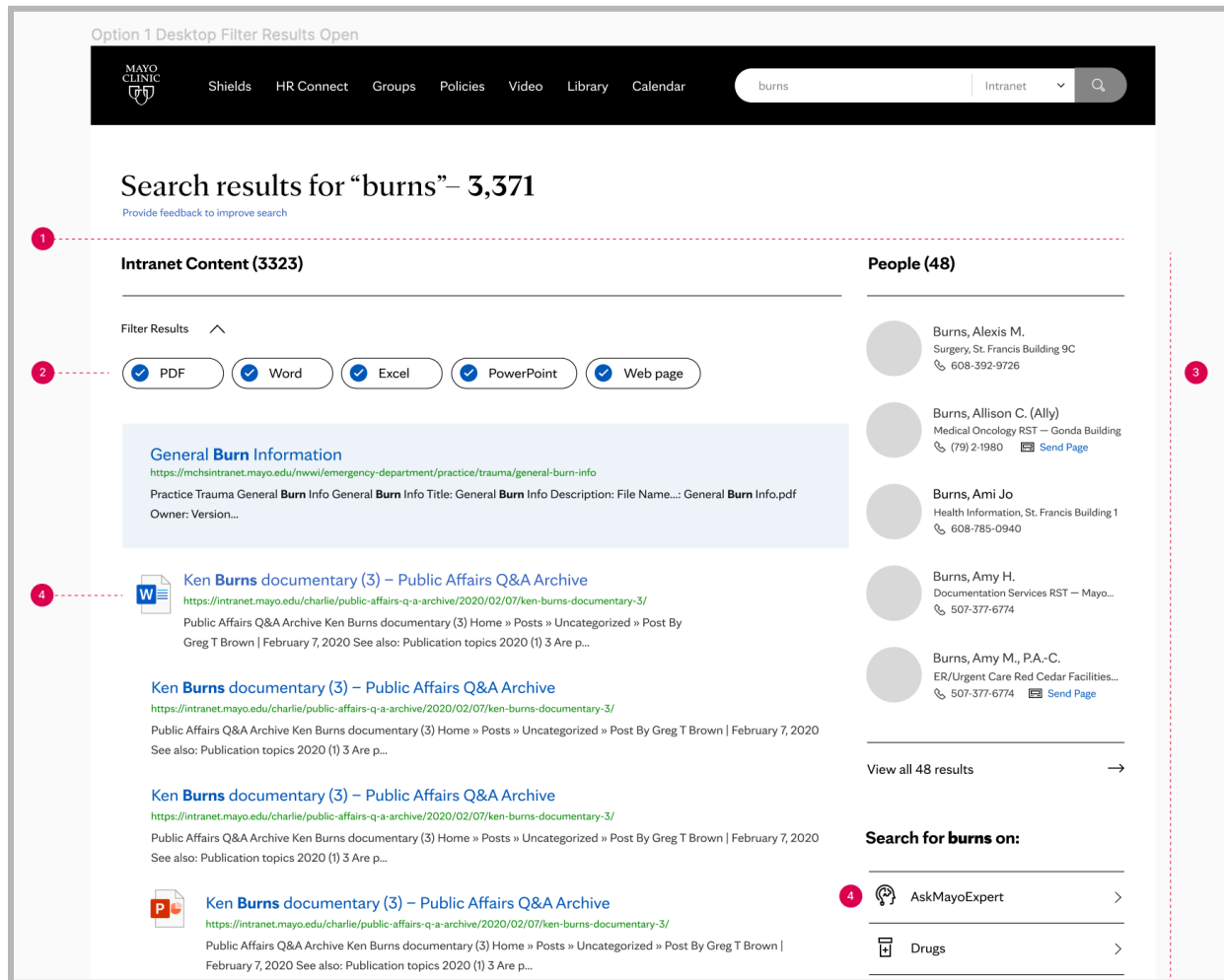
Design 1 (Desktop)

Figure 15 - Design 1 (Desktop)

1. Design 1 features a **two column layout** versus Design 2 which features a 3-column layout
2. Design 1 features **pill style checkboxes** for Filter Results
3. The aside column on the right features People Results and the ability to carry over the search term to external sites' search engines (Search For On).
4. **Design 1** is icon heavy versus Design 2 which is not.

Design 1 (Tablet)

When the screen is resized to tablet, the design switches to use a **one column layout**. The Search For On section is moved into a **dropdown** menu right next to the Filter Results. The People results are prominently displayed before the Intranet results.
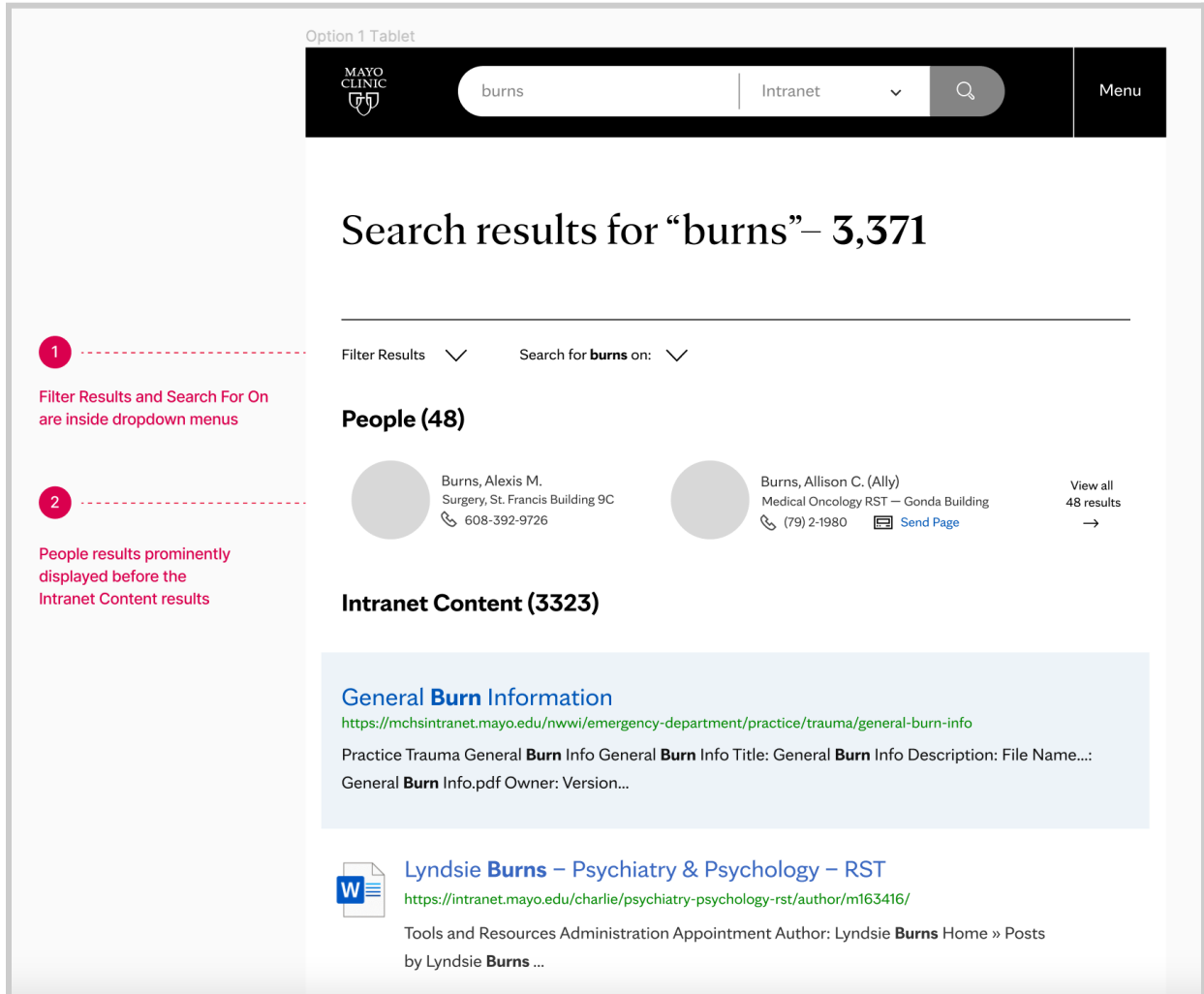
MAYO CLINIC

burns | Intranet ⌄ | 🔍 | Menu

Search results for "burns"– 3,371

Filter Results ⌄   Search for **burns** on: ⌄

1 ----- Filter Results and Search For On are inside dropdown menus

People (48)

Burns, Alexis M.
Surgery, St. Francis Building 9C
📞 608-392-9726

Burns, Allison C. (Ally)
Medical Oncology RST — Gonda Building
📞 (79) 2-1980   📧 Send Page

View all
48 results
→

2 ----- People results prominently displayed before the Intranet Content results

Intranet Content (3323)

General **Burn** Information
https://mchsintranet.mayo.edu/nwwi/emergency-department/practice/trauma/general-burn-info
Practice Trauma General **Burn** Info General **Burn** Info Title: General **Burn** Info Description: File Name...:
General **Burn** Info.pdf Owner: Version...

Lyndsie **Burns** – Psychiatry & Psychology – RST
https://intranet.mayo.edu/charlie/psychiatry-psychology-rst/author/m163416/
Tools and Resources Administration Appointment Author: Lyndsie **Burns** Home » Posts
by Lyndsie **Burns** ...

*Figure 16 - Design 1 (Tablet) **initial** state*

MAYO CLINIC

burns | Intranet ⌄ | 🔍 | Menu

Search results for "burns"– 3,371

Filter Results ⌃   Search for **burns** on: ⌄

1 ----- Filter Results dropdown opened
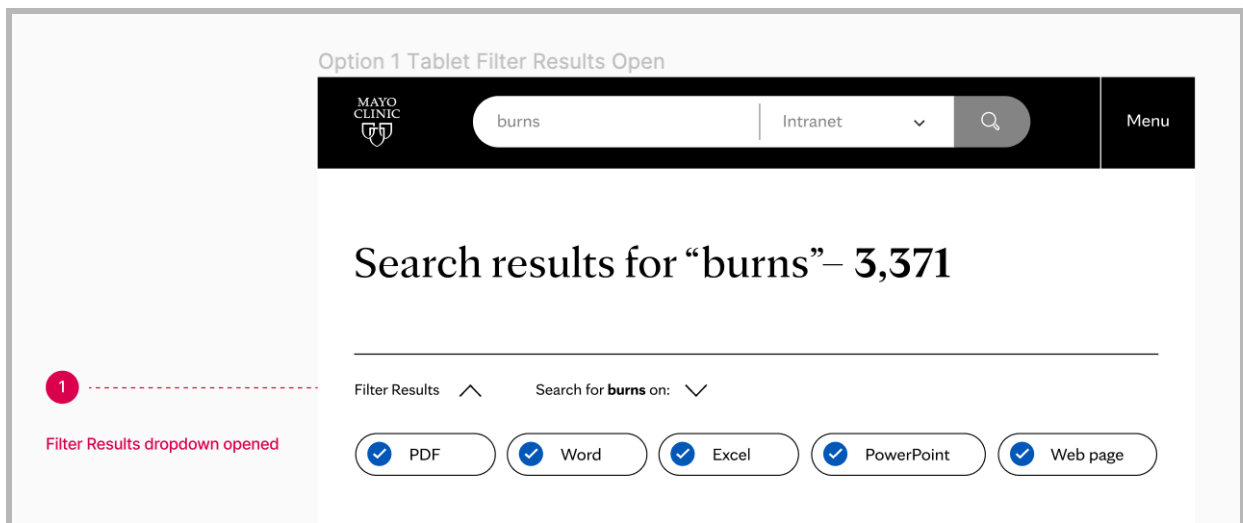
✅ PDF   ✅ Word   ✅ Excel   ✅ PowerPoint   ✅ Web page

*Figure 17 - Design 1 (Tablet) Filter Results dropdown in **open** state*
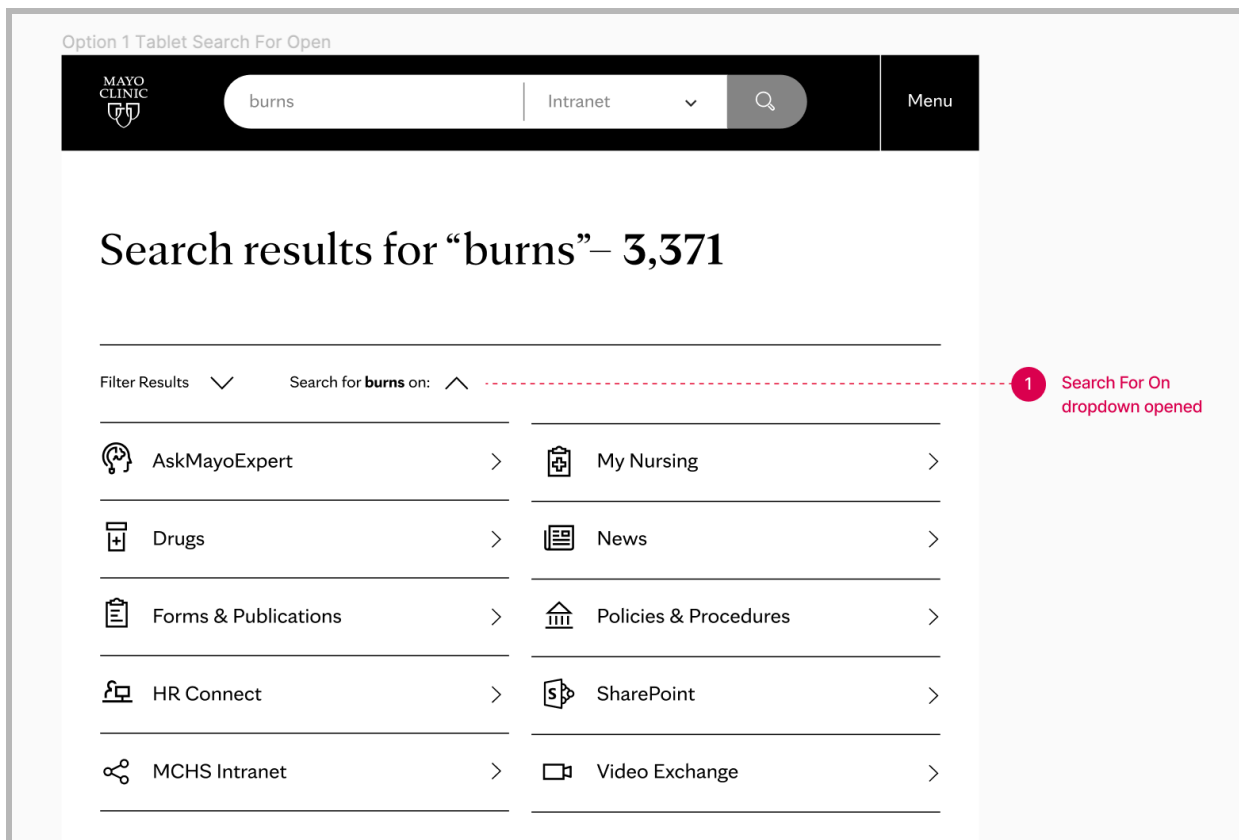
*Figure 18 - Design 1 (Tablet) Search For On dropdown in **open** state*

Design 1 (Mobile)

When the screen is resized to mobile, we move the Filter Results and Search For On to an **accordion menu**. When the accordions are opened, they show their respective content, and it pushes the other content further down the page.
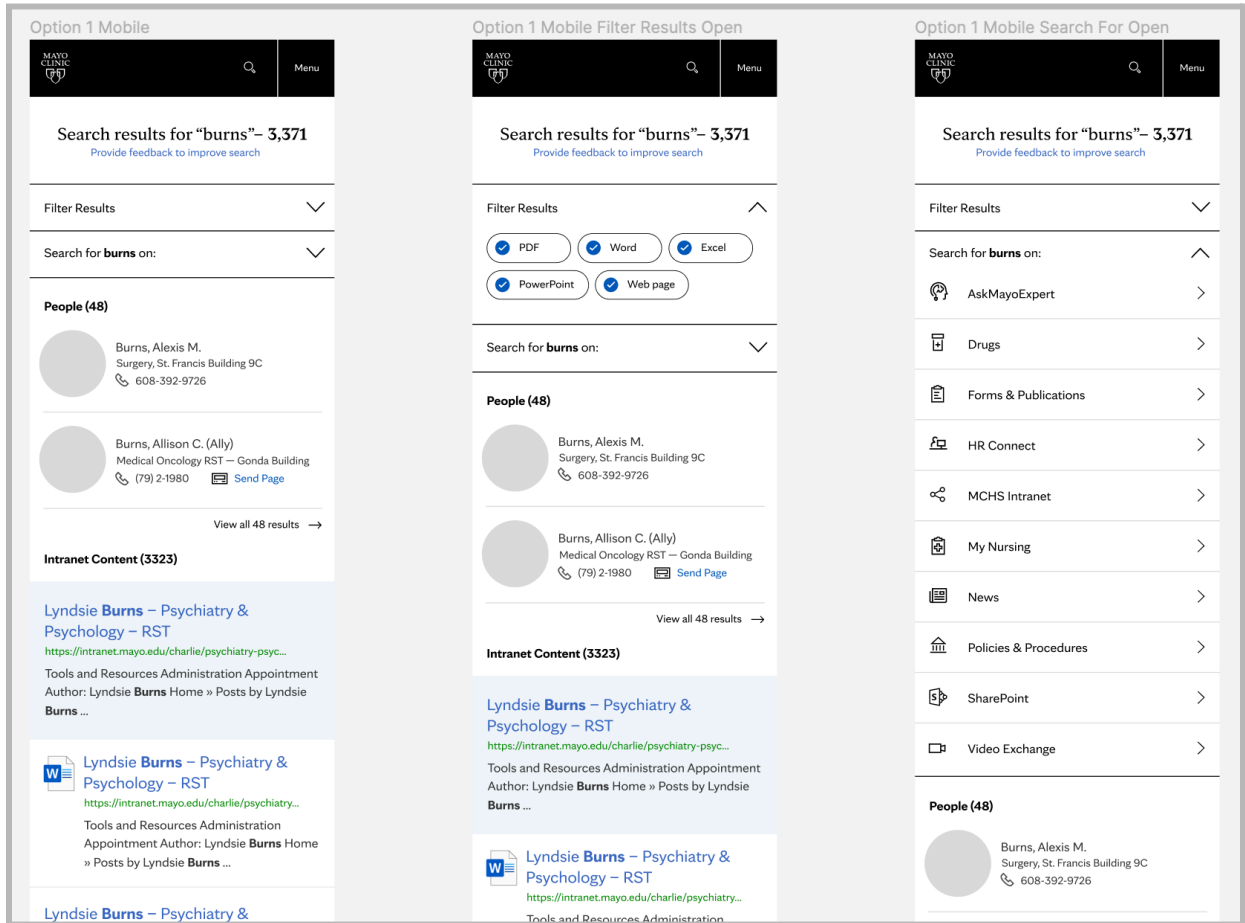
Figure 19 - Design 1 (Mobile) with all three accordion states (closed, Filter Results open, Search For 'term' On open)

Design 2 (Desktop)

Figure 20 - Design 2 (Desktop)

1. Design 2 (Desktop) uses a **three column layout** versus Design 1 (which uses a two column layout).
2. The Filter Results section is prominently displayed on the left aside column. It uses **traditional checkboxes**, instead of the pill style checkboxes.
3. **No icon treatment** for both the document type results and the Search For On external sites.
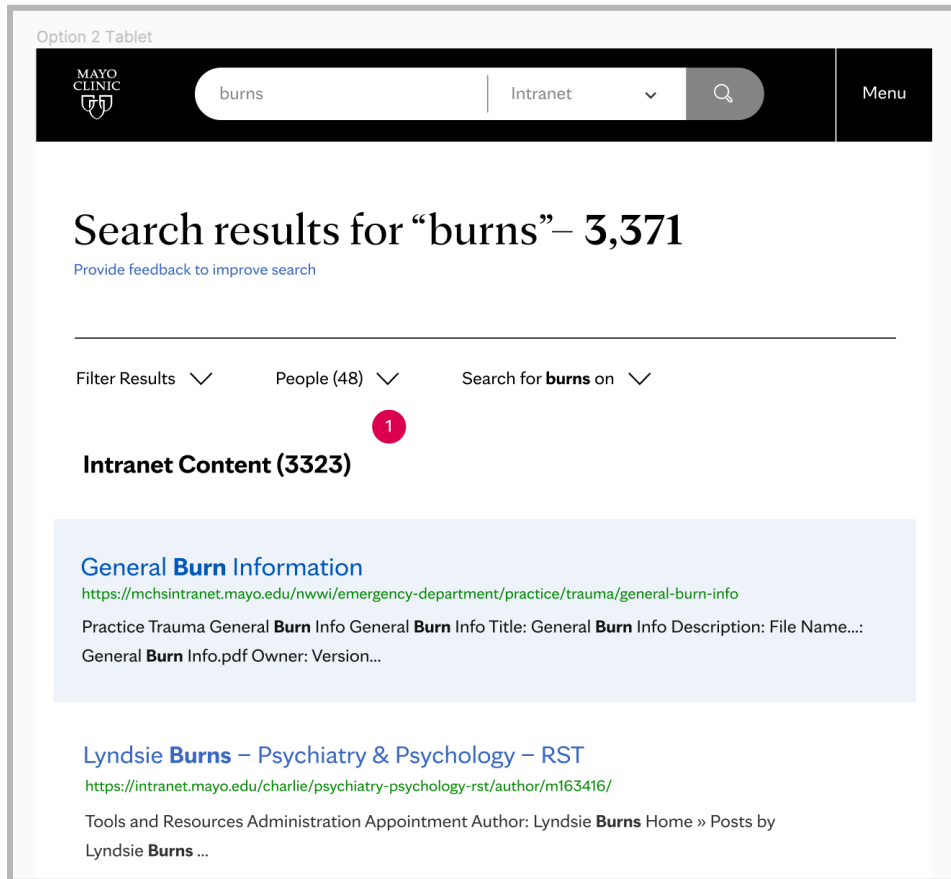
Design 2 (Tablet)

Figure 21 - Design 2 (Tablet) initial state - all menus closed

1. People Results will be initially hidden inside the dropdown menu, until the user clicks to expand the dropdown. This is different from Design 1, where it is initially shown, and not hidden inside a dropdown menu.
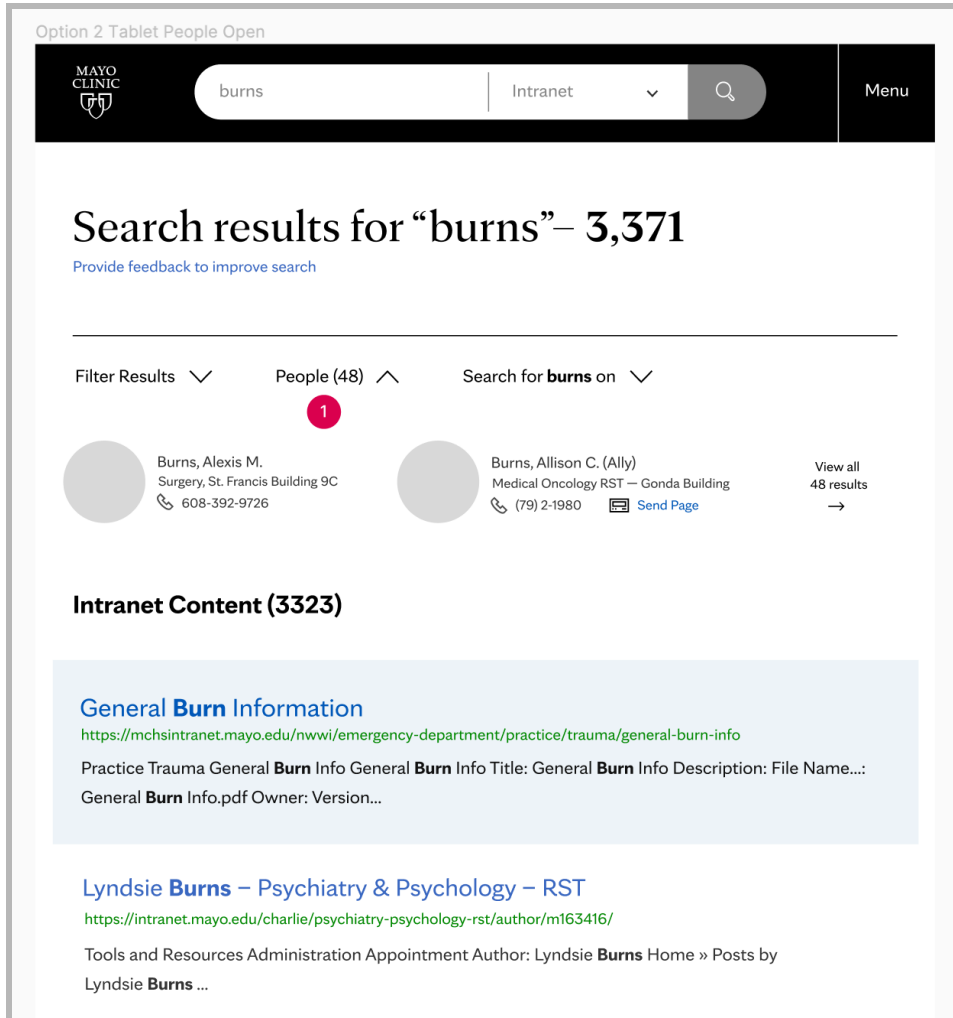
Figure 22 - Design 2 (Tablet) People Results open state

1. When the People dropdown is clicked, the People Result cards are flowed horizontally with a maximum of two results shown.
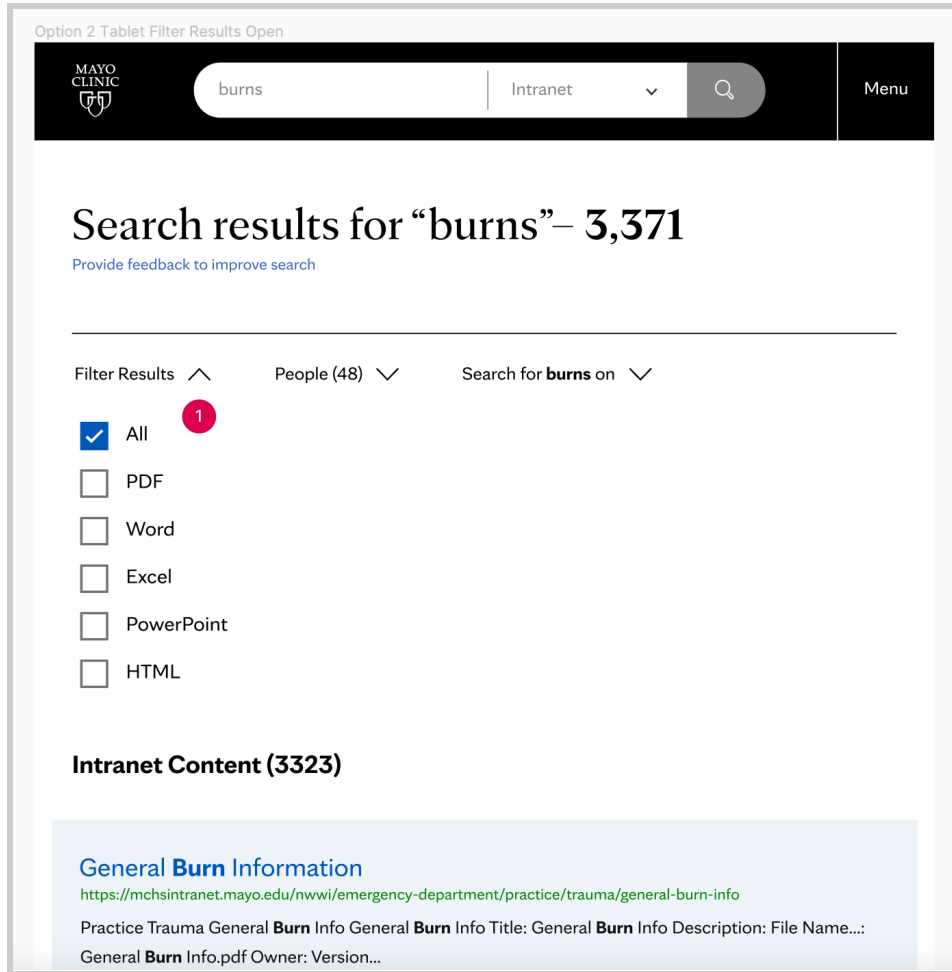
Figure 23 - Design 2 (Tablet) Filter Results open state

1. When the Filter Results dropdown is clicked, the Filter Results as normal checkboxes are shown and flowed vertically.
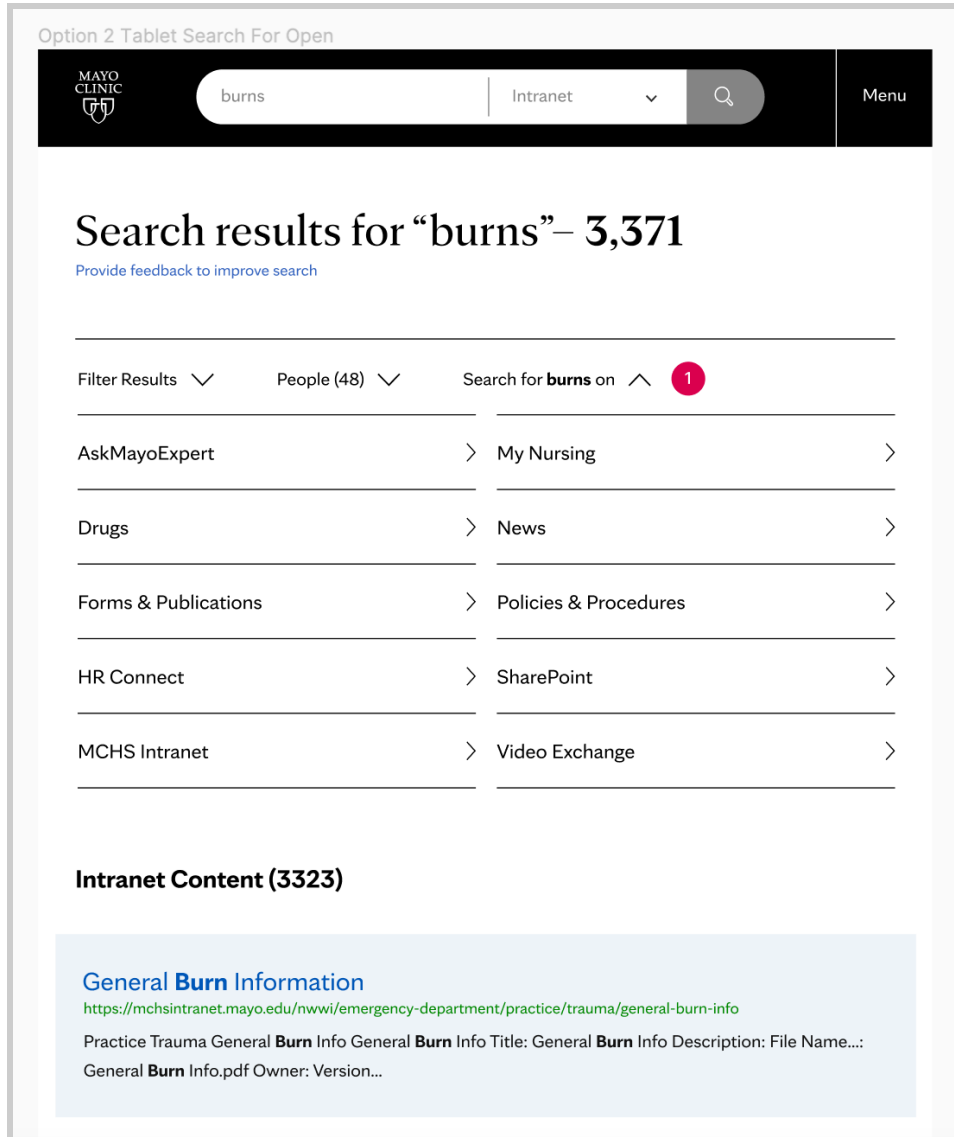
MAYO CLINIC

burns | Intranet ⌄ | 🔍 | Menu

Search results for "burns"– 3,371

Provide feedback to improve search

Filter Results ⌄   People (48) ⌄   Search for **burns** on ⌃ ①

AskMayoExpert ›		My Nursing ›
Drugs ›		News ›
Forms & Publications ›		Policies & Procedures ›
HR Connect ›		SharePoint ›
MCHS Intranet ›		Video Exchange ›

Intranet Content (3323)

General **Burn** Information
https://mchsintranet.mayo.edu/nwwi/emergency-department/practice/trauma/general-burn-info

Practice Trauma General **Burn** Info General **Burn** Info Title: General **Burn** Info Description: File Name...: General **Burn** Info.pdf Owner: Version...

Figure 24 - Design 2 (Tablet) Search For On open state

1. When the Search For 'term' On dropdown is clicked, the external sites listing is shown in a **two column** format.
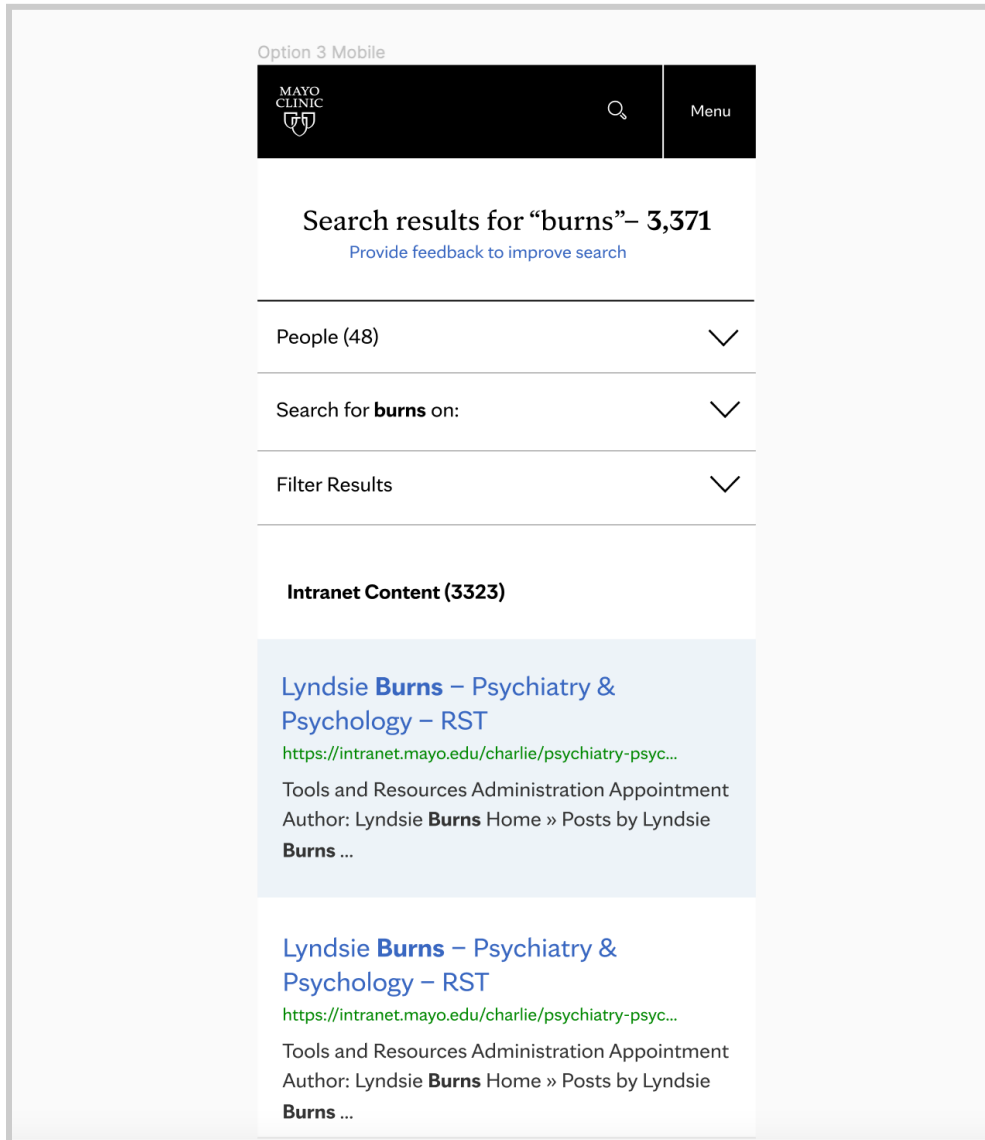
Design 2 (Mobile)

Figure 25 - Design 2 (Mobile) initial state - all accordion items closed.

Design 2 (Mobile) behaves almost exactly as Design 1 (Mobile), except for pill style checkboxes, and no icon treatments.

User Research for the New Search Engine Results Page

UMUX and Design Impressions Survey

We showed (N=144) users the two new Search Engine Results Page designs (Design 1 and Design 2).

After showing each design option, we asked the four UMUX questions. The results of the UMUX study showed that **users preferred Design 2** over Design 1 (only slightly).
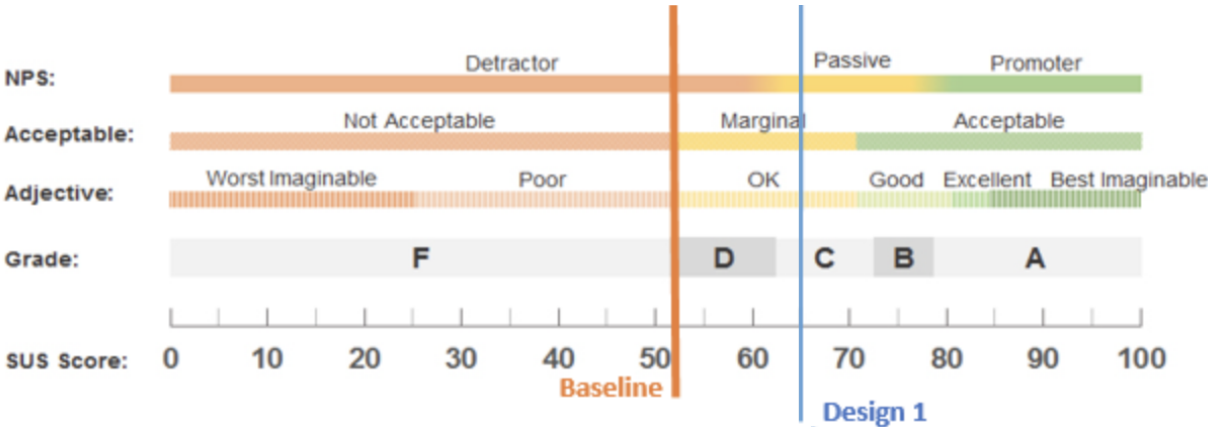

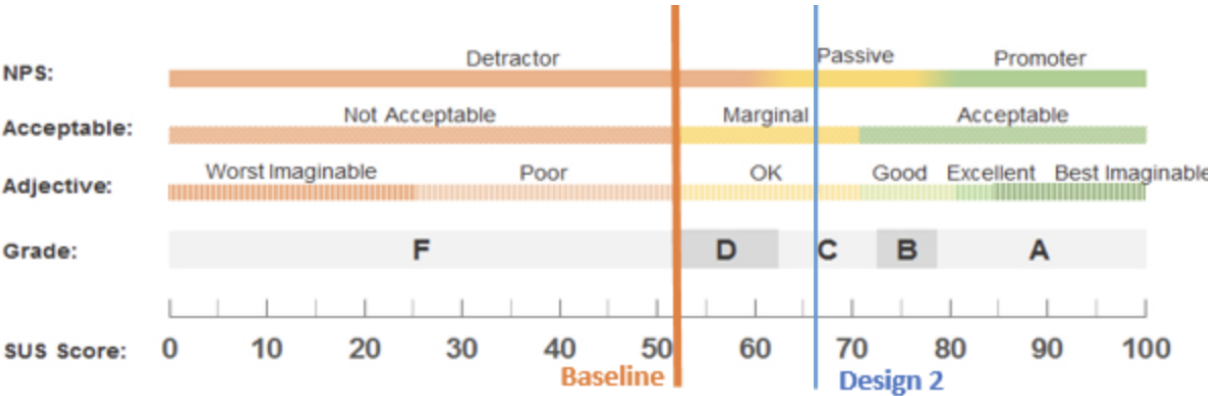*Figure 26 - Design 1 SUS-Equivalent Score: **65.28***

*Figure 27 - Design 2 SUS-Equivalent Score: **66.10***

As part of the survey, we also gathered open-ended questions on their initial impressions of each design. To make a definitive decision, we looked towards the qualitative part of the UX Research study.

SERP Design Conversations

In addition to the UMUX and Design Impressions Survey, the UX Research Team conducted 1-1 User Interviews with (N=9) randomly selected participants from the same pool that answered the survey. The goal was to clarify and dig a little deeper into why they liked certain designs. We also knew that some users would like certain design elements in one design and certain design elements in another.

User Research Insights

Here are some of the major themes discovered.

Fix the relevance of the results, not just the visual design

This finding was not unexpected. However, we knew that for Phase 1, relevance of results would require extensive tuning. Getting more relevant results would be a long term goal, and not a magic wand solution.

QUOTABLES

> "Quite honestly it's not the look of the page but refining the search tool that I'd like to see updated."

> "I feel like this is missing the problem - the problem is how results are returned, not the layout of the results. Make it more like Google."

> "In my opinion the layout of the intranet page isn't the issue, getting to the right content/improving the search function is what needs improvement."

> "First thought is that you would want the search to display all results. Filters should not be checked by default, instead you select the one or two required and then update the search."

Search For 'term' On was slightly confusing

Participants did not understand that by clicking on one of the external sites listed in this section, it would carry over the search term into the external site. Some thought that these were just links to the external sites, and that once in that site, they would need to find the search bar and type in the search term again.

Users did not prefer prioritizing People Results over Intranet Results

Participants told us that they preferred prioritizing the Intranet Results over the People Results in the mobile and tablet designs.

People Cards design was well received

Participants liked that the People results included photos next to the names. Also, the ability to quickly see the relevant information like their department, phone number, and pager number was identified as being very useful.

Preferred placement of Filter Results in a visible location on the left

Participants commented that they did not even realize that this feature already existed in the old search results page. They seemed to like that in Design 2 (Desktop), it was placed prominently on the left column right next to the results.

There are not enough filter options in the Filter Results

Participants said that it would be better to have more than just filters for document types. For example, they wanted to filter by department/area or by dates.

Users preferred icon treatments in the results and the Search For On external sites

Even though Design 1 (with icon treatments), did not get the higher UMUX score, the qualitative data told us that many participants did like the icon treatments.

Pill style checkboxes and traditional style checkboxes were equally liked

There were equal amounts of participants that liked the pill style checkboxes, and those that preferred the standard treatment.

Recommendations

1. The UI Design team should **redesign the Search For On** so that it is clearer as to the action that is expected when the user clicks on one of the external sites. Perhaps, changing the location or icon treatments to indicate that it is not just a link out to the external site, where the user has to locate the search field and retype the search term.
2. **Prioritize Intranet Results** over People Results in the flow of the page.
3. Keep the **People Results** card style design.
4. Keep the **three column layout** for Desktop from Design 2. Use the left most column for the Filter Results.
5. Keep the document **icon treatments** for the search results. Continue the use of icons in the Search For On external sites.
6. Play it safe. Use **standard checkboxes** for the filter options, since that is what users are most familiar with.
7. For **Mobile/Tablet**, the placement of the filters in dropdown menus and accordion menus was disjointed and inconsistent. Perhaps, **create a slide over menu** that is triggered from a standard **filter icon**, which is a design pattern that Google mobile apps use.

UI Changes Based On UX Feedback

Color changes

We showed the designs to the Mayo Clinic Visual Design team and asked for feedback. They wanted us to **not use black** in the header and footer. We were given a separate color for the header and the footer.
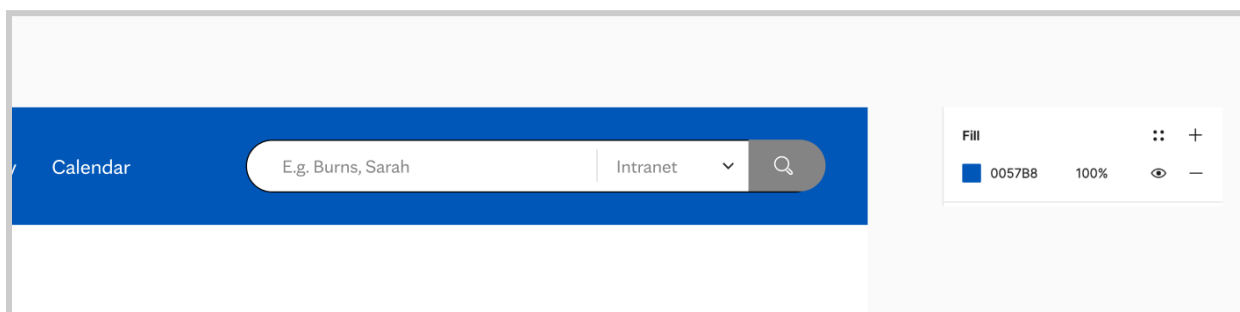

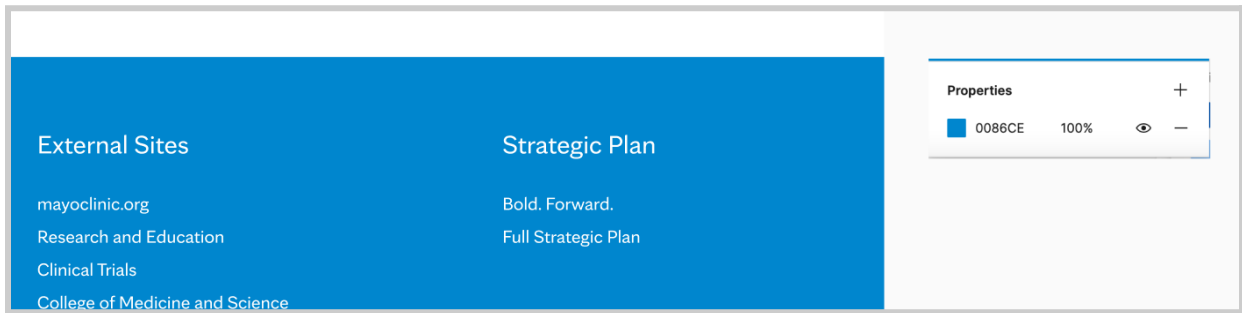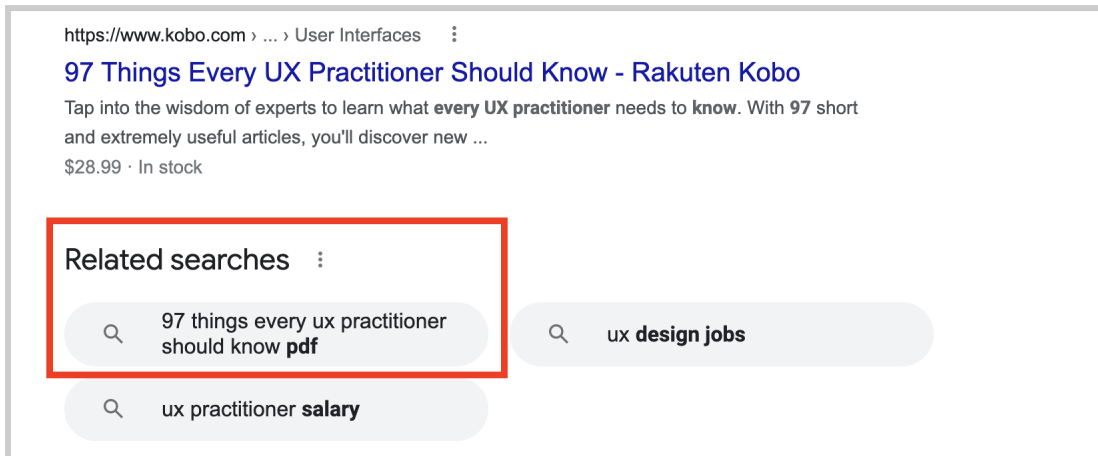Figure 28 - #0057B8 as the new unibanner header color

Figure 29 - #0086CE as the new footer color

Redesigning Search For On

The UI Design Team took a look at examples from Google and others.

We decided to replace the external site icons with a **search icon**. This makes it clear that we are not just linking to an external site, but **continuing the search** on the external site.
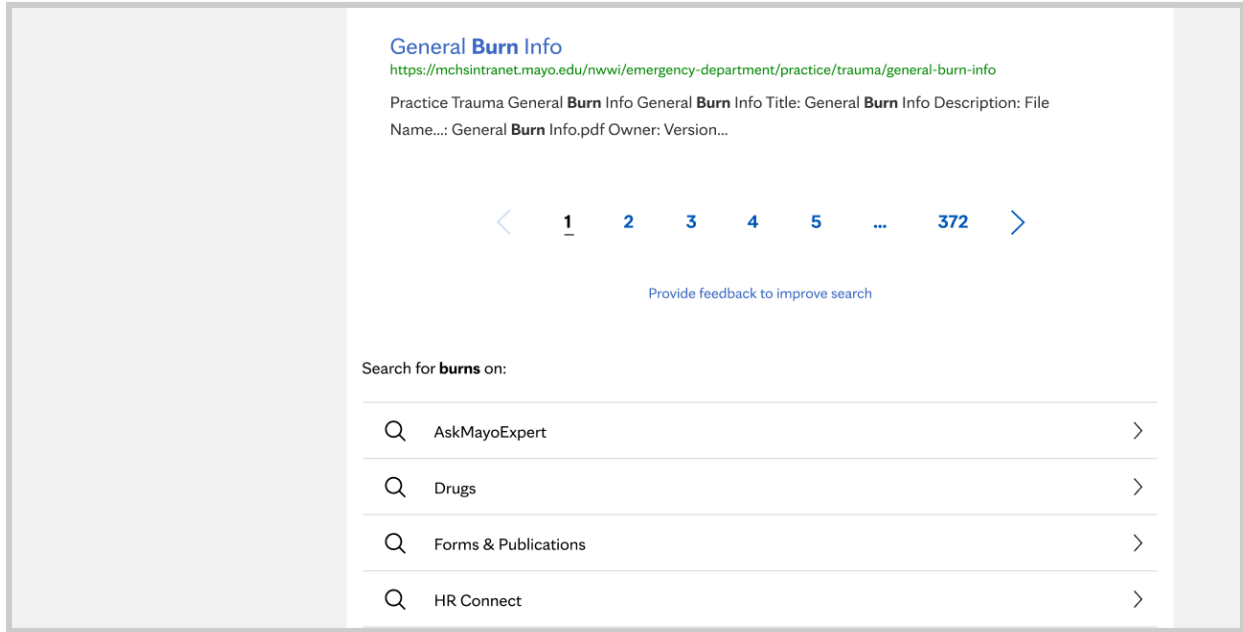
General **Burn** Info
https://mchsintranet.mayo.edu/nwwi/emergency-department/practice/trauma/general-burn-info

Practice Trauma General **Burn** Info General **Burn** Info Title: General **Burn** Info Description: File
Name...: General **Burn** Info.pdf Owner: Version...

< 1 2 3 4 5 ... 372 >

Provide feedback to improve search

Search for **burns** on:

🔍 AskMayoExpert >

🔍 Drugs >

🔍 Forms & Publications >

🔍 HR Connect >

Figure 30 - Changed icons and moved the Search For On section to below the results

For **mobile/tablet**, we placed the Search For On section **below the Intranet Content results**. This makes it clear that it is **not a filter**, but that you are continuing the search term on the external sites.

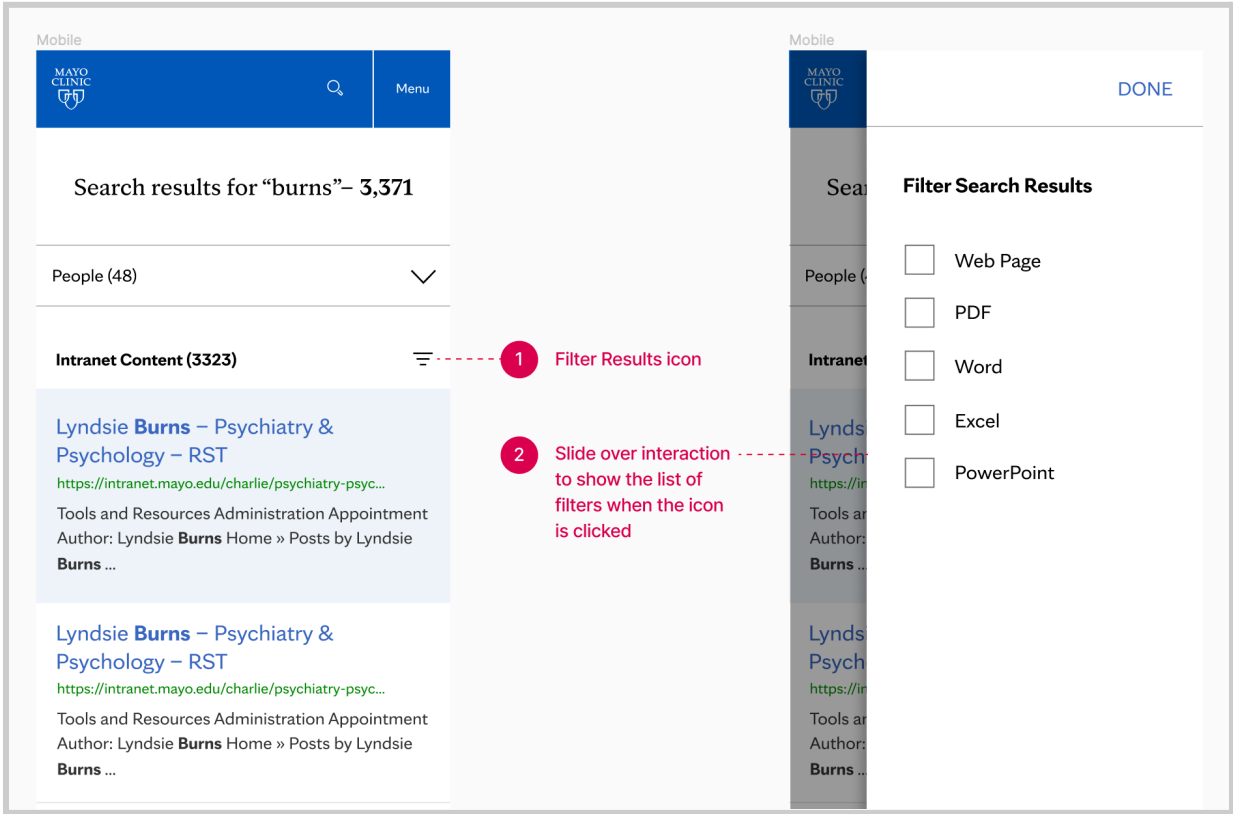# Filter Results Slide Over Menu

Figure 31 - Filter Results in slide over menu

The old design switched from accordion menu to drop down menu when moving from mobile to tablet. This inconsistency can be confusing. After discussing with the Dev Team, we agreed to use a **slide over menu for both mobile and tablet** screen sizes. This has the added benefit of reducing the code used for mobile and tablet. It allows us to be future-proof in our designs, since the list of filters can be expanded vertically down the page. The previous designs (drop down menus) would have left no room to grow, since they were displayed horizontally.

Filter Results As Radio Buttons
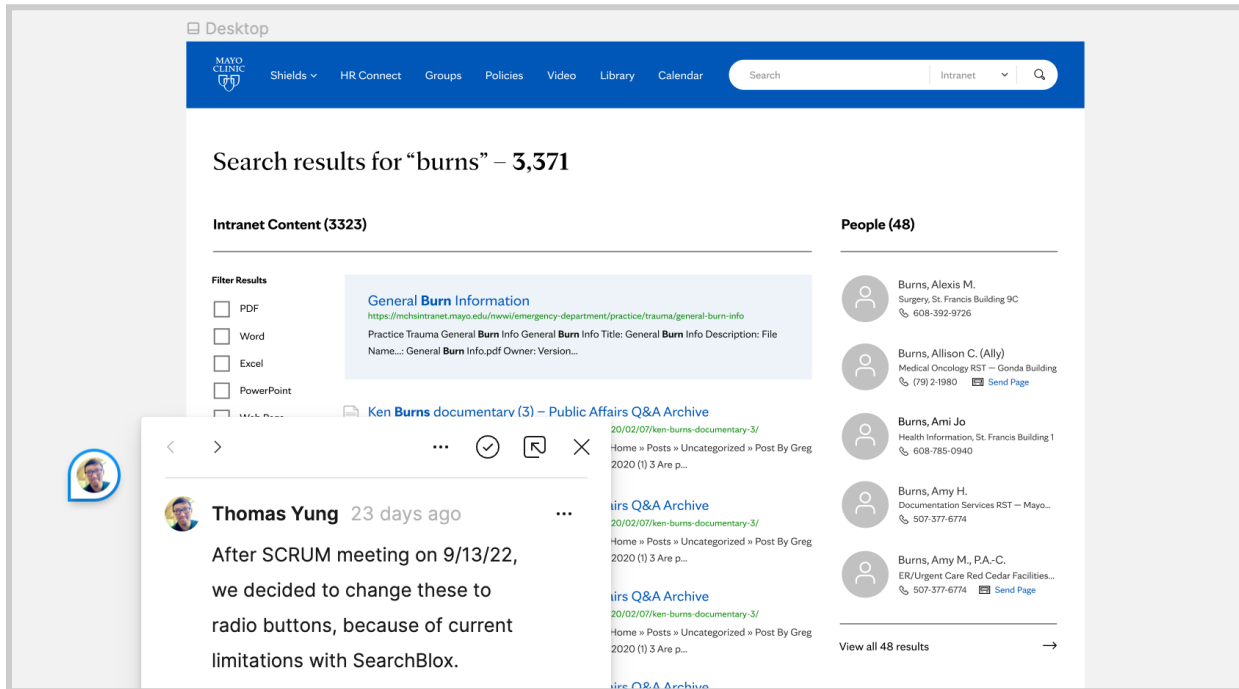
After showing the new designs to the Dev Team, they told us that the search vendor's out-of-the-box Filter Results does not behave like checkboxes, but rather like radio buttons. It would take more time to implement and test new functionality. That would push our dates further out. Therefore, we changed the designs from checkboxes to radio buttons. The UX team recommended that in future releases, we change it back to checkboxes.
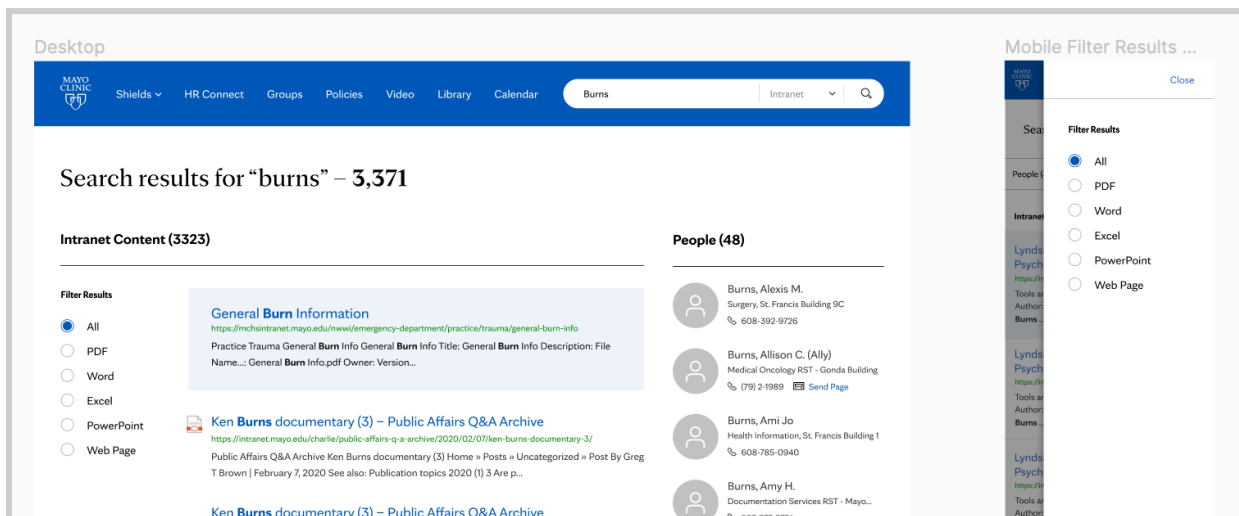

Figure 32 - Changed Filter Results checkboxes to radio buttons

People Results in Mobile/Tablet

We wanted to prioritize the Intranet Content Results over People Results in mobile and tablet contexts.
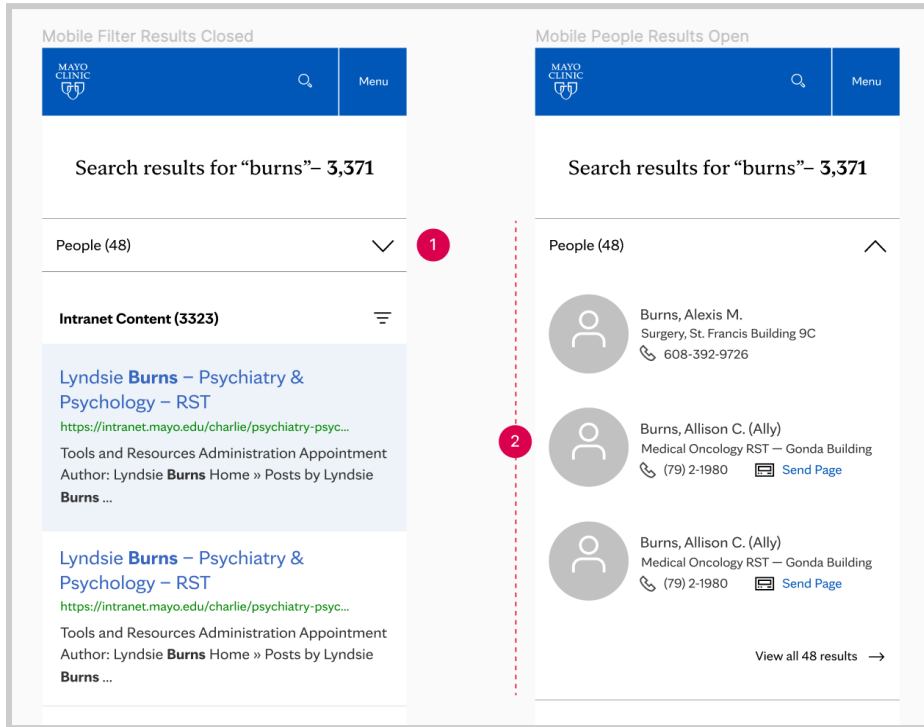

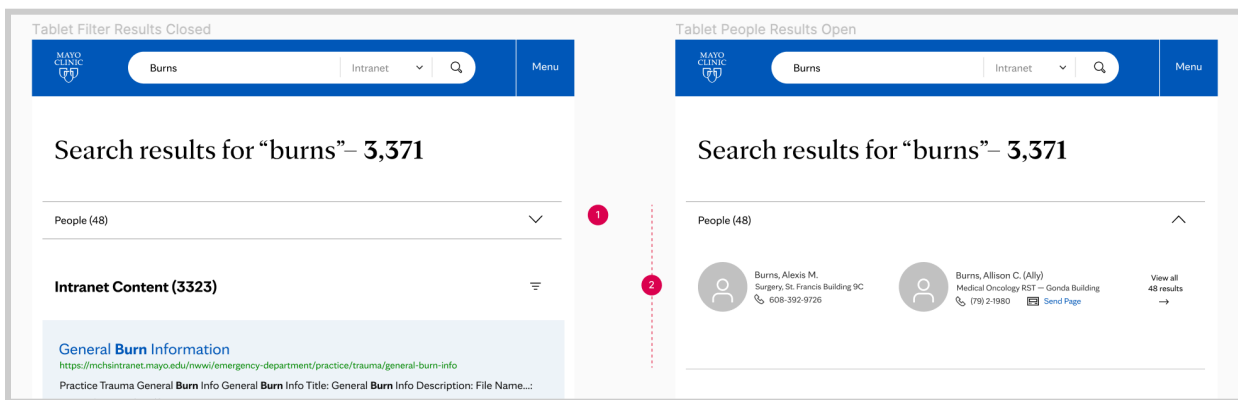*Figure 33 - People Results (Mobile) inside an accordion menu (initially closed)*

Figure 34 - People Results (Tablet) inside an accordion menu (initially closed)

1. We put People Results inside a closed accordion menu.
2. If the user chooses to see the People Results, they can click to show it.

Last Minute Items

Update Education Intranet Search Results Page

The Dev Team asked the UX/UI Team to redesign the Education site's search page two weeks prior to the official launch of the primary Intranet's search page. The Education site needed to be upgraded to the latest version of the search vendor's software, so that we didn't maintain two versions of the same search engine for both the primary Intranet Search and the Education site specific search engine. It was a basic design without Filter Results, People Results, or Search For On components.
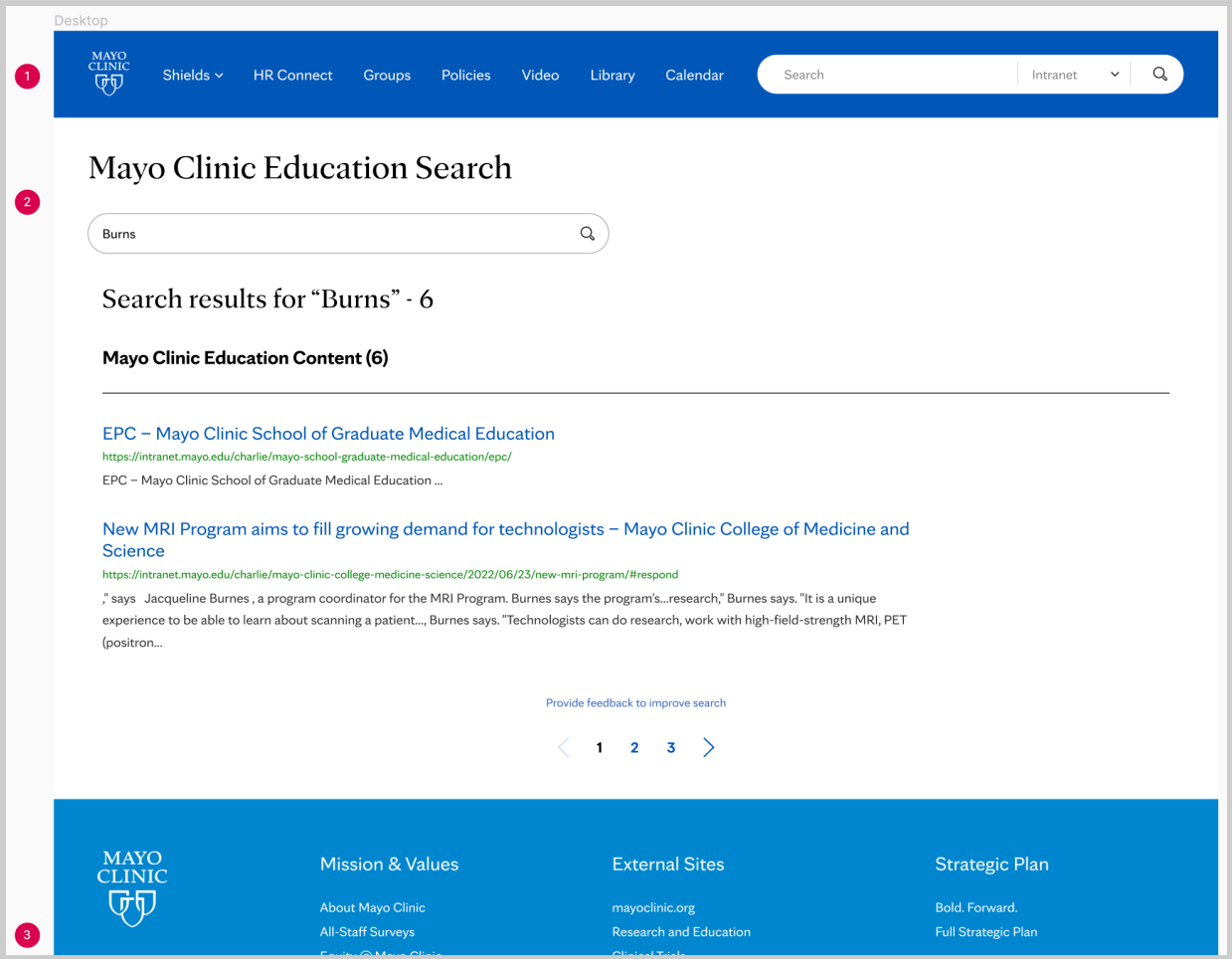

Figure 35 - New design for Education Intranet Search Results Page

1. Update to new header
2. A search box and heading to indicate that the user is searching only the Education site.
3. Update to new footer

What We Delivered

On September 29, 2022, the new Mayo Clinic Intranet Search experience was launched.
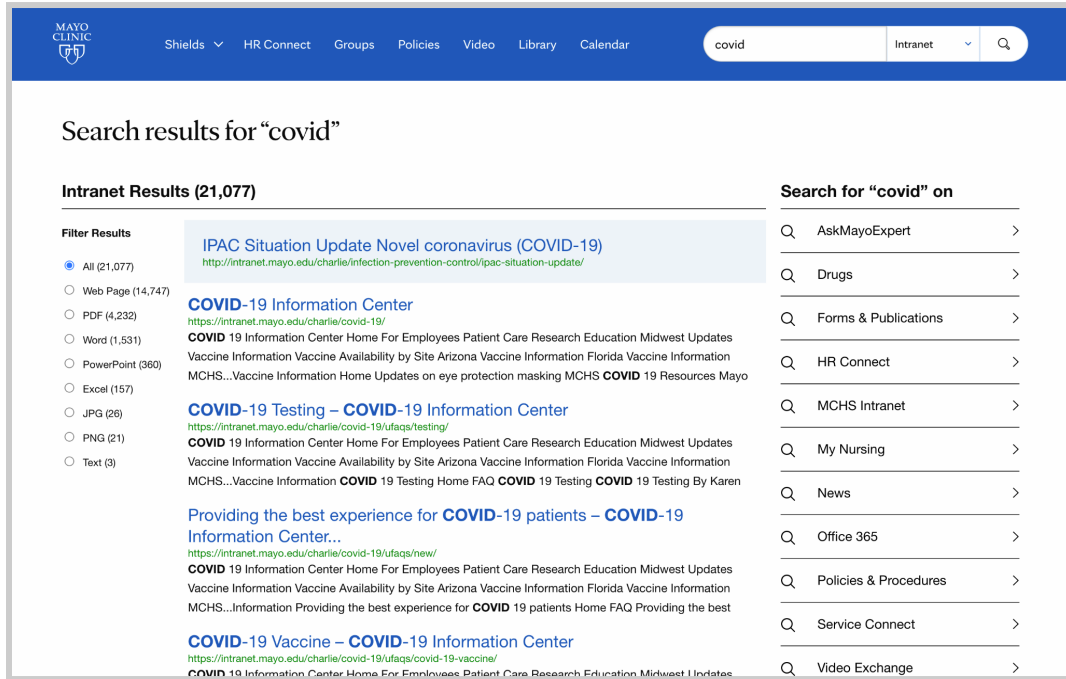

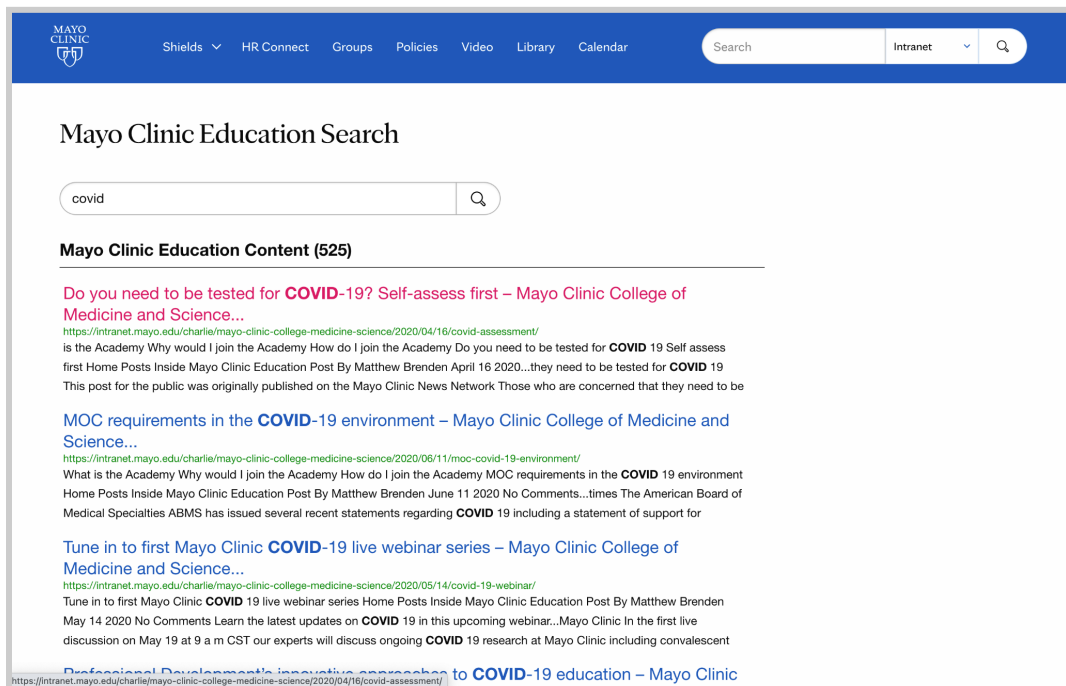*Figure 36 - Primary search results page after searching for the term "covid"*

Figure 37 - Education search results page after searching for the term "covid"

Retrospective

What Went Well

Despite limited design and developer resources, the talented individuals and team player mentality really helped to deliver a successful product launch. It was a collaborative effort from several departments and areas (Center For Digital Health providing leadership and strategy; Information Technology providing software development resources; and Media Support Services/Intranet Web Services for UX/UI support).

What Could We Do Differently Next Time

Accessibility Should Be Designed From Day 1

An accessibility review was done at the end of the development process. The amount of work required to meet the accessibility requirements was more effort than if we started earlier in the process. The UI Design Team should be sending off final designs with accessibility annotations in the Figma design files.
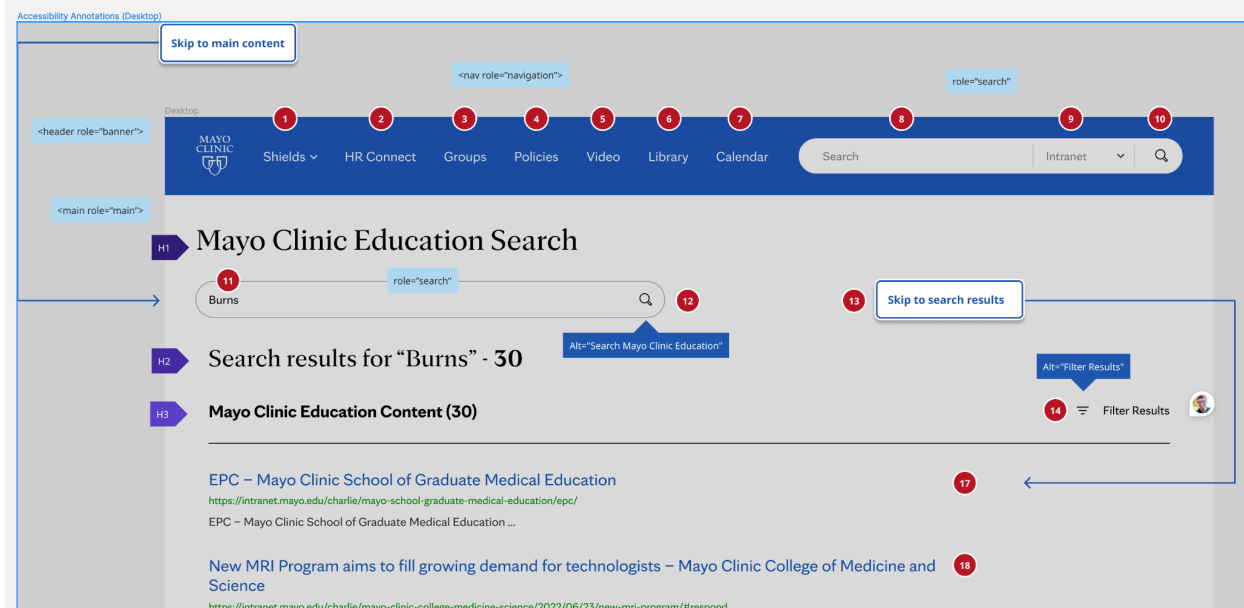

Figure 38 - An example of a Figma design with accessibility annotations.

Deadlines and Agile Process

The whole idea that we used Agile process on a project with a firm deadline given to the team goes against the principles of Agile. However, the team still delivered a functional product with very few

bugs. This is a testament to the team and the talented individuals. In the future, the team should be empowered to adjust schedules and timelines as new information and feedback rolls in after every sprint.

> "The word agile means nothing when agile projects have had all the agility squeezed out them"
>
> "You cannot create fixed deadlines unless you know all the requirements and guarantee no requirements are changed."
>
> — (Ben Hosking, Software Solutions Architect)

Reference:
https://medium.com/itnext/agile-projects-have-become-waterfall-projects-with-sprints-536141801856

UX Process in Agile

Many of the UX methods chosen were due to the short sprint cycles. In a typical waterfall project, it is more common to invest in even more user interviews and testing to understand how a broader set of users interact with our proposed designs. This takes up more time, but the confidence in the design decisions also increases.

Conclusion

This was only Phase 1 of a multi-phase roadmap to improve enterprise search at Mayo Clinic. Future iterations will include many more ways to filter, sort, and integrate more databases/sites. The work done in phase 1 sets us up for providing even better relevant results. Finally, personalization will become an important aspect of the user experience. Type ahead auto-suggestions, spellcheck, and ability to recognize abbreviations and jargon. These are all coming in 2023 and beyond. Stay tuned.