Toolkit Title*

CHI App Guidelines and Examples

Purpose of Toolkit*

To ensure that digital solutions are accessible and usable by a wide range of users, enhancing overall user experience and effectiveness.

Toolkit Attachment

See attached.

Toolkit Methodology and Application

See attached.

Case Study or Example

See attached.

Acknowledgements and Sources

See attached.

Toolkit Category*

Technology – Design Guidelines

Keywords*

Technology, Digitalisation, UX Design, Application

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Centre for Healthcare Innovation (CHI) App Guidelines and Examples

Consolidated app considerations that included the needs of senior users (age 65 and older)

Last edited 23 Oct 2022

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An idea is only as good as its execution.

Ideas cannot be converted to results,

if staff, patients, caregivers and the public:

- Cannot read and understand the words
- Cannot navigate the app/service
- Do not like to use certain devices
- Uninstall/abandon it due to certain issues

Translating to

↓ Lower goal completion rate

↓ Lower customer satisfaction

↓ Lower adoption rate

↑ Higher drop-off rate

Which this document is trying to prevent.

The document contains recommended digital UX guidelines for apps, meant <mark>to maximise accessibility and usability for users of all ages</mark>, including senior users aged 65 and older.
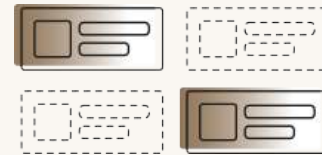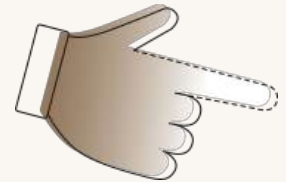
It also addresses users with:
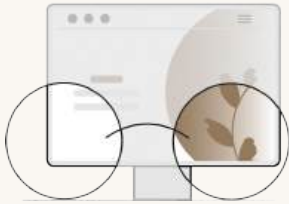
Declined vision

Failing memory

Slower information processing

Dexterity issues

The Tan Tock Seng Digital UX guidelines aligns with the Digital Service Standards[1] released by GovTech[2] Singapore and is referenced from Nielsen Norman Group[3]: UX Design for Seniors (Ages 65 and older), 3rd Edition[4].

[1]The Digital Service Standards (DSS) is a set of standards for agencies to implement their digital services with the goal of delivering digital services that are easy, seamless and relevant for citizens and businesses.

[2]GovTech, or Government Technology Agency of Singapore is a statutory board of the Government of Singapore, aiming to empower the nation with possibilities through Infocomm Technology and related Engineering Technology.

[3]Nielsen Norman Group is a UX research and consulting firm trusted by leading organizations worldwide to provide reliable guidance on user experience.

[4]The guidelines are based on research studies; in-person usability tests, focus groups and contextual inquiry sessions, with 123 seniors from the United States, Canada, Australia, Germany, Japan and the United Kingdom.

GOVTECH
SINGAPORE

N N /g
Nielsen Norman Group
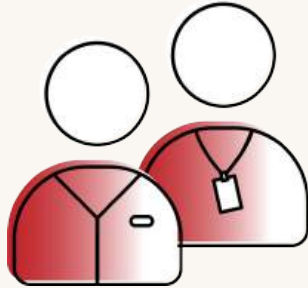
All staff is advised to be at least familiar with the 5 general considerations (page 7 - 18)
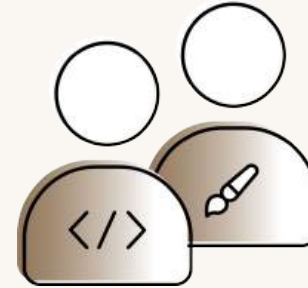
All vendors/developers/designers are advised to begin their project with all the listed guidelines as a foundation, on top of the other considerations they may have.

Directory

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General Considerations

Consideration 01

Prioritise content accessibility.

Do consider:

- Displaying important content in large fonts for users (minimum 16pt for mobile devices).
- Maximising content contrast against the background, using [widely available tools](#).

Else:

- Expect users to take up an extensive amount of time or simply give up, when consuming content or service.

View without colour blindness

Colour code #17a5ca
33.3%

Colour code #44A98F
33.3%

Colour code #00a9b0
33.3%
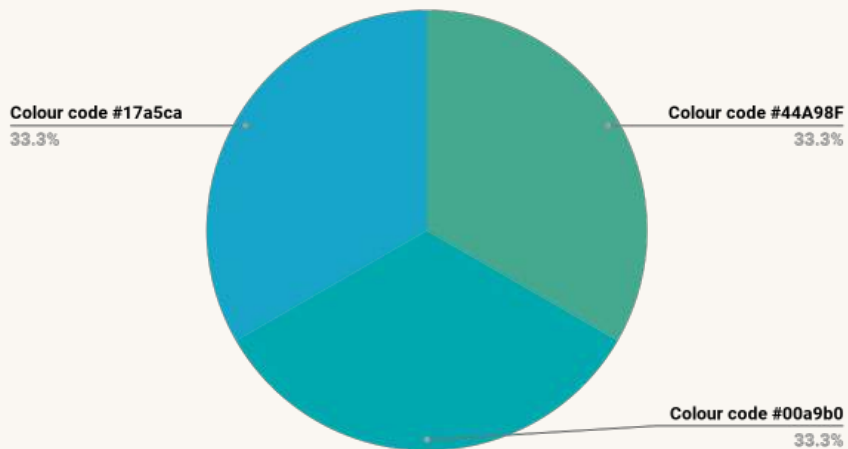
View with Tritanopia (Blue-blind)

Colour code #17a5ca
33.3%

Colour code #44A98F
33.3%

Colour code #00a9b0
33.3%
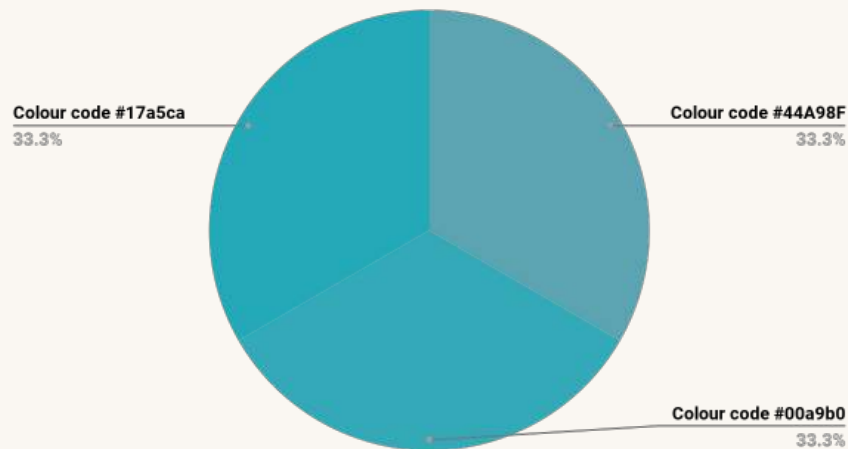
Do consider checking Checking if the materials are colourblind-friendly.

Avoid visual elements that only contains blue and green components, especially the combination of #44A98F, #00A9B0 and #17A5CA.

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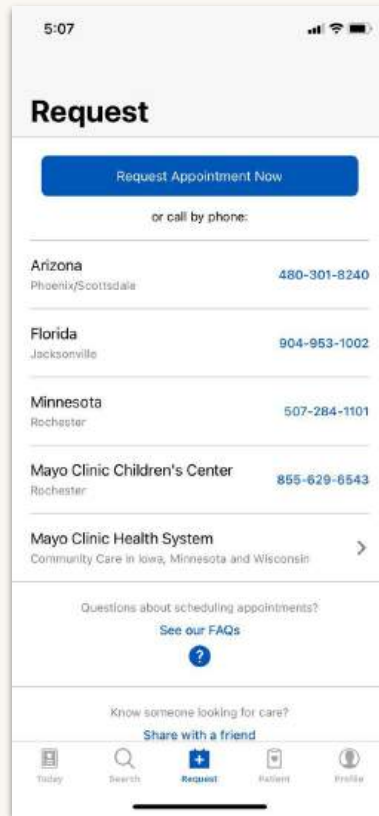
Do provide content in a spaced-out layout with large and readable text. It makes it easier for users with a declined vision to scan and decide which information to consume.

Consideration 02

Design layouts that adapts to users' app habits.

Do consider:

- Designing layouts that adapt to the user's app habits rather than a one-size-fits-all approach. Users have different priorities on an app compared to a website.

Else:

- Expect a drop in user activity or an extended time taken to complete a task, or as far as uninstalling the app entirely.
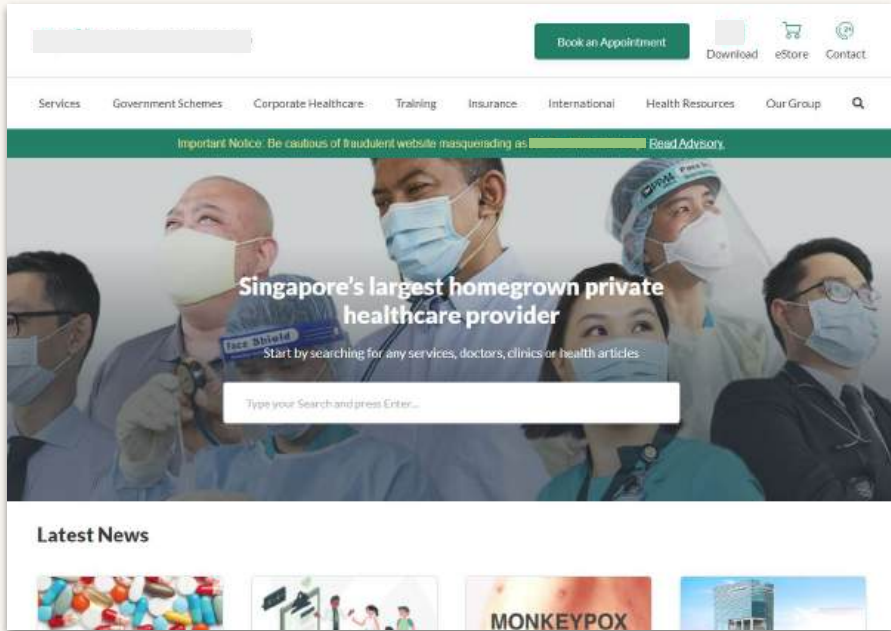
Do research and design layouts according to the users' device habits. Notice that the tablet and mobile website view (2nd and 3rd image) have additional functions at the bottom; "Make an Enquiry" and "Book an Appointment". as compared to the desktop website view (far left image), while the app (far right image) has reduced functions as compared to the website view.
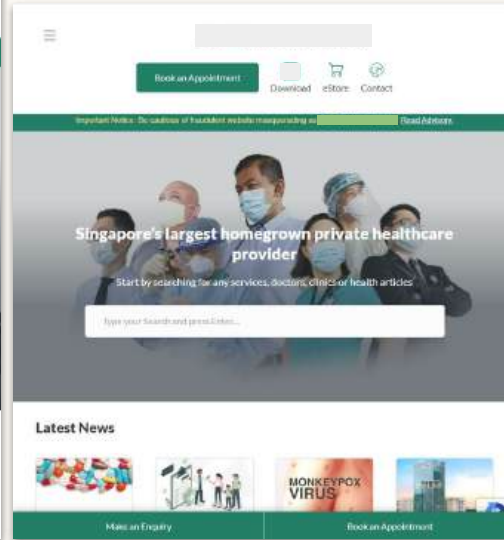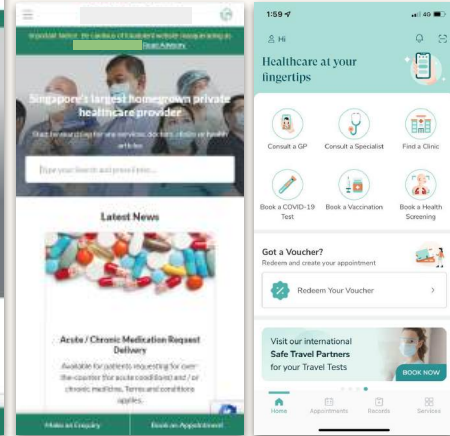
Consideration 03

Provide multiple ways to input information.

Do consider:

- Providing more than one way for users to submit information to cater to the various user habits.
- Providing voice input as one of the methods when requesting for user input.

Else:

- Expect a drop in user activity or an extended time taken, in pages where information input is required. Time taken would be longer for users with dexterity issues.

Do **provide multiple ways of inputting information** like the date selection below. It allows users to type in their answers or select from a date selector.
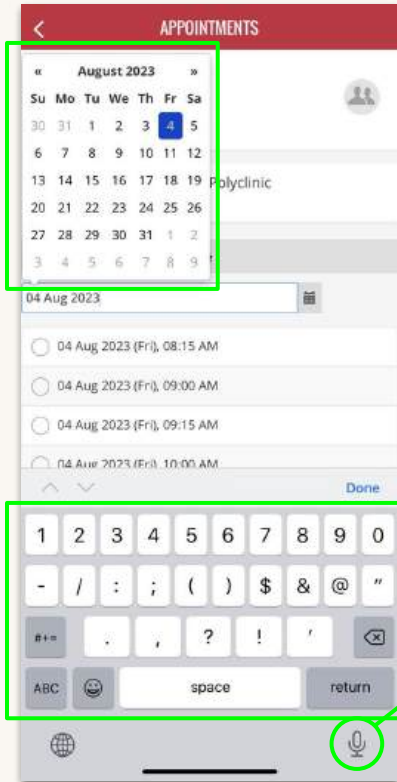
Do **consider alternative input methods like voice input** when applicable.
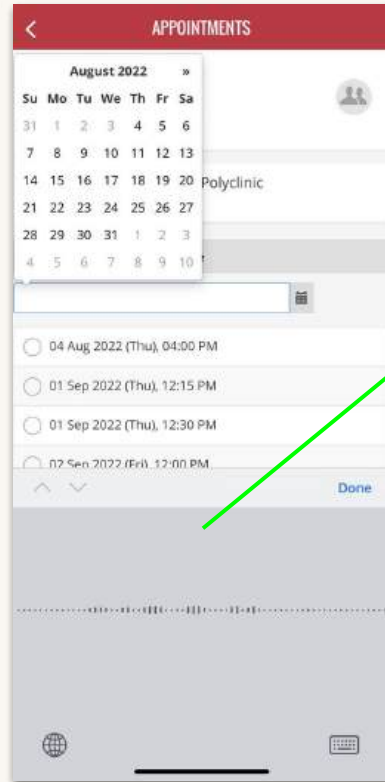
Do **display the words that users were saying as they speak** to let users verify their request.
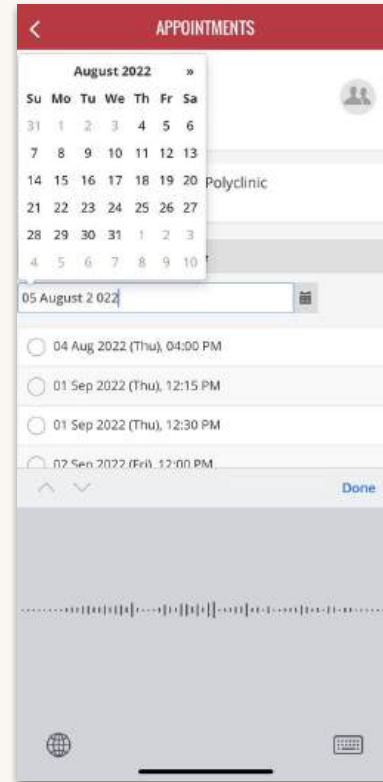
Do **provide voice assistance to read out the results of voice queries** to benefit users with low eyesight.

Consideration 04

Maximise data visibility, comprehension and control.

Do consider:

- Providing quick and easy access to the data the users are sharing to or app.
- Giving users the ability to control all the information they are sharing on a single page.
- Explaining each data in simple, clear and concise terms and why each piece of information is required.

Else:

- Expect a drop in user activity as they would go as far as uninstalling the app entirely.

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Do provide descriptions/ explanations in clear, short and easy to understand language as privacy settings tend to be confusing.

Do allow all available privacy settings to editable on the same page. Intuitive privacy settings help builds trust with users.

Do allow users clear and distinctive options to stop sharing information that is sensitive to senior users, like location, income, address.etc
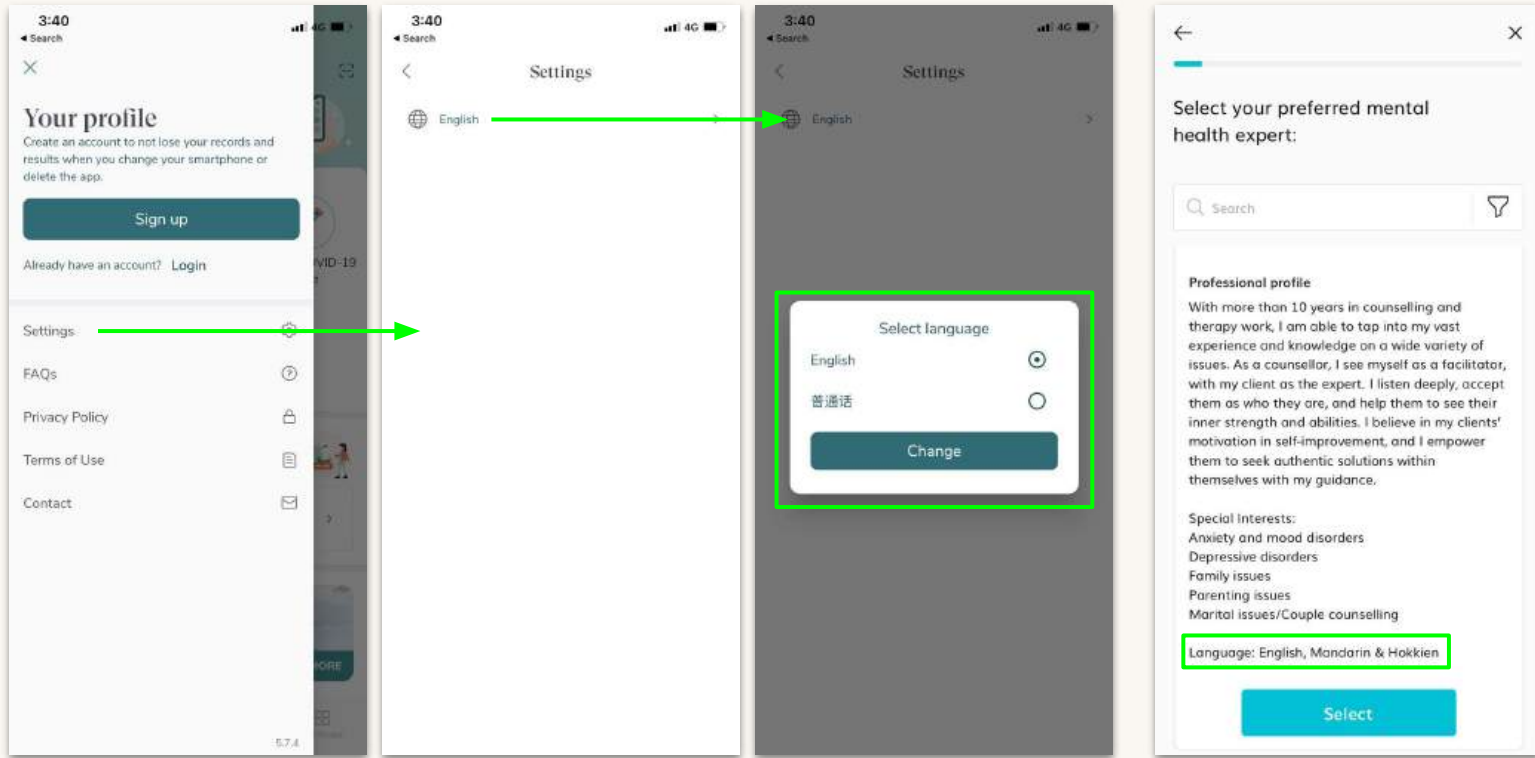
Consideration 05

Provide language alternatives.

Do consider:

- Providing the option to view digital content in different languages.
- Allowing users to select their preferred language before purchasing/engaging in a digital service; e.g. Teleconsult, chatbot enquiry or online purchase.

Else:

- Expect users to take up an extensive amount of time or simply give up, when consuming content or service.

Do inform users of the languages available for the service and allow them the option to filter by languages for services like Teleconsulting.
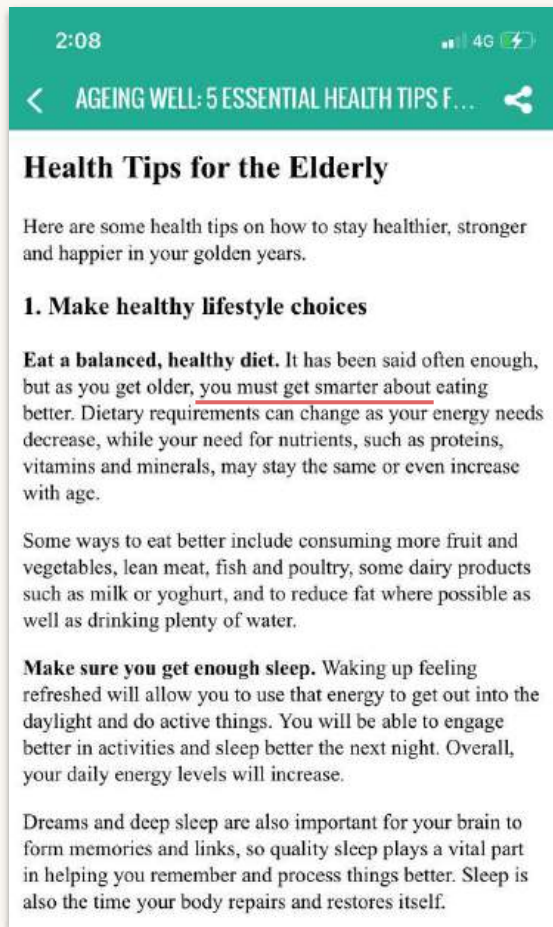
Do allow users the option to view content in their preferred language.

Content Writing and Segregation

06

Do provide content in a neutral tone when writing content for users of all ages.

- **Avoid writing content that stereotypes or makes fun of your users or anyone they care for** as it reduces the credibility of your content.

2:08 · 4G

AGEING WELL: 5 ESSENTIAL HEALTH TIPS F...

Health Tips for the Elderly

Here are some health tips on how to stay healthier, stronger and happier in your golden years.

1. Make healthy lifestyle choices

Eat a balanced, healthy diet. It has been said often enough, but as you get older, you must get smarter about eating better. Dietary requirements can change as your energy needs decrease, while your need for nutrients, such as proteins, vitamins and minerals, may stay the same or even increase with age.

Some ways to eat better include consuming more fruit and vegetables, lean meat, fish and poultry, some dairy products such as milk or yoghurt, and to reduce fat where possible as well as drinking plenty of water.

Make sure you get enough sleep. Waking up feeling refreshed will allow you to use that energy to get out into the daylight and do active things. You will be able to engage better in activities and sleep better the next night. Overall, your daily energy levels will increase.

Dreams and deep sleep are also important for your brain to form memories and links, so quality sleep plays a vital part in helping you remember and process things better. Sleep is also the time your body repairs and restores itself.

Avoid words like "you must get smarter" when writing for users. It suggests that users are currently not smart and it dissuades them from reading further.

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07

Do write content in that is concise, objective and facts-driven.

- **Do** provide facts and statistics in an objective manner when it comes to sensitive topics such as health concerns and end-of-life care.

Sense-less death risk

Hearing loss and vision loss have also been linked, not only to reduced quality of life, but an increased risk of death in older adults.

A Purdue University study found that a person's death risk jumped by 16 percent each time their eyesight declined enough to obscure an additional letter on the traditional eye exam chart.

Study author and assistant professor at Purdue, Sharon Christ, says the elevated danger was likely due to the fact that fading eyesight prevented people from performing instrumental activities of daily living (IADLs) including shopping, using the telephone, paying bills and cooking meals. "When individuals were no longer able to engage in these activities because of visual impairments, their life expectancy was reduced," says Christ.

In 2010, a group of Australian scientists discovered that aging adults with hearing loss were more likely to die

There are two kinds of AMD, dry and wet. More common is the dry, which can cause loss of central vision — essential for reading and driving — but so gradually that many people have it for decades with no obvious effect. Wet, or neovascular, is more dangerous. Abnormal blood vessels grow into the retina, in some cases leading to bleeding or leaking of fluid. Wet AMD is frightening, Pluznik says, because it may alter vision suddenly: "Patients can wake up one day and just see a central black spot."

Don Albrecht, 85, of Great Falls, Va., was recently diagnosed with dry AMD in his left eye and wet AMD in his right eye. The warning sign came last fall, when he was watching a baseball game on TV and couldn't see certain details on the players' uniforms. He became alarmed and eventually was referred to a retina specialist, who treated his wet AMD with injections that eliminated the intruding blood vessels, a relatively new procedure. "If it had been 10 years ago," he says, "I may have lost my sight."

Avoid titles and choice of words that instill fear in your users, such as "Sense-less death risk".

Do provide concise and fact-driven content to make it more receptive for users to consume and understand.

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08

Do curate different sets of information meant for the different intended audiences.

- **Do** simplify complex topics to help the general staff and patients digest information with ease.

- **Do** separate and provide clear labels for information meant for clinicians, from information meant for patients.

- **Avoid** providing the same complex information to both the general users and the expert users.

Do label the information according to the intended audience, when they are presented on the same page.

09

Avoid using jargons as much as possible.

- **Avoid** terminology and language that may not be easily understood by users who are new to technology.

- **Do** define the technology-related terms immediately if the usage is necessary.

Avoid terms like :

- RSS
- URL
- Web
- Lan
- Cloud
- Wifi

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Page Layout

10

✅

Do prioritise information and features based on the users' needs.

- **Do** identify the key users and place the most accessed features and information in the most noticeable areas.

- **Avoid** cluttering the screens with content and features that are not the user's priority.

- **Avoid** hiding the frequently accessed features and information.
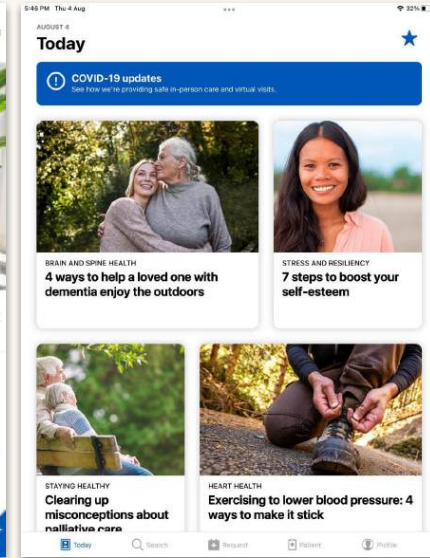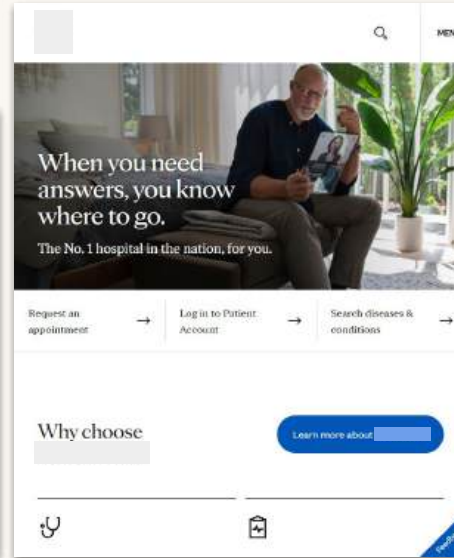
Do identify the key user needs and behaviour for each platform. In the example above, similar appointment booking features can be found on the website (left) and app (right), but the website prioritises transactions while the app focuses more on health information.

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11

Do display content links up front, to help users navigate to the information they need.

- **Do** identify what is the information your users need before deciding on the page layout.

- **Do** use informative and intuitive terms to help users navigate with ease.
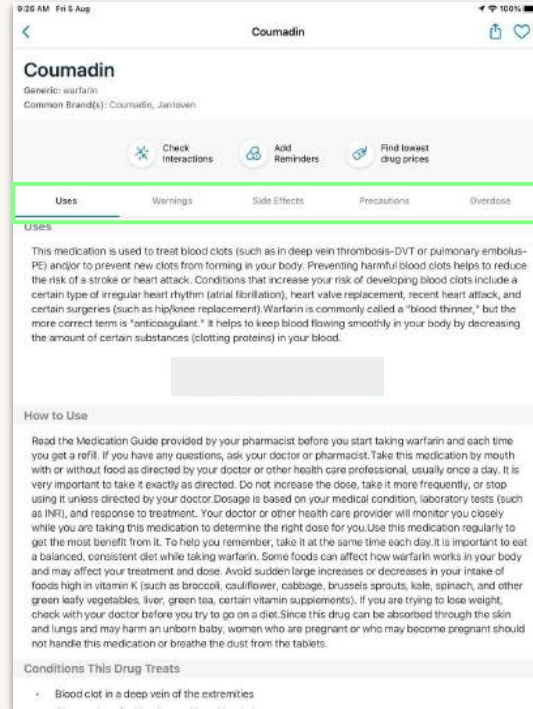
Do bring forward the content links to help users identify the information they need before committing their time to consume them.
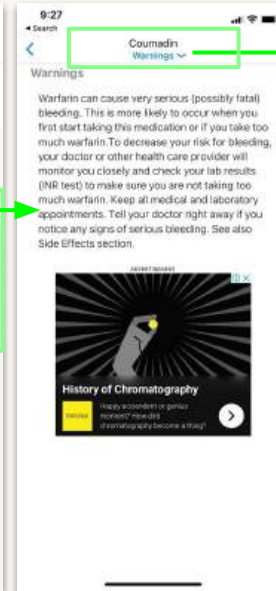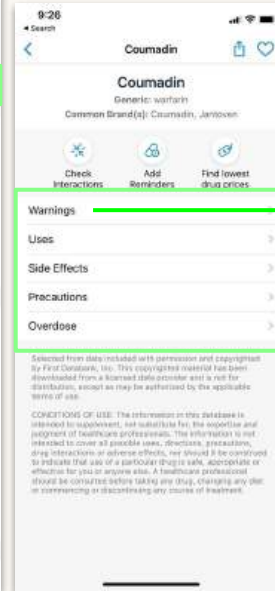
Do provide the option for users to switch between the content links with ease.

12

Do reduce the number of actions available on each viewable area.

- **Avoid** **having multiple actions on a single screen** as it may overwhelm users new to technology.
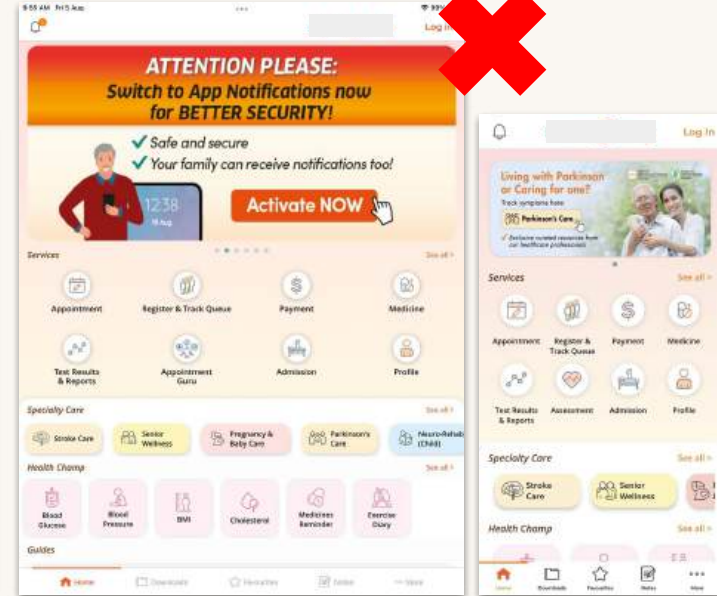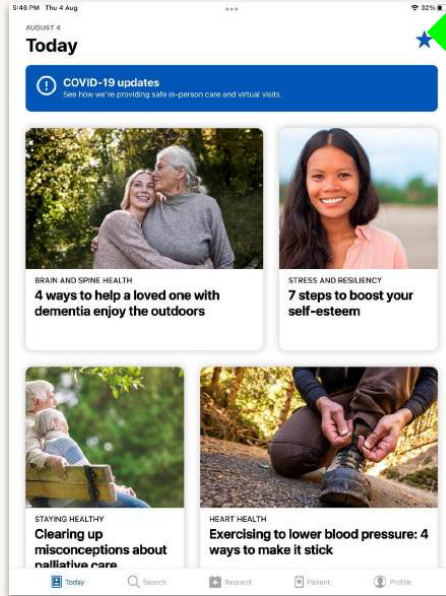
Do reduce the number of items on a given screen. Lesser items help users with concentration issues or new to technology, focus better. More items could mean a longer processing time before they attempt to complete their goals.

13

Do break down large chunks of information with the help of text formatting elements.

- **Avoid** presenting information in one large chunk as it requires users to read each line before finding out if it contains any information they need.

- **Do** make information easy to scan by using text formatting elements like:
  - Headings
  - Subheadings,
  - Bolded keywords
  - Bulleted lists .etc

Risk factors

Factors that may make you more susceptible to interstitial lung disease include:

- **Age.** Interstitial lung disease is much more likely to affect adults, although infants and children sometimes develop the disorder.

- **Exposure to occupational and environmental toxins.** If you work in mining, farming or construction or for any reason are exposed to pollutants known to damage your lungs, your risk of interstitial lung disease is increased.

- **Gastroesophageal reflux disease.** If you have uncontrolled acid reflux or indigestion, you may be at increased risk of interstitial lung disease.

- **Smoking.** Some forms of interstitial lung disease are more likely to occur in people with a history of smoking, and active smoking may make the condition worse, especially if there is associated emphysema.

- **Radiation and chemotherapy.** Having radiation treatments to your chest or using some chemotherapy drugs makes it more likely that you'll develop lung disease.

Complications

Interstitial lung disease can lead to a series of life-threatening complications, including:

- **High blood pressure in your lungs (pulmonary hypertension).** Unlike systemic high blood pressure, this condition affects only the arteries in your lungs. It begins when scar tissue or low oxygen levels restrict the smallest blood vessels, limiting blood flow in your lungs. This in turn raises pressure within the pulmonary arteries. Pulmonary

Do use subheadings and short paragraphs to make content easy to consume.

Do use bullet points to break the content down and reduce unnecessary words.

Do bold keywords or phrases to help users jump to the different points.

Do begin each sentence or bullet point with informative and distinctive words to help users find the information they need.

14

Do use tabs or accordions .etc, to present long pieces of content.

- **Avoid** presenting information that requires the users to scroll continuously to prevent building up fatigue in users.

- **Do** use information-layering techniques to avoid the need for endless scrolling:
  - Tabs
  - Anchor links
  - Divide content into multiple pages
  - Accordions
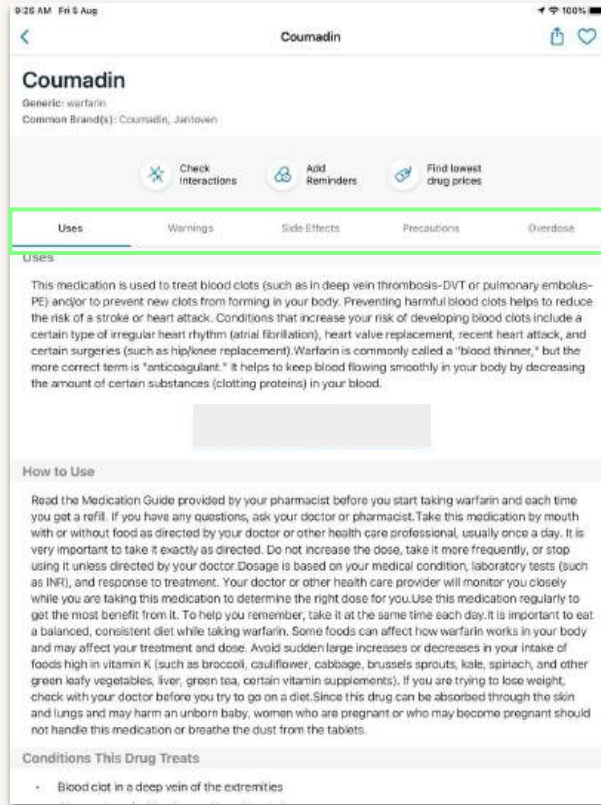
Do use tabs or accordions with descriptive names to split up content into different sections for easier consumption.
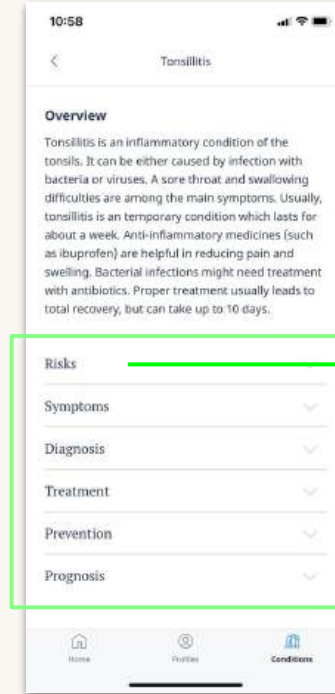
Do consider the devices your content would be displayed before deciding on the information-layering technique.
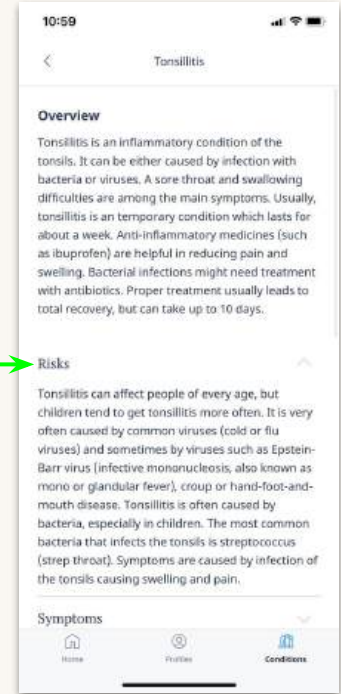
15

Do provide the option to compare products or information.

Do allow users to:

- Select the items they are interested in
- And/or do a side-by-side comparison

In the event when

- There are multiple items
- There are multiple lines of details
- Users are required to constantly scroll up and down to compare products

Do allow users to conduct a detailed side-by-side comparison of similar products when there are multiple items with many lines of details.

16

✓

Do design layouts that allow some elements to peek out to invite scrolling.

- **Avoid** presenting content that appears to be 'complete' within the viewable area. Users may assume that there is nothing more beyond and decided not to scroll further.
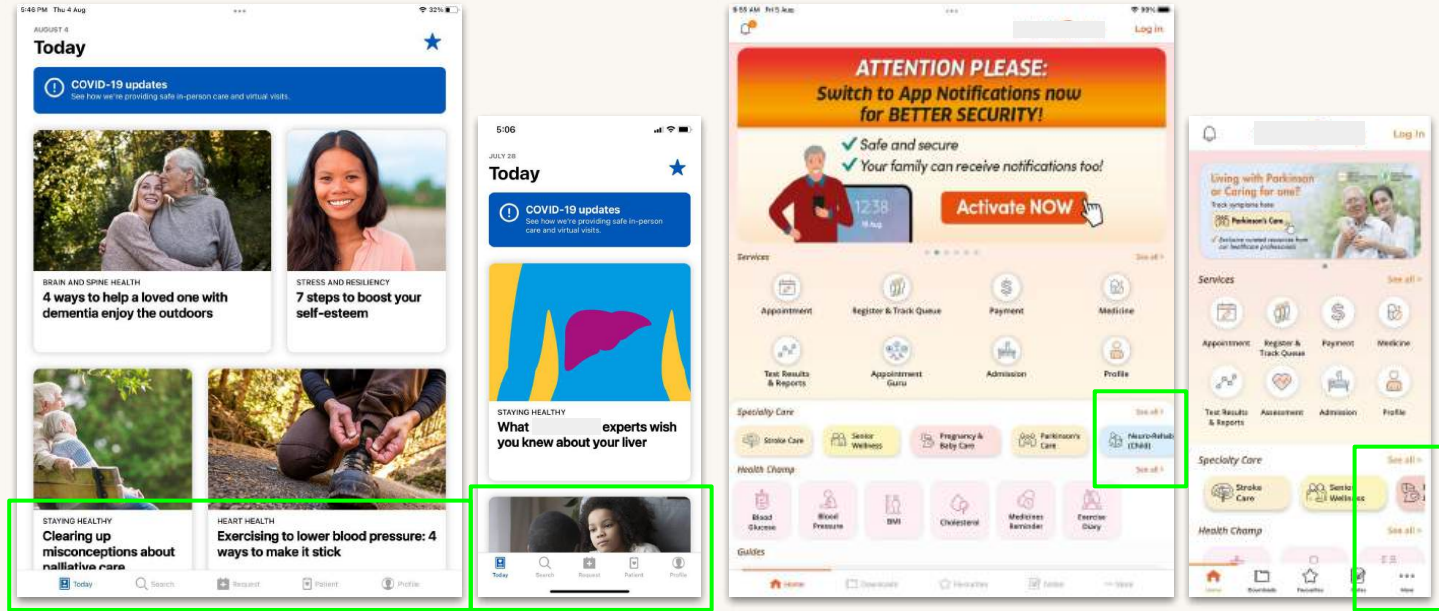
Do ensure that content peeks out or gets cut off at the end of the screen whenever there is a need to scroll in that direction.

17

Do use tables whenever possible to help users scan and consume information.

- **Do** present information that involves numbers and the need for comparison in a simple table for easy scanning.

Do create tables with the following criteria:

- Keep it simple with minimal columns
- Intuitive and distinctive headings
- Only include relevant information without overloading the users

18

Do ensure that information in the table is easy to scan and consume.

- **Do include the following when presenting information in a table**:
  - Provide ample white spaces between each piece of information.
  - Use legible font size.
  - Consider having different alignment between the column and row headers, from the information in each cell.
  - Consider having alternate row colours.

Do ensure that there is a comfortable amount of white space between each table/cell value to help users glance through the information with ease.

19

Avoid distracting or leading users away from the content they came for.

- **Avoid** placing non-related content links (like content recommendations) in between the content. Users may assume that the content has ended.

Avoid placing recommendations in the middle of the content that your users are consuming.

Do present recommendations at the end of the content, within the viewable area.

20

Do provide easy and clear instructions for any new app features.

- **Do** ensure that each onboarding instruction is short and concise to cater to users of all ages.
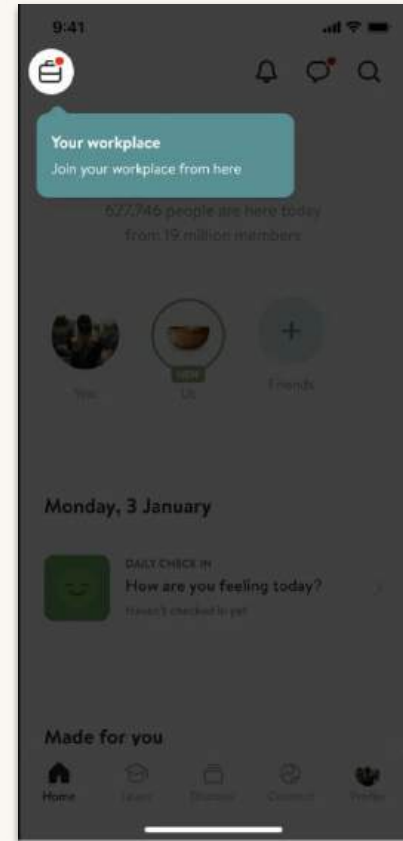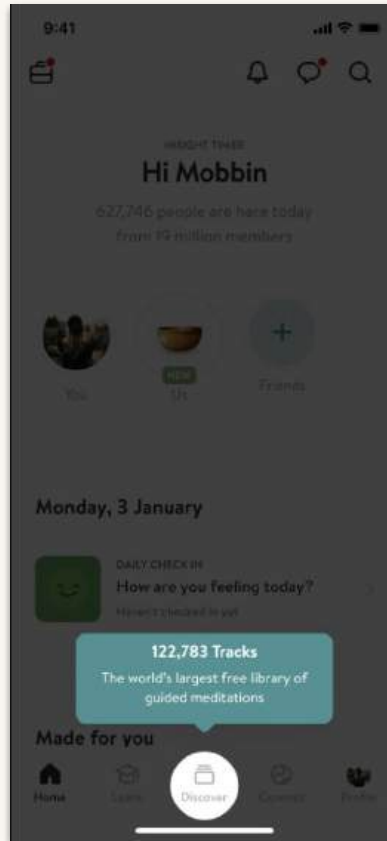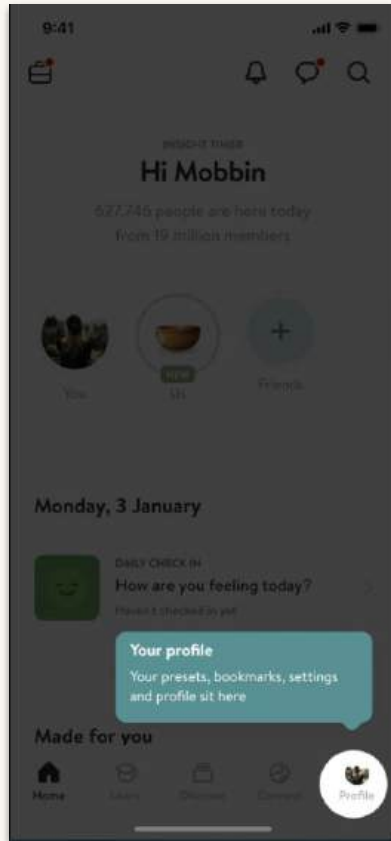
Do provide clear instructions to help users ease into the functions of a new app.
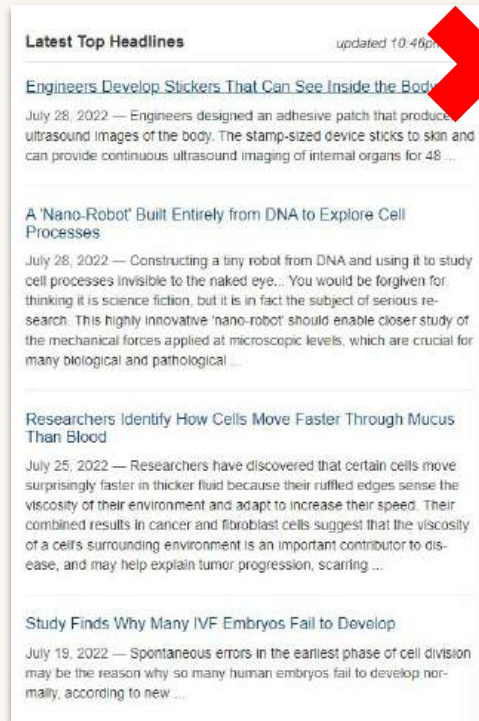
Information
Presentation

21

Do ensure adequate font sizes and contrast for minimal readability.

- **Do** ensure that the body copy is at least 16 points(pt) for mobile devices.

Avoid having small text in dense layouts as it would require users to put in effort when scanning and finding the information they need.

Do present content with ample spacing and contrasting headers. It makes it easier for users with visual issues to scan and consume large amounts of information.

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22

Do allow your user to increase the content font sizes with ease.

- **Do** ensure that the responsive pages maintain consistency when the option to change font sizes is available.
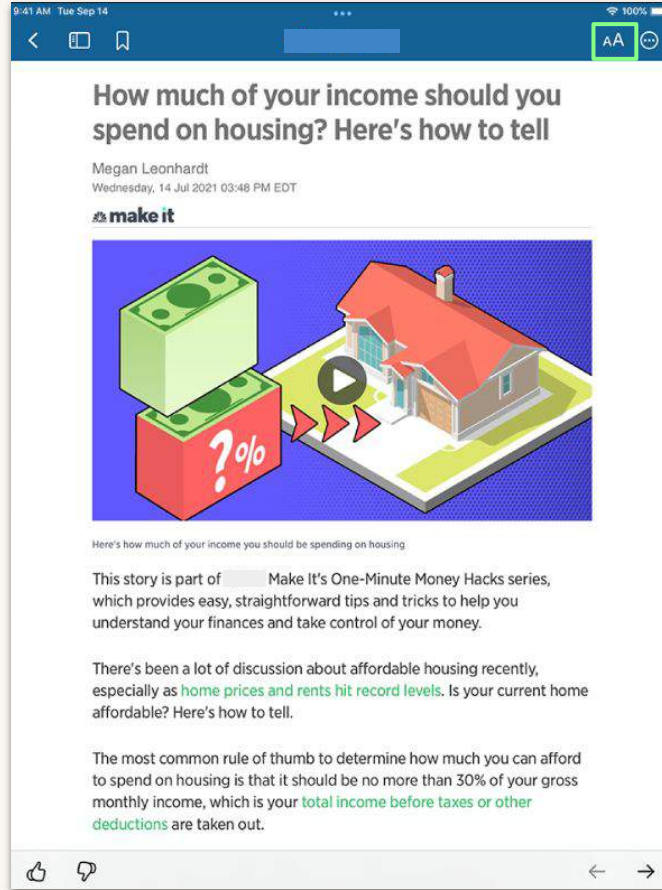
Do provide the option to increase font size in a prominent position for articles.

23

Do ensure each line of text is easy to scan.

- **Do** ensure that any paragraph of text (or body copy) has a line-height of at least 1.5x of the font size; If the font size is 12pt, the recommended line-height is 12*1.5= 18pt.

- **Avoid** justifying text as it creates uneven pockets of spaces, distracting users from connecting one word to another.

❌

This body of text has a line height of 1x of the font size. Although it seemed negligible, compounding discomfort when reading information can lead to user frustrations and skipping of crucial information. This body of text has a line height of 1x of the font size. Although it seemed negligible, compounding discomfort when reading information could lead to user frustrations and skipping of crucial information.

✔

This body of text has a line height of 1.5x of the font size. Although it seemed negligible, relieving discomfort when consuming information can reduce user frustrations and the chances of them skipping crucial information. This body of text has a line height of 1.5x of the font size. Although it seemed negligible, relieving discomfort when consuming information could reduce user frustrations and the chances of them skipping crucial information.

24

Do ensure that all page elements have a clear contrast between the text and background colour.

- **Do** use colours schemes like
  - Black text on a white or off-white background,
  - White text on a black or dark background or,
  - Any that passes the WCAG AAA; a global benchmark for website accessibility.

Avoid overlapping text on images, especially for images that move automatically.

Varying contrast between the text and the background makes it hard for users with visual issues to read.
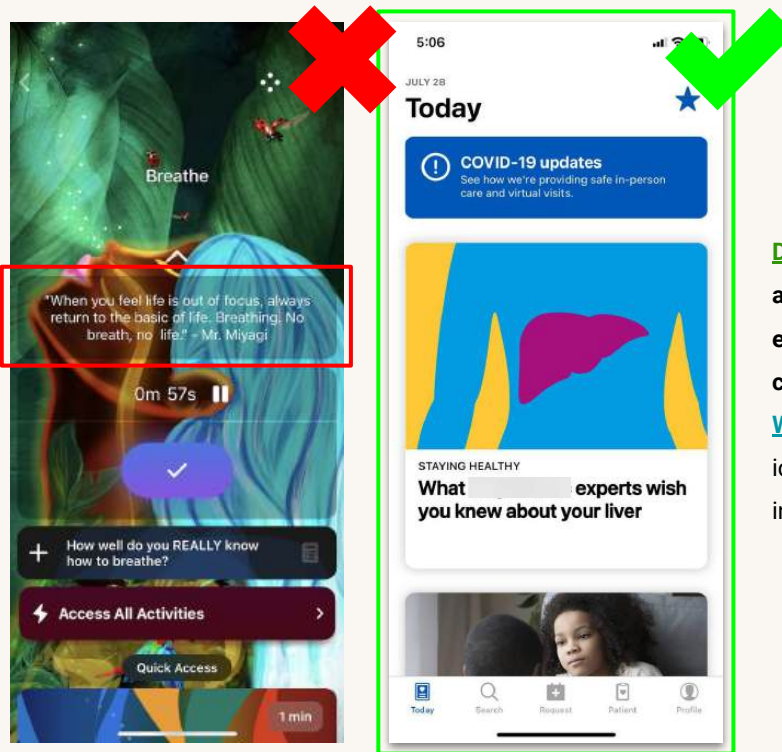
Do ensure that the text and background presented elements are of a certain contrast; passing the WCAG AAA, to help users identify or perform the intended actions with ease.

25

Do use visual elements to help users understand better.

- **Do** use simple and relevant visual elements.

- **Avoid** using visual elements purely for decorative purposes or as a replacement for text.
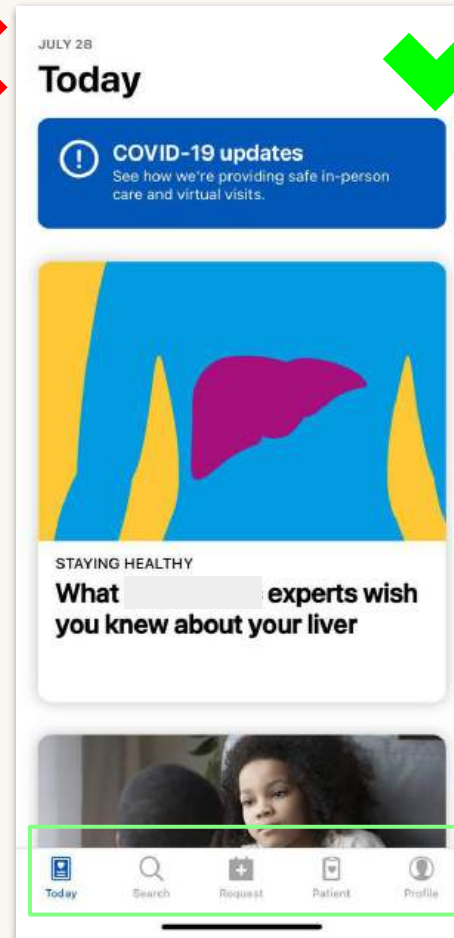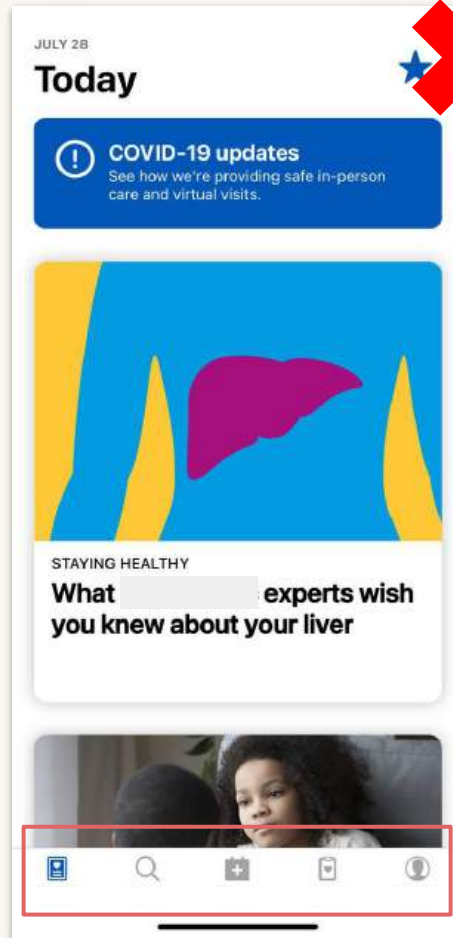
Do provide graphical elements with text labels to provide easier comprehension.

Removal of the text labels would cause confusion to users of all ages, especially for icons that are shaped differently or aren't commonly used.

26

Avoid replacing text links with image-only links.

- **Do** prioritise presenting links as text as it helps users:
  - Intuitively register what are the clickable elements.
  - Scan for the information they need.
  - Improve accessibility for anyone using a screen-reader or voice assistant
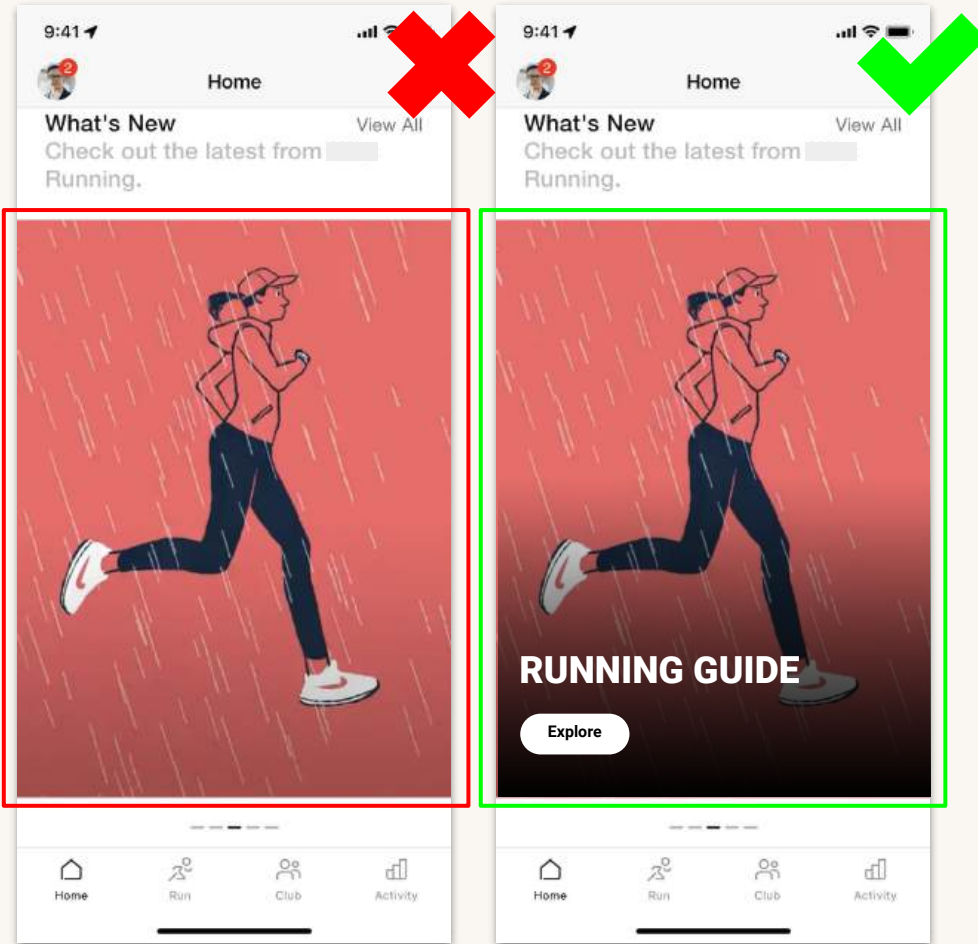
Do ensure that all clickable images are accompanied by descriptive text links. Without the descriptive text links, users that could not connect the images to the headers or website would presume the images to be purely decorative.

27

Do provide PDF files for documents that are meant to be printed.

- **Do** label the PDF documents by indicating 'PDF' after the document name or show the Adobe Reader icon.

- **Avoid** using PDF files as a replacement for website content. PDF files are usually not designed to adapt to users' device habits, resulting in potential frustrations.

Diet and Exercise: Choices Today for a Healthier Tomorrow

Download a printable PDF version of the Diet and Exercise: Choices Today for a Healthier Tomorrow infographic (PDF, 259K). En español (PDF, 240K).

Lifestyle choices you make today can lead to a healthier future. Learn how eating a healthy diet and exercising can help control or delay age-related health problems.

Share this infographic and help spread the word about healthy diet and exercise. Click on the social media icons above, or copy and paste the URL and post it to your account (Twitter, Facebook, etc.).

DIET AND EXERCISE:
Choices Today for a Healthier Tomorrow

Eating a healthy diet and exercising often can help control or delay health issues associated with aging, like high blood pressure and diabetes.

Do label the PDF documents to let the users know what to expect before they click on a link.

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28

Avoid using colours as the only indicator to convey information.

- **Do** check every screen against a [colourblind simulator](#) or [software plugins](#), to ensure that users with visual issues would be able to comprehend the designs.

Normal View
Colour only

Red-blind view
Colour only

Avoid using colours as the only indicator when presenting detected errors. Users with visual issues will not be able to register the error and would be stuck, not understanding how to proceed.

Normal View
Colour + Icon

Red-blind view
Colour + Icon

Do ensure that icons are included when presenting detected errors.

It allows users to register and resolve the error despite having visual issues.

29

Do provide clear indications for progress and completion.

- **Do display progress markers at each step of the process** to inform users of their progress in relation to the entire process.

- **Do ensure that the indications are consistent for all processes.** Users would be confused if progress indicators change for each process.
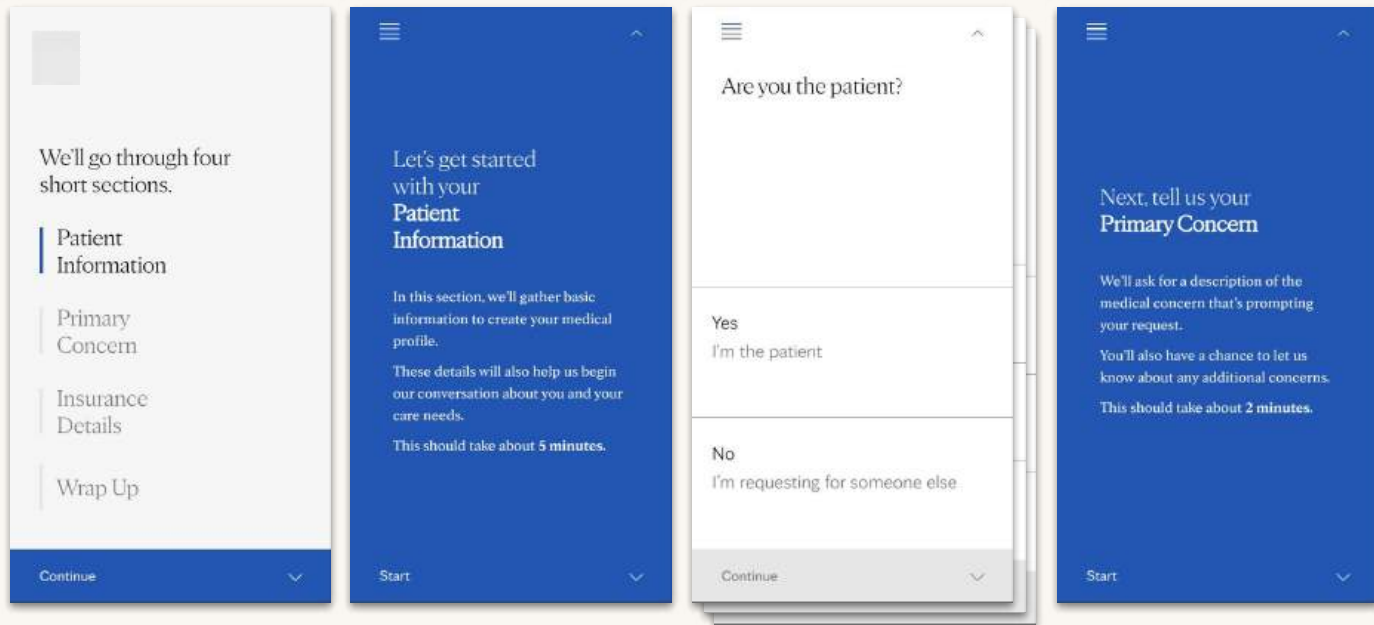
Do provide distinctive visual aids to remind users of their progress and successful applications.

A full blue page is used to represent the completion of a section instead of a page in white,

to avoid being mistaken as a question that needed to be answered.

30

Avoid using excessive and complicated animations.

- **Avoid** the use of flashing, blinking and displacement animations as it could create discomfort for some users.
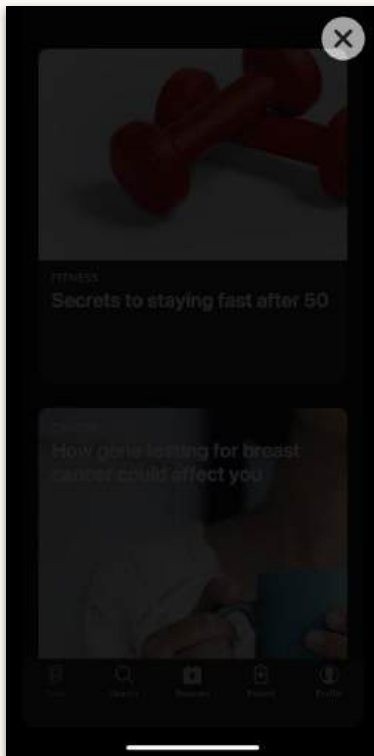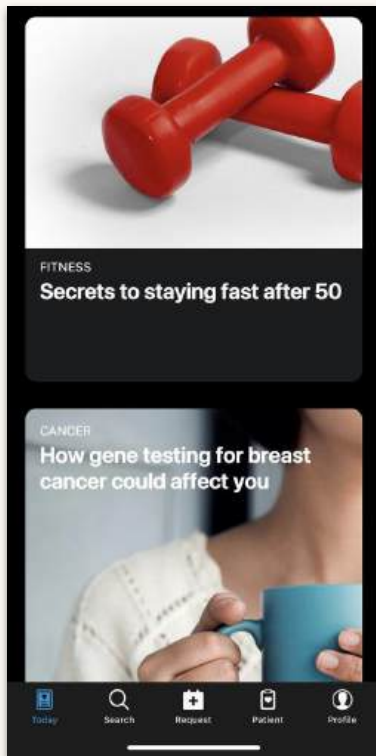
Do keep transitions and animations simple and minimal, like a quick and mild fade in or out, to reduce potential frustrations for the users.

31

Do add alt text for meaningful or actionable non-text content.

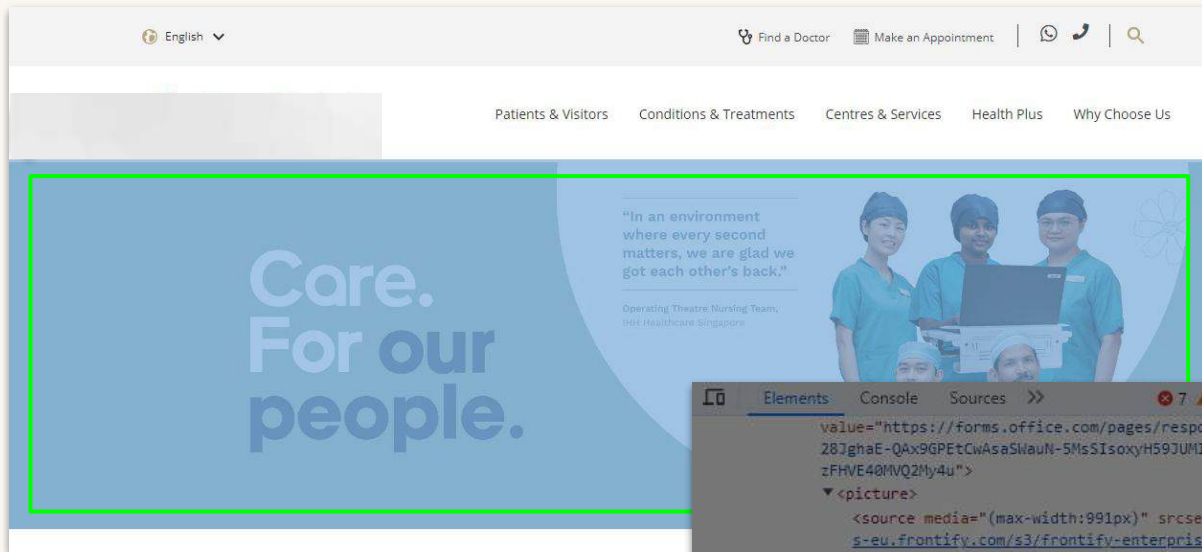- **Do provide precise and concise content descriptions in alt text.** Alt text is typically found under labels like "description," "alt," or "alt text."

Low-to-no vision users depend on screen readers that can't read text within images, making alt text essential for app accessibility.

Web banners, like the ones shown, allow screen readers to vocalise the actionable content: "Join Our Nursing Team."

Personalisation & Customisation

32

Do ensure that personalisation is consistent in all areas of the service or product.

- **Avoid** personalising only some of the services. Inconsistent levels of personalisation discourage users from services that lack personalisation.
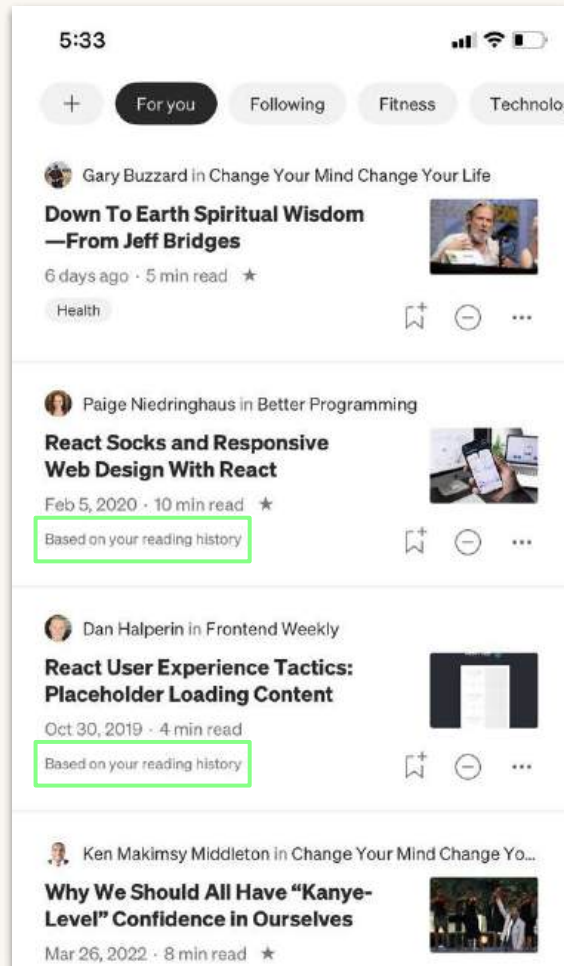
Do provide an explanation for each suggestion to build trust with users. Knowing how and why a suggestion is presented gives users the impression that the service only tries to personalise the user's experience based on their browsing history and indicated interest.

33

Do provide users full control of their data.
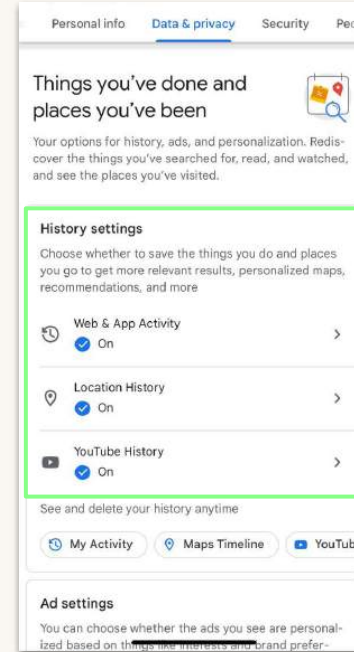
- **Do** provide quick and intuitive **access** to the data and privacy settings.

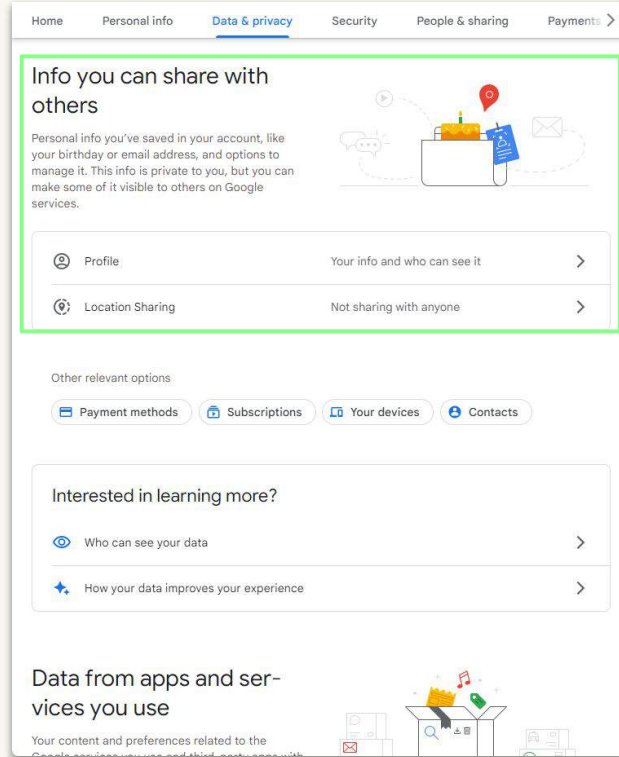- **Do** allow users full control over the information they can share, on a single page.

- **Do** explain each data point, and how they would be used during personalisation, in simple, clear and concise terms.

Do describe the data and their usage, in simple terms.

Do modularise the personalisation algorithms to ensure that personalisation can still happen even if some data points are turned off.

Social Media

34

Do label the actions that would be taken for social media icons.

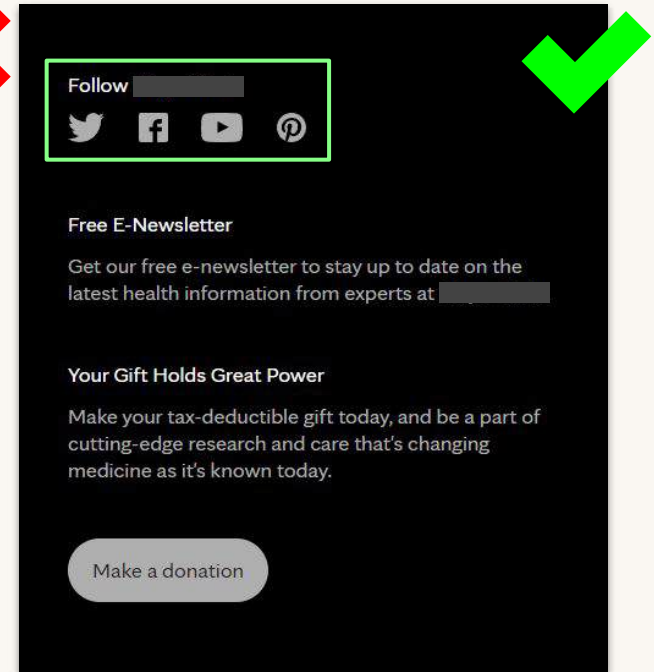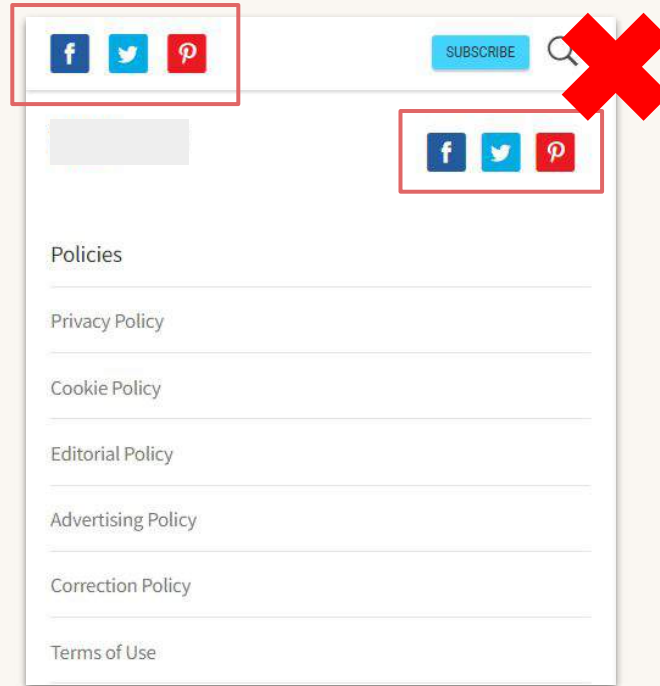- **Do** indicate the actions taken around the icons, to help users understand if it would lead to following or sharing on the different platforms.
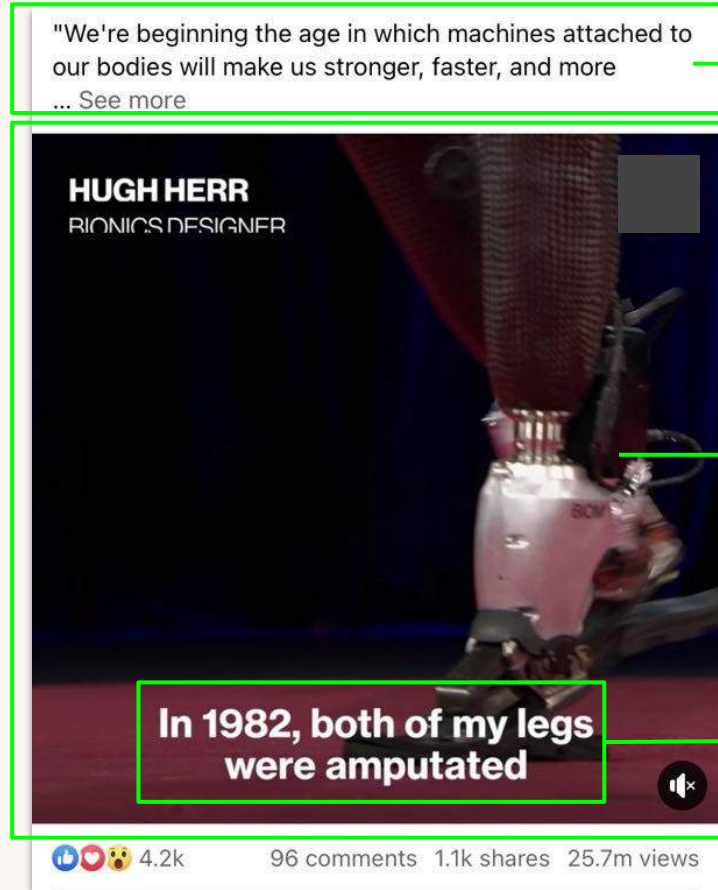

Avoid placing social media icons without indicating the actions it would lead to as they may cause uncertainty for users new to technology.

35

Do post content that is engaging, bite-sized and easy to understand.

- **Avoid** posting just anything and everything. Bombarding content that your users do not care about would dissuade them from coming back for more.

- **Do** conduct research on your target audience before generating content.

"We're beginning the age in which machines attached to our bodies will make us stronger, faster, and more
... See more

HUGH HERR
BIONICS DESIGNER

In 1982, both of my legs were amputated

🔵❤️😮 4.2k   96 comments   1.1k shares   25.7m views

Do introduce the content with clear and brief descriptions; the who, the what, where is and when is it. (when applicable)

Do use images or videos would stop your target audience in their tracks as they are scrolling through their feed.

Do provide large and easy to read captions for video content as they often play automatically and without audio, when they appear on the screen.

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Navigation

36

Do present navigation menus in commonly placed and visible areas, for each device.

- **Do** ensure that the navigation menu is consistently located in the same spot, usable and **visible** throughout the app.
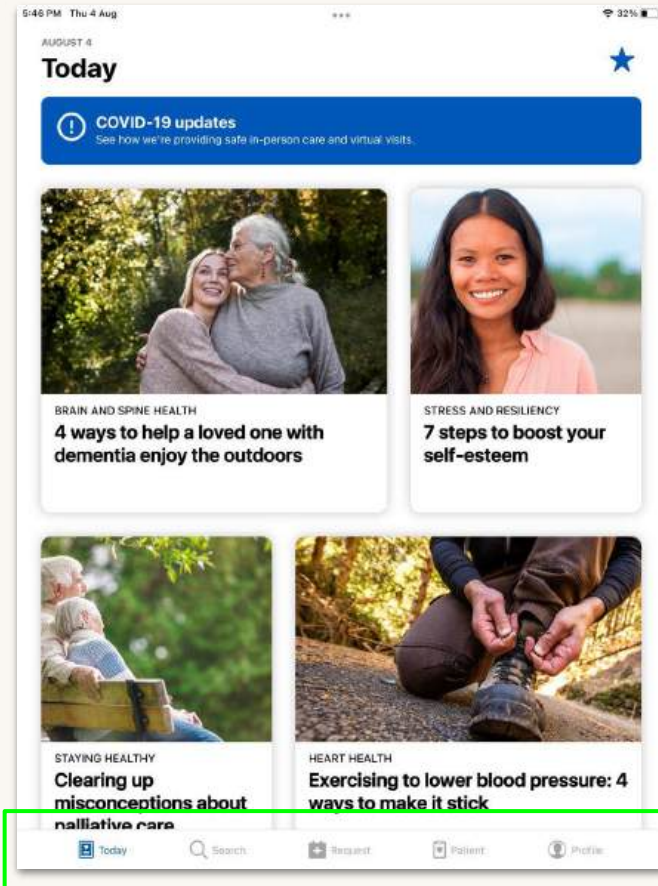
Do ensure that navigation menus appears in a tab bar at the bottom of the screen.

37

Do simplify navigation methods; clicks and gestures.
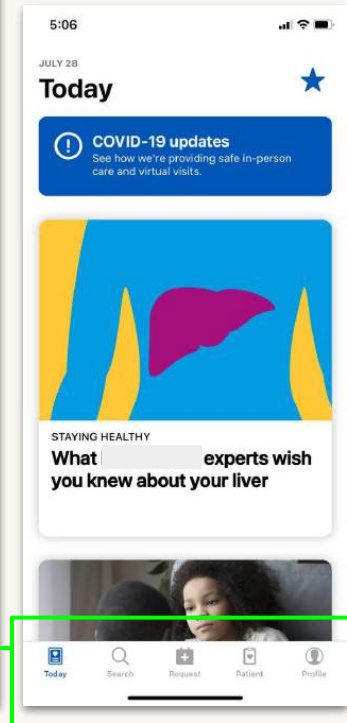
- **Do** keep clicking to a minimum; preferably a single click.

- **Avoid** including navigation that requires multiple gestures and quick movements; swiping or zooming in and out.
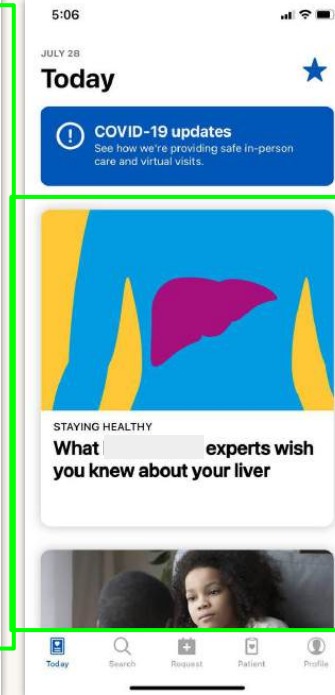

Do keep scrolling simple, to accommodate users with limited dexterity and varying tech experience.

This app kept it simple by only allowing users to navigate hidden content through up and down scrolling.

38

Do ensure that each navigation option is distinctively different from the other.

- **Do** match the navigation menu structure according to the **user's view** of the organisation, information and/or services.

- **Do** use language that is easy to understand from the user's perspective. Navigation menus that contain brand language or jargon could confuse users who are new to the platform.
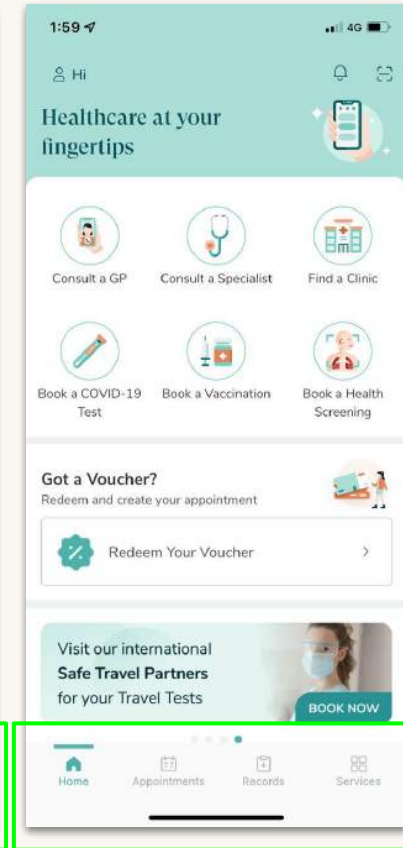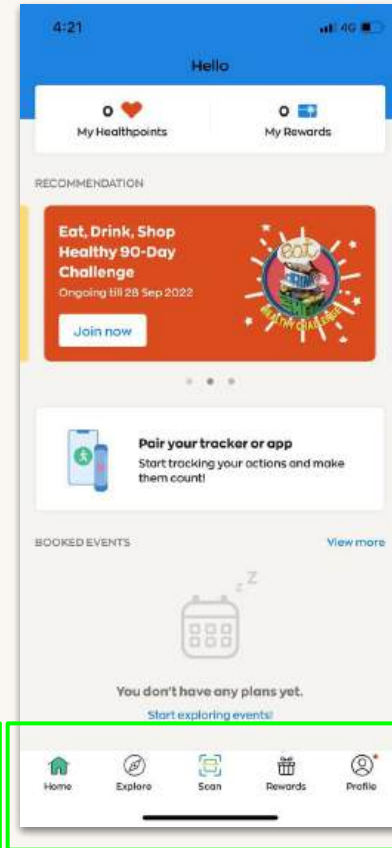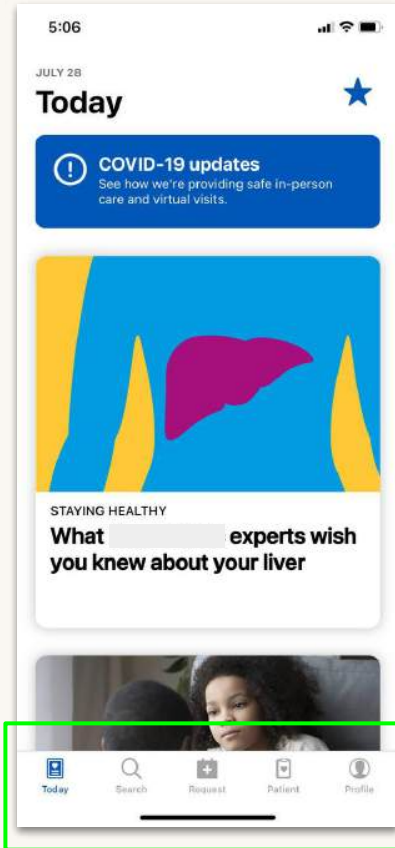
Do ensure that each navigation category is distinctively different, visible and easy to understand, to reduce the need for users to 'test' each option to find what they need.
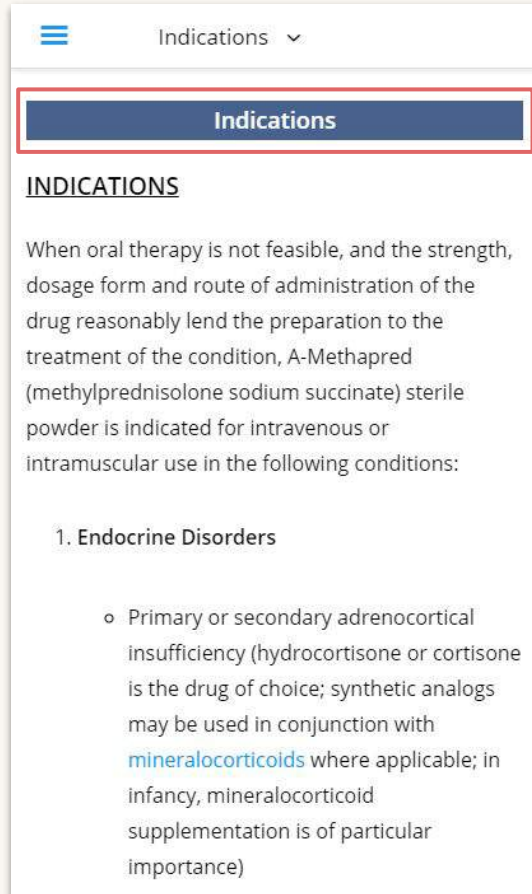
Links &
Interactive Elements

39

Do provide clear visual differences between clickable and non-clickable elements.

- **Do** style clickable elements with clear distinctions by:
    - Bolding the words
    - Underlining the words
    - Changing the colour
    - Creating a pill or box shape around it .etc

- **Do** also provide an obvious visual change when hovering above a clickable element.

Avoid designing non-clickable elements to look like common button designs like the "Indications" panel above. It invites users to click only to be at a loss when nothing happens.

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40

Do ensure that constructive actions are visually different from destructive actions.

- **Do** distinguish clearly between action buttons that confirm, cancel and delete to prevent unintended actions and errors.

- **Do** ensure that each button type has a consistent visual style for the entire service or app.
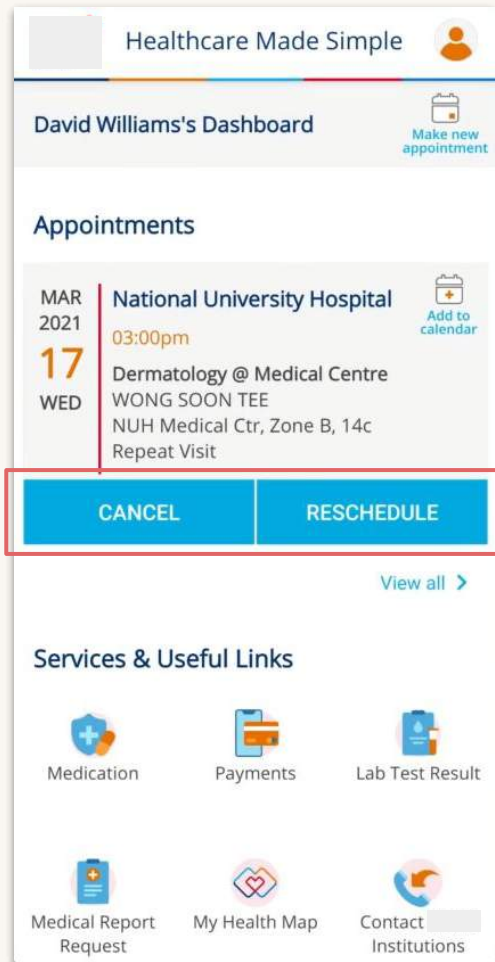

Avoid having identical visual styles for progressive and cancellation actions presented on the left; 'Cancel' and 'Reschedule'. Users are used to having a design that has a lesser visual priority for 'Cancel' buttons.

Do request for user confirmation before carrying out a 'destructive' request; 'Cancel' or 'Delete' an appointment .etc, especially when the request is not easily reversible.

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41

Do use descriptive button labels.

- **Avoid** using a generic 'Submit' for all progressive or 'Cancel' for all destructive actions.
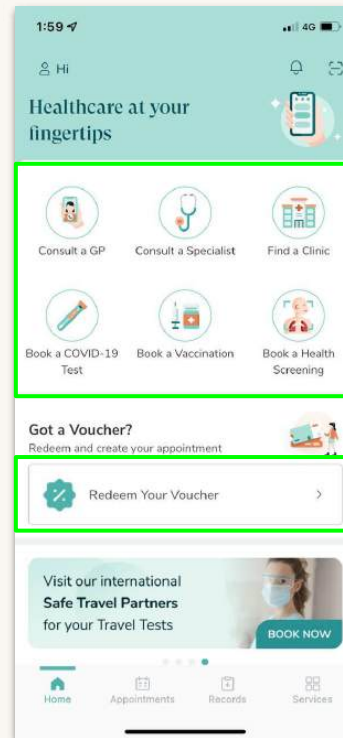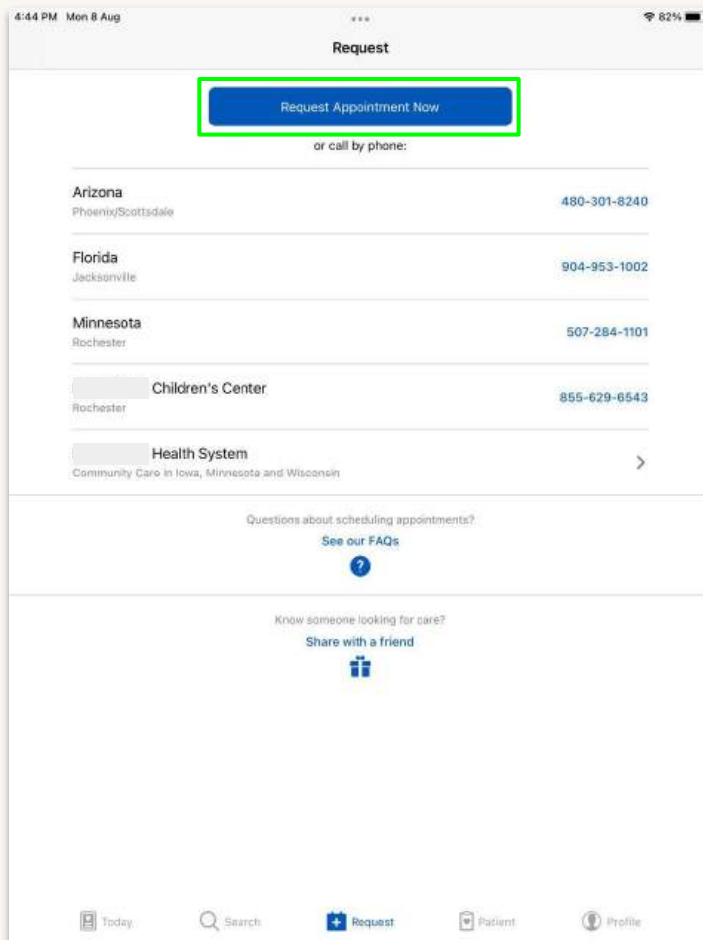

Do use descriptive button labels to remind users of the objective they are attempting to complete.

42

Do ensure that there is a minimum clickable area for interactive elements.

- **Do** provide a minimum touch area of 1cm x 1cm (48dp x 48dp) for each interactive element.

- **Do** provide adequate spacing between each interactive element to reduce unintended selections; The smaller the target, the larger the space.
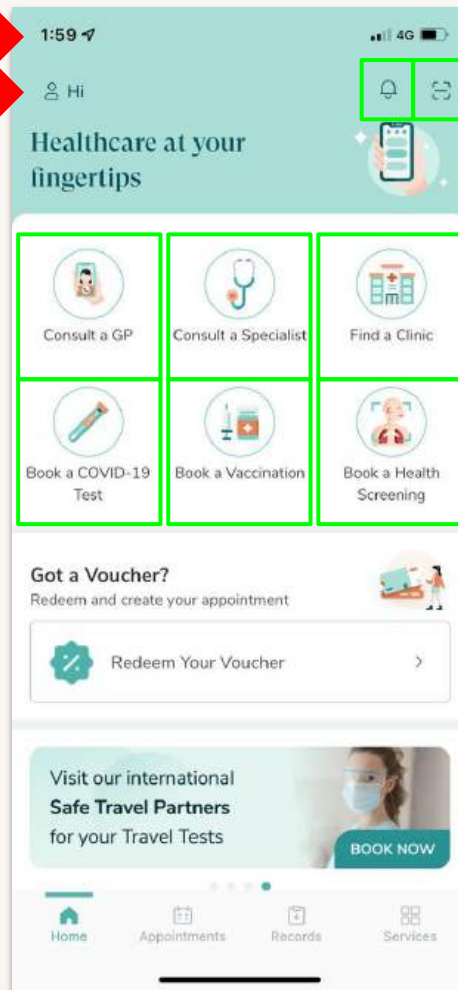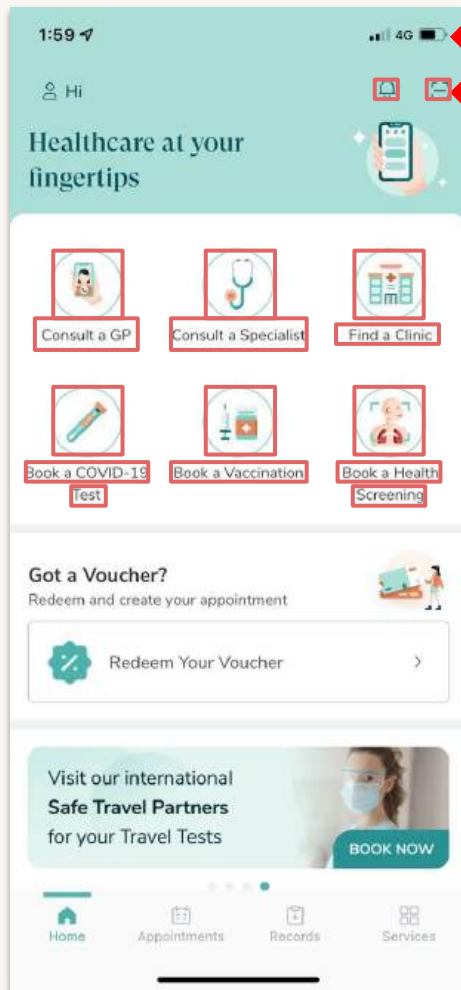
Avoid limiting the clickable area to the size of the icons or words as marked in red. Include both the icon and word in one large clickable area.

Do allow for a bigger clickable area when possible, to maximise navigational ease.

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Images

43

Do use informative images that aid users in understanding the content.

- **Avoid** images that are only meant for decoration. They tend to 'distract' users from achieving their goals.

- **Do** test the images on the intended device(s), to check the image visibility.

- **Do** perform a squint test; squinting your eyes, to roughly determine the recognisability of the image.

Arm Curl with Resistance Band

WHAT YOU NEED: Resistance band and sturdy, armless chair

This variation of the Arm Curl uses a resistance band instead of weights.

1. Sit in a sturdy, armless chair with your feet flat on the floor, shoulder-width apart.
2. Place the center of the resistance band under both feet. Hold each end of the band with palms facing inward. Keep elbows at your sides. Breathe in slowly.
3. Keep wrists straight and slowly breathe out as you bend your elbows and bring your hands toward your shoulders.
4. Hold the position for 1 second.
5. Breathe in as you slowly lower your arms.
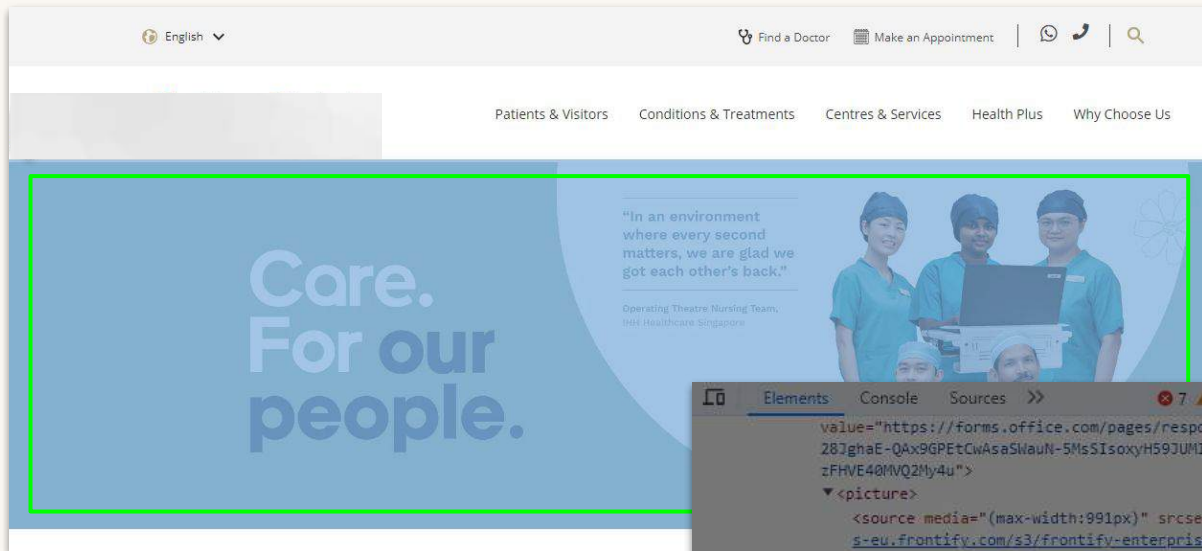6. Repeat 10-15 times.
7. Rest; then repeat 10-15 more times.

Do use informative images that are relevant or representative of the content you have written, to aid users in their understanding.

44

Do add alt text for meaningful or actionable non-text content

- **Do provide precise and concise content descriptions in alt text.** Alt text is typically found under labels like "description," "alt," or "alt text."

Low-to-no vision users depend on screen readers that can't read text within images, making alt text essential for app accessibility.

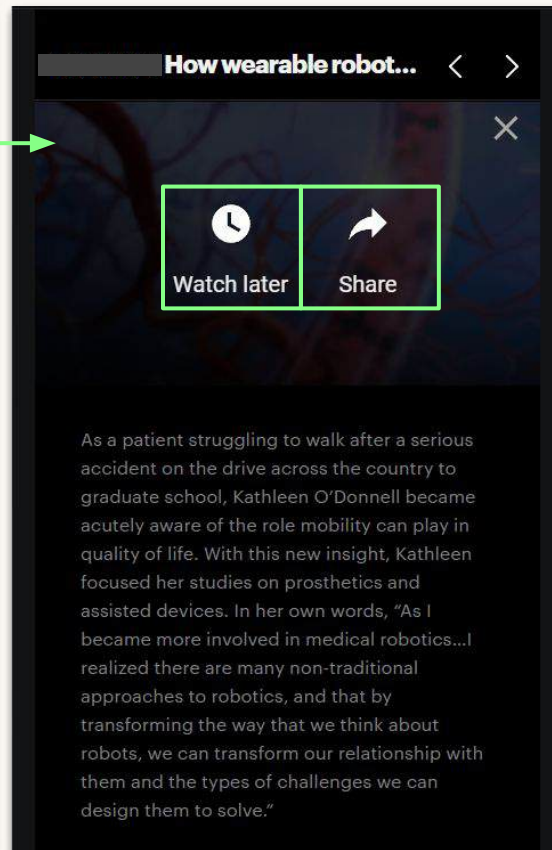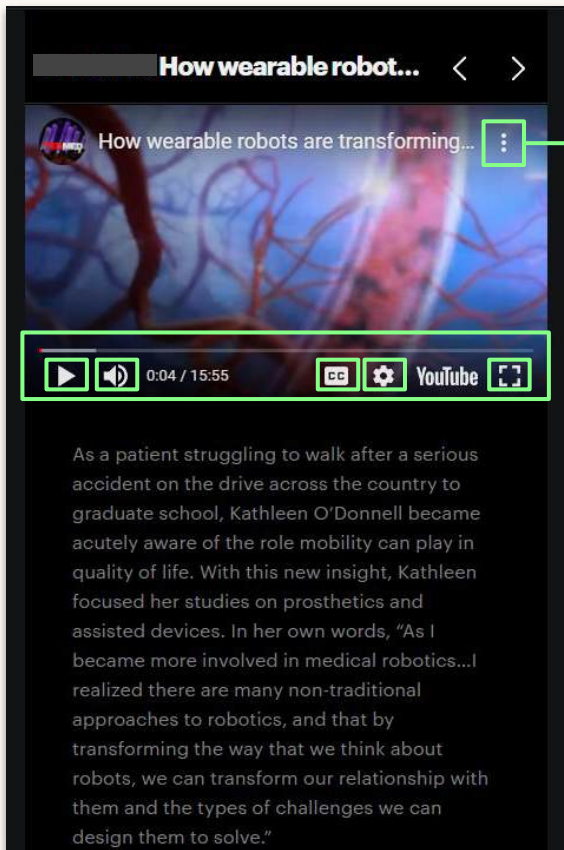Web banners, like the ones shown, allow screen readers to vocalise the actionable content: "Join Our Nursing Team."

Videos

45

Do allow all control options to be available for the video content.

- **Avoid** allowing video content to auto-play. Users would get annoyed if they have to pause each video they scroll past.

Do activate and present all available controls clearly, within the video. The embedded video above allow users to pause, play, maximise, skip, playback etc.

46

Do allow the option to 'read' the video.

- Do allow users to turn captions on and off, and if possible, provide a transcript of the video. It enables users with hearing or sound device issues to consume the video content.

Do allow users to 'read' the video content. Consider providing users the option to watch the video with captions and/or to read the entire video through the transcripts.

47

Avoid having the autoplay feature when video content comes to an end.

- **Do** provide recommended video options instead, to allow users to decide if the suggested content is relevant to their needs before consuming them.


Do allow video content to simply end without any video suggestions if there isn't relevant content available.

Search Function

48

Do ensure that the search function is placed in a common location.

- **Do** use the magnifying glass icon when representing the search feature and accompany it with a search field (18 to 27 characters wide) when possible.

- **Do** ensure that the search icon is clearly visible and labelled when it is presented without a search field.
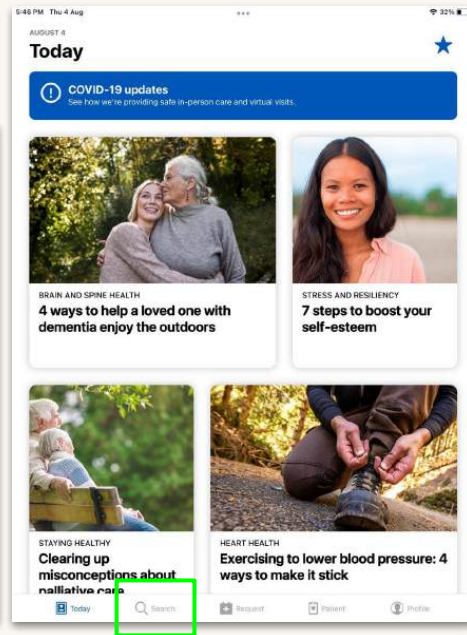
Do present the search feature in common locations at the upper right corner or…
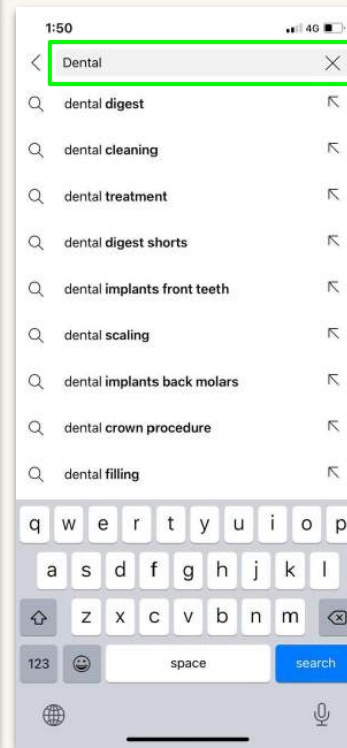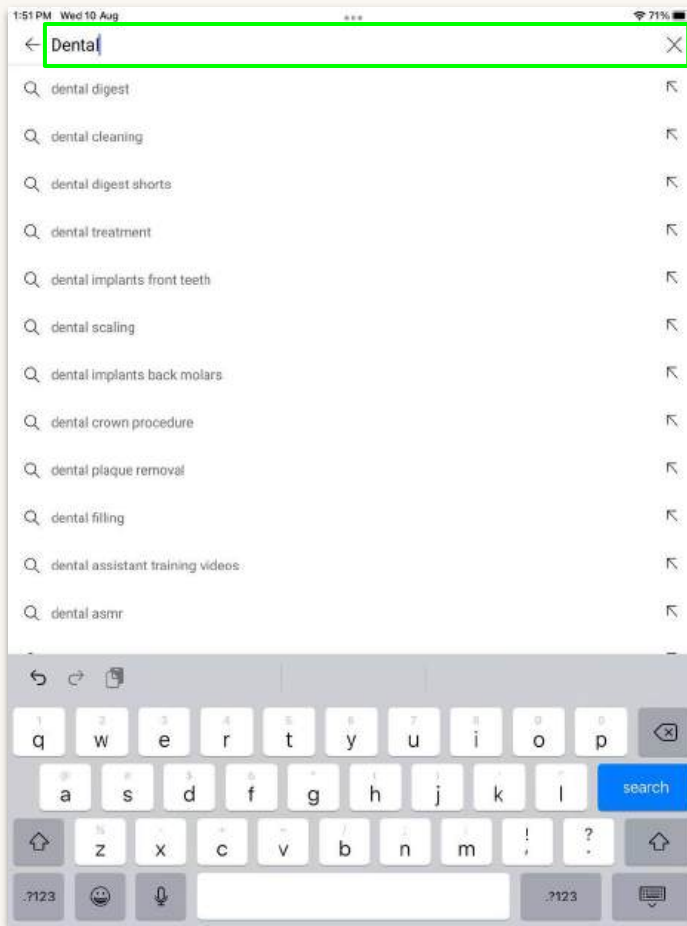
…at the bottom with the menu bar.

49

Do ensure that the text in the search field is legible.

- **Do use large font sizes for the text within the search field.** The font sizes should be at least 16 points (pt) for mobile devices.

- **Do ensure there is a contrast between the font colour and the colour of the search field.**
 - Pass the WCAG AAA for normal text; a benchmark for website.

Do ensure that the text in the search field can be seen with ease to help users verify their search request before they proceed.

50

Do provide relevant search suggestions when the user is entering their query.

- **Do** provide search suggestions based on:
  - Common searched terms
  - Most visited content

- **Do** enable the search feature to provide suggestions based on correct spellings of misspelt words.
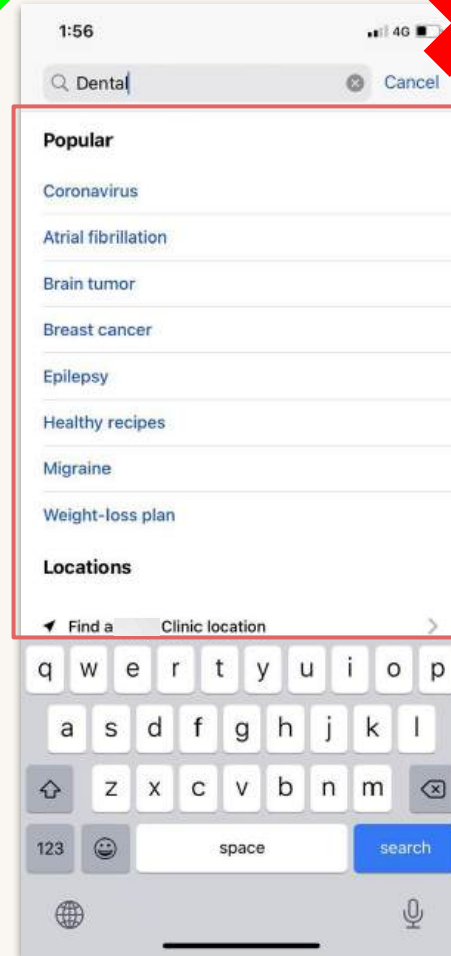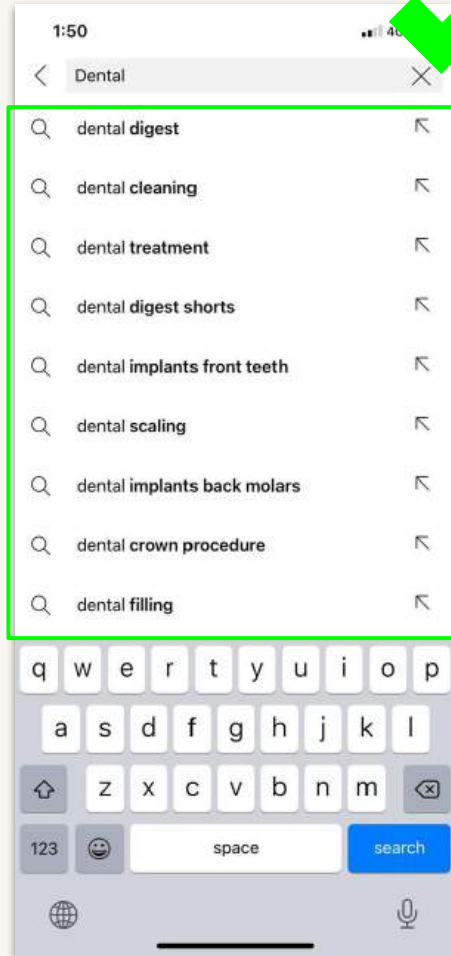

Avoid suggesting anything and everything without any prioritisation of users' needs, in the search bar. It does not help users find what they need in a shorter amount of time.

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51

Avoid implementing a search feature that requires the exact words to match the site content.

- **Do** create and grow a list of terms that references each of the keywords so users who have submitted similar terms, could be directed to the information they need.
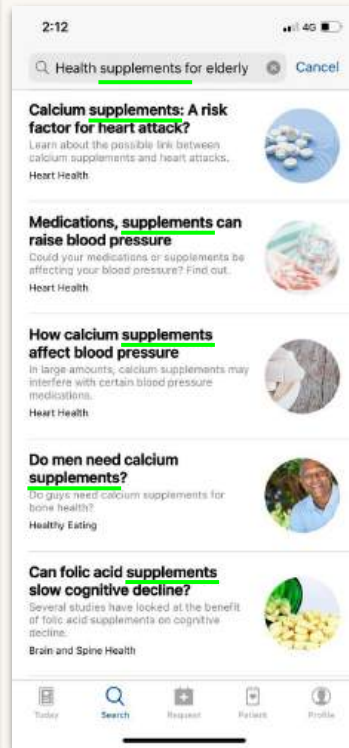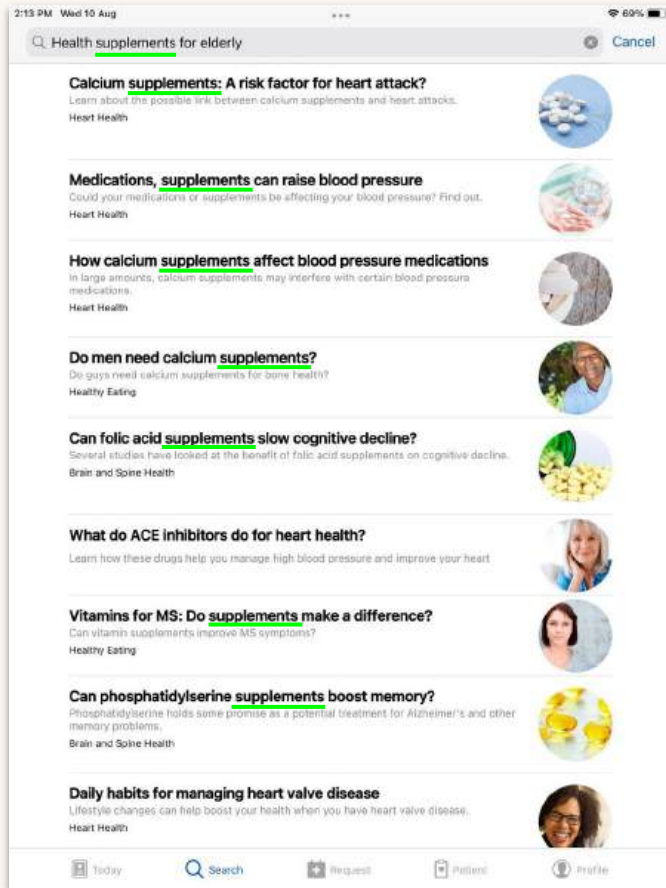
Do provide results based on some or all of the submitted key terms, rather than the exact searched terms, to help users get one step closer to the information they need.

Search Results

52

Do ensure that results are relevant and within the immediate viewable area of the device.

- **Do** include some if not all of the listed practices when creating a new search feature**.**

- **Do** allocate resources to refine the search feature. It takes time to tailor the search accuracy to the users.

If an exact match is not available	- Present findings based on the search terms and present the results in the order of: a. Number of search terms found b. Content relevance c. Content popularity
If none of the search terms provide any results	- Inform the user that no results can be found. - Suggest popular search queries as alternatives to help users refine their search.
If the search terms is deemed invalid	- Inform the user on the steps that could be taken to provide a valid query.

53

Do provide relevant results and suggestions despite spelling mistakes

- **Do opt for a search feature that is tolerant of misspelt words** to help users search for information with ease.

- **Do provide a clear recap of the query** to remind users with memory issues.
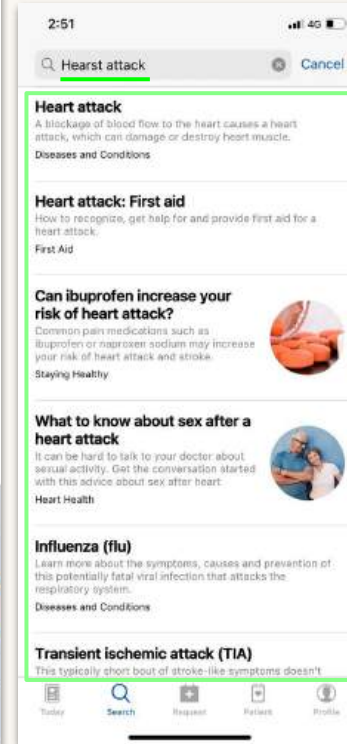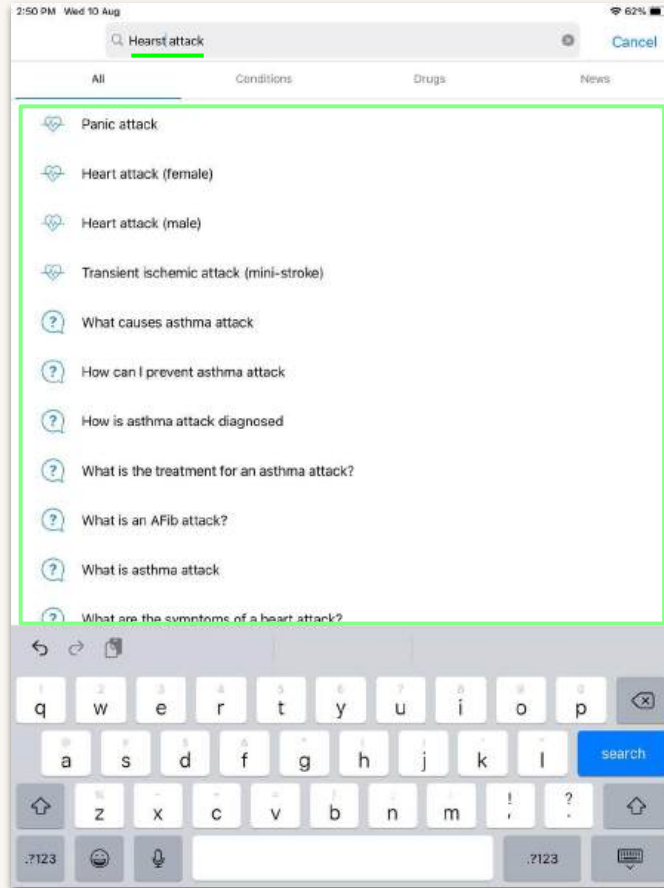
Do provide users with the option to query based on their initial search term even if it is deemed to be a spelling mistake.
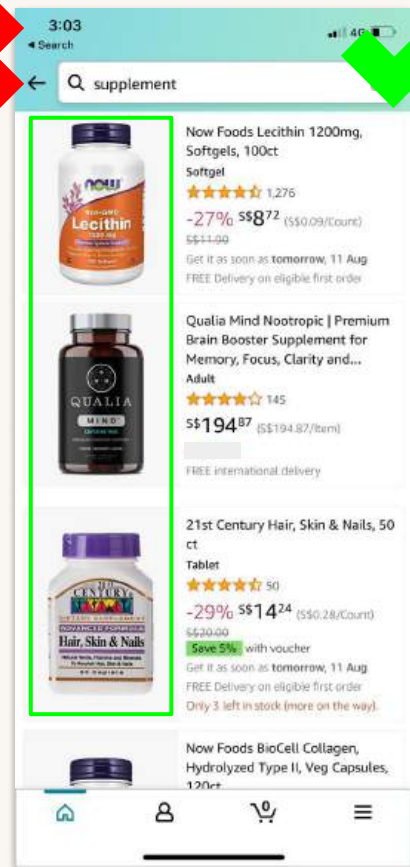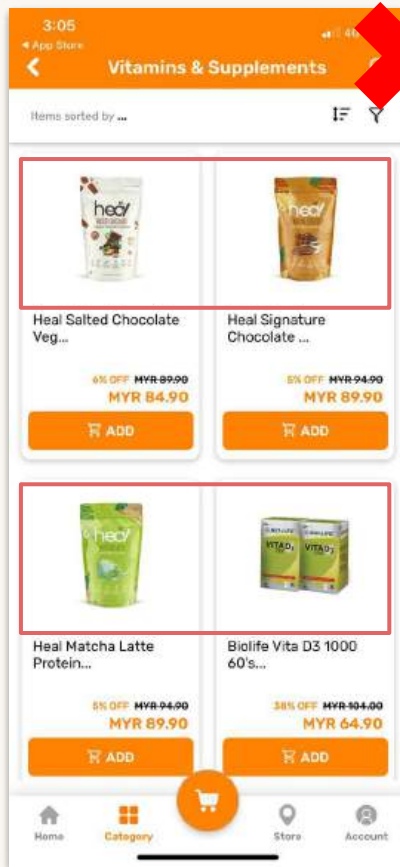
E-Commerce

54

Do display product image results that are large, clear and recognisable at a glance.

- **Do** allow product images, on e-commerce platforms, to be zoomable in the product details page. Users would be able to zoom in on the details regardless of the device.

Avoid displaying small product images, requiring the users to physically move in to identify the product.

Do fill up the display space with a clear image of the product so it could be recognised with ease at a distance.

55

Do allow users to verify and edit the details before completing a transaction.

- **Do** provide a details verification page when:
  - A submission is not easily cancelled or edited.
  - Money is involved.
  - There is extensive user information being requested.

Forms

56

Do label each form field with descriptive and easy to understand terms.

- **Do** position the field labels to:
  - The left of the field or
  - Above the field, to the left

Avoid positioning the field labels in the field itself. Information have to be deleted to view the field label.

Do position the labels close to the respective fields. Labels that are far from the fields would create uncertainty for users.

57

Avoid requesting information that would not enhance the user's experience.

- **Do** provide immediate explanations when requesting uncommon information; location .etc

Account details

Your ____ account allows you to setup personal drug lists (with detailed interaction data), rate and review medications, join support groups, ask questions, and subscribe to newsletters.

Email address

Username

Password

Very weak

Password must be at least 6 characters.

Age

-- Select --

Healthcare Professionals

☐ I am a Healthcare Professional

Send me News Updates

☐ FDA Safety Alerts

☐ Daily MedNews

☐ Monthly Newsletter

☐ I accept Drugs.com's Terms of Use and Privacy Policy

Create your account

9:18

Cancel   Sign up

You must be 18 or older to create a Patient Online Services account using the ____ app. If you're between 13 and 17 go to a ____ Health System location with a parent or guardian to create your account. Parents must create caregiver accounts for patients under 12.

Tan

Legal last name

Birthdate

Email

Password   SHOW

Minimum of 8 characters, including at least 3 of the 4 following: lowercase characters, uppercase characters, numbers (0-9) or symbols. Case sensitive. No spaces.

Use of this app signifies your agreement to the Terms of Service and Privacy Policy

Agree & Create Account

**Do** request information **necessary to complete the user's goal** and nothing more. Users get wary if they do not understand why certain information is required.

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58

Do use descriptive button labels.

- **Avoid** using a generic 'Submit' for all progressive or 'Cancel' for all destructive actions.

Account details

Your ▮▮▮▮ account allows you to setup personal drug lists (with detailed interaction data), rate and review medications, join support groups, ask questions, and subscribe to newsletters.

Email address

Username

Password

Password must be at least 6 characters.

Age

-- Select --

Healthcare Professionals
☐ I am a Healthcare Professional

Send me News Updates
☐ FDA Safety Alerts
☐ Daily MedNews
☐ Monthly Newsletter

☐ I accept Drugs.com's Terms of Use and Privacy Policy

Create your account

9:18   4G

Cancel   Sign up

You must be 18 or older to create a Patient Online Services account using the ▮▮▮ app. If you're between 13 and 17 go to a ▮▮▮ Health System location with a parent or guardian to create your account. Parents must create caregiver accounts for patients under 12.

Tan

Legal last name

Birthdate

Email

Password   SHOW

Minimum of 8 characters, including at least 3 of the 4 following: lowercase characters, uppercase characters, numbers (0-9) or symbols. Case sensitive. No spaces.

Use of this app signifies your agreement to the Terms of Service and Privacy Policy

Agree & Create Account

Do use descriptive button labels to remind users of the objective they are attempting to complete.

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59

Avoid using scrolling lists to input information.

- **Do** provide more than one way to submit the same information; allowing the user to type the information .etc
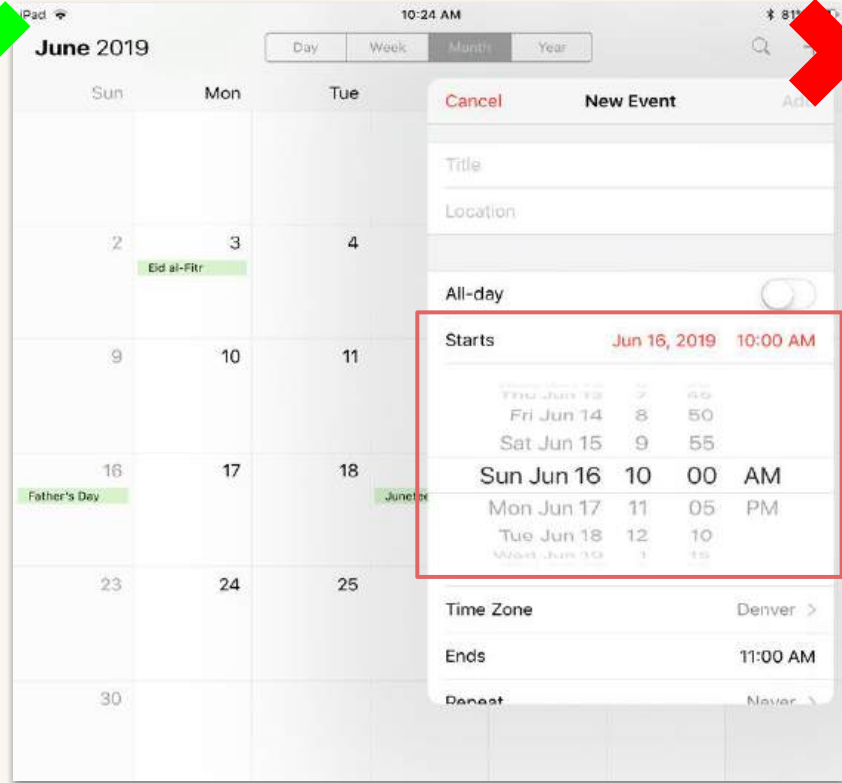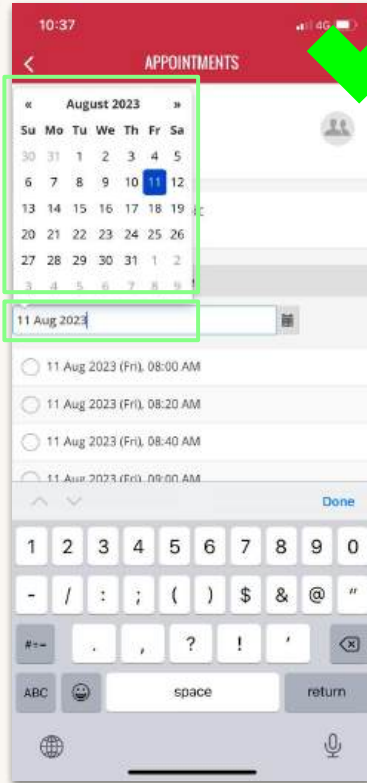
The date field above allows users to type in their preferred date or select from a date selector.

Avoid using scrolling lists to be the only option to input information, users with dexterity issues would tend to 'miss' their intended selections.

60

Do place error messages close to the element that triggered it.

- **Do** provide visual signals to help users locate and recognise interface elements.

- **Do** explain the cause of the error in a direct and easy to understand language.

- **Do** provide live feedback if an error has occurred or if the requirements are not met.

Avoid consolidating all the errors away from the cause of the error. In the example above, it requires users to remember which information to change.
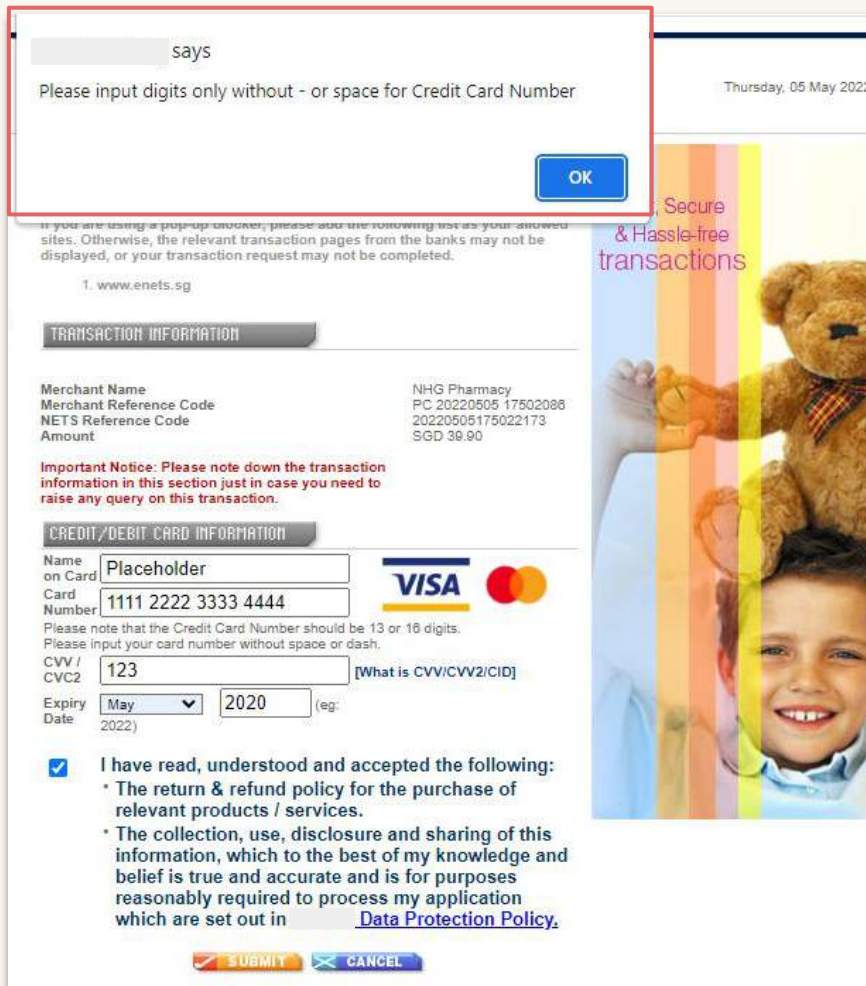
Do provide clear and descriptive directions to resolve the errors.

61

Do allow spaces or hyphens in credit or debit card entries.

If it is not applicable,

- **Do** detect and notify users of invalid entries, before a submission is made.

Avoid notifying users of their invalid entries after the submission. Either accept entries with spaces/ hyphens or notify users upon detection.

62

Avoid implementing time limitations.

- **Do** allocate more time than what is needed to complete the process, if there is a need for a countdown.

- **Do** notify your users if there is a need to time them out, preferably 20-30 minutes before the timeout, with additional notifications when the time is almost up.
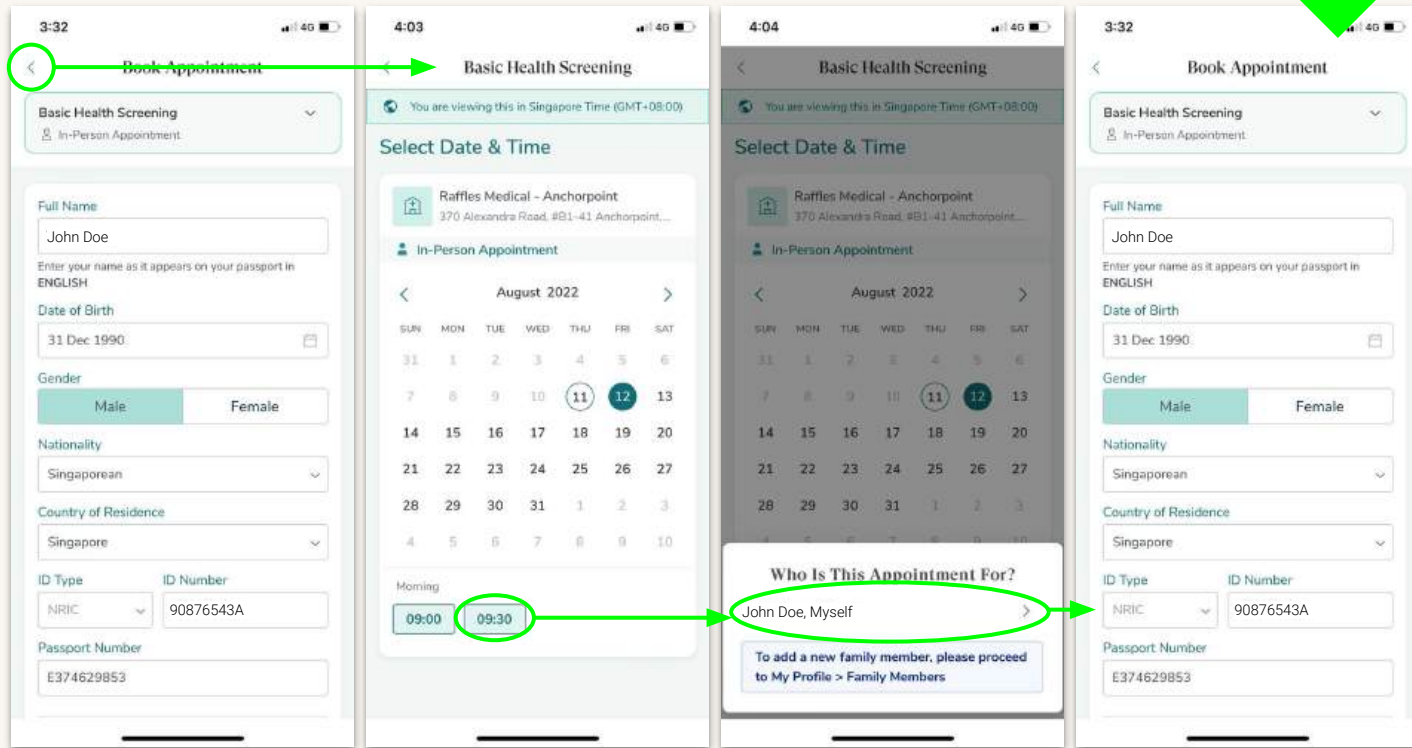

Do opt for forms that do not time users out. When there is a need to book a time slot, hold the selected time slot for an extended amount of time.

63

Do provide the option to "Save as draft" or enable the auto-save function.

- **Do** autosave the information provided and allow users to continue where they left off, in the event they dropped unintentionally.

When an extensive amount of information is required, there is a chance that users may:

1. Not have all the information on hand
2. Accidentally exit the submission

64

Do allow users to verify and edit the details before making an appointment.

- **Do** provide a details verification page when:
  - A submission is not easily cancelled or edited.
  - Money is involved.
  - There is extensive user information being requested.

Do provide a summary page of the successful appointment request, that allows users to edit the details.

Do provide clear and simple instructions on how to cancel or change the appointment details if an appointment confirmation email is sent.

Customer Support

65

Do provide an online chat option when applicable.

- **Do** display the online chat option in an easy-to-spot location and style; usually at the bottom right or top right of the screen.

Ask Me

Today

Hi there, I am CareBot, how may I assist you?

You may select from the options below or ask any question to begin.

Book an appointment

Join a health program

Contact a clinic

See more

Type message...

Home   Appointments   My Health   Ask Me   More
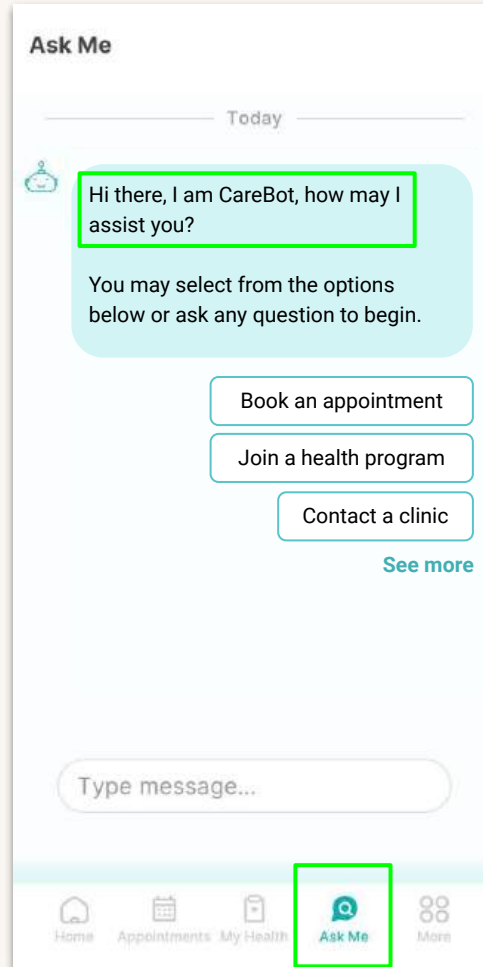
Do inform the users at the beginning, who would be handling their requests.

Do ensure that the online chat option can be accessed on any page and does not automatically open unless selected by the users.

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Reference

The UX Guidelines have been compiled with inputs from:

1. **Accessibility in Design,** by Singapore Government Design System
2. **Age-friendly: UI UX design thinking for senior citizens, 2019,** by Roman Berezhnoi
3. **Designing Apps and Digital Interfaces for Elderly**, 1st edition, 2018, by CIBP Sprint
4. **Designing User Interfaces for the Elderly: A Systematic Literature Review, 2017**, by Connor Dodd, Rukshan Athauda and Marc T. P. Adam
5. **Digital Service Standard, Public Release, 2020,** by GovTech Singapore
6. **Nielsen Norman Group: Usability for Senior Citizens: Improved, But Still Lacking, 2013,** by Jakob Nielsen
7. **Nielsen Norman Group: UX Design for Seniors (Ages 65 and older), 3rd Edition,** by Lexie Kane and Kara Pernice
8. UI Guidelines and Best Practices, V1.02, 2017, by Ang Eng Kiat
9. **UX accessibility for elderly — 12 principles, 2019,** by Szymon Trzepla
10. **UX Design Thinking From A Senior Citizen's Perspective,** by Emily Grace Adiseshiah

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The guidelines may be revised over time, it includes but is not limited to:
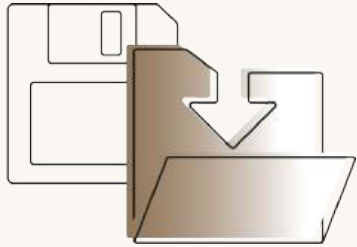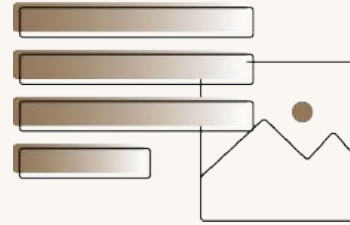
Iconography

As the new generation age, the icons they understand (or grow up with) changes.
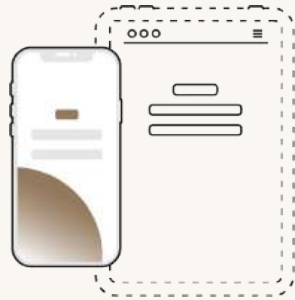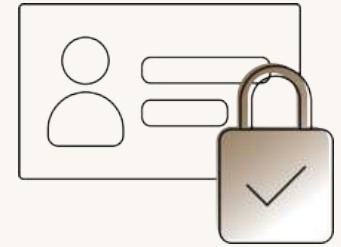
New devices

Devices come and go. New devices could mean a new set of responsive designs and user habits.

Content preference

The current preference for text, over symbols and colours, would change over time as a medium for information.

Data privacy

The amount of information that users are willing to share about themselves would change over time.

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