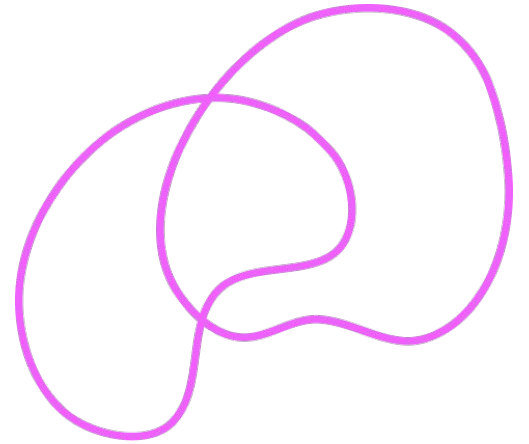


Designing for digital health

By Alina Bochkacheva



Introduction

I am Alina, a principal design consultant.

- Started as a front-end developer, ended up obsessed with human behaviour
- 15 years in UX design, user research and product development
- Worked across cybersecurity, health & safety, eCommerce, and now health tech
- Currently advising early-stage SaaS startups on product discovery and design



It's Just a Virus, the E.R. Told Him. Days Later, He Was Dead.

Sam Terblanche was just 20 years old. Can a busy E.R. handle the hardest cases?

Banerjee testified that he examined Sam, too, then consulted with Agyare and they made a plan. It was Banerjee's task to document Sam's care, and as he began to do so, a pop-up appeared on his computer screen. Sam's fever and heart rate had triggered an automated warning for sepsis, a potentially life-threatening condition in which the immune system has a dangerous reaction to an infection. It requires speedy intervention. To help the hospital

Terblanche has read the record countless times, each time searching for clues. He finds the chart risible: Why would a physician decide to override an alert designed to protect Sam from danger?

Sam's chart is 51 pages long, a catalog of billing codes and abbreviations, check-boxes and shorthand, updates and addenda. The record of the second visit contains numerous contradictions: Sam's heart rate was documented at 126, yet Banerjee clicked the box "normal." In one place it says Sam didn't have a cough, while in another it says he did. The signatures of doctors who testified they never saw Sam — including one who was not in the hospital that night — accompany notes. Vital signs were ordered and not taken, as was an EKG.

Doctors talk about electronic medical records as an unpleasant and frustrating chore. They object to how the charts have evolved to prioritize billing and liability defense over clinical care. And they regard the symphony of well-meaning alerts and pop-ups as a distraction at best.

The alert worked. The system failed completely.

- A sepsis alert pops up on the resident's screen.
- The resident — a month into his career — can't figure out how to navigate the template.
- A senior resident dismisses the alert from his own computer without ever seeing the patient.
- The chart is 51 pages of contradictions, auto-populated fields, and signatures from doctors who weren't even there.

“Alert fatigue”

Alert fatigue occurs when too many alerts are generated by the system, leading to users simply ignoring them

(The terms came from aviation safety literature)

What went wrong?

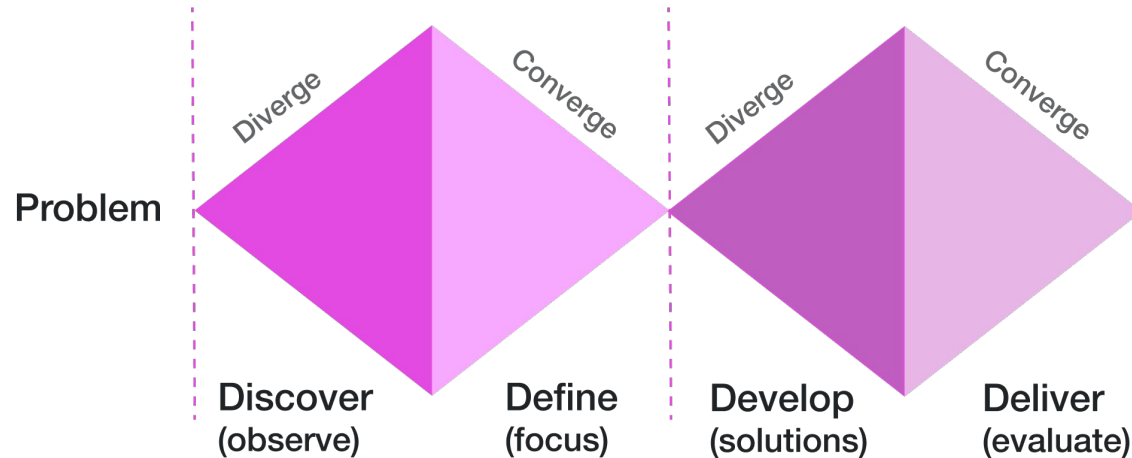
- System was drowned in noise, teaching clinicians to ignore that noise.
- Product with too many custom features, full of functionality; less focused on usability. (Microsoft Word vs Google Docs)
- Catering to too many users at the same time (An alert that's critical for a first-year resident is insulting to a 20-year veteran.)

**So how do we avoid
building the next system
that does this?**

Design thinking

Design Thinking is a framework that helps you to solve problems through human-centered lens. It puts emphasis on human needs.

Problem → Discover → Define → Develop → Deliver



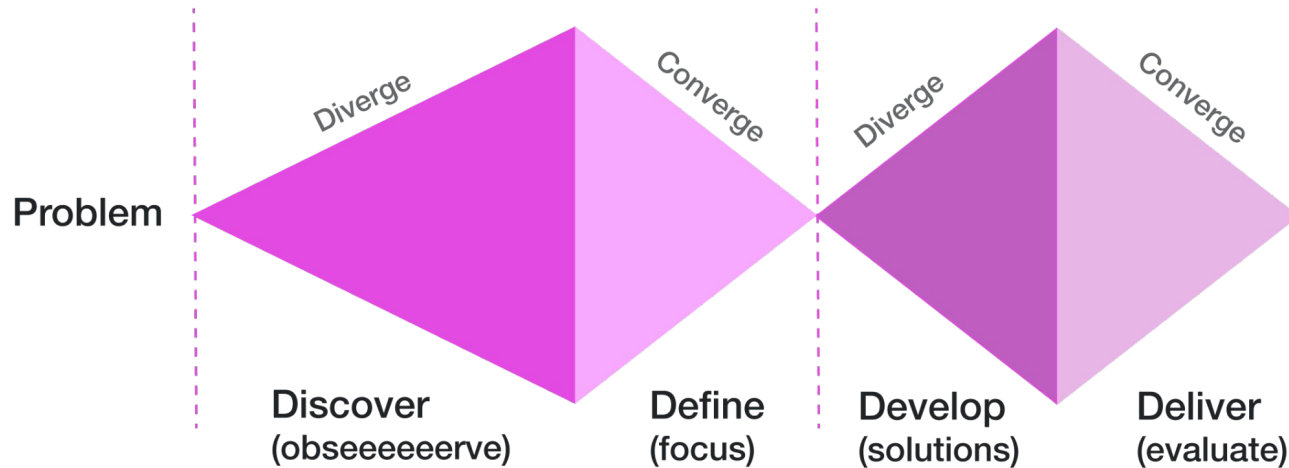
**Your design
thinking home:**

<https://designthinking.ideo.com/process>

Design thinking - the Observe phase

We need to be spending more time in the beginning

Problem → **Discover (obseeeeeerve)** → Define → Develop → Deliver



The real world problem

Back in 2025..

I see that patients going through joint replacement aren't being properly educated about their procedure!

Doctor:

That's a great hypothesis. But before we build anything — let's find out if that's actually what's happening.

**Design
thinking hat:**

Problem

Framing

Assumption:

Patients are not being properly educated about their procedures

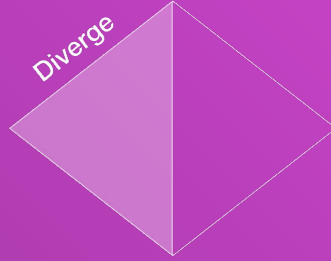
- They don't know what exactly will be done to them
- They are not aware of strengthening exercises they can do
- They are not aware of possible complications and degrees of them
- They don't know how they will be anaesthetised (sleep or awake?)

So what do we do?

Let's go talk to patients.

- Why do patients need to be educated in the first place?
- What if they don't want to be educated?
- What if it is available but inaccessible?
- So what do we do!?

Obseeeerrve

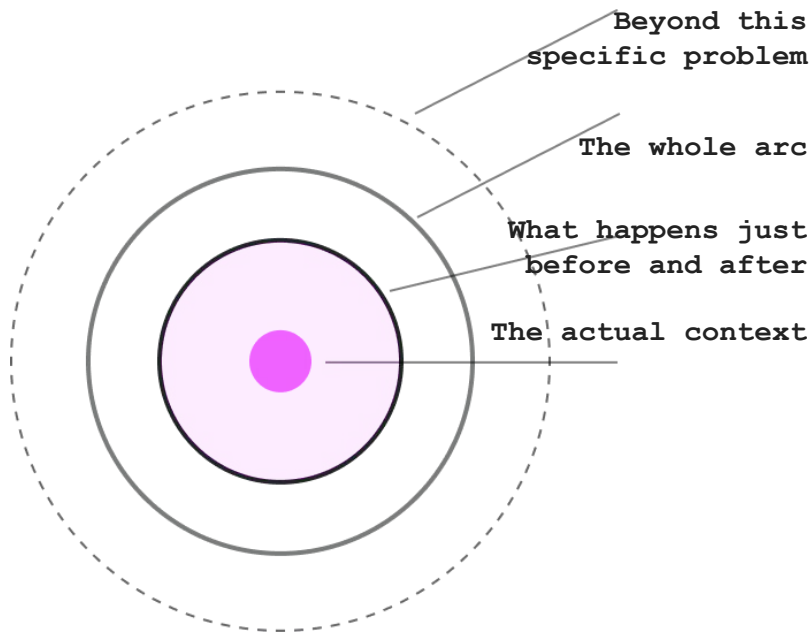


Discover (Obseeeeeeerve)

The importance of the whole journey

We can't design successful solutions if we don't know:

- How people arrived at the problem in the first place
- The scale of the problem
- Who and what is involved in the whole journey
- The impact of the problem (which is also often what happened “after”?)



Who we interviewed

5 patients

Type of interview: structured

Gender: 4 male + 1 female

Age: 48 to 74 years old

System: 1 Private, 4 Public

Procedure: Knee and hip replacement

Procedure status: 2 completed, 3 upcoming

Why so few!?

This is not clinical research.
This is design research.

The goal isn't to prove a hypothesis with statistical significance. It's to understand people's lived experience deeply enough to design something that actually works for them.

What we learned from an actual research: the journey

Wait

Pre-surgery prep

Surgery

Post-surgery recovery

Wait

- **Biggest pain point** in the journey
- No ability to predict
- No expectation settings
- Rely on your GP to advocate for you
- Wait times are significantly quicker in the private setting

Pre-surgery prep

- In **public setting** involves 3 appointments:
- Anaesthetic assessment
 - Educational session
 - Pre-admissions appt

In **private setting**, a phone call from an anaesthetist (not always)

Surgery

- Involves 2-3 days of admission.
- Patients are visited by physio to get them moving and give instructions

Post-surgery recovery

- A GP appt at 2 weeks
- A surgeon appt at 6 week
- No physio

Other tidbits we learned

Communication breakdowns between healthcare providers

- No clarity if referral is sent
- No clarity if the patient has been placed on the list
- Referrals require constant follow-up

Need for persistent self-advocacy

- Constant follow-ups with GP
- Patients advised to exaggerate symptoms

Anaesthetic pre-assessment is anxiety inducing

- Patients fear being turned away after long waits
- Anxiety especially present when patients know they have health issues

Surprising anaesthetic options

- Patients assume they will be knocked out completely
- Most patients don't feel comfortable being awake, but can be convinced
- Previous experiences of anaesthetic play a big role

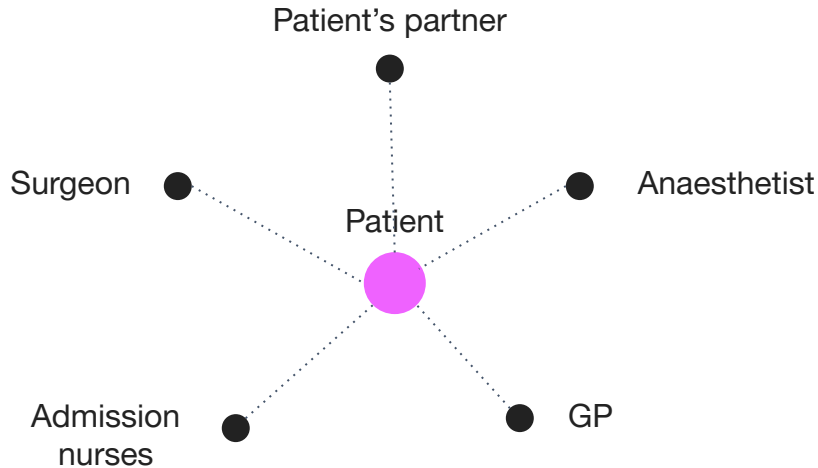
If we did not go wide, we would have missed..

- That APAC appointments are anxiety inducing
- That some patients get a call from anaesthetists and some don't
- That education is inconsistent between private and public patients
- That we need to involve partners as much as patients
- And more!

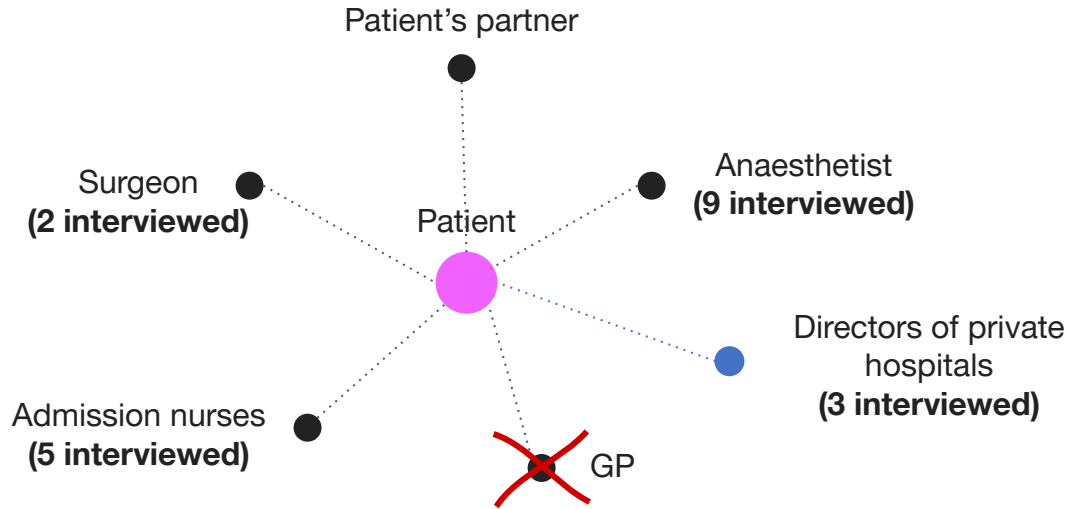
What's going on within the anaesthetic process?

Let's look at the ecosystem

Zoom out and talk to others involved in this journey



Expanding to understand the whole ecosystem



Why no GPs?

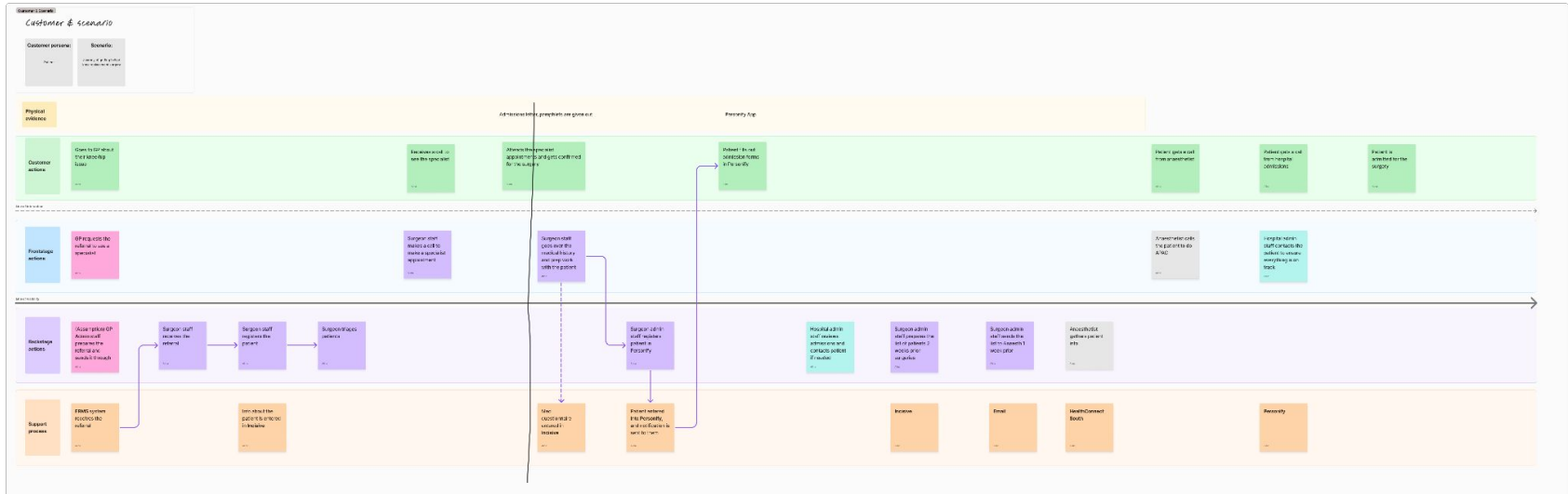
You can't solve a problem that is so large. GPs come earlier in the journey and play little role in the procedure itself

Why directors?

We needed to understand how management currently makes decisions around software.

Service blueprint

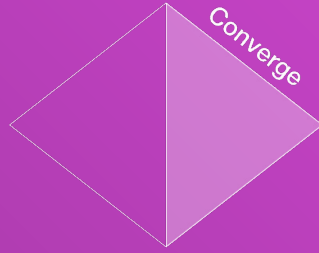
..is a diagram that visualizes the relationships between different service components — people, props (physical or digital evidence), and processes — that are directly tied to touchpoints in a specific customer journey.



Source: <https://www.nngroup.com/articles/service-blueprints-definition/>

What the clinicians told us

- Gathering patient info can take up to 30 mins!
- There is no single source of patient data
- Patients are asked to complete multiple forms from different departments that ask them same questions.



Define

Seeing clear patterns

“A well-defined problem is already half-solved.”

- Charles F. Kettering

What we have

- Quotes
- Observations
- Insights

What we get

Themes and patterns

Example: Health data

A well-defined problem is already half-solved.

What we heard

- There are many different tools are currently used by different hospitals (Personify, Incisive, paper, etc)
- Patients are asked to fill out multiple forms from different departments that ask for same information
- In private, some can access public records, some can't

What we see

Fragmented data across different departments

“How might we..”

Classic design thinking tool that converts insight into opportunities

Insight

Data is fragmented and patients are repeatedly asked the same questions by different departments.

How Might We..

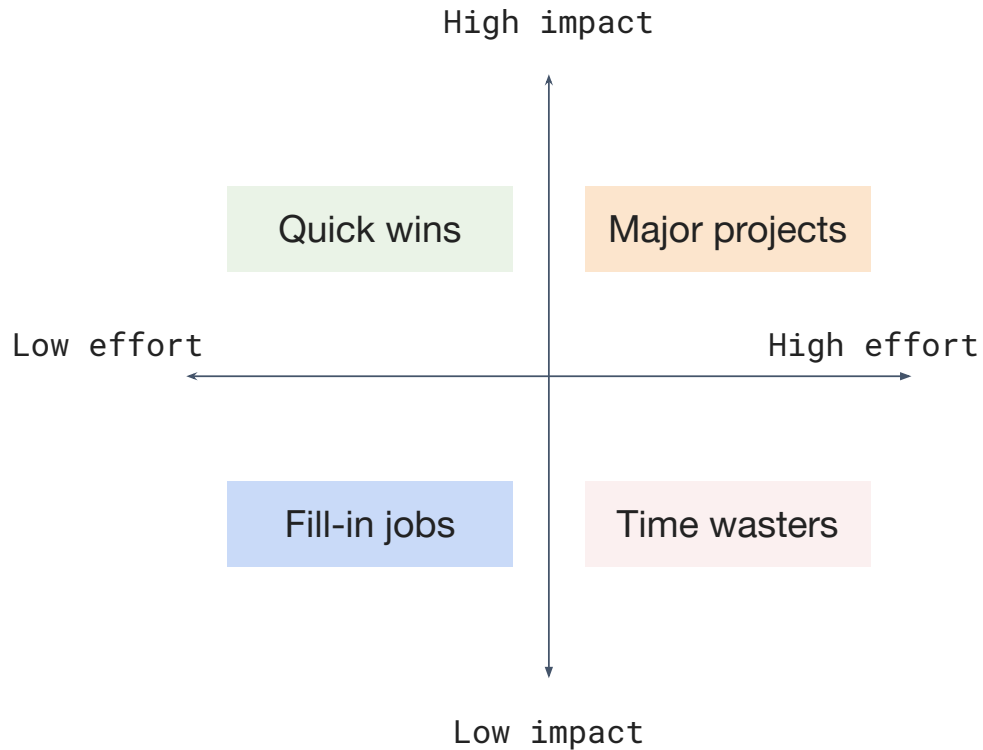
How might we create a single source of patient truth that every touchpoint in the surgical journey can draw from — without the patient having to repeat themselves?

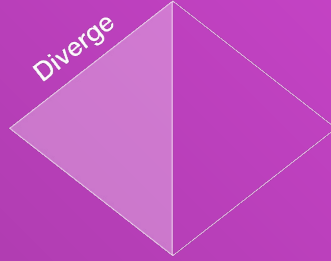
Prioritize

What problems do we solve?

Prioritization frameworks help you:

- See picture more clear
- Pick priorities
- Align the team





Develop

Nudges

Nudge theory comes from behavioural economics, pioneered by Thaler and Sunstein.

The core idea is that how choices are presented influences what people choose.

There is no neutral design. Every default, every button placement, every label is already a choice about what behaviour you're encouraging.

Examples of nudges

Smart defaults

Set the default to what evidence says is best for most users; defaults act as recommendations

Example:

- Defaulting organ donation to opt-out
- Pre-filling known information so patients don't have to re-enter it

Smart reminders

“Smart reminders” are smart, because they align with behaviours

Example:

- **Timing:** sending fasting reminders at 9pm
- **Channel:** SMS might work better for elderly patients
- **Frequency:** frequent alerts = alert fatigue

Friction

Sometimes good design means making the wrong action harder

Example:

- Require clinicians to type the reason to view someone's record or to override a drug interaction alert
- Confirming pop-up dialog if someone is trying to delete important data

Sometimes the best design decision is removing the decision.

Sometimes it's just better to do it for your user base than rely on them to take an action.

“Opt in vs opt out”

You are enrolled in a dental care since you are born.

Silent software updates

Updating software is not just for “new features”. Most of the time is it enhance security.

Smart pumps

Between 2005 and 2009, 56,000 infusion pump errors occurred in the US alone, resulting in 710 deaths. Solution: "Smart" pumps that auto-calculate rates and enforce limits — they removed the decision

Information hierarchy

- The biggest pet peeve in the healthcare industry: we chose to show everything in fear something will be missed.
- Identify use cases and how individual personas will use the system. Prioritize.
- Progressive disclosure - uncover information gradually

“All these warnings treating me like I am incompetent. I have 20 years of practice, I don’t need the software to tell me things I already know”

Anaesthetist

Examples: Displaying medicine

Left:

No hierarchy, hard to decipher the text

Right:

Use of different font weights and colours plus more white space and lines, help you see much clearly the entire list

The image shows two side-by-side screenshots of a web application titled 'Meridian Chart'. Both screenshots have a search bar and tabs for 'Active', 'Historical', and 'All' medications. The left screenshot shows a list of medications under the heading 'Current medications: (selected)'. The list is a single block of text with no formatting, making it difficult to read. The right screenshot shows a table of medications with clear headers, bolded medication names, and consistent formatting for dosages and frequencies.

Medications	
albuterol HFA	90 mcg/spray 2 puffs every 4 hr as needed
aspirin	81mg 1 tablet daily
beclomethasone HFA (QVAR HFA)	40 mcg/spray 2 puffs daily
carvedilol	25mg 1 twice daily
chlorthalidone	25mg 1 tablet daily
citalopram	20mg 1 tablet daily
gabapentin	600mg 1 twice daily
insulin glargine (Lantus)	40 units 1 at bedtime
losartan	100mg 1 daily
lisinopril	20mg 1 daily
metformin	1000mg 1 twice daily
naproxen	500mg 1 twice daily
nitroglycerin	0.4mg 1 as needed
omeprazole	40mg 1 daily
prednisone	20mg 2 daily as needed
simvastatin	80mg 1 daily
terbinafine	150mg 1 daily
zolidem	5mg 1 at bedtime

Examples:

Every form asks for your GP's phone number. How many of you remember it?

Solution:

Ask for the name of the practice, then do generic automated look up for digital services

Examples:

Many patients don't remember the name of their GP or attend a practice where there is no primary GP.

What is the name of your GP?

First and last name

Save

I don't remember

Not everyone knows their weight. With no option to say "I don't know", patients can put guesses that are significantly off from the reality.

What is your current weight? (approximate is fine)

e.g. 75

kg

lb

Save

I don't know my weight

Examples:

31% of patients prefer to be called something different than their official name.

Solution

Ask what they want to be called.

Did you know?

“Preferred name” can sound offensive as it’s not “preferred”, it’s the name they chose or have been called their entire life.

<https://callmebecausenamesmatter.org/>

Dark patterns (aka deceptive designs)

Dark patterns are deliberately deceptive design choices that manipulate users into actions that benefit the business at the user's expense:

- making it easy to subscribe but hard to cancel
- burying opt-outs in confusing language
- sneaking items into a cart
- using guilt-tripping copy on decline buttons ("No thanks, I don't want to save money")

Good resource: <https://www.deceptive.design/>

Examples: Flo Health

The dark pattern: Users thought they were tracking their health. Flo was tracking them — and selling what it found to advertisers. It only stopped when journalists caught them.

What user were told

"Your data will not be disclosed to or used by third parties."

Flo's privacy policy explicitly promised that period dates, pregnancy status, symptoms, and mood data would remain private.

What actually happened

Every time you logged your period, pregnancy status, or symptoms, Flo quietly sent that data to Facebook and Google — so advertisers could target you based on your most intimate health details.

You were the product. Your body was the data.

Accessibility

Web accessibility

Designing for everyone

Web accessibility means building websites and applications that everyone can use — including people with **visual**, **auditory**, **motor**, or **cognitive disabilities**. It's not a feature; it's a foundation.

WCAG (Web Content Accessibility Guidelines) are developed by W3C (world web consortium) and continuously evolve with WCAG 2.2 being latest (as of 2023).

Did you know?

- In 2023, an estimated **17%** of people living in New Zealand households were identified as disabled. (*Stats NZ*)
- All public service departments and non-public service departments in the Executive branch **must meet** the NZ Government Web Accessibility Standard

Accessibility levels

Level A

Minimum accessibility

Essential baseline, most basic.

Will still contain some accessibility barriers.

Level AA

More accessibility

Provides broader access to user.

Most **commonly** cited as the required level.

Level AAA

Even more accessibility

Highest level, includes all criterias.

Not always realistic to meet.

Visual examples

Color contrast

Meet WCAG AA minimum ratio of 4.5:1 for text. Don't rely on color alone to convey meaning — use labels and icons too.

Add condition

+ Add condition

Good typography

Use a minimum 16px base size. Choose legible sans-serif fonts. Ensure line height of at least 1.5× for body text.

Bad font (Roboto Mono):

Error: Please enter a valid email address to continue.

Good font (Lexend):

Error: Please enter a valid email address to continue.

Beyond visual

Keyboard Navigation

Every interaction must work without a mouse. Logical tab order and visible focus states are critical.

Authentication

[WCAG standard](#)

Offer alternatives to CAPTCHAs. Support password managers and biometric login. Don't enforce time limits on forms.

Screen Readers

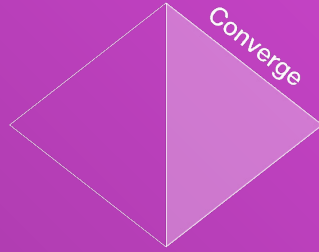
Use semantic HTML and ARIA labels. Ensure forms have proper labels and error messages are announced.

Your accessibility resources

- [W3C](#) - official website of world web consortium that develops the standards
- [WebAIM contrast checker](#) - allows you to check color contrast and map it against the standards
- [WCAG.com](#) - great private resource on accessibility standards

A Tip

AI tools can be a good help in checking accessibility of your designs. For example, you can paste your designs and ask to analyze it against the standards, and, if it doesn't meet them, you can ask to modify colors



Deliver

What are “prototypes”?

A prototype is simulation of a product built to test ideas, evaluate design decisions, and gather user feedback before committing to full-scale development.

What do they achieve:

- Help you evaluate your solution early
- Catch usability issues
- Align stakeholders
- Decrease developmental costs
- Keep users happy (aka, not piss them off)

Fidelity of prototypes

Low fidelity

Sketches, paper prototypes, whiteboard flows

Purpose:

Early concept testing

Medium fidelity

Wireframes (skeleton), no color, no final copy.

Purpose:

Structure and flow testing

High fidelity

Pixel-perfect working interface. Looks and feels close to the real product.

Purpose:

Final stage, usability testing.

What to test and why

Before building anything, you should be able to answer: what assumption are we testing, and what would prove us wrong?

Desirability

Do users actually want this?

The question

Will patients engage with a pre-surgery education module, or ignore it the same way they ignore paper pamphlets?

Usability

Can users figure it out without help?

The question

Can a 70-year-old patient complete the anaesthetic pre-assessment form on a computer without calling the hospital?

Clinical fit

Does it fit how clinicians actually work?

The questions

Does the alert appear at a moment in the workflow where the clinician has time to act — or mid-procedure?

Digital prototyping

The landscape changed a lot (thanks AI).

Figma (design tool)

Brainstorm, design, AND prototype within one tool. Most popular design tool.

However, can't test real data entry or conditional logic.

AI note: Figma does have native AI that helps you to create complex interactions and integrate them into your final prototype.

Figma→Claude Code

Huge benefit of these tools is that your prototypes feels like a real finished product. You can create real users for the purpose of testing and it created the most realistic environment for your testers.

AI-powered interface generators (e.g. Lovable, Replit, Magic patterns, etc. or Code Claude for advanced)

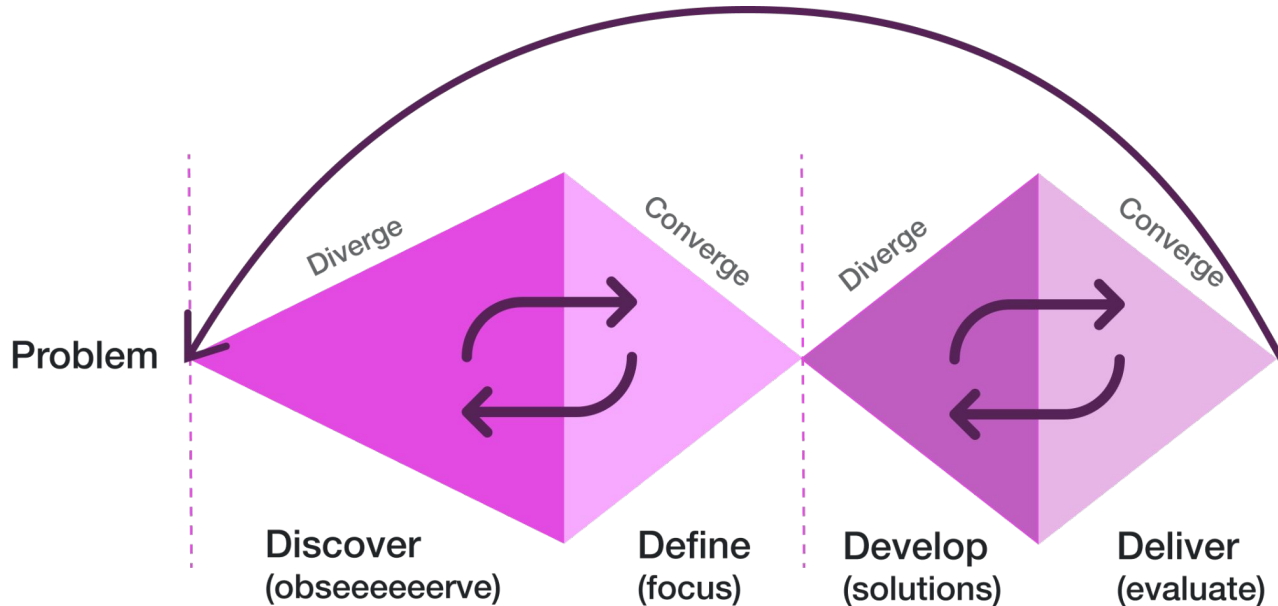
Describe what you want in plain language and they produce a working interface (design +build).

Does not produce research-backed design, or accessible design either.

Repeat

It's rarely linear

You often have to go back to the drawing board:



Use it no matter the size

Design thinking is not just for building new products from scratch.

Design thinking can be applied anywhere!

- Small improvement within the product
- Big new feature
- Improving something within your community
- Figuring out how to solve a problem within your life

The next time you use a health app or sit in a waiting room, notice one moment of friction — and ask what question the designer forgot to ask.