

Human Centered Design Toolkit

How might we identify innovations with the most impact on people's lives?

2022

Version 2

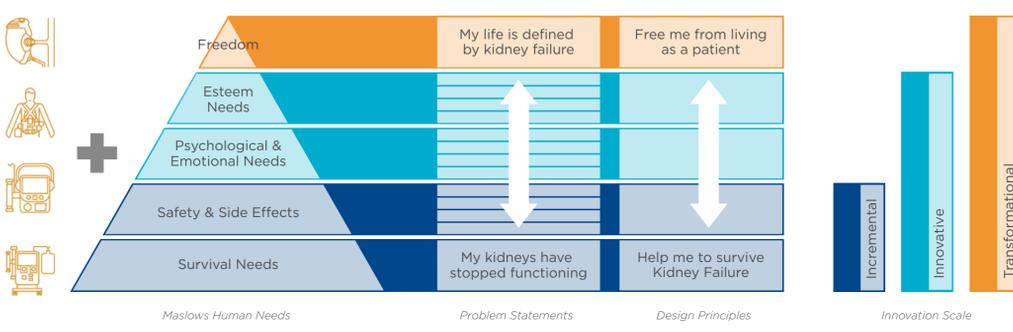
Navigating the Toolkit

Early-stage startups and pre-clinical researchers developing artificial kidneys often have difficulty capturing the problems people with kidney failure face and the context in which they live. Treating people with kidney failure as consumers can facilitate more productive conversations that glean insights into product design. This empathetic perspective reveals a broader set of problem statements that go beyond clinical benchmarks to encompass the context and aspirations of a person. Human centered design is one method of capturing that broader set of problem statements and ensuring products work for the people who need them. The Human Centered Design Toolkit for Kidney Failure was designed with artificial kidney innovators in mind to help design better artificial kidneys evaluated by how well they meet people's needs. To accomplish this, the toolkit lays out methods to generate design inputs from people's stories:

- **The Innovation Scale**, a new framework based on Maslow's Hierarchy of Needs describing the relationship between patient needs where basic needs are prerequisites for aspirational needs. It invites innovators to map their product to the scale according to the problems it solves.
- **Three fictional Ambassadors** representing the spectrum of people with kidney failure on dialysis help innovators begin to segment their market. Each ambassador lives in a different setting, faces different problems, and has different expectations for their therapy.
- **A Matrix of Design Principles**, the emotional result of solving someone's problem, and Metrics, measurable approaches that demonstrate a technology has satisfied the intent of the Design Principle, to focus on the development of a product and communicate its benefits.

These three tools will help innovators communicate the value of their product, avoid false tradeoffs between clinical outcomes and quality of life, and understand when their product is good enough. The toolkit is one part of a total product system, including reimbursement and care delivery among other factors, necessary to transform the kidney care landscape. Human centered design may be the most important part because it is intimately connected to adoption and commercialization. By centering the needs and context of people with kidney failure, the Human Centered Design Toolkit for Kidney Failure prompts innovators to focus on how their product will change someone's story.

Please note:
The materials in this toolkit are free for your use. The Ambassadors, their Problem Statements, and the associated Design Principles are backed by research interviews with people with kidney failure.



1 Innovation: Human Needs & Technology

Understanding the methodology to bridge the gap

In order to meet the urgent market demand for innovation, we must use a value proposition of innovation that goes beyond technological advancement.

We have created a new framework based on a model from psychology that has been applied in multiple areas: Maslow's Hierarchy of Needs. This is intended to help guide innovators to redefine the range of the problem space available for innovative solutions.

Maslow's Hierarchy of Needs functions like a ladder: the lower rungs are the basics of survival. Without achieving these goals, it is difficult

to focus on the next rungs above: Emotional, Psychological and Esteem Needs. People progressing through all of the rungs in our ladder will have achieved full self-actualization.

We are adapting this model to communicate a broader set of problems faced by people with kidney failure. This model acknowledges an opportunity space for innovators that includes both survival and a return to life moments that are freed from the burdens imposed by kidney failure. The higher up the ladder a kidney replacement therapy reaches, the more it delivers health and life experiences more similar to curing kidney failure.

Layered on top of this new model are targets to communicate a revised definition for scaling innovation: incremental, innovation and transformational.

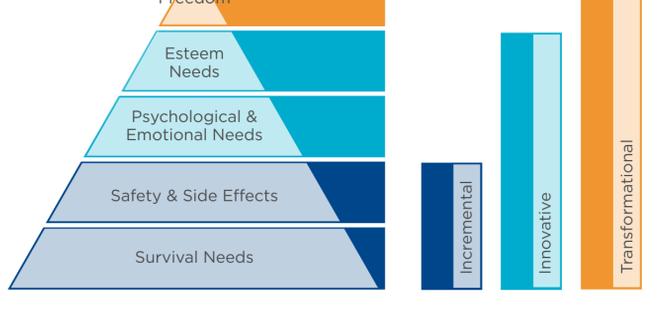
The incremental range achieves near-term improvements to healthcare experiences that have aged out of being innovations, such as conventional dialysis.

Dialysis, as a standard of care, has existed for decades with small improvements. Its primary benefit of extending life has become an expectation for any new product addressing the needs of people with kidney failure.

The "innovative" range delivers a product experience that solves the expected product benefits in the incremental range while starting to deliver solutions to unaddressed kidney failure experience opportunities. These mid range problems do not fully achieve the urgently needed freedom from the burden of kidney disease, but they are achievable within a near-term window for medical product innovation.

The transformational range establishes a "moonshot" target for the patient experience: a daily life experience which is difficult to discern from a life lived after a true cure for chronic kidney disease is achieved.

The challenge within this range is realizing the result within a meaningful timeline.



2 Ambassador Stories

Problem Statements & Design Principles

(Click on an ambassadors photo to read their story)



3 Measurement of Metrics

How you can apply metrics and design principles to your product design

What's Next

We hope this toolkit will help you build an empathetic understanding of people's lives that you can apply to product design. Your first empathy tool is an innovation scale that describes the relationship among the needs of people with kidney failure in a way that avoids tradeoffs and prioritization. Your next tool are the ambassador stories, which represent the lives of people with kidney failure on dialysis. They give a more tangible representation of the innovation scale and help you envision the context in which your product must work. The final empathy tool that ties the innovation scale and ambassadors to product development are the design principles and metrics to help you demonstrate that your product meets needs described in the ambassador's stories. Metrics function as specific calls to action that can help you measure the impact of your innovation. Review the metrics and use them to measure how much your innovation is likely to change the story for people with kidney failure. Use those design opportunities to ensure your product goals stay grounded in the way they

will change the life experience of people with kidney failure. These three tools will help you communicate with people with kidney failure as consumers. Consumers expect the products they use to meet their needs and work in their context, or they will not adopt them. This toolkit cannot replace actual engagement with the community. Instead, it is meant to help open a dialog so that the next generation of kidney replacement therapies have a deeper and more meaningful impact.

We hope this toolkit inspires you to answer the call for innovation from people with kidney failure. We are invested in supporting your efforts to address their needs. We believe this toolkit can help inspire you to identify and meet the needs of specific groups of people with kidney failure and develop technology to solve their problems. Identifying and prioritizing people's problems before designing solutions that work for those people in their context is the process at the core of human centered design.

As you take your next steps towards innovation, please reflect on the three following ways the toolkit can help you start by:

- Providing language, in the form of design principles, to describe how a product can meet the needs of people with kidney failure.
- Offering a way to avoid the false dichotomy between survival and quality of life needs by acknowledging the importance of both along a spectrum from incremental to transformational.
- Providing a basis for you to evaluate when a product, requirement, or specification is good enough by comparing it to the emotional outcome captured in a design principle, measured in by a metric, and linked back to the context captured in a patient story.

Embrace the process and prioritize the aspirations faced by a person with kidney failure. They will lead you to market disrupting solutions that bring us ever closer to restoring the whole person.

If I'm a person, don't make my life revolve around being a patient.			
Kidney Disease Limits my life, give me back options.			
Relieve my family of the burdens of being a care partner			
Kidney disease is isolating, help me be a contributing member of my community			
Managing my kidney disease shouldn't require an advanced degree			
Don't Add to My Financial Burden			
Treating my kidney disease should make me feel better not worse.			
Help me to survive kidney failure			

