



Quality Improvement | Design Thinking | Resilience | For Healthcare

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# AM-EPIC Framework



## Academic Medicine – Enhancing Performance, Improving Care (AM-EPIC)

The AM-EPIC Framework is an education and professional development framework that comprises a portfolio of programmes aimed at upskilling and uplifting the Patient Safety, Quality and Innovation capabilities of our staff.



Provides leaders with broad knowledge in systems governance, enables them to oversee effective programmes in quality & safety and align innovation & quality initiatives with academic clinical organisations' strategic initiatives.

### Leadership Programmes

Provides advanced knowledge and skills that enable Quality Professionals to lead large scale quality initiatives and facilitate the work of quality, innovation and patient safety teams.

### Train the Trainers / Masters Programmes

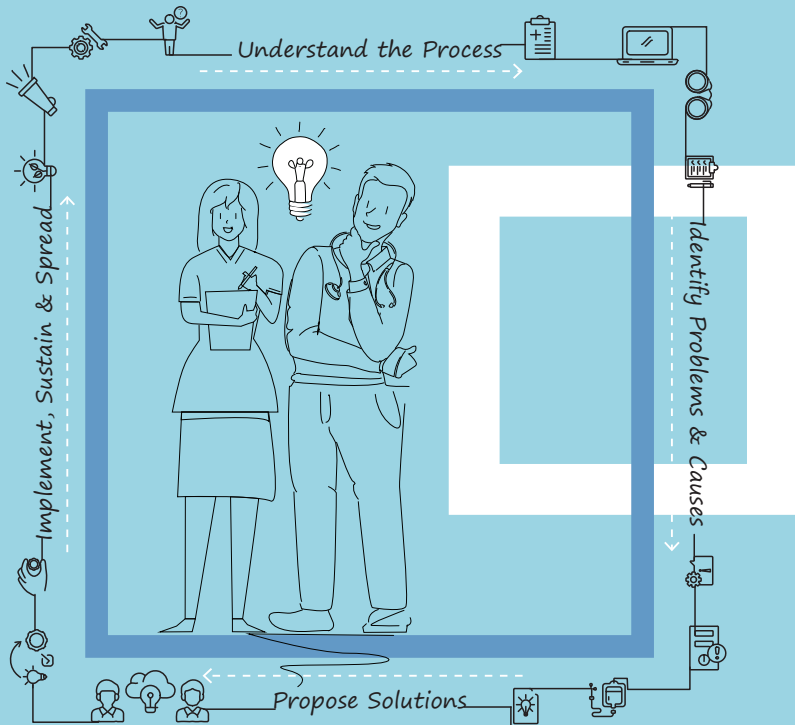
Provides quality, innovation and patient safety teams with knowledge and skills to analyse problems, develop, test and implement impactful interventions to improve care delivery systems.

### Skills & Training Programmes

Provides faculty and staff with a strong foundation in key concepts in quality and safety in healthcare.

### Foundation Programmes

Figure 1: Education and Professional Development Framework for Academic Medicine – Enhancing Performance, Improving Care (AM-EPIC)



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# Quality Improvement Toolkit

*For Healthcare*

Contributors:

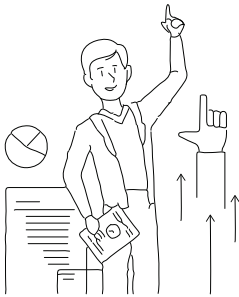
Teo Shao Chu, Seow Yee Ting & William Yap

# Quality Improvement

# 01

## Quality Improvement in Healthcare

Quality Improvement (QI) in Healthcare is a systematic approach in making processes safe, efficient, patient-centred, timely, effective and equitable.



### Six Aims for Improvement

To Improve Healthcare Quality

- Safe** Ensure no additional harm is introduced when delivering care to patients
- Timely** Reduce waiting and delays, which may cause potential harm to patients
- Equitable** Provide same quality of care regardless of patient's socioeconomic status, geographical locations, race and religion
- Efficient** Avoid non-value added activities (Wastes), maximising resources
- Effective** Provide care based on professional knowledge, which produces clear evidence-based benefits to patients
- Patient-Centred** Ensure services and care provided are based on patient's preferences and needs

Source: *Crossing The Quality Chasm: A New Health System for the 21st Century*, IOM, 2001

# Getting Ready

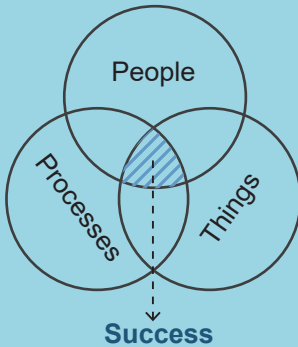
## 03

### Before you start

#### Understand System

System consists of People, Things and Processes. These are interdependent elements that influence one another directly and/or indirectly to maintain their activities and the existence of the system, in order to achieve the goal of the system. Appreciating system and its elements allows us to tap on this knowledge to make changes that will result in improvement.

System



#### Identify Problem Worth Solving

- A systemic problem that is inherent, affecting stakeholders involved in the process
- Use baseline data to identify your problem
- Examples of problem worth solving: long waiting time, increase in number of complaints

# A Systematic Approach to Quality Improvement

## 04

### Quality Improvement step-by-step approach

#### A. Understand the process

- Form a team and identify mission statement
- Map out the process flow
- Collect baseline data

#### B. Identify problems and causes

- Identify problems, drill down to the root causes
- Prioritise root causes to focus on

#### C. Propose solutions

- Focus on process streamlining without compromising patient safety and quality of care using relevant QI tools

#### D. Implement, sustain and spread

- Change management
- Implement, monitor and refine
- Sustain and spread improvement efforts
- Celebrate success

### 3 Basic Questions to Drive Quality Improvement

#### Goal

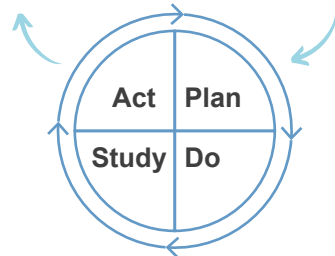
What are we trying to accomplish?

#### Measurement

How will we know that a change is an improvement?

#### Intervention

What change can we make that will result in improvement?



Source: Model for Improvement - Institute for Healthcare Improvement (IHI)

# 05

## Form the team

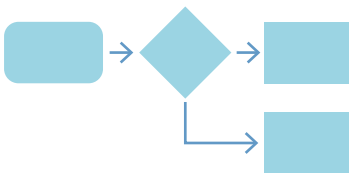
- Involve the process owner and stakeholders
- Ensure the team consists of members from multi-disciplines to avoid biased viewpoints of the problem
- Define roles and responsibilities

## Construct Mission Statement

- State the project goal clearly with a measurable outcome
- Use numerical value to set stretch goal
- State the timeline to achieve the goal
- Do not work backwards from a solution

## Phase 1 : Understand the Process

### Flow Chart



## Map Process Flow

- Create a common understanding of the process in a visual manner
- Clarify steps in the process
- Identify improvement opportunities in the process (error-prone areas, inefficiencies, bottlenecks, etc.)



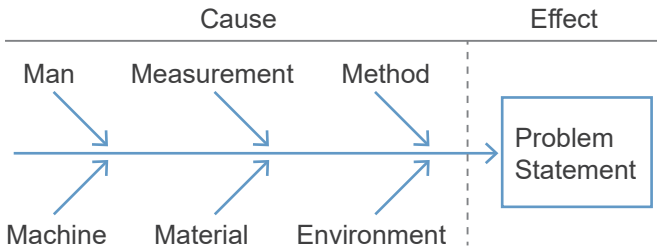
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## Phase 2 : Identify Problems and Causes

### Identify Root Causes

- To drill down to the underlying root causes of the problem to ultimately resolve the issues

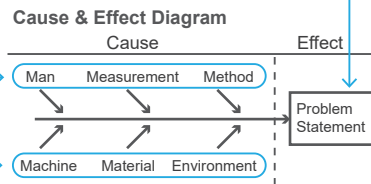
#### Cause & Effect Diagram Also known as Ishikawa diagram



#### To construct a Cause and Effect Diagram (refer to above template)

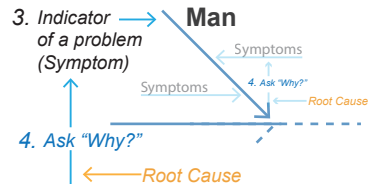
1. Write the problem statement in a box on the right hand side
2. List down the generic categories

*Note: You can refer to some of the commonly used categories in the above template. However, this is not an exhaustive list. Please ensure the categories are relevant to your problem statement.*



3. Arrange the symptoms in their appropriate categories
4. Ask "why" repeatedly to identify root cause to each symptom

*Note: You can stop asking "why" when you have drilled down to the systemic cause (e.g. there is no policy to standardise the process).*

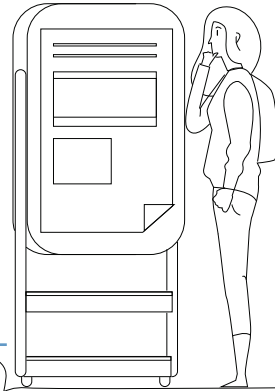


## Phase 2 : Identify Problems and Causes

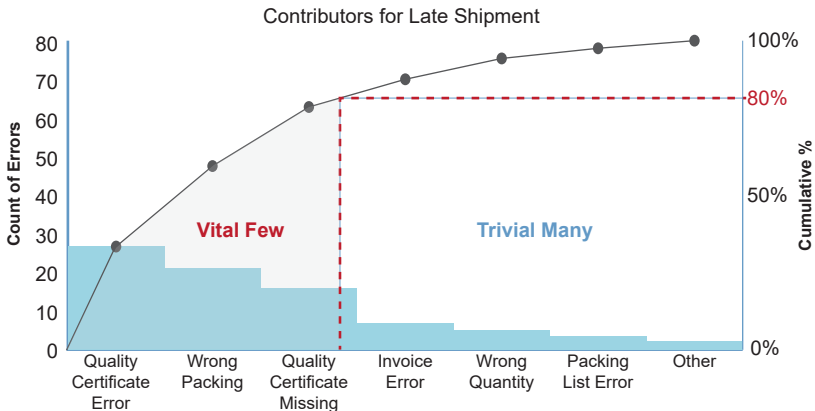
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### Prioritise Root Causes

- Useful to prioritise root causes to work on when there are limited resources
- The Pareto Principle states that 80% of the problems are caused by 20% of the causes
- Using the Pareto Principle, the Pareto Chart helps to prioritise the root causes to focus on (To make improvements to the 'Vital Few')



### Pareto Chart



# 08 Phase 2 : Identify Problems and Causes

## Look Out for Wastes

- Identify and eliminate wastes in your process to maximise resources
- Wastes are process steps that require resources but customer is not willing to pay for

### 8 Wastes: DOWNTIME (Acronym)

#### Waste

#### Description

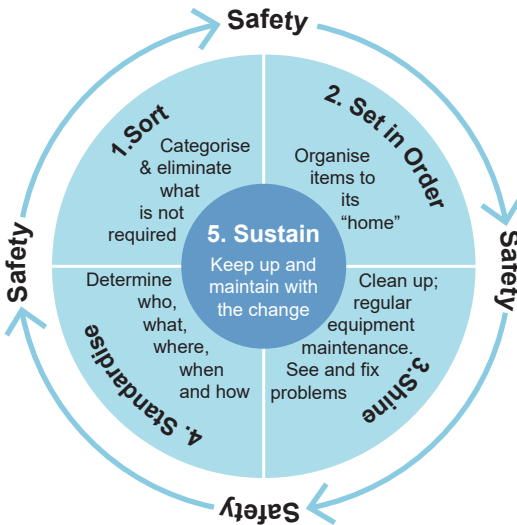
Waste	Description
<b>D</b> efects	Errors compromising safety, quality and time, often causing rework
<b>O</b> verproduction	Produce more than required or faster than the demand
<b>W</b> aiting	Time spent on non-value added activities in the process
<b>N</b> on-utilised Talent	Not utilising or underutilising staff's potential, skillset and knowledge
<b>T</b> ransportation	Unnecessary movement of items
<b>I</b> nventory	Accumulation of work in progress
<b>M</b> otion	Unnecessary movement of people
<b>E</b> xtra-processing	Excessively processing things, requiring more work or higher quality which is not required by the customer

## Brainstorm for Solutions

- Use idea generation techniques to trigger new ways of thinking

09

## Phase 3 : Propose Solutions

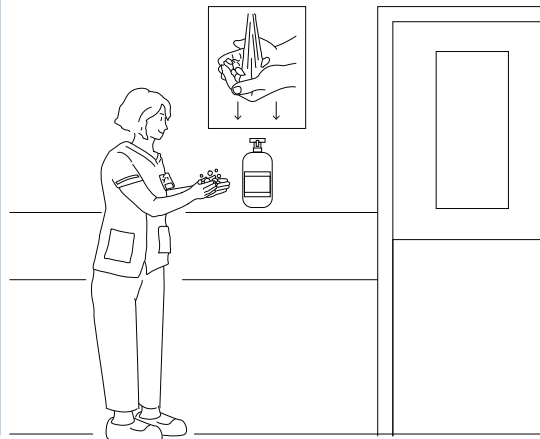


### 5S + Safety

- A waste-eliminating tool to improve workplace safety and organisation

## Visual Management

- Use visual management tool to create a visual workplace where anyone who walks into the work area could understand the current situation immediately without having to check with anyone or against anything
- Example: directional signage, hand hygiene poster as a reminder on the moments of hand hygiene



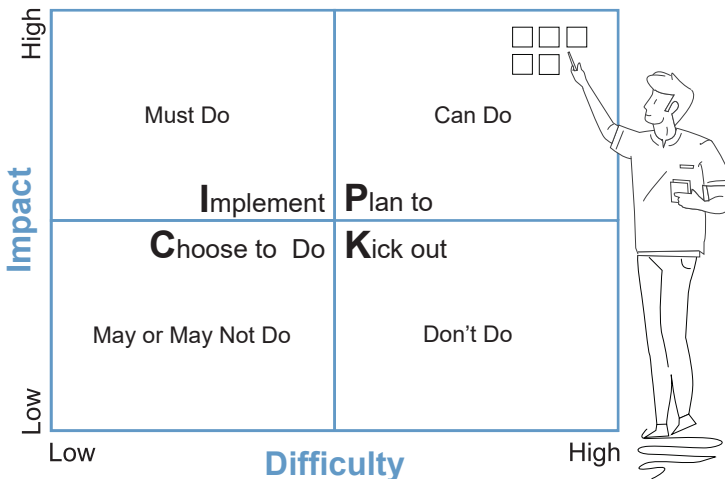
# 10

## Phase 3 : Propose Solutions

### Prioritise Ideas Generated

- A 2x2 matrix to guide the project team in prioritising the ideas
- Write the ideas generated into the respective quadrant based on the level of impact on the goal and difficulty of the tasks
- Useful for focusing discussion & achieving consensus

### PICK Chart





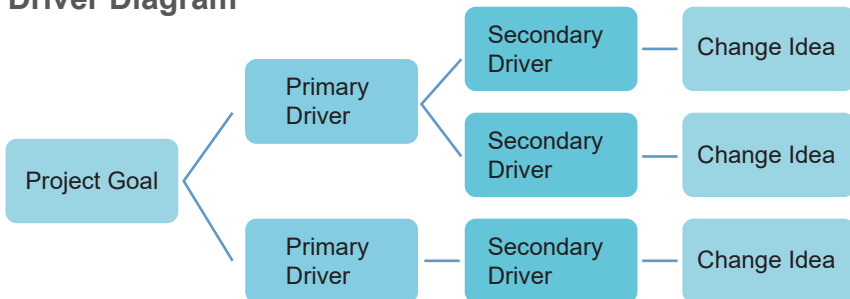
# 11

## Phase 3 : Propose Solutions

### Communicate to Stakeholders

Illustrate how the factors and ideas lead to the achievement of the goal

#### Driver Diagram



- Primary drivers focus on the key areas and influences that need to change to achieve the project goal
- Secondary drivers break primary areas down into sub-sections or processes
- Change ideas are specific ideas that the team can test and see if they influence the secondary drivers and ultimately the goal

# 12

## Phase 3 : Propose Solutions

### Test Solutions

#### 4 Stages of the PDSA

- **PLAN** what you are going to do with the ideas, how to complete the test, who, when and where to do it
- **DO** it, preferably on a small scale first
- **STUDY** the results (Does the plan work?)
- **ACT** on the results. If the plan was successful, test on a bigger scale and eventually standardise on this new way of working. If it does not work, conduct another PDSA cycle on another idea

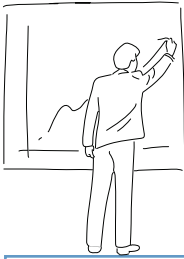


Plan,  
Do,  
Study,  
Act  
(PDSA)

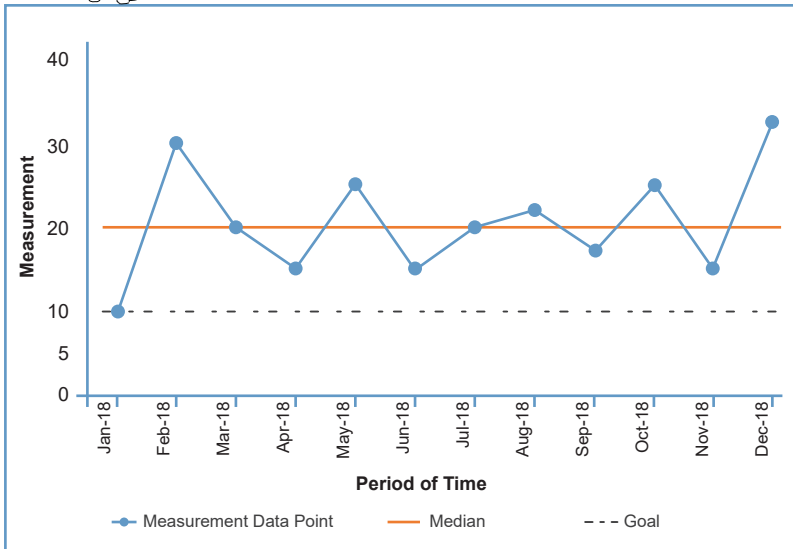


# 13

## Phase 4 : Implement, Sustain and Spread Run Chart



- A graph that displays data over time. It allows the team to verify if the changes result in real improvement by observing the pattern displayed in the data collected
- Annotate interventions / PDSAs on the run chart
- Add median line on the run chart
- Freeze baseline data as median if there are at least 12 data points





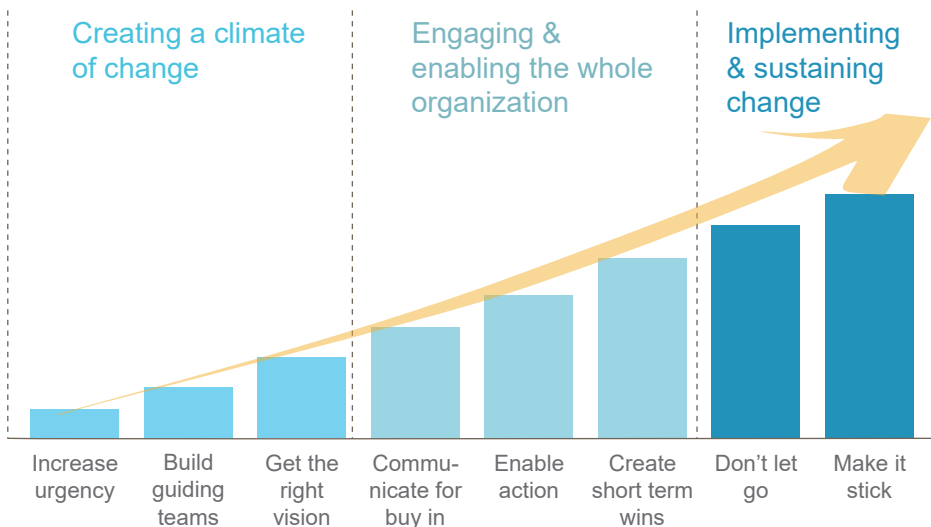
## Phase 4 : Implement, Sustain and Spread

### Change Management Concept:

8 sequential steps aimed at thoroughly preparing the organisation for change and implementing it successfully



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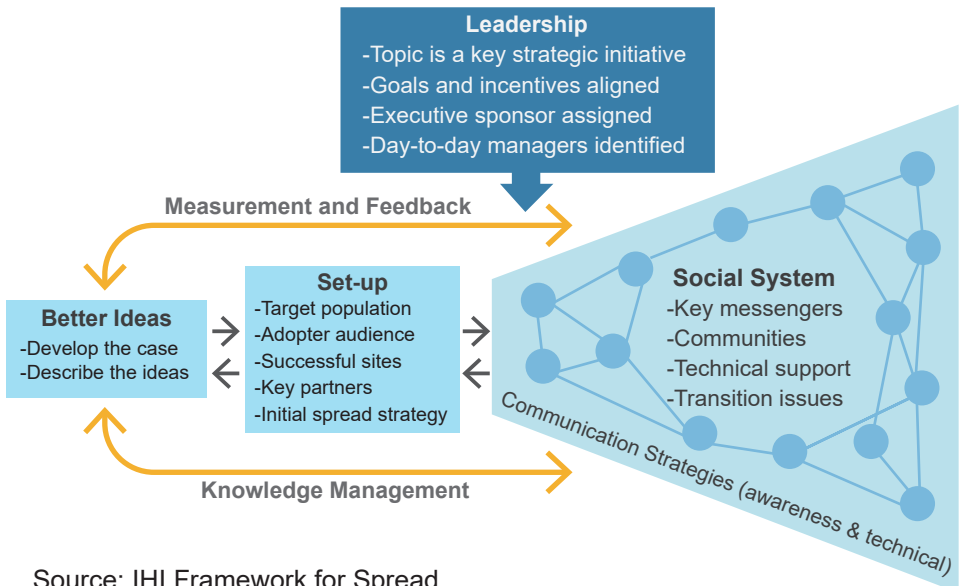
Source: Kotter's 8-step change model

# 15

## Phase 4 : Implement, Sustain and Spread

### Sustain Improvement & Spread Change

- Standardise and document best practices and knowledge
- Require measurement, continuous monitoring and ongoing communication with stakeholders
- Change must be easy to understand and implement
- Ensure current and new staff are aware and comply with the new practices.



Source: IHI Framework for Spread

## Showcase Quality Improvements

- Showcase successful projects internally, locally or internationally

Examples: SingHealth Duke-NUS Quality & Innovation Day, Singapore Healthcare Management Congress, Patient Safety Summit, IHI Congress, etc.

- Establish new network
- Share and learn best practices from participating healthcare organisations and professionals

## Sources

- Langley GL, Moen R, Nolan KM, Nolan TW, Norman CL, Provost LP(2009) The Improvement Guide: A Practical Approach to Enhancing Organisational Performance (2nd Edition). San Francisco: Jossey-Bass
- Massoud MR, Nielsen GA, Nolan K, Nolan T, Schall MW, Sevin C. A Framework for Spread: From Local Improvements to System-Wide Change. IHI Innovation Series white paper. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2006. (Available on [www.IHI.org](http://www.IHI.org))
- The Health Foundation 2013, Quality improvement made simple (2nd Edition), The United Kingdom. (Available on [www.health.org.uk](http://www.health.org.uk))
- Institute for Healthcare Improvement 2017, QI Essentials Toolkit: Driver Diagram, United States. (Available on [www.IHI.org](http://www.IHI.org))





# Design Thinking Toolkit

*For Healthcare*

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# Design Thinking

## 01

### Design Thinking in Healthcare

Design thinking is a human-centered approach that prioritises developing empathy for users when gaining insights, exploring ideas and testing prototypes to improve healthcare system and experience.

Design thinking integrates various improvement methodologies where we see a combination of system-based and empathy-based approach in healthcare improvement. In fact, Design Thinking and Quality Improvement methodologies can work hand in hand to complement each other.

#### **Benefits of Applying Design Thinking in Healthcare?**

- Supports shift from volume to value based care
- Encourages creativity when exploring ideas
- Allows for prototyping where valuable feedback can be gathered, and mistakes can be made. It lets you experiment and take risks that you would otherwise avoid when the cost of failure is too high

# Getting Ready

## 02

### Basic Principles of Design Thinking

Get to know your users and the context so that it can help you understand the perspectives of the people you are designing for.

#### **(Re)Frame**

By looking at things differently, you can develop products and services that are meaningful to all users.

#### **Collaborate**

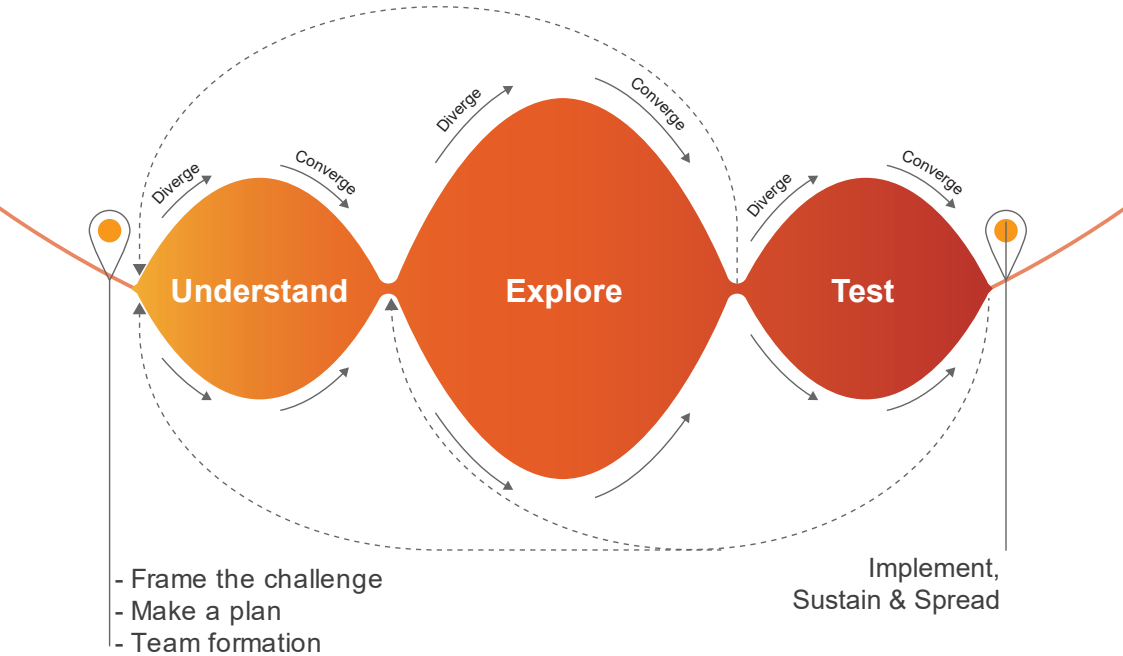
Collaborate and leverage on each other's strengths.

#### **Embrace Experimentation**

Stay curious. Do not fall in love with your first idea. Experiment, test, try and learn from experience.

# 03

## An Overview of Design Thinking Methodology



### Overview of tools used in each phase:

#### Understand



- Stakeholder mapping
- Secondary research
- Empathy interviews
- User observations
- Context immersion
- Make sense of data
- Identify opportunities
- Craft "How Might We" statements

#### Explore

- Brain writing + Round robin
- Analogies
- Trigger cards
- Idea selection



#### Test

- Prototyping
- Test & learn
- Iterate & refine

# 04

## Three Phases of Design Thinking

### Understand

This first phase lays the foundation for innovation. It frames your challenge statement, conducts user research to understand a particular healthcare experience, and how people feel about it.

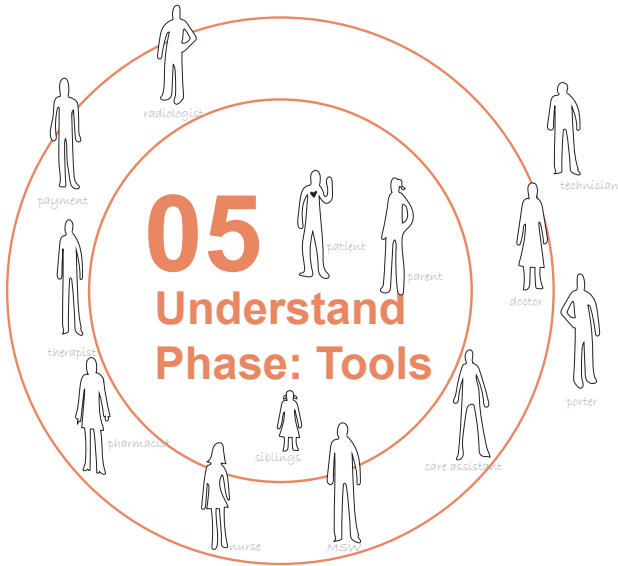
### Test

This phase allows your ideas to be enriched and refined for development towards implementation through iterative testing with stakeholders. Building prototypes allows you to elicit feedback in the context of use and also help you understand what works and what can be improved. With these information, you can assess the value, impact and potential implementation plan for your ideas.

### Explore

In this phase, you will translate your insights into ideas for new products, services, processes and spaces. Exploring concepts visually, through sketching and storytelling, is a tangible way to develop ideas towards testing.





## 1. Stakeholder Mapping

Stakeholder maps are used to document key stakeholders and their relationships involved within the problem statement. Mapping all of the different people that surround the patient can reveal important relationships and social dynamics that can influence people's experiences of care.

**HOW:** Discuss and identify a list of social relationships within a user group and map the network of their interactions.

## 2. Secondary Research (Desk Research)

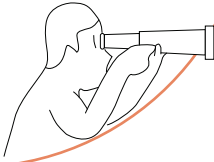
Secondary research will help you build your base of knowledge and complements the information from empathy interviews and other qualitative research methods to help you gain a better understanding of the situation.

**HOW:** Review published articles and other relevant documents to develop an informed point of view on the challenge statement.



# 06

## Understand Phase: Tools



### 3. User Observation

Observing what people do and how they interact with their environment gives you clues about what they think, feel and why they act the way they do. It also helps you learn about what they need. By observing people, you can capture physical manifestation of their experiences – what they do and say.

**HOW:** Observe and record behavior within its context, without interfering with people's activities. Use the **POEMS** observation framework to guide and provide a structure to your research during user observations.

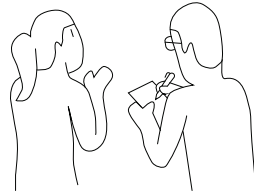
**POEMS** stands for:

- P** - People
- O** - Objects
- E** - Environments
- M** - Messages
- S** - Services

If possible, take photos. A photo tells a thousand words.

# 07

## Understand Phase: Tools



### 4. Empathy Interviews

Begin by understanding the hopes, motivations and needs of users by interviewing them.

**HOW:** Conduct the interviews in the interviewees' point of view. During these interviews:

- **Probe** to uncover the truths behind their stories
- **Observe** their non-verbal cues, as well as pick out observations of their natural setting
- **Record** all interview data for analysis (word for word)

# 08

## Understand Phase: Tools

### 5. Context Immersion

There is no better way to understand the people you are designing for than to immerse yourself into their lives and communities.

**HOW:** Identify stakeholders involved in the challenge statement and enact the activities within a real or imagined context to trigger empathy for actual users and raise other relevant issues.

### 6. Craft “How Might We....?” Statements

“How Might We” (HMW) is a process to reframe challenge statement into actionable problem statements. HMW defines the design intents and will be used as a basis for the Explore phase.

**HOW:** Discuss and define the users, their needs that will be the subject of the project and the insights that will be the basis for brainstorming in the Explore phase.

**Who** does **What** because of **Why?**  
(User)    (Action/Problem)    (Insights)

# 09

## Explore Phase: Tools



Set the stage for a successful brainstorming session by sharing these rules with the team.

### Rules for Brainstorming

1. Defer judgement
2. Encourage wild ideas
3. Go for quantity, not quality
4. Build on the ideas of others
5. Stay focused on topic
6. Be visual



# 10

## Explore Phase: Tools

### Brain-writing + Round robin

Brain-writing is recommended as a first tool to start off ideation session. It equalises the contribution of the resource group and allows for more introverted people to communicate their ideas. Round robin allows participants to build on each other's ideas.

### Analogies

Useful to help one move away from the obvious and encourage out-of-the box thinking.

### Trigger Cards

Provide diverse thought-provoking stimuli with the intention to act as trigger for discussion, further research and reflection for the future.

# 11

## Explore Phase: Tools



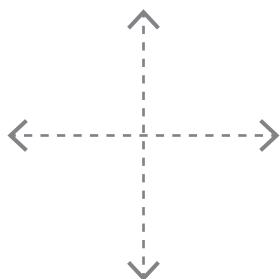
### Idea Selection

This is a necessary convergence step once you have generated a volume of potential ideas. The idea selection process uses either the Venn diagram or 2 x 2 Matrix as a decision tool to evaluate, shortlist and prioritise ideas.

### 2x2 Evaluation Matrix

The 2x2 Evaluation Matrix creates a systematic way to analyse multiple solutions and helps build consensus within the team to select and evaluate a variety of promising solutions against selected criteria.

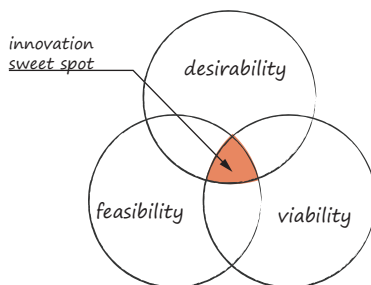
**How:** Define criterion for each axis that the team has agreed to use to evaluate the generated concepts.



### Venn Diagram

A Venn diagram allows the team to visualise how different parameters share overlapping impacts.

**How:** Define at least two criteria for each of the domains that the team agreed to use for evaluating the generated concepts.



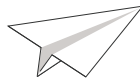
# 12 Test Phase: Tools

## Why test with users ?

Testing with users is a fundamental part of a human-centered design approach. You test with users to refine your solution and also to refine your understanding of the people for whom you are designing for.

### Objectives of Testing:

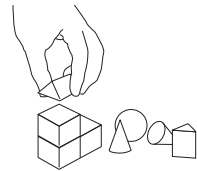
- Communicate idea (Visualise and contextualise)
- Gather feedback
- Fail cheaply and learn quickly



### Paper Prototyping

Paper prototyping is a quick and cheap way of gaining insights and inform decision-making without the need for costly investment. It is a good way to quickly organise, articulate, and visualise interaction design concepts.

**HOW:** Using any materials available, rapidly sketch and assemble possible forms or interaction for evaluation.



### 3D Prototype

3D prototypes allow user to interact more effectively than a sketch and will lead to more useful insights gathered during testing.

**HOW:** Depending on the level of fidelity, team may need to outsource to external prototyping services.



# 13

## Test Phase: Tools



### Storyboarding

Storyboarding is a series of drawings or pictures put together in a narrative sequence. It shows the interactions between user and the design at every touchpoint.

**HOW:** Illustrate a user-centered story line describing different contexts when the product or service is used.

### Role-playing

Role-playing helps teams to imagine and explore new ideas or communicate design intentions, which allows users to understand other points of views. It allows user to explore pain points and potential user scenarios.

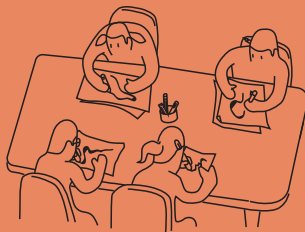
**HOW:** Using any materials available, rapidly sketch and assemble possible forms or interaction for evaluation.

# Design Thinking Collaboration

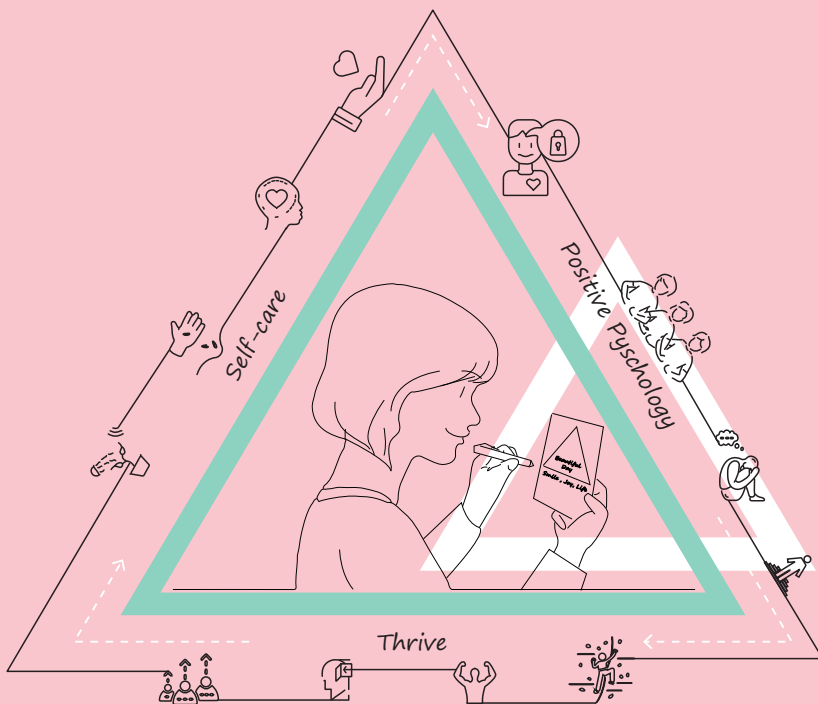
The IPSQ Design Team provides project consultation and facilitation to enhance patient safety.

## **Our expertise are:**

- Project Consultation & Facilitation
- Product Design
- UI/UX Design
- Systems/ Service Design
- Spatial Proposal



Please email [ipsq@singhealth.com.sg](mailto:ipsq@singhealth.com.sg) for more information



# Resilience Toolkit

*For Healthcare*

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# Build Your Resilience

01

## 3 Good Things Cultivate Positive Emotions

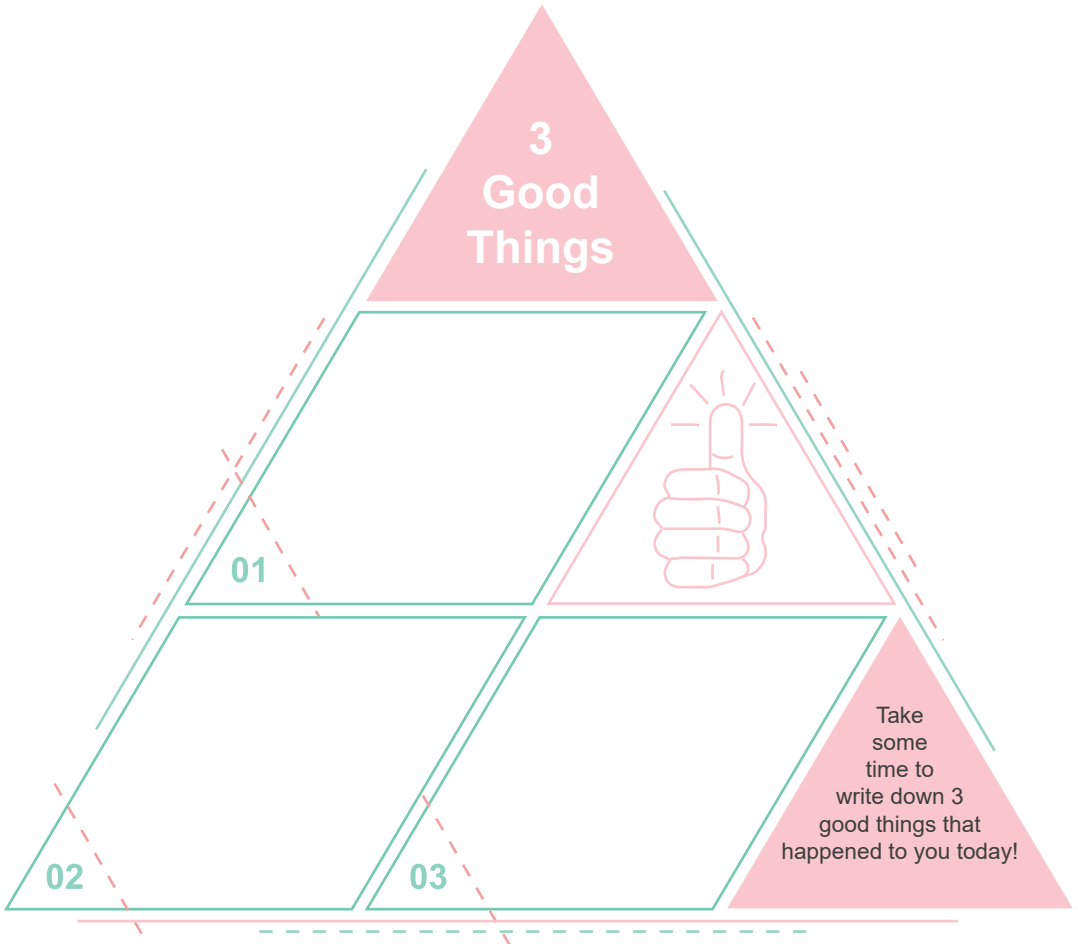
Humans are naturally hard-wired in remembering the negative aspects of our day, but flipping around this inclination can be simple.

Promoting positive thoughts and building resilience can be as easy as taking notes each night before bed. Think of three things that happened during the day that went well and your role in the positive outcome, then jot them down.

The key is to savour those positive emotions to train your brain to remember good things.

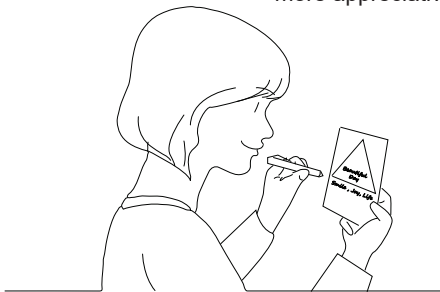
Source: Dr Bryan Sexton, Associate Professor in Psychiatry and Behavioral Sciences at Duke's School of Medicine and an expert in the field of resilience.





Each day for at least one week, write down three things that went well for you today.

It is important to create a physical record of the good things that happened. By taking time to notice the good things around us, we will be more appreciative and grateful in our lives.



"There is always a rainbow after every storm."

For softcopy of this graphic, scan the QR code here





02



## Gratitude Letter

**Be Genuine, Kind,  
and Appreciative**

Showing Gratitude is the ability to be thankful, appreciative and kind. Gratitude can be cultivated with simple tools.

Think of someone who has done something amazing for you, or contributed to your well-being in any way; this person can be alive or no longer with you.

Spend the next few minutes to write a brief note, telling this person what they did, how it impacted you and what this says about them.

Source: Dr Bryan Sexton, Associate Professor in Psychiatry and Behavioral Sciences at Duke's School of Medicine and an expert in the field of resilience.



[Bit.ly/grattool](https://bit.ly/grattool)

03

## 1 Good Chat

### Cultivate Relationship Resilience

Positive and strong social relationships enhance emotional well-being. You can start building and improving social connection through good chats.

As you start noticing the good chats you have with others, you will notice and appreciate what makes it good. It enhances your ability to notice small moments of connection with people, even those you do not know well.

Take a moment to reflect on a conversation over the past 24 hours that made you feel relatively warm and uplifted. The nature and duration of the conversation do not matter; it can be with your loved one, co-worker or even a stranger. The point is that it left you feeling more replenished and not drained.



Source: Dr Bryan Sexton, Associate Professor in Psychiatry and Behavioral Sciences at Duke's School of Medicine and an expert in the field of resilience.



[Bit.ly/1goodchat](https://bit.ly/1goodchat)

# Quality Improvement & Design Thinking Methodology

## Quality Improvement

### Understand

Form Team  
Construct Mission Statement  
Map Process Flow

### Identify Problems & Causes

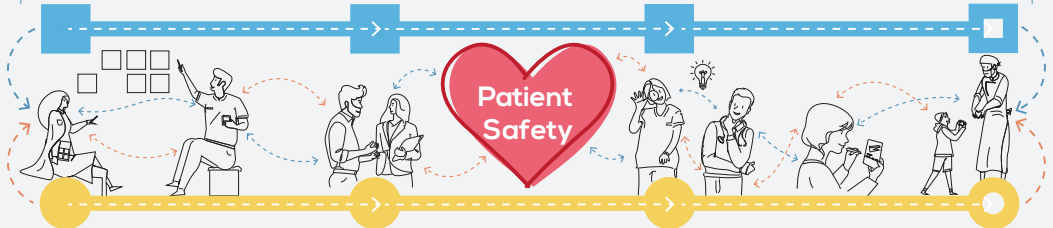
Identify & Prioritise Root Causes  
Identifying Wastes of the Process

### Propose Solution

Brainstorm  
5S + Safety  
Visual Management  
PICK Chart  
Communicate to Stakeholders  
PDSA

### Implement, Sustain & Spread

Implement  
Run Chart  
Change Management  
Sustain & Spread



### Understand

Stakeholder Mapping  
Secondary Research  
Empathy Interviews  
User Observations  
Context Immersion  
Make Sense of Data  
Identify Opportunities  
Craft "HMW" Statements

### Explore

Brain-Writing & Round Robins  
Analogies  
Trigger Cards  
Ideas Selection

### Test

Prototyping  
Test & Learn  
Refine & Iterate

### Implement, Sustain & Spread

Implement  
Sustain & Spread

## Design Thinking



**In your Patient Safety and Quality  
Improvement journey,  
please contact your institution  
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