

the human reality...

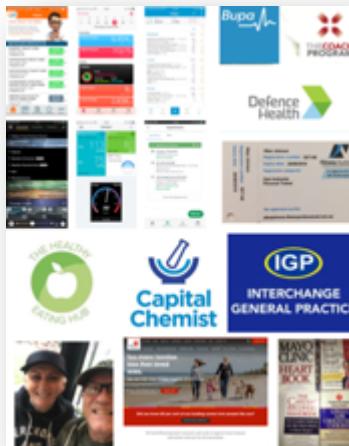
Abandoned by Government eHealth — Heart Patient Turns to Apple

By Allan Johnson and Marie Johnson

 Centre for Digital Business [Follow](#)



4 to 5 hours per day managing health



- Managing medications
- Meal planning and recording
- Exercise planning
- Performance recording
- Booking & attending appointments
- Reading – keeping up to date
- Meditating...

Apple health care ecosystem...

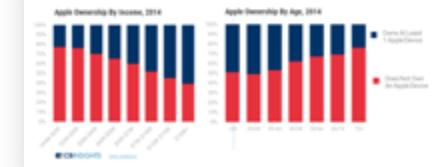
The Apple Watch is Apple's definitive jump into making its own medical devices



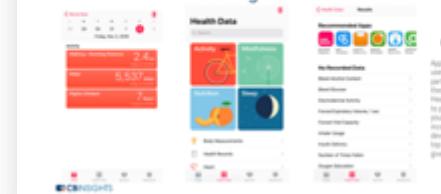
Apple has direct reach to a large customer base



Healthcare can help Apple increase penetration of its devices into new demographics



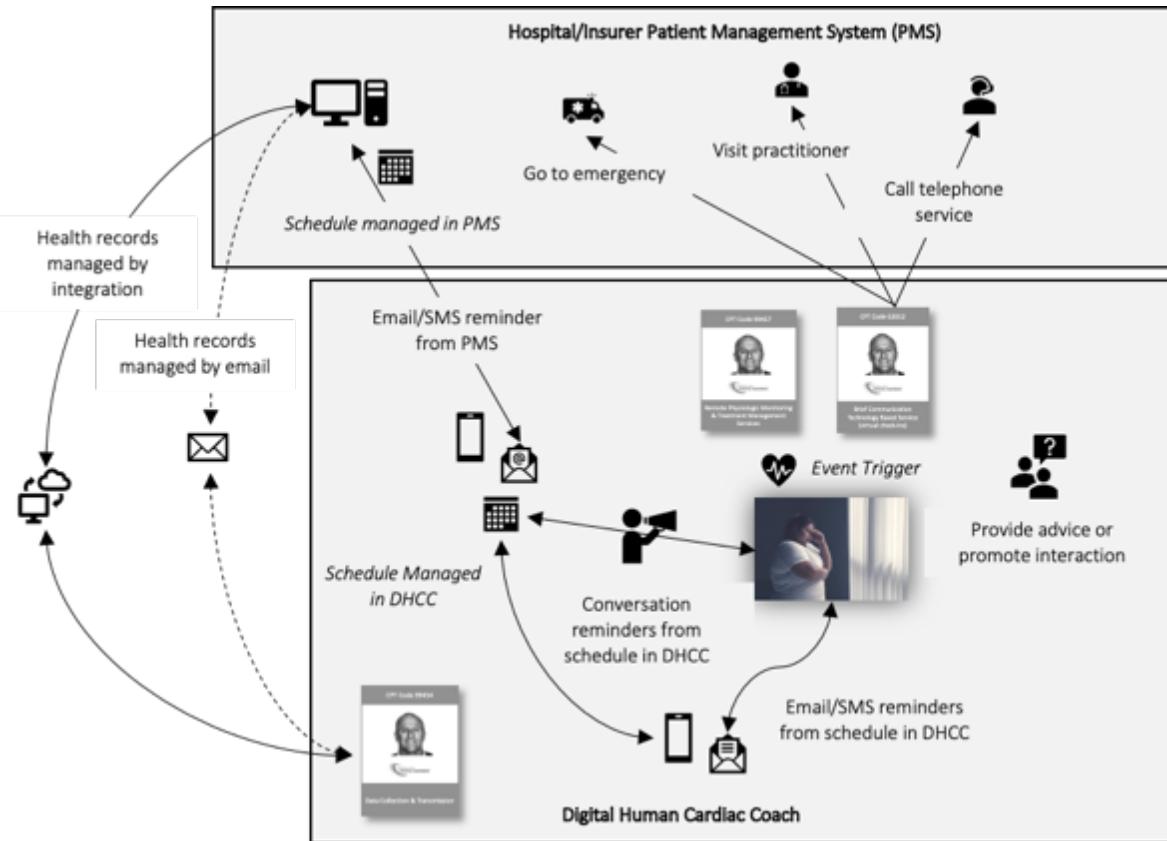
Apple combines wellness and health to make healthcare a more regular habit + check-in



...still requires literacy, resources, skill...

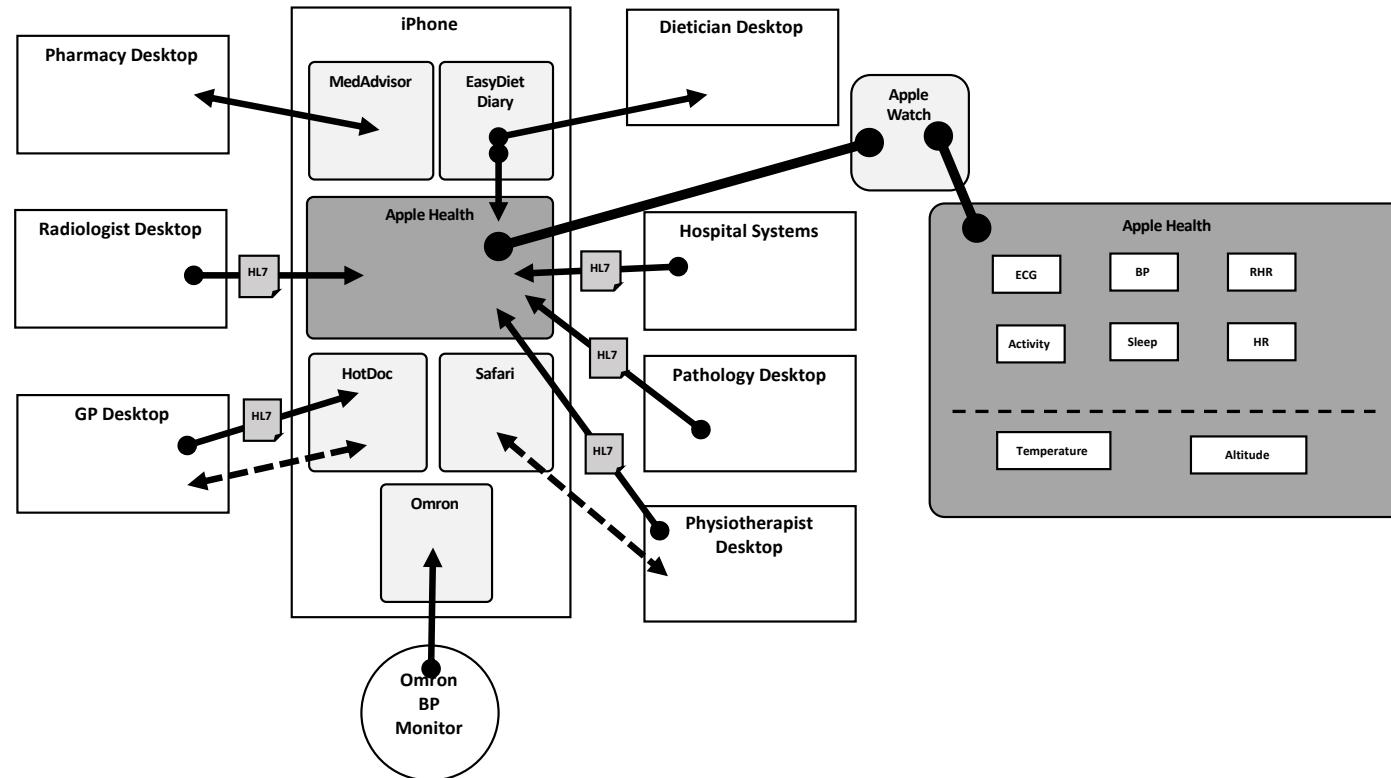
DHCC design mapping to new CMS codes...

...and telehealth ecosystem and processes



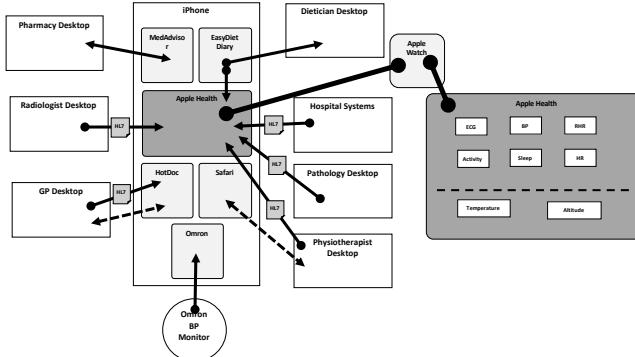
using the Apple health ecosystem as a "one stop shop" in telehealth...

...for screen capture of data such as BP, RHR, sleep

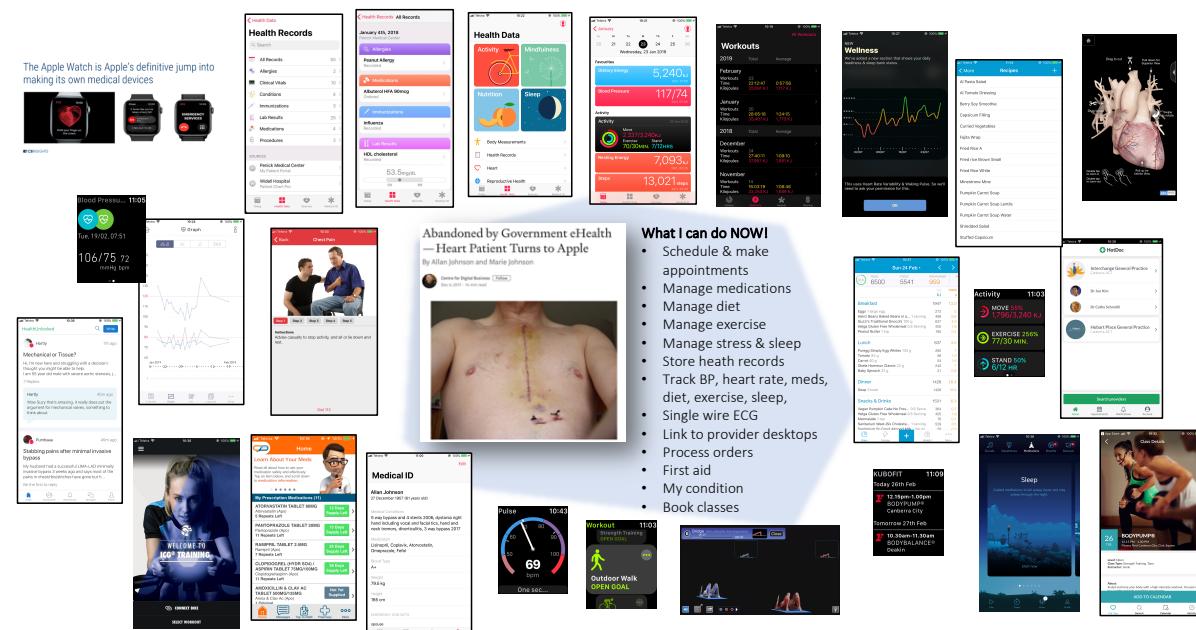


using the Apple health ecosystem as a “one stop shop” in telehealth...

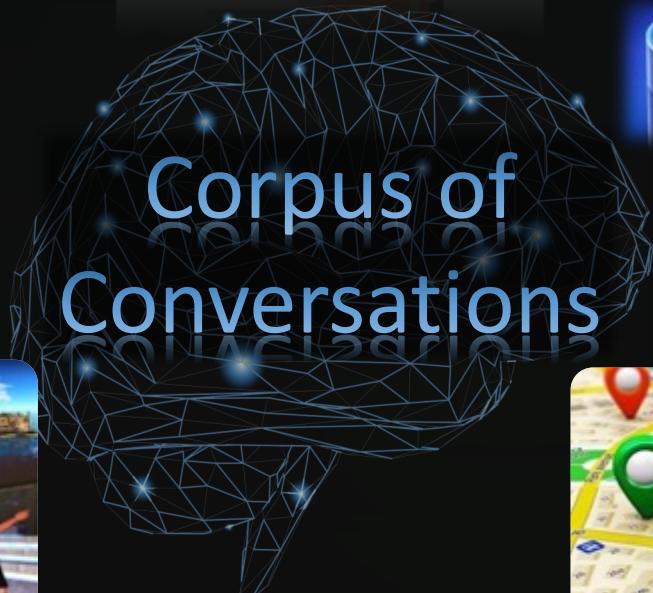
...for screen capture of data such as BP, RHR, sleep



- Some device apps (e.g. Omron Wireless BP Monitor) integrate with Apple Health so daily data, monthly data, trends etc. can be screen captured there along with diet, sleep, RHR etc. This would reduce the onboarding effort and complexity for patients.
 - Some apps also connect with practitioner desktops. For example, Easy Diet Diary (Australia only) integrates to dietitian desktops.
 - Ultimately DHCC would need to choose between integration with multiple apps or integration with just the Apple Health Ecosystem. Given the Apple Health ecosystem and app also supports HL7 ERM for health records and is rolling out ECG on Apple Watches the future direction is probably pretty clear.

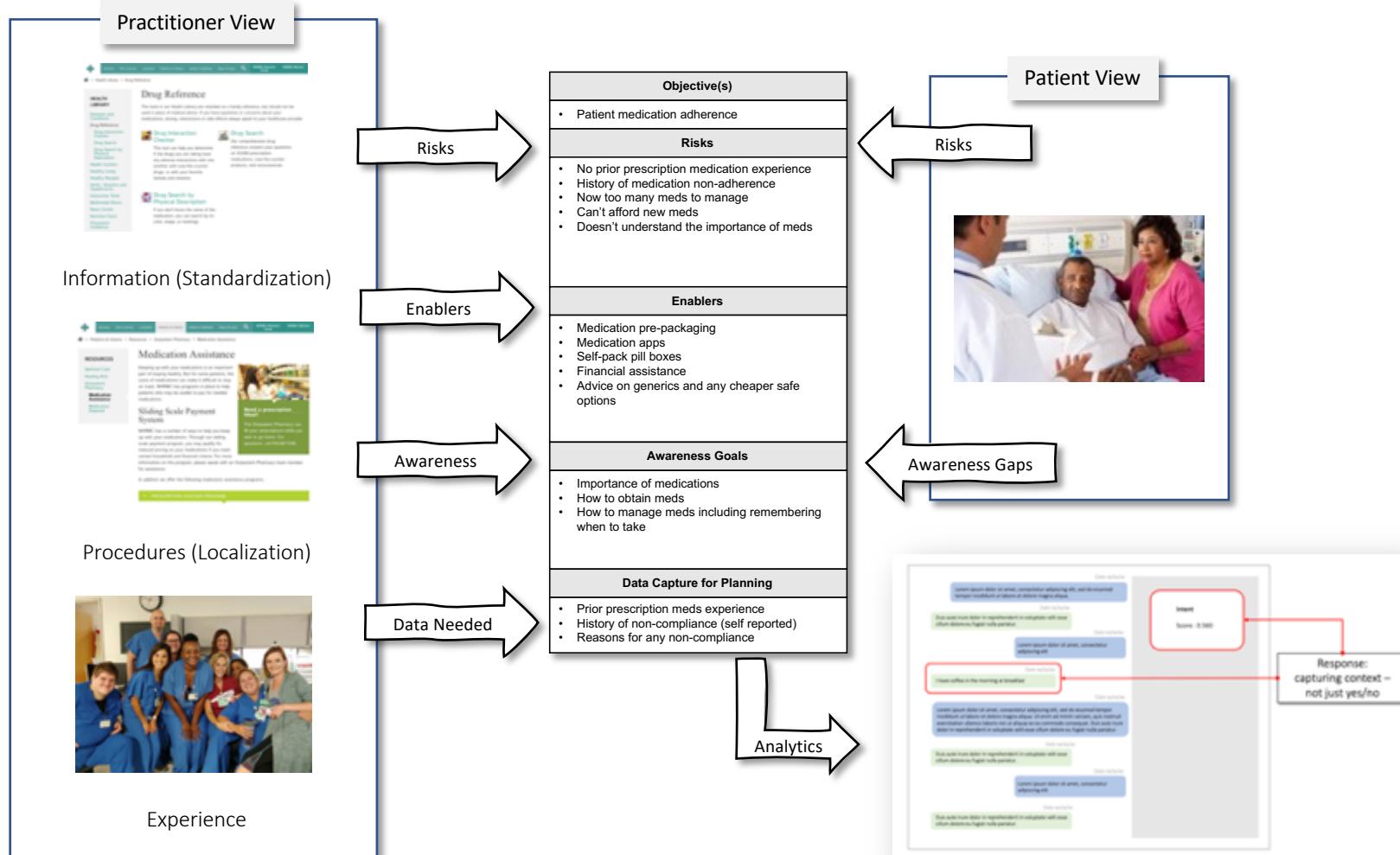


conversations through ecosystems

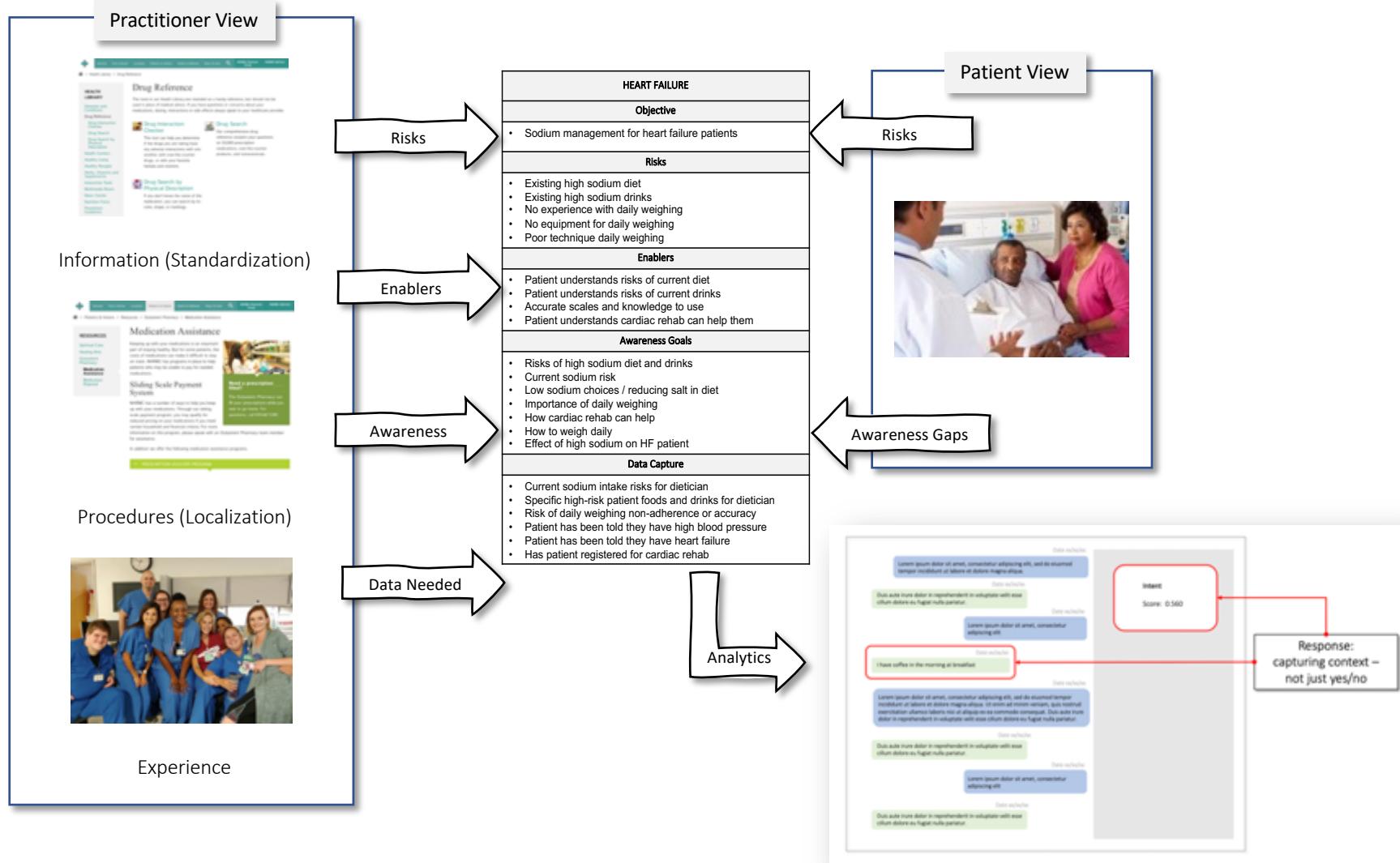


overview of pathway to digital human conversations
includes explanation of worksheet templates

co-design | combining the patient and practitioner views



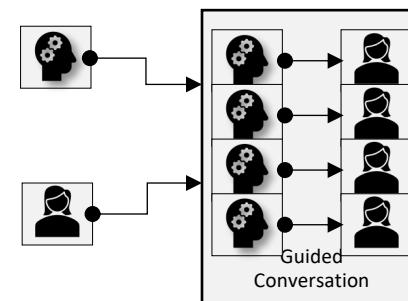
co-design | combining the patient and practitioner views



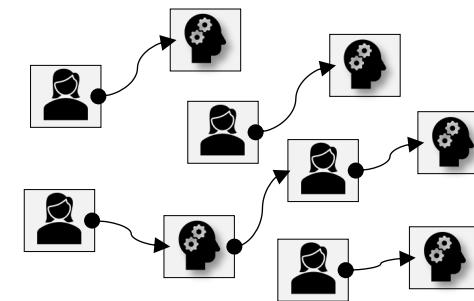
overview: the practitioner and patient views are converted into guided conversations and Q&A

difference between “guided conversation” and “Q&A”

Primary Prevention	Hospital / Surgery	Recovery and Rehabilitation	Beyond Rehab – Secondary Prevention
 Guided Conversation Focus			 Q&A Focus
Primarily DHCC led guided conversations			Primarily patient led Q&A
Supports recovery & rehab through 90 – 120 days			Supports whole of life secondary prevention
Emphasis on therapeutic (food as medicine etc.)			Emphasis on lifestyle
Inpatient, outpatient and early at home			The at-home patient experience
Analysis risk reduction & adherence focused			Analysis research focused on patient experience
Higher regulatory / privacy impact (FDA/HIPAA)			Low regulatory / privacy impact (TGA)
Qualitative benefit is patient health			Qualitative benefit is patient quality of life
Quantitative benefits are reduced ACA penalties & litigation costs			Quantitative benefit is reduced repeat CABG
Full transcript recorded and reviewed by hospital staff			Default AI recording – used for design only

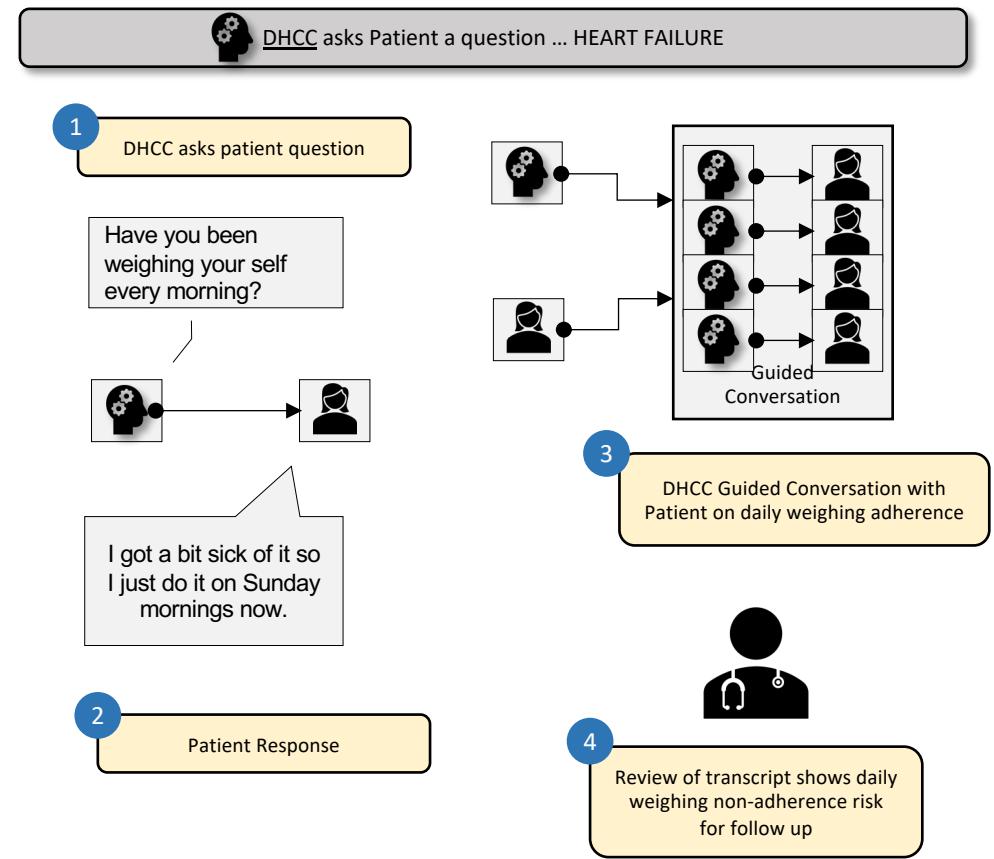
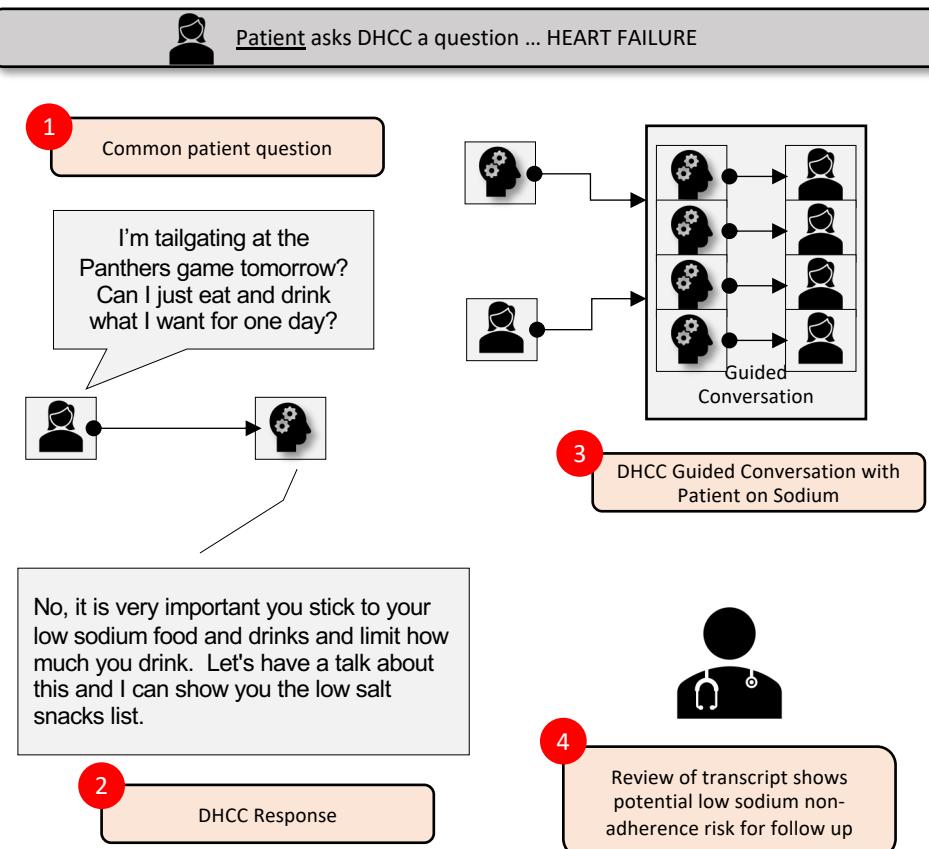


Active Conversation – All Necessary Information Communicated



Passive Conversation – Info Only Communicated If Asked For by Patient

overview: Q&A after leaving hospital can trigger guided conversations / clinician support



These interactions can now be codesigned to reflect practitioner and patient views and localization

example worksheet 1: listing and prioritizing DHCC guided conversations for roadmap

(Note: see attached Word document which is the actual worksheet template)

1

Conversation	Explanation	Setting	Patient/Carer	Owner	Priority		
					Health/Safety	Staff Workload	Litigation Costs
Home safety	Stairs to home, in home, caregiver at home to cook, clean etc.	Inpatient		Rehab	High	Medium	Low
Travel (early weeks)	Travel home from hospital, to appointments etc.	Inpatient		Rehab			
Medications	Factors affecting adherence including supply, management, interactions and attitude	Inpatient and Home	Patient	Pharmacy			
Eating (early weeks)	Foods that aid recovery, ease of preparation, heart healthy	Outpatient and Home	Caregiver				
Moving (early weeks)	Mobilize joints, clear lungs, start walking etc.	Outpatient and Home		Exercise Physiologist	High	Low	Medium
Sleep (early weeks)	Sleep position, how much needed, pain meds	Outpatient and Home		Psychologist/rehab			
Relaxation (early weeks)	Limit visitors and trips, reduced stress helps quit smoking, meditation/music etc.	Outpatient and Home	Both	Psychologist			
Measurements	Weight, BP, RR etc. and warning signs/actions	Inpatient and Home		Nurse/Discharge	High	High	High
Dietary Sodium	As per HF patient requirements and general heart health – home, take out etc.	Inpatient		Dietician	High	High	High

ILLUSTRATIVE

1

The main purpose of this worksheet is to record a master list of candidate guided conversations that DHCC might have with patients and/or their caregivers.

These guided conversations might be delivered in the inpatient, outpatient or at home settings:

- o Inpatient guided conversations would typically be initiated by DHCC.
- o Outpatient (e.g. cardiac rehab) and at home guided conversations might be directly initiated by DHCC or in response to a patient question.

The second purpose of this template is to record the priority assigned to each candidate guided conversation by the DHCC team and other hospital stakeholders.

Prioritization of the candidate guided conversations is required to schedule the most impactful guided conversations into the limited available time of each patient whilst they are in hospital and later in cardiac rehabilitation. The most impactful guided conversations will:

- o Maximise patient health and safety, especially in the first few weeks at home, to meet reduced readmission targets.
- o Reduce staff workload on repeatable patient awareness and data capture communications.
- o Provide patient information transfer and patient acknowledgement in areas that typically result in high litigation costs.

The first few conversations should aim to reduce complexity – no integration with Electronic Health Records (EHR), no machine vision etc; these can be added later when the team has experience with designing and using conversations.

example worksheet 1: listing and prioritizing DHCC guided conversations for roadmap

(Note: see attached Word document which is the actual worksheet template)

Conversation	Explanation	Setting	Patient/Carer	Owner	Priority		
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Measurements	Weight, BP, RR etc. and warning signs/actions	Inpatient and Home		Nurse/Discharge	High	High	High
Dietary Sodium	As per HF patient requirements and general heart health – home, take out etc.	Inpatient		Dietician	High	High	High

Hospital team records their 'candidate conversations' and 'priority assessment' in blank Worksheet 1

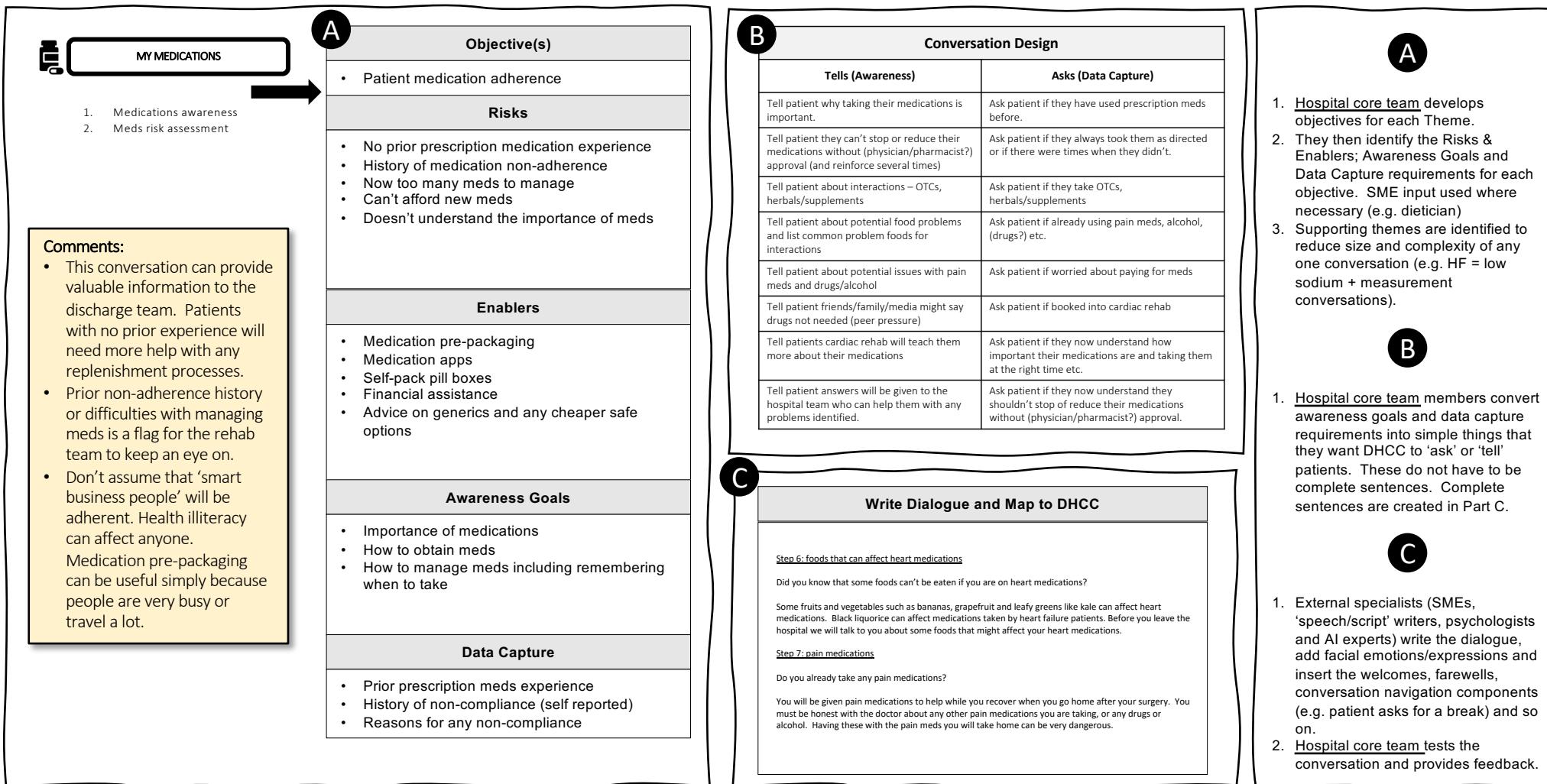


Conversation	Explanation	Setting	Patient/Carer	Owner	Priority		
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- Actual Worksheet 1 is a Microsoft Word Document (supplied)
- Worksheets A, B, C etc. are for Conversation Design
- Worksheets 1,2,3 etc. are for strategy and management (e.g. list, prioritize etc.)

overview: step-by-step instructions for creating a guided conversation

example: “in hospital” medications conversation



EXAMPLE WORKSHEETS "A" AND "B":

example: “in hospital” medications conversation

The hospital core team documents their ideas and requirements in simple worksheets

A

MEDICATIONS
Objective
<ul style="list-style-type: none"> ○ Medications adherence
Risks
<ul style="list-style-type: none"> ○ No prior prescription meds experience ○ History of medication non-adherence ○ Interactions with OTC, herbals, supplements, foods ○ Affordability ○ Peer influence
Enablers
<ul style="list-style-type: none"> ○ Understand importance of meds ○ Know who to ask before reducing/stopping meds ○ Support for payment if required ○ Know who to ask about OTC/herbals/supplements/foods ○ Support for managing /remembering meds
Awareness Goals
<ul style="list-style-type: none"> ○ Meds importance ○ Interaction risks ○ Everyone has different meds ○ Can't reduce/stop without proper approval ○ Don't abuse pain meds/alcohol/drugs
Data Capture
<ul style="list-style-type: none"> ○ Prior meds experience (will they know about ordering etc.) ○ Prior non-adherence (important to ask even if won't answer) ○ Use of OTC, herbals, supplements etc. ○ Concerns about paying for meds ○ Understanding confirmation

B

MEDICATIONS	
Tells (Awareness)	Asks (Data Capture)
Tell patient why taking their medications is important.	Ask patient if they have used prescription meds before.
Tell patient they can't stop or reduce their medications without (physician/pharmacist?) approval (and reinforce several times)	Ask patient if they always took them as directed or if there were times when they didn't.
Tell patient about interactions – OTCs, herbals/supplements	Ask patient if they take OTCs, herbals/supplements
Tell patient about potential food problems and list common problem foods for interactions	Ask patient if already using pain meds, alcohol, (drugs?) etc.
Tell patient about potential issues with pain meds and drugs/alcohol	Ask patient if worried about paying for meds
Tell patient friends/family/media might say drugs not needed (peer pressure)	Ask patient if booked into cardiac rehab
Tell patients cardiac rehab will teach them more about their medications	Ask patient if they now understand how important their medications are and taking them at the right time etc.
Tell patient answers will be given to the hospital team who can help them with any problems identified.	Ask patient if they now understand they shouldn't stop or reduce their medications without (physician/pharmacist?) approval.
	Ask patient if any more questions (these would just be recorded and passed to hospital team for action)

WORKSHEET A : high level requirements for DHCC guided conversations

(Note: see Word document which is the actual worksheet template)

THEME/TOPIC
Objective
Risks
Enablers
Awareness Goals
Data Capture

Hospital team records their ideas and requirements in blank Worksheet A

A	MEDICATIONS
	Objective
	<ul style="list-style-type: none"> • Medications adherence
	Risks
	<ul style="list-style-type: none"> • No prior prescription meds experience • History of medication non-adherence • Interactions with OTC, herbsals, supplements, foods • Affordability • Peer influence
	Enablers
	<ul style="list-style-type: none"> • Understand importance of meds • Know who to ask before reducing/stopping meds • Support for payment if required • Know who to ask about OTC/herbals/supplements/foods • Support for managing /remembering meds
	Awareness Goals
	<ul style="list-style-type: none"> • Meds importance • Interaction risks • Everyone has different meds • Can't reduce/stop without proper approval • Don't abuse pain meds/alcohol/drugs
	Data Capture
	<ul style="list-style-type: none"> • Prior meds experience (will they know about ordering etc.) • Prior non-adherence (important to ask even if won't answer) • Use of OTC, herbsals, supplements etc. • Concerns about paying for meds • Understanding confirmation

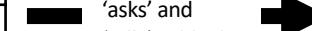
- Actual Worksheet A is a Microsoft Word Document (supplied)
- Worksheets A, B, C etc. are for Conversation Design
- Worksheets 1,2,3 etc. are for strategy and management (e.g. list, prioritize etc.)

WORKSHEET B: What DHCC “Tells” the Patient and What DHCC “Asks” the Patient

(Note: see Word document which is the actual worksheet template)

THEME/TOPIC	
Tells (Awareness)	Asks (Data Capture)

Hospital team records their 'asks' and 'tells' in blank Worksheet B



B

MEDICATIONS	
Tells (Awareness)	Asks (Data Capture)
Tell patient why taking their medications is important.	Ask patient if they have used prescription meds before.
Tell patient they can't stop or reduce their medications without (physician/pharmacist?) approval (and reinforce several times)	Ask patient if they always took them as directed or if there were times when they didn't.
Tell patient about interactions – OTCs, herbals/supplements	Ask patient if they take OTCs, herbals/supplements
Tell patient about potential food problems and list common problem foods for interactions	Ask patient if already using pain meds, alcohol, (drugs?) etc.
Tell patient about potential issues with pain meds and drugs/alcohol	Ask patient if worried about paying for meds
Tell patient friends/family/media might say drugs not needed (peer pressure)	Ask patient if booked into cardiac rehab
Tell patients cardiac rehab will teach them more about their medications	Ask patient if they now understand how important their medications are and taking them at the right time etc.
Tell patient answers will be given to the hospital team who can help them with any problems identified.	Ask patient if they now understand they shouldn't stop or reduce their medications without (physician/pharmacist?) approval.
	Ask patient if any more questions (these would just be recorded and passed to hospital team for action)

- Actual Worksheet B is a Microsoft Word Document (supplied)
- Worksheets A, B, C etc. are for Conversation Design
- Worksheets 1,2,3 etc. are for strategy and management (e.g. list, prioritize etc.)

OVERVIEW: step-by-step instructions for creating a guided conversation

example: “in hospital” heart failure conversation

A

WHAT WILL I EAT (low sodium)
<ul style="list-style-type: none"> 1. Healthy eating awareness 2. Eating risk assessment (all & HF specific) 3. Eating first days at home
MY MEASUREMENTS
<ul style="list-style-type: none"> 1. What do I need to measure 2. How do I measure these 3. When do I measure and report 4. Adherence monitoring

HEART FAILURE
Objective
<ul style="list-style-type: none"> • Sodium management for heart failure patients
Risks
<ul style="list-style-type: none"> • Existing high sodium diet • Existing high sodium drinks • No experience with daily weighing • No equipment for daily weighing • Poor technique daily weighing
Enablers
<ul style="list-style-type: none"> • Patient understands risks of current diet • Patient understands risks of current drinks • Accurate scales and knowledge to use • Patient understands cardiac rehab can help them
Awareness Goals
<ul style="list-style-type: none"> • Risks of high sodium diet and drinks • Current sodium risk • Low sodium choices / reducing salt in diet • Importance of daily weighing • How cardiac rehab can help • How to weigh daily • Effect of high sodium on HF patient
Data Capture
<ul style="list-style-type: none"> • Current sodium intake risks for dietician • Specific high risk patient foods and drinks for dietician • Risk of daily weighing non-adherence or accuracy • Patient has been told they have high blood pressure • Patient has been told they have heart failure • Has patient registered for cardiac rehab

Comments:

- This conversation can provide valuable information to the dietitian. It enables them to assess risk and also propose alternatives to favorite foods.
- The measurement conversation is also required so that patient and physician become aware of any problems.

B

HEART FAILURE (REDUCING SODIUM)	
Tells (Awareness)	Asks (Data Capture)
Tell patient why reducing sodium (salt) is important.	Ask patient if told they have high BP and / or heart failure
Tell patient why too much salt is bad for them – swelling, hard to breathe etc	Ask if told they have heart
Tell patients importance of weighing daily to check for these problems	Ask patient if going to cardiac rehab - risk is higher if not
Emphasize importance of going to rehab to learn to manage HF	Ask patient about high sodium foods they eat – in general, frozen, packaged etc.
Tell patient about foods and drinks that are high in sodium – general and specific examples	Ask patient about eating patterns – eating out, adding salt, take out etc. that increase risks of too much sodium
Tell patient about healthy foods and options to high sodium foods	Ask patient about specific foods (useful for dietician to suggest alternatives) – deli meats, fried food, nuts, chips etc.
Make patient aware that the hospital (and other) dieticians can help them with low sodium foods	Ask patient about high sodium drinks they might consume – sodas, energy drinks etc.
Tell patient about low sodium frozen and delivered meals that can be ordered online	Ask patient if they want the dietitian to help them and give them ideas on low sodium foods, snacks, drinks etc.
	Confirm with patient that they now understand importance of a low sodium diet and know how to reduce sodium in their diet

C

Write Dialogue and Map to DHCC
Step 2: told about high blood pressure
Have you ever been told that you have high blood pressure?
Too much salt can cause high blood pressure, so that is why we will talk about it today.
Step 3: told about heart failure
One of the most important questions I would like to ask today is, have you been told that you have heart failure?
Too much salt is very bad for heart failure patients.
It causes their body to retain water.
This can cause their bodies to swell and make it hard for them to breathe.
All heart patients must weigh themselves every day so that they can see if they are hanging onto water.

A

1. **Hospital core team** develops objectives for each Conversation.
2. They then identify the Risks & Enablers; Awareness Goals and Data Capture requirements for each objective. SME input used where necessary (e.g. dietician)
3. Supporting themes are identified to reduce size and complexity of any one conversation (e.g. HF = low sodium + measurement conversations).

B

1. **Hospital core team** members convert awareness goals and data capture requirements into simple things that they want DHCC to ‘ask’ or ‘tell’ patients. These do not have to be complete sentences. Complete sentences are created in Part C.

C

1. External specialists (SMEs, ‘speech/script’ writers, psychologists and AI experts) write the dialogue, add facial emotions/expressions and insert the welcomes, farewells, conversation navigation components (e.g. patient asks for a break) and so on.
2. **Hospital core team** tests the conversation and provides feedback.

EXAMPLE WORKSHEETS "A" AND "B":

example: “in hospital” heart failure guided conversation

A	HEART FAILURE
Objective	
• Sodium management for heart failure patients	
Risks	
• Existing high sodium diet • Existing high sodium drinks • No experience with daily weighing • No equipment for daily weighing • Poor technique daily weighing	
Enablers	
• Patient understands risks of current diet • Patient understands risks of current drinks • Accurate scales and knowledge to use • Patient understands cardiac rehab can help them	
Awareness Goals	
• Risks of high sodium diet and drinks • Current sodium risk • Low sodium choices / reducing salt in diet • Importance of daily weighing • How cardiac rehab can help • How to weigh daily • Effect of high sodium on HF patient	
Data Capture	
• Current sodium intake risks for dietitian • Specific high-risk patient foods and drinks for dietitian • Risk of daily weighing non-adherence or accuracy • Patient has been told they have high blood pressure • Patient has been told they have heart failure • Has patient registered for cardiac rehab	

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These tables can now be updated to reflect
practitioner and patient views and localization

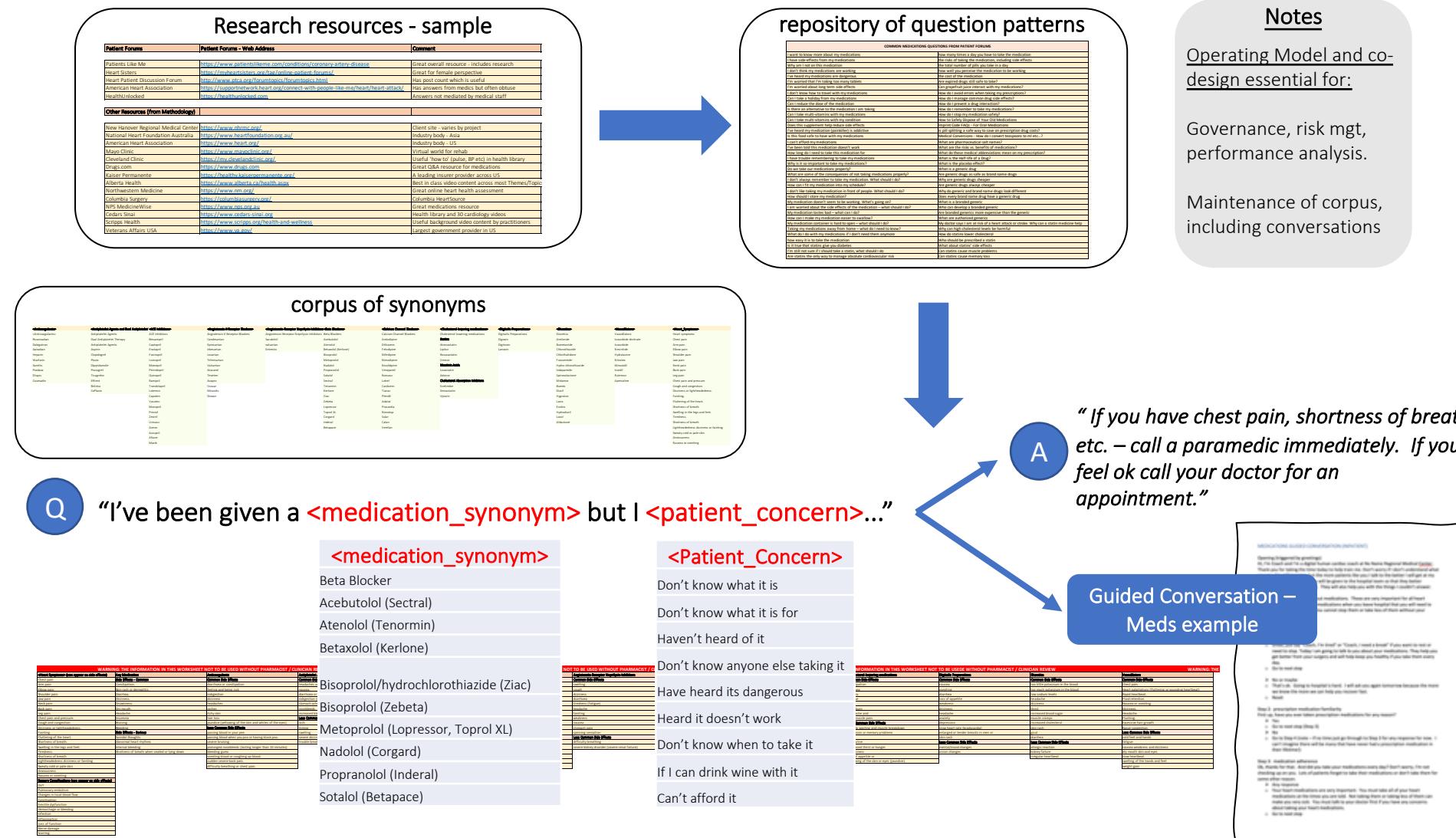
corpus development:

question patterns

and

guided conversations

corpus development – Q&A patterns and guided conversations





END OF SECTION

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