Perioperative Models of Care

early out-of-hospital management for post-operative patients

Don Campbell
October 2018
The Moonshot

I believe that this Nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to earth.

More science quotes at Today in Science History - todayinsci.com
The Moonshot: 
Early out-of-hospital management

“We are going to discharge post operative patients to their homes and manage them safely”

• More or less complex than the moonshot?
Complexity

Chronic Ill-Health Management via Complexity Science

- Probe > Sense > Respond
  - RETRO-SPECTIVELY COHERENT
    - Multiple Diseases and Complications
    - COMPLEX

- Sense > Analyse > Respond
  - POTENTIALLY KNOWABLE
    - Broken Hip
    - COMPLICATED

- Act > Sense > Respond
  - INCOHERENT
    - Potentially Fatal Emergencies
    - CHAOTIC

- Sense > Categorise > Respond
  - KNOWN
    - Asthma
    - SIMPLE
Quick ...

Don’t think of an elephant!
Epidemiology of multimorbidity and implications for healthcare

Figure 1: Number of chronic disorders by age-group
Growth rates of the oldest is set to dramatically increase over the next 20 years.
The Moonshot for post–operative care

• What is our overarching strategic objective for successful perioperative care AT HOME?
Three horizons for systems of care

- **Horizon 1**
  - Closed/Physician-Centric System: unstable space of transition
    - “pockets of the future” embedded in the present

- **Horizon 2**
  - Decentralized Mess: vision for the future
    - Dr Google
    - Health records leaks

- **Horizon 3**
  - Integrated/Patient-Centric System.
Time frames for strategic innovation

Horizon 1
• Requires strategies that improve current operations or incremental innovations to help keep the system relevant longer.

Horizon 2
• Requires strategies that extend current competencies and address growing tensions within this space.

Horizon 3
• Demands radical innovations that change the nature of the industry and bring to life the vision for an integrated, patient-centred system.
What does a home-based post operative care system look like?

Key (unacknowledged) issue:

- Interaction between a service/system and an environment
  - Home replaces the ward
  - Care system includes the home
  - Patient interacts with Care system and the home

Creates a complex adaptive system with emergent properties
What does a home-based post operative care system look like?

- **Participants**
  - Patient
  - Family/Informal carers
  - Professional health care workers

- **Service elements**
  - Medication
  - Wound management
  - Nutrition
  - Exercise (Rehab)
  - Bed

- **Information management**
  - **What type?**
    - Patient bioinformation
    - Patient experience
    - Informal Carer experience
  - **Who collects it?**
    - Quantified self (Monitor)
    - Telecare Guide Questionnaire?
  - **Who makes use of it?**
    - To what purpose
  - **Risk mitigation**
  - **Risk and incident management**
What does a home-based post operative care system look like?

- (Arche)types of patients
- Types of procedures/interventions in Acute care
- Codify as per Cynefin framework
  - Simple/Complicated in the acute setting
  - Simple/Complicated in the home care setting

BUT

Interactions with environments create complexity:
  - Emergent behaviours

How do we anticipate/plan for and manage/mitigate risk?
Interactions and complexity

Real issue
• Given the potential for bewildering range of possibilities

Need to constrain the number of possible choices
• Manage complexity by reducing choices

Model of Care that is “simple on the other side of complexity”

<table>
<thead>
<tr>
<th>Number of dots:</th>
<th>Number of possible links: $L = (N)N - 1)/2$</th>
<th>Number of possible patterns: $P = 2^L$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N = 4$</td>
<td>$L = 6$</td>
<td>$P = 64$</td>
</tr>
<tr>
<td>$N = 10$</td>
<td>$L = 45$</td>
<td>$P = 3.5$ trillion</td>
</tr>
<tr>
<td>$N = 12$</td>
<td>$L = 66$</td>
<td>$P = 4,700$ quadrillion</td>
</tr>
</tbody>
</table>

Boisot and McKelvey
Systems of home based post-operative Care

Care bundles based on need
- Patient types/personas
- Interventions (acute and convalescent)

Base model of care on defining features
- Care type required
- Type of environment (home)
- Location, geographical area

Think about components of post acute care
- Intervention and repair
- Inflammatory burden
- Nutrition
- Deconditioning/Rehab exercise
- Management of comorbidities
- Psychological and carer stress
- Patterns of interactions between person and carer(s)

Collect data that matters and monitor
What has to happen?

• Data collection and (anticipatory) monitoring
• Risk stratification based on Complexity model
  – “Probe, sense, respond”
• Safety and risk management
• Training/support for informal carers
• Home care team
  – Geographical basis
  – Self-management
  – Generalist skills
  – Coaching
Health System Transformation?

Now

- Responsible for health of individuals
- Treat in institutions
- Focus on “professional” caregivers
- Technology to *support* current process
- Accept provider fragmentation

Future

- Individuals/ Groups/ Populations
- Treat in the home and community
- + Family, friends, lay carers, patients
- Technology to *disrupt* current process
- Drive person-centred integration
Anticipatory models of care

Anticipatory system adjusts forwards not backwards or afterwards (like sailing).

Implications for:
- How we manage the environment
- The service as it interacts with the environment

What information do we collect and how do we manage the information?

- Cross check individual particulars against (idealized) model
- Adjust in the present, informed by the future
Successful models of perioperative care

Start with the end in mind (early out of hospital management)
• Use appropriate tools, methods and models of care, including pathways and protocols to achieve it

How has post operative care changed in your professional lifetime?
  – What
  – How
  – Why
• How will it change in the future?
We shape our tools:
Thereafter our tools shape us.

- All change in the era of the enlightenment has come about because of the fusion of ideas with new technology.

- Let's look at how “they” put the digital camera in the iPhone.

“We shape our buildings, and afterwards our buildings shape us.”

Winston Churchill
Phillipe Kahn transmitted the first digital image via mobile phone 1997

"I wanted to create a 21st century version of a Polaroid picture."
On June 11, 1997, an image of Kahn's new baby Sophie was transmitted. He attributes his inspiration to Claude Debussy.
Steve Sasson invented the digital camera 1975

Kodak 1975:
“no one would ever want to look at their pictures on a television set,”
Russell Kirsch 1957

* NBS 1957
* First digital scanner
  * “I wanted to take pictures of the moon as the space ship went past”
  * Photo of his baby son
  * 176X176 pixels
* Life Magazine 2003
  * One of the 100 most influential pictures that changed the world
The digital camera in the first iPhone

“I’d like you to meet Raj. Raj Mehta. Raj put the digital camera in the iPhone”

Novel combination of existing technology
We are in the middle of a revolution

- Radically redesigning our services in combination with technology
- Capitalising on the ITC revolution
- What are the possibilities for home-based perioperative care?
- What will drive it?
Story time: then and now

- Arthroscopy 1967: simple
- Now...
  - Who
  - Where
  - How long
  - Rehab?

“All innovation rides on the back of technological innovation”
Monash Watch: keeping an eye on our most vulnerable people at home

Complexity Lens:

- “Probe, sense respond”
- Use of lay care guides supported by AI and Health Coaches
- Eschew Medical paradigm
- Include the importance of the environment
  - Collaborate, Cooperate, Communicate

Dadirri: deep listening

Cybernetics- the role of conversation
Change: Why does it occur and How?

- All innovation is driven by technology
- Home based care will utilize ICT:
  - The tools will change our behavior
  - Workforce will modify its behavior: Why?
  - Different Mindsets
    - How is this achieved?
      - Stories and meaning
    - New Language
Environments

As patients become more complex, and surgical interventions, anesthetic and technological capability increase, indications for interventions will increase.

• This is only one part of the equation

Environments change

• The driver to change is how we manage the interaction between the service and environment and patient

How we manage information to manage risk
How do we get from the present to the future? The Moonshot

- What are our:
  - Fears/concerns
  - Hopes aspirations

- What limits our thinking now?
  - Paradigms

- **What Can We Change?**
  - *How or what* are you willing to change in regard to home-based perioperative care?
How do we get from the present to the future?

What does an ideal future state look like?

– Free of constraints

What has to change in terms of our thinking and our mindsets if we are to change what we do now?
Transcending Paradigms

- What beliefs, assumptions and cultural norms would be different for home based perioperative care in 2050?
  - For the various stakeholders
A new approach is needed

First we have to see things differently

• The patient trajectory
• Management system needs to be an anticipatory one
• Think beyond medical
• Think resilience and vulnerability

Team members work to maintain the trajectory and anticipate need rather than react.
The Moonshot for post-operative care: Early out-of-hospital management

- Starts with the end in mind
- Plans and adapts to circumstances
- Ensures that clinicians use tools and thinking that are appropriate to context and circumstance.

Above all
- Focus on communication and anticipation
- Customized to each patient's need
- Keeps the patient (and carers) safe
Yes we can

- Imagine different personas and patient trajectories
- Create models for particular personas and trajectories
- Create anticipatory models
Successful models of home-based post-operative care

• Built around clusters of patients
  – Defined care requirements

• Move away from (old) models:
  – Place the surgical event as a technical element in a complex sociotechnical system
  – Team-based plan to safely place patient back in their own home as early as possible with a focus on restoration of function.
Thoughts: a risk-management framework

• Use anticipatory models
• Develop monitoring systems that generate information that tell us about incipient risk of instability
• Use human behavior (telecare guides) and bioinformatics (AI plus human-centred design)
My first thoughts

- Who can go home & when
- Who can look after them
- What needs to be in place
  - Personnel
  - Monitoring
- Batch the bundles of care based on patient care need requirements
- Get away from Disease/intervention/professional based approaches
- Eg
  - Buurtzorg nursing
  - Monash Watch
- Geographical delivery approaches
- Transcend professional boundaries
- Use data to identify patient care need types
- Generalism >> specialism
- Small scale trials: Learning Launch
- Learn your way in
How we do this is the challenge

The moonshot is a good start
- Begins with a different way of thinking bound up in a new language

What Now?
- Create future models of care that represent desired ways of being
- Projects to move us there