

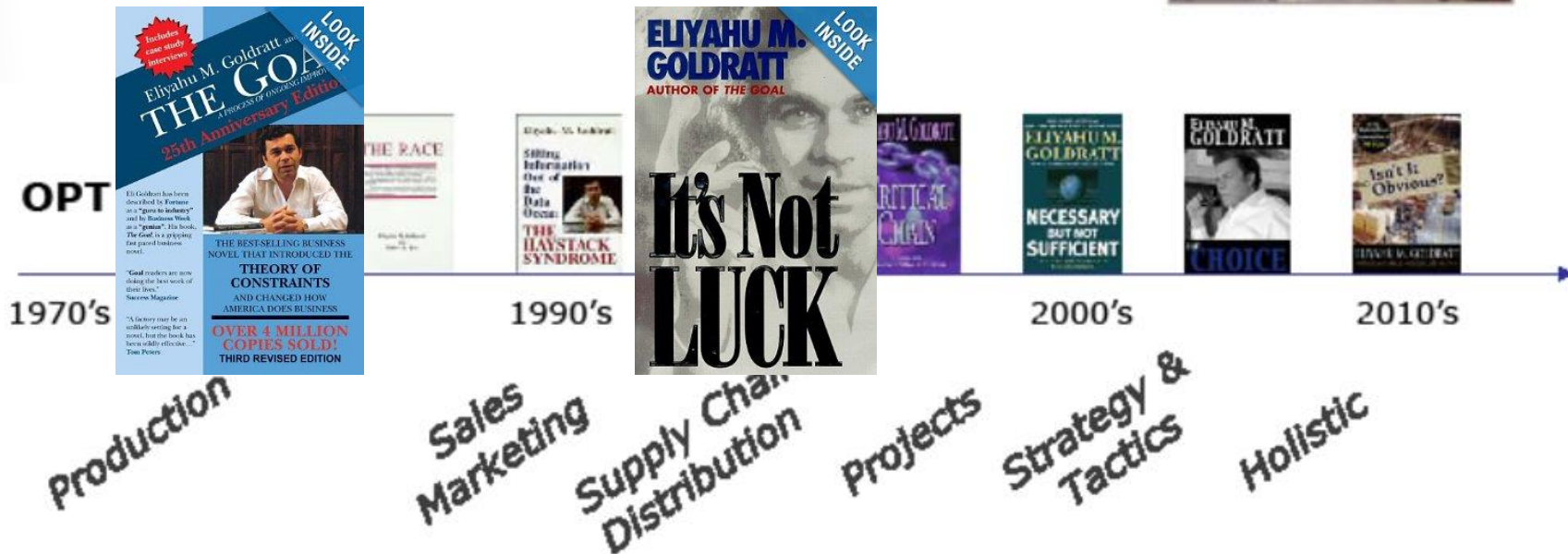
# It's just common sense, right? So why is it so uncommon?

Professor **Vicky Mabin**  
School of Management  
and Associate Dean (Teaching and Learning)  
Victoria Business School

Victoria University of Wellington  
Inaugural Professorial Lecture  
12 November 2013

# The theory of constraints (TOC)

- Originator: Dr. Eliyahu Goldratt (1947-2011)
- Origins in the hard sciences (physics)
- Aims to continually achieve more of the goal of a system



# Five Focusing Steps (5FS)

1. **IDENTIFY** the system's constraint(s)
2. **Decide** how to **EXPLOIT** the system's constraint(s)
3. **SUBORDINATE** everything else to the above decisions.
4. **ELEVATE** the system's constraints.
5. If the constraint has been broken, **GO BACK** to step 1

*A Process of Ongoing Improvement*

# Manufacturing





Cutting



Printing



Sewing



Finishing



# Step 1. **Identify** the system's constraint



## Step 2: **Decide** how to **Exploit** the Constraint

- Use constraint effectively
  - make the right products
  - most efficiently

So...

- Avoid wasting time on the constraint
- Make only what's needed

## Step 3: **Subordinate** everything else to those decisions

- Borrow workers from elsewhere
- Set up 'off line'



- Make sure Cutting cuts only to customer demand



## Step 4: **Elevate** the constraint

- No big investment – just some custom made racks!



- Step 5: **Go back** to Step 1
- Do not let inertia become the system constraint!

# Second constraint: sewing



# And then ...

After

1. printing
2. sewing

tackled the next constraints  
in turn:

3. inventory
4. marketing
5. cut planning
6. quality .....

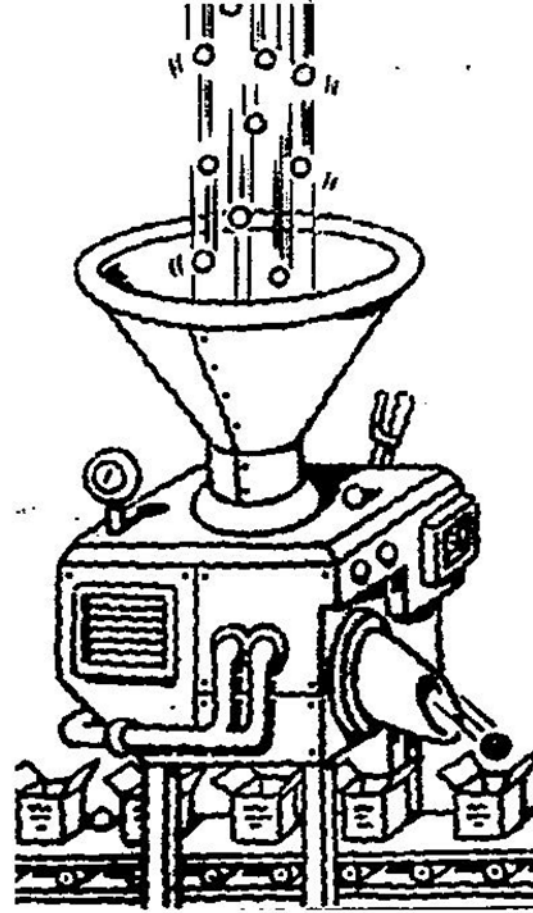
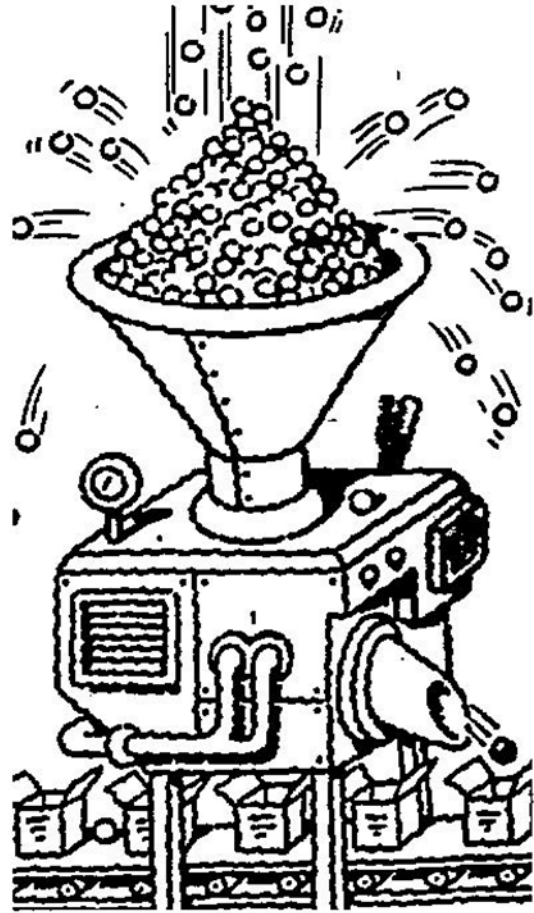


# After applying 5FS at Expozay

- Sales up 80% in 3 years
- Inventory down 13% in 8 mths
  - WIP down from 30k to 4k
- Operating expenses steady
- Quality, flexibility, responsiveness, and due date performance all improved
- Faster quotes for delivery dates

*“Chaos was replaced by order”*

Tony Alvos, Managing Director, Expozay International.



# Key lessons from The Goal



*A chain is only as strong as its weakest link!*



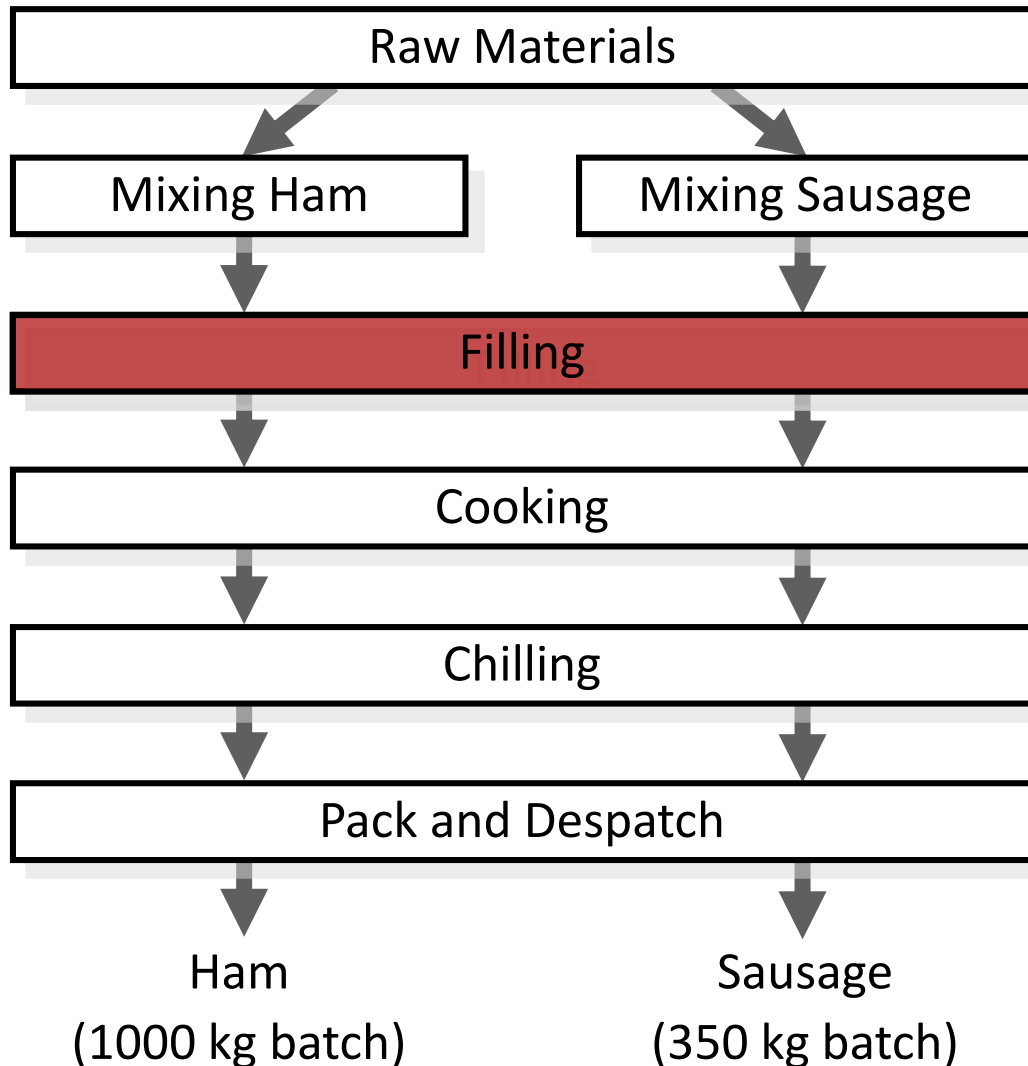


# Gould's Fine Foods

- Situation:
  - Two product lines:  
Sausages and Hams
  - Shared production resources
  - Couldn't meet demand
  - High unplanned overtime



# Process Flowchart



**Demands:**

**8**

**20**

**(batches/wk)**

# How to set priorities?

- TOC Product Mix Heuristic

	Hams	Sausages
Gross Profit	6	1
Time on Constraint (Filler hrs/batch)	8	1
<b>Gross Profit per Constraint Hour</b>	<b><math>6/8 = 0.75</math></b>	<b>1</b>

# Goulds Fine Foods - Results

## Results

- Improved productivity:
  - Throughput improved by 70%
  - Unplanned overtime slashed
- Allowed Goulds to supply the market demand and increase profits without extra staff or capital

## Research spinoffs

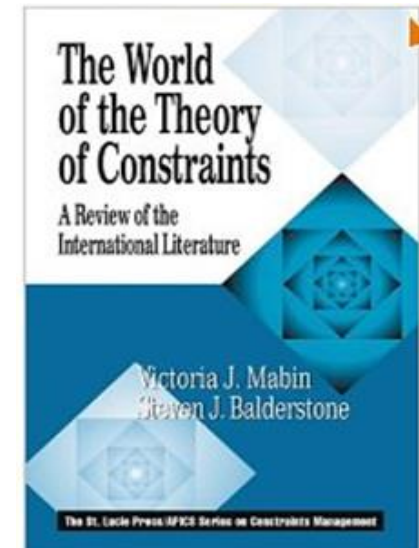
Synergies between Linear Programming and TOC's 5 Focusing Steps



# Impacts of applying The Goal and 5FS

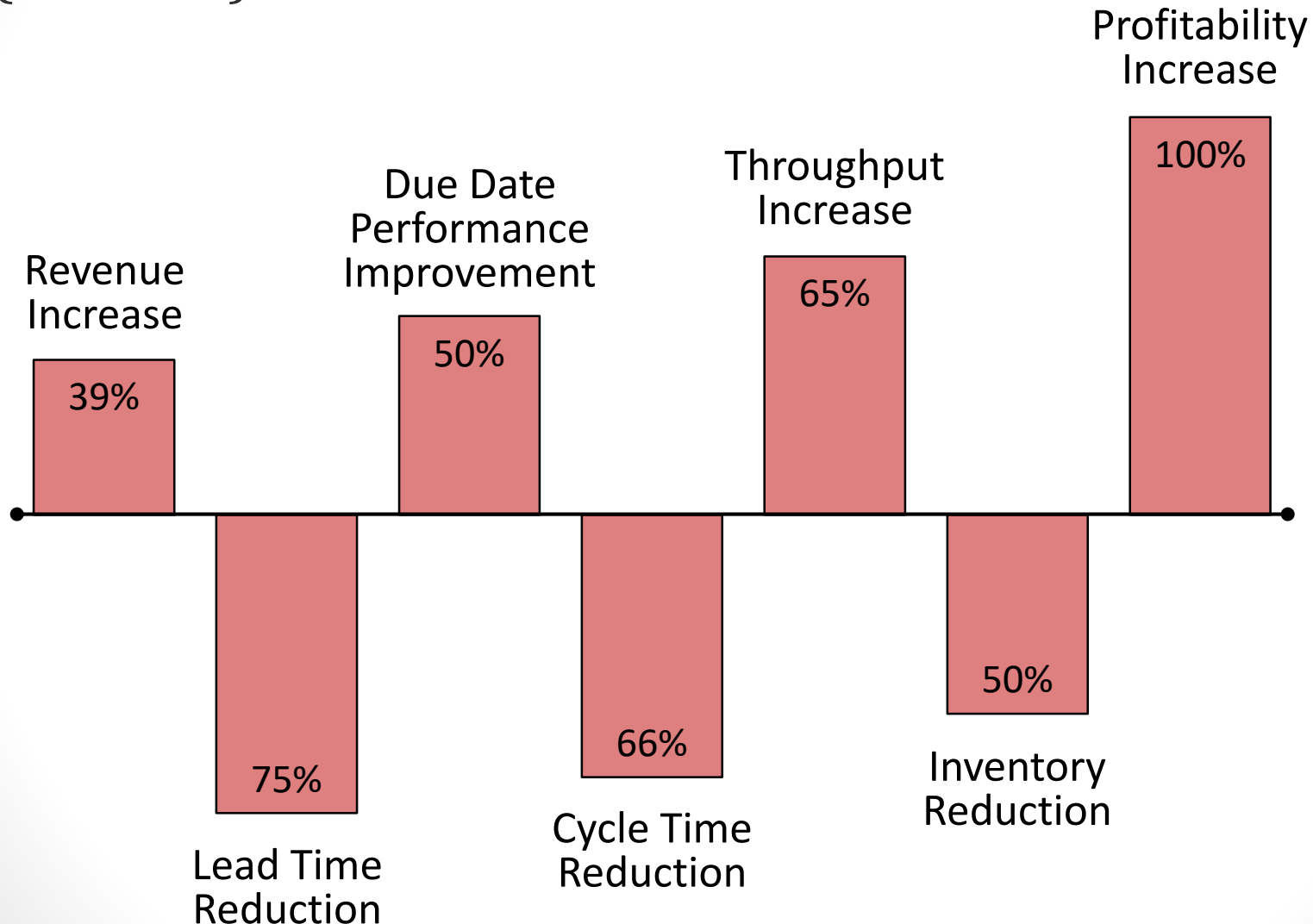
## Evidence from the international literature

- Published papers and books up to late 1990's
- 100 case studies, no failures reported
- Large measurable improvements from TOC
  - (better than from other methods)
  - eg 75% reduction in Lead time, 50% in Inventory!



# Improvements using TOC

(Medians)



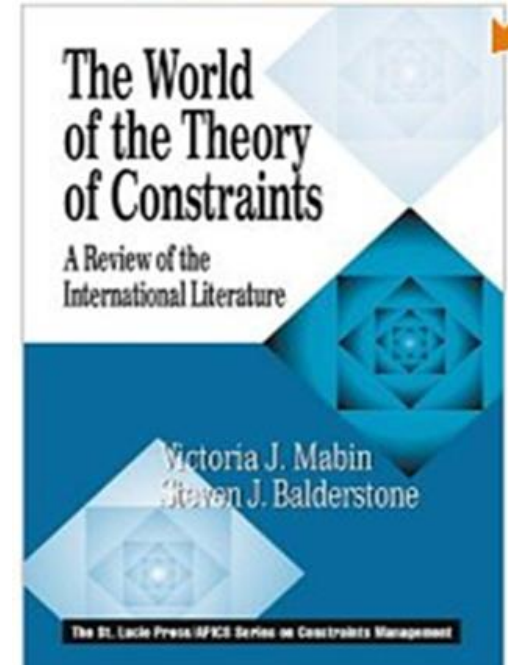


# Impacts of applying The Goal and 5FS

## Evidence from the international literature

- **Observations:**

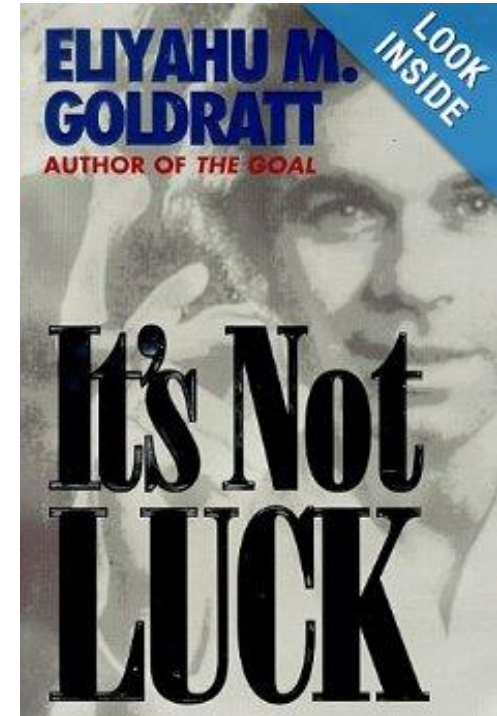
- Some BIG companies achieved BIG results
- Having already used other methods
- Worth sharing?!
- Most applications used only part of TOC



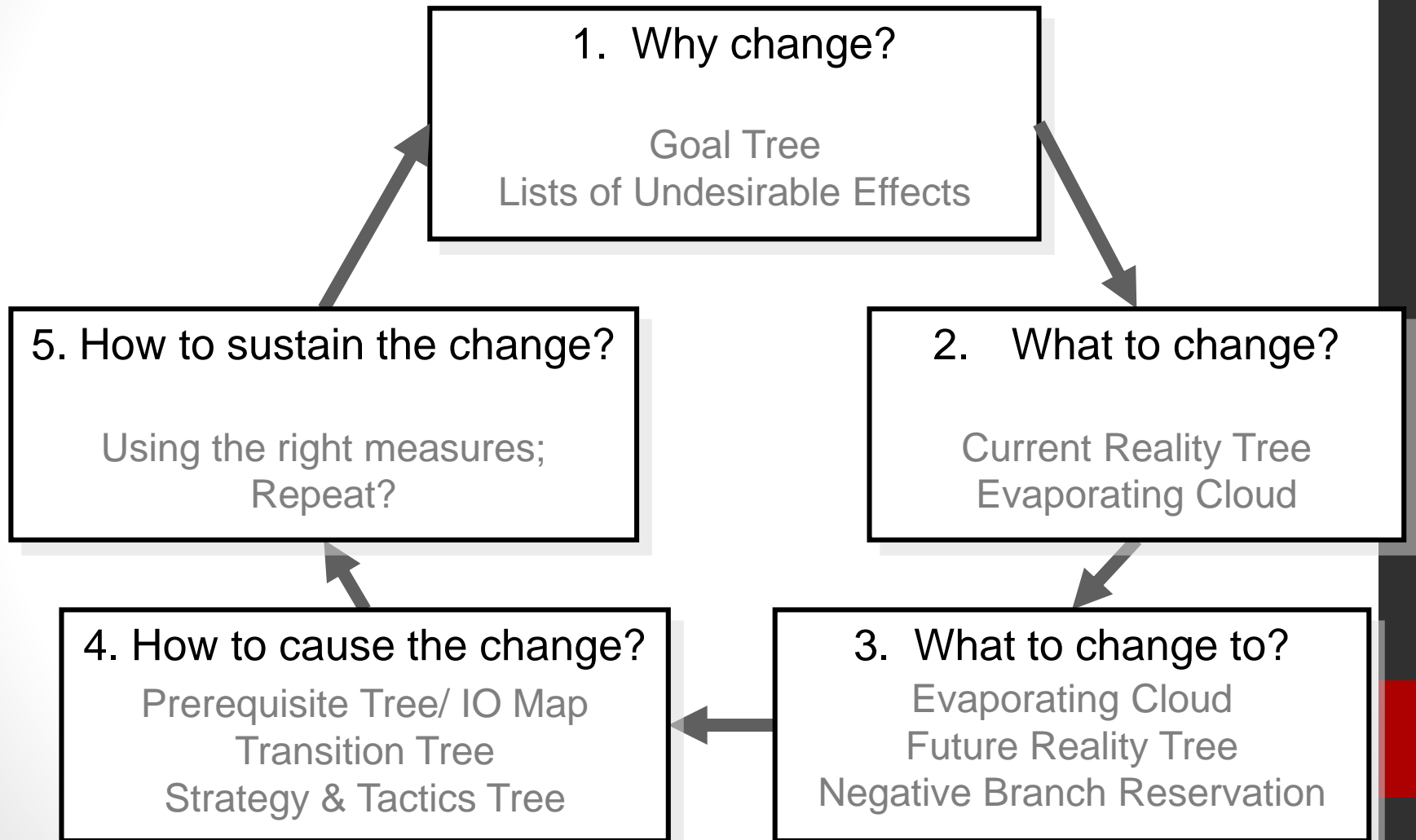
# TOC Thinking Processes

## It's Not Luck

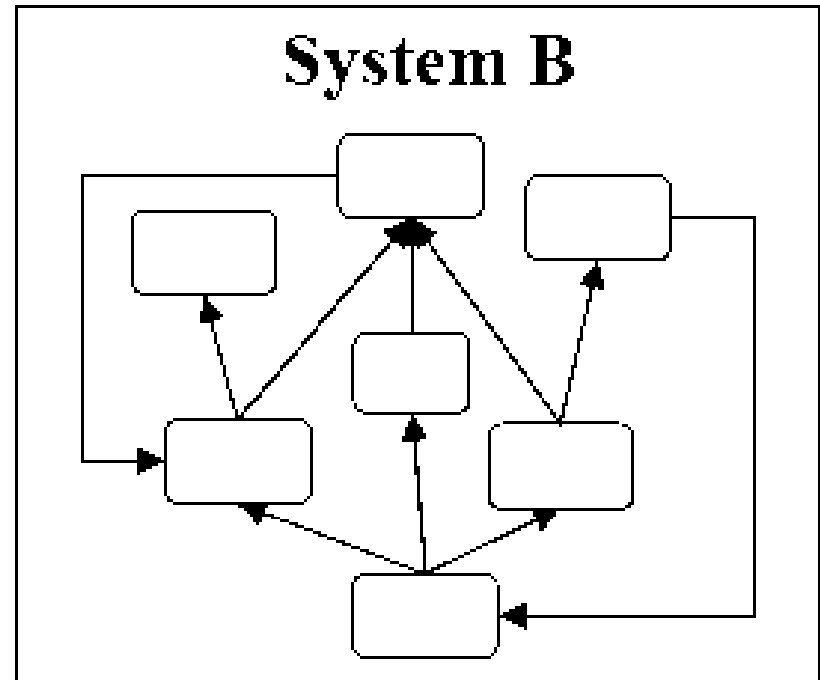
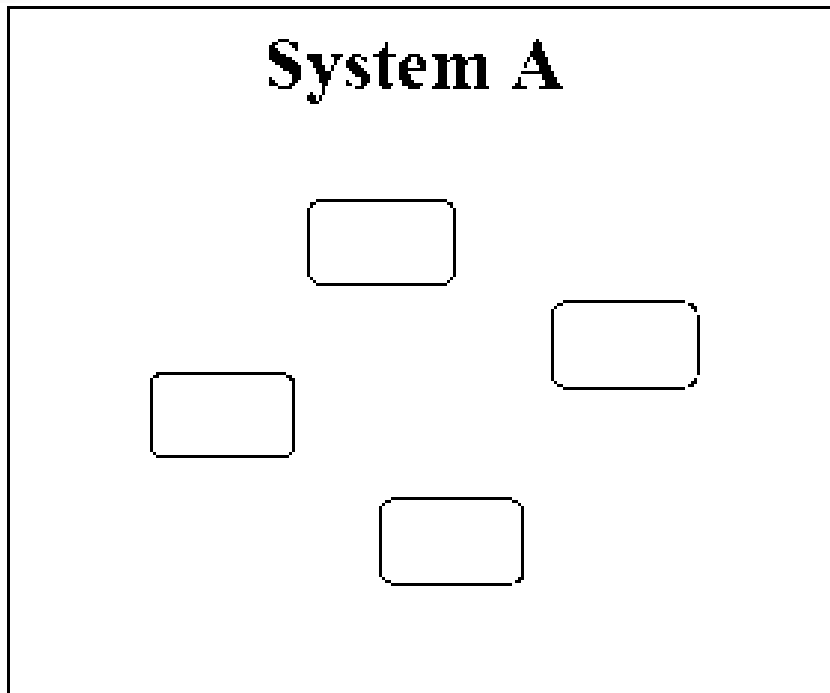
- How to develop solutions
- Via a change process ...



# Key Questions to Guide Change ... ... and TOC Thinking Tools



# Simplicity in complexity



*“The whole is greater than the sum of its parts”*

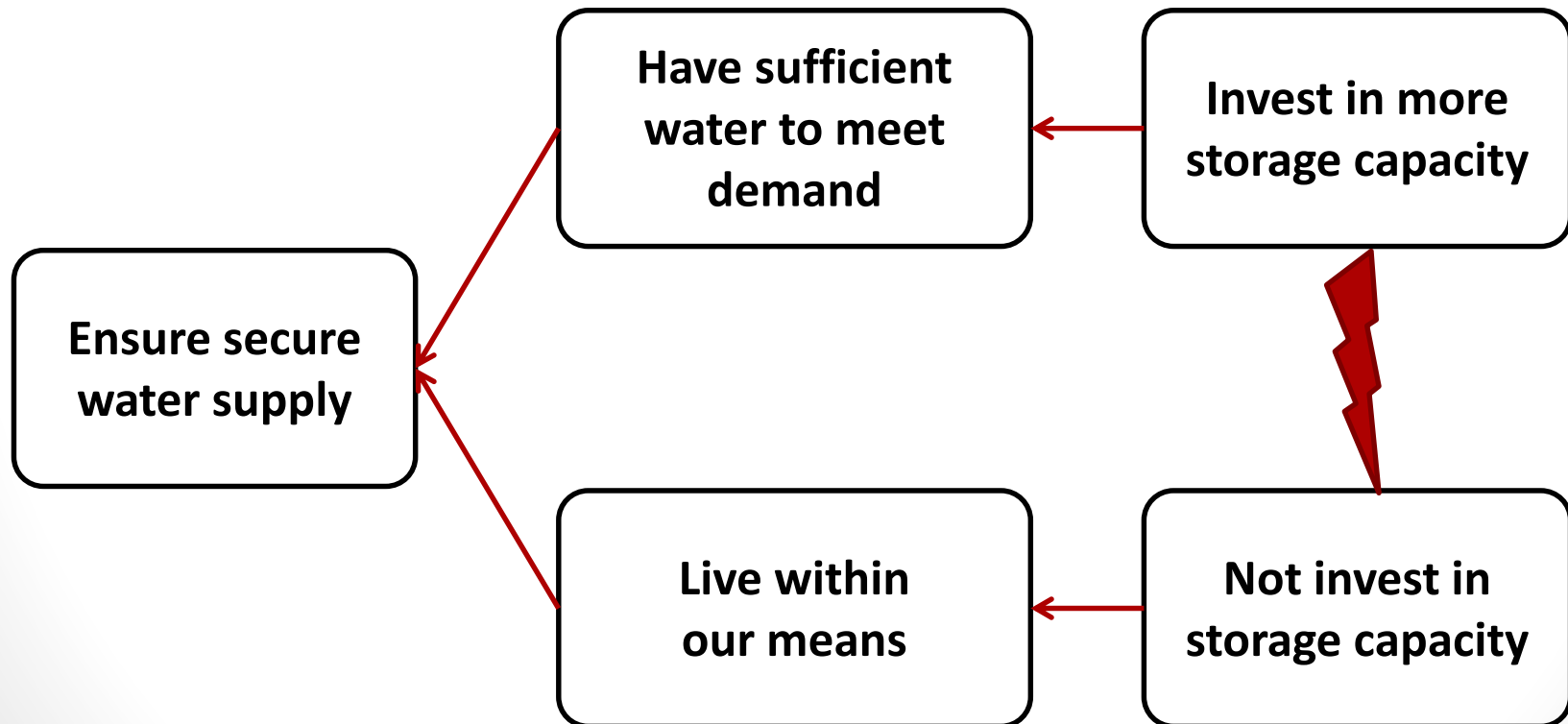
# Some Local Applications of the Thinking Processes

- Banking
  - *“TOC provided framework and tool kit to help manage and lead a major bank merger, harnessing resistance to change”* Steve Forgeson, Area Manager, Westpac
- Manufacturing:
  - *“Led to fundamental shift in the way we think, unlocked potential we never realised we had.”* Lawrie Evans, Managing Director, Astra Print
  - Milk products (Fonterra)
- Regulatory issues: electricity, telecoms, education
- Resource management: water, biofuels
- Health: Hospitals, elder care, smoking, ...
- Distribution networks
- Projects

# Water

## – the case of Kāpiti district

- Finding a solution using TOC's Evaporating Cloud

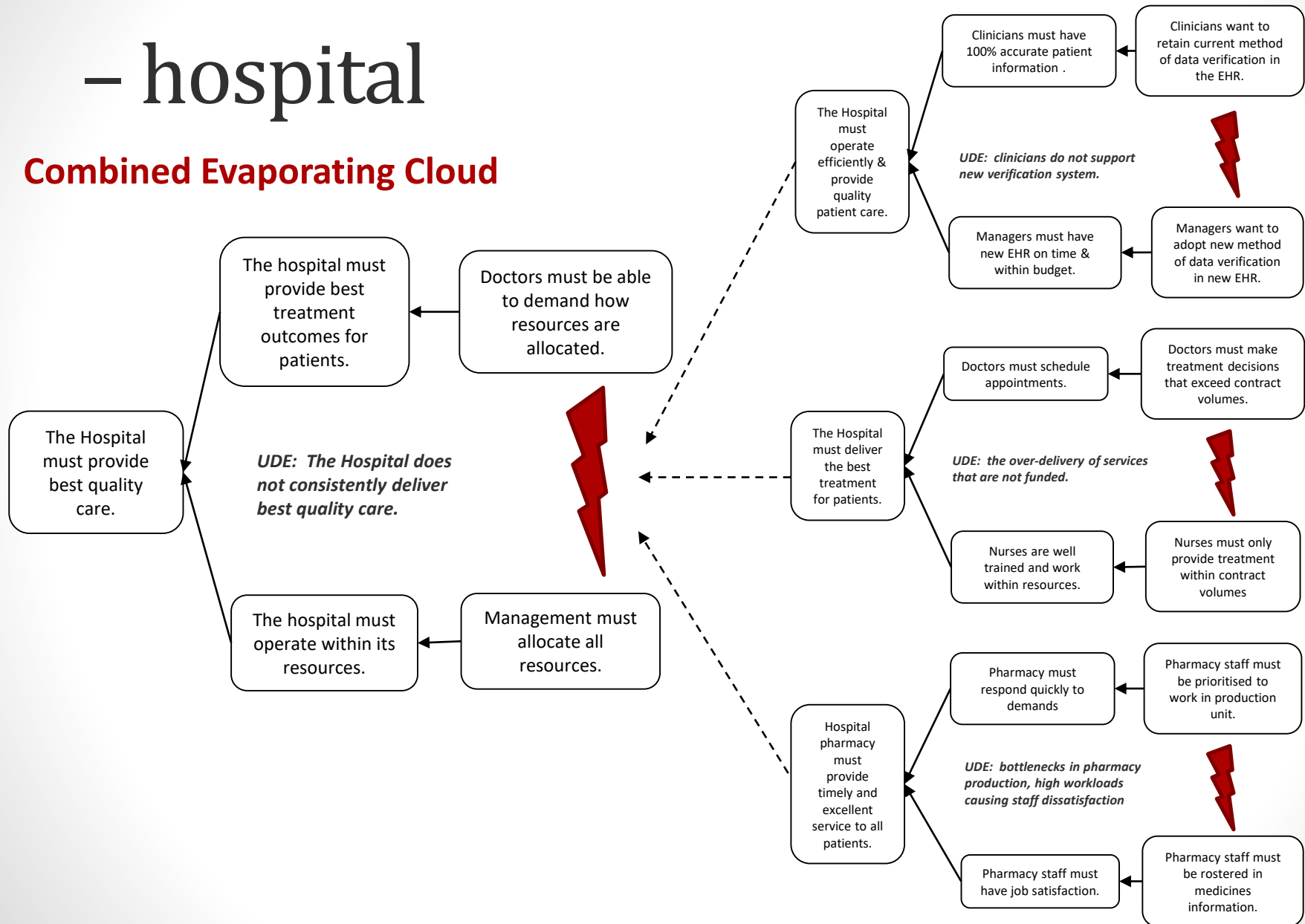




# Healthcare – hospital

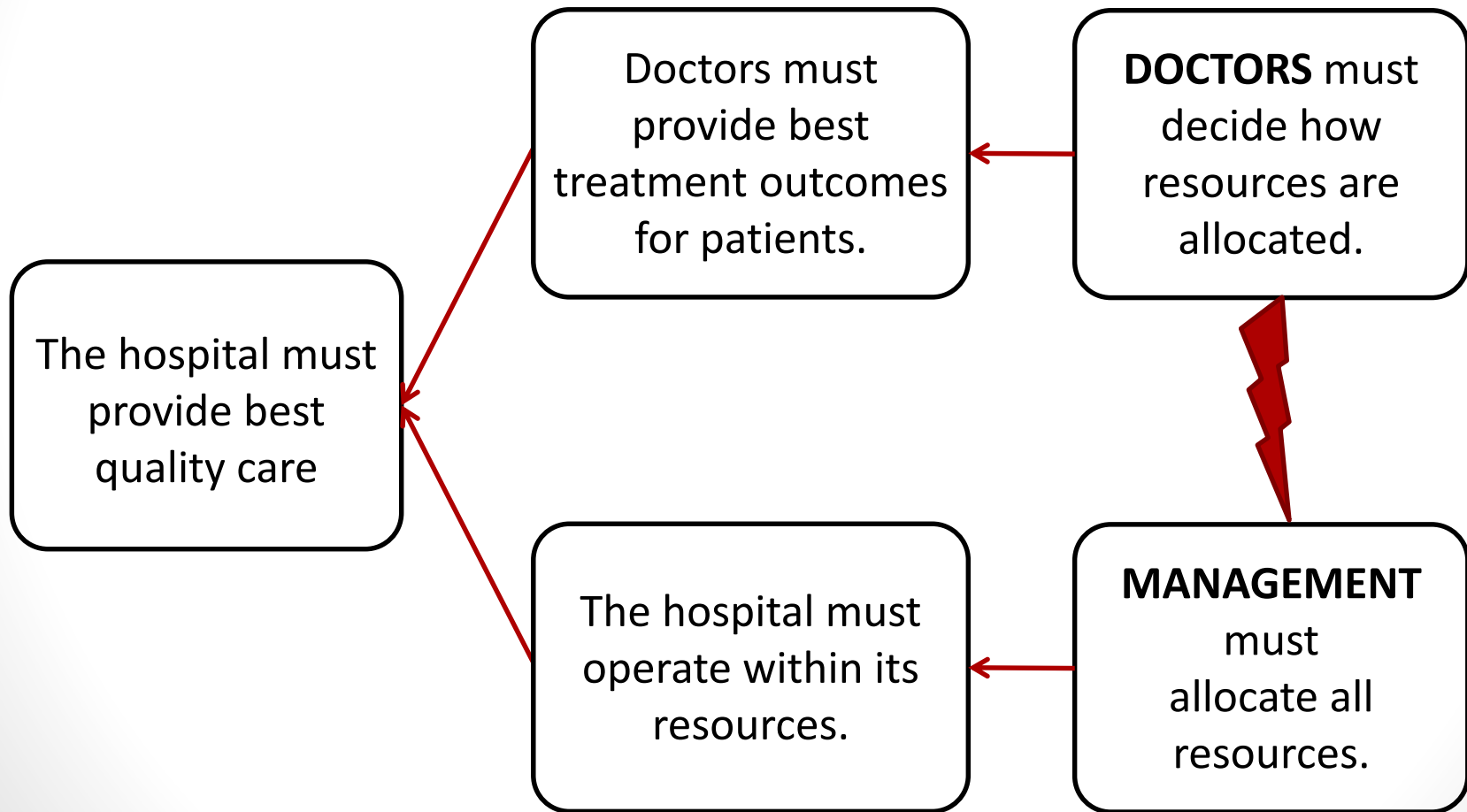
## Combined Evaporating Cloud

## Individual Evaporating Clouds



# What to change?

- core conflict

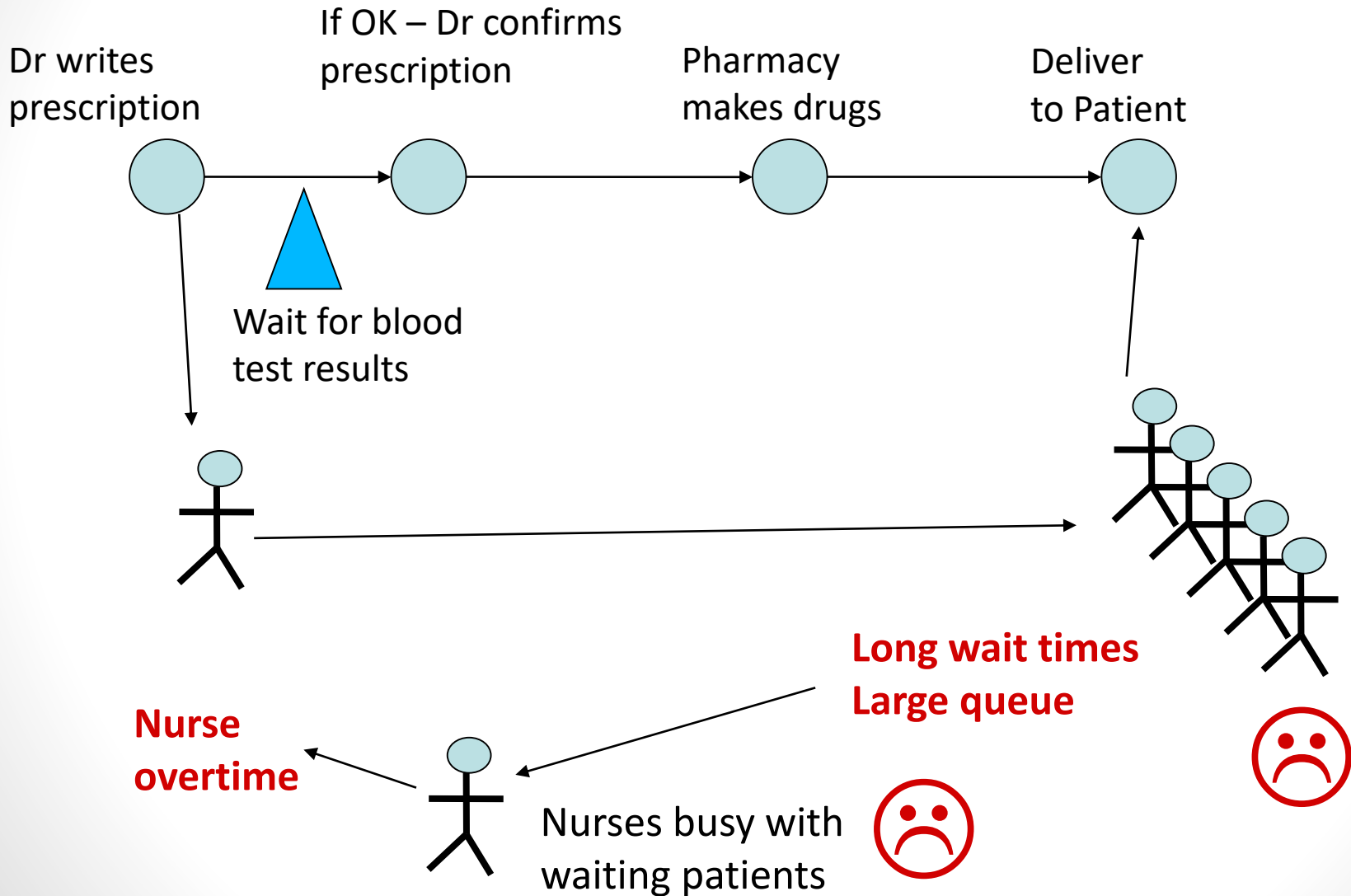


# Back in the hospital pharmacy

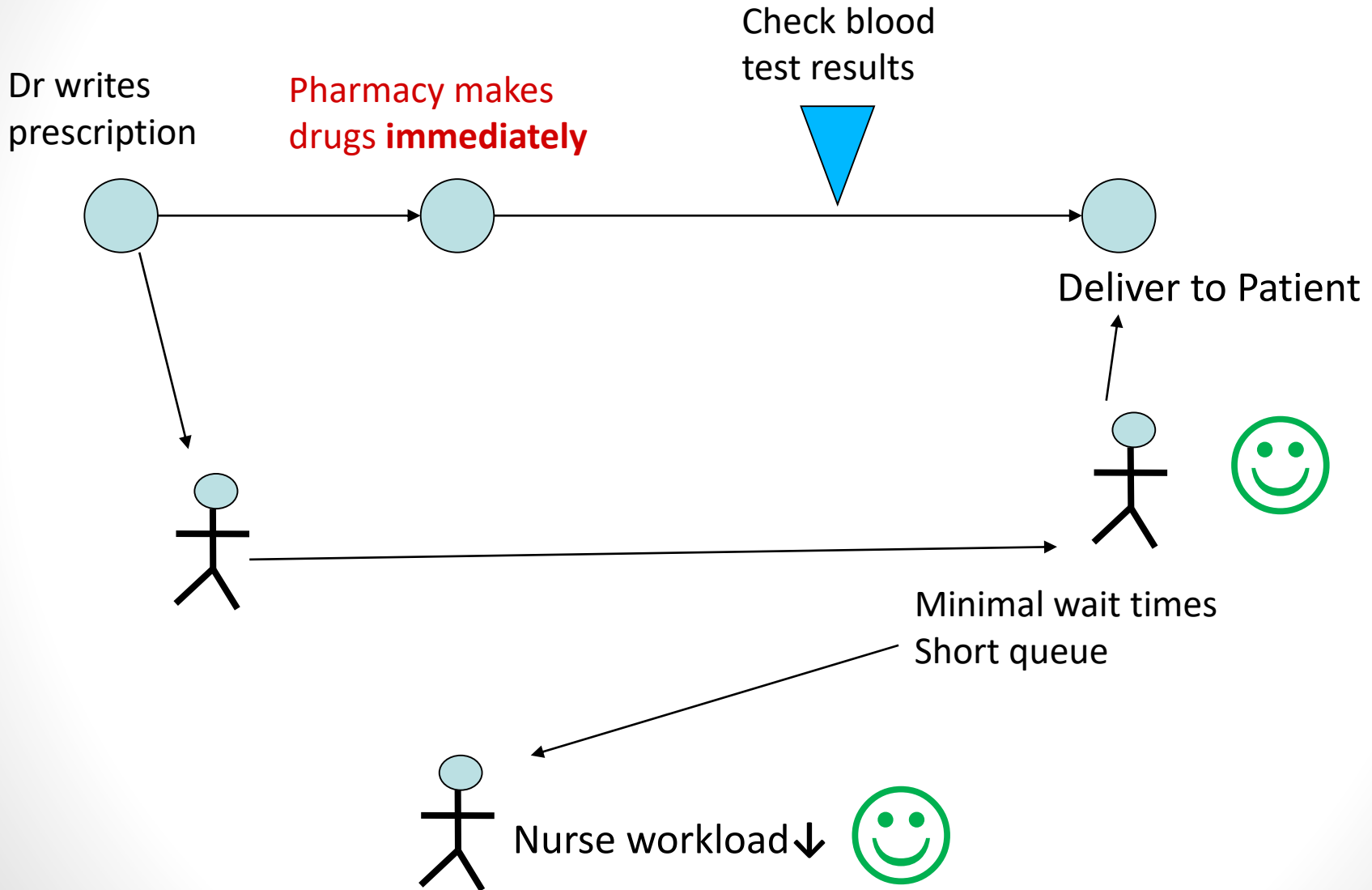
Problem symptoms:

- Long **waiting times** for patients in cancer centre
- Fluctuating workload
  - Idle time and **overtime**
- Increasing **stress levels** for staff

# Problematic situation

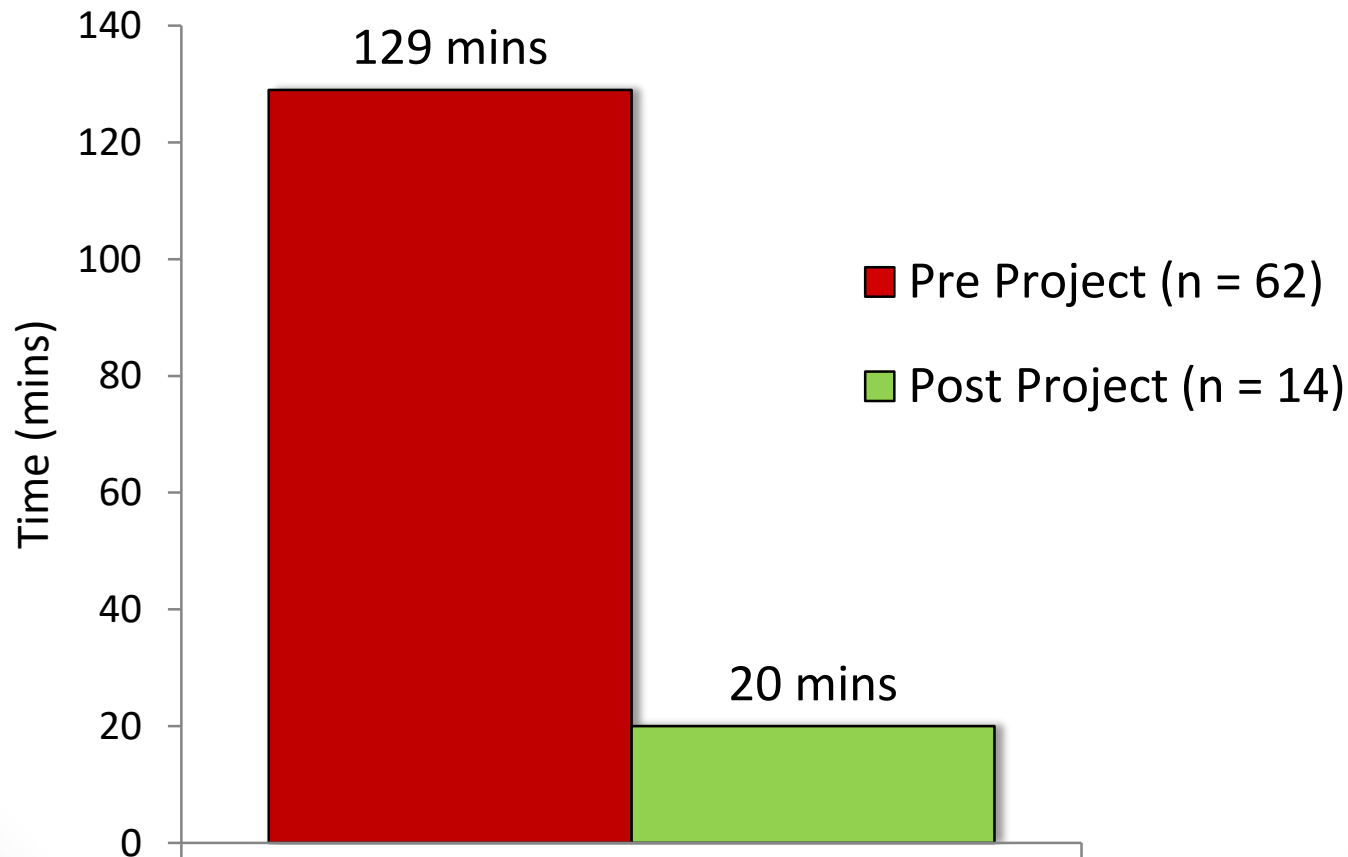


# What to change to? *Pilot solution*



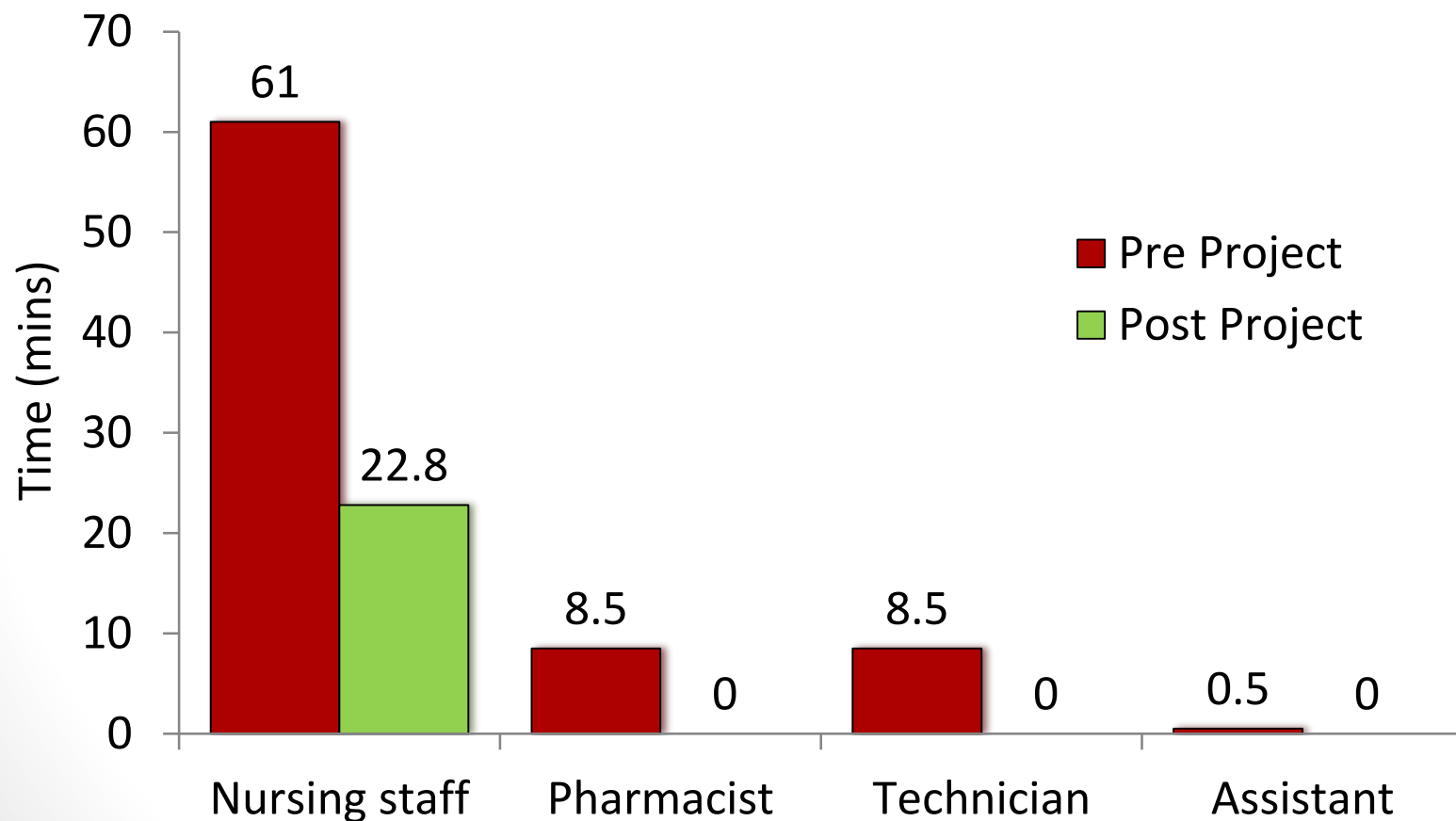
# Impact on Waiting Times

Average Overall Patient Waiting Times Pre and Post Project

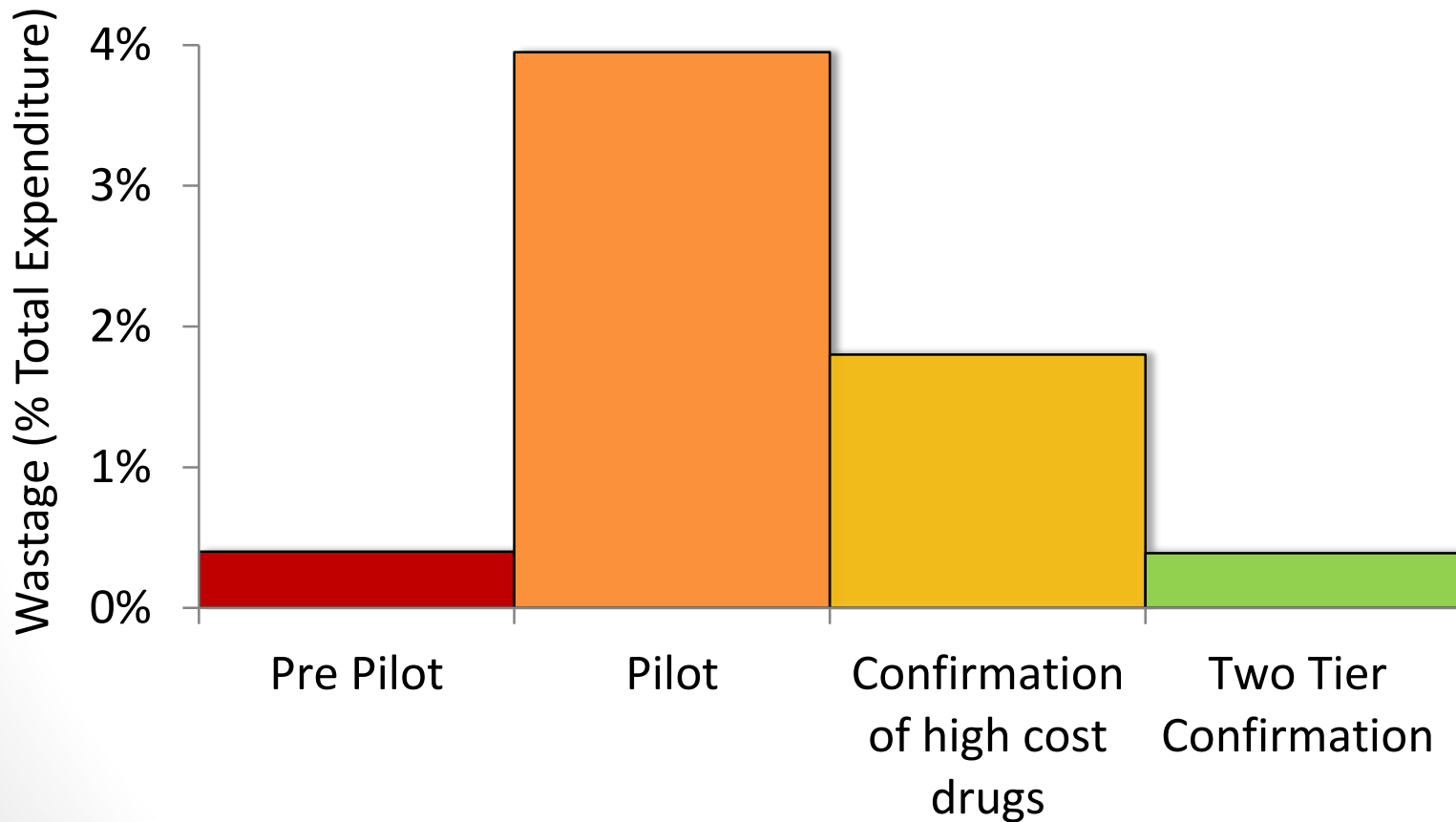




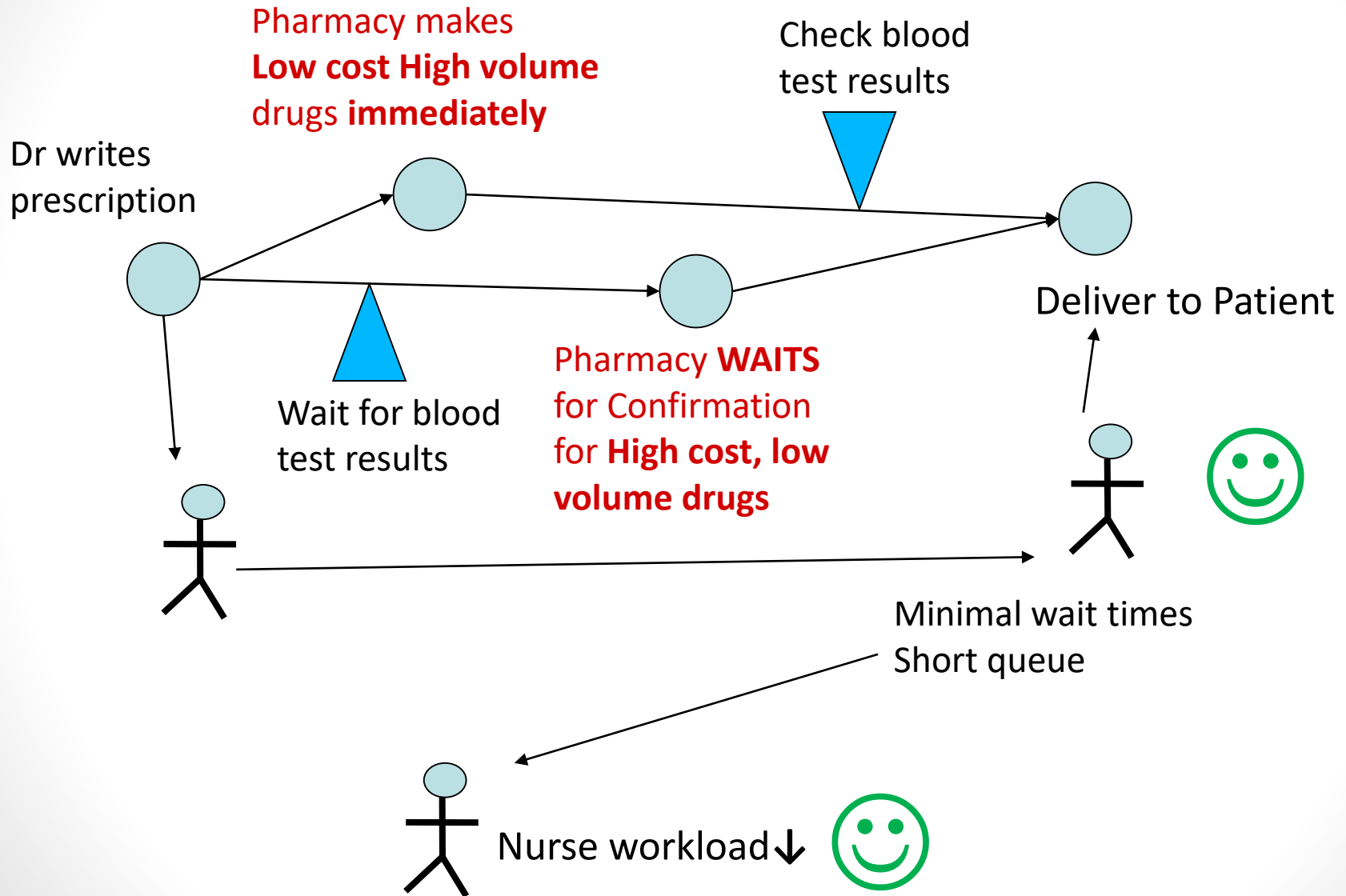
# Impact on Staff Overtime



# Impact on Wastage Cost (% Total Expenditure)



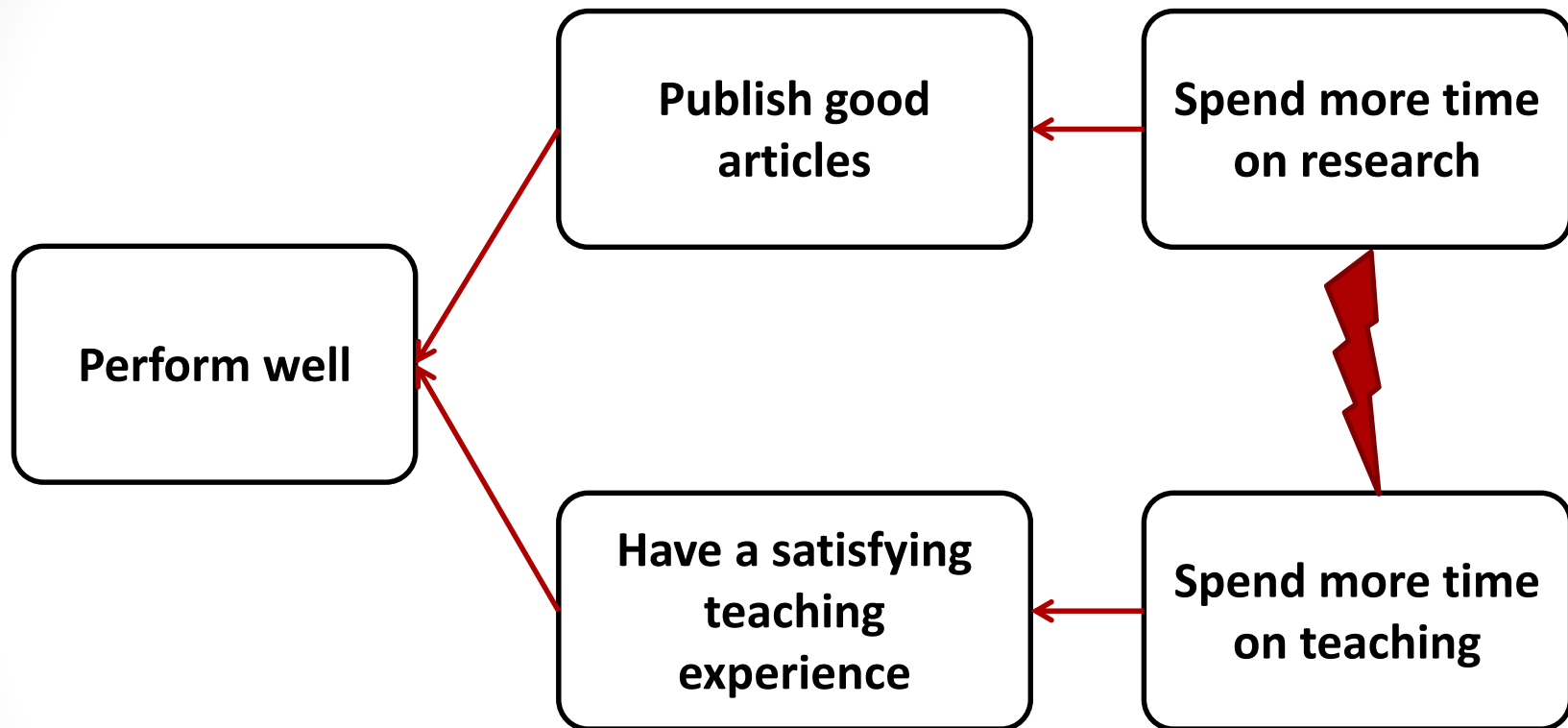
# What to change to? *Win-win solution*



# Education

- TOC for Education – worldwide movement
- At Victoria:
  - Setting up ‘Assurance of Learning’ processes
  - Designing and implementing new policies/operations
  - Regulatory issues: tuition fees/institutional funding
  - Strategic issues: inter-school organisational structure
  - Improving student research thesis completion
  - Improving teaching and learning experiences

# An Academic's Dilemma?



## *Key Questions:*

- *How can we spend more time on teaching AND publish good articles?*
- *How can we spend more time on research AND have a satisfying teaching experience?*

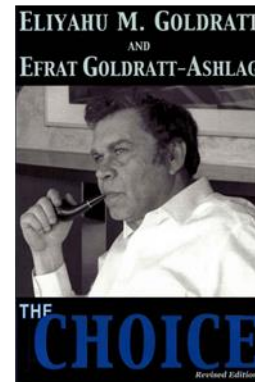
# Goldratt's tenets

*"I smile and start to count on my fingers:*

- 1. people are good*
- 2. every conflict can be removed*
- 3. every situation, no matter how complex it initially looks, is exceedingly simple*
- 4. every situation can be substantially improved; even the sky is not the limit*
- 5. every person can reach a full life*
- 6. there is always a win-win solution*

*Shall I continue to count?"*

*Goldratt (2008) The Choice, North River Press, Greater Barrington, MA, p158*  
*Goldratt and Goldratt-Eshlag (2010) The Choice – Rev Ed. P168.*



# Further Reading

- Dettmer, The Logical Thinking Process
- Scheinkopf, Thinking for a change
- Yean, Thinking Smart
- Cox & Schleier (Eds). TOC Handbook, McGraw-Hill, 2010,
- Cox & Boyd (Eds). TOCICO Dictionary, 2<sup>nd</sup> ed, McGraw-Hill, 2012
- Ronen, Focused operations management for ... health services organizations, Jossey Bass (2006)
- Ricketts, Reaching the Goal: How managers improve a services business using Goldratt's Theory of Constraints, IBM Press, 2008.
- Papers on cases referred to in this talk available on request.

