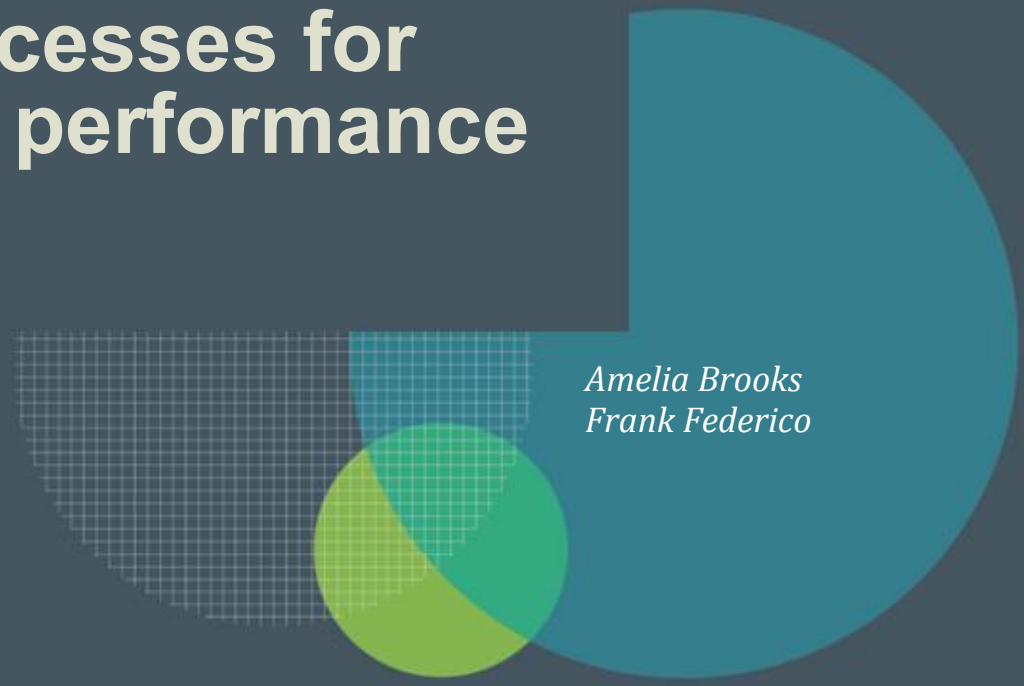
Institute *for* Healthcare Improvement

These presenters have nothing to disclose

Human Factors: How to connect humans with systems and processes for better culture and better performance



Amelia Brooks
Frank Federico

Institute *for* Healthcare Improvement

World Patient Safety Day

17 September 2019

The Institute for Healthcare Improvement (IHI) is joining the World Health Organization (WHO) and other leading organizations around the world to recognize **World Patient Safety Day,** 17 September 2019.

Declaring patient safety to be a global health priority, WHO will use the day to initiate a campaign of building awareness and commitment to improve the safety of health care worldwide.

For this inaugural year, WHO is urging all stakeholders to "Speak Up for Patient Safety." In the spirit of supporting that goal, IHI is pleased to share the following resources.

Human Factors

- Human factors is a discipline dedicated to uncovering and addressing elements of mismatch between people, the tools they have to work with and the environments in which they work.

Why is understanding human factors important to health care?

The Case of Nifedipine Gel Capsule

What Would your Root Causes Analysis Uncover?

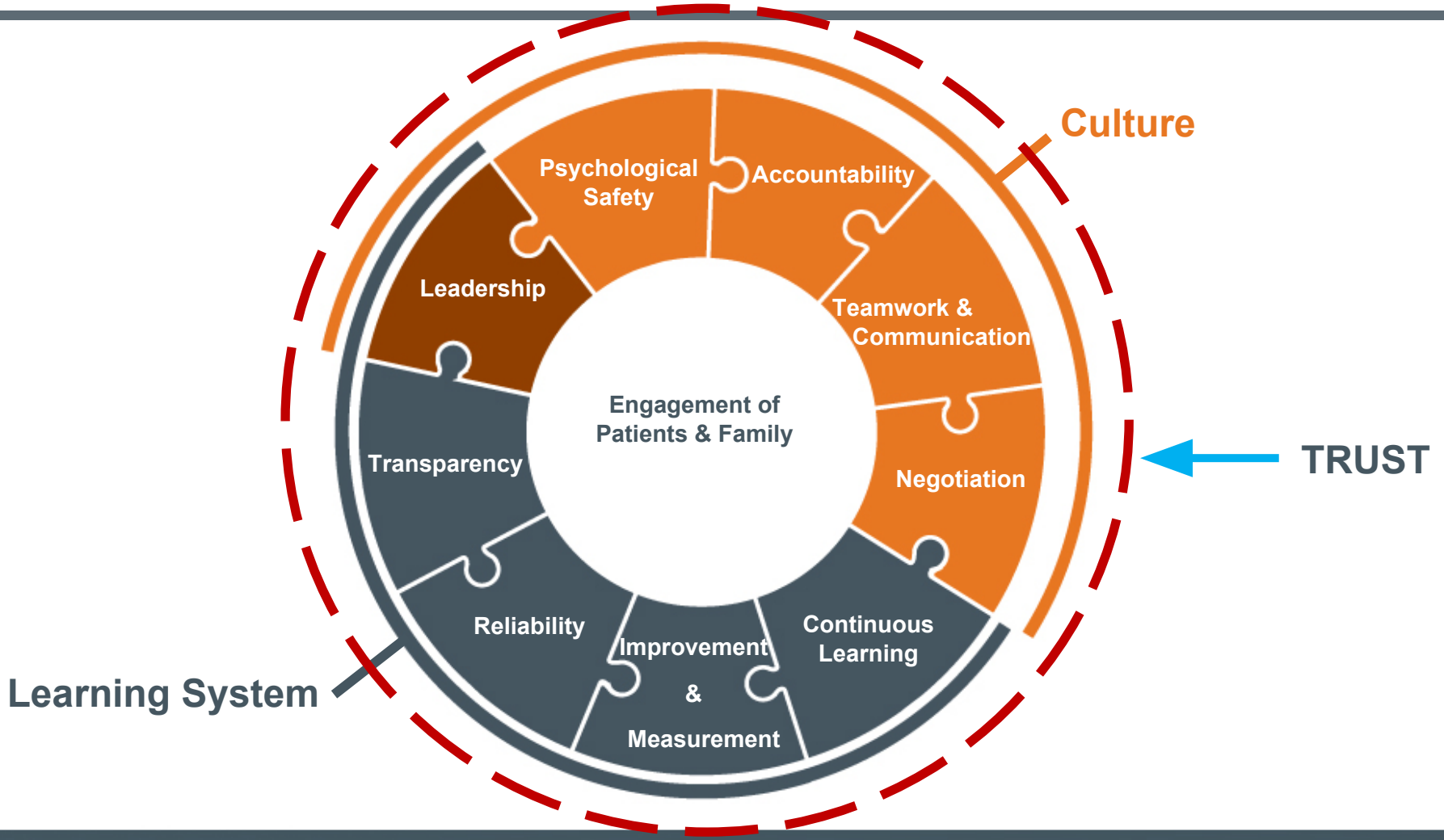
Discovery Questions

- What is the policy?
- Is the nurse competent?
- Does the nurse need retraining?
- Did the nurse have the appropriate education?
- Did we consider what would happen if a nurse has a syringe and needle in hand? Priming?

Would You……

- Ask whether interruptions are a common occurrence?
- Ask about the culture?
- Ask how long this process has been in place?
- Ask whether anyone ever considered what could go wrong and why?
- Test whether the individuals act as a team?

Framework for Safe, Reliable, and Effective Care



Source: Frankel A, Haraden C, Federico F, Lenoci-Edwards J. A Framework for Safe, Reliable, and Effective Care. White Paper. Cambridge, MA: Institute for Healthcare Improvement and Safe & Reliable Healthcare; 2017. (Available at ihi.org)

Some common ‘solutions’

Are they effective?

Some common ‘solutions’

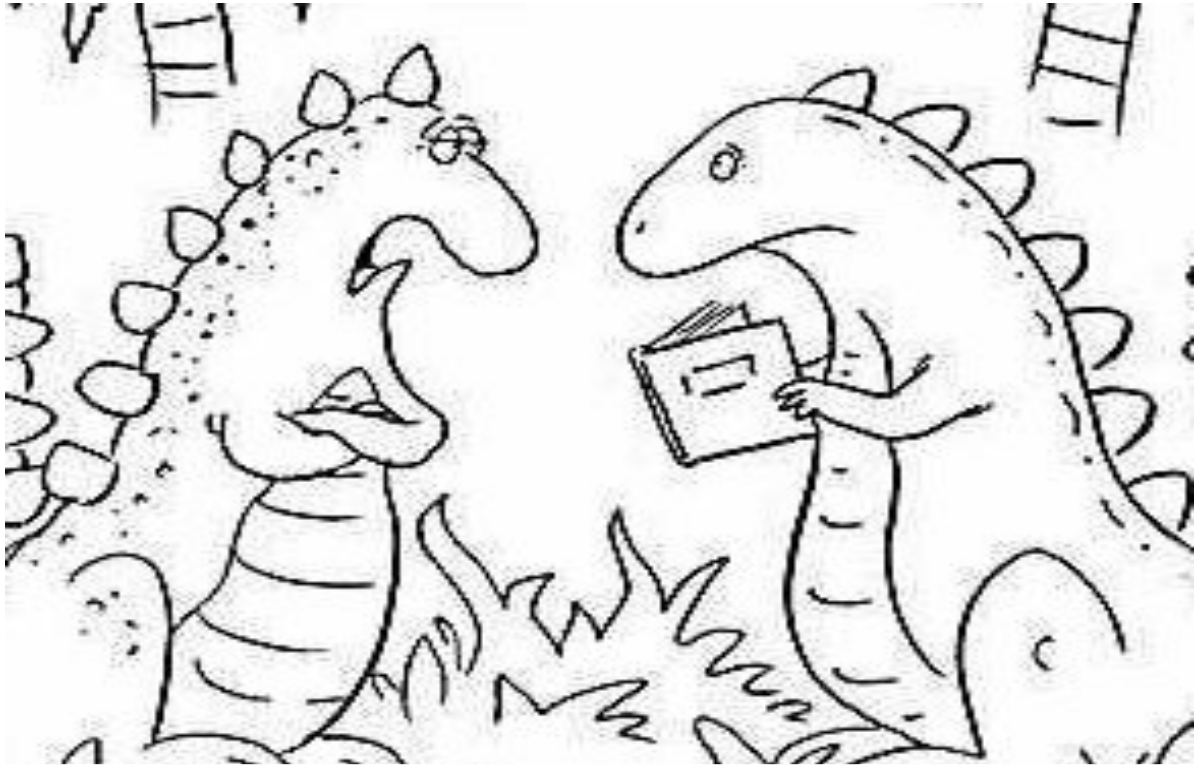
- Update policy/procedure/guideline
  - Email to all
  - Signature on a document
  - Promise compliance

Some common ‘solutions’

- Raise awareness
  - Campaigns
  - Posters
  - Newsletters
  - Briefings

Some common ‘solutions’

- Training & Education
- ***Necessary, but not sufficient***



‘Forget it, no matter how hard you study you’ll never become a thesaurus’

Violation Producing Conditions
Do they exist in your organization?

- Perceived low likelihood of detection
- Inconvenience
- Misperception or lack of recognition of risk
- Authority / status to violate (self-perceived)
- Copying behavior
- No disapproving authority figure present
- Group pressure

{Primary Source Human Error Assessment & Reduction Technique, Jeremy Williams

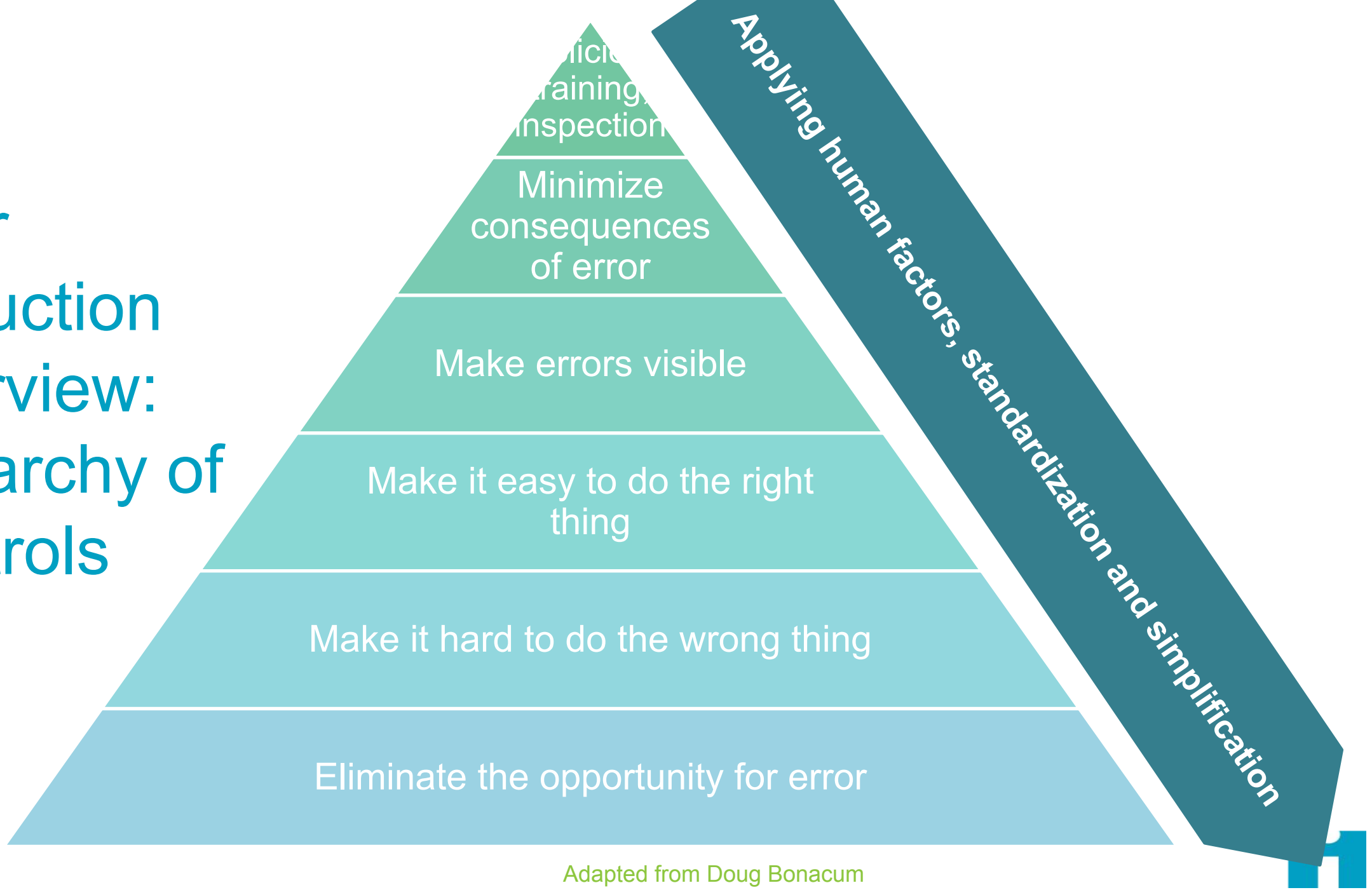
Some of the Drivers of Human Error

- Fatigue
- Boredom
- Frustration
- Shift work
- Injury or illness
- Devices designed in an accident prone fashion
- Noise, heat, clutter, lighting
- Unnatural workflow
- Reliance on memory
- Reliance on training
- Reliance on vigilance
- Assuming communication competence
- Assuming teamwork competence
- Interruptions/distractions
- Processes designed in an accident prone fashion (e.g. overly complex, too many steps)

Cultural Drivers of Human Error

- Lack of trust
- Disrespect & incivility
- Silo working
- Steep authority gradient
- Fear of failure
- Isolation
- Stress
- Burnout

Error Reduction Overview: Hierarchy of Controls



Adapted from Doug Bonacum

Areas to Consider

1. Cognition and mental workload
2. Distractions
3. The physical environment
4. Physical demands
5. Service/product design
6. Teamwork
7. Process design

Specific Error Reduction Strategies

- Use visual controls
- Avoid reliance on memory
- Simplify and Standardize
- Use constraints/forcing functions
- Use protocols and checklists
- Improve access to information
- Reduce handoffs
- Decrease look-alike / sound-alikes
- Automate carefully
- Reduce interruptions and distractions
- Take advantage of habits and patterns
- Promote effective team functioning

Human Error

‘We can’t change the human condition, but we can change the conditions under which humans work’

James Reason

Reflection

Humanity in Healthcare

Putting the Person back in Personnel

Prof Lee Chien Earn & Dr Syahid Hassan, PhD

17 Sep 2019

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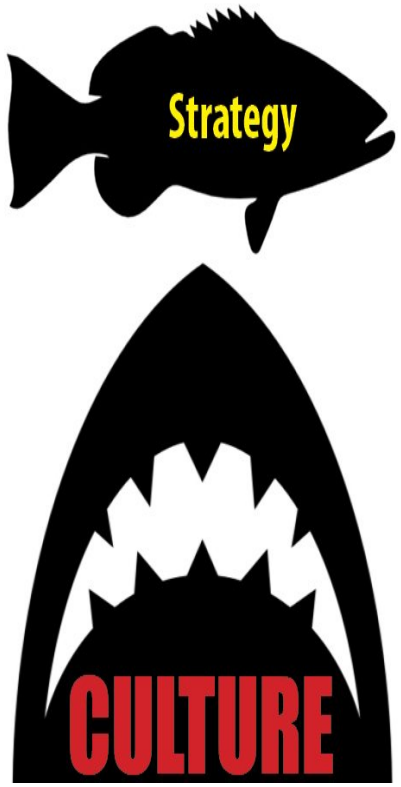
Eliminating ~~Human~~ Error

Part of the
☑ Problem
☐ Solution

HUMANS AS PART OF THE PROBLEM



Source: http://english.cri.cn/12394/2014/12/22/2743s857735.htm

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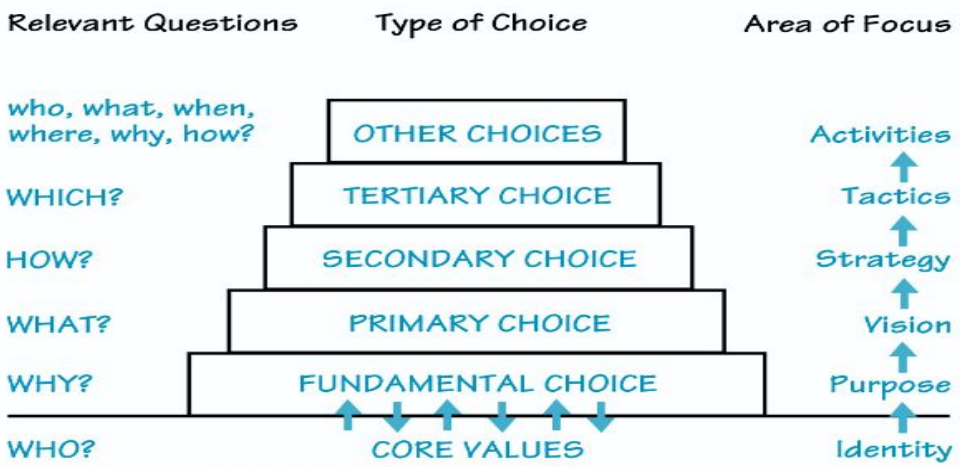
HUMANS AS PART OF THE SOLUTION



"The source of energy at work is not in control, it is in connection to purpose."

Comprehensible, Manageable and Meaningful

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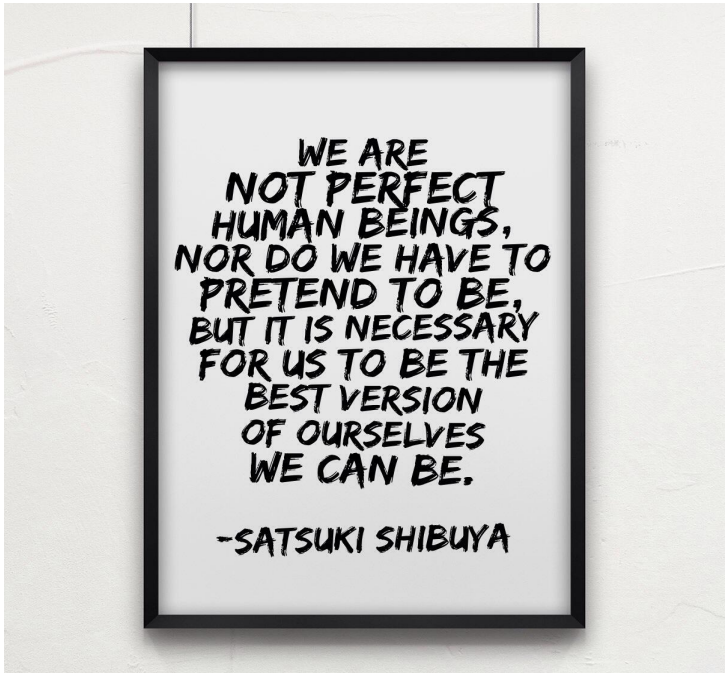
PURPOSE

Our Mission

To deliver the BEST patient care with passion and empathy

- A choice and commitment
- Learn, Unlearn, Relearn



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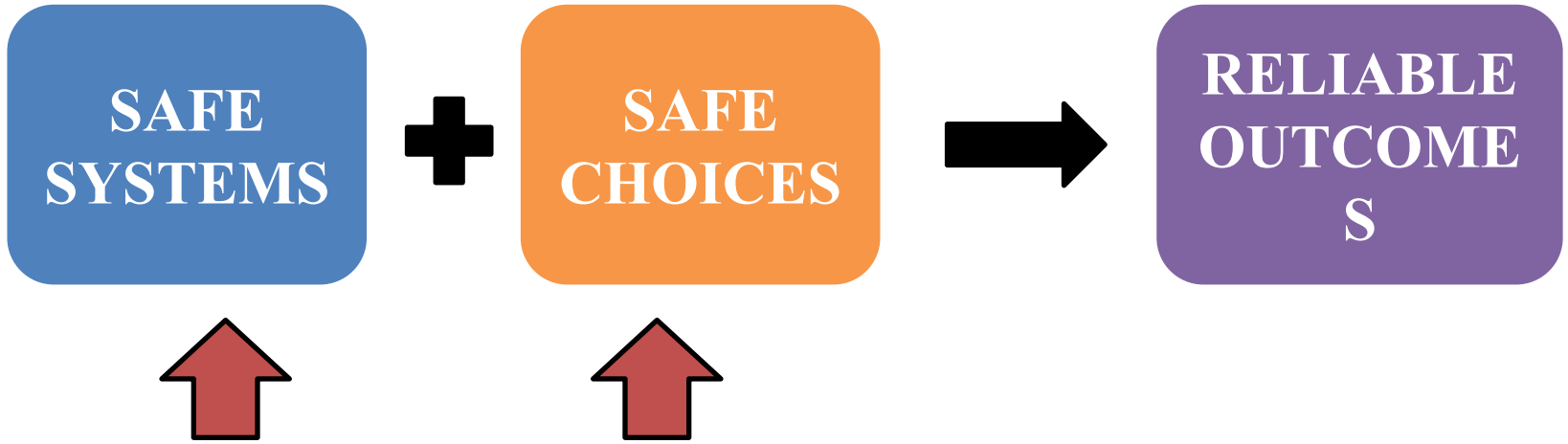
JUST AND LEARNING CULTURE

Organization has a responsibility to employees (and ultimately to patients)

Staff accountable for the quality of choices they make regardless of the outcome

Shared Accountability



ENABLED BY GOOD HUMAN-CENTERED DESIGN

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Just Culture and Human Error

Reckless Behavior:
Knows the act is unsafe and unjustifiable, but does it anyway

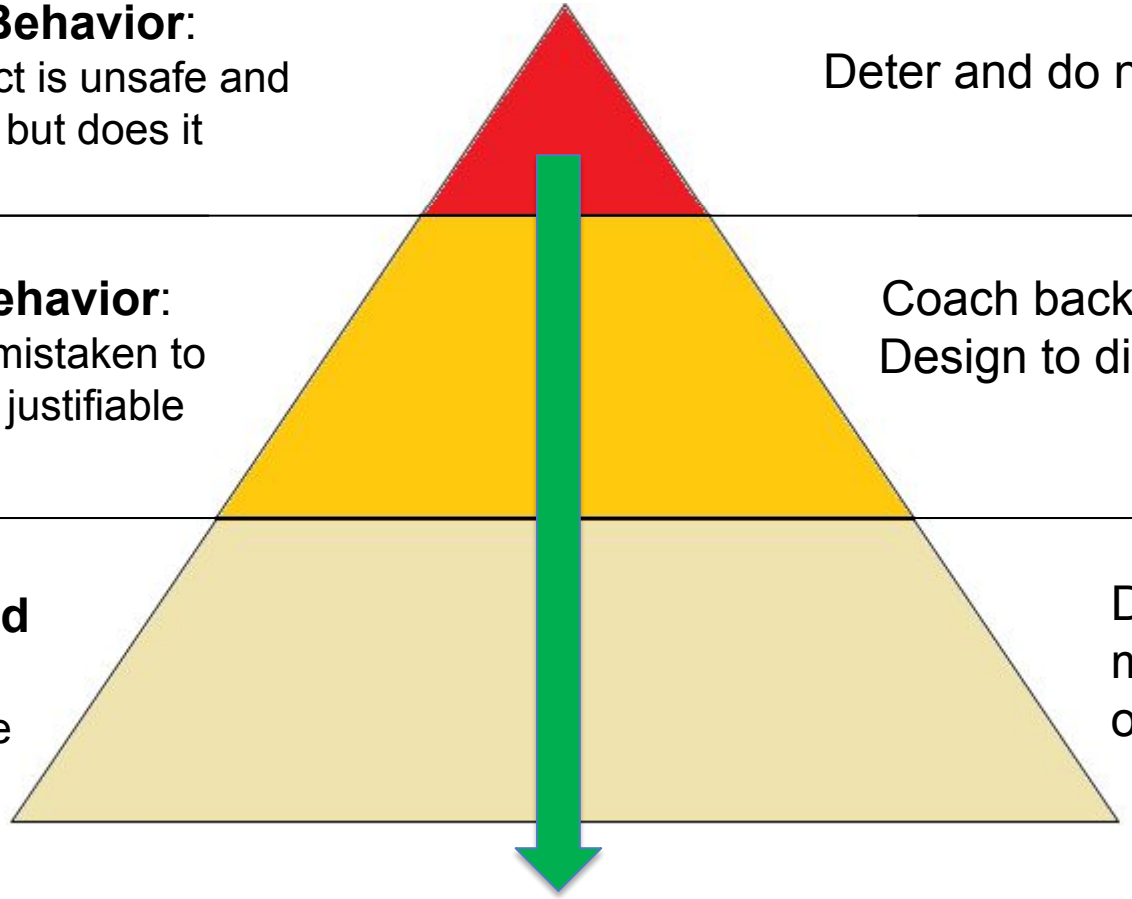
Deter and do not tolerate

At-Risk Behavior:
Unsafe act mistaken to be safe and justifiable

Coach back to safe act
Design to disincentives

Slips, lapses and mistakes
despite safe choices

Design to minimize or mitigate



A learning culture throughout the organization

Sources:
Just Culture (Outcome Engenuity)
Enterprise Risk Management Handbook for Healthcare Entities (2nd Edition), American Health Lawyers Association

PSYCHOLOGICAL SAFETY

- Define Assumptions
- Examine Assumptions
- Challenge Assumptions

Single-Loop Learning
The most common style of learning i
just problem solving – improving the
system as it exists.

Assumptions
Why We Do What We Do

Strategies and Techniques
What We Do

Results
What we Get

Double-Loop Learning
More than just fixing the problem, this style of learning questions the underlying assumptions, values and beliefs behind what we do.

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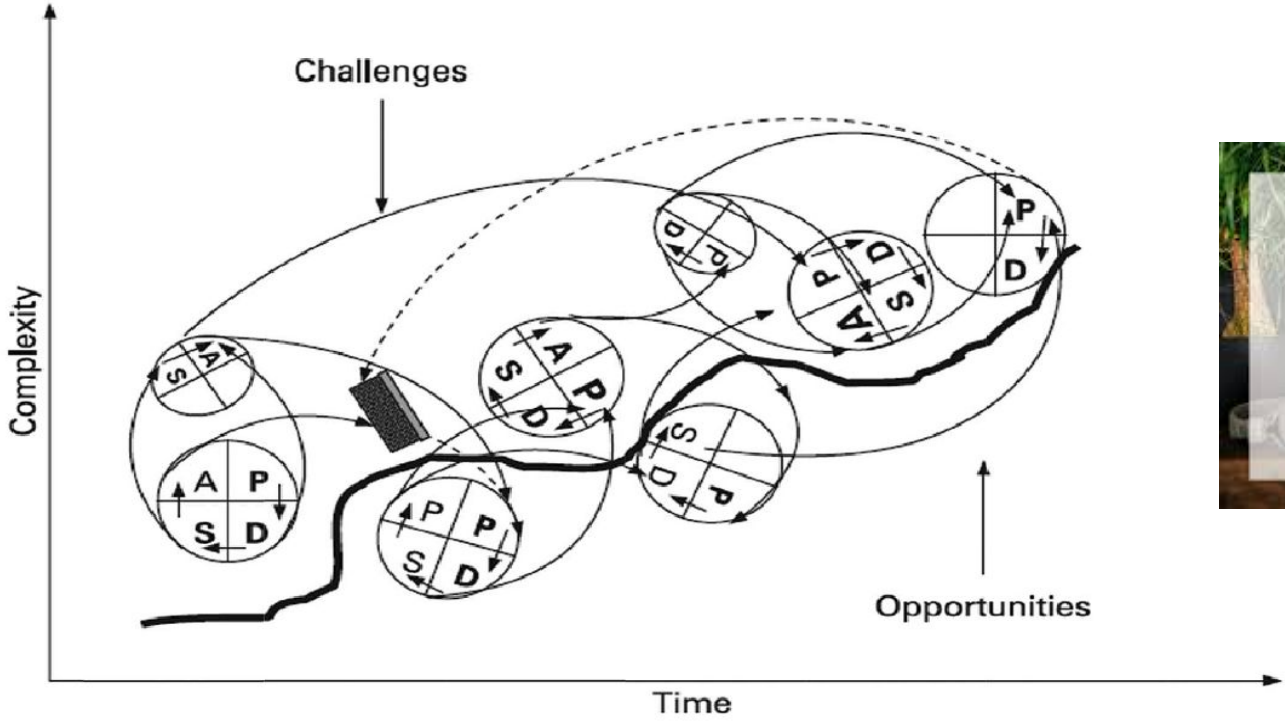
FOCUS ON LEARNING, NOT PERFECTION

Learning Organisations are places "where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together."



WHAT HUMAN FACTORS IS

Create **good "fit"** between the human and system based on an understanding of the **interaction between system design and human abilities & limitations**

SAY OUT THE COLOURS OF THE WORDS

TASK AIM: Before the mic drops, say out the **colours** of the words in the black boxes, from top to bottom

Say

PRACTIC
E

"green"

HAS

"blue"

ICON

"red"

POLAR

SAY OUT THE COLOURS OF THE WORDS

TASK AIM: Before the mic drops, say out the **colours** of the words in the black boxes, from top to bottom

TEST No.1:
READY?

FLIP

STUNT

CAP

IMPORT

NICE

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SAY OUT THE COLOURS OF THE WORDS

TASK AIM: Before the mic drops, say out the **colours** of the words in the black boxes, from top to bottom

TEST No.2:
READY?

RED

YELLOW

PURPLE

GREEN

BLUE

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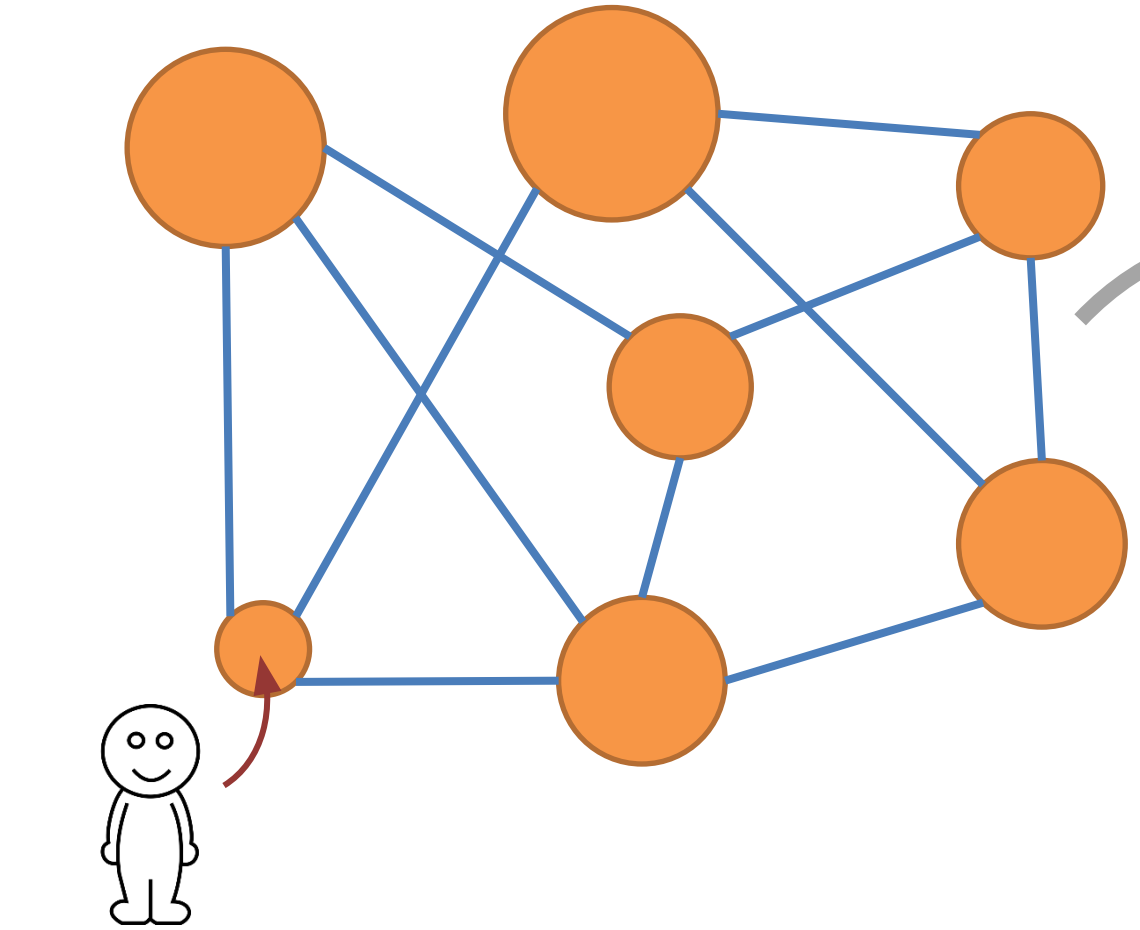
SYSTEMS THINKING



HUMAN

Goals, Needs,
Abilities & Limitations

OUTCOME

Every system is perfectly designed to get the results it gets

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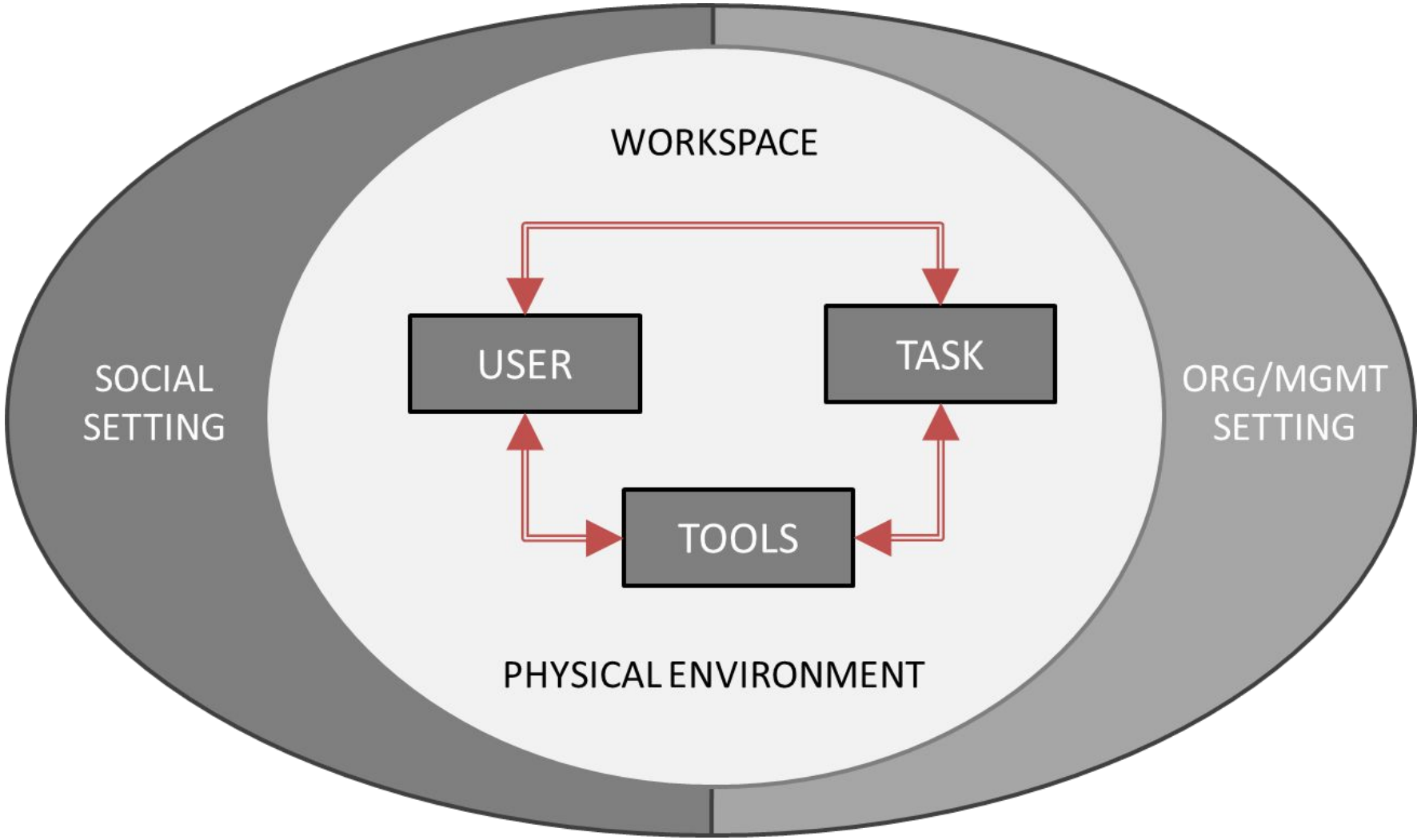
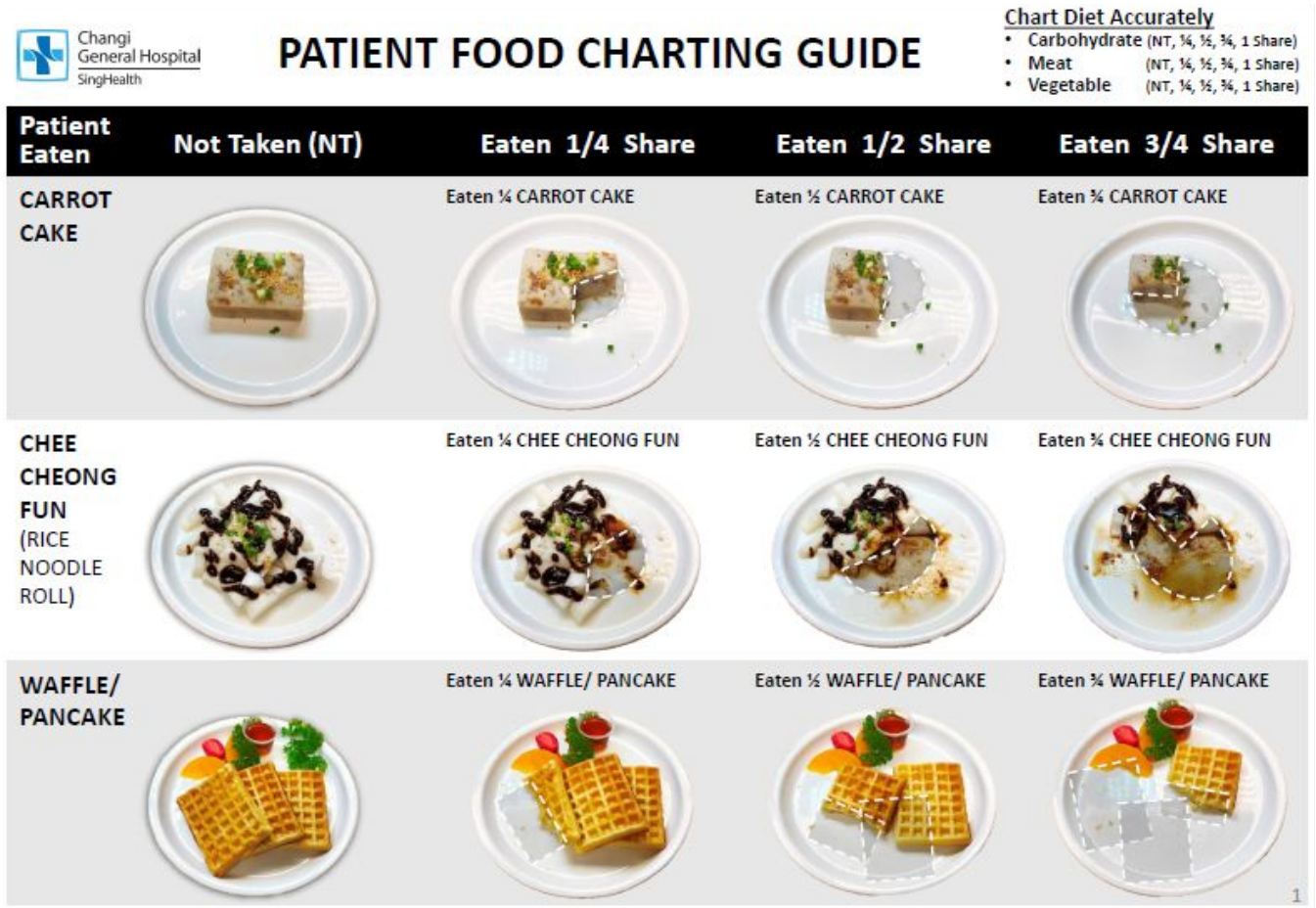
SOCIO-TECHNICAL SYSTEM THINKING



PATIENT-CENTERED COMMUNICATION DESIGN



"Match the real world" visual design facilitate accurate communication and charting of food consumption

Credit: CGH Dietetic Consultation

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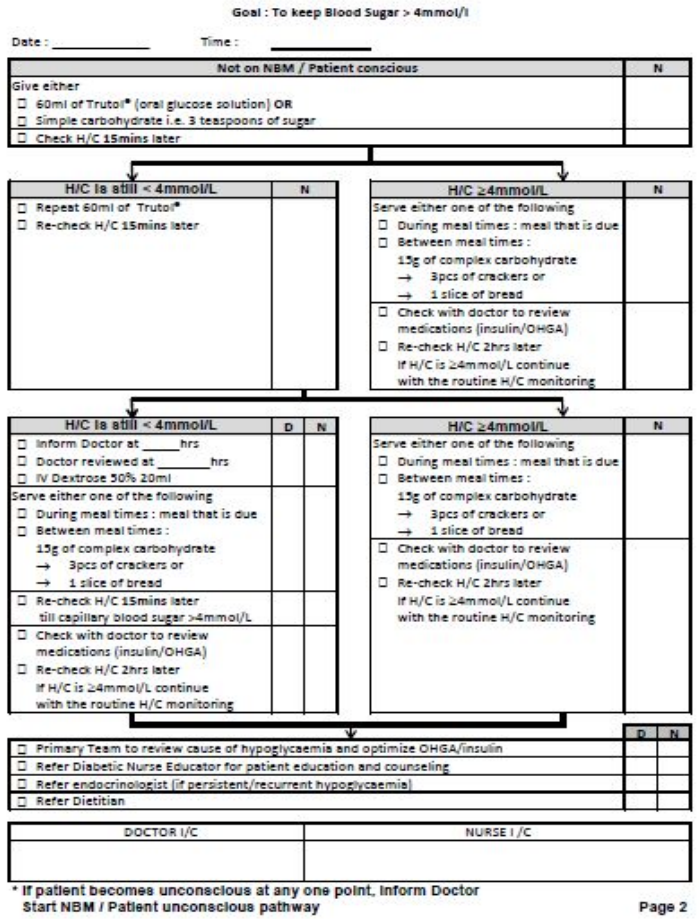
STAFF-CENTERED DECISION AID DESIGN



Goal : To keep Blood Sugar > 4mmol/l

Date : _____ Time : _____

Not on NBM / Patient conscious	N
Give either ☐ 60ml of Trutol® (oral glucose solution) OR ☐ Simple carbohydrate i.e. 3 teaspoons of sugar ☐ Check H/C 15mins later	

H/C is still < 4mmol/L	N
☐ Repeat 60ml of Trutol® ☐ Re-check H/C 15mins later	

H/C ≥4mmol/L	N
Serve either one of the following ☐ During meal times : meal that is due ☐ Between meal times : 15g of complex carbohydrate → 3pcs of crackers or → 1 slice of bread	
☐ Check with doctor to review medications (insulin/OHGA) ☐ Re-check H/C 2hrs later If H/C is ≥4mmol/L continue with the routine H/C monitoring	

H/C is still < 4mmol/L	D	N
☐ Inform Doctor at ____hrs ☐ Doctor reviewed at _____hrs ☐ IV Dextrose 50% 20ml		
Serve either one of the following ☐ During meal times : meal that is due ☐ Between meal times : 15g of complex carbohydrate → 3pcs of crackers or → 1 slice of bread		
☐ Re-check H/C 15mins later till capillary blood sugar >4mmol/L		
☐ Check with doctor to review medications (insulin/OHGA) ☐ Re-check H/C 2hrs later If H/C is ≥4mmol/L continue with the routine H/C monitoring		

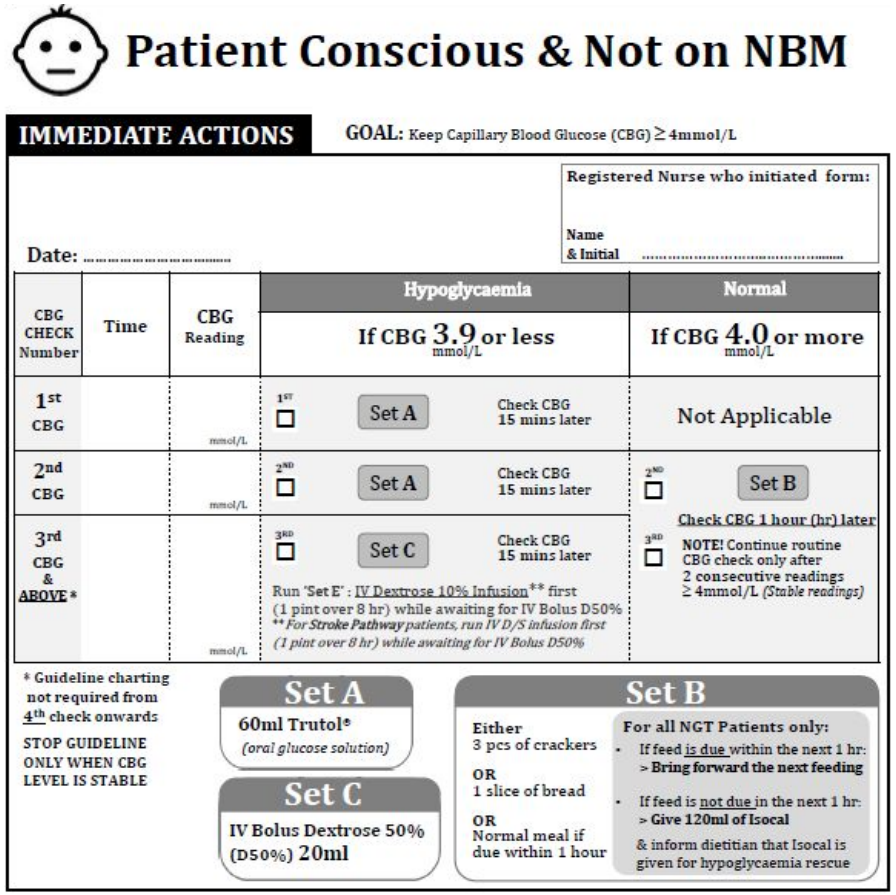
H/C ≥4mmol/L	N
Serve either one of the following ☐ During meal times : meal that is due ☐ Between meal times : 15g of complex carbohydrate → 3pcs of crackers or → 1 slice of bread	
☐ Check with doctor to review medications (insulin/OHGA) ☐ Re-check H/C 2hrs later If H/C is ≥4mmol/L continue with the routine H/C monitoring	

	D	N
☐ Primary Team to review cause of hypoglycaemia and optimize OHGA/insulin		
☐ Refer Diabetic Nurse Educator for patient education and counseling		
☐ Refer endocrinologist (if persistent/recurrent hypoglycaemia)		
☐ Refer Dietitian		

DOCTOR I/C	NURSE I/C

* If patient becomes unconscious at any one point, inform Doctor
Start NBM / Patient unconscious pathway

Page 2



Patient Conscious & Not on NBM

IMMEDIATE ACTIONS GOAL: Keep Capillary Blood Glucose (CBG) ≥ 4mmol/L

Registered Nurse who initiated form:
Name & Initial .....

Date: .....

CBG CHECK Number	Time	CBG Reading	Hypoglycaemia If CBG 3.9 or less mmol/L	Normal If CBG 4.0 or more mmol/L
1st CBG		mmol/L	1ST ☐ Set A — Check CBG 15 mins later	Not Applicable
2nd CBG		mmol/L	2ND ☐ Set A — Check CBG 15 mins later	2ND ☐ Set B Check CBG 1 hour (hr) later
3rd CBG & ABOVE *		mmol/L	3RD ☐ Set C — Check CBG 15 mins later Run 'Set E' : IV Dextrose 10% Infusion** first (1 pint over 8 hr) while awaiting for IV Bolus D50% ** *For Stroke Pathway patients, run IV D/S infusion first (1 pint over 8 hr) while awaiting for IV Bolus D50%*	3RD ☐ NOTE! Continue routine CBG check only after 2 consecutive readings ≥ 4mmol/L *(Stable readings)*

* Guideline charting not required from 4th check onwards

STOP GUIDELINE ONLY WHEN CBG LEVEL IS STABLE

Set A
60ml Trutol®
(oral glucose solution)

Set C
IV Bolus Dextrose 50% (D50%) 20ml

Set B
Either
3 pcs of crackers
OR
1 slice of bread
OR
Normal meal if due within 1 hour

For all NGT Patients only:
- If feed is due within the next 1 hr: > Bring forward the next feeding
- If feed is not due in the next 1 hr: > Give 120ml of Isocal

& inform dietitian that Isocal is given for hypoglycaemia rescue

Information grouping and graphical design eases understanding of algorithm

Credit: CGH Hypoglycaemia Prevention Team

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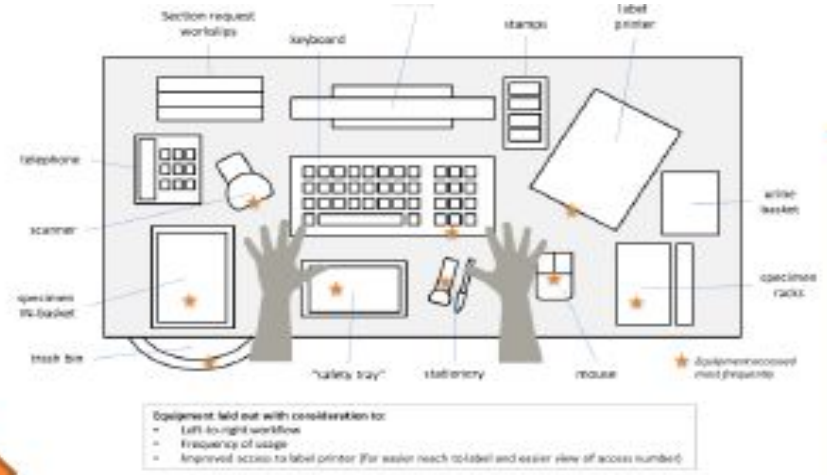
STAFF-CENTERED TASK & WORKDESK DESIGN

Old Processing desks



New Processing desks

Items placed to facilitate efficient flow of motions

Credit: CGH Core Lab Processing Team

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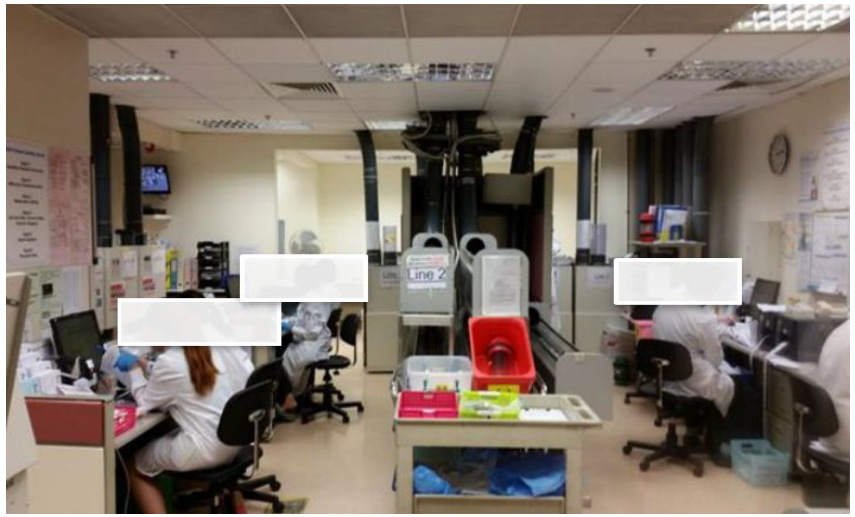
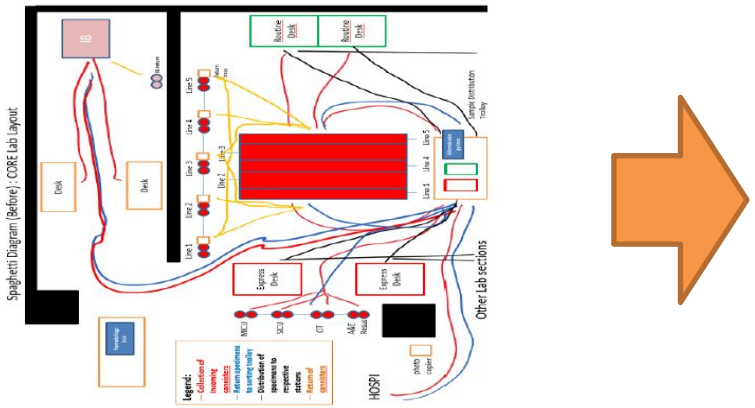
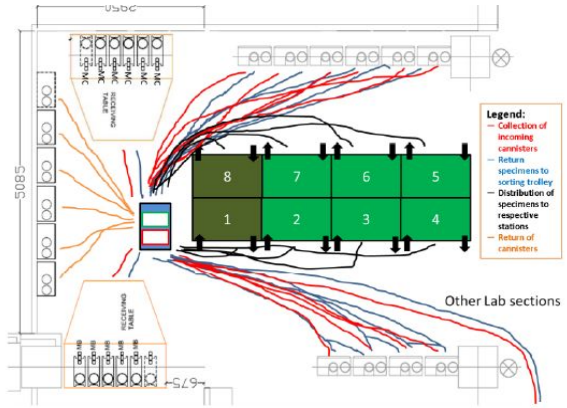
STAFF-CENTERED TEAMWORK & WORKSPACE DESIGN



Distributed outward facing desks

Clustered central facing desks





Credit: CGH Core Lab Processing Team

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PATIENT-CENTERED MODEL OF CARE & SPACE DESIGN

Empowering patients to return to normalcy and wellness

"Cluster housing" ward concept with common dining, family area and rehab to encourage interactivity and peer support amongst patients

Pre-discharge Rehab in mock-up HDB apartment

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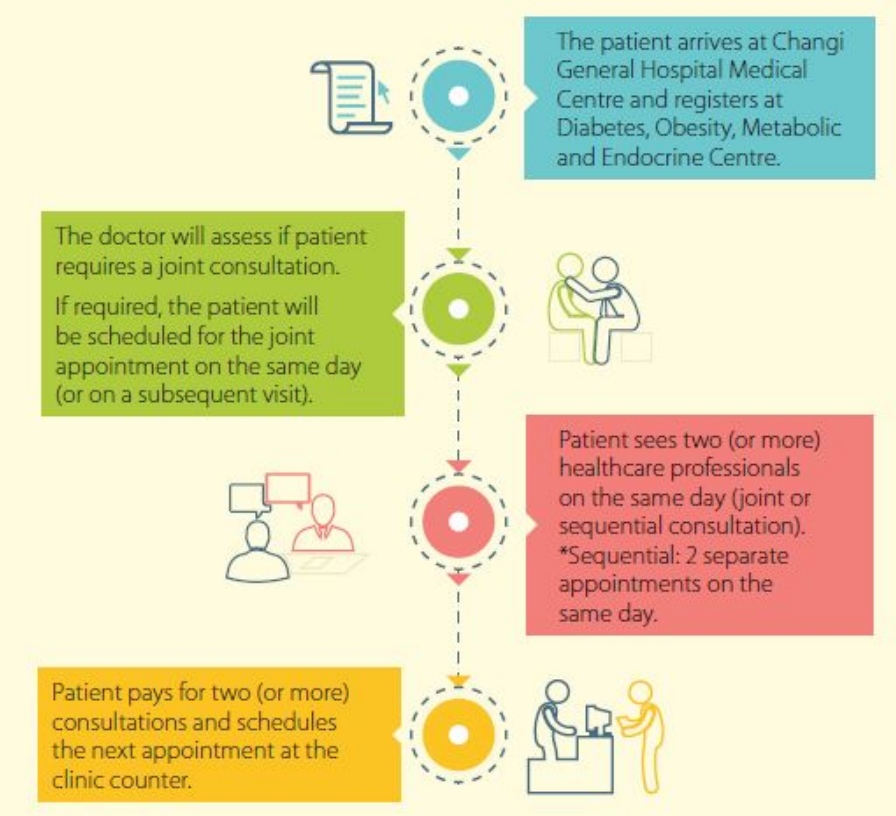
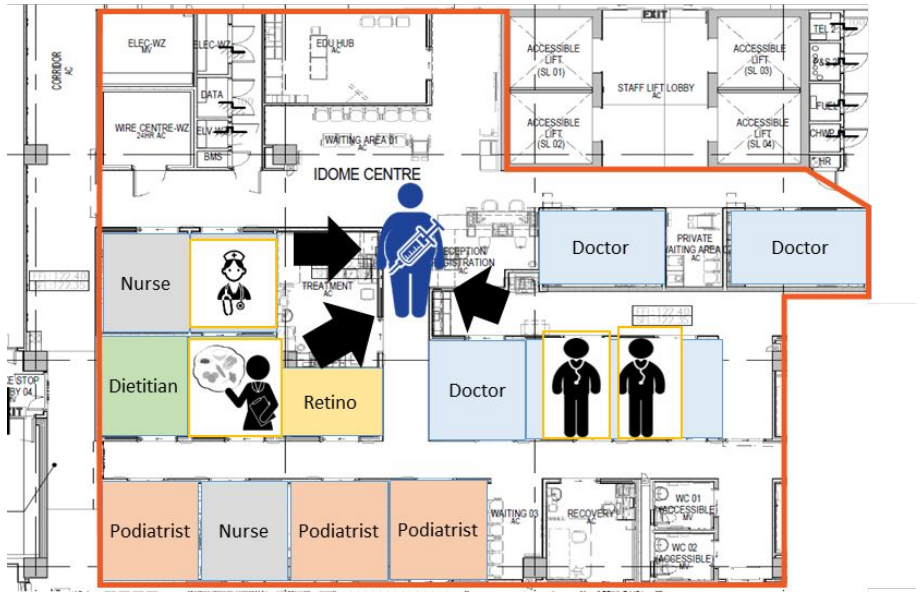
PATIENT-CENTERED MODEL OF CARE & SPACE DESIGN

Integrated Multi-Specialty Practice: One-Stop Centre for Patient



Aligned clinical protocol for same condition across specialties

Diabetes, Obesity, Metabolic and Endocrine Centre



Infrastructure design facilitates cross-corridor consultation and collaboration

Allows patient to experience integrated care, save travel time, receive diagnosis & treatment earlier

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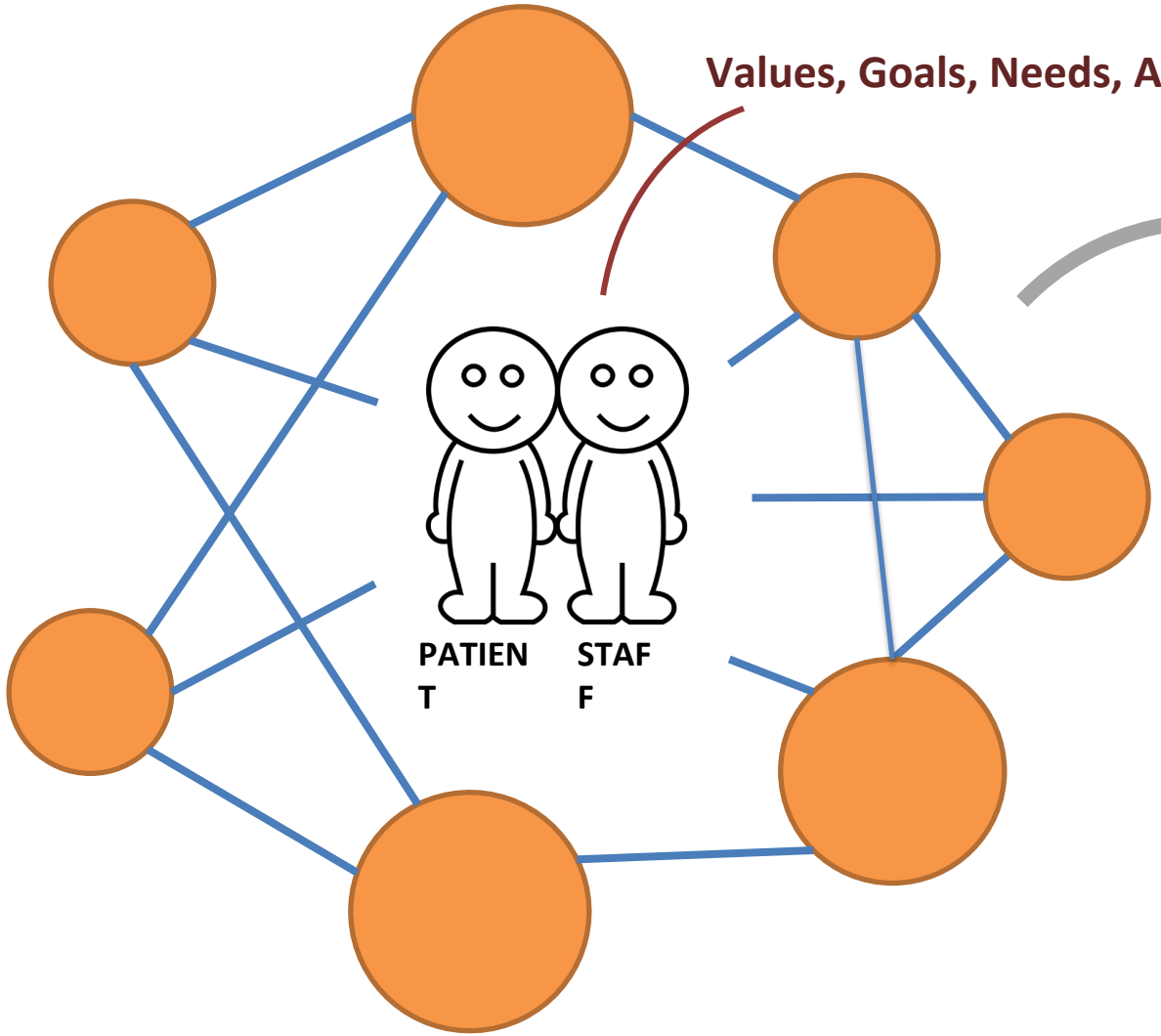
HUMAN-CENTERED SYSTEMS



OUTCOME

Every socio-technical system is perfectly designed to get the human performance, errors & experience it gets

Thank you

Questions/Comments