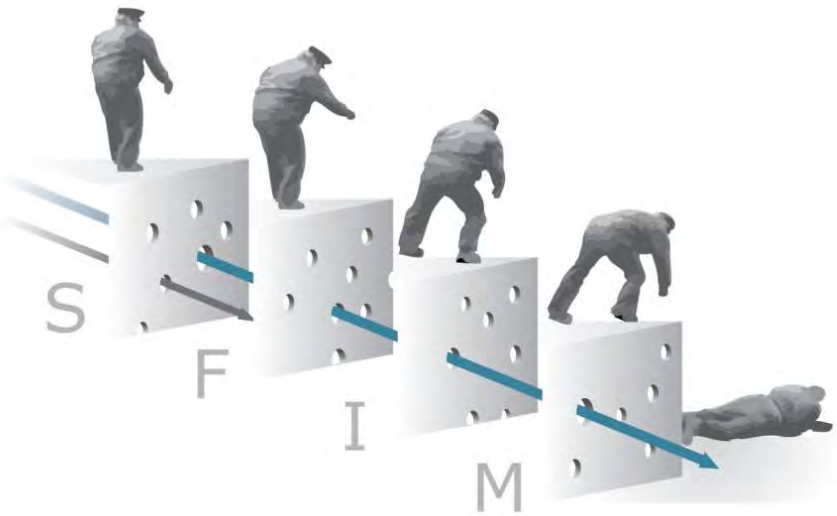
The Art and Science of Fall Prevention
Focus 2012; 11the Annual Conference for Health Providers and Division of Quality Assurance Staff
November 28-29, 2012; Kalahari Convention Center, Wisconsin Dells, Wisconsin

The CSI of a Fall

A Systems Approach to Investigating Causes of Falls



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Western HealthSciences

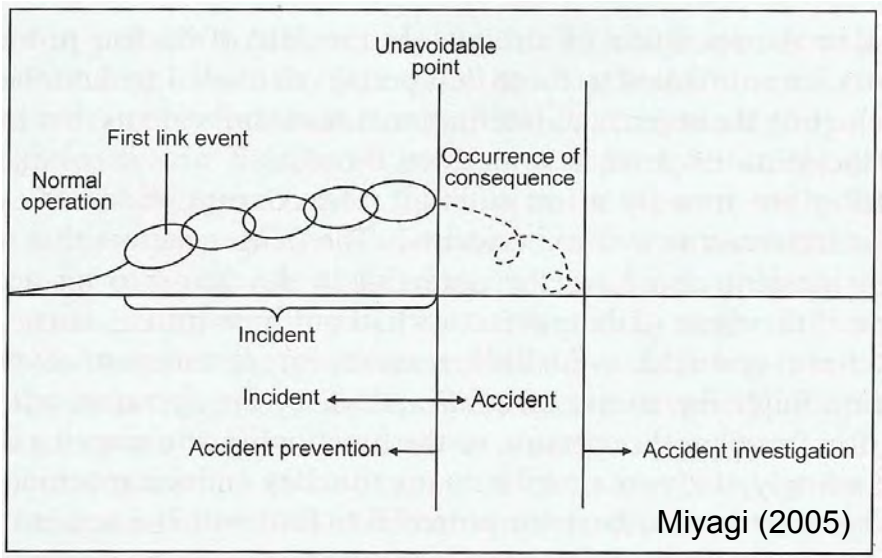
Objectives

At the end of this presentation you will be able to:

1. Differentiate risk factors from causes of falling
2. Distinguish between person and systems approaches to falls prevention
3. Recognize Systemic Falls Investigative Method (SFIM)
4. Be aware of safety culture and components of positive safety culture in health care
5. Understand how SFIM contributes to improvement of safety culture
6. Correctly answer all quiz questions

Persons vs. System Approach

The purpose of an accident investigation is to learn from failure and advance safety.



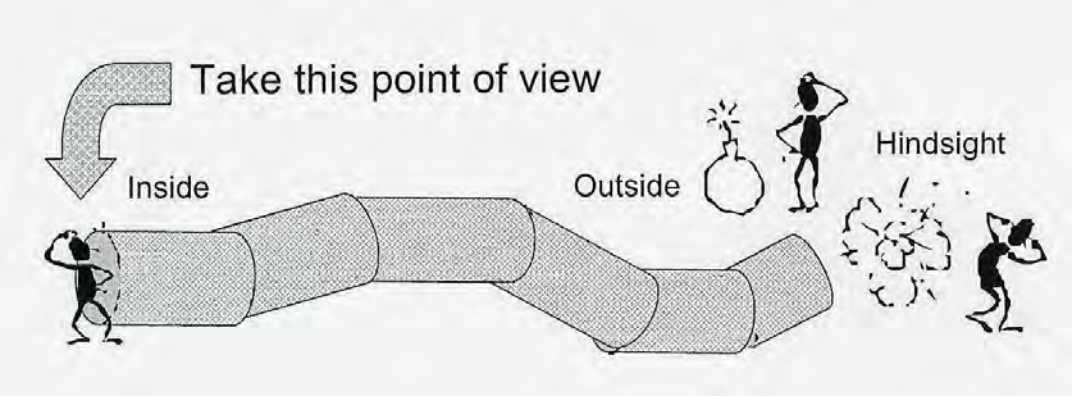
Miyagi (2005)

Investigate how people's assessments and actions made sense in the given circumstances.

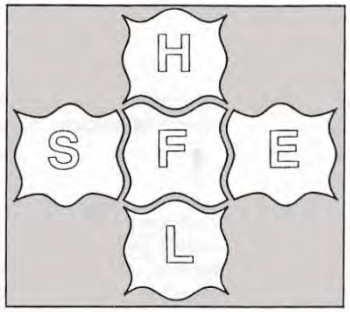
How did people get caught in an Error Trap?

Decker (2002)

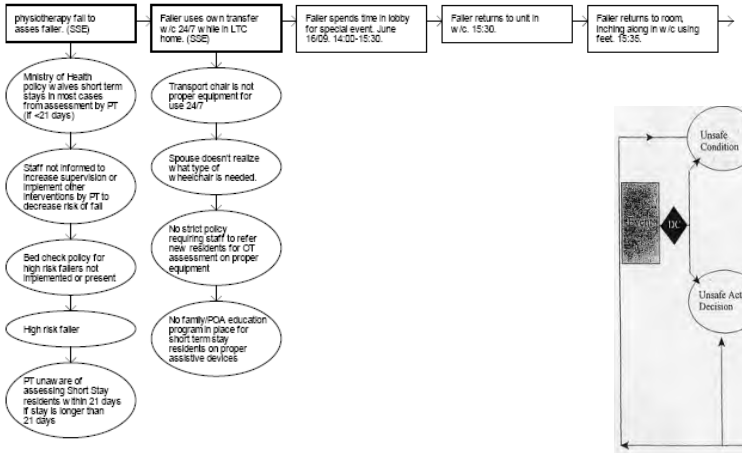
Human error is a symptom of trouble deeper in the system!



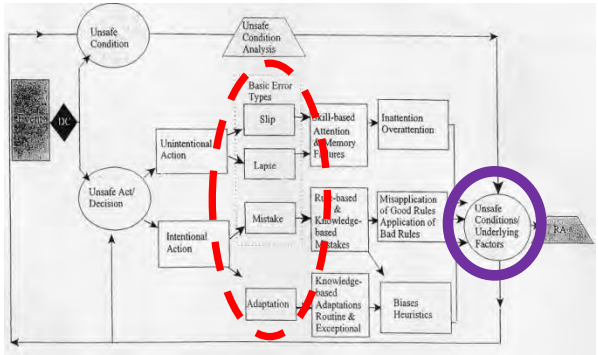
Systemic Falls Investigative Method (SFIM)



1. F-SHEL data collection tool



2. Sequence of Events



3. GEMS – Generic Error Modeling System

4. Swiss Cheese Model of Accident Causation

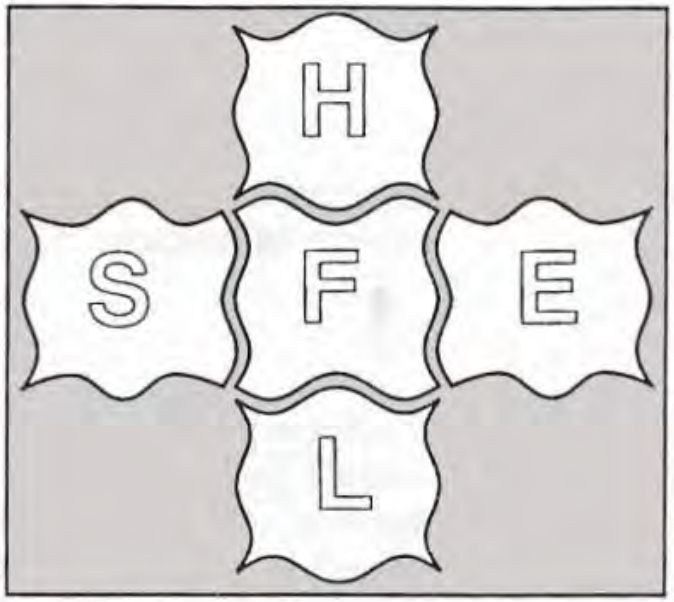
5. Identify safety deficiencies

6. Develop safety action

Zecevic et al. (2007), Canadian Journal on Aging

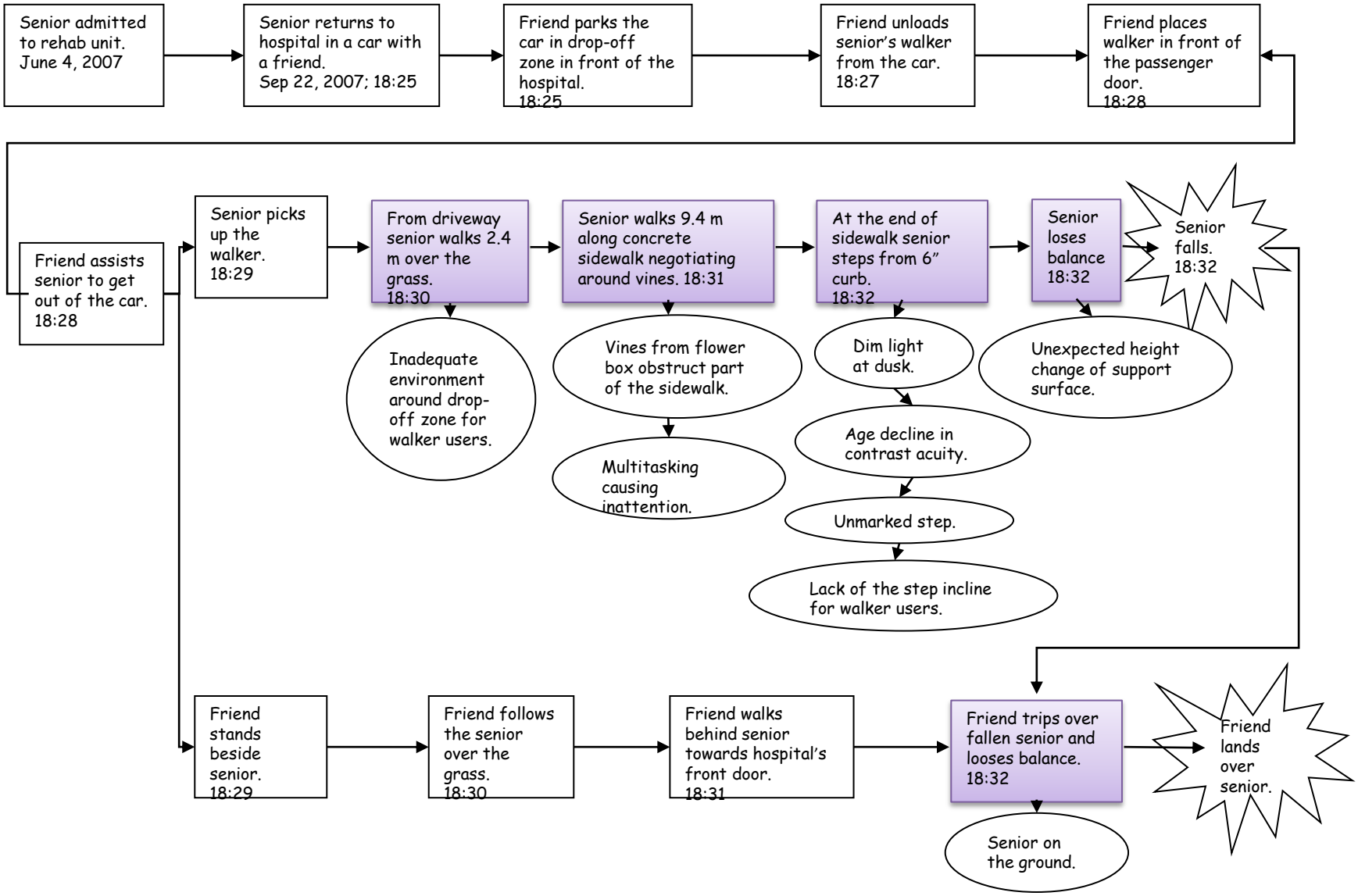
1. F-SHEL data collection tool

F = The Faller
S = Software
H = Hardware
E = Environment
L = Liveware

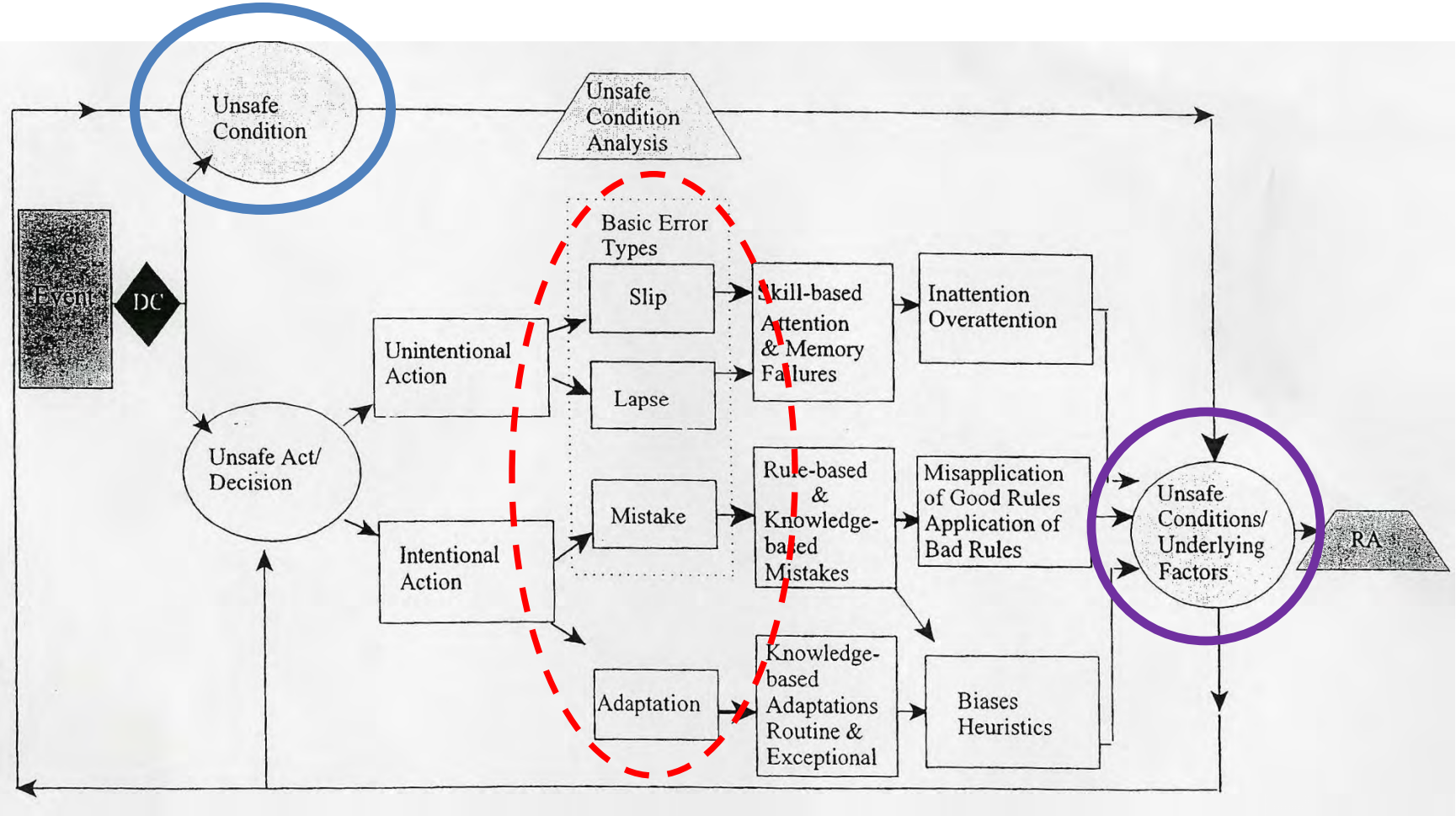


Edwards (1972),Hawkins (1993)

2. Sequence of Events

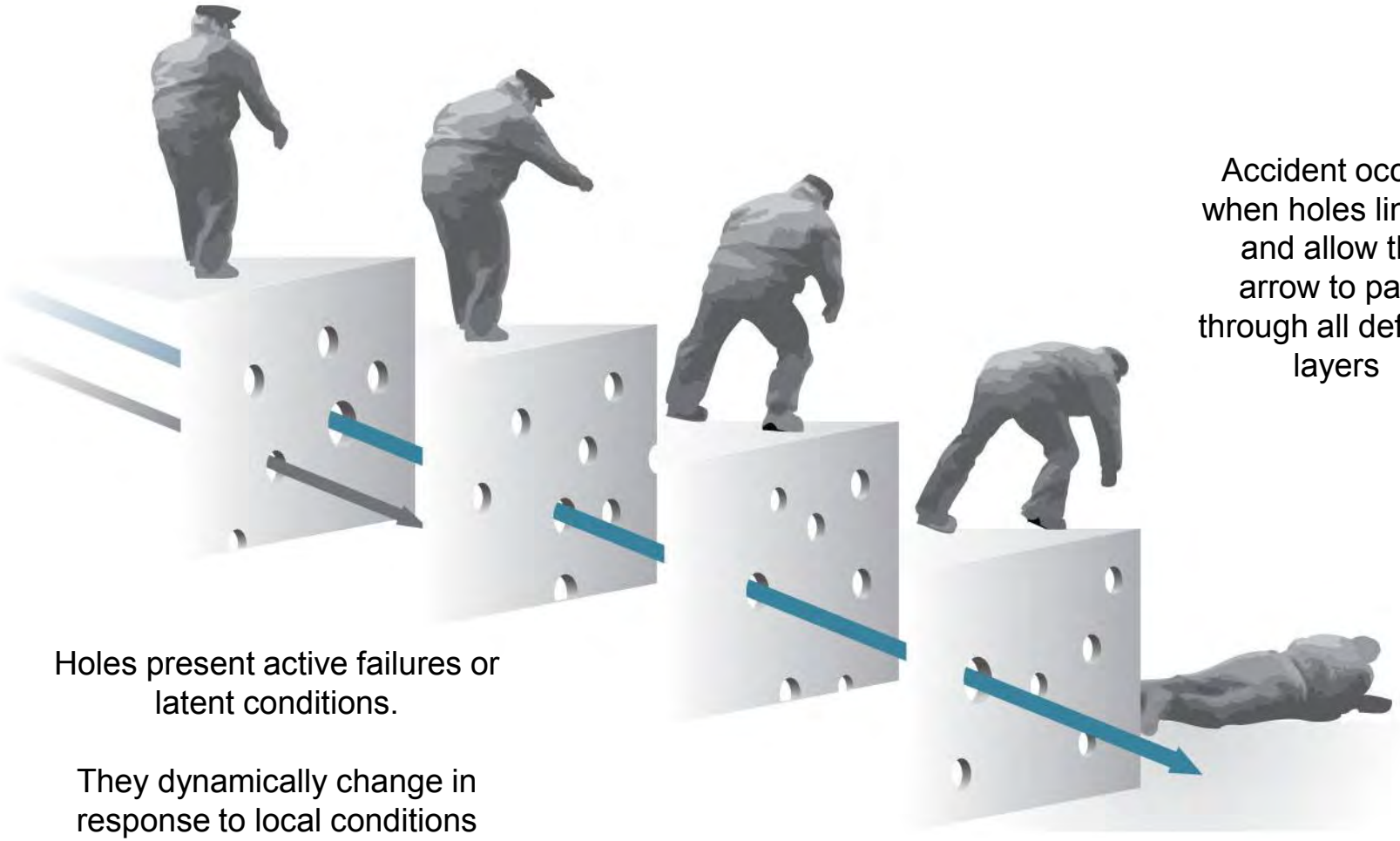


3. GEMS Generic Error Modeling System



Rasmussen (1987), Reason (1990)

4. "Swiss Cheese" Model of Accident Causation



Accident occurs when holes line up and allow the arrow to pass through all defense layers

Holes present active failures or latent conditions.

They dynamically change in response to local conditions

(Reason, 1990, 1997)

5. Identify safety deficiencies

- Evaluate level of risk
- Assign priorities

6. Develop safety action

- Goal: improve safety
- Propose safety mechanisms

Implementing changes is not in a domain of the investigator!

SFIM Database

http://empowerhealthresearch.ca
User Name: SFIMguest@empowerhealthresearch.ca
password: *SFIMwelcome*

SFIM

azecevi2@uwo.ca [edit]

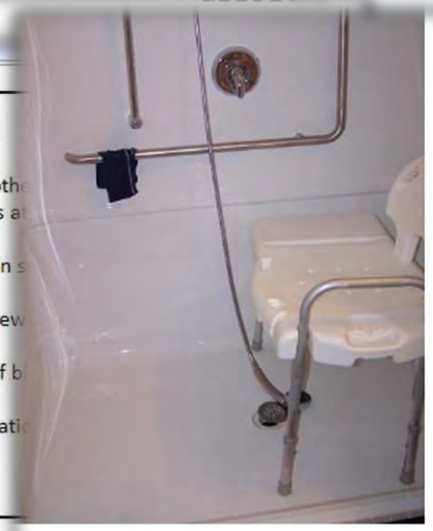
Search:

Fall Information

EmPOWER, affiliated with The Univ... | http://empowerh...ssCheeseReport

Organizational Factors:

- No individulaized assessment of the environmnent from Physiotherapist and Occupational Therapist for the Fallers right side hemiparisis.
- No policy to assess new environments by an occupational therapist or physioth
- No policy for formal training for staff members working with new participants a new residence.
- No procedure to ensure that support strategies are up to date and available in s binders.
- No policy regarding the minimum number of staff required for safety at the new residence.
- September 1st, 2009 the binder system was changed to reduce the number of b traveling to the centre and from the residence.
- No policy to ensure that all staff are trained on the changes in the documentati system.
- No policy on anti slip floors.



Supervision:

- Balance test is not completed due to the time constraint in the mornings.
- The staff member providing support to the Faller was not trained on his shower
- Staff member was unable to find the strategies outlining how to support the Fa
- Other staff members at the residence reported they were not trained to suppor Faller during his shower routine.
- The residence was running short staffed by one staff.

Preconditions:

- Ataxia due to ABI.
- Faller is more unsteady and off balanced than usual the next morning.
- Faller is fatigued in the morning.
- Faller is agitated.
- No non-slip mat on the bathroom floor.
- The bathroom floor is slippery.
- He feels unsafe as he walks toward the towel rack.
- There is no non-slip mat in the shower.

Case Study 1

On August 27, an 83 year-old hospital resident with cognitive impairment, had an unwitnessed fall around one o'clock in the morning. He woke up with urgent need to empty his bladder. He got up and used his two-wheeled walker to get to the bathroom independently, despite advise to call for supervision when walking.

He fell while returning from the bathroom. He was carrying a full urinal back to his bedside and slipped on urine that had spilled. He could not remember why he decided to use the urinal rather than the toilet or why he did not empty the urinal into the toilet. He fell onto his left side hitting his head on the bedrail and the floor.

Nursing staff heard noise and found the patient on the ground. He received medical attention for a cut, bruise and sprain, but x-rays and a CAT scan ruled out spinal cord or brain trauma.

WHAT DO YOU THINK CAUSED & CONTRIBUTED TO THIS FALL?

Case Study 1 - Conclusions

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SFIM application

2004-05	SFIM development
2005-06	Used to investigate falls in community dwelling seniors
2007	Tested in 3 hospitals and 1 LTC
2008	Piloted in a residential care of individuals with ABI
2009-10	Developed models for capacity building and knowledge translation to allow uptake of SFIM conclusions (5 sites)
2011-13	Investigate falls of stroke survivors

SFIM Findings (2005-2009)

(2 communities, 1 residential care, 3 hospitals, 1 LTC)

Lack of or inadequate policies and mediocre practices, unregulated designs of built environments and assistive devices , limited resources for supervision, budget restrictions, inadequate management of property, poor inspection policies, workload, scheduling, fatigue management , Ministry of Health policies on staffing levels, assessment requirements …

Poor monitoring of patient's whereabouts, communication problems (staff-patient, staff-staff, management-staff, between institutions), misinformation, scanty training of new and replacement staff, poor education of residents/patients or family…

Incontinence, dementia, confusion, muscle strength, vision, pain fatigue, dizziness, , gait problems, medication side-effects, new or unfamiliar environment or activities, unmarked obstacles, poorly designed equipment, darkness, broken footwear, room space restrictions, noise, temporary fixes, …

Multitasking, hurry, incorrect self-assessment, impulsive decision making, attempts to do things independently, walking on slippery surfaces, voiding, not following instructions,…

Fall or near fall

We know SFIM works!

Why is it difficult to implement and sustain it?

Development of knowledge translation strategies for removal of causes of falls, identified through Systemic Falls Investigative Method (SFIM), in hospitals, LTC and community

Objectives:

- Review literature on Safety Culture in healthcare
- Understand Safety Culture in 5 health care organizations using mixed methods design (survey, interviews and focus groups)
- Implement SFIM
- Understand barriers and facilitators to SFIM implementation (environment, adopters and innovation)
- Test potential of SFIM to influence Safety Culture
- Collect a dataset of 20+ comprehensive falls investigations

PRE-intervention
Safety Culture
survey, interviews and FG

POST-intervention
SFIM implementation
interviews and FG

SFIM Training

SFIM implementation and mentorship

21 comprehensive falls investigations

Tools
Survey: Modified Stanford Patient Safety Culture Survey Instrument[1]
FG and I: Patient Safety Culture Maturity Model[2] and Ottawa Model for Research Utilization framework[3]

[1]Ginsburg, et al. (2009); [2]Fleming & Wentzell (2008), [3]Graham & Logan (2000)

Barriers and Facilitators for Safety Improvement

Rehab Hospital

Barriers	Facilitators
Heavy workloads	
Lack of staffing	
Nursing Culture	safety ff
Increase of patients rehabilitation	
Protective answering	

"Really only people can prevent falls. This is all it is. And it does come down to dollars and cents. They physically can't put that many people here [rehab hospital] anymore. It's just the way our healthcare has changed. But if you have the people, people don't fall and we know that."

"It's a guilty thing to say, but some of it is nursing culture. Unfortunately when you present something new to a lot of nurses, a lot of them immediately decide I know already, or I learned this in school already, or I've been doing this for 15 years already. "

Barriers and Facilitators to SFIM implementation

Rehab Hospital

"I know the manager really thought it [SFIM] was a good idea."

Barriers	acilitators
Time consuming	Interest in SFIM's systems approach
Lack of awareness of SFIM	Good characteristics of SFIM investigator
Lack of communication betwe frontline staff and managem	Unit manager was a good champion
One SFIM investigator un participate due to pers sons	

"I think it's [SFIM] a different way of looking at issue [and] problems and solving them from a comprehensive way."

Common Findings for all 5 Sites

Facilitators

Safety is a priority
Teamwork / shared workload
Good communication
Open door policy
Management involvement
Good incident reporting
Low staff turnover
Awareness of fall risks
No blame culture
Training opportunities
Enthusiastic staff

Barriers

Time
Budget and resources
Workload
Communication
Built environments
Blame culture
Lack of training
Complex clients needs
Underreporting of incidents
No follow-up/continuity
Professional silos

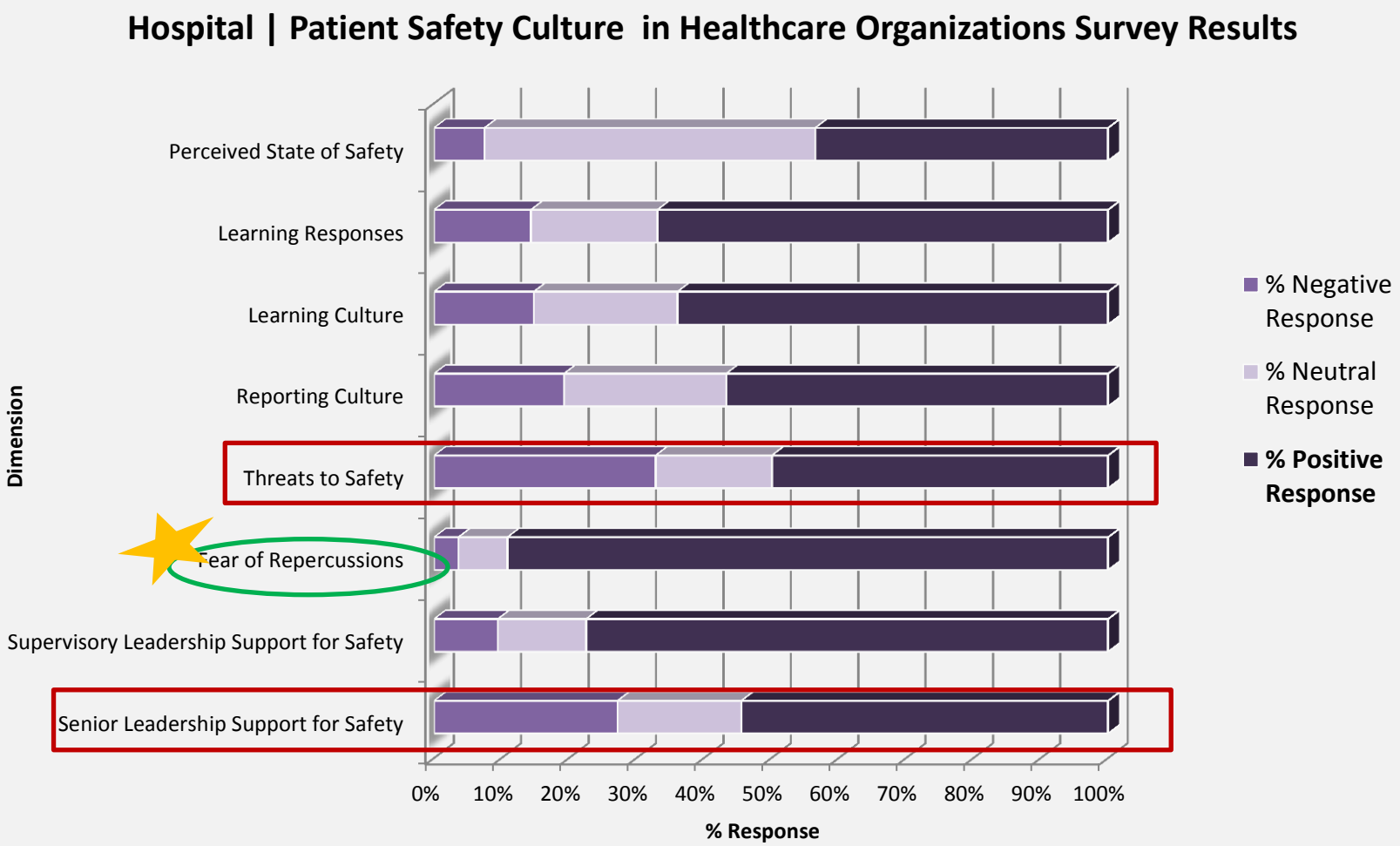
What is safety culture?

"…is the product of individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety programmes. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measure"

Improving safety culture improves patient/resident safety!

Health and Safety Commission. (1993).; Ginsburg, et al. (2009).

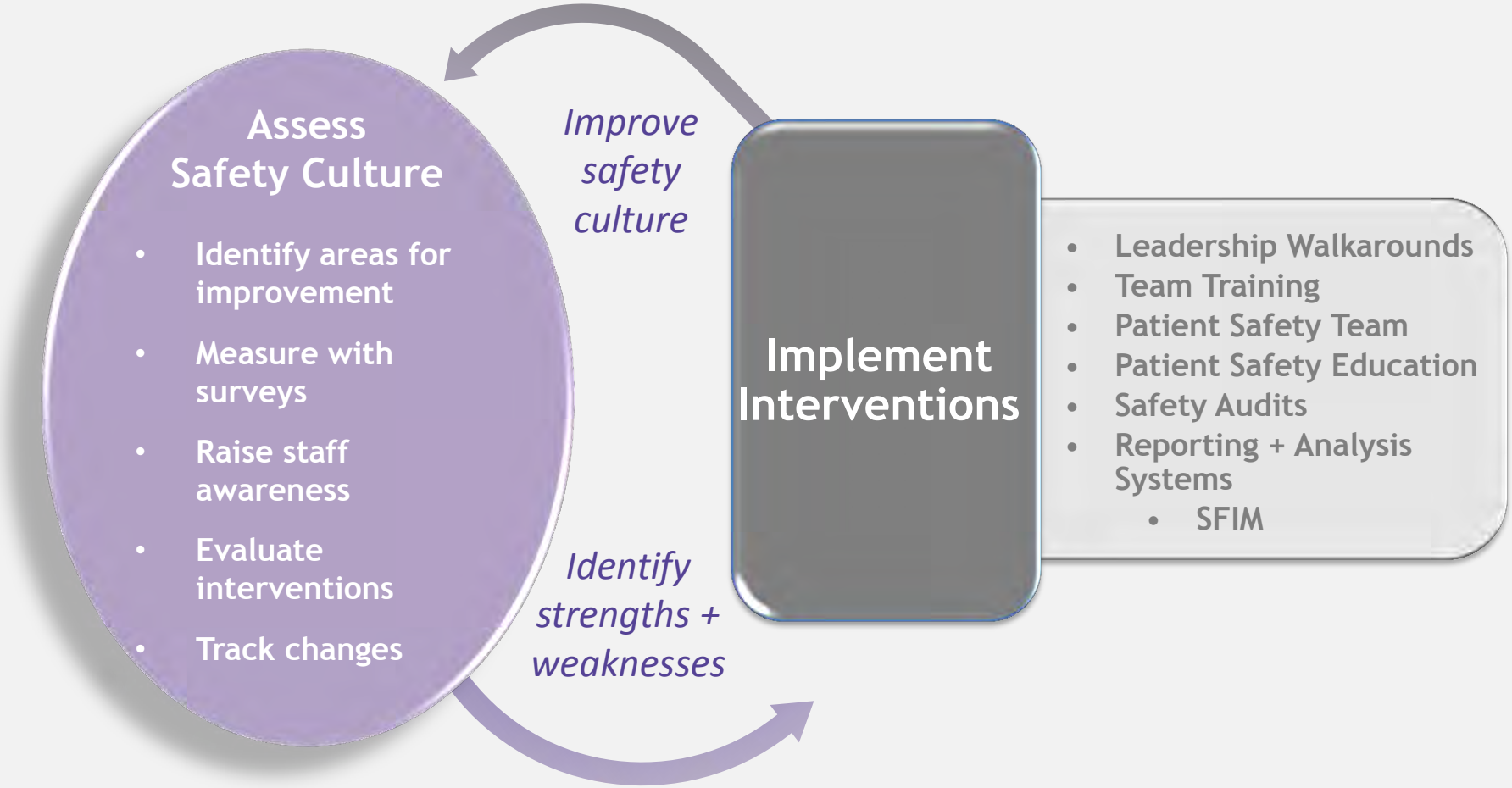
Measuring Safety Culture using Survey



Strengths and **areas for improvement** can be readily identified

Ginsburg, L., Gilin, D., Tregunno, D., Norton, P. G., Flemons, W., & Fleming, M. (2009). Advancing measurement of patient safety culture. *Health Services Research, 44*(1), 205-224.

Safety Culture - Improvements

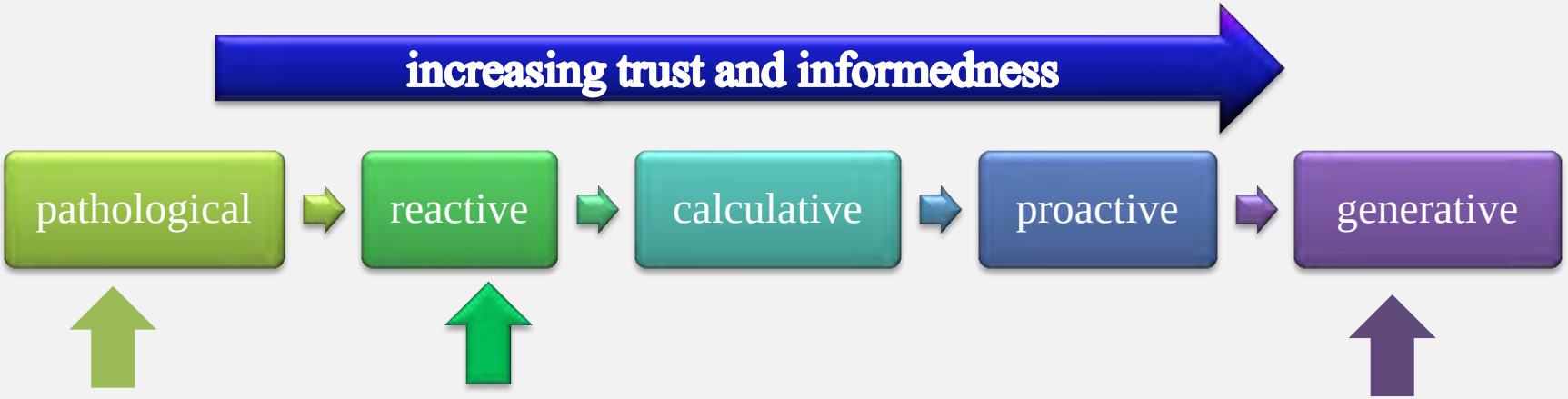


- Leadership commitment to safety improvement is essential
- Culture is a context-specific, local phenomenon, best to focus on a single unit
- Culture change takes time, approx. 3-5 years

Safety Culture Maturity Model

Healthcare Organizations

High Reliability Organizations
(aviation, nuclear power, military)



No systems in place to promote a positive safety culture

Systems are piecemeal, developed only in response to occurrences and/or regulatory or accreditation requirements

Safety is how we do business around here

Westrum, 2004

Patient Safety Culture Improvement Tool (PSCIT)

- Safety culture development in 5 stages (from poor to good) on 5 dimensions:
  - **Safety Leadership**
    - Leader safety training; Leader performance evaluation
  - **Resource Management**
    - Training & Teamwork
  - **Workload Management**
    - Workload; Fatigue management
  - **Sharing & Learning**
    - Organizational learning; Incident reporting; Disclosure
  - **Risk Analysis**
    - Safety analysis systems
- Once level diagnosed, actions required to move to the next level are identifiable

Fleming & Wentzell, 2008

Dimensions	Sub-Dimensions	Pathological	Reactive	Calculative	Proactive	Generative
Safety Leadership	Leader PS Training	No resident safety education/training is provided to leaders	General informati including pr	eaders receive information about their They	Leaders are taught interpersonal competencies (thru skill-based training) to motivate colleagues and subordinates to improve resident safety. ing is recurrent (at least annual) and includes ting to improve interpersonal skills	Leaders receive mandatory individualized resident safety leadership development based on upward appraisal and evaluation. There is a formal ongoing evaluation of leaders' behavioural change
	Leader PS Performance Eval	Leaders are not evaluated resident safety	sig their area	s routinely monitored using a variety s (e.g. performance reviews, ive chart reviews). Input from colleagues ight. Results from monitoring are discussed with individual being reviewed		Performance is monitored with leading indicators of resident safety. Ongoing and systematic observations of practice are conducted. The results from performance monitoring are used to develop individual learning plans. Peers routinely monitor each other's performance and provide constructive feedback for improvement.
Workload Management	Workload	No consideration of the impact of workload on resident safety	Guidelines for the ratio of health workers to residents are u workload levels	inimum healt		There is a holistic approach to workload management that considers all demands placed on workers, such as the intensity of the work enviro (i.e. task be performed, number of client ti ac he ll mix of the healthcare in providing additional resources for ons.
	Fatigue Management	No consideration of the impact of fatigue on resident safety	Fatigue safety effort hours			entified as a form of impairment influencing cognitive (e.g. decision making). Performance is routinely g validated instruments to provide information on airment and enables workers the self-assess their d take remedial action (request support from
Resource Management	Training & Teamwork	No resource management training (interpersonal skills, communication, team working, personal awareness or decision-making) is provided	Informatio is provided t within a team envi		ress am and g challenges	Resource management training includes practice in a simulated enviro and is followed by behavioural observation of performance using validated indicators. Feedback is provided to all individuals after training, and a formal evaluation of the training's effectiveness is conducted.
Sharing & Learning	Organizational Learning	There are no systems in place to support organizational learning	Events that result in significant harm (e.g. wrong-site surgery) are investigated, and actions are specified to prevent the reoccurrence of this event	l event reports are invest idated tools and processes (e.g. RCA). esident safety improvement actions are dentified from the investigation and plementation tracked	egrated investigation system is implemented (IRS, retrospective chart reviews, clinical audit process). Detailed results of investigations for each dept are discussed gular	A comprehensive organizational learning system is in place that includes incident reporting, retrospective chart review and audits. The organization learns from both negative and positive ctices that protect residents as
	Incident Reporting	There are no reporting systems in place	Incident report forms or electronic reporting system is available to enable staff to report resident safety events and concerns	ident reporting syste c) is in place. Trainin e system is provid m reporte ety train individu t addition obtained		ption of the t and follow-up ported the every incident sed as members and
	Disclosure			ning icians) including s under the policy	managed	t to assess quality (and extent) of s occurred.
Risk Analysis	Safety Analysis Systems	No systematic use of safety analysis systems to promote resident safety	e used for major events. E.g. retrospective analysis tools (RCA) are used to investigate the causes of events that resulted in significant harm , and prospective analysis tools are used when planning major org changes such as a new building	afety analysis tools are used frequently. e analysis is led by resident safety pecialists with involvement of healthcare orkers	A wide range of healthcare workers are competent in using safety analysis tools. Healthcare workers regularly use these tools to learn from incidents and indentify ways of improving resident care	Safety analysis system integrated into the routine activities of healthcare workers, effectiveness of the system is monitored. E.g. actions iden ed during a prospective analysis are tracked to ensure they were implemented and worked as intended

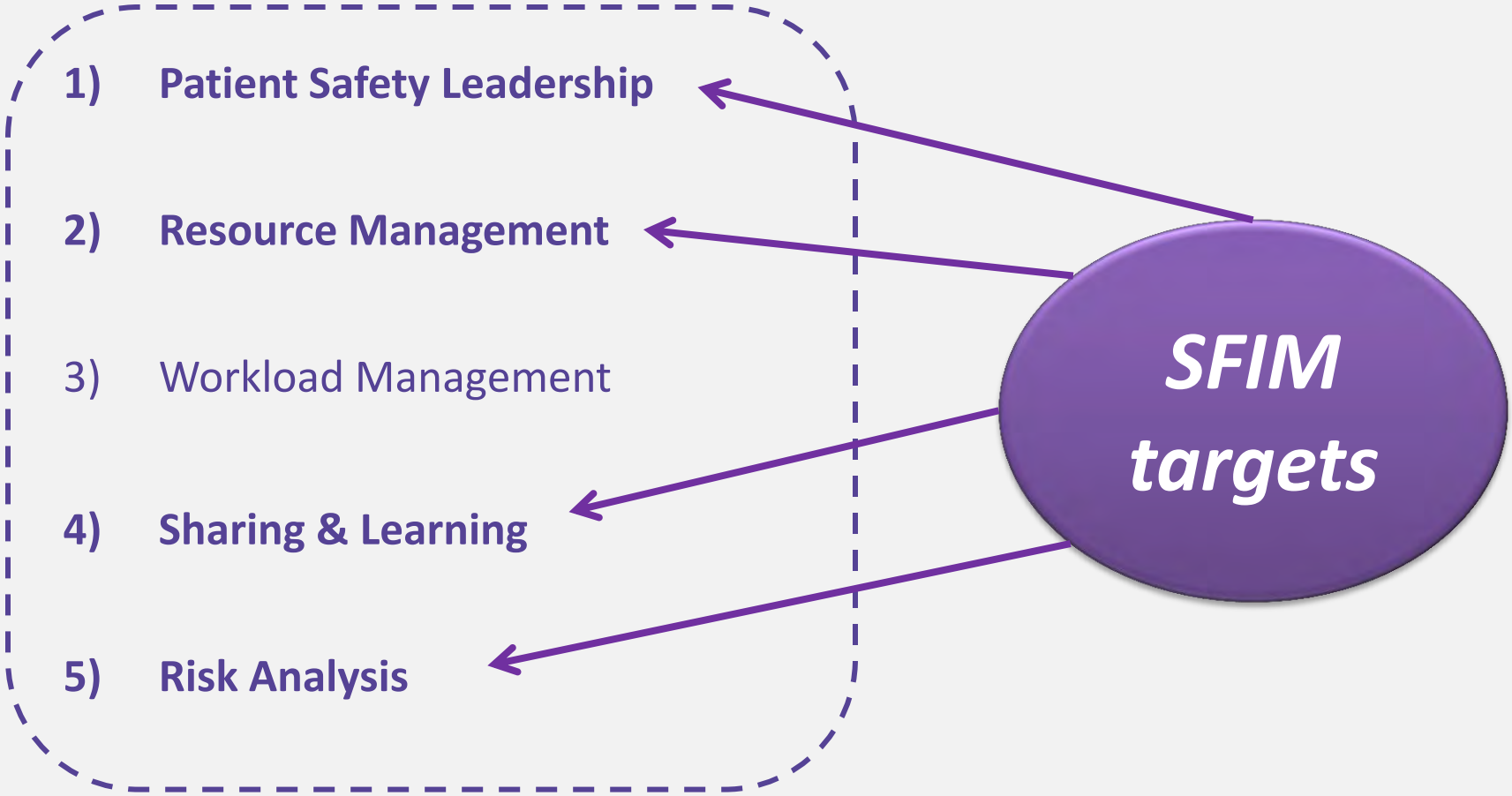
Guidelines for the ratio of healthcare workers to residents are used to manage workload levels

There is a holistic approach to workload management that considers all demands placed on workers, such as the intensity of the work environment (i.e. tasks to be performed, number of client interactions), client acuity and the skill mix of the healthcare team. This approach involved providing additional resources for high-intensity situations.

Safety analysis systems are integrated into the routine activities of healthcare workers; the effectiveness of the system is monitored. E.g. actions identified during a prospective analysis are tracked to ensure they were implemented and worked as intended

No systematic use of safety analysis systems to promote resident safety

Elements of Safety Culture & SFIM



Reason (1998); Sorra & Nieva (2004); Kirk et al. (2007); Fleming, & Wentzell (2008); Ginsburg et al. (2009)

Conclusions

1. There are two approaches to falls prevention - *person* and *systems* approach
2. Risk factors are different from causes of falling. Both need to be addressed
3. Systemic Falls Investigative Method (SFIM) is a comprehensive way to identify unsafe acts and latent unsafe conditions that can guide targeted falls prevention
4. Falls occur in a large context of safety culture of a health care organization that must be assessed
5. SFIM can contribute to improvement of safety culture

The SFIM Team

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ontario stroke network
Advancing the Ontario Stroke System

RNAO Registered Nurses' Association of Ontario
L'Association des infirmières et infirmiers autorisés de l'Ontario

Thank you

Questions?

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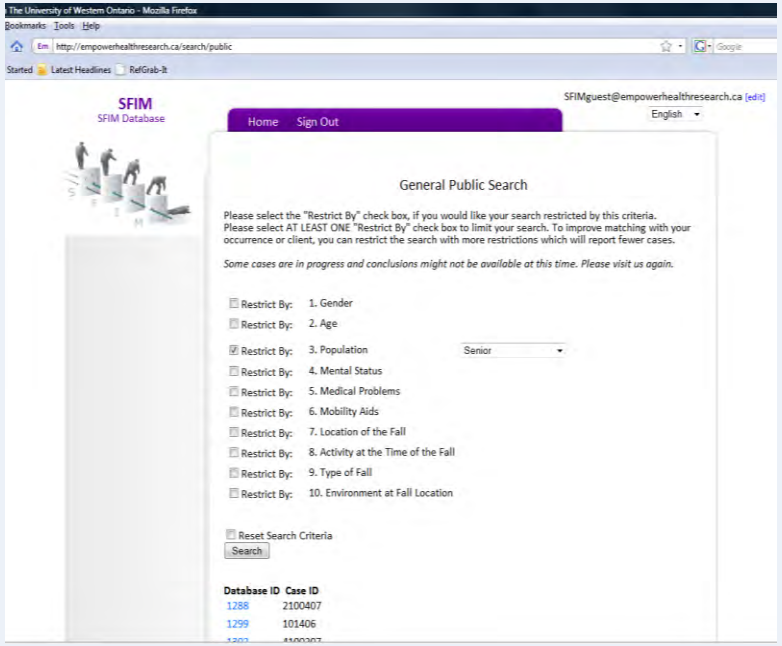

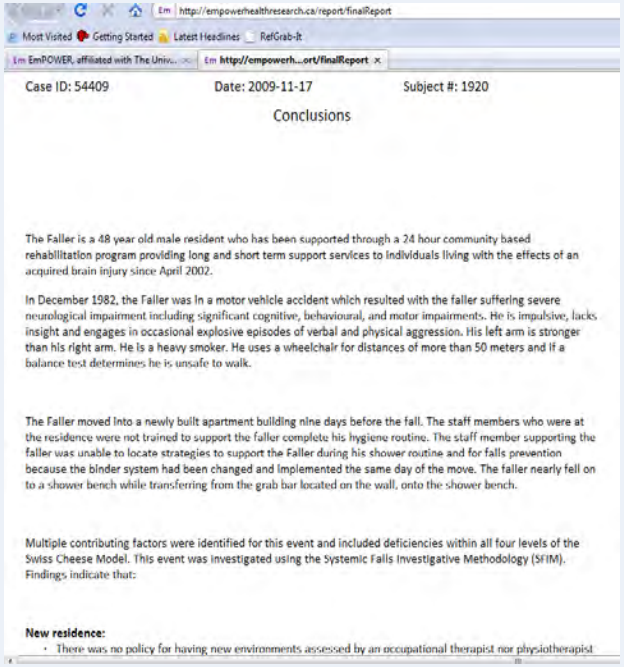

Case Study 2

A faller was 77 year-old male, admitted to the LTC home. The fall occurred on September 22, 2007 at about 6:30 pm, as the senior was returning to the home from an outing with a friend. He fell outside the hospital front door.

A friend (also an elderly men), parked his vehicle in a designated drop off zone. The friend unloaded the senior's walker and stood by to offer assistance. The senior walked around the front of the car across a small grassy slope and onto a sidewalk that runs along the front of the parking area toward the front doors.

The sidewalk was bordered by a large planter box. Vines growing from the box covered part of the narrow sidewalk. The senior was careful not to step on the plants and did not notice that the sidewalk ended in a 20cm curb. He stepped off the edge and fell over his walker to the ground.

His friend, who was following closely behind, tripped over and landed on top of the senior. The friend was uninjured and quickly stood up. The senior was also uninjured, but required the assistance of two bystanders to regain standing. The senior's hearing aid fell from his ear and was recovered the next day.

WHAT DO YOU THINK CAUSED AND WHAT CONTRIBUTED TO THIS FALL?

Case Study 2 - Conclusions

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Falls can Help Improve Healthcare Safety: Potential of Systemic Falls Investigative Method (SFIM)

Aleksandra Zecevic, PhD

University of Western Ontario, Faculty of Health Sciences, School of Health Studies

Top ten reasons why you should implement Systemic Falls Investigative Method (SFIM) in your healthcare organization

1 **Systemic Falls Investigative Method (SFIM)** identifies why actions of people made sense to them at the time of the incident, and how their actions evolved in presence of latent safety deficiencies present in the system. This **systems approach** is comprehensive and superior to persons approach where blame and shame are inherently present.

2 **Falls are frequent** and account for 40% of in-hospital accidents. Hospital fall rates vary from 2.9 to 13 falls per 1000 patients >60 years of age.

3 Falls are **expensive and congest hospital beds**. Patients who were seriously injured after a fall during an in-hospital stay cost on average $30,000 more, and stay in hospital on average 34 days longer, than patients that did not fall while in hospital.

4 There are **too many risk factors** for falling **to address them all**. Learning from adverse events and past accidents worked well in the aviation industry. An adapted version of the technique used to discover causes of airplane crashes is now available for health care. It is called Systemic Falls Investigative Method (SFIM).

5 SFIM moves the investigative process **beyond immediate causes of an incident** and reveals how unsafe acts and decisions made by people are combined with deeply embedded **latent unsafe conditions**. If not removed, these latent unsafe conditions, or "error traps" will cause other people to commit the same errors in different circumstances.

SFIM

Our aim is to improve healthcare safety one fall at a time.

6 SFIM allows the organization to **learn from near-misses** and **create evidence based targeted interventions**.

7 **Training** staff and middle management in how to use SFIM **builds capacity** for **improvement of safety culture** across your organization. The safest organizations are those where safety is everybody's business.

8 To create a **standardized adverse event reporting system,** the SFIM utilizes a **web-based SFIM Database** which healthcare organization can continuously use for analysis of patterns and trends.

9 Although currently used to investigate falls, SFIM is an in depth, comprehensive investigative method that can be used for identification of **system-wide adverse events** such as medication errors, surgical errors or staff injuries.

10 SFIM was **already implemented** in four hospitals, one long-term care home, a residential setting for individuals with acquired brain injury and in two communities. It consistently demonstrated the ability **to identify safety deficiencies** that lead to adverse events.

For more information please contact:

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To access the SFIM Database:

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