

IRSN

INSTITUT
DE RADIOPROTECTION
ET DE SÛRETÉ NUCLÉAIRE

Organizational and human risk analysis: a focus on the health care team's modes of success rather than their modes of failure

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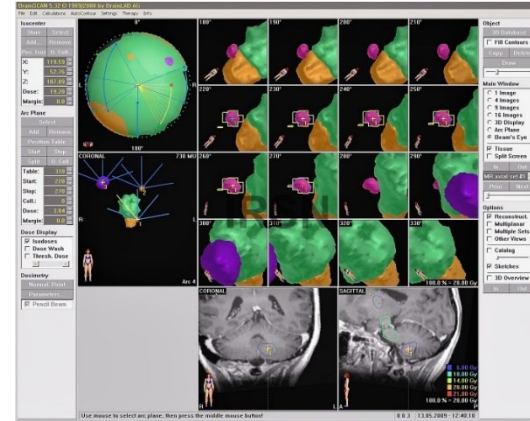
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MEMBRE DE

ETSON

EUROPEAN
TECHNICAL SAFETY
ORGANISATIONS
NETWORK

Introduction



What is a safe care? Safety is no accident (ASTRO, 2012)

What is a "risk" in radiotherapy (RT)?

- For the team: a risk of not delivering “the right dose to the right patient in the right place at the right time”
- For patients: a risk of accident (death, serious or severe complications) or a risk of not being treated



Two risk management systems to improve process safety

Safety depends on:

- **The quality of the design** → safety is based on anticipation:
 - *remove unforeseen events, latent failures, ambiguities and uncertainties...*
 - *define defence in depth (succession of independent lines of defence), redundant mechanisms, backup devices...*
 - *use automation, plans, work rules, standard practices...*
- **The quality of the daily operation** → safety is based on human activities: Ability to react, adapt, recover, regulate, self-organize to situations, capacity to detect risks,...
 - *Classic approaches: analyzing events (a posteriori method) and identifying and controlling human and technical failures (a priori method)*
 - *A new approach: understanding how the team success modes could turn into risks for patients (after events and during daily work)...*

Safety in Radiotherapy

Anticipation requires knowledge of the radiotherapy system's behavior. **But the complexity of this sociotechnical system:**

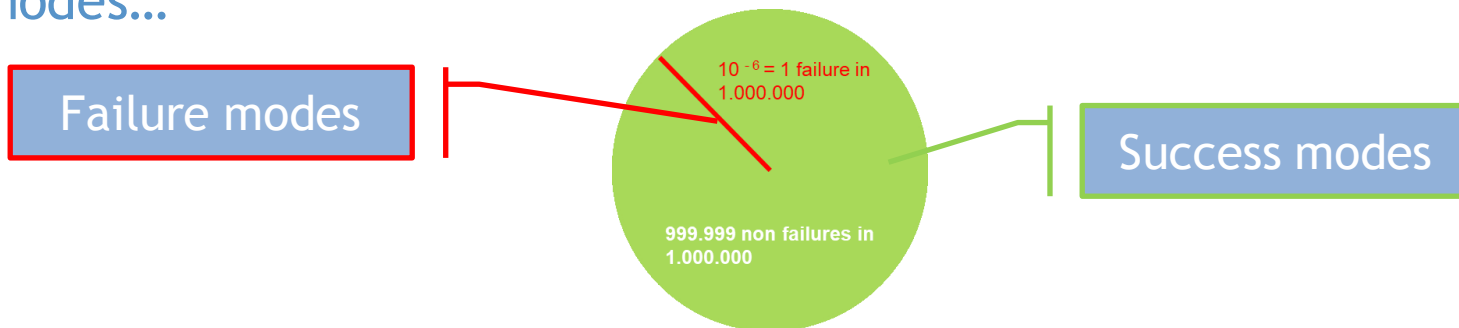
- makes prescribing, anticipating, predicting and forecasting very difficult;
- can generate risks that cannot be easily detected.

The quality of daily operation and patient safety based on the team performance capacity :

- To integrate prescribed security tasks into its activities (preparation, measurement, checking, verification, validation, traceability of actions, team vigilance, etc.);
- to adapt their behaviors and practices to real work situations.

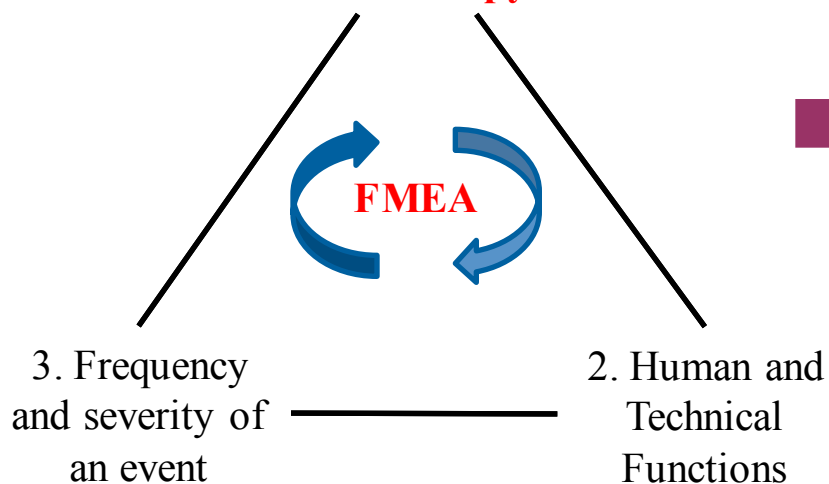
Which data to analyze?

There is more potentially analyzable data by studying the team success modes...

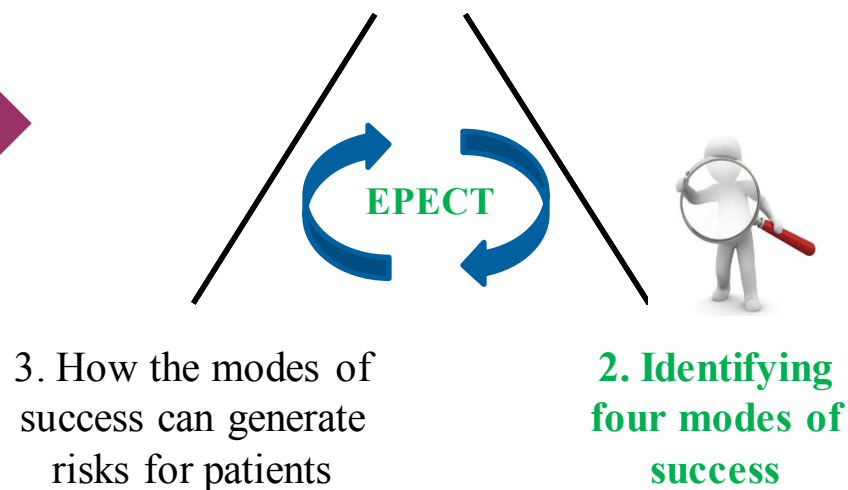


Inspired by « Safety 2 » diagram

1. Analyzing failure modes in radiotherapy



1. Exploring the complexity of work in radiotherapy



The « EPECT » Method

The **new method** proposed : Spaces for Sharing and Exploring the Complexity of Work (**“EPECT”** in French)

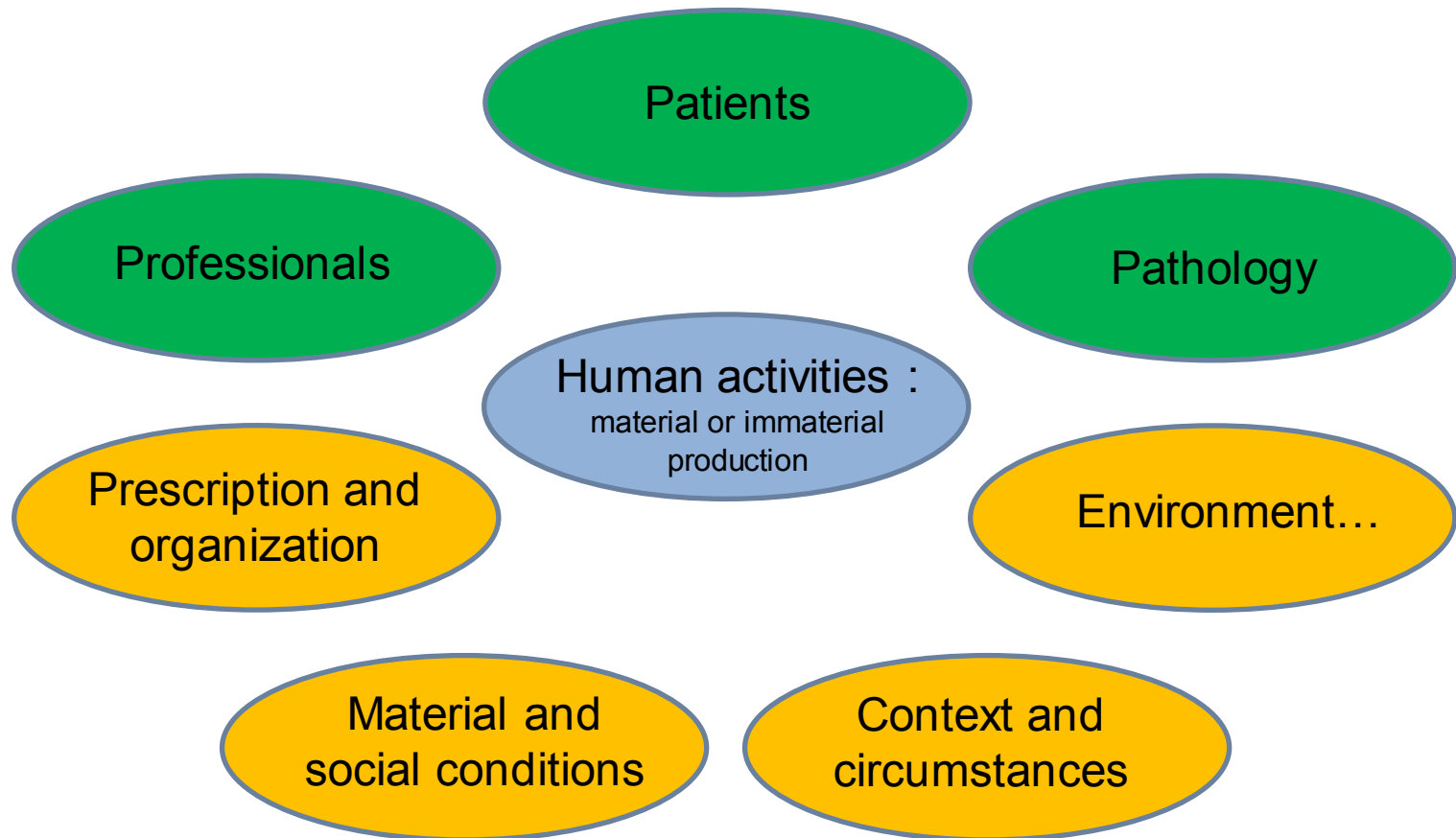
- A think tank :
 - At least 2 people per function (*restricted medical team*)
 - 1 facilitator (risk management coordinator)
 - 2h every 3 months

A method in 4 steps :

- **Steps 1 & 2** → Understand how care continues despite the complexity of work situations (*performance phase*)
- **Step 3** → Understand how care can become dangerous for patients (*risk phase*)
- **Step 4** → Develop a preventive approach (*secure phase*)

knowledge on human and organizational factors : What is a “work situation”?

Principles elements in radiotherapy:



Step 1 of the EPECT Method:

Exploring a disorganized situation of daily work

Develop a  based on disorganized situation of daily work (30 mn):

■ **Constraints on activity** due to time pressure, technical, organizational, strategic, patient-related dimensions...

■ **Changes:** technical, organizational, human practices and behaviours changes *which are* a significant breakthrough or not, temporary or permanent, local or systemic...

■ **Inertia:** slowness in decisions and choices making, resistance...

■ **Disorders:** contradictions, absurdities, blurriness, inconsistencies, lack of logic...

■ **Tensions:** questionable or divergent practices or opinions, loss of meaning, misunderstandings, unclear objectives...

Example of a scenario: a patient comes for a complete breast treatment. She sees a substitute doctor [*change*]. He makes the medical prescription on computer but not on paper whereas it is important in the process of the center [*constraint, tension*]. As the doctor does not know the practices of the centre, the balls are not positioned as usual [*change, tension*]. The manipulator scans the patient while she takes an analgesic position, difficult to reproduce for treatment [*constraint*]. Dosimetry is complicated [*constraint*] because it is a complete breast treatment (many beams). The TPS used is not linked to ARIA [*constraint*]. The manipulators cannot check the beams because the treatment is too complicated, it is not their job and they trust them [*constraint*].

knowledge on human and organizational factors : What is “human activities”?

Two types of activity:

- Individual activity: this is what is really done by a person, in a given context, to achieve his or her objective.
- Collective activity that is what is really done by several persons, in the same organization (or not), in the same environment (or not)..., to achieve a common objective.



The activity is "located" at a given time, in a context that cannot be predicted in detail a priori;

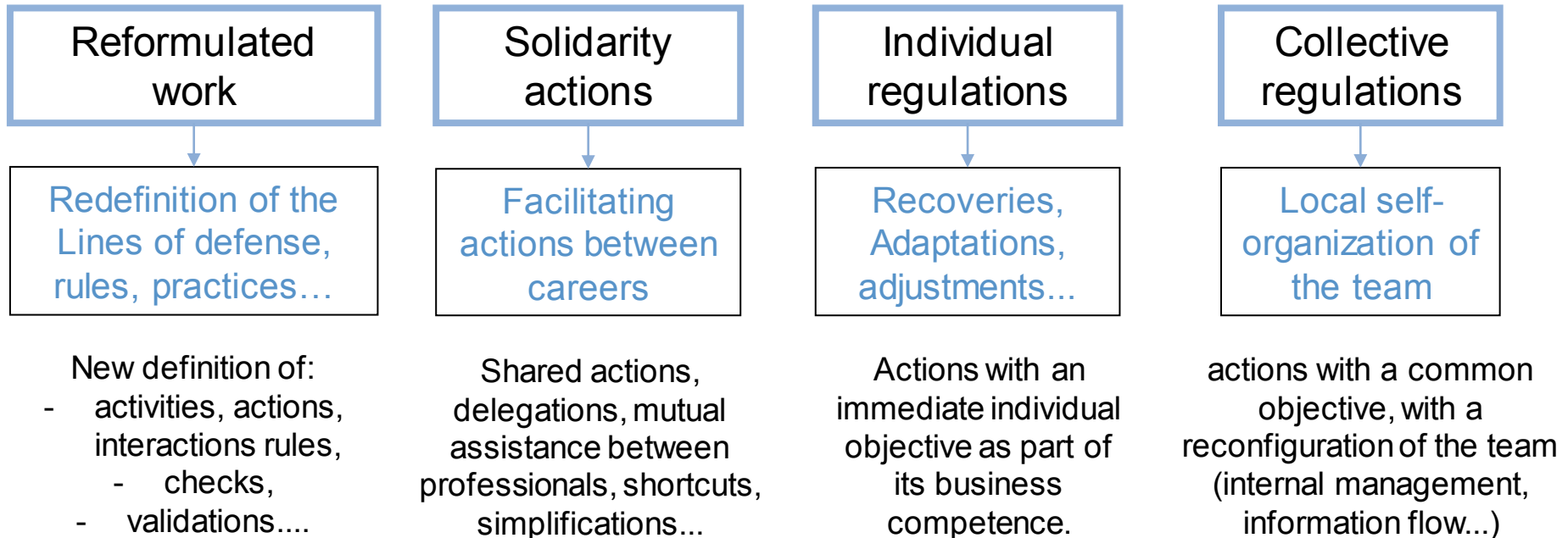
The individual and collective activity is variable (variability of situations, conditions, individuals,...).

Step 2 of the EPECT Method:

Elements contributing to the team's care performance

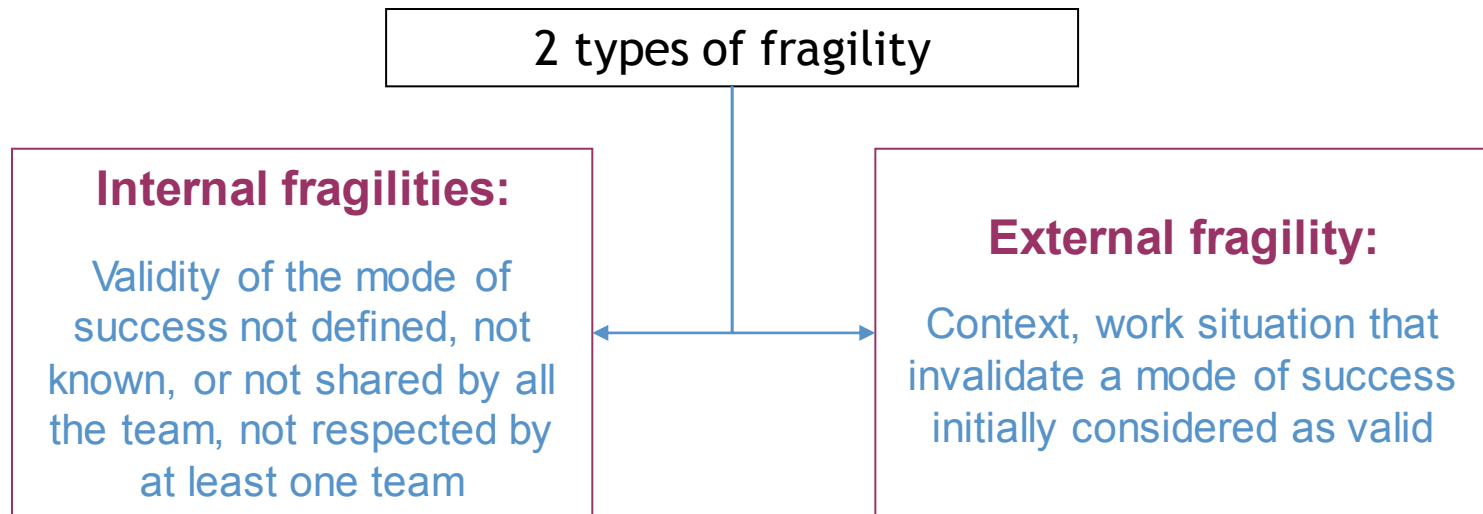
Participants are asked to :

Identifying the modes of success allowing to solve the scenario defined previously and improving the health care team performance (30 mn):



Step 3 of the EPECT Method: Identifying risks for the patients

Participants are asked to identify fragilities in the modes of success (30 mn):



Example of weakening collective regulation: "verification of the previous step by the following professional"

Internal fragility: lack of knowledge of this regulation (uninformed or newly arrived professional), disagreement from some team members, lack of competence...

External fragility: taking a patient in emergency, overwork of a professional, social conflict...

knowledge on human and organizational factors : What is behind “organization”?

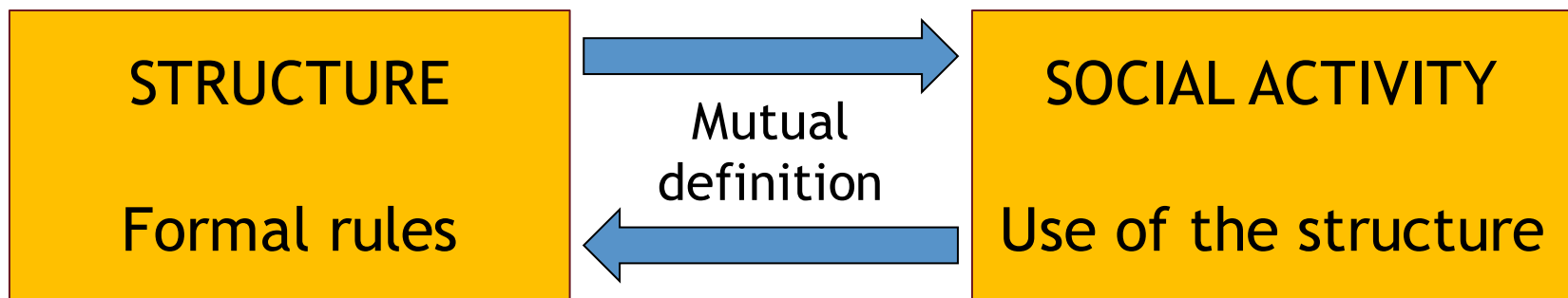
The organization of a system can be seen as :

- a certain order and arrangement of the parts that constitute the system,
- the seat of flows and transformations.

The organization is seen as a "living" system with two faces:

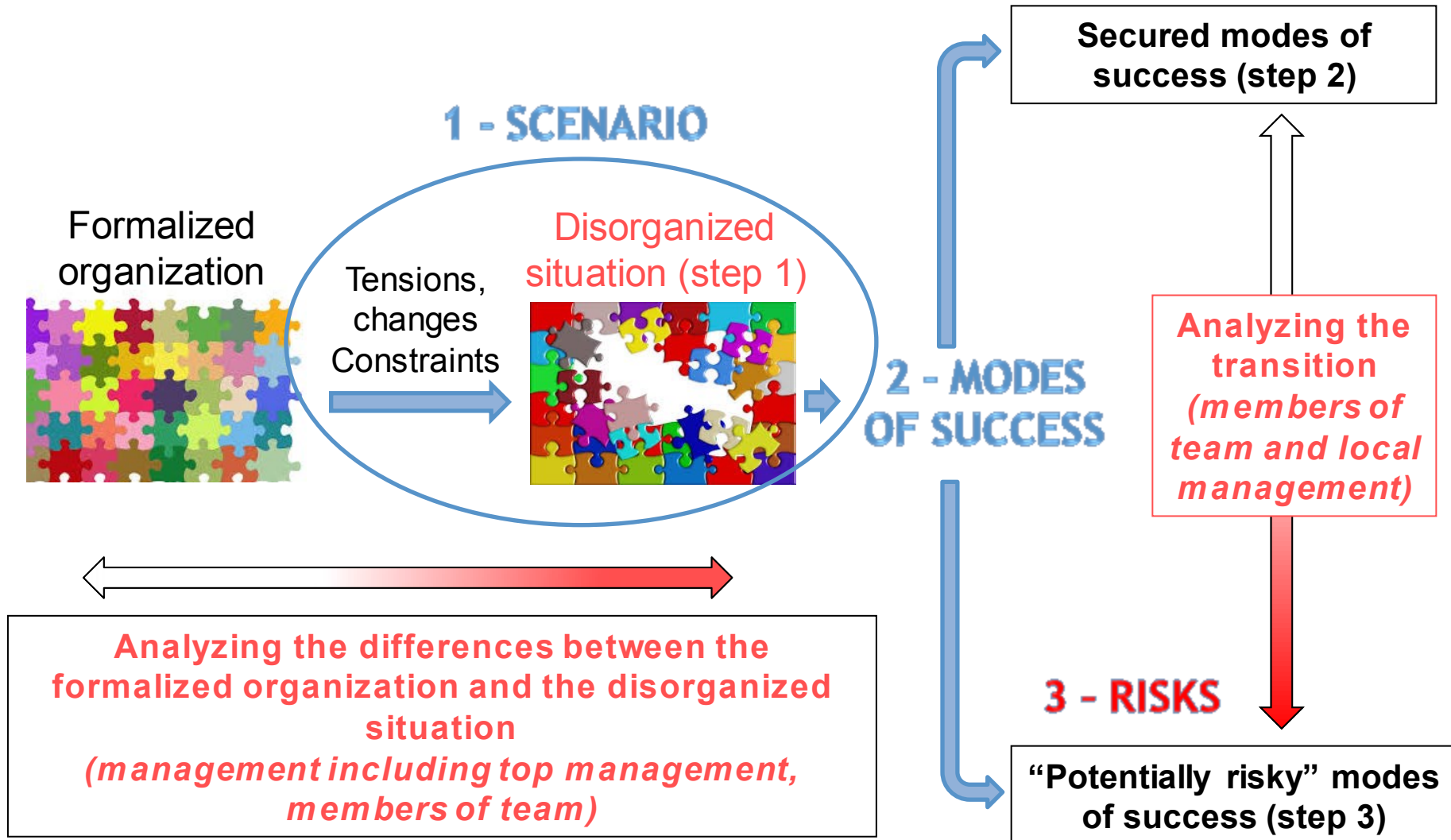
Formal organization

Real organization

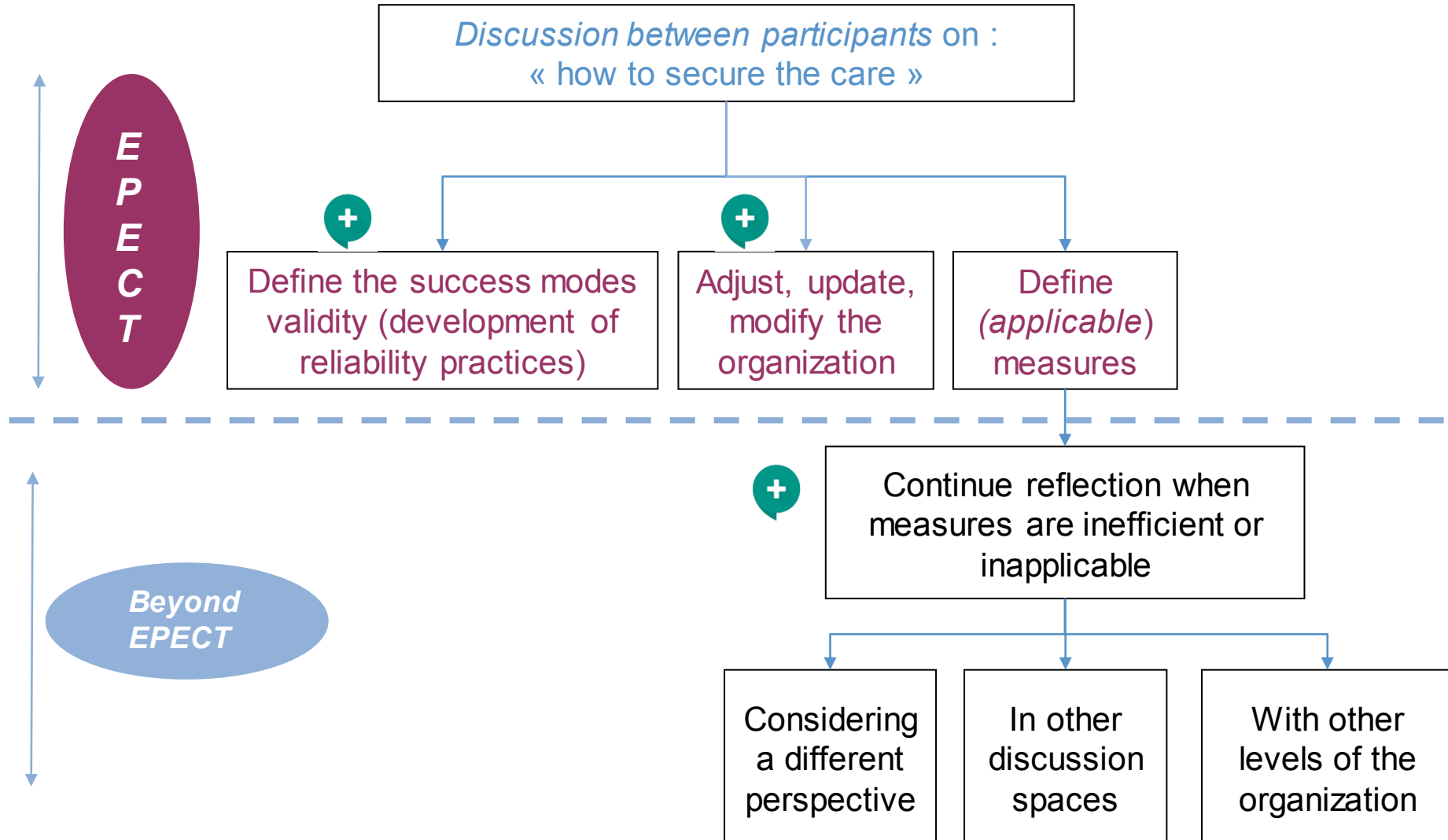


According to B. Dugué, K. Chassaing et J. Petit - Ergonomics Institute of Bordeaux

Step 4 (1/2): Discussing the work organization



Step 4 (2/2): Securing the care



Thank you for your attention

Bibliographie

- Thellier, S., Falzon, P., Cuvelier, L. (2015). Construction of an “activity sharing space” to improve healthcare safety. *ECCE 2015, July 01 - 03*, Warsaw, Poland
- Thellier, S., Cuvelier, L., Falzon, P., Jeffroy, F. (2016). Risk analysis by healthcare professionals in radiotherapy: assessing difficulties, developing a method. *HEPS 2016, October 05 - 07*, Toulouse, France
- Thellier, S., Falzon P. (2016). L’analyse de la complexité de l’activité pour identifier les risques encourus par les patients en radiothérapie. *Lambda Mu 20, 11 - 13 octobre 2016*, Saint-Malo, France.
- Thellier, S. (2017). *Approche ergonomique de l’analyse des risques en radiothérapie : de l’analyse des modes de défaillances à la mise en discussion des modes de réussite*. Thèse de doctorat en ergonomie. Conservatoire National des Arts et Métiers, Paris, soutenue le 12 décembre 2017, 294 p.
- Thellier, S., Jeffroy, F., Cuvelier, L., & Falzon, P. (2018). L’analyse des risques en radiothérapie : quelle alternative à l’AMDEC ? *Lambda Mu 21, 16 - 18 octobre 2018*, Reims, France.
- THELLIER, S. (2019). Analyse des risques en radiothérapie. Partie 1 : forces et faiblesses de la méthode AMDEC. *Radioprotection* 54(1): 11-19. <https://doi.org/10.1051/radiopro/2019004>
- THELLIER, S. (2019). Analyse des risques en radiothérapie. Partie 2 : des modes de défaillances aux modes de réussite, un changement de paradigme. *Radioprotection* 54(1): 21-30. <https://doi.org/10.1051/radiopro/2019003>
- Thellier, S. (à paraître). De la gestion des risques à la sécurité des patients en radiothérapie : un défi conceptuel et managérial. In E. BERTRAND, E., & B. GOUGET (Eds.), *Qualité et sécurité en établissement de santé - Panorama de la gestion des risques en France en 2019*. LEH Edition

Bibliographie (2)

- Thellier, S., Le Tallec, P. (2019). L'analyse des risques d'un système sociotechnique complexe : le cas de la radiothérapie. *Revue Cancer / Radiothérapie*
- Thellier, S., Cuvelier, L., Falzon, P., & Jeffroy, F. (à soumettre). Failures in "Failure Mode and Effects Analysis" (FMEA). *Journal of Patient Safety*