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Background

- Interprofessional in situ simulations take place every week on the pediatric ward of our hospital.
- The simulations are held on the clinical teaching unit with a low-fidelity mannequin, vital sign simulator, medical equipment, and medication to try to reproduce as closely as possible a patient room.
- The simulation session includes a short briefing period, followed by a simulation session of 10 minutes and a debriefing session of 10 minutes.
- Scenarios are specific to situations encountered on the ward and come from a bank of simulation cases that has been elaborated by facilitators over time.
- The weekly scenario is chosen ad hoc by the facilitator depending on the current needs of the healthcare team. This random selection is time-consuming for the facilitator and does not allow to tailor the simulation to current active issues and incidents experienced on the ward.

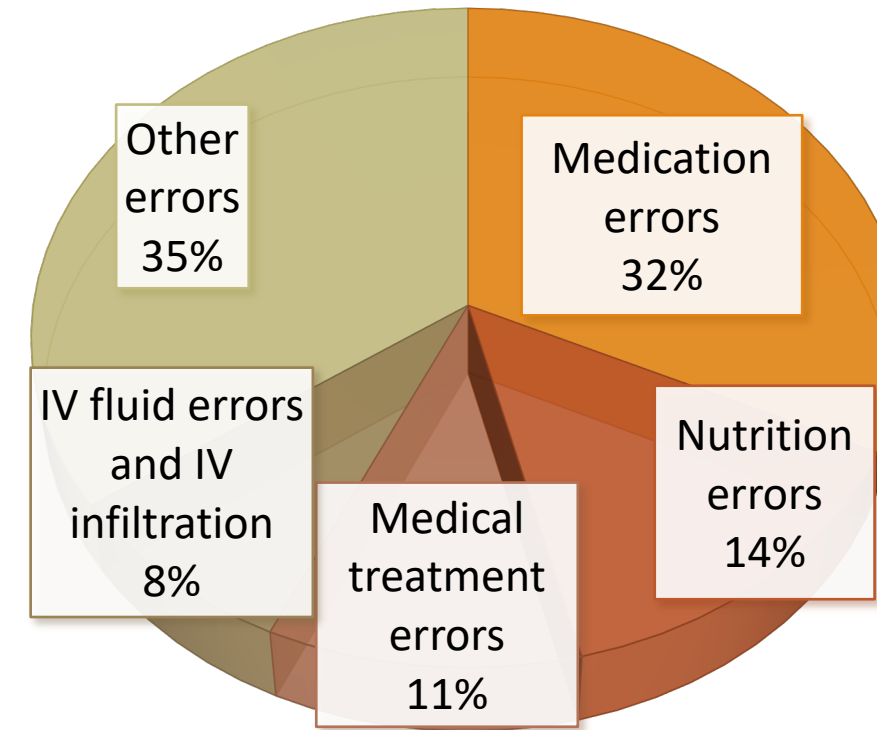
Assessment of current curriculum

- A survey of facilitators' perception of the current simulation curriculum identified time management as the main barrier to run a simulation on the ward.
- The facilitators asked for a predefined schedule of scenarios to help keep track of which scenarios have been done recently and to ensure adequate representation of diversity of scenarios.
- The facilitators, who are busy clinicians, asked for a detailed list of materials and medications, and for a pre-prepared patient's medical chart for every scenario to allow for faster preparation of the simulation.

Review and analysis of incident and accident reports

- Incident and accident reports from April 2021 to September 2022 were reviewed to understand the type of events happening on the ward.
- Scenarios were specifically designed to help recognize those events earlier and mitigate their effects.

DIAGRAM 1. TYPES OF EVENTS



*EPA : Entrustable professional activities are authentic tasks of a discipline. A supervisor can delegate a task to a resident and observe their performance in the workplace. Frequent observations of a trainee's performance of an EPA, will provide a comprehensive image of their competence and inform promotion decisions.
 **The SET-M questionnaire is a validated tool designed for the evaluation of simulation scenarios. It includes different subscales to evaluate the briefing, the scenario, and the debriefing. This allows for early identification of concerns or trends in the data.
 ***PEWS : Pediatric Early Warning Systems is a five-component system that provides a standardized framework and language to identify potential deterioration in a child, mitigate the risk and escalate care as needed as early as possible.

Goals

1. Formalize the simulation curriculum to improve the facilitators' and participants' experience.
2. Ensure adequate representation in the simulation curriculum of incidents and accidents happening on the ward.
3. Introduce psychological safety scenarios that aim to decrease hierarchy and increase comfort to speak up when a patient risk is identified.

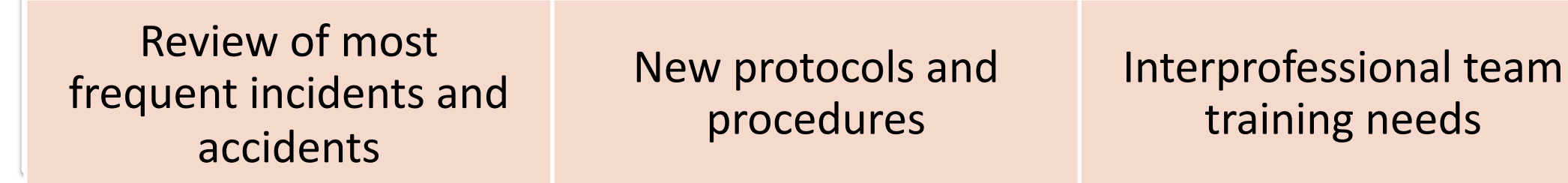
Methods

Creation of a simulation curriculum with 18 scenarios

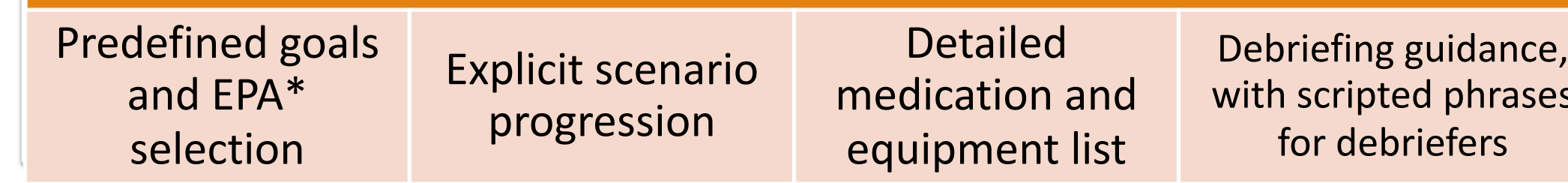
4 types of scenarios



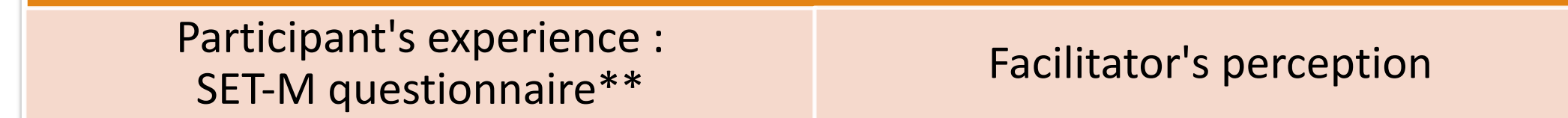
Scenario selection by an interprofessional committee based on



Scenario creation



Post-simulation survey



Curriculum

HALO events

- Cardiac arrest : Asystole
- Code white : Patient with anorexia refusing to eat
- Septic shock : Listeria in a newborn
- Diabetic ketoacidosis complication : Cerebral edema
- Asthma exacerbation : Missed doses of Ventolin
- Bronchiolitis : Impending respiratory failure

Incidents and accidents

- Wrong IV fluid : Hyponatremic or hypoglycemic seizures
- IV infiltration : Irritability
- Tracheostomy complications : Desaturation
- Gastrostomy button dislodged
- Feeding rate errors : Metabolic acidosis
- Nasogastric tube losses not replaced : Metabolic alkalosis
- Oversedation : Altered mental status
- Wrong nebulizer : Deterioration in a patient admitted with croup

New protocol testing

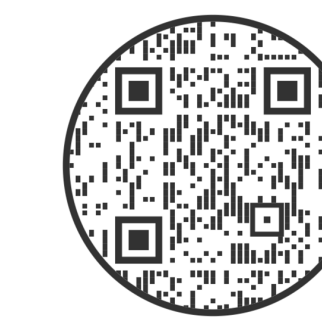
- Nitronox use for mild sedation
- Alteplase use for chest tube and complications

Psychological safety focused simulations

- High PEWS*** score : Physician tells not to call critical care response team
- Anaphylaxis : Physician actor suggests an inappropriate treatment

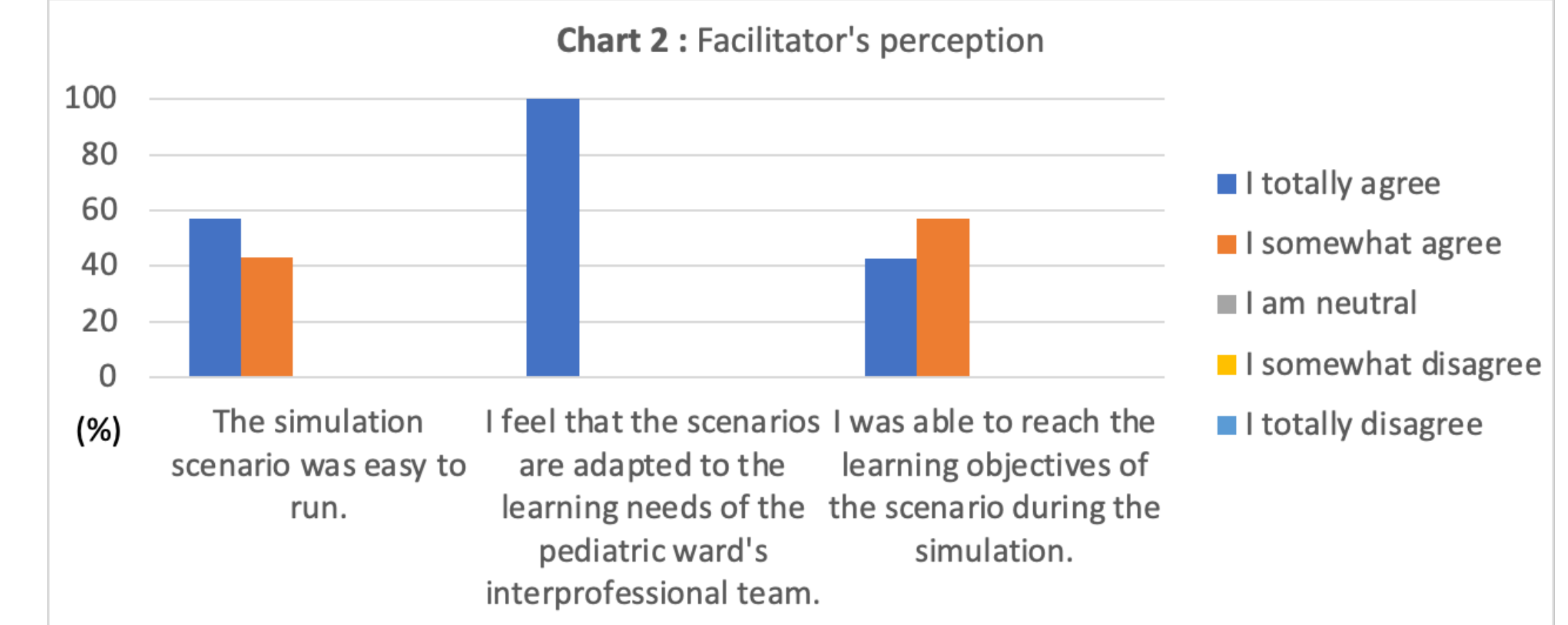
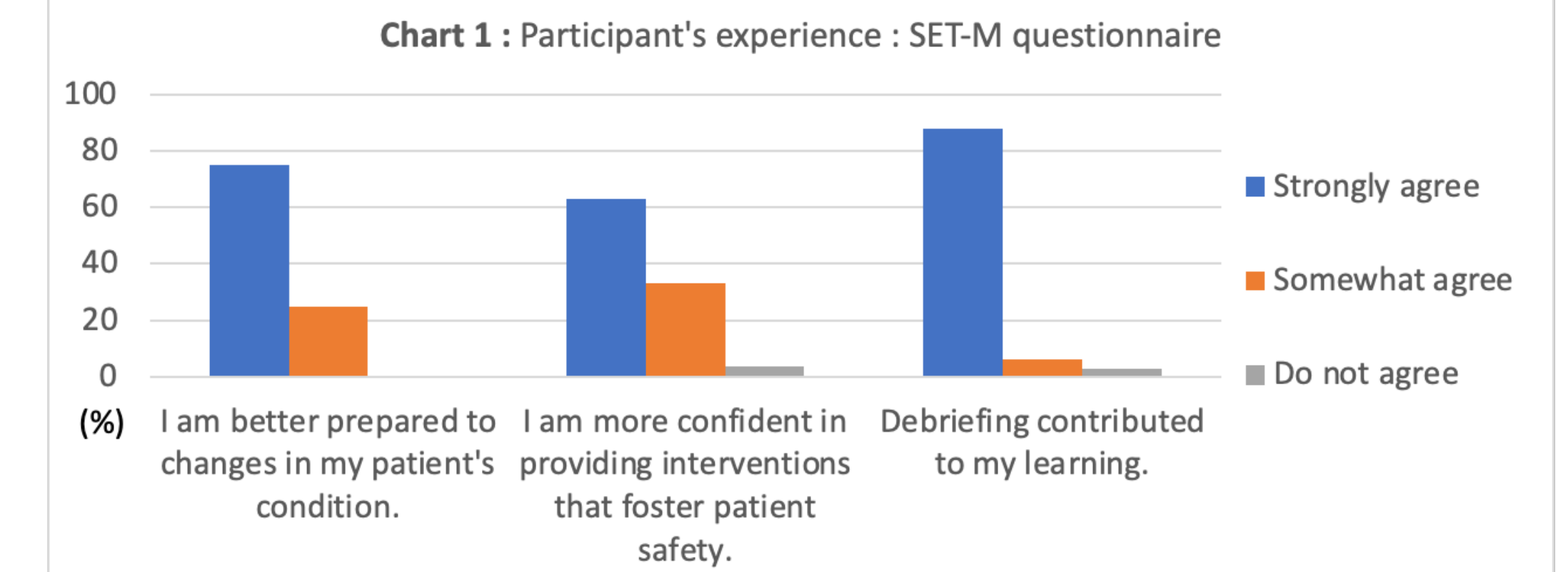
Scenario example : Anaphylaxis Speaking up for patient safety

- Scenario goals :
 - Recognize an inadequate action by a colleague, express concern regarding patient safety, and acquire assertive communication skills.
- Scenario progression :
 - A physician actor introduces wrong treatment for anaphylaxis (wrong medication, wrong route of administration and dose).
 - The facilitator observes the participant's reactions to actor errors and progresses the scenario accordingly to the participant's response.
- Debriefing :
 - Address both medical management of anaphylaxis and teach assertive communication strategies.
- Scan the following QR code to access this scenario:



Preliminary results

18 scenarios are being designed, tested, and evaluated.



Conclusions

- We formalized our simulation curriculum by defining goals, selecting EPAs*, and making explicit the scenario progression, detailed list of medications and equipment, and debriefing guidance for each scenario.
- This new curriculum of 18 scenarios is innovative, as it ensures better representation of incidents and accidents that happen on the ward, and meets the interprofessional team's current training needs.
- Finally, we introduced two new psychological safety focused scenarios, to simulate situations when a patient risk is identified and to teach strategies to speak up within an interprofessional team.
- Next steps : continuous reassessment of the curriculum so that it stays relevant to the interprofessional team: yearly review of incident and accident reports, and of new clinical care protocols; ongoing reassessment of the team's training needs.

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References

1. Emergency Medicine Simulation Educators Research Consortium (EM-SERC) (2019). EM Sim Cases simulation template. Retrieved from <https://emsimcases.com/template/>
2. Burns, R., Madhok, M., Bank, I., Nguyen, M., Falk, M., Waseem, M., & Auerbach, M. (2021). Creation of a standardized pediatric emergency medicine simulation curriculum for emergency medicine residents. *AEM Education and Training*, 5(4), e10685.
3. Leighton, K., Ravert, P., Mudra, V., & Macintosh, C. (2018). Simulation Effectiveness Tool - Modified. Retrieved from <https://sites.google.com/view/evaluatinghealthcaresimulation/>