The Co-Design of Simulation-Based Training for
Collaboration between Healthcare Services

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Collaboration between the healthcare services

- It is stipulated that specialist healthcare services at the hospitals and municipal health services must collaborate to achieve a more efficient patient flow.

- Over time, a gap in the competence base between central and local government and between the health services has been uncovered, making coordination difficult

- Can lead to serious consequences for patient safety and treatment

- The Government presented a new "National Health and Coordination Plan 2024–2027 — Our Common Health Service" on 1 March 2024, which points to insufficient coordination between the services

  - Must increase interaction across levels to strengthen coordination between municipalities and hospitals,

  - many problems, but common to all is the need for better communication and better solutions related to the patients/users' movement between levels, and better knowledge of each other's competence and opportunities
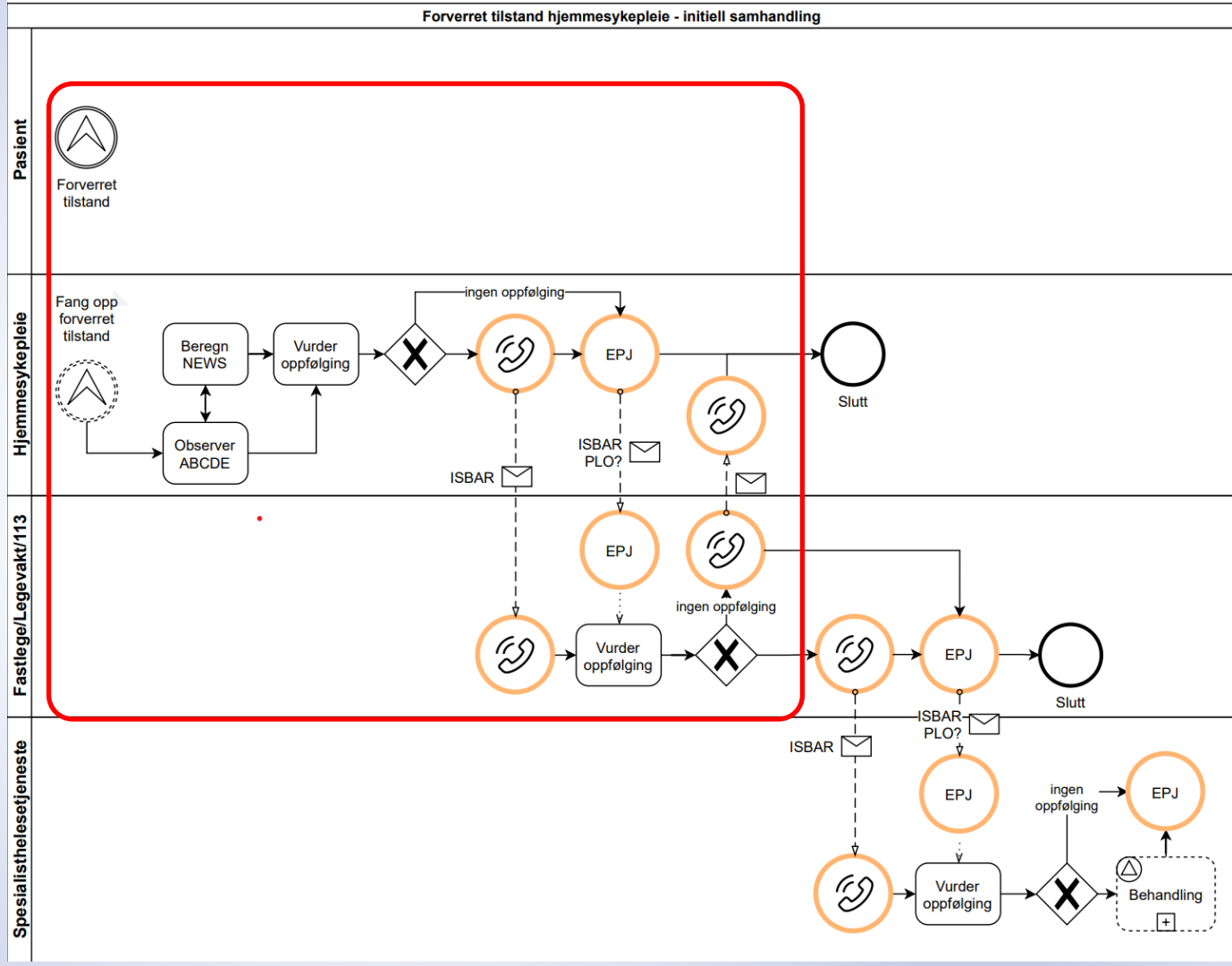
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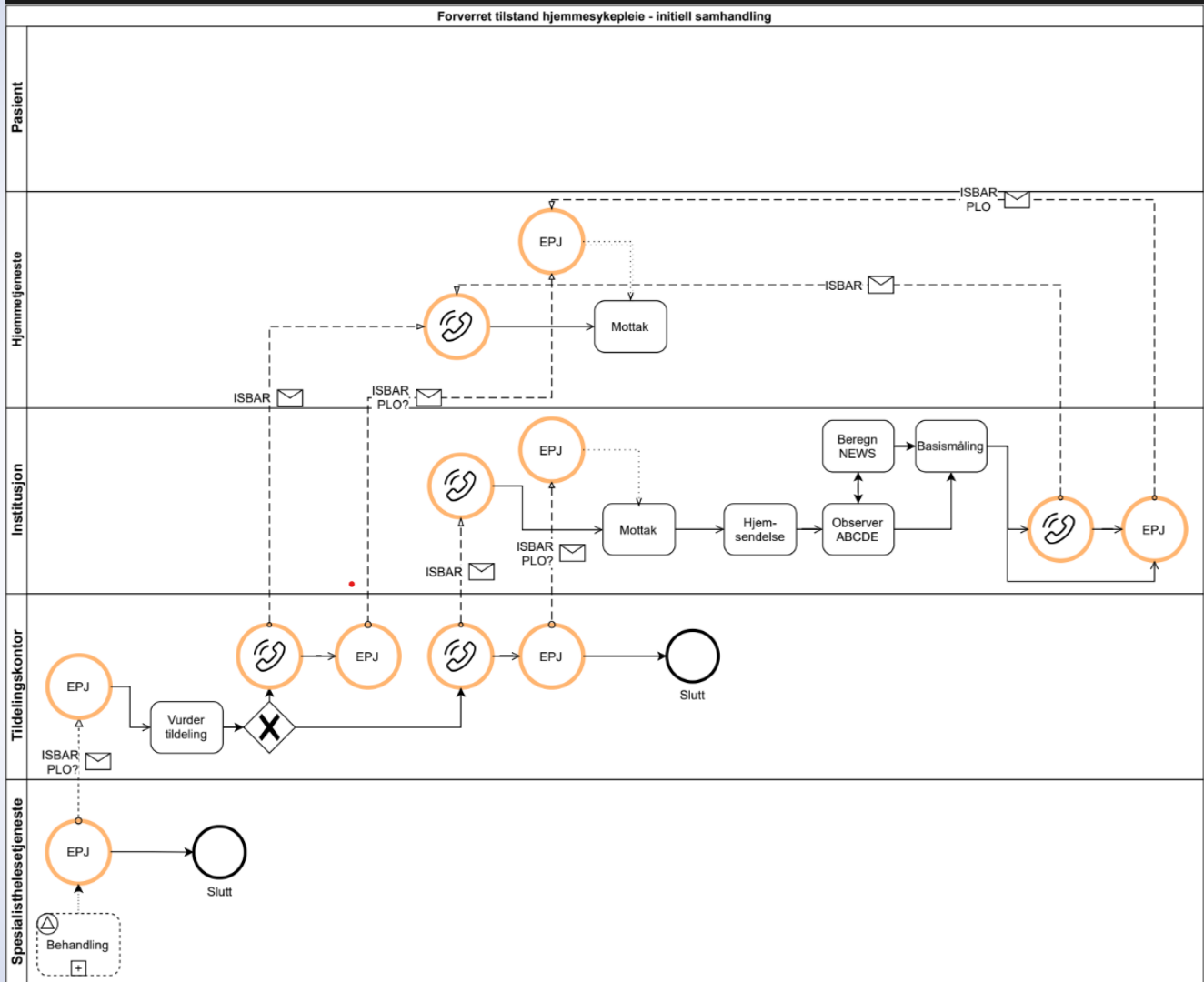# Model of collaboration points:

Home patient via municipal healthcare services to hospital specialist services
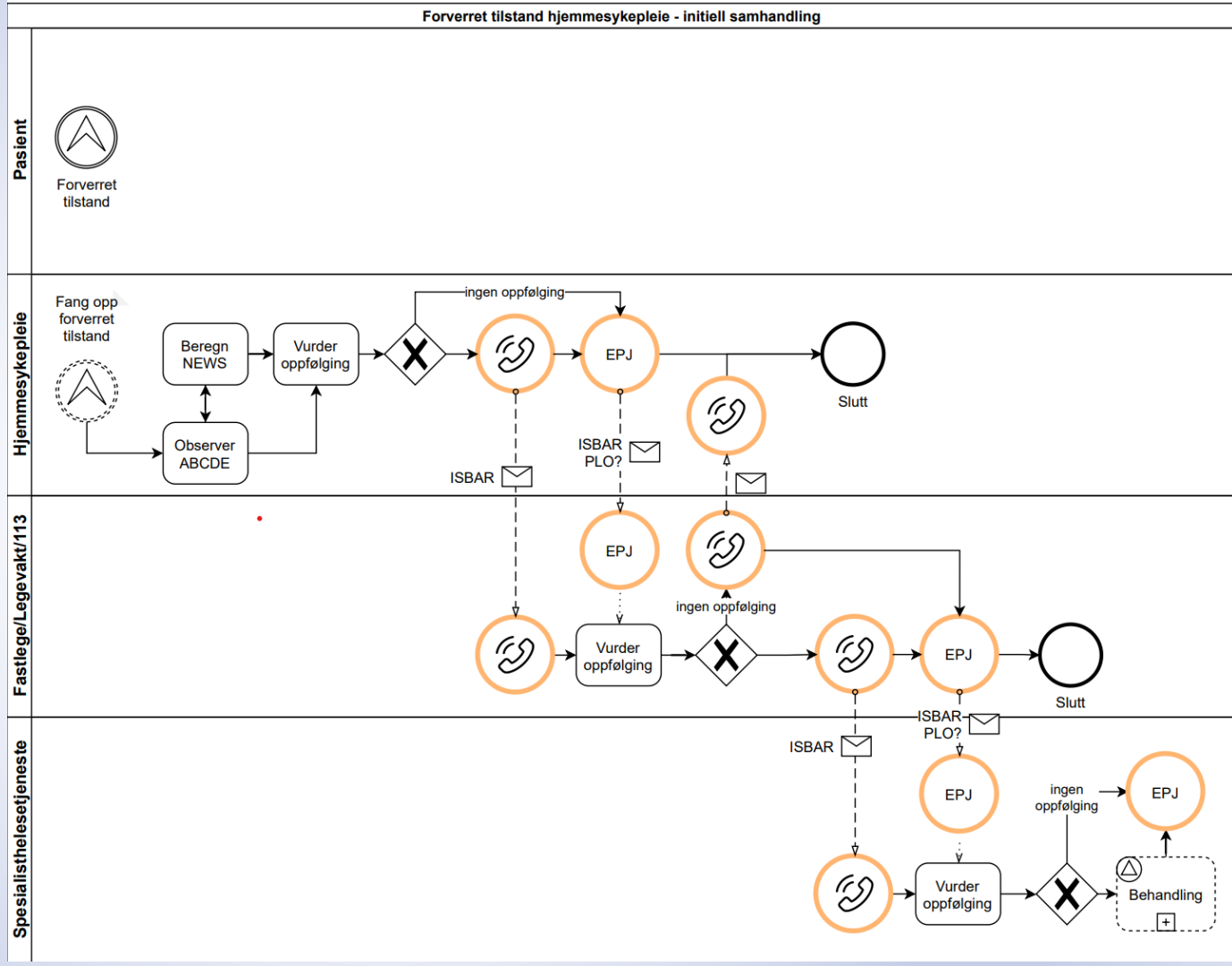
Model of collaboration points:

Home patient via municipal healthcare services to hospital specialist services

Model of collaboration points:

…and back again

The Scenario

- Patient deterioration in home setting
- home care worker, who may not know procedures ABCDE, NEWS and ISBAR well
- Should call ER for help
- Together over the phone, they should establish patient condition and decide next step

Clinical deterioration home care service: initial interaction and collaboration
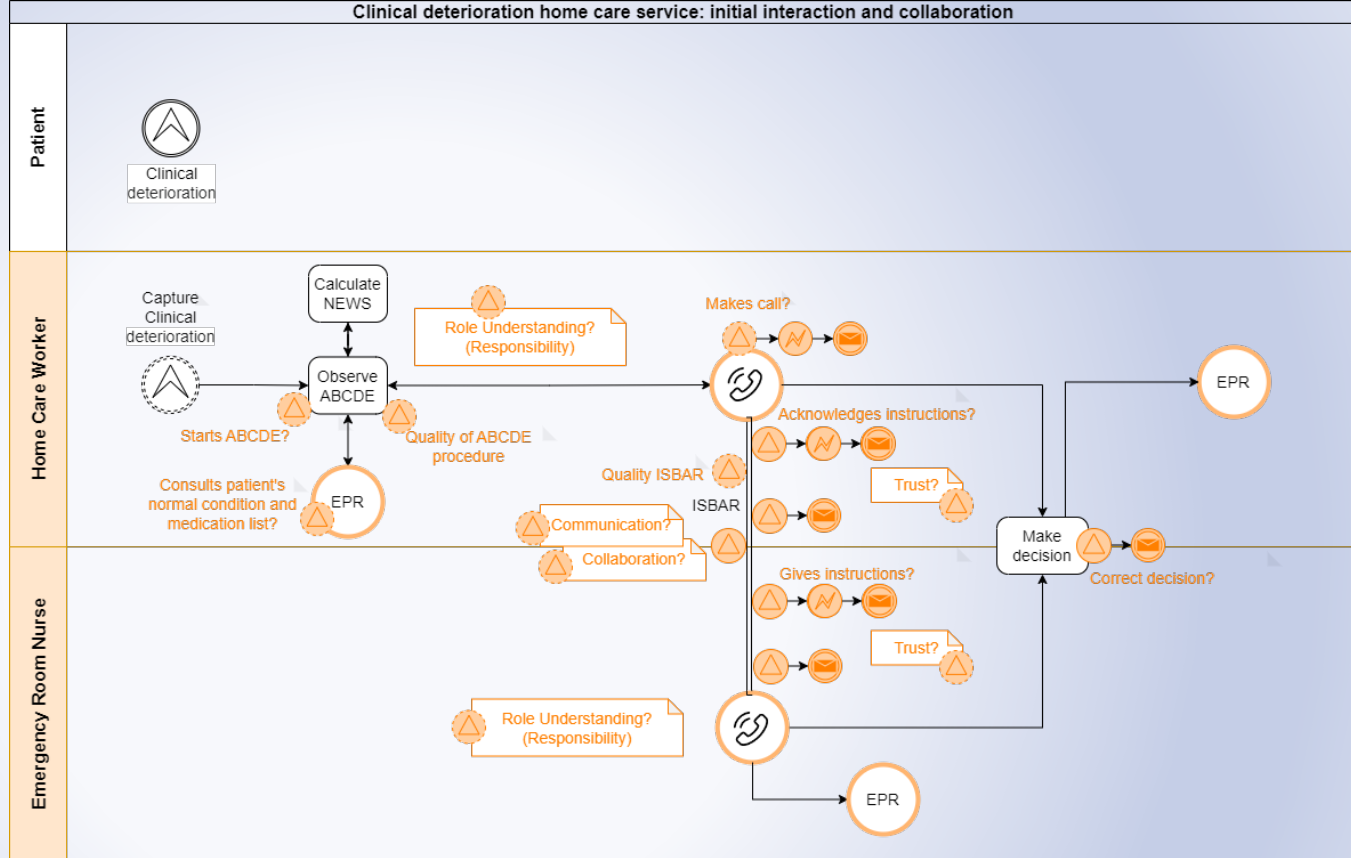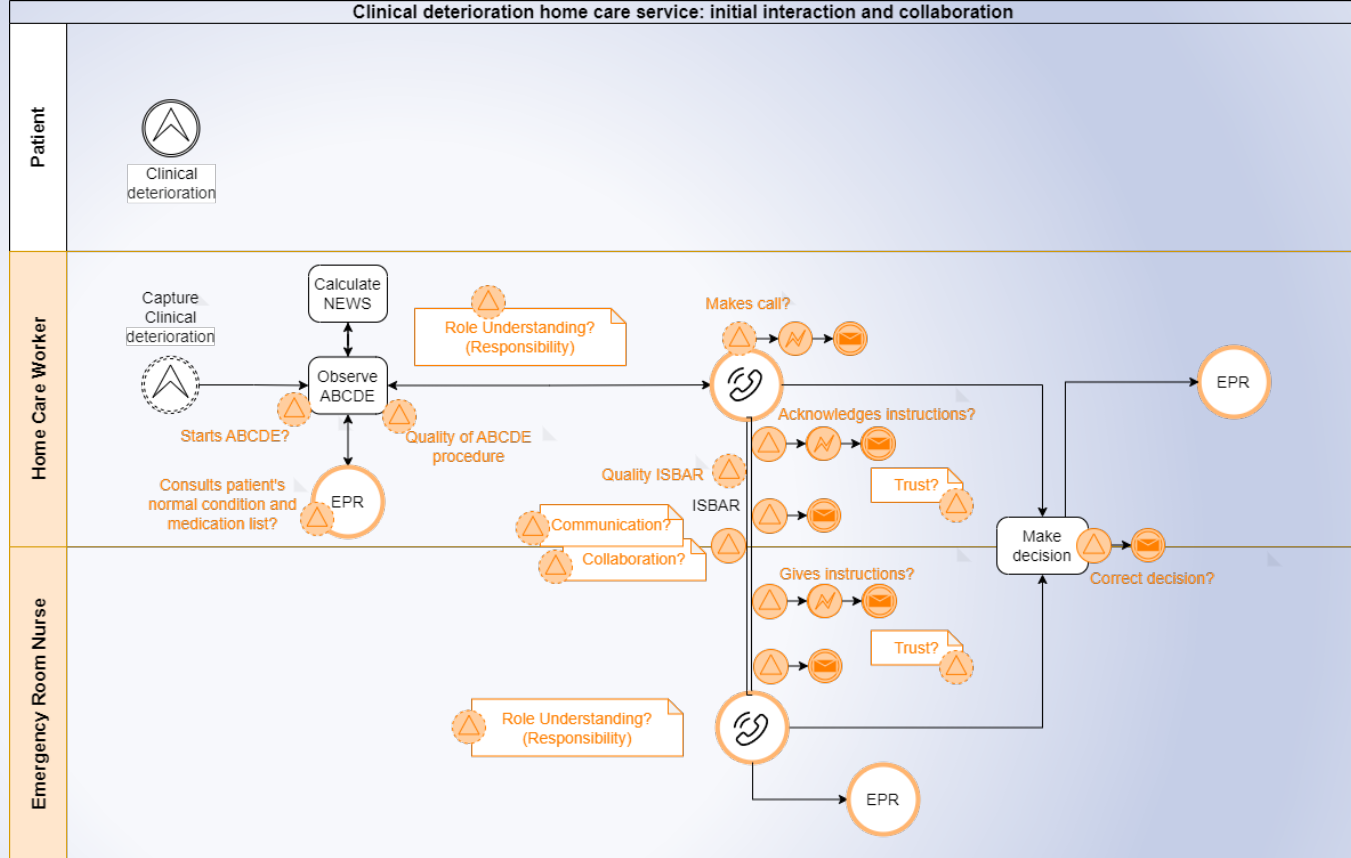
Game Master activities

- Observation point. Registrered by the simulation system
- Observation point. Registered manually.
- Prompt for activity.
- Observation included in debrief

6

The Scenario

Train to enhance
- Responsibility
- Trust
- Communication
- Collaboration

Training Scheme

Training Brief

Simulation-based training:
Collaboration between emergency room nurse and home care nurse

PEARLS Debrief

Self reflection (questionnaire)

Simulation-based training:
Collaboration between emergency room nurse and home care nurse

PEARLS Debrief

Self reflection (questionnaire)

Training

Retraining
(role reversal)

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Simulation-Based Training

- Artificial elements
  - Safe, para-realistic
- Repeteatable
  - Volume training,
  - Immediate retraining
- Targeted
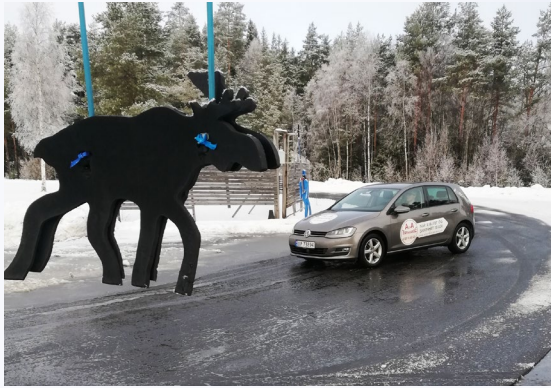 - Focus on what really needs to be trained
  - Deliberate practice
- Mixed Reality
  - Train as above – with the equipment you use normally

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Virtual Reality
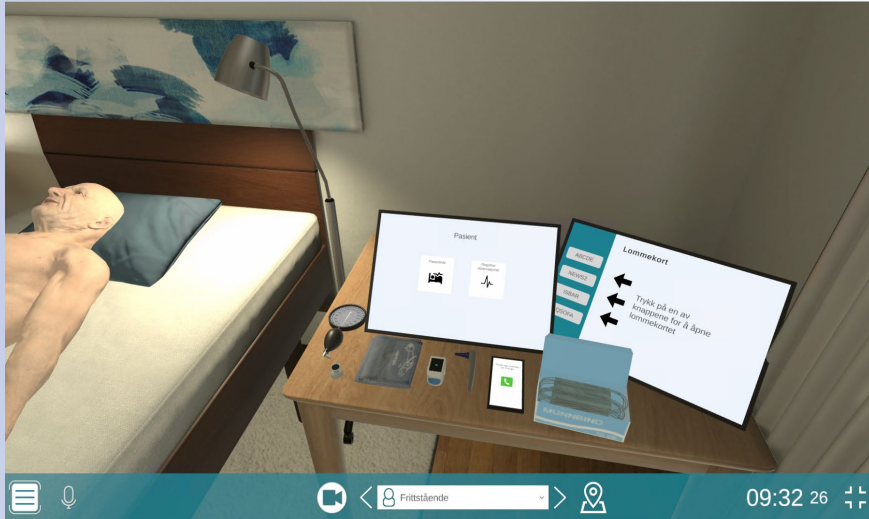
Patient room (home)

Emergency room

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The Scenario

What does it mean to exhibit

- Responsibility
- Trust
- Communication
- Collaboration

Instruments for measuring responsibility, trust, communication, collaboration

- IPC-DLC: Interp*rofessional Collaboration: Q 3, 4, 5, 10*
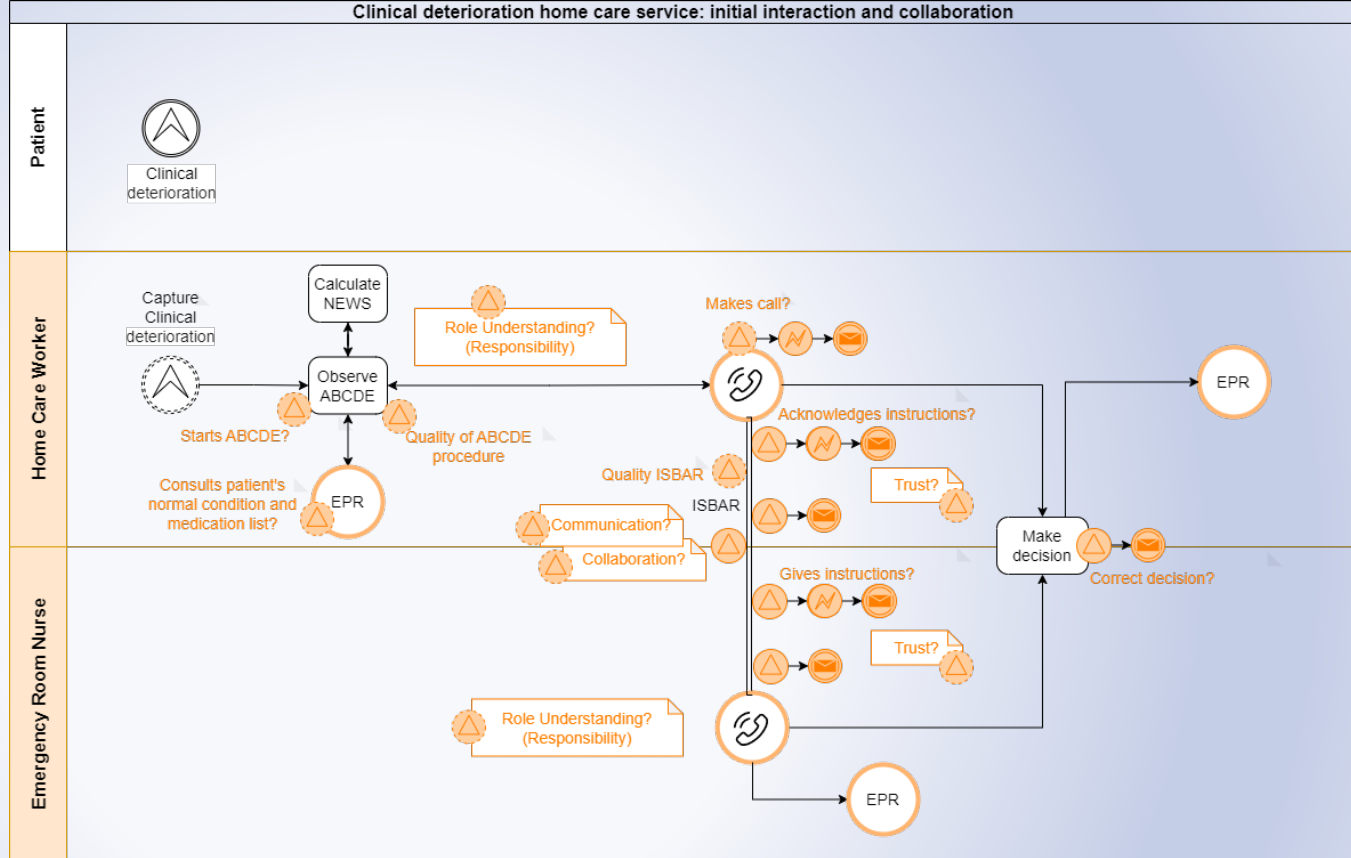- *MGMS: Multiple* Group Measurement Scale for Interprofessional Collaboration: Q 1, 7, 9, 10,14
- MIIC: Modified Index of Interdisciplinary Collaboration: Q 16, 20, 22, 23
- AITCS: Assessment of Interprofessional Team Collaboration Scale: Q 3, 4, 5,15, 18, 19, 26, 31, 33, 34
- CPAT: Collaborative Practice Assessment Tool: Q 8, 9, 17, 30, 32, 34, 37–41, 46, 54, plus free text
- IPS: Internal Participation Scale: Q 5, 6
- JeffSATIC: Jefferson Scale of Attitudes Toward Interprofessional Collaboration: Q 1, 2, 4, 11, 13, 15, 17–19
- TEAM: Team Emergency Assessment Measure: Q 3–9, 11, 12
- TPOT: the Team Performance Observation Tool: Mutual Support b, Communication a–e, plus phrases for mutual support and communication
- SCLS: Student Satisfaction and Self-Confidence in Learning Scale: Q 1, 3, 6, 7, 11, 12

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Instruments for measuring communication and interaction - discourse analysis

▪ Discourse patterns
(T. Okada and H.A. Simon, "Collaborative discovery in a scientific domain," Cognitive Science, vol. 21, no. 2, pp. 109–146, 1997.)

▪ Assimilative versus problem-centered discourse: 1. Surface assimilation, 2. Stonewalling, 3. Patching, and 4. Problem-Centered
(C.K.K. Chan, "Peer collaboration and discourse patterns in learning from incompatible information," Instructional Science, vol. 29, 2001.)
(C. Bereiter and M. Scardamelia, Surpassing Ourselves: An Inquiry into the Nature and Implications of Expertise. Open Court, 1993.)

▪ Knowledge construction: Conceptual, Metacognitive, Question-Query, Nonsubstantive, or Other.
(K. Hogan, B.K. Nastasi, and M. Pressley, "Discourse patterns and collaborative scientific reasoning in peer and teacher-guided discussions," Cognition and Instruction, vol. 17, no. 4, pp. 379–432, 2000.)

  ▪ Interaction Pattern: Consensual, responsive, elaborative, and nonconceptual.

  ▪ Revised Interaction Pattern: Consensual (c), Stonewalling (s), Cross Purpose (x), Responsive (r), Elaborative (e), Nonresponsive (n)
(Hannay, Walle 2009)

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Couldn't find any that captured the four competencies *in the situation*

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Made our own items for each construct

Responsibility
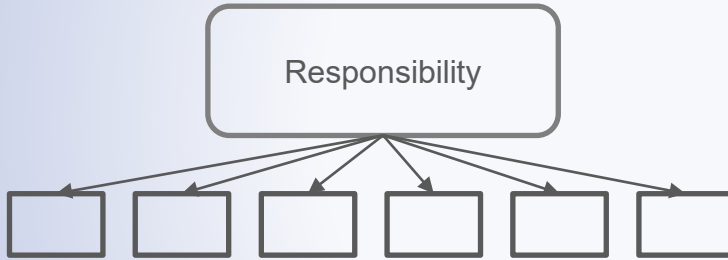
Indicators (questionnaire items)

Reflexive measurement model

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Made our own items for each construct

Responsibility

Trust

Communication

Collaboration

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A structured method for developing unidimensional Thurstone scales with equal-appearing intervals
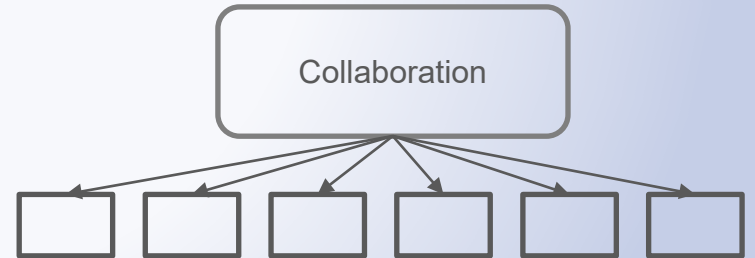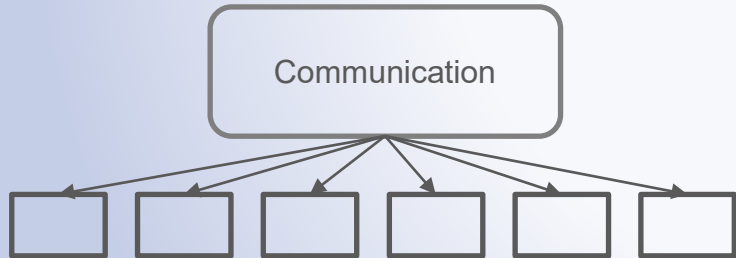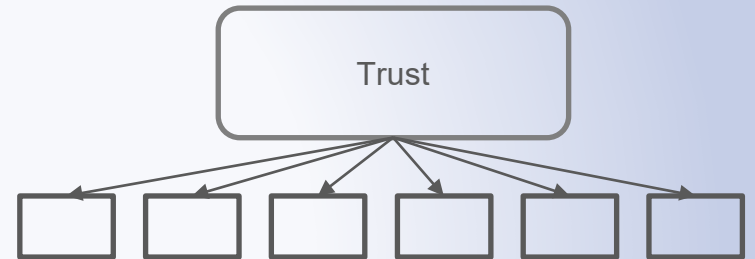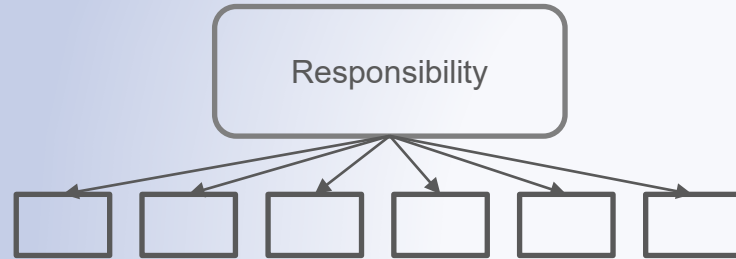
1. Elicit statements from subject matter experts on what is to exhibit
   - Responsibility (individual)
   - Trust (individual)
   - Good communication (team)
   - Good collaboration (team)

In the situation you were in,

RU-HCW: what does a home care worker do who takes responsibility for the patient?
RU-ERN: what does an emergency room nurse do who takes responsibility for the patient?
RU-HCW-neg: what does a home care worker do who does not take responsibility for the patient?
RU-ERN-neg: what does an emergency room nurse do who does not take responsibility for the patient?
T-HCW: what does a home care worker do who trusts the person they are talking to on the phone?
T-ERN: what does an emergency room nurse do who trusts the person they are talking to on the phone?
T-HCW-neg: what does a home care worker do who does not trust the person they are speaking to on the phone?
T-ERN-neg: what does an emergency room nurse do who does not trust the person they are speaking to on the phone?
COM: what do a home care worker and an emergency room nurse do who communicate well over the phone?
COM-neg: what do a home care worker and an emergency room nurse do who communicate poorly over the phone?
COL: what do a home care worker and an emergency room nurse do who collaborate well over the phone?
COL-neg: what do a home care worker and an emergency room nurse do who collaborate poorly over the phone?

A structured method for developing unidimensional Thurstone scales with equal-appearing intervals

1. Elicit statements from subject matter experts on what is to exhibit
   - Responsibility (individual)
   - Trust (individual)
   - Good communication (team)
   - Good collaboration (team)
     - We elicited 298 statements in total

     "I choose not to call anyone"
     "I call for expert help due to lack of skills"

     "I share what I do not know"
     "I feel embarrassed, appeared dismissive, and think what the home care worker says is not serious"

     "They ensure that the other person understands what was said"
     "They have hectic and stressed communication"

     "They are both calm, not stressed, talk a little back and forth, consider further observations"
     "They don't listen to each other, are not professional, and have no respect for each other"

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   "They are both calm, not stressed, talk a little back and forth, consider further observations"
   "They don't listen to each other, are not professional, and have no respect for each other"

2. Ask them to rate (1-11) each statement according to how much the statement demonstrates the relevant construct.

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   - Trust (individual)
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   "I choose not to call anyone"   3
   "I call for expert help due to lack of skills"   9

   "I share what I do not know"   11
   "I feel embarrassed, appeared dismissive, and think what the home care worker says is not serious"   4

   "They ensure that the other person understands what was said"   10
   "They have hectic and stressed communication"   3

   "They are both calm, not stressed, talk a little back and forth, consider further observations"   11
   "They don't listen to each other, are not professional, and have no respect for each other"   2

2. Ask them to rate (1-11) each statement according to how much the statement demonstrates the relevant construct.

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"I choose not to call anyone"	3 2 3 4 1 1 1 3 2
"I call for expert help due to lack of skills"	9 9 10 11 7 8 9 7 9

"I share what I do not know"	11 10 10 9 11 10 8 7 9
"I feel embarrassed, appeared dismissive, and think what the home care worker says is not serious"	4 3 2 2 4 3 2 1 2

"They ensure that the other person understands what was said"	10 10 10 11 6 7 7 9 9
"They have hectic and stressed communication"	3 3 2 1 1 2 2 3 2

"They are both calm, not stressed, talk a little back and forth, consider further observations"	11 10 10 9 11 7 6 11 11
"They don't listen to each other, are not professional, and have no respect for each other"	2 1 3 4 2 2 3 1 3

2. Ask them to rate (1-11) each statement according to how much the statement demonstrates the relevant construct.

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   - Good collaboration (team)
     - We elicited 298 statements in total

   "I choose not to call anyone"   3 2 3 4 1 1 1 3 2 median 2
   "I call for expert help due to lack of skills"   9 9 10 11 7 8 9 7 9 median 9

   "I share what I do not know"   11 10 10 9 11 10 8 7 9 median 10
   "I feel embarrassed, appeared dismissive, and think what the home care worker says is not serious"   4 3 2 2 4 3 2 1 2 median 2

   "They ensure that the other person understands what was said"   10 10 10 11 6 7 7 9 9 median 9
   "They have hectic and stressed communication"   3 3 2 1 1 2 2 3 2 median 2

   "They are both calm, not stressed, talk a little back and forth, consider further observations"   11 10 10 9 11 7 6 11 11 median 10
   "They don't listen to each other, are not professional, and have no respect for each other"   2 1 3 4 2 2 3 1 3 median 2

2. Ask them to rate (1-11) each statement according to how much the statement demonstrates the relevant construct.

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   - Good collaboration (team)
     - We elicited 298 statements in total

     "I choose not to call anyone"   3 2 3 4 1 1 1 3 2 median 2
     "I call for expert help due to lack of skills"   9 9 10 11 7 8 9 7 9 median 9

2. Ask them to rate (1-11) each statement according to how much the statement demonstrates the relevant construct.
3. Each statement gets a number of associated responses from 1 to 11. Find the median number for each statement.
4. For each median number between 1 and 11, choose a statement that the subject matter experts rated most consistently (has least variance).

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A structured method for developing unidimensional Thurstone scales with equal-appearing intervals

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   - Trust (individual)
   - Good communication (team)
   - Good collaboration (team)
     - We elicited 298 statements in total

     "I assessed the situation, even though I am a student or unskilled"   6 6 6 11 11 10 9 9 9   median 9, irq 4
     "I call for expert help due to lack of skills"   9 9 10 11 7 8 9 7 9   median 9, irq 2
2. Ask them to rate (1-11) each statement according to how much the statement demonstrates the relevant construct.
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4. For each median number between 1 and 11, choose a statement that the subject matter experts rated most consistently (has least variance).

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A structured method for developing unidimensional Thurstone scales with equal-appearing intervals

5. We get a list of statements for each construct, each one with a "weight" (its median) between 1 and 11.

| Home Care Worker	Weight
Responibility	
I assessed the situation, even though I am a student or unskilled.	5
I did not get along with the person at the emergency clinic and said as little as possible.	4
I made good observations, watched how the patient was breathing and performed ABC, even though I might not have been able to measure.	7
I chose not to call anyone.	2
I had vital measurements ready when I called.	8
I called for expert help due to lack of skills.	9
I took measurements where it was relevant.	6
I renounced responsibility and walked away from the situation.	1
I went in to the patient, saw that the patient was sick, and said I would come back later.	3
I ensured good communication and interaction with the emergency room nurse.	10
Trust	
I felt safe.	9
I contradicted the emergency nurse when I disagreed.	5
I shared what I did not know.	7
I became unsure of my own assessments.	6
I did not call and left the patient in a potentially critical condition.	3
I gave poor information and cooperated poorly with the emergency room nurse.	3
I did not dare to consult with the emergency room nurse.	4
I informed about the patient's condition.	8

A structured method for developing unidimensional Thurstone scales with equal-appearing intervals

5. We get a list of statements for each construct, each one with a "weight" (its median) between 1 and 11.

6. These 11 statements are given to training participants after a training session. They tick of if they agree or disagree with each statement. The sum of the weights for those "agreed" on is that participants score on that construct.

Agree

Home Care Worker	Weight	
Responibility		
I assessed the situation, even though I am a student or unskilled.	5	1
I did not get along with the person at the emergency clinic and said as little as possible.	4	0
I made good observations, watched how the patient was breathing and performed ABC, even though I might not have been able to measure.	7	1
I chose not to call anyone.	2	1
I had vital measurements ready when I called.	8	0
I called for expert help due to lack of skills.	9	0
I took measurements where it was relevant.	6	0
I renounced responsibility and walked away from the situation.	1	1
I went in to the patient, saw that the patient was sick, and said I would come back later.	3	0
I ensured good communication and interaction with the emergency room nurse.	10	1
		25
Trust		
I felt safe.	9	
I contradicted the emergency nurse when I disagreed.	5	
I shared what I did not know.	7	
I became unsure of my own assessments.	6	
I did not call and left the patient in a potentially critical condition.	3	
I gave poor information and cooperated poorly with the emergency room nurse.	3	
I did not dare to consult with the emergency room nurse.	4	
I informed about the patient's condition.	8	

The items (instruments) for each construct
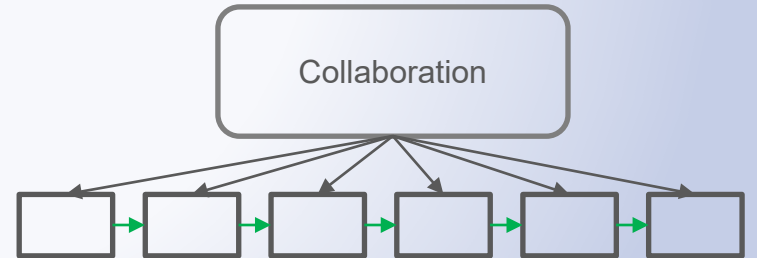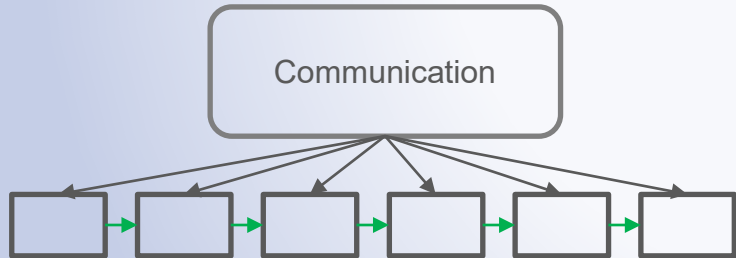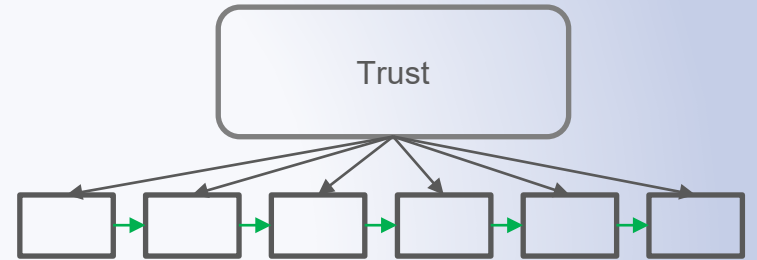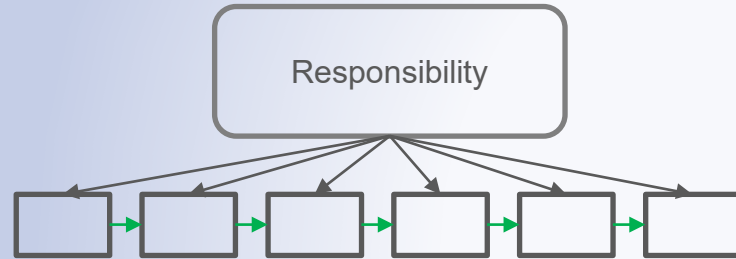
Using the Instruments

We tested the instruments on healthcare worker students.

(We developed two versions of the instruments, using professional healthcare workers and students)

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Results from six pairs (home healthcare worker – ER nurse)

Pair	Round	Home care worker				Emergency room nurse				Decision for patient		
		R	T	Com	Col	R	T	Com	Col	Call EMS	Observe	Call doctor
A	1	3.8	3.6	3.2	4.3	3.3	3.1	3.9	3.3	x		
A	2	4.5	2.1	2.9	4.1	3.8	2.1	3.4	3.1	x		
B	1	3.3	4.0	2.9	3.8	4.0	3.1	2.9	3.8		x	
B	2	3.7	3.6	2.9	4.3	2.4	2.3	1.9	4.4		x	
C	1	4.5	1.6	4.6	2.3	3.3	3.1	2.4	3.8			x
C	2	3.7	3.6	4.2	3.3	3.3	3.9	5.0	3.8	x		
D	1	2.8	4.0	3.4	4.6	3.6	3.1	2.9	3.1		x	
D	2	4.5	2.1	2.9	2.6	3.6	3.1	3.3	3.8		x	
E	1	4.6	2.1	4.2	5.4	3.8	2.1	4.1	2.6			x
E	2	2.1	5.1	1.8	2.5	3.6	5.3	4.9	3.5		x	
F	1	4.5	3.0	2.3	3.8	3.3	3.1	3.6	3.8	x		
F	2	4.1	3.0	1.0	2.6	3.3	3.1	2.3	3.8	x		

Relation between constructs and clinical response?
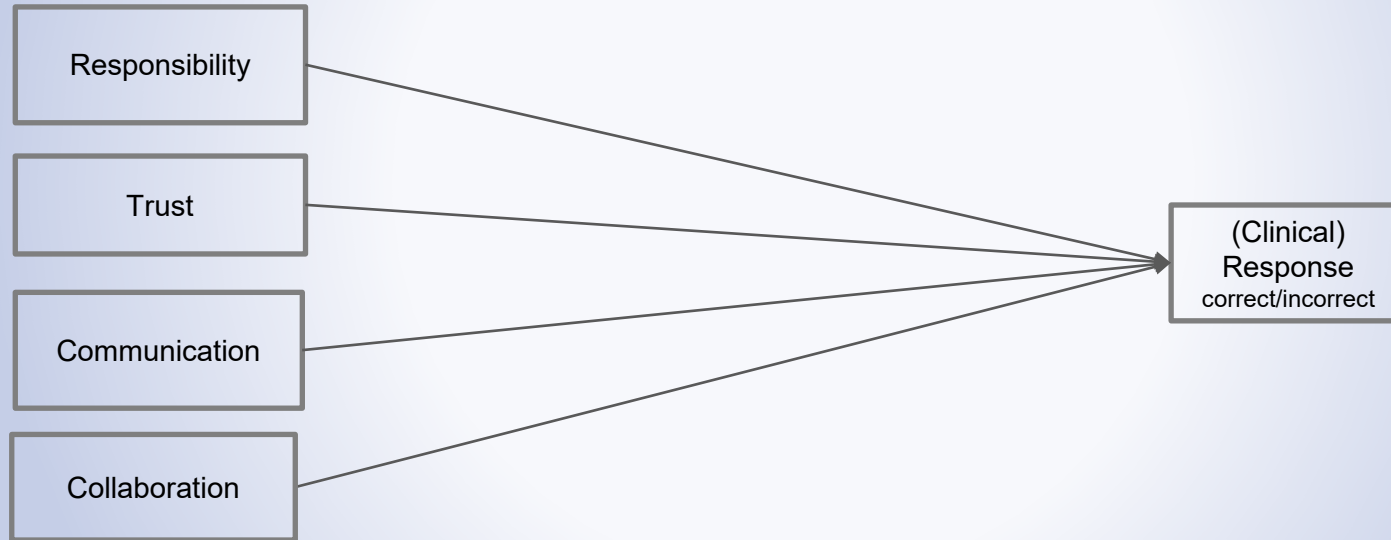
Relation between constructs and clinical response?

Nope!

Group Statistics

	Decision	N	Mean	Std. Deviation	Std. Error Mean
Resposibility	Call EMS	10	3.3511	.72125	.22808
	Observe	10	3.7711	.46467	.14694
Trust	Call EMS	10	3.5765	1.05615	.33398
	Observe	10	3.0765	.58408	.18470
Communication	Call EMS	10	2.9779	.85970	.27186
	Observe	10	3.1882	1.12469	.35566
Collaboration	Call EMS	10	3.6260	.70956	.22438
	Observe	10	3.5635	.49347	.15605

Group Statistics

	Call EMS	N	Mean	Std. Deviation	Std. Error Mean
Resposibility	yes	10	3.7711	.46467	.14694
	no	14	3.5516	.74323	.19864
Trust	yes	10	3.0765	.58408	.18470
	no	14	3.1982	1.11726	.29860
Communication	yes	10	3.1882	1.12469	.35566
	no	14	3.2225	.93763	.25059
Collaboration	yes	10	3.5635	.49347	.15605
	no	14	3.5904	.89875	.24020

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Relation between constructs?
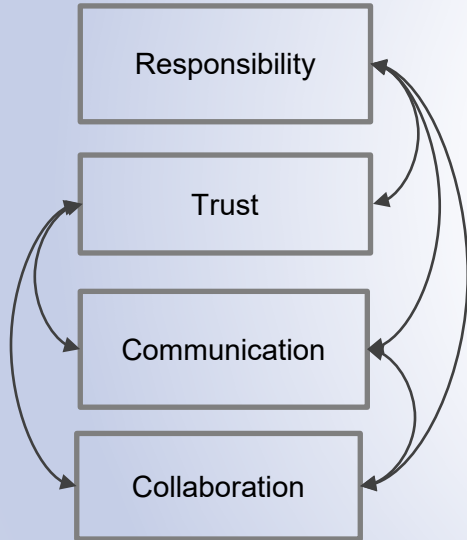
Relation between constructs?

Home Care Workers
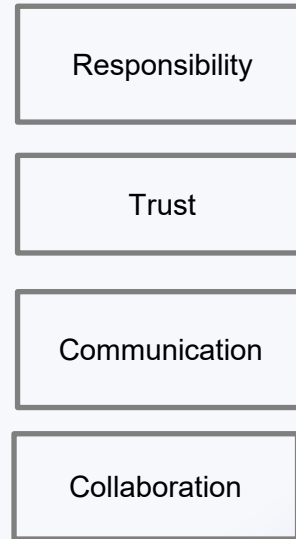
Responsibility

Trust

Communication
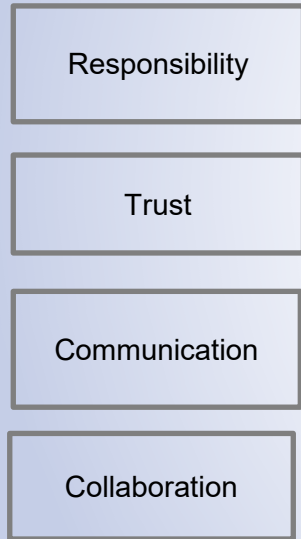
Collaboration

-.925 (p < .001)

As the perception of taking responsibility increases the level of trust decreases.

A challenge for collaborative practice?

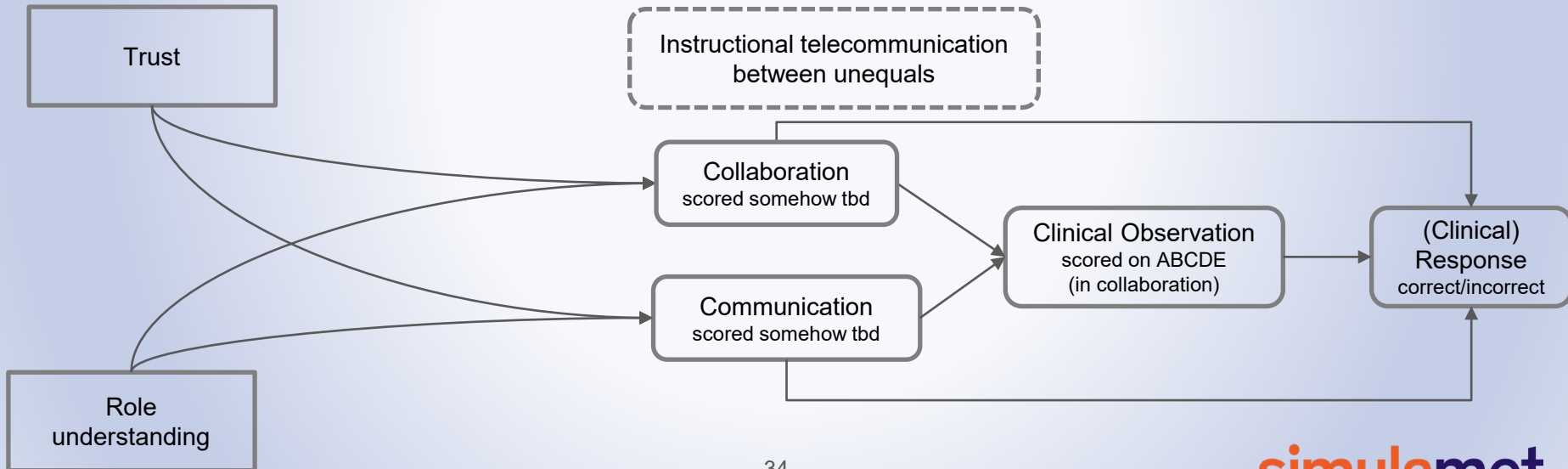**ER Nurses**

Responsibility

Trust

Communication

Collaboration

-.656 (p = .021)

Perhaps, emergency room worker players who take responsibility take charge of the situation and get into a mode of telling the home care worker what to do, rather than trying to figure out what to do together.

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More complex relationships

Thanks!

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