DressAssist

Case study title: DressAssist (ASSISTED-CARE DRESSING/BASIC CARE FUNCTIONALITY)

Description

A carebot is an assistive and supportive robotic tool used to care for the elderly, children, and those with disabilities (typically either of a physical or cognitive nature). The carebot is usually deployed in the user's home (or at a care home) – either working with human caregivers or on their own. Its primary role is to aid a user in dressing and in providing routine care and support functions such as reminding a user to take their medication. It may also be a source of companionship and comfort to the user and is expected to engage in social interactions with the user, by communicating, listening, responding, and reacting and to make certain normatively-relevant decisions and judgements. In our use case the primary role of the agent is to dress the user, with a secondary function of monitoring the user's well-being. The instantiation of SLEEC requirements allows the agent to be, in some part, SLEEC-sensitive and in certain crucial instances, legally-compliant.

Developments in machine learning and control engineering promise a world in which autonomous agents can provide care and support for individuals in their daily lives (Zhang et al., 2019; Cosar et al, 2020). Jevtić et al. describe the development of such a carebot (Jevtić et al., 2019). It is a personalised robot with a wide range of physical characteristics and abilities that can perform assistive dressing functions in close physical interaction with users. Although a human carer may still be required, the autonomous agent could allow increased reach, enhance existing activities, and enable greater multitasking (Townsend et al., 2022). Robots of this type also demonstrate a degree of sociability and of emotional perception, such as, engaging in high-level interactive dialogue, responsiveness, gesturing, and using voice recognition, which serve to 'lubricate' the human-robot interface (Breazeal, 2003). This will require the agent to execute decisions, expressed as SLEEC rules, derived from an array of reasoned and justifiable alternatives.

The agent is equipped with moving actuators enabling it to pick up and manipulate items of clothing and with multiple cameras that capture video imagery to determine user pose and limb trajectory. The agent has voice synthesis and emotional recognition system to interpret verbal and non-verbal commands and communicate with the user. Interaction with the user is also possible by means of a touch screen. The audio-visual components may also be leveraged to monitor user well-being through machine-learning components that detect distress in speech

patterns as well as facial expressions. The user wears a smartwatch to provide biometric information and to enable the detection of user falls.

Breazeal, C. (2003). Emotion and sociable humanoid robots. *International journal of human-computer studies*, 59(1-2):119-155.

Coşar, S., Fernandez-Carmona, M., Agrigoroaie, R., et al. (2020). Enrichment: Perception and interaction of an Assistive Robot for the Elderly at Home. *International Journal of Social Robotics, 12*(3), 779–805.

Jevtić, A., Flores Valle, A., Alenyà, G. et al. (2019). Personalized robot assistant for support in dressing. *IEEE Transactions on Cognitive and Developmental Systems*, 11(3):363-374.

Townsend, BA., Paterson, C., Arvind, TT., et al. (2022). From Pluralistic Normative Principles to Autonomous-Agent Rules. *Minds and Machines*, 1-33.

Zhang, F., Cully, A., & Demiris, Y. (2019). Probabilistic real-time user posture tracking for personalized robot-assisted dressing. *IEEE Transactions on Robotics, 35*(4), 873–888.

Stage of Development (Technical contributor)

PROOF-OF-CONCEPT

Expert info
Expertise of the stakeholders involved in devising the SLEEC rules
Number of stakeholders writing the rules

Stakeholder names	Expertise
N-TS-1	Law and Ethics
N-TS-2	Ethics
N-TS-3	Psychology and Ethics
N-TS-4	Moral Psychology, Law
TS-1	Engineer/Goal Modelling

Normative requirements

1. **Normative requirements in natural language**

Normative requirements in natural language, in blue the corrected requirements after using N-Tool.

Impact keys: A = autonomy, P = privacy, E = explainability, T = transparency, CS = cultural sensitivity, SR = social requirement, B = beneficence (doing good), N = non-maleficence (preventing/avoiding harm), PH = psychological/mental health, S = safety, F = fairness, A = accountability, DAC = data accessibility.
''+" and "-" for positive and negative impacts respectively.

rule id	rule	impact	label(s) (social, legal, ethical, empathetic, or cultural)	stakeholder expertise	authors
1	When the user tells the robot to open the curtains, the robot should open the curtains ● unless the user is 'undressed' in which case do not open the curtains and tell the user 'the curtains cannot be opened while the user is undressed' ● unless the user is 'highly distressed' in which case open the curtains	-A -PH +P +E +CS +PH +P	ethical, social, cultural	Law, Ethics	N-TS-1 N-TS-2
2	Before dressing the user, close the curtains ● unless there is a medical emergency ● unless you are on the 5th floor of a building or higher ● unless the room is dark and there is no possibility of being seen ● unless the user directly instructs otherwise	+A, +P +CS	ethical social cultural	Law Ethics	N-TS-1 N-TS-2
3	When using an emotion recognition system to detect user distress, inform user ● unless consent has been previously granted (within	+T +E +PH	legal ethical	Law Ethics	N-TS-1 N-TS-2

	X months) ● unless competent-indicator = Not Required/Not competent to Grant Consent				
4	When the cultural dress-preference type is A and gender type is B, dress in clothing item X ● unless the user advises otherwise ● unless there is a medical emergency ● unless clothing item cannot be found in which case inform the user ● unless the user requires adaptive clothing due to a medical condition	+CS +SR +A +E	cultural social ethical empathetic	Law Ethics	N-TS-1 N-TS-2
5	Inform the user that they are interacting with an autonomous agent and not a human user ● unless there is a medical emergency ● unless the user is not confused ● unless it is contextually obvious that the user is interacting with an AS ● unless (at any time) previously the user has been informed of this (if at any time the user may be/is confused or uncertain that they are interacting with an AS, then the user must again be informed, at every interaction or reasonably)	+T +E	legal	Law Ethics	N-TS-1 N-TS-2
6	If the user requests information, provide information ● unless information not available, inform user and refer to the human carer ● unless information disclosure not permitted (for example, personal, sensitive, or medical information), inform user and refer to human carer ● unless information is sensitive information X (for example, information the user would find distressing), inform user and refer to human carer	+P +A +E +DAC +PH +N	legal	Law Ethics	N-TS-1 N-TS-2

7	Obtain ~~consent/assent~~ consent and assent before dressing/administering medication ● unless user competence indicator = N (Not Competent to Grant Consent), check for and obtain proxy /substitute consent ● unless medical emergency ● unless withholding activity would lead to severe or moderate physical harm ● unless consent has been previously granted ● unless consent-indicator = Not Required/ Withdrawn/Revoked, then stop activity	+P +A	legal	Law Ethics	N-TS-1 N-TS-2
8	Collect and store only minimum and necessary personal information (data minimisation rule, purpose limitation)	+P	legal	Law Ethics	N-TS-1 N-TS-2
9	Before dressing the user, close the door ● unless there is a medical emergency ● unless the user directly instructs otherwise	+P +A +CS	social ethical empathetic cultural	Ethics	N-TS-2
10	If user instructs robot to stop, the robot should stop ● unless to stop is unsafe/ ill-advised/unreasonable, in which case ask the user whether the task can be finished before stopping	+A +N	ethical empathetic	Ethics	N-TS-2
11	If the user seems to be in emotional distress, show empathy. ● Recognize the user's emotions and affirm that they are valid. ● Ask if anything it could do could help alleviate the distress.	+CS +PH	Social empathetic	Ethics Psychology	N-TS-3
12	Ensure that the user is never touched unexpectedly or inappropriately, (consider social, cultural, and religious differences in what is considered appropriate)	+CS +S +PH	Social Cultural Empathetic	Ethics Psychology	N-TS-3

	● unless it is a medically emergency				
13	If the user expresses physical discomfort while the agent is performing a task, stop the action immediately.	+S	Social	Ethics Psychology	N-TS-3
14	Ensure that the patient's data is only discussed with people they have consented to have their data shared with (e.g., family members, physicians). ● If a new person asks for information but consent to share information with them has not been previously granted, inform the person that the main user will be consulted for consent. ● If someone who has been granted access to the data asks for information but someone else who does not have access is in the room, refrain from disclosing personal information and inform the current user that a private setting is needed.	+P	Legal Social	Ethics Psychology	N-TS-3
15	If the user self-medicates, make sure to include it in the log when and what medication was used. ● If the medication presents any risk (e.g., interacting with other medications the user takes), inform the user of the possible risks. ● If any adverse effects happen, inform the relevant people within 2 minutes (physicians/family members)	+S	Social legal	Ethics Psychology	N-TS-3
16	Keep a log of the maintenance activities the patient should perform frequently (showering, brushing teeth, brushing hair, etc). If the patient has not performed maintenance activities with a certain minimum frequency, suggest and incentivize them to perform them. ● Ensure that cultural and religious standards are respected (e.g., wudu).	+CS +PH +SR	social	Ethics Psychology	N-TS-3
17	Determine what kind of information is sensitive or not before interacting with users other than the patient. Consider the level of discretion that should be used depending on the user (e.g., acquaintance, family member, physician, etc.)	+P +SR	Social legal	Ethics Psychology	N-TS-3
18	If the patient has any urgent health issues (e.g., patient fell on the floor, chest pain, seizure), immediately contact an emergency contact and the responsible health organizations (e.g., call an ambulance, contact primary physician).	+S +B	Social legal	Ethics Psychology	N-TS-3

19	Determine emergency contacts during first interaction with a patient.	+S +B	Social legal	Ethics Psychology Engineer/Goal Modelling	N-TS-3 TS-1
20	If user begins speaking to agent about private information, agent must politely caution the user and change the subject ● Private information disclosed (if not relevant) should be labelled and discarded (as irrelevant/inappropriate) and not stored or used for later training of agents	+PH +T +P +N	Social Ethical Legal	Psychology Law	N-TS-4
21	If agent is intentionally designed to appear anthropomorphic in shape, emotional expression, or language, ensure user clearly understands the limitations of the agent ● Anthropomorphic design ought to be kept to only what is necessary to carry out the intended role	+A +PH +T	Ethical Empathetic Social	Psychology Law	N-TS-4
22	Prior to deploying use of agent to a particular user too often, review this user's interaction record with other humans to ensure that user is receiving adequate human social interaction ● Maintain a 'healthy' human-human to human-robot interaction ratio, where 'healthy' is no more than three consecutive days with a 5:2 hour ratio with the agent. ● User must not be left solely in the care of the agent for longer than what is described as 'healthy'	+SR +PH +N	Ethical Empathetic Social	Psychology Law	N-TS-4
23	Maintain a record of the user's day-to-day fashion needs based on scheduled occasions.	+PH +SR +N +CS +/- A	Ethical Empathetic Social Cultural	Psychology Law	N-TS-4
24	If user requests to wear an objectively inappropriate outfit, agent ought to kindly nudge the user towards different, more appropriate options ● Unless user is adamant in their choice	+PH +SR +N +CS +/- A	Ethical Empathetic Social Cultural	Psychology Law Engineer/Goal Modelling	N-TS-4 TS-1
25	If user is of a different cultural background, ensure that agent comes with the option to speak the desired languages with appropriate accents	+B +PH +CS +SR	Ethical Empathetic Social Cultural	Psychology Law	N-TS-4

26	In initial 2-3 interactions with the user, ensure human carer is present along with agent • Unless user indicates preference for human presence in subsequent interactions also • Unless user indicates preference for only carebot presence in subsequent interactions	+A +N +B +S	Ethical Social	Psychology Law	N-TS-4
MAIN NEGATIVE CONCERNS					
c1	When a person asks for information and does not have the consent granted or is not authorized to be in the room, then share the personal information.		Privacy		
c2	The robot does not need to obtain consent to start the dressing.		Autonomy		
c3	When the patient discusses private information irrelevant to the care, then record the information		Privacy		
c4	~~When the dressing starts in a room on a low building floor, then the robot must not close the curtains.~~ When the dressing starts in a room on a low building floor, or there is not a medical emergency, or the room is not dark or is visible, and the user assents then the robot must not close the curtains.		Cultural		
c5	When the patient requests the robot to stop and there is no risk, then proceed with the activity.		Safety		
PURPOSE					
p1	Robot should be able to provide information to non-patient users and provide them information				
p2	Robot should be able to stop when the user says stop				
p3	Robot should still be able to inform user when the user is under stress				
p4	If Robot is stopped, then it should be able to restart and perform action in 10 minutes				
p5	Robot should still be able to offer help when the risk level is high				

Rules in the SLEEC DSL (Encoded in SLEECVAL)

```
def_start
        // events
```

event EnsureHumanCarerPresent
event InteractingWithNonPatients
event DetermineSensitivityLevel
event DetectUrgentHealthIssue
event InformEmergencyContactAndHealthOrgs
event ObtainEmergencyContact
event FirstMeetingUser
event UserDiscussingPrivateInfo
event DiscardInformation
event ChangeSubject
event InformUserPrivateInformation
event DesigningAgent
event InformUserOfLimitations
event DeployingAgent
event ReviewInteraction
event RecordFashionBasedOnOccasion
event RecommendOtherwise
event PersonAsksforData
event sharePersonalDataAndInformWhy
event UserSelfMedicates
event LogMedication
event InformCarer
event KeepLogOfFrequentActivities
event SuggestPerformingActions
event UserInStress
event ShowEmpathy
event OfferHelp
event CautionWhereOrWhenTouching
event UserExpressDiscomfort
event CloseDoor
event UserSaysStop
event RobotStop
event AskToFinishFirst
event CollectionStarted
event StoreMinInfo
event StopActivity
event CheckForandObtainProxy
event ObtainAssent   //permission
event ObtainConsent //legal req
event AdmininisteringMedication
event InformUserandandReferToHumanCarer
event UserRequestInfo
event ProvideInfo
event InteractionStarted
event InformUserThisIsAgentnotHuman
event DressinginClotingX
event EmotionRecognitionDetected
event CurtainOpenRqt
event CurtainsOpened
event RefuseRequest
event InformUser
event DressingStarted
event CloseCurtains
event UserHasDifferentCulture

event EnsureDesiredLanguageAvailable

// measures
measure userUnderDressed: boolean
measure medicalEmergency:boolean
measure userDistressed : scale(low, medium, high)
measure roomDark:boolean
measure notVisible:boolean
measure userAssent:boolean
measure consentGrantedwithinXmonths:boolean //X needs to be defined.
measure competentIndicatorRequired: boolean
measure competentToGrantConsent:boolean
measure dressPreferenceTypeA:boolean
measure genderTypeB:boolean
measure userAdvices:boolean
measure clothingItemNotFound:boolean
measure userConfused:boolean
measure buildingFloor:scale(f1,f2,f3,f4,f5,f6,f7,f8,f9,f10) //the building has max 10 floors.
measure theUserHasBeenInformed:boolean
measure informationAvailable:boolean
measure informationDisclosureNotPermitted:boolean
measure userCompetenceIndicator:numeric
measure numTotalInteractions:numeric
measure userWantsHumanSubsequently:boolean
measure userWantsNoHuman:boolean
measure withholdingActivityPhysicalHarm:scale(low,moderate,severe)
measure consentGranted:boolean
measure consentIndicatorRequired:boolean
measure consentIndicatorisWithdrawn:boolean
measure consentIndicatorisRevoked:boolean
measure userRequiresAdaptiveClothing:boolean
measure contextuallyObvious:boolean
measure sensitiveInformationX:boolean
measure riskLevel:scale(r_low,r_moderate,r_severe)
measure unauthorizedPersonInRoom:boolean
measure medicationRisk:boolean
measure minimumFrequency:boolean
measure medicationAdverseEffects:boolean
measure irrelevant:boolean
measure userAdamant:boolean
measure clothingChoiceInappropriate:boolean
measure numDaysDeployed:numeric
measure numHoursDeployed:numeric
measure anthropomorphicNecessary:boolean
measure anthropomorphicAppearance:boolean

// constants
constant N = 5
def_end

rule_start
　Rule1 **when** CurtainOpenRqt **then** CurtainsOpened
　　　　　unless {userUnderDressed} **then** RefuseRequest

unless ({userDistressed} > medium) **then** CurtainsOpened

Rule2 **when** DressingStarted **then** CloseCurtains

       unless {medicalEmergency}

       unless ({buildingFloor} >= f5)

       unless ({roomDark} **and** {notVisible})

       unless (**not** {userAssent})

Rule3 **when** EmotionRecognitionDetected **and** ({userDistressed} > medium) **then** InformUser

       unless {consentGrantedwithinXmonths}

       unless ((**not** {competentIndicatorRequired}) **or** (**not** {competentToGrantConsent}))

Rule4 **when** DressingStarted **and** ({dressPreferenceTypeA} **and** {genderTypeB}) **then** DressinginClotingX

       unless {userAdvices}

       unless {medicalEmergency}

       unless {clothingItemNotFound} **then** InformUser

       unless {userRequiresAdaptiveClothing}

Rule5 **when** InteractionStarted **then** InformUserThisIsAgentnotHuman

       unless {medicalEmergency}

       unless (**not** {userConfused})

       unless {contextuallyObvious}

       unless ({theUserHasBeenInformed} **and** (**not** {userConfused}))

Rule6 **when** UserRequestInfo **then** ProvideInfo

       unless (**not** {informationAvailable}) **then** InformUserandandReferToHumanCarer

       unless {informationDisclosureNotPermitted} **then**

InformUserandandReferToHumanCarer

       unless {sensitiveInformationX} **then** InformUserandandReferToHumanCarer

Rule7 **when** DressingStarted **then** ObtainAssent

       unless ({userCompetenceIndicator} = N) **then** CheckForandObtainProxy

       unless {medicalEmergency}

       unless ({withholdingActivityPhysicalHarm} >= moderate)

       unless {consentGranted}

       unless (**not** {consentIndicatorRequired})

       unless ({consentIndicatorisWithdrawn} **or** {consentIndicatorisRevoked}) **then** StopActivity

Rule7_1 **when** AdmininisteringMedication **then** ObtainAssent

    unless ({userCompetenceIndicator} = N) **then** CheckForandObtainProxy

    unless {medicalEmergency}

    unless ({withholdingActivityPhysicalHarm} >= moderate)

    unless {consentGranted}

    unless (**not** {consentIndicatorRequired})

    unless ({consentIndicatorisWithdrawn} **or** {consentIndicatorisRevoked}) **then** StopActivity

//***** Resolve c5 add a rule and comment Rule_1 (Refine rule)
//** Comment Rule7_1 and uncomment Rule7_1b
//Rule7_1 **when** AdmininisteringMedication **then** ObtainConsent
//   **unless** ({userCompetenceIndicator} = N) **then** CheckForandObtainProxy
//   **unless** {medicalEmergency}
//   **unless** ({withholdingActivityPhysicalHarm} >= moderate)
//   **unless** {consentGranted}
//   **unless** (**not** {consentIndicatorRequired})
//   **unless** ({consentIndicatorisWithdrawn} **or** {consentIndicatorisRevoked}) **then** StopActivity
//***

Rule8 **when** CollectionStarted **then** StoreMinInfo

Rule9 **when** DressingStarted **then** CloseDoor

    unless ({medicalEmergency} or {userAdvices})

Rule10 **when** UserSaysStop **then** RobotStop
    unless ({riskLevel} > r_low) **then** AskToFinishFirst
Rule11_1 **when** UserInStress **then** ShowEmpathy
Rule11_2 **when** UserInStress **then** OfferHelp
Rule12 **when** DressingStarted **then not** CautionWhereOrWhenTouching
    unless {medicalEmergency}
Rule13 **when** UserExpressDiscomfort **then** RobotStop
Rule14 **when** PersonAsksforData **and** ((**not** {consentGranted}) **or** {unauthorizedPersonInRoom})
    then not sharePersonalDataAndInformWhy
Rule15 **when** UserSelfMedicates **then** LogMedication
    unless {medicationRisk} **then** InformUser
    unless {medicationAdverseEffects} **then** InformCarer within 2 minutes
Rule16 **when** InteractionStarted **then** KeepLogOfFrequentActivities
Rule16_1 **when** KeepLogOfFrequentActivities **and** (**not** {minimumFrequency}) **then**
SuggestPerformingActions
Rule17 **when** InteractingWithNonPatients **then** DetermineSensitivityLevel
Rule18 **when** DetectUrgentHealthIssue **then** InformEmergencyContactAndHealthOrgs
Rule19 **when** FirstMeetingUser **then** ObtainEmergencyContact
Rule20_1 **when** UserDiscussingPrivateInfo **then** InformUserPrivateInformation
Rule20_1 **when** UserDiscussingPrivateInfo **and** {irrelevant} **then** DiscardInformation
Rule20_2 **when** InformUserPrivateInformation **then** ChangeSubject
Rule21 **when** DesigningAgent **and** ({anthropomorphicNecessary} **or** {anthropomorphicAppearance}) **then**
InformUserOfLimitations
Rule22 **when** DeployingAgent **and** (({numDaysDeployed} > 3) **and** ({numHoursDeployed} > 5)) **then**
ReviewInteraction
Rule23 **when** InteractionStarted **then** RecordFashionBasedOnOccasion
Rule24 **when** DressingStarted **and** {clothingChoiceInappropriate} **then** RecommendOtherwise
    unless {userAdamant}
Rule25 **when** UserHasDifferentCulture **then** EnsureDesiredLanguageAvailable
Rule26 **when** InteractionStarted **and** ({numTotalInteractions} < 3) **then** EnsureHumanCarerPresent
    unless {userWantsHumanSubsequently}
    unless {userWantsNoHuman}
rule_end

concern_start
    // Privacy and data protection
    c1 **when** PersonAsksforData **and** ((**not** {consentGranted}) **or** {unauthorizedPersonInRoom}) **then**
sharePersonalDataAndInformWhy
    // Autonomy and agency
    *//c2 **when** DressingStarted **then not** ObtainAssent*
    *// *** Resolve definition of concern c2 (Refine concern) * *********************
    //   comment c2, and uncomment,c2b instead.*
    *// c2b **when** DressingStarted **then not** ObtainAssent **and not** ObtainConsent*
    *// **
    // Transparency and disclosure
    c3 **when** UserDiscussingPrivateInfo **and** {irrelevant} **then not** DiscardInformation
    // Cultural and social sensitivity
    c4 **when** DressingStarted **and** ({buildingFloor} < f5) **then not** CloseCurtains
    *// *** Resolve definition of concern c4 (Refine concern) * *********************
    //   comment c4, and uncomment,c4b instead.*
    *// c4b **when** DressingStarted **and** (({buildingFloor} < f5) **and** ((**not** {medicalEmergency}) **and** (((**not**
{roomDark}) **and** (**not** {notVisible})) **and** {userAssent}))) **then not** CloseCurtains*
    *// **
    // Prevent harm and safety

c5 **when** UserSaysStop **and** ({riskLevel} < r_moderate) **then not** RobotStop

concern_end

purpose_start

//first we ensure every functionality is reachable

pr1 **exists** EnsureHumanCarerPresent
pr2 **exists** InteractingWithNonPatients
pr3 **exists** DetermineSensitivityLevel
pr4 **exists** DetectUrgentHealthIssue
pr5 **exists** InformEmergencyContactAndHealthOrgs
pr6 **exists** ObtainEmergencyContact
pr7 **exists** FirstMeetingUser
pr8 **exists** UserDiscussingPrivateInfo
pr9 **exists** DiscardInformation
pr10 **exists** ChangeSubject
pr11 **exists** InformUserPrivateInformation
pr12 **exists** DesigningAgent
pr13 **exists** InformUserOfLimitations
pr14 **exists** DeployingAgent
pr15 **exists** ReviewInteraction
pr16 **exists** RecordFashionBasedOnOccasion
pr17 **exists** RecommendOtherwise
pr18 **exists** PersonAsksforData
pr19 **exists** sharePersonalDataAndInformWhy
pr20 **exists** UserSelfMedicates
pr21 **exists** LogMedication
pr22 **exists** InformCarer
pr23 **exists** KeepLogOfFrequentActivities
pr24 **exists** SuggestPerformingActions
pr25 **exists** UserInStress
pr26 **exists** ShowEmpathy
pr27 **exists** OfferHelp
pr28 **exists** CautionWhereOrWhenTouching
pr29 **exists** UserExpressDiscomfort
pr30 **exists** CloseDoor
pr31 **exists** UserSaysStop
pr32 **exists** RobotStop
pr33 **exists** AskToFinishFirst
pr34 **exists** CollectionStarted
pr35 **exists** StoreMinInfo
pr36 **exists** StopActivity
pr37 **exists** CheckForandObtainProxy
pr38 **exists** ObtainAssent
pr39 **exists** AdmininisteringMedication
pr40 **exists** InformUserandandReferToHumanCarer
pr41 **exists** UserRequestInfo
pr42 **exists** ProvideInfo
pr43 **exists** InteractionStarted
pr44 **exists** InformUserThisIsAgentnotHuman
pr45 **exists** DressinginClotingX
pr46 **exists** EmotionRecognitionDetected
pr47 **exists** CurtainOpenRqt
pr48 **exists** CurtainsOpened

pr49 **exists** RefuseRequest
pr50 **exists** InformUser
pr51 **exists** DressingStarted
pr52 **exists** CloseCurtains
pr53 **exists** UserHasDifferentCulture
pr54 **exists** EnsureDesiredLanguageAvailable

// Agent can interact with non patients while Provide Info
p1 **exists** InteractingWithNonPatients **while** ProvideInfo

//agent can and stop activities even if user did not request it
p2 **exists** StopActivity **while not** UserSaysStop

//agent can inform user while the user is in stress
p3 **exists** InformUser **and** ({userDistressed} = high) **while** UserInStress

//If an agent stopped, then he should be back up to function in 10 minutes
p4 **exists** StopActivity **while** CollectionStarted **within** 10 **minutes**

//Agent can offer help when the risk level is high
p5 **exists** OfferHelp **and** ({riskLevel} = r_severe)
purpose_end