**1. Due to the need to alleviate boredom & engage socially**

* The robot should be programed to portray a gregarious and happy attitude. This will have to be done with adjective choice and possibly the use of lights.
* The robot should play a variety of interesting and social games. Prompting the child to choose an option from the tablet
* Ask the child if they would like to play another game at the end of a game

**2. Due to the need to be interesting**

* Games should be engaging and challenging/fun
* The best games can be played multiple times but feel unique each time such as 20 questions or randomized based Simon says

**3. Due to the need to be quickly silenced or turned off by health care workers & authority figures**

* The robot should have an integrated e-stop command / button.
* The robot should be able to notify the nurse station if there is a serious error

**4. Perceivable by children as a playmate / agemate**

* The health care professional should be able to create/select a profile for each child before their session that contains name, age and approved games
* There should be game options on the robot that cover several age groups
* The robots speech should be chosen to reflect peer status so that it doesn't seem like an extension of the doctors and nurses

**5. Due to a need not be intimidating or creepy**

* The robot should avoid irregular movement patterns or sudden movements that do not seemed prompted
* The robot should use harsh language or mimic speech patterns associated with negative stereotypes of robots

**6. Due to the need to conduct initial social interactions**

* The robot should introduce itself to the child and initiate the option to play a game from the associated tablet
* Patient information should be stored on the tablet so that the robot can remember patient names and demonstrate a level of familiarity

**Research Questions**

* What color lights or word choices cause a robot to be perceived as more happy?
* Does an E-Stop option make a robot more effective during routine patient care?
* Does a robot designed to change the type of vocabulary that it uses based on age make it appear more like a peer?
* Are there certain movement patterns that make the robot appear more “creepy” in its movements?
* What method of demonstrating that the robot has “retained” the childs name and past game plays make it seem more familiar?

**Hypotheses**

* Warm colors flashing faster will make the robot appear more happy.
  + **Independent Variable:** Cycle through light color options while the robot says a greeting. Also vary the flashing rate.
  + **Dependent Variable:** Provide a survey to users about how warm/kind the robot appeared
* ??? Couldn’t figure out a good one for the estop research question and honestly not sure its needed ???
* Short words and small sentences will make the robot seem more like it is trying to interact with a toddler vs more contractions and slang words will make it seem more like a pre-teen.
  + **Independent Variable:** Build two simple conversations options based on the above. Use a simple topic like getting to know the child and what their interests are.
  + **Dependent Variable:** Ask users to estimate what age the robot seems to represent
* Singular joint movements without including the rest of the body will make the robots movements seem less natural.
  + **Independent Variable:** Have the robot stand up wave and then sit back down. In one iteration it does this using full body movement and in the other each joint is programmed individually.
  + **Dependent Variable:** Ask users to rate how creepy or disturbing they found the robots motion
* Having the robot save a face and greet the child first will make it appear more familiar.
  + **Independent Variable:** Program the robot to store and use facial recognition to greet the user first on second meeting and another instance where the robot waits until after completing the greeting process to state that it remembers the user and say what game they played last.
  + **Dependent Variable:** Ask users to rate how familiar or friendly the robot seemed in each case.