

Meal Tray Table

Collaborative Project 2019-2020

A modular meal tray table for hospitalised patients to eat comfortably and independently at mealtimes.

Clinical Leads

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The Challenge

Nutrition and food consumption in older adults decreases due to factors relating to ageing, physical mobility and chronic illnesses. Many patients experience physical barriers which prevent them from eating on their own and so they require assistance from nurses. This impacts patient self esteem and food intake, thus decreasing quality of life.

The problem that the older adults in St Thomas Hospital Older Person's Unit (OPU) currently face is the inaccessibility of the meal tray on the bedside table. Since adult cot sides are raised up to prevent patients from falling and injuring themselves, the bedside tables cannot be lowered to a comfortable height. Patients end up eating from a table which is almost at their head level, making it difficult to transport the food to their mouth.

The aim of this project is to address these physical constraints in the context of mealtime experience for older adults with varying impairments.

Existing Solution



- Patients who are bedbound are unaware of meal placed on the table as it is not in their direct view.
- The table is unable to be positioned within the patient's reach and often results in them not eating their meals.
- The table mechanism is not robust.

Research

Observations

Three exploratory non-participant observations were undertaken at lunch and dinner mealtimes in the wards over a span of 2 weeks.



Semi-Structured Interviews

Semi-structured interviews with 4 clinical staff members were conducted to gain a deeper understanding and clarity of certain user behaviours.

“The main challenge is that the patient should be positioned 90° and made to sit upright during mealtimes. If they are not sitting upright, then the table is even further away for the patients to eat from.”
– Nurse-in-charge (Participant 1, 2020)

“I have ordered 3 new tables this month to replace the broken ones. If the mechanism was something easily fixable, we would not be needing new ones every few months.”
– Ward nurse (Participant 3, 2020)

“Sometimes it’s hard to adjust table top, either to lower or put down or pull up with force, needs a wiggle with some tables.”
– Ward nurse (Participant 2, 2020)

Initial Direction and Development

Ideation

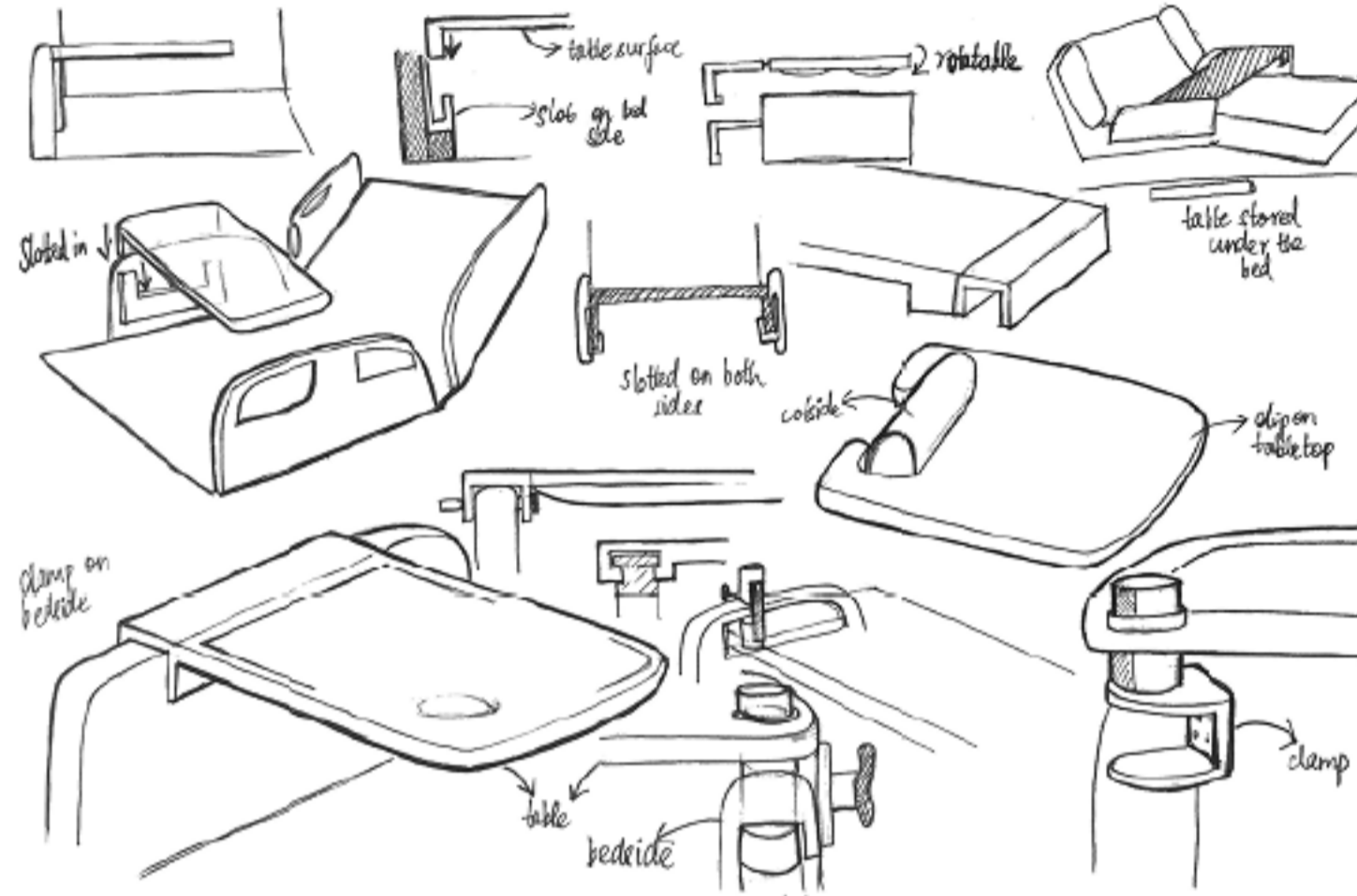
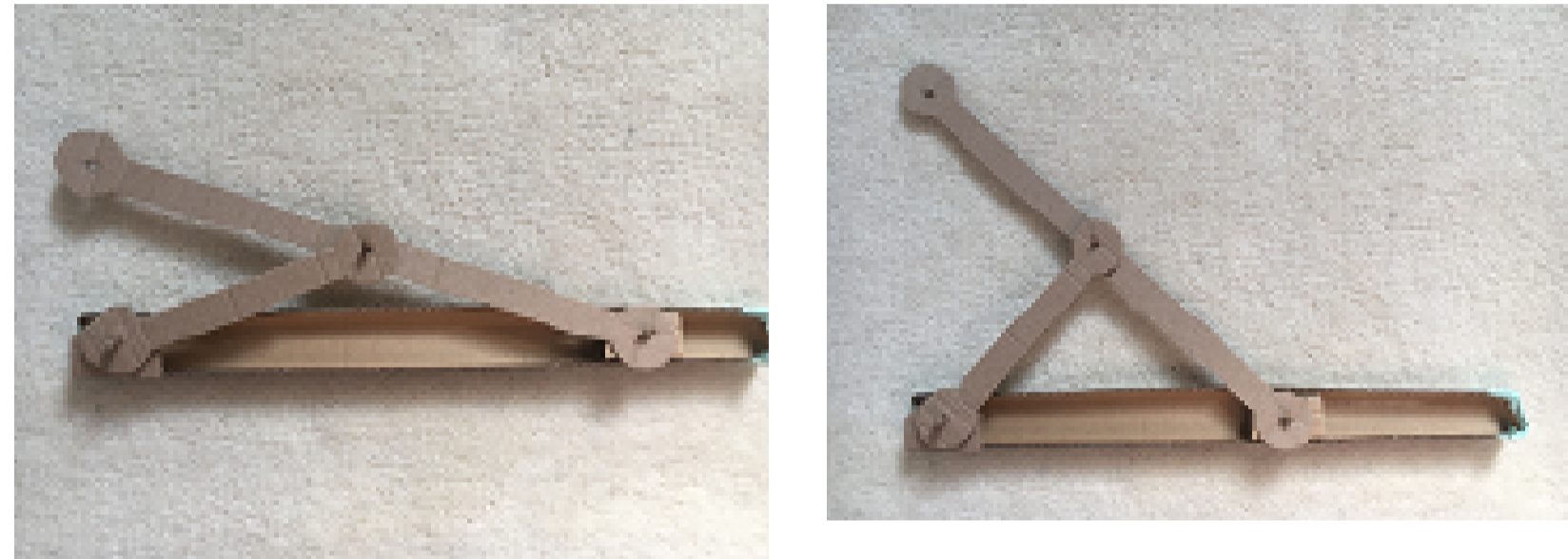


Table Prototype

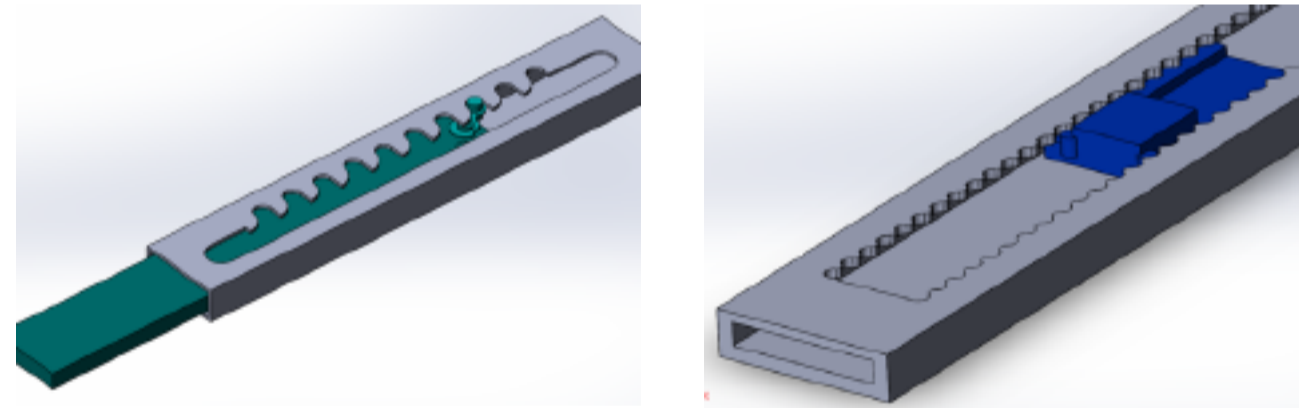


Mechanism Development

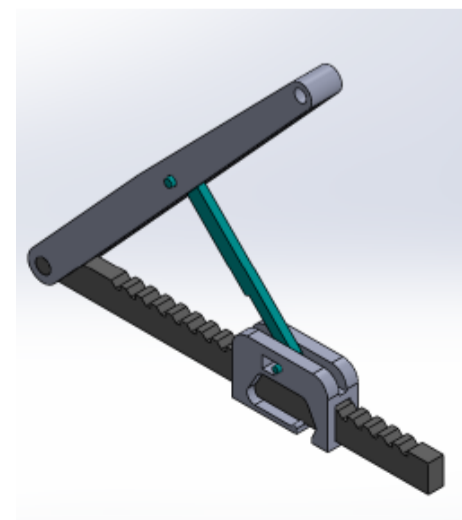
Scott - Russel Mechanism



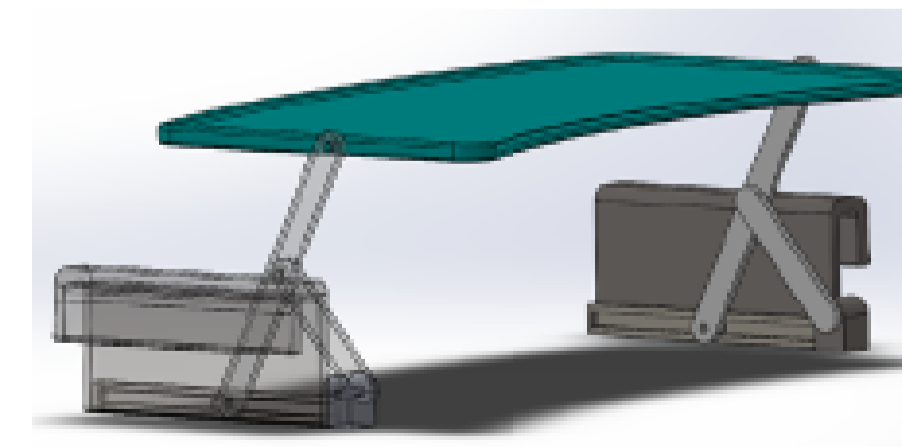
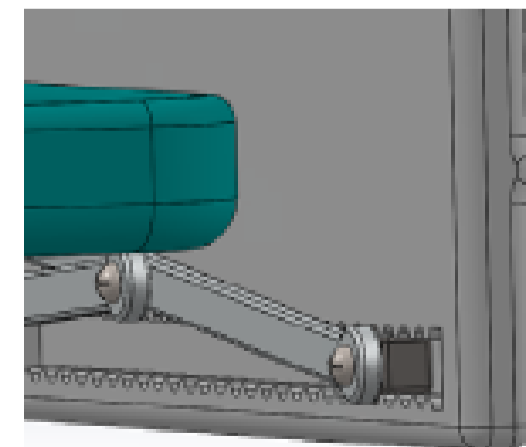
Ratchet Spring Mechanism - Retractable



Ratchet Mechanism and Pawl



Bed Hook



Final Design

Slidable along the cot sides

The tray table can be positioned along the cot sides depending on the user's reach.

Curved surface finish

The table top is designed with subtle curves and fillets for easy cleaning and maintenance.

Snap-fit bedside hooks

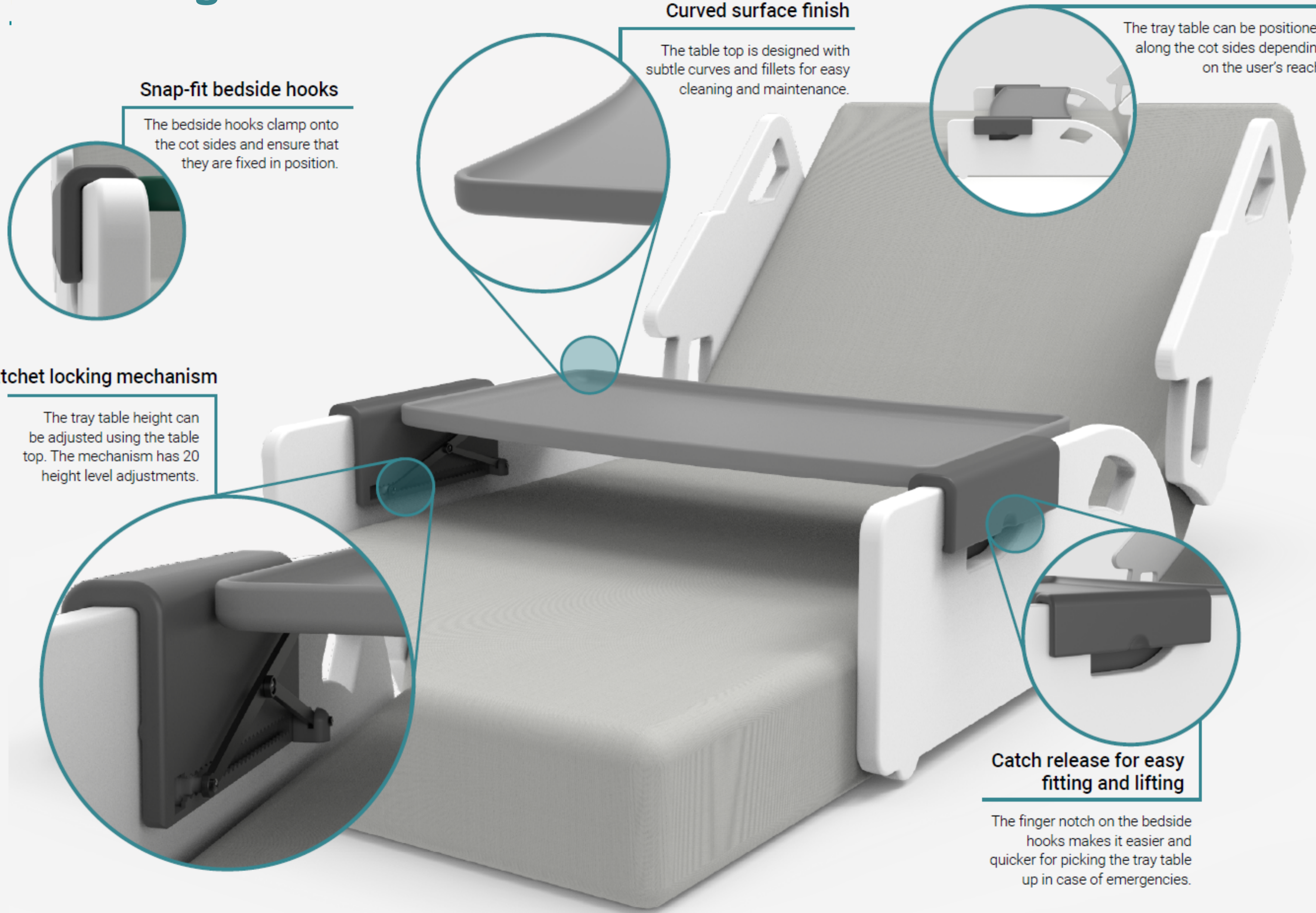
The bedside hooks clamp onto the cot sides and ensure that they are fixed in position.

Ratchet locking mechanism

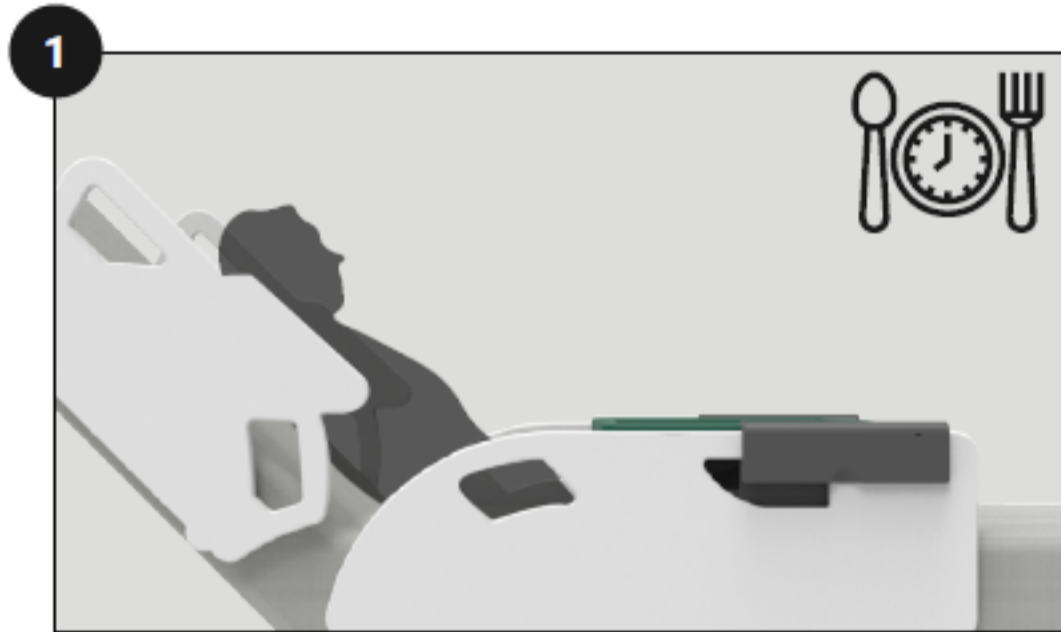
The tray table height can be adjusted using the table top. The mechanism has 20 height level adjustments.

Catch release for easy fitting and lifting

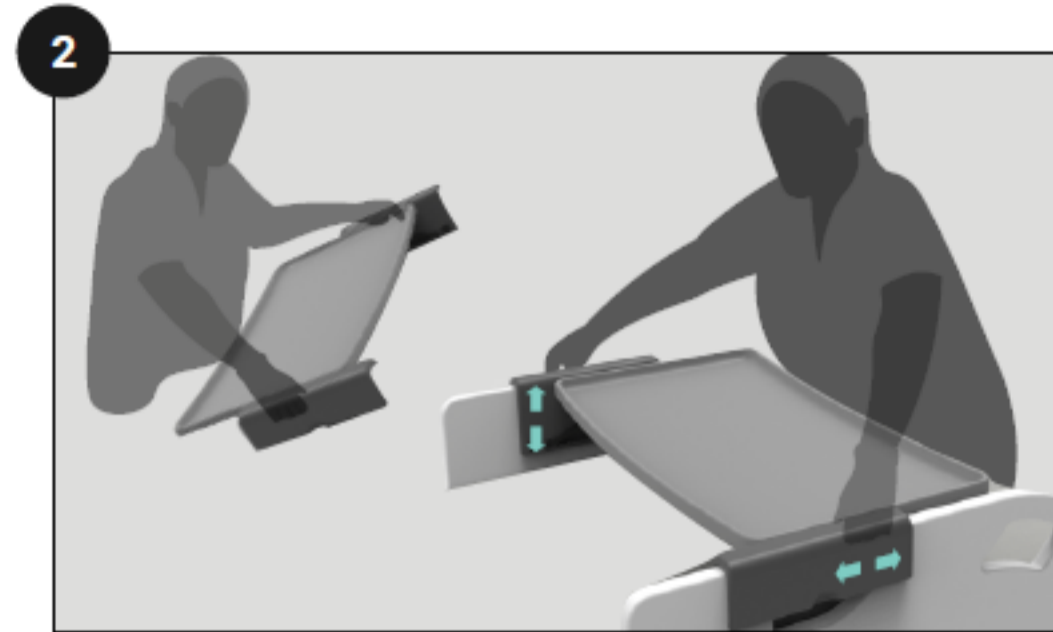
The finger notch on the bedside hooks makes it easier and quicker for picking the tray table up in case of emergencies.



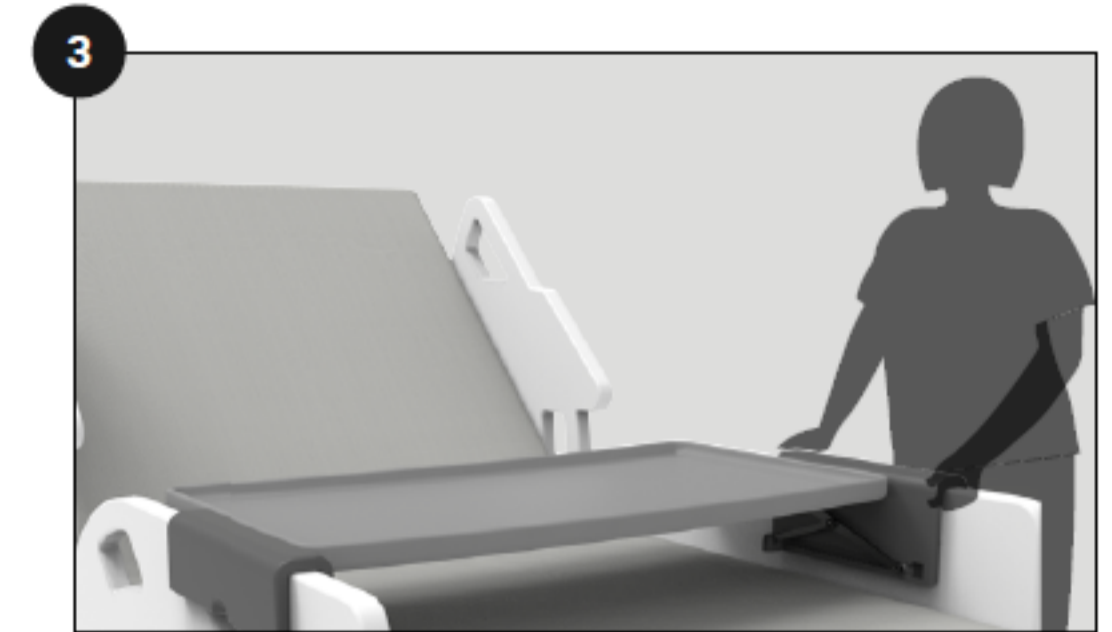
User Storyboard



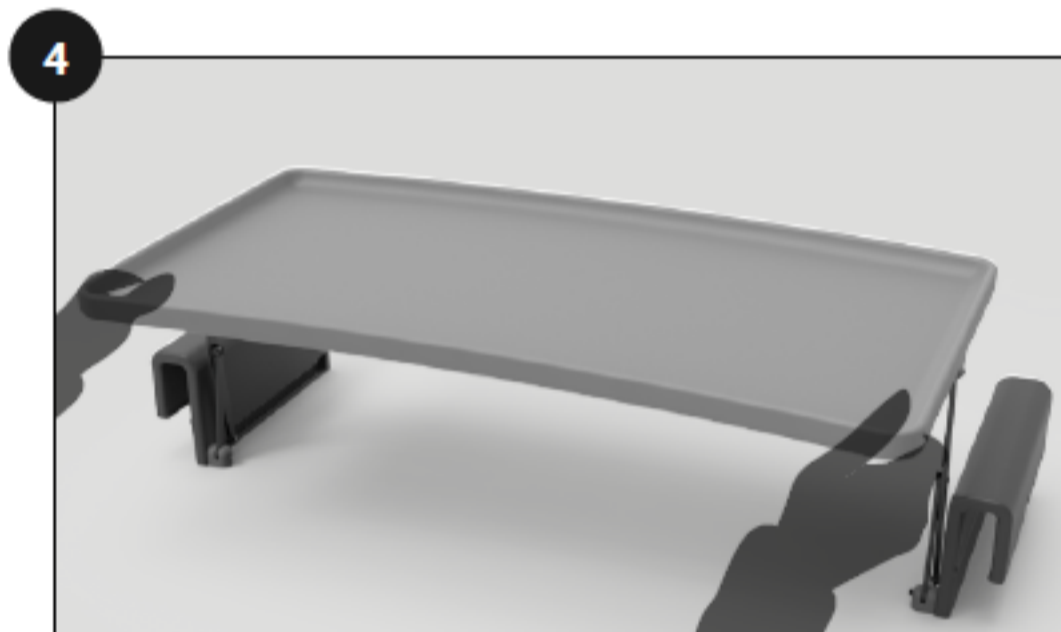
1 Mealtime bell rings in Henry ward for lunch. Nurses start preparing for food service and positioning patients.



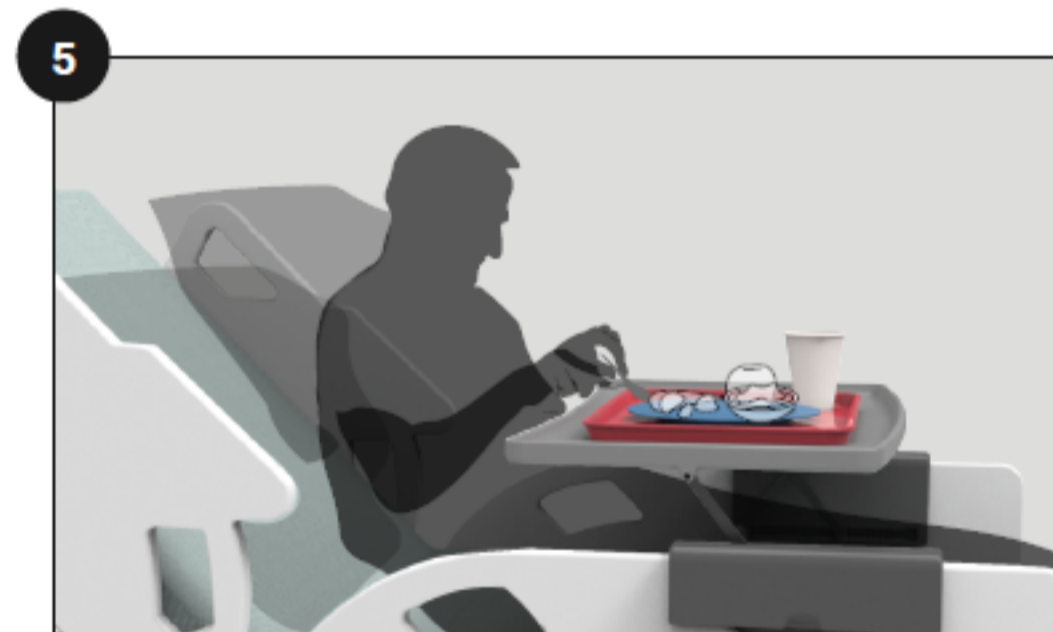
2 Nurse takes the meal tray table and fits it on the cot sides.



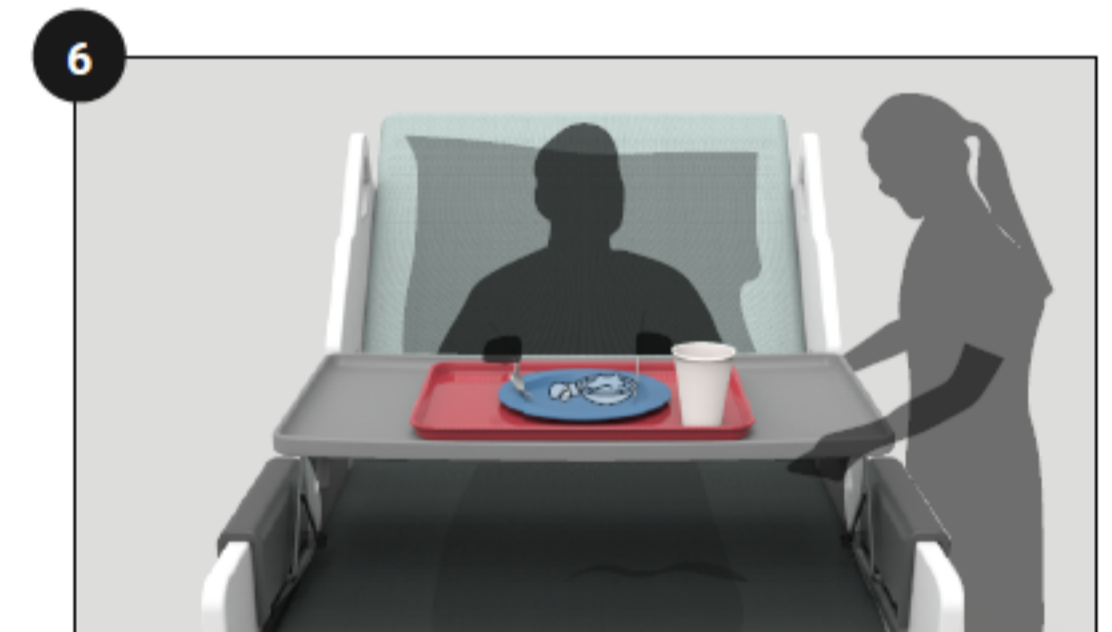
3 She adjusts the position of the tray for the patient.



4 The patient lowers the table top to a lower height suitable for comfortable eating.



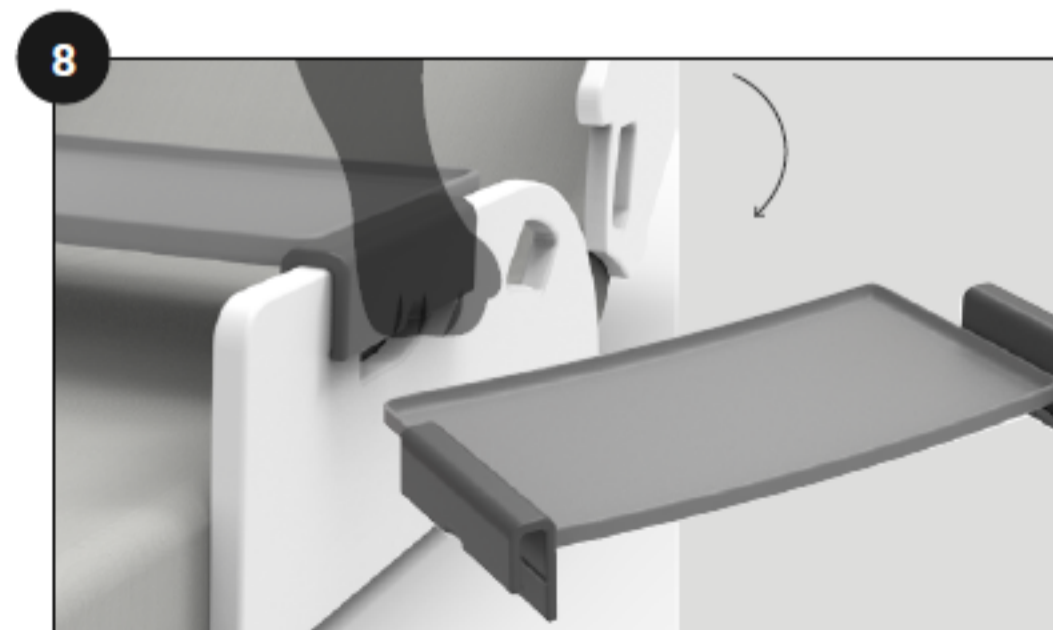
5 The patient eats his meal comfortably and independently in bed and enjoys the food given.



6 After meal time is over, the plates are collected and the food service assistant asks if he wants his table left in place.



7 The nurse gives the table top a quick and easy clean after mealtimes to wipe off any food spilt.



8 The nurse removes the tray table by unhooking it from the cot side and lowers the table top to the minimum height.



9 She stores it by clipping it to the storage attachment on the side of the cabinet.