

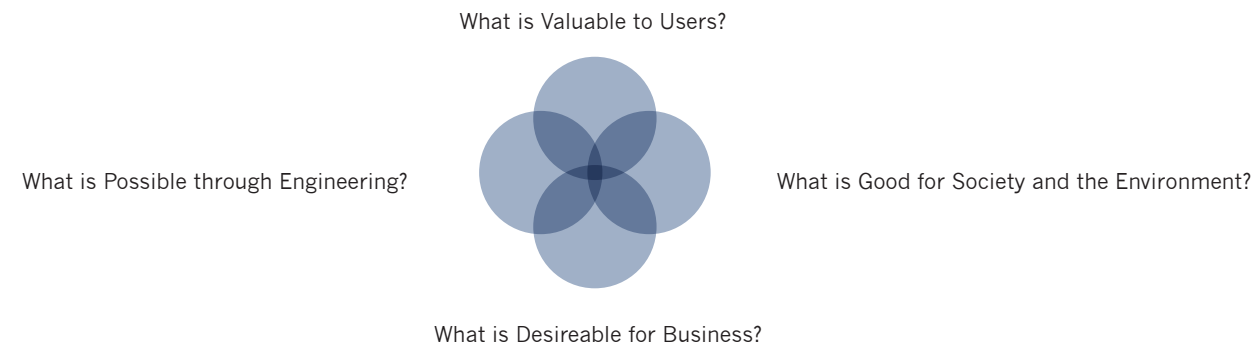
Patient Transfer

PHASE 4 DOCUMENTATION: INNOVATION PROPOSAL

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PREFACE



InnovationSpace is a year-long transdisciplinary product development program for select students of four disciplines at Arizona State University. Intense research methods are applied to create marketable products that serve real societal needs while reducing envi-

ronmental impacts. The core of InnovationSpace is founded on the model of "Integrated Innovation." The model represents the four main values that identified in our research to develop innovative product concepts.



Herman Miller seeks to develop problem-solving and innovative solutions to problems within the healing environment to further expand their "For Healthcare" division. Herman Miller's vision for our team was to discover problems regarding patient transfer scenarios within the healthcare environment. Our research team had the opportunity

of working with Herman Miller researchers toward this goal, adopting and putting forth Herman Miller methodologies and values of design, research, innovation, quality, and environmental consciousness. The year-long project is divided into 7 phases, utilizing a strong process to obtain one result :innovation.

PROJECT TIMELINE

● ● ➔ PHASE 1
"Collecting information"

We shadowed transfer teams and paramedics.
We interviewed medical staff and experts.
We looked at the existing products.
We analyzed the market & social trends.

● ● ➔ PHASE 2
"Making Discoveries"

We analyzed the data.
We made it make sense.

● ● ➔ PHASE 3
"Creating Opportunities"

We brainstormed... A lot.
We formed ideas and collaborated on them
with medical experts.



● ● ➔ Phase 5
"Concept Development"

We'll continue with one concept.
We'll make it work, beautifully.

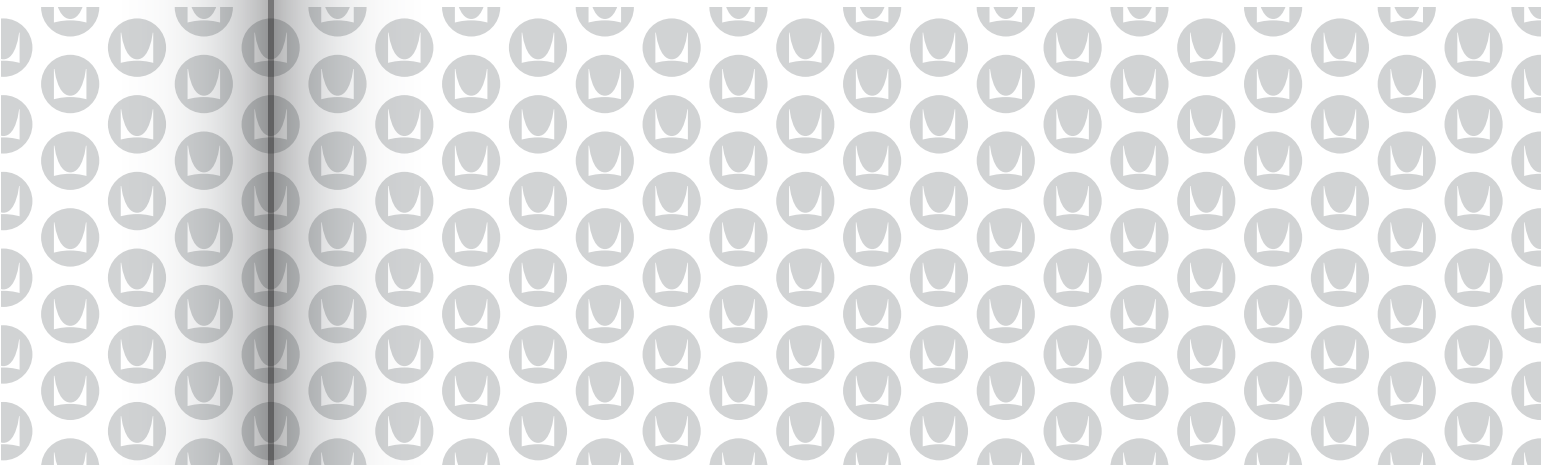
● ● ➔ Phase 6
"Concept Finalization"

We'll study it's use and refine it.
We'll analyze it's environmental and social
impacts.

● ● ➔ Phase 7
"Exhibit+Documentation"

We'll prove it works.
We'll decide on the next step.

2 PHASE



Research

DATA TO UNDERSTANDING

In Phase 1, we collected as much raw information as possible. We shadowed nurses, transport teams, and Paramedics, and researched the competitive landscape. In Phase 2 we sorted through our interviews and observation notes to present our findings in an understandable matter. This phase highlights the most relevant data.

PATIENT TRANSFER OVERVIEW

Patient transfer is a generic term that applies to a number of situations throughout the healthcare system where patients need to be moved. Transfers can occur in any environment, with any person or type of people, and vary in difficulty and risk. With this broad spectrum, our potential users can be anyone, of any age, gender, size, ethnicity and economic status. However, we can identify two primary user groups: medical staff, and patients. More specific users and their needs can be identified as we look into specific transfer scenarios, and address the issues associated with those scenarios. While our team researched all patient transfer environments, our primary focus was eventually directed to the hospital, as greater needs were revealed here.



Helicopter evacuation



Transfers from gurney-to-bed or bed-to-bed



Ceiling hoist lift



Gait therapy

RESIDENTIAL & NURSING HOME

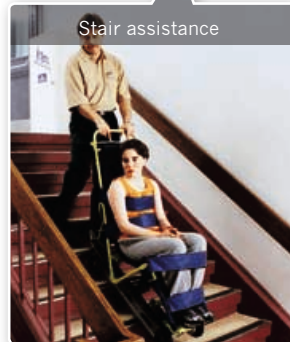
RESCUE

HOSPITAL

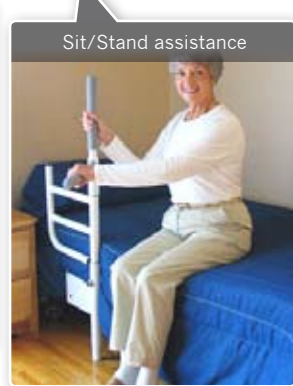
SKILLED NURSING FACILITIES

PHYSICAL THERAPY

HOSPICE



Stair assistance



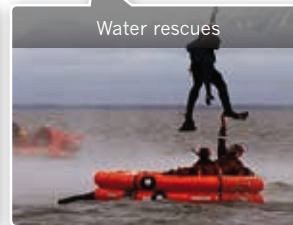
Sit/Stand assistance



Ceiling hoist lift



Assisting accident victims



Water rescues

Emergency transfers occur in air, land and sea. While there is no definition of or limitation on the patients involved in these transfers, medical personnel primarily consists of EMT and Paramedics.



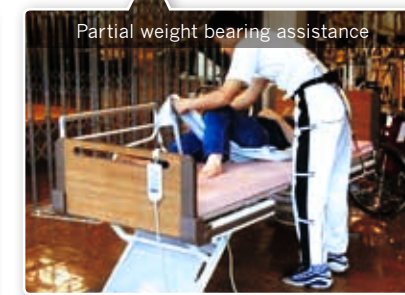
Sit/Stand assistance



Bariatric assistance



Full weight-bearing



Partial weight bearing assistance

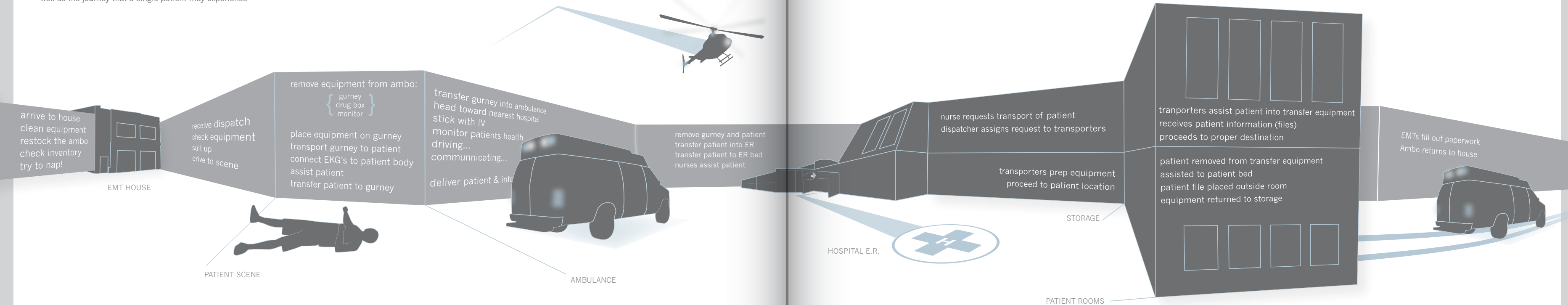
These four environments differ in atmosphere and purpose, yet share similar transfer scenarios. Potential patients here are also undefined, as they can be nearly anyone. However the users may include nurses, transporters, and physical therapists.

Residential equipment is geared toward those who need long term mobility assistance. Potential users include geriatric patients and patients with physical limitations such as muscular dystrophy.

WHAT IS VALUABLE TO USERS?

Activity Model

Our shadowing experiences revealed the processes involved in patient transfer scenarios. We began mapping basic activities and environments to help us identify particular activities we can address within the broad scope of patient transfer. This diagram illustrates some of the activities that paramedics and transporters may be involved in when transporting a single patient, as well as the journey that a single patient may experience



WHAT IS VALUABLE TO USERS?

transporters:
move her from ER to ICU
she's attached to machines from head to toe it all needs to stay with her

her conditions:
car accident victim with serious brain trauma



Patient: Kindra Johnston

transporters:
she is at home & needs emergency transfer
BE QUICK (possible heart attack)


her conditions:
previous gallstones
chest pains
diabetes



Patient: Georgia Redfield

transporters:
needs to be moved to 3rd floor
if smart we cant afford more injuries!

his conditions:
bariatric (428 lbs)
dislocated hip

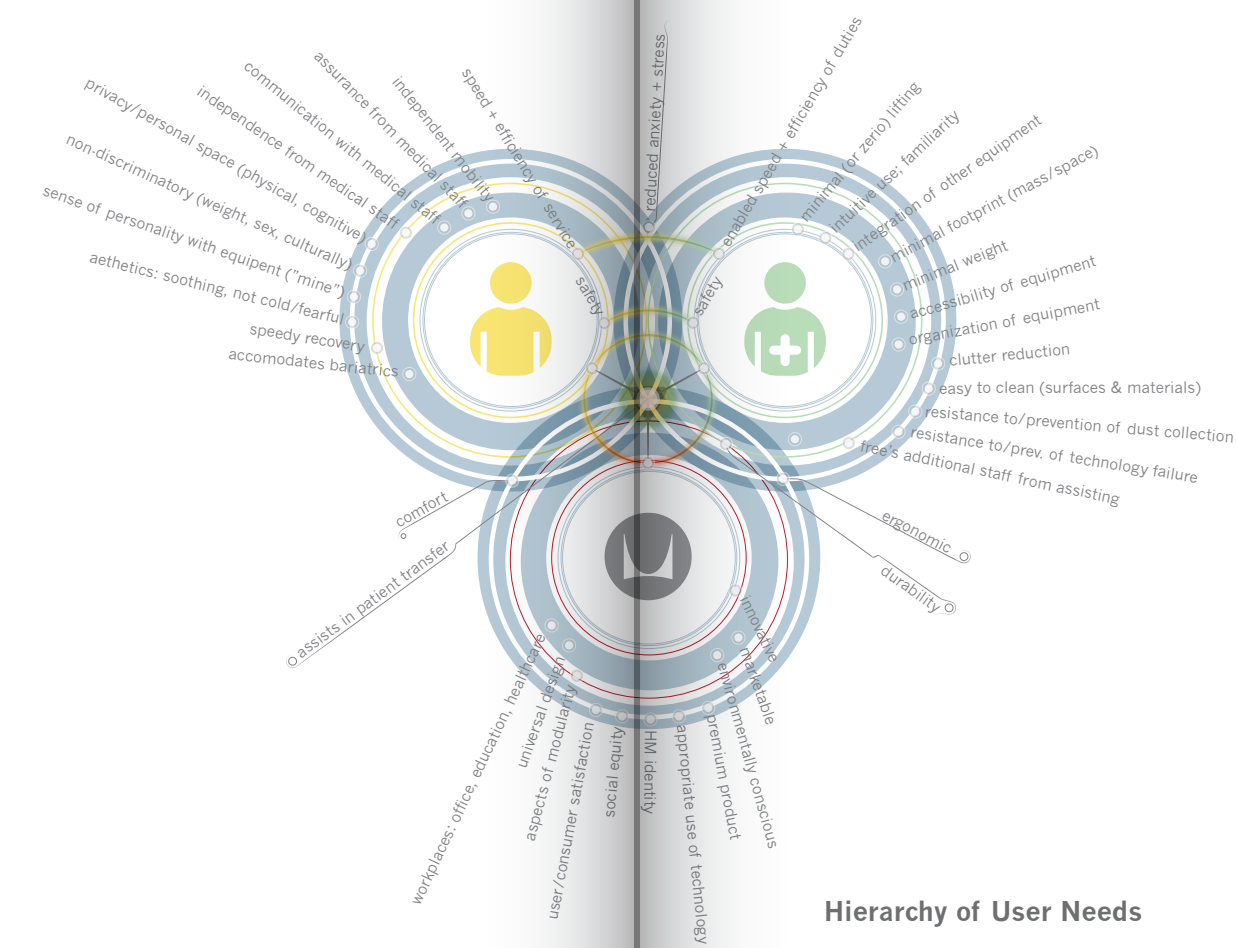


Patient: Robert Gonzalez

PATIENT SNAPSHOTS

User Snapshots

Specific context regarding the use of transfer products is well illustrated in brief snapshots. By looking at these snapshots, we can assess how our product concepts will assist in patient transfer scenarios, as well as the numerous needs the concepts will need to address in design. Our users include medical staff, patients, and Herman Miller.




Hierarchy of User Needs

The needs of the three users are depicted as targets. The areas closer to the user are primary needs, as the further ones digress in importance. However, the needs shown are the most relevant needs regarding patient transfers. The overlapping regions are shared needs between user groups.

the Paramedic

TRANSFERS PERFORMED:
emergency rescues patient to gurney
gurney to ambulance
patient scene to hospital ER
gurney to ER bed

CONCERNS:
I would like to see more integration of equipment within transfer equipment. There is a lot of equipment that we are required to bring on every call, and it starts getting a BIT heavy towards the end of a 24hr shift!



Name: J. Fenley

MEDICAL STAFF SNAPSHOTS

the Registered Nurse

TRANSFERS PERFORMED:
gurney to bed (ER)
assist to sit-up
bed to bathroom

CONCERNS:
There are few enough of us nurses as it is, the hospital will be hopeless if we have anymore injuries. I'm busy enough as it is, i don't have time to track down where the transfer equipment i need is



Name: Ranae

the Therapist

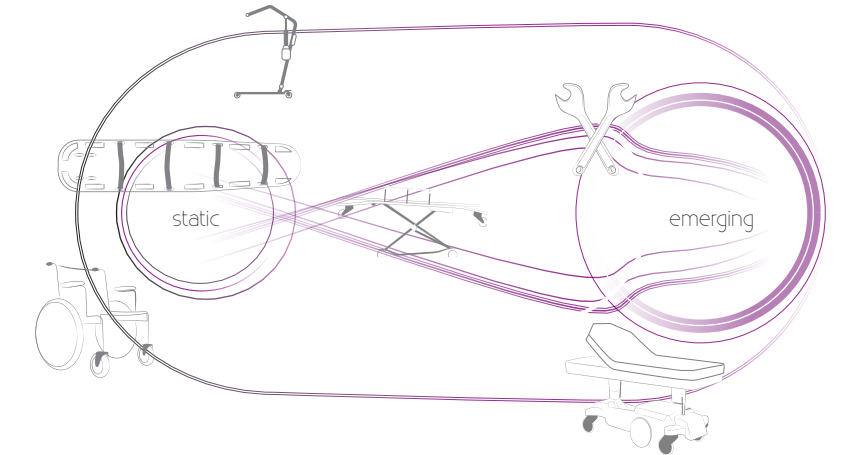
TRANSFERS PERFORMED:
gait therapy
bed to chair
bed to standing
bed to bathroom
chair to bed

CONCERNS:
Transfer devices are far too cumbersome, inconvenient, and time consuming. I can't find it when I need it, yet the hospital insists I use them. Gait therapy is causing me some backpain, and my assistance isn't strong enough to help out.



Name: Rick M.

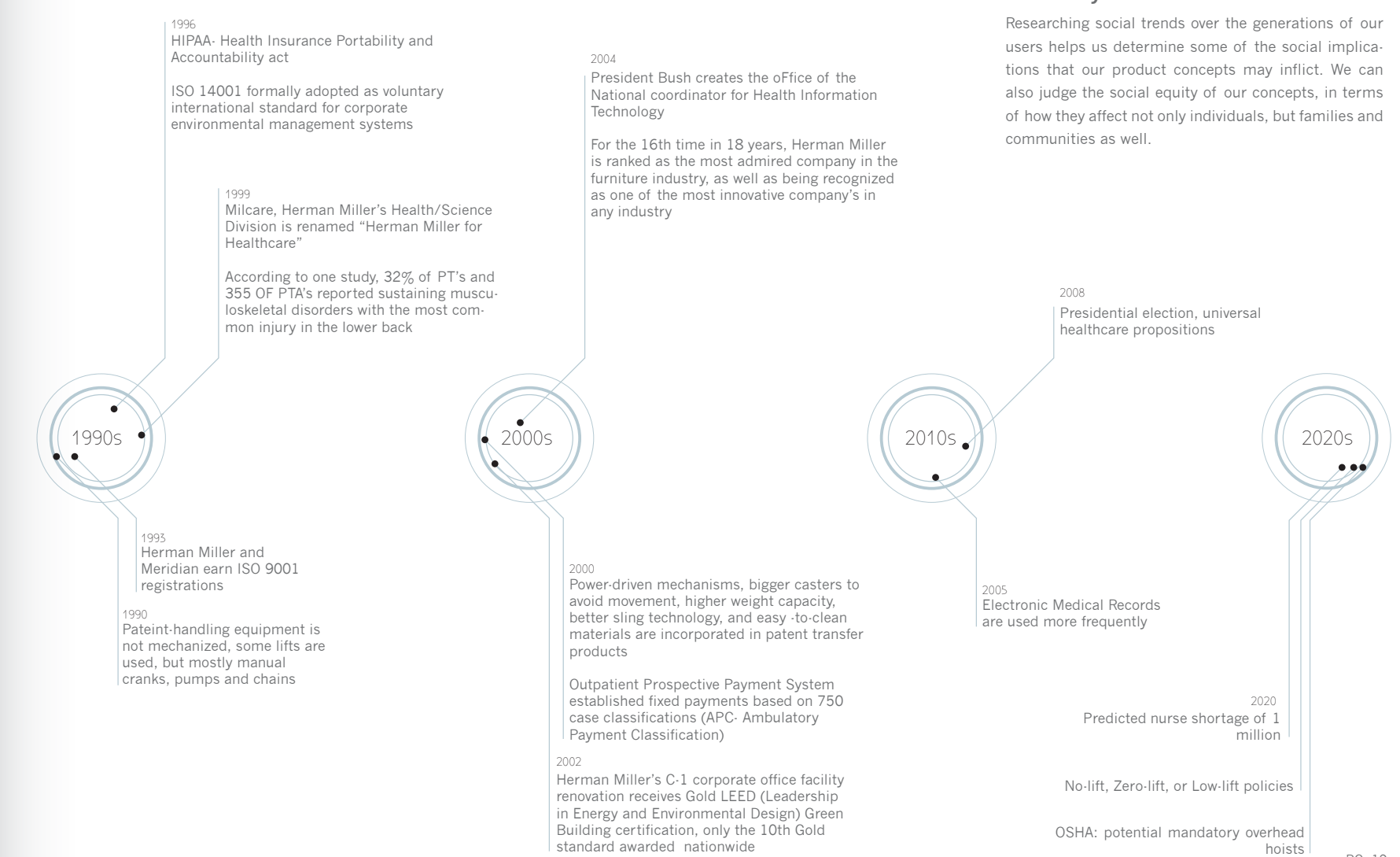
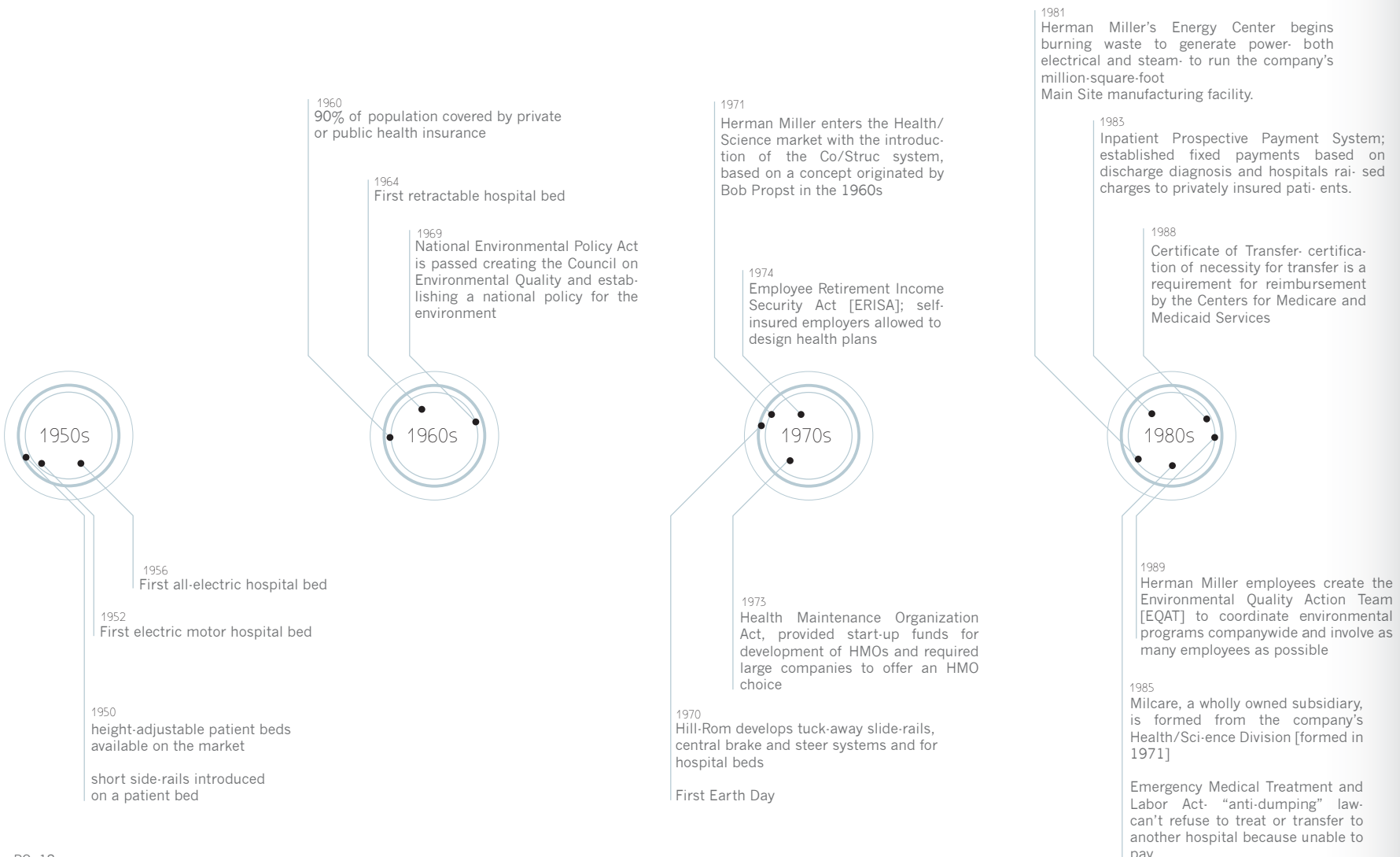
WHAT IS POSSIBLE THROUGH TECHNOLOGY?



Technology Benchmarking

By looking at the technologies used in existing patient transfer systems, we get an idea about the level of technology that may be appropriate in our concepts. Our research illustrates that high-technology is not necessarily the best solution for patient transfer products, particularly in portable applications.

WHAT IS GOOD FOR SOCIETY+THE ENVIRONMENT?



Era Analysis: 1950-2020

Researching social trends over the generations of our users helps us determine some of the social implications that our product concepts may inflict. We can also judge the social equity of our concepts, in terms of how they affect not only individuals, but families and communities as well.

WHAT IS DESIRABLE FOR BUSINESS?

HAWORTH® Furniture For What's Next®
 Haworth is an office furniture and architectural interiors company offering a full range of furniture products including partitions, desks, chairs, tables, and storage products. Known globally for their innovative design, Haworth strives to create inspiring environments which are sustainable, ergonomically sound, and aesthetically relevant. Although Herman Miller and Steelcase have a greater healthcare emphasis, Haworth does offer solutions for both laboratories and other healthcare environments. For example, their LifeSCIENCE line cuts costs and compresses the construction schedule by providing endless configuration options for laboratories.

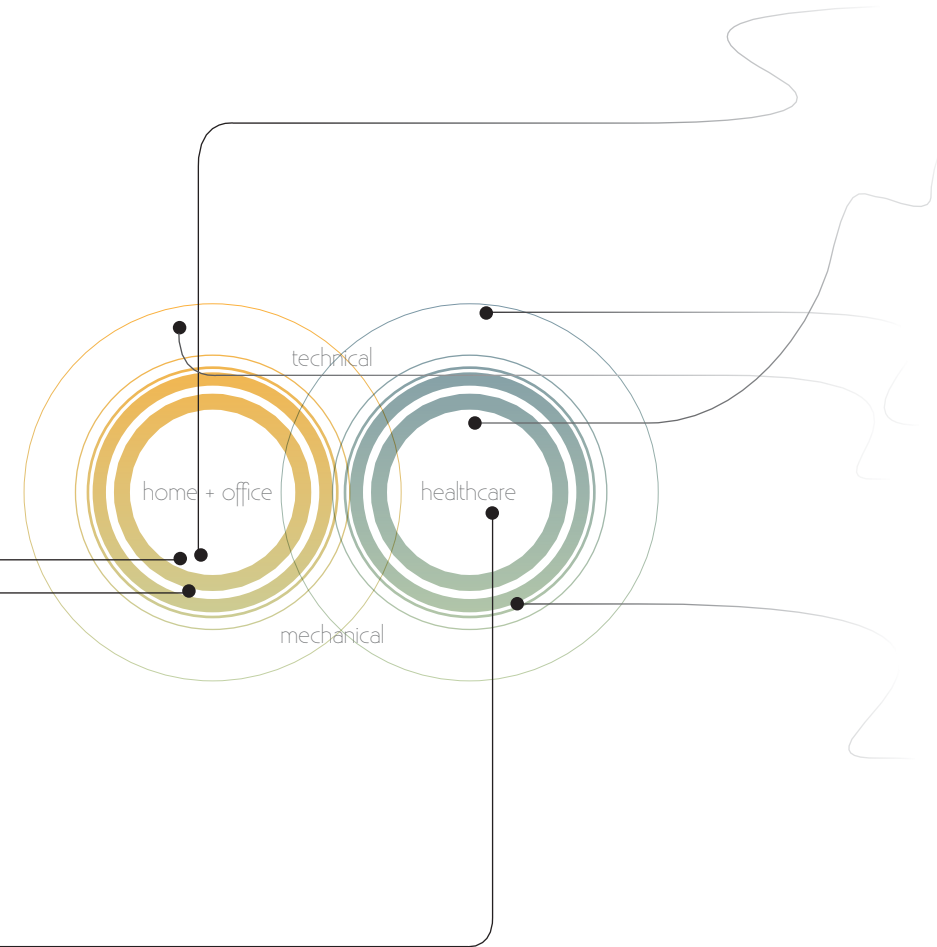
HNI
 HNI Corporation is a group of seven companies, each representing a family of leading brands, products, and services for the office and home environments. They use this decentralized approach so that each company is structured to meet the needs of specific industry segments. The company's main focus is a large presence and has a strategy of being wherever buyers go looking to buy a product in the market. They sell primarily to dealers, wholesalers, and retail superstores (unlike some of its competitors). Although they currently do not target the healthcare industry, they should not be ignored as a competitor as they are the second largest office furniture manufacturer in the world and have potential to join in creating for healthcare environments like Herman Miller. Like most of the companies in this industry they also have a strong environmental commitment stemming from the start of the company.

Hill-Rom
 A HILLENBRAND INDUSTRY
 Having developed core competencies around high performing medical beds, Hill-Rom sits firmly as a market leader in the manufacturing and distribution of medical technology. Their product offerings have grown steadily over time to include non-medical furniture and fixtures in addition to a wide array of beds for sub-specialized patient needs. Hill-Rom is just one step away from entering the patient transfer market and competing head to head with Herman Miller.

Brand + Competitor Benchmarking

Understanding the Brand Presence of competitors within the desired marketplace is important when creating new products. Herman Miller faces significant competition in multiple markets including healthcare, specifically in patient transfer.

Herman Miller's position in the marketplace was determined by comparing the products, services, and processes of competitors to their own.



Steelcase
 Steelcase is Herman Miller's top competitor in the office furniture industry and has led the industry in sales every year since 1974. With its Nurture segment specifically for healthcare, it is a direct competitor with Herman Miller for Healthcare. Like Herman Miller, they pride themselves in using research-based insights to solve real problems. They strive to create products so people can accomplish whatever they need to do "better, faster, and more effectively." A product line setting them apart from others is their technology line specifically for healthcare. This includes a series of interactive whiteboards, a rolling cordless lectern, and others. Both Steelcase and Nurture also have a strong commitment to the environment and reducing their ecological footprint.

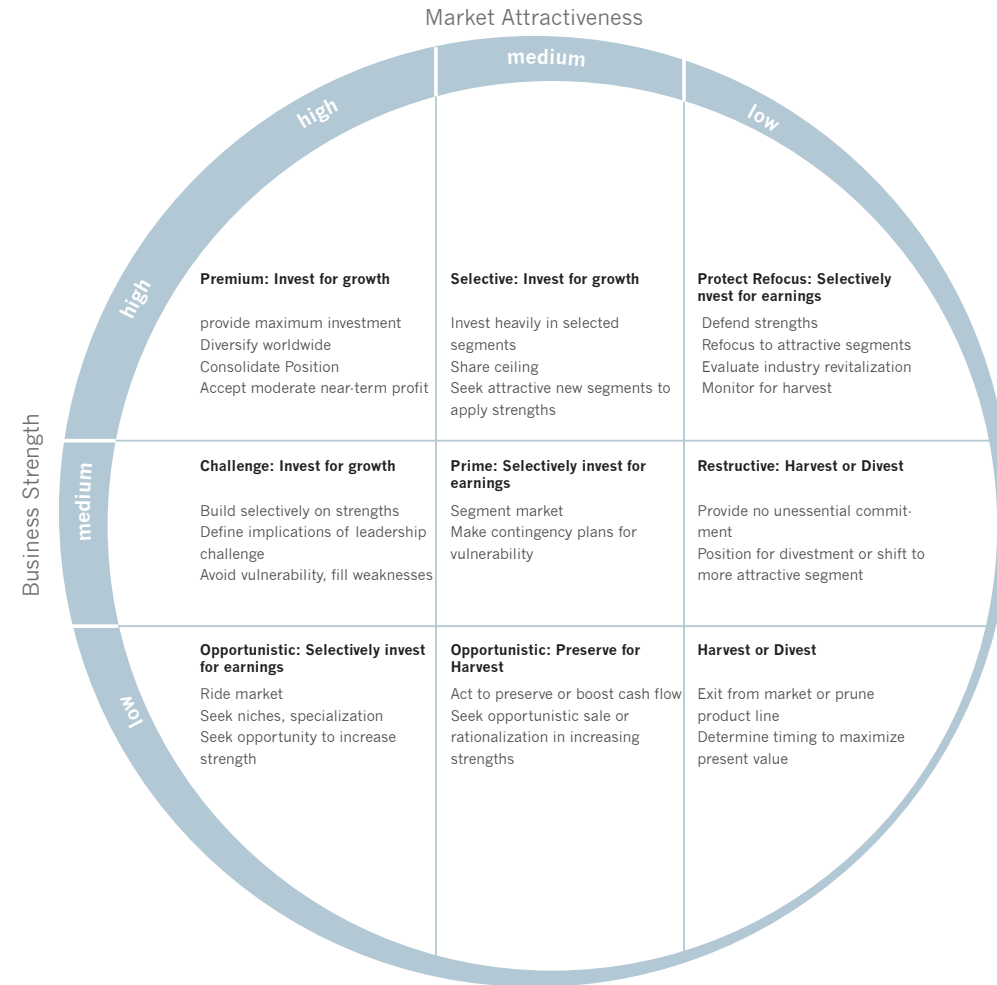
flo HEALTHCARE
EMERSON
 Flo Healthcare provides comprehensive wireless and mobile clinical workstation solutions designed specifically for the healthcare industry. Flo Healthcare is part of Emerson Storage Solutions. Like Emerson, which is focused on making people's lives better through its products, systems, and solutions, Flo Healthcare's top priority is improving patient care and safety. Flo's parent company, Emerson, is strongly recognized for its engineering capabilities which provides options for future growth of Flo's product line. Flo Healthcare has been providing mobile wireless solutions to the healthcare industry since 1997 so it is a relatively new company. However, they claim to have their systems in over 900 hospitals. They offer products to all sizes of healthcare facilities.

stryker®
 Stryker prides itself as a leader in high tech medical device manufacturing. Their orthopedic segment (which produces their largest amount of sales) includes products such as knee, hip, shoulder, and spinal implants, implant instrumentation, trauma-related products, and bone cement. Stryker is also a leading manufacturer of medical patient handling equipment for hospitals and emergency rescue environments. They offer a broad selection of hospital beds, support surfaces, stretchers, and hospital room furniture with a special "BackSmart" technology that reduces the risk of caregiver injury. Stryker's all-encompassing approach allows for companies to purchase all of their healthcare products from one manufacturer and their strong brand name poses a significant threat to competitors in the industry.

WHAT IS DESIRABLE TO BUSINESS?

Product Portfolio Matrix

The nine cell matrix analysis was used to estimate where our Product Opportunity Gaps would lie within Herman Miller's business goals. This helped our team determine that the task of improving patient transfer would be desirable as well as marketable for Herman Miller.

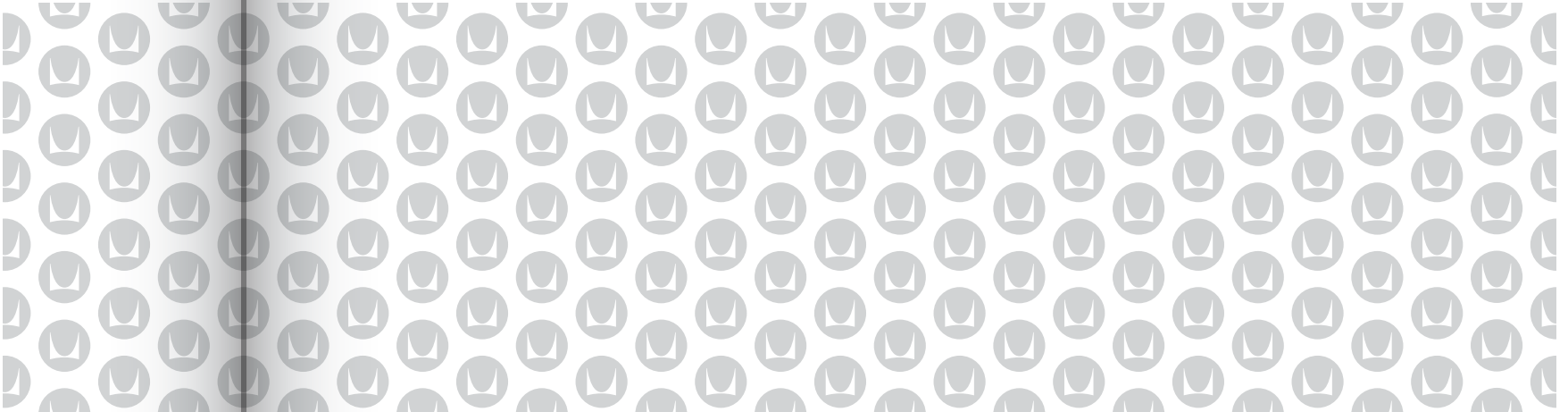


SWOT Analysis

The SWOT Analysis was used to identify favorable and unfavorable factors in Herman Miller's interest in patient transfer assistance. This analysis illustrates that Herman Miller's strengths and opportunities greatly outweigh their weaknesses and threats.

3

PHASE



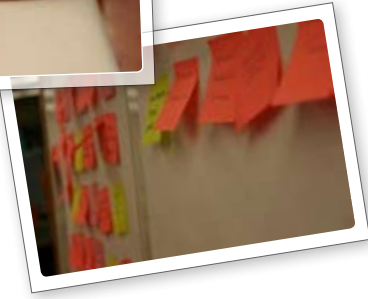
Opportunities

FROM INSIGHTS TO INNOVATION

Phase 3 was all about discovering opportunities. Brainstorming played a key role in analyzing the complex issues discovered in Phases 1 and 2. We attempted to create a diverse collection of solutions, and begin visualizing those solutions without emphasis on form and features. The goal was to generate ideas, not designs.

BRAINSTORMING THE ISSUES & OPPORTUNITIES

A number of brainstorming sessions were conducted, using various methods to extract and converge ideas and solutions to the problems we discovered in our research.



Team Brainstorming

By assessing the data we collected and sharing our own first-hand experiences, our team was able to ideate on possible product solutions in a small group setting.

Other sessions were held as well, involving multiple teams and medical experts. These sessions were done in 3 hour segments.

Professional Facilitations

Herman Miller-sponsored teams had the opportunity to brainstorm in sessions led by Gretchen Gscheidle. Herman Miller methods were used to promote creative thinking while generating possible product concepts.

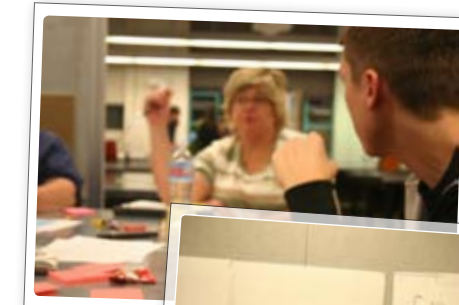
An additional professional facilitation was led by the President of local Atom Design. IDEO-inspired brainstorming sessions were used here to stimulate innovative thinking.

With Medical Staff & Herman Miller

With so many legal and ethical issues in medical practice, we collaborated with working medical professionals and Herman Miller researchers, who could consult our ideas and guide them in a more feasible direction.

Concept Reviews

Medical professionals from our brainstorming sessions volunteered their time on numerous occasions to review the product concepts our team generated from the brainstorming sessions. Their expertise provided useful feedback on what concepts would be the most practical in the real world.



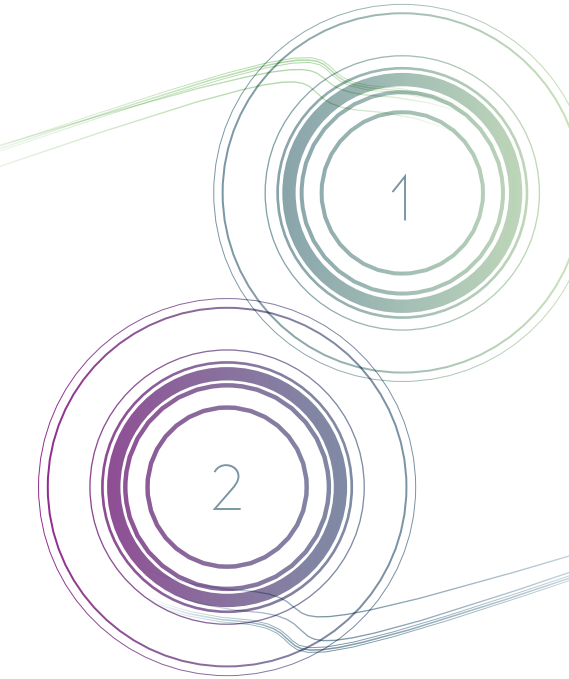
Product Opportunity Gaps

POGs identify areas that are in need of innovative solutions. In Phase 3 of the project, the team narrowed 20 POGs to five POGs. Based on the research, these areas suggest the most promising areas within the realm of patient transfer. The POGs can be categorized into two approaches.

The direct approach: innovative solutions that assist in the physical lifting and or moving of patients.

POGs:

- Improve maneuverability of patient transfer systems
- Products that enable greater patient mobility
- Improvement of transfers from gurney to bed
- Enhanced patient comfort (cognitive & physical)

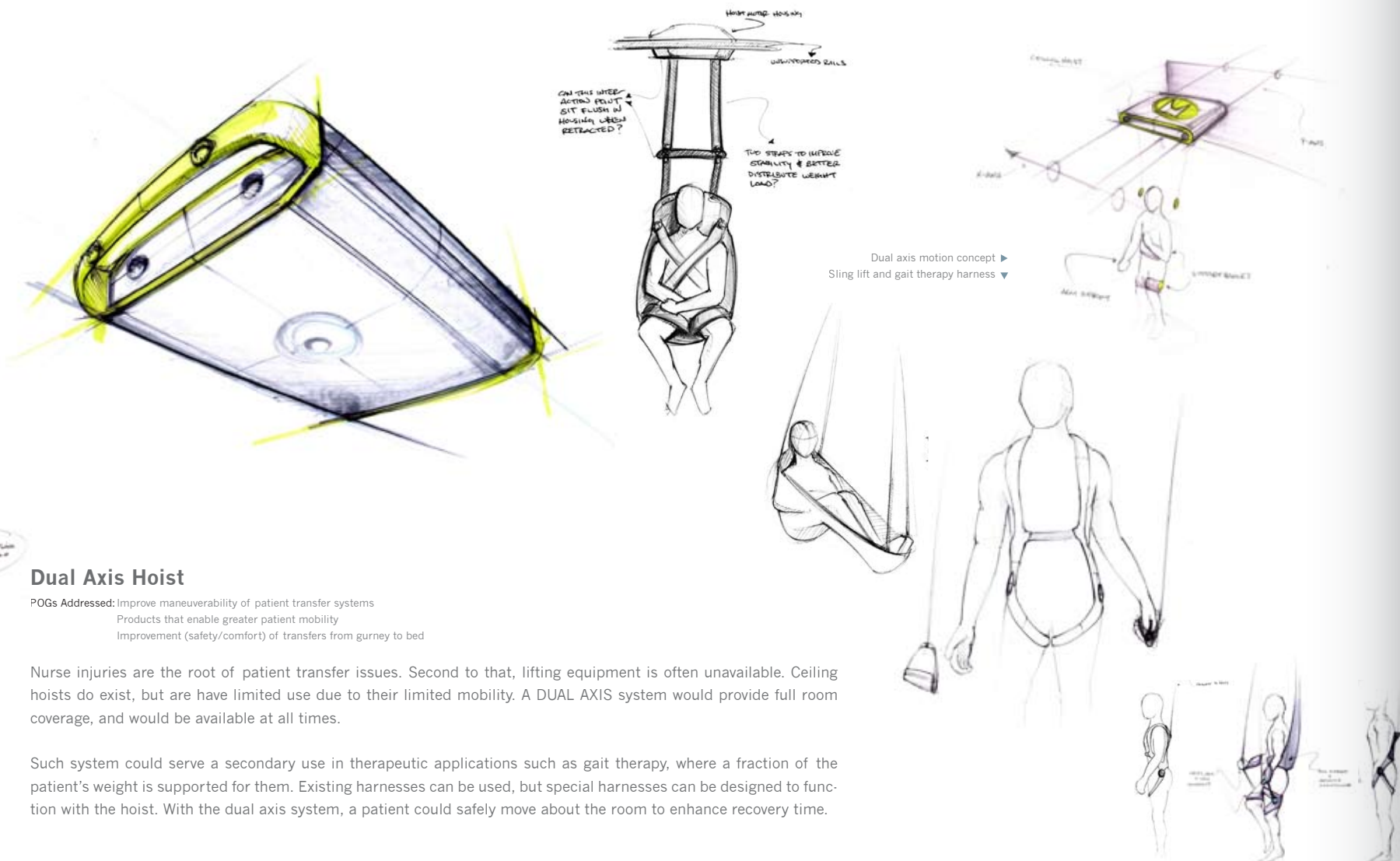


The alternative approach: medical products that are more “transfer friendly.”

POGs:

- Management of equipment connected to a patient during transfer
- Improve communication between nurses and transporters
- Improve transfer of patient information

DIRECTION 1 DIRECT SOLUTIONS



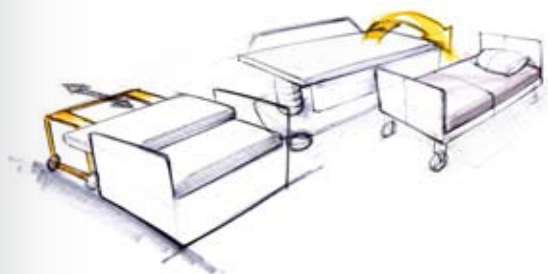
Dual Axis Hoist

POGs Addressed: Improve maneuverability of patient transfer systems
 Products that enable greater patient mobility
 Improvement (safety/comfort) of transfers from gurney to bed

Nurse injuries are the root of patient transfer issues. Second to that, lifting equipment is often unavailable. Ceiling hoists do exist, but are have limited use due to their limited mobility. A DUAL AXIS system would provide full room coverage, and would be available at all times.

Such system could serve a secondary use in therapeutic applications such as gait therapy, where a fraction of the patient's weight is supported for them. Existing harnesses can be used, but special harnesses can be designed to function with the hoist. With the dual axis system, a patient could safely move about the room to enhance recovery time.

Various gurney functions to promote safer transfers to the ER bed



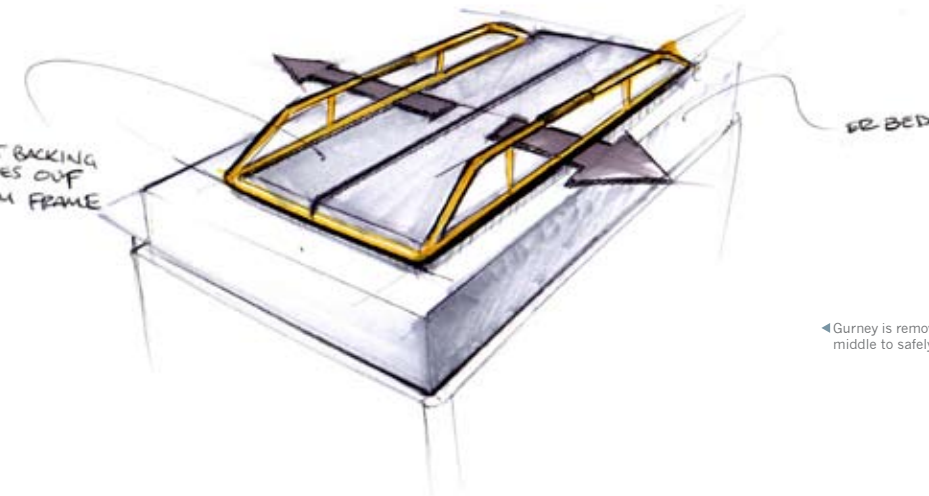
Gurney Improvements

POGs Addressed: Improve maneuverability of patient transfer systems
 Improvement (safety/comfort) of transfers from gurney to bed

One of the most notable observations made in our ambulance ride-alongs was the transfer from gurney-to-bed. Patient's brought into the ER on a gurney from the ambulance need to be transferred to the hospital bed ASAP. This demands the hospital staff and ambulance crew to lift the patient off the gurney by hand. A majority of the time, the sheet covering the gurney mattress is used to lift the patient. Just in our observation, the sheet ripped and the patient was almost dropped! A splitting gurney would allow the patient to be placed on the bed while on the gurney, minimizing the risk of more injury to the patient, and making it easier for staff to lift the patient. The sketches below illustrate other gurney functions that could assist in transfers to the bed.



SPLIT BACKING SLIDES OUT FROM FRAME



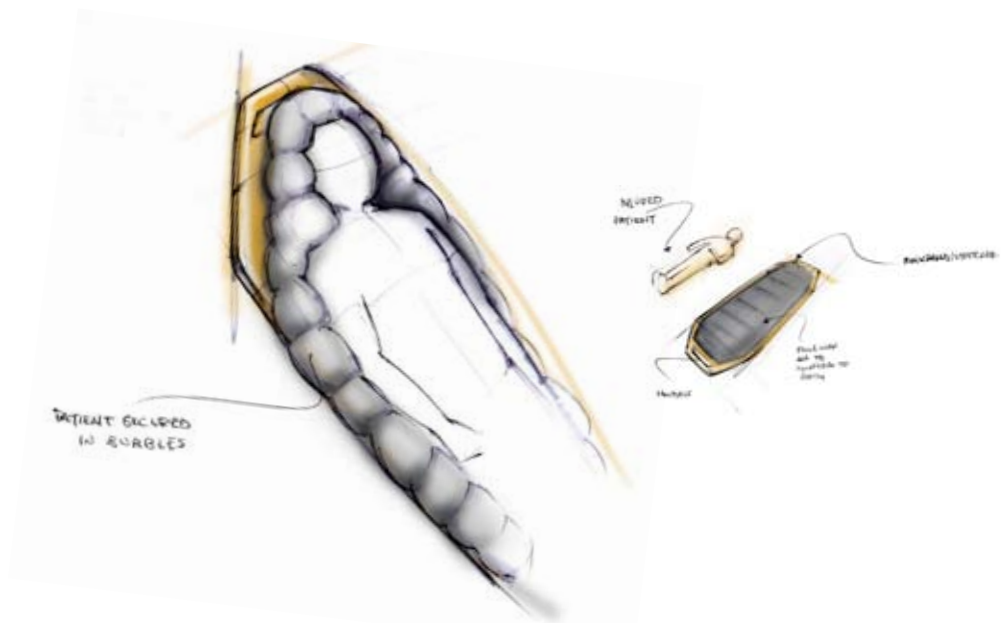
Gurney is removed from its frame and splits down the middle to safely place the patient on the ER bed.

DIRECTION 1 DIRECT SOLUTIONS

Inflatable Backboard

POGs Addressed: Enhanced patient comfort (cognitive & physical)

Injured patients are already in pain when paramedics arrive on the scene. Yet, they're pinned down to a hard plastic board with straps causing pressure points across their body. An inflatable backboard utilizes inflatable air pockets along the sides of the patient, distributing a securing force evenly across the body to stabilize the spine while providing comfort.



▲ The Aeron wheelchair!

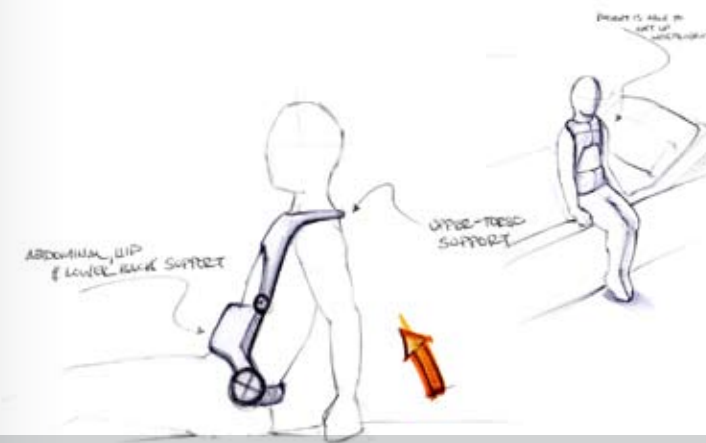
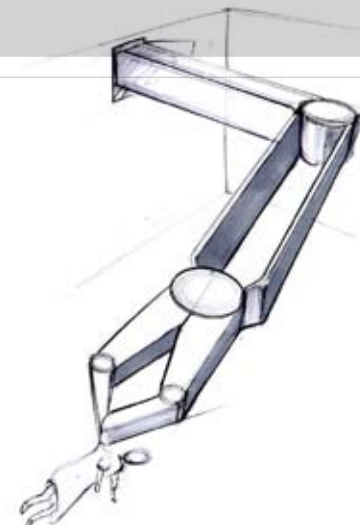
Premium Redesigns

POGs Addressed: Improve maneuverability of patient transfer systems
Products that enable greater patient mobility
Enhanced patient comfort (cognitive & physical)

With the power and influence of the Herman Miller name, typical transfer equipment can be redesigned with enhanced ergonomics, materials, and reduced environmental impact. The wheelchair is a prime example of a common transfer device that has not had substantial redesigns, and could be physically reflect other known Herman Miller furniture works such as the Aeron chair.

If only...

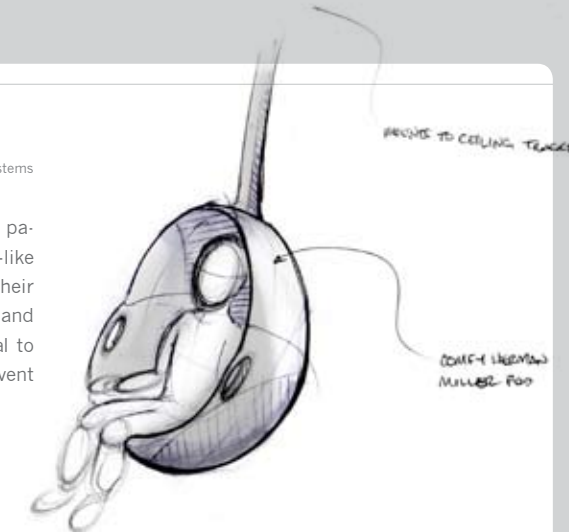
POGs Addressed: Improve maneuverability of patient transfer systems.
Improvement of transfers from gurney to bed



Patient Pods

POGs Addressed: Improve the maneuverability of patient transfer systems
Products that enable greater patient mobility

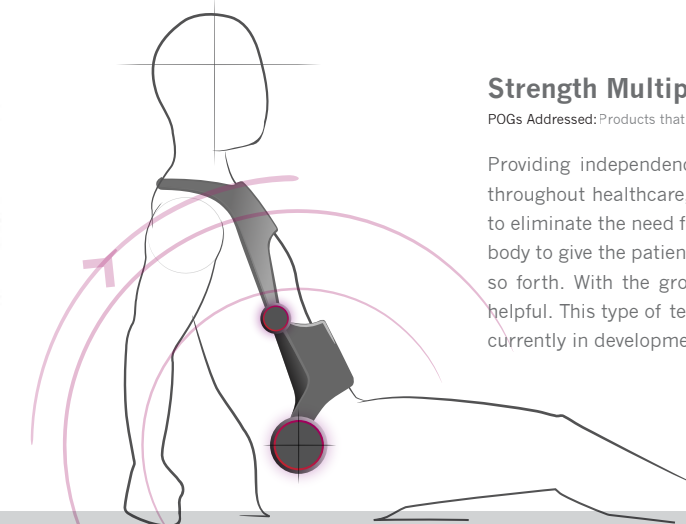
Patient Pods is a hospital transportation concept. Patients are essentially placed in "classy" furniture-like pods that are programmed to take the patient to their destination within the hospital. This frees nurses and transporters from long walks across the hospital to promote efficiency, time management, and prevent nurse fatigue.



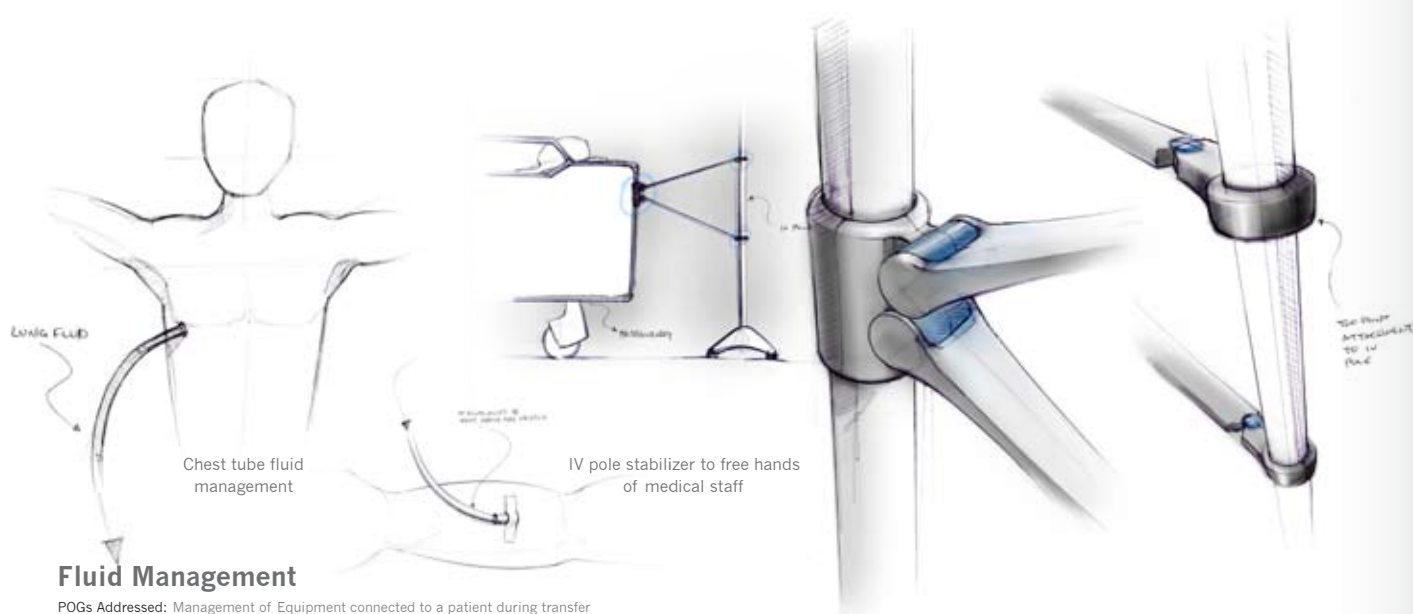
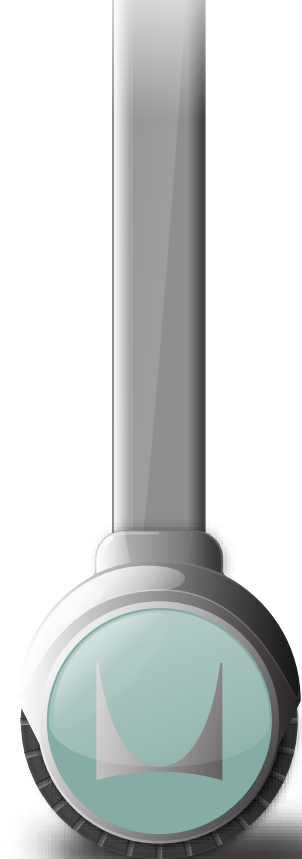
Strength Multiplying Device

POGs Addressed: Products that enable greater patient mobility

Providing independence is perhaps the most powerful means of assistance throughout healthcare, and especially in transfers. This concept is an attempt to eliminate the need for staff assistance. This is a device worn on the patient's body to give the patient enough strength for sit/stand (stand/sit) scenarios and so forth. With the growing nurse shortage, this device would be particularly helpful. This type of technology has been recently introduced in robotics and is currently in development.



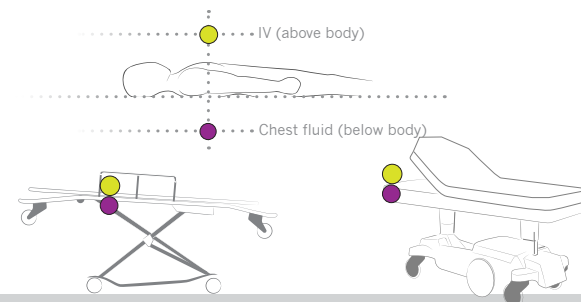
DIRECTION 2 ALTERNATIVE SOLUTIONS



Fluid Management

POGs Addressed: Management of Equipment connected to a patient during transfer

One of the biggest hassles in transferring patients is managing all the fluids connected to the patient. The primary fluid, IV, is extremely difficult to manage and transport with a patient, as long tubes get tangled and the pole is tipsy. This makes it extremely difficult for a nurse to steer the gurney without having a lot of focus on supporting the IV pole. An IV pole attachment would free the hands of medical staff, allowing them to better steer the gurney. Chest tube fluid is also cumbersome. This fluid drains into a bucket that is usually placed on the floor, and has zero mobility. Medical personnel must handle patient with chest tubes with extreme caution to not agitate the patient, as the chest tube bores a hole nearly half an inch in the patients ribs. The drainage collector must also stay below the patient as it is gravity fed.



Gyro IV Pole

POGs Addressed: Management of Equipment connected to a patient during transfer

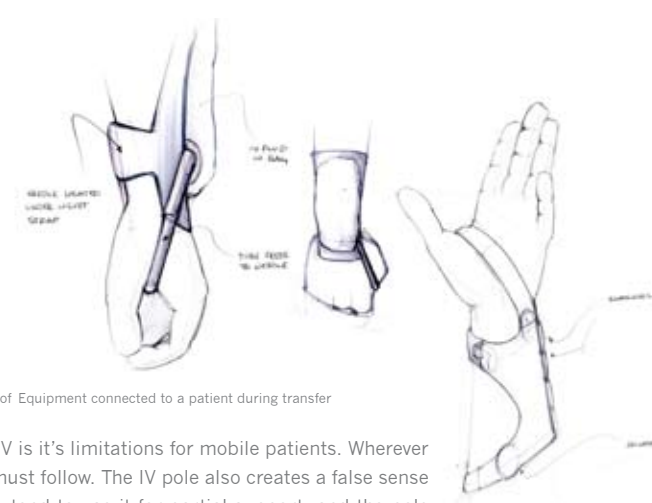
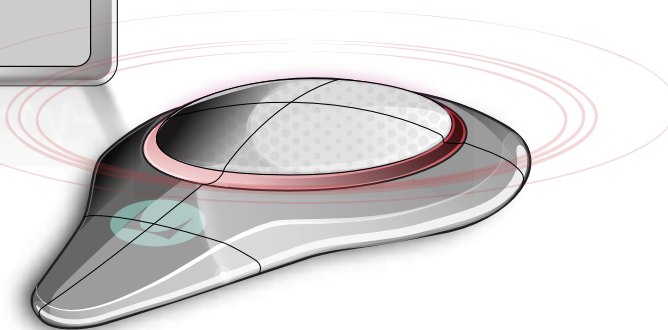
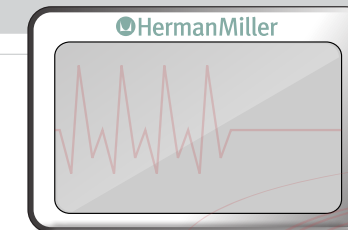
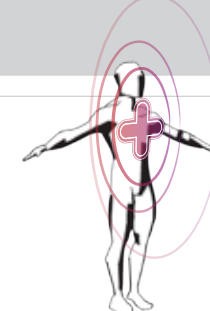
Again, the tipsy IV pole. Using technology similar to the Segway scooter, a self-stabilizing IV pole would need no extra support or attention when being dragged around the hospital. This would help nurses when transporting patients in a gurney, as well as mobile patients that need to carry the IV pole by their side.



Wireless EKG

POGs Addressed: Management of Equipment connected to a patient during transfer
Improve transfer of patient information

When EMT transport a victim to the hospital, the equipment connected to the patient creates a mess. Cords of the EKG system are often tangled, become easily damaged, and are expensive to replace. Current EKG boxes are already equipped with wireless technology, so should the transmitters placed on the patient's body.



On-Body IV

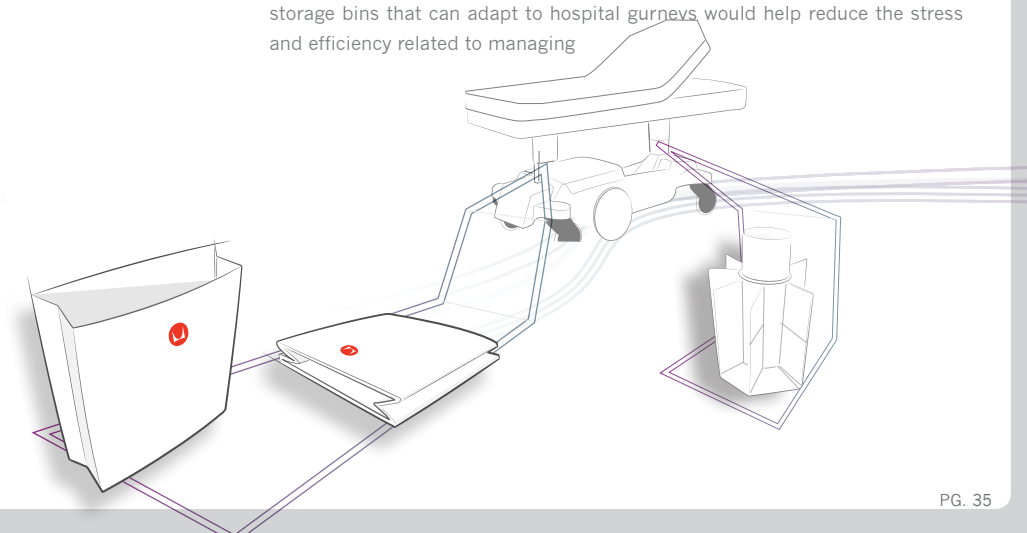
POGs Addressed: Management of Equipment connected to a patient during transfer

Another problem with IV is its limitations for mobile patients. Wherever a patient goes, the IV must follow. The IV pole also creates a false sense of security, as patients tend to use it for partial support, and the pole is not designed for. An on-body reservoir system would allow patients to be temporarily free from the IV pole. Reducing the tubes would also help eliminate the management hassles for hospital staff.

Gurney Cubbies

POGs Addressed: Management of Equipment connected to a patient during transfer

Apart from fluids, patient transfer scenarios usually involve other pieces of equipment related to maintaining the patient's health. Organization and storage are essential. Existing gurneys do not provide equipment storage. Modular storage bins that can adapt to hospital gurneys would help reduce the stress and efficiency related to managing



4

PHASE



Product Concepts

INVELOP | VIV | ORBIS

Practicing nurses, transporters, medical professionals, and other potential users consulted our team, helping us to narrow a list of innovative ideas into three promising product concepts. In Phase 4, we gave a little bit of form to the three concepts, with a primary focus on addressing the overall problem and solution, as well as considerations that should be addressed upon further development. One of the three will be selected for further development, starting in Phase 5.



paramedics; EMT



accident victims; athletes; outdoorsman

INVELOP

When a patient at the scene of an injury has potential trauma to the spinal cord or vertebral column, backboards are used to transport the patient into an ambulance. The patient will remain on the backboard throughout the journey to the nearest hospital, and will be put directly through x-ray and MRI machines. While backboards are purposefully designed to be rigid for spinal support, current designs create points of pressure where straps secure the patient.

Invelop enables the same spinal stability provided by existing backboards, while improving comfort for the patient. This is achieved through inflatable air pockets which envelop the patient to a spine-stabilizing backboard. The natural characteristics of the air-pockets to conform to a patient's body results in greater stability and comfort.

BACKBOARD PROPOSAL [INVELOP]



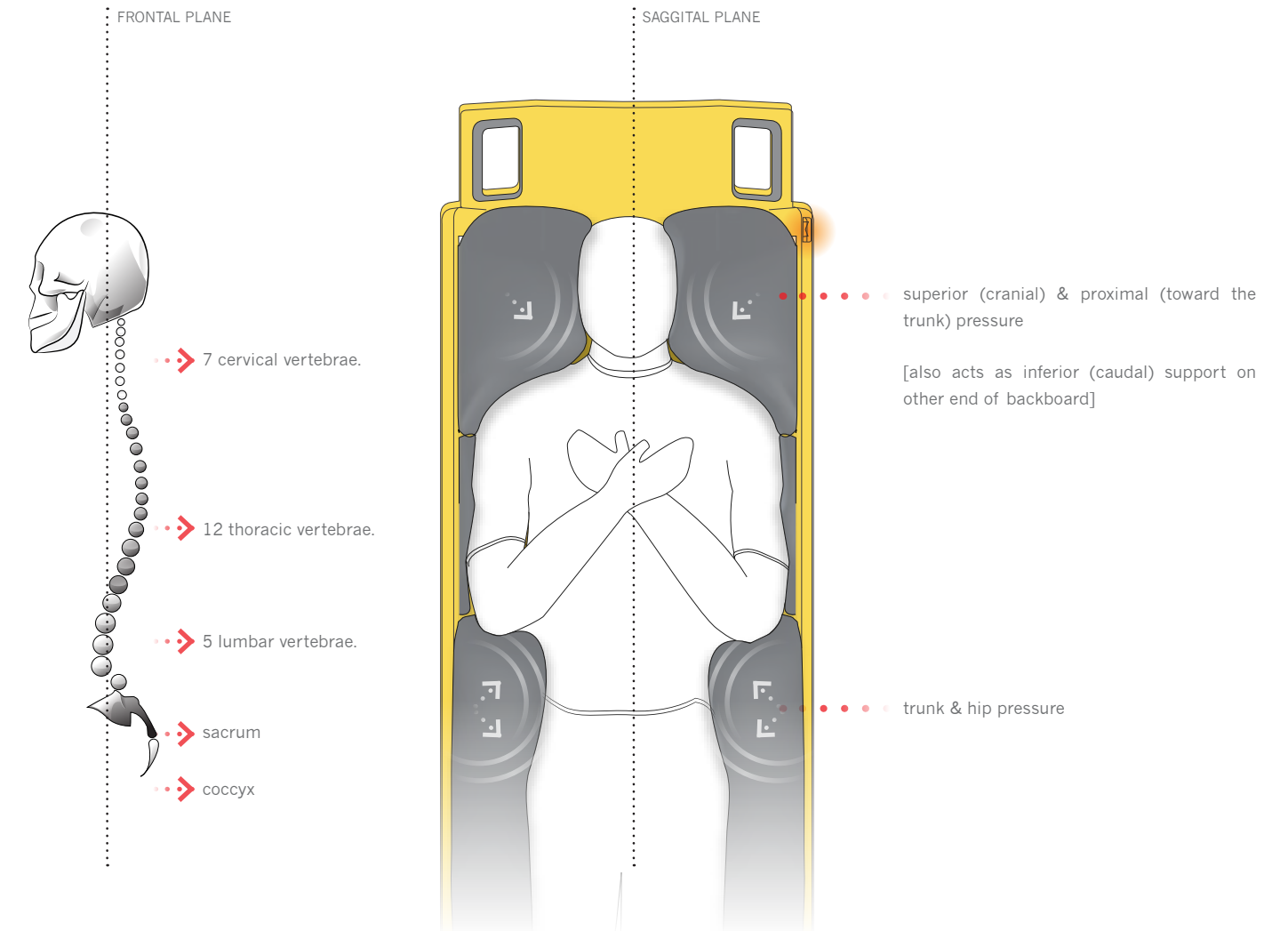
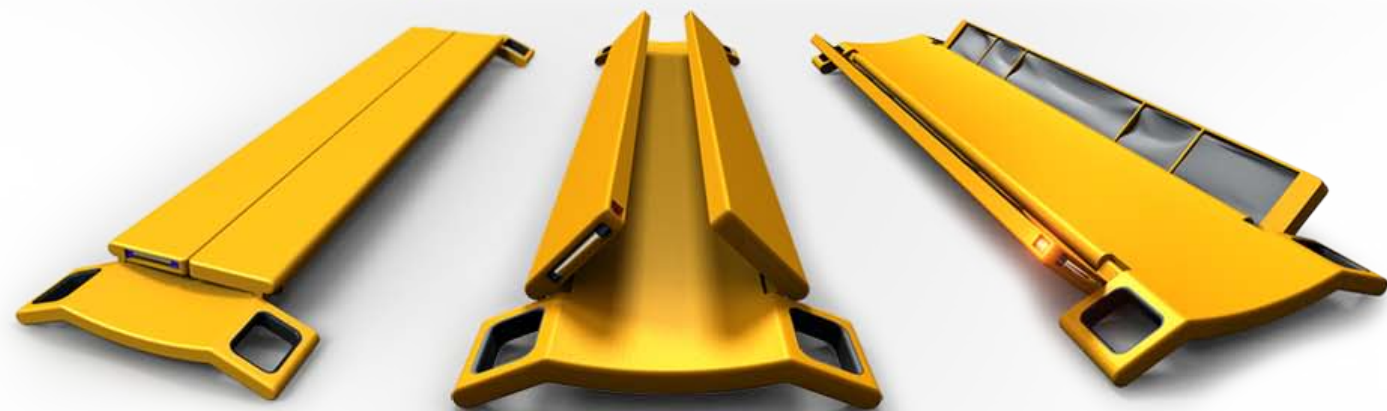
Invelop used to stabilize the patient's spine



Patient carried away on inflated Invelop



It stores in the ambulance like an existing backboard



The Patient Experience

Invelop acts like a full body splint, compressing the patients entire body. Not only does this immobilize the torso and limbs, as movement may further injure or aggravate any spinal or neck injuries, but it comforts the pain. The inflated bladders distribute pressure medial (direction relative to the midline of the patients body) to the patient, naturally causing the "enveloping" characteristic of the bladders. This prevents any major mobility of the patients limbs across the Sagittal and Frontal planes of the body, which better stabilizes the spine.

BACKBOARD PROPOSAL [INVELOP]



“IV poles suck.”



nurses; transporters



mobile residents

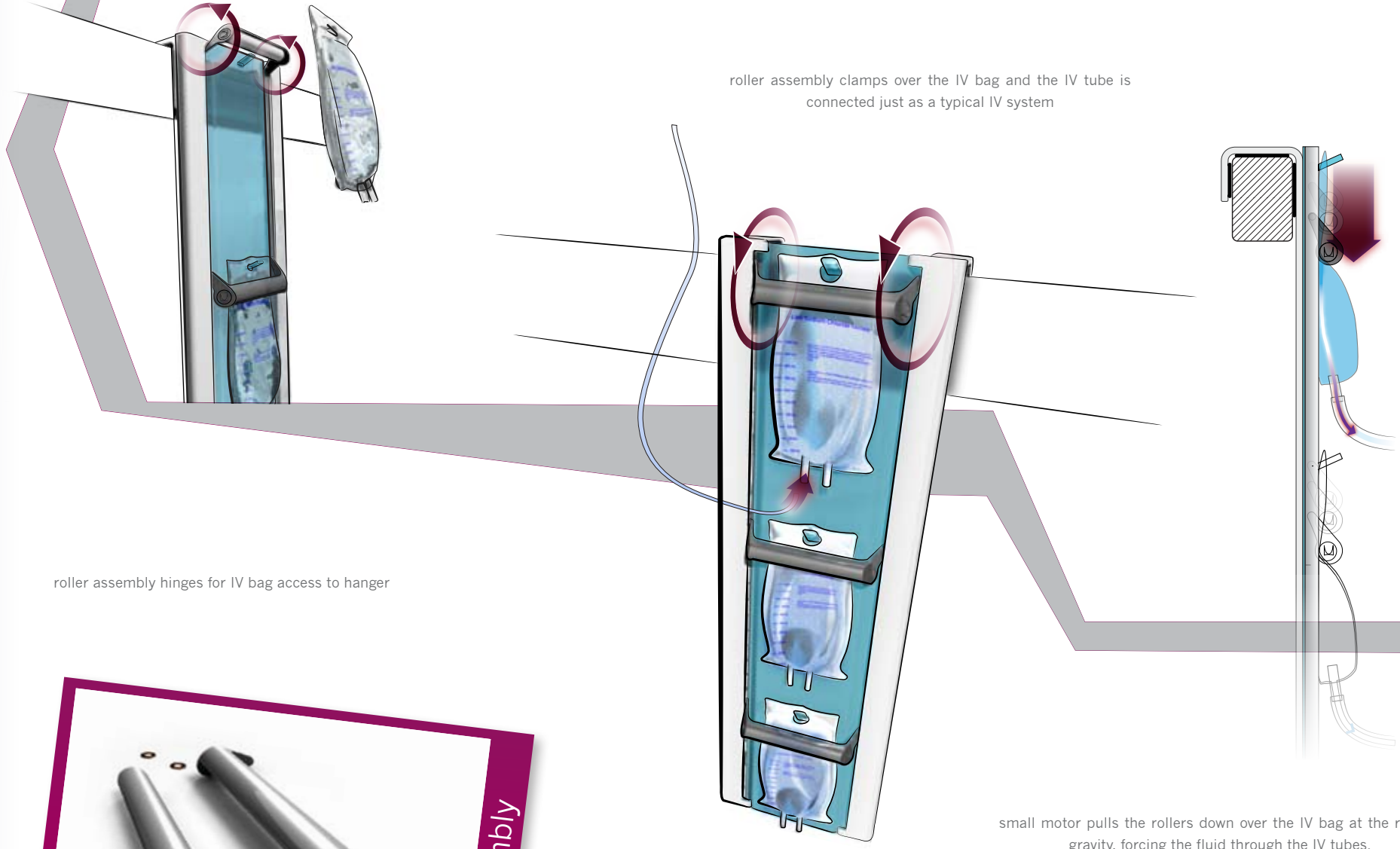
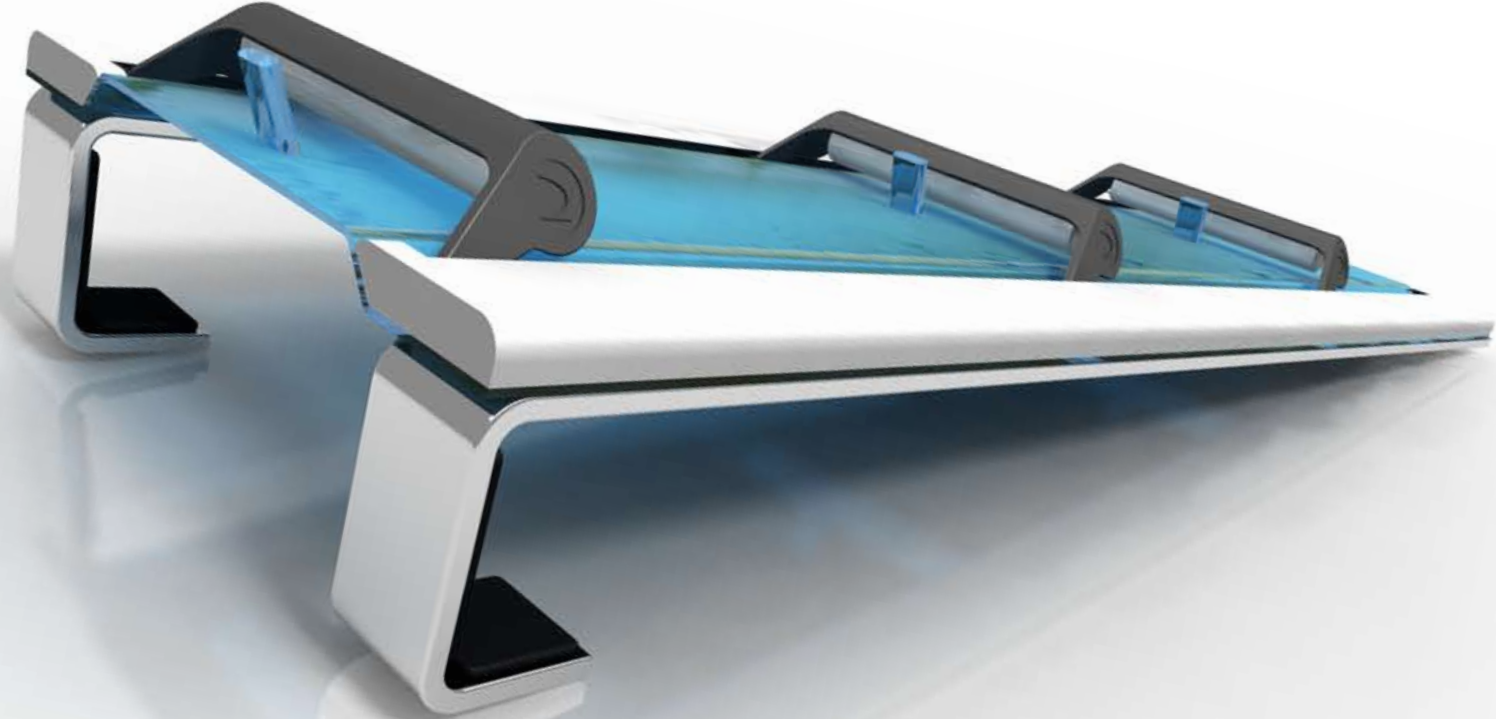
VIV

Managing equipment in transfer scenarios is one of the primary issues during patient transfers. Any transporter or nurse will tell you, “IV poles suck.” Current IV poles are very cumbersome to manage when transferring a patient. Not only are the poles top heavy and unstable, but the tubes are a hassle as well.

VIV changes the way IV is delivered, with the use of existing IV bags, tubes, and needles. This two-part system enables transporters to effectively steer a bed and manage the other needs during transfers, while allowing mobile patients to temporarily be free from their IV pole.

IV RACK PROPOSAL [VIV]

The idea behind the VIV system is to redesign the IV pole - minus the pole. Mounting the IV system to the bed or gurney allows transporters to better steer and manage the patient, rather than the IV pole. The IV rack is more compact, and creates a more stable platform for distributing IV within the hospital.



roller assembly clamps over the IV bag and the IV tube is connected just as a typical IV system

roller assembly hinges for IV bag access to hanger

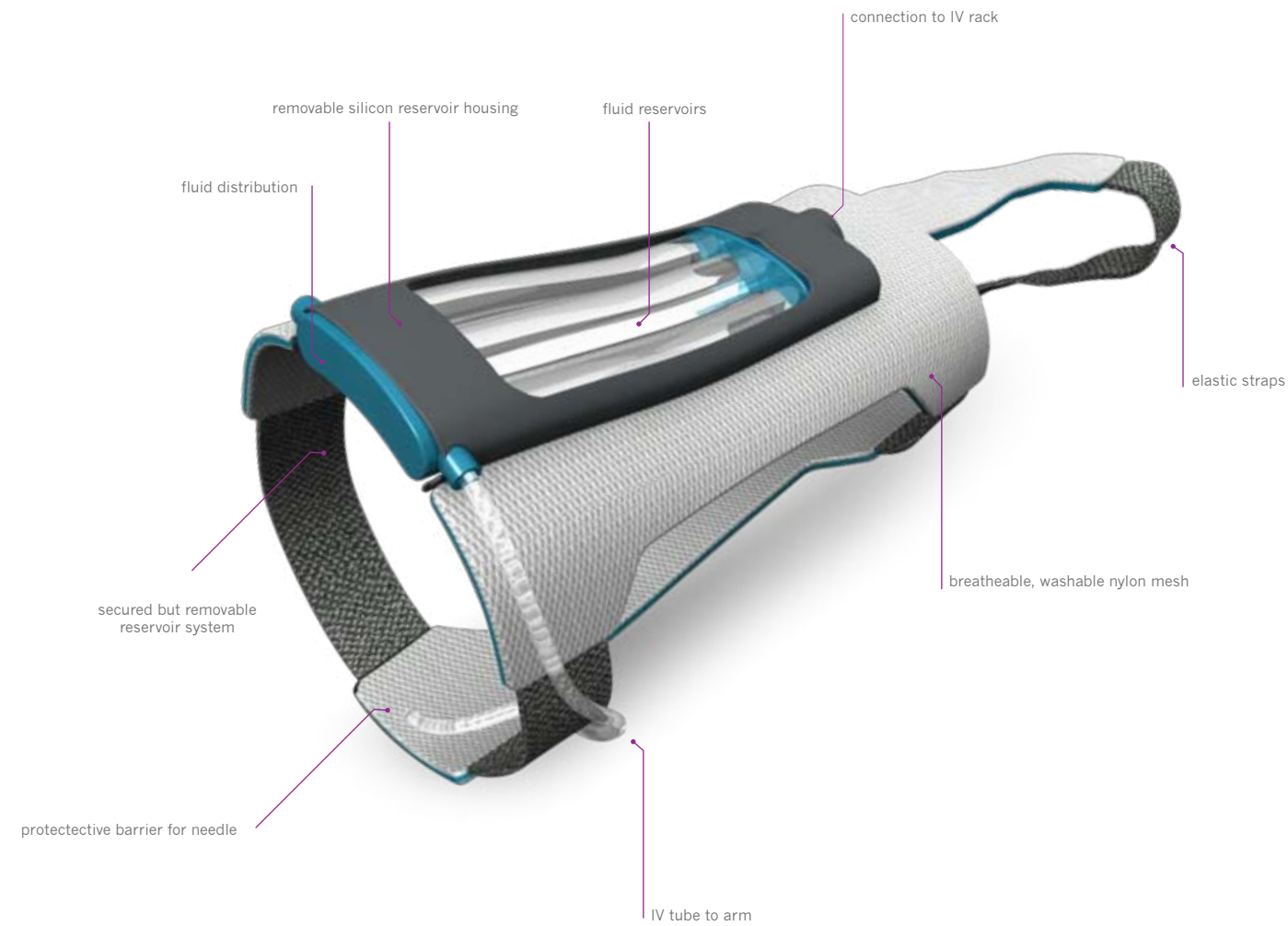
small motor pulls the rollers down over the IV bag at the rate of gravity, forcing the fluid through the IV tubes.



roller assembly

WRIST WRAP PROPOSAL [VIV]

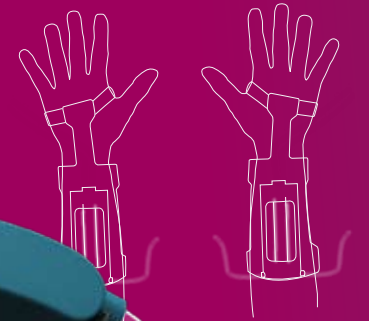
The design of the wrist strap should include washable and durable materials. While the soft materials can be machine washed, the silicon top would be removed for manually cleaning. Reservoirs would function with existing universal IV tubes and needles, as those items would be disposed after use. Accommodating various needle points is also a necessity.



Nikki's Story

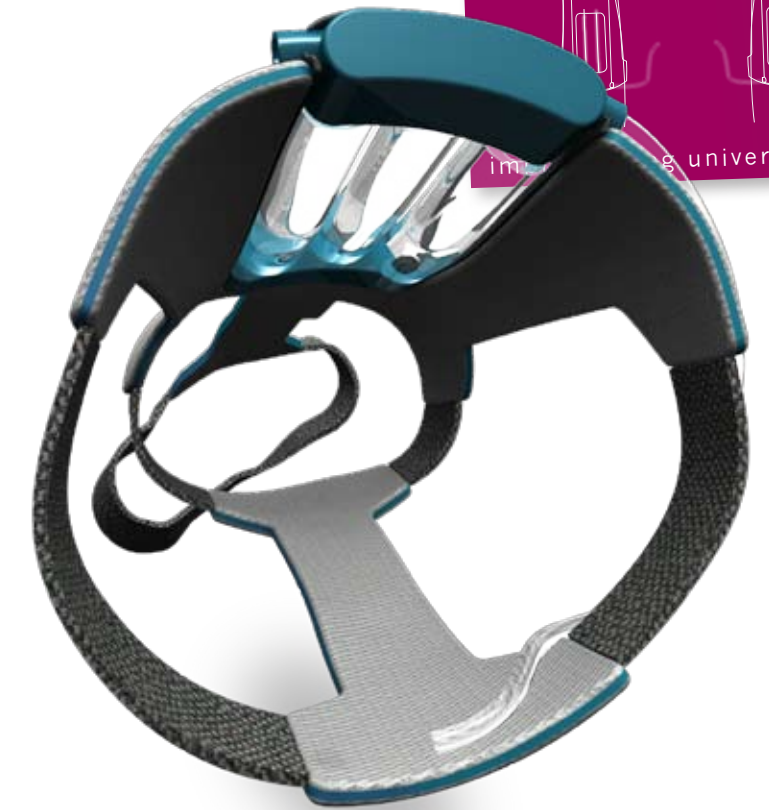
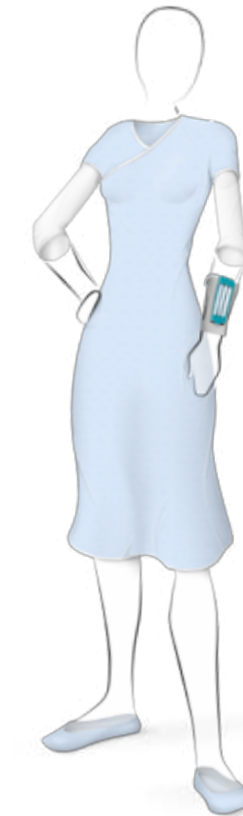
Recovering from minor head trauma caused by a car accident, she is still in need of daily medical assistance. However, rehabilitation experts suggests she practices independence by going to the hospital cafeteria on her own. Without having to drag the IV pole at her side, her mobility is increased.

👉 left, or right.



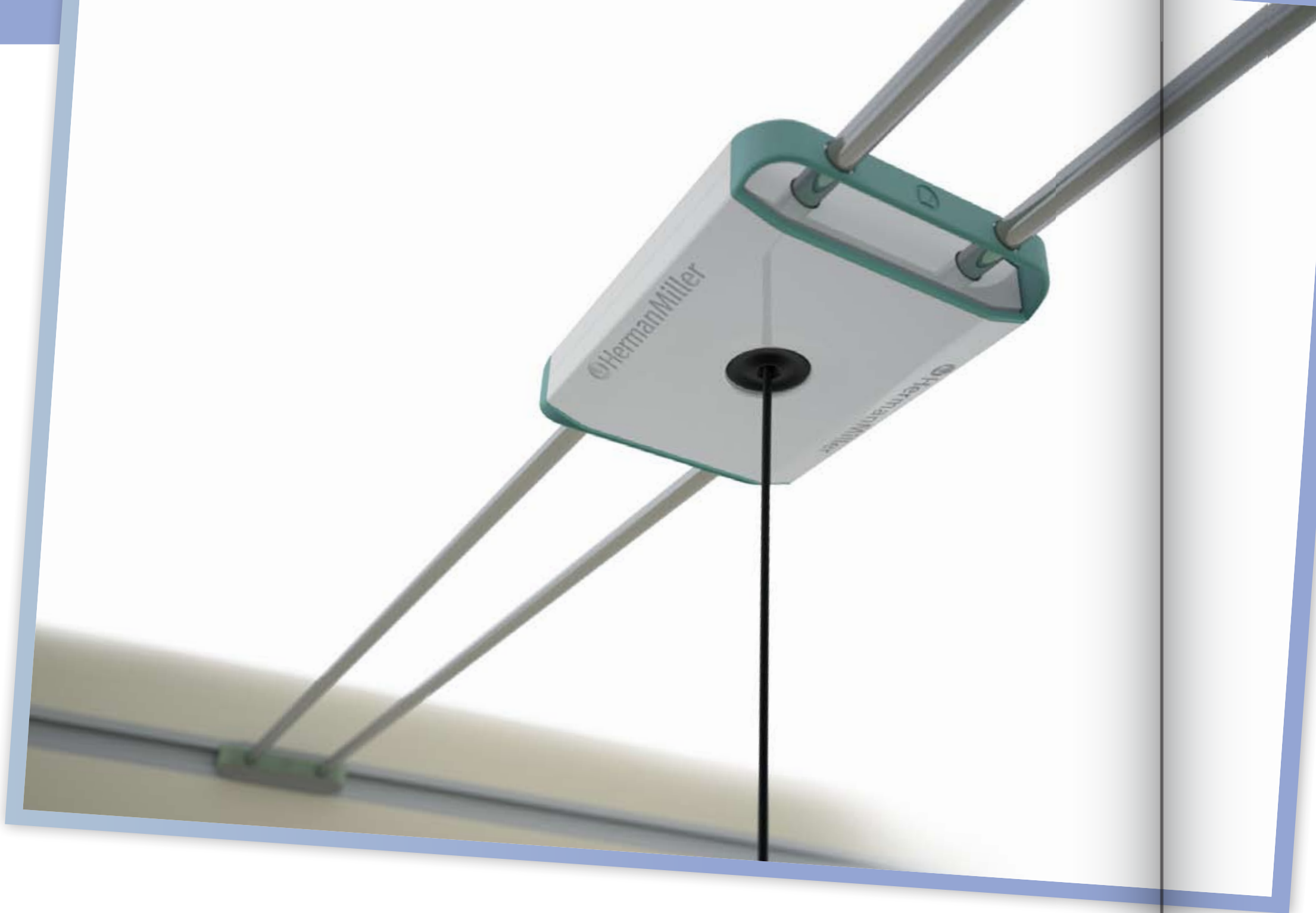
improving universal design.

VIV
iv system



The wrist wrap should be put on the patient with the easiest means possible, and fit snugly on the arm.

- ▲ preferred: slips over hand
- acceptable: straps-on



nurses; transporters; occupational therapists; assistants



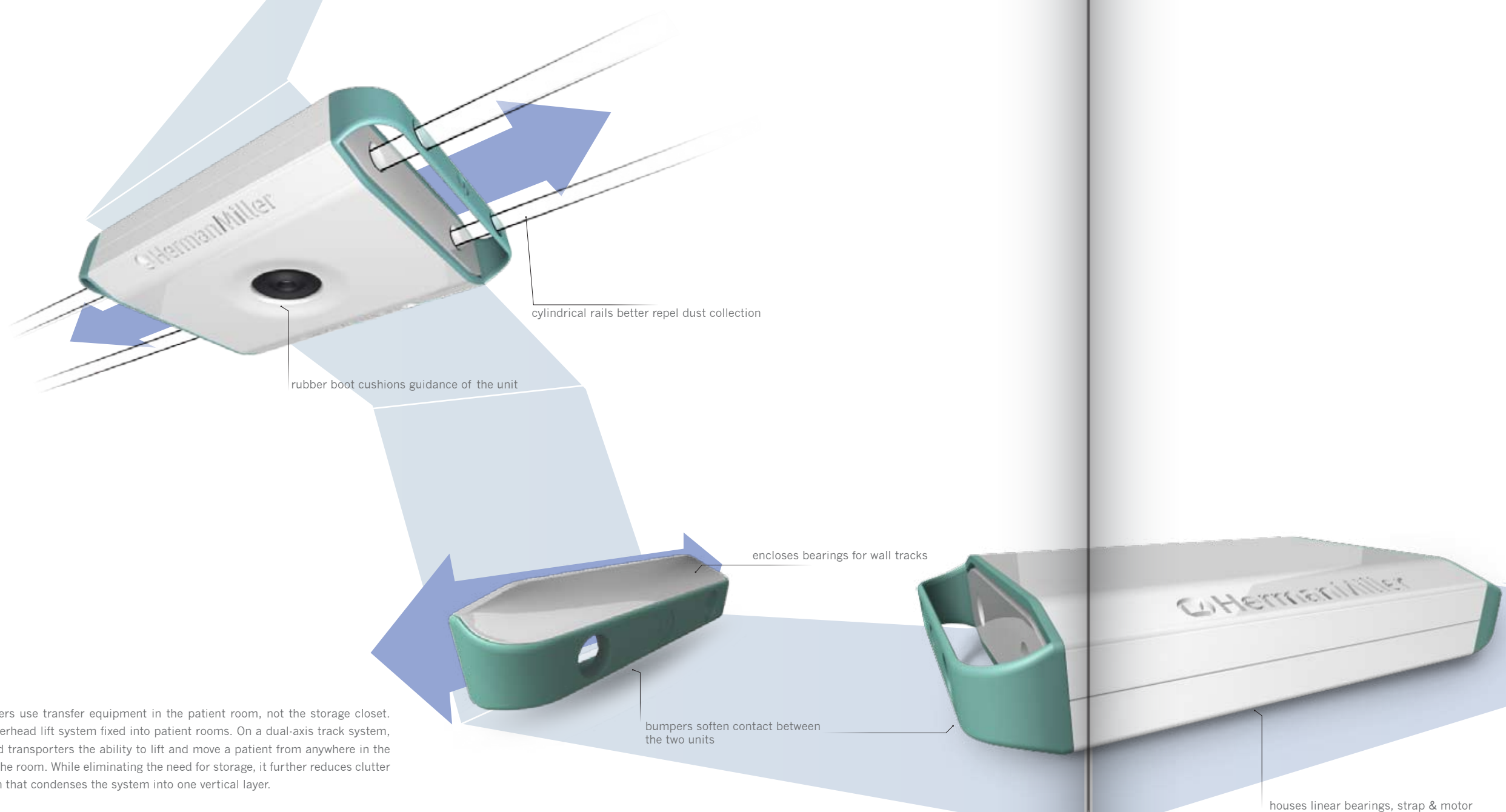
bariatric; geriatric; physically disabled; special needs; accident victims

ORBIS

Nurses have a higher rate of injury on-the-job than any other industry. Many of these injuries occur as the nurses assist in moving patients. While many solutions already exist for lifting and moving patients, their limitations and awkwardness leave them unused. Hospitals invest millions of dollars into this equipment, only to have them remain in a storage closet.

Orbis changes this with an easy-to-use three axis lift system. On a dual axis track system, Orbis can reach any spot within a room or environment.

HOIST PROPOSAL [ORBIS]



Nurses and transporters use transfer equipment in the patient room, not the storage closet. Orbis is a dual-axis overhead lift system fixed into patient rooms. On a dual-axis track system, Orbis gives nurses and transporters the ability to lift and move a patient from anywhere in the room, to anywhere in the room. While eliminating the need for storage, it further reduces clutter with a compact design that condenses the system into one vertical layer.



Sherry. Due to the number of recent nurse injuries resulting in high insurance payouts and a short staff, Sherry is encourage to take no risks when transferring a patient. With so many patients to attend to, she does not have time to track down where transfer equipment is.

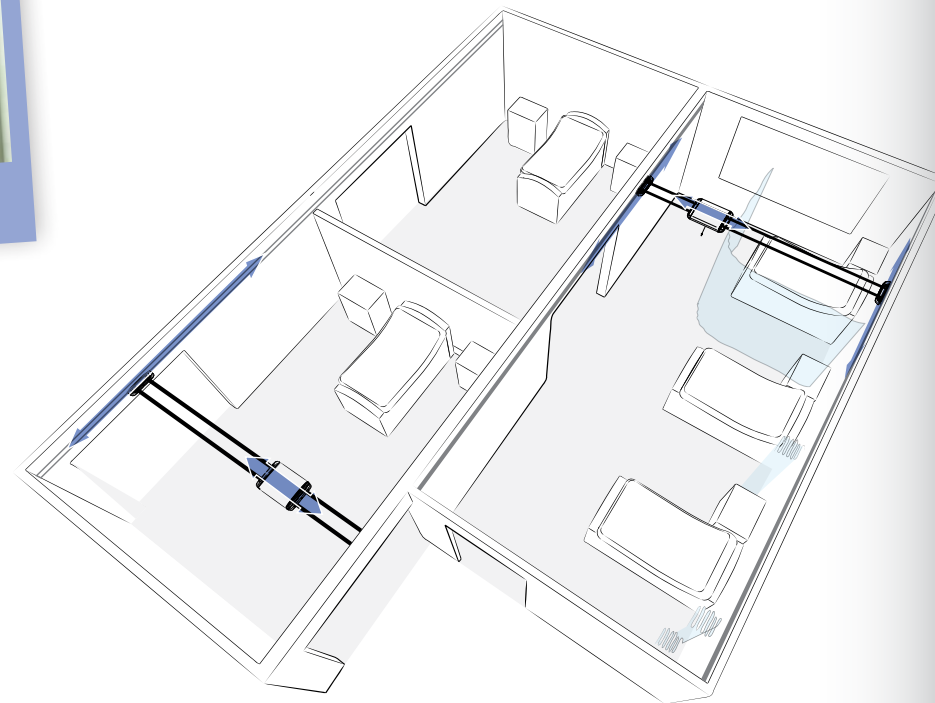
Some patients need constant to move constantly, whether to the bathroom, or to another room. Because Orbis is available in the room at all times, hospital staff is more likely to use it, preventing injuries and hospital insurance pay. It also means no time wasted in tracking down and dragging in equipment that resembles a car-engine hoist.

HOIST PROPOSAL [ORBIS]

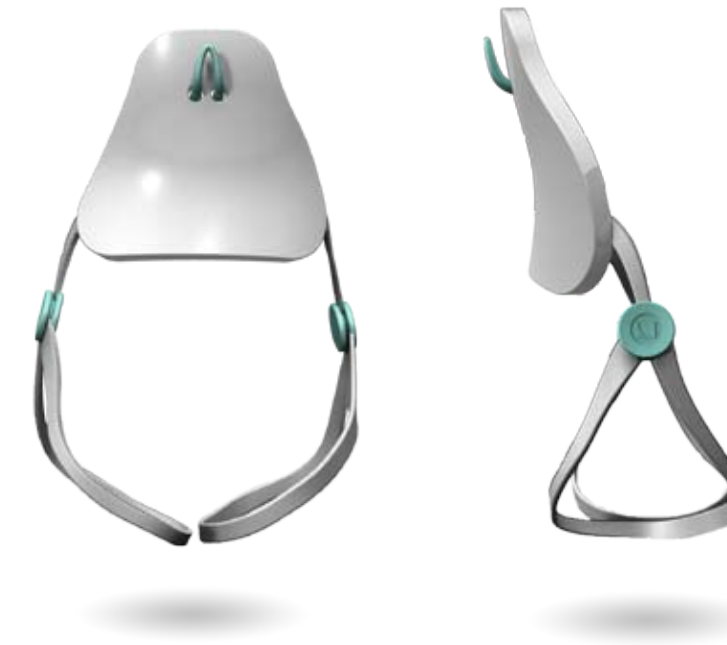


Orbis dual-axis overhead hoist in patient room

Orbis can easily service multiple patient rooms, single patient rooms, and surgical areas. With future hospital trends towards modular walls and partitions, one Orbis can accommodate many individual-patient rooms.



Orbis gait therapy



The functionality of the Orbis system extends well beyond hospital patient transfers. Rehabilitation patients who must re-learn how to walk can be greatly aided through the incorporation of Orbis with gait therapy. It allows the patient to simulate independent walking by supporting them as they walk. Frictionless bearings enable the unit to be guided with minimal effort along the two axes.

This harness attachment serves as a walking assistant to diminish the risk of falling for patients. Although Orbis is designed for patient transfers, additional purposes such as this create the opportunity to further develop the market for Orbis. Special purpose slings and harnesses can be designed to perfectly integrate with the hoist, to create a more extensive patient transfer product line.

