

Construction/Renovation Guidelines for Healthcare Facilities

Patient Handling Equipment				
Per 2014 Guidelines for Design and Construction of Hospitals and Outpatient Facilities; 1.2-3.3 Patient Handling and Movement Assessment (PHAMA)				
Unit Type	Ceiling Lift*	Floor-based, powered total dependent lift with scale (i.e. Maximove)	Floor-based, powered sit-to-stand lift with scale (i.e. Saraplus)	Floor-based, non-powered, active standing device (i.e. SaraStedy /Quickmove, Rowalker)
ICU	100% Coverage w/ 600 lb lift motor & track; NOTE: One 1000 lb track and motor is needed	1 per unit (if ICU has 100% ceiling lift coverage) 2 per unit (if ICU has less than 100% coverage)	2 per unit (1 per 8 – 10 partially weight-bearing patients)	2 per unit (1 per 8 -10 partially weight-bearing patients)
PICU/PCICU	20% Coverage w/ 600 lb lift motor & track capacity (if more than 1 ceiling lift, install in adjacent rooms)	1 per unit or floor	1 per unit or floor	1 per unit or floor
Intermediate/ Stepdown	50% Coverage (install in rooms adjacent rooms)	1 per unit	1 per unit	1 per unit
PT/OT gym	1-2 depending on physical size of gym			
Radiology	1 each: CT, MRI, Nuclear Med Traverse or straight Track	1 per area		1 per Diagnostic X ray
Treatment Area/Entrances/ ED	50% -100% coverage: Dialysis , GI	1 per area/entrance (i.e. Golvo lift by Liko for clinic needs and car transfer	1 per area/department (i.e. ED)	1 per area/entrance (i.e. Return device by Handicare)

*** Additional recommendations for ceiling lifts:**

1. Recessed, continuous charge transverse (H-Style) track; 600 lbs lift motor with 2-pt loop hanger bar; bracket to hold hanger bar & hand control
2. If ceiling lifts are in all rooms of a unit, then quantity of floor-based, powered sit-to-stand lift will decrease
3. If ceiling lifts are not in all rooms of a unit:
 - a. first priority is to install ceiling lift motor and tracks in all rooms in ICU.
 - b. second priority is to build the ceiling track now and add lift motors later
 - c. third priority is to build infrastructure for later addition of ceiling lifts (conduit and power receptacles)

Storage requirements for portable lifts:

- Need average of 8-10 square feet per portable lift for storage & outlets to charge battery; ceiling lifts require no additional storage

*Ceiling Lift Requirements and Cost Breakdown (Per Room)	600 lb lift system	1000 lb lift system
Recessed transverse track only	\$4000	\$6000
Lift motor	\$2200	\$6000
2-point hanger bar	\$200	\$350
4-point hanger bar		\$565
Hanger bar bracket	\$170	\$170
Total Turnkey installation Cost	\$ 6570	\$13,085

Furniture and Patient Care Areas

Based on 2014 Guidelines for Design and Construction of Hospitals and Outpatient Facilities, ANA Safe Patient Handling and Mobility Interprofessional National Standards, evidence/current literatures, expert opinions

Furniture/Area	Essential Features for Safety of Patients and Employees
Standard adult bed	<ul style="list-style-type: none"> • Power-drive feature • Lowest height of bed frame @ 16 inches • Height-adjustable handles • Allow patient to get in and out of bed at BOTH sides & foot of bed • Chair position possible • Adequate clearance underneath the bed for patient lifts to go under during transfer
Bariatric bed	<ul style="list-style-type: none"> • Power-drive feature • Frame and mattress width between 39" to 48"; length between 80" to 86" • Lowest height of bed frame @ 16 inches • Adequate clearance underneath the bed for patient lifts to go under during transfer <p><i>NOTE:</i> Compella bed by HillRom is not recommended because its lowest bed frame height is too high for patients who are 5 feet or under and patients can only get in and out of bed at the end of the bed.</p>
Doors in patient room, treatment /procedural rooms	<ul style="list-style-type: none"> • All doors must be wide enough for 48" wide bariatric bed to get through and turn (this is NOT just patient room doors but all areas patient may be moved to in bed i.e., dialysis, radiology, etc.
Psych bed & room in ED	<ul style="list-style-type: none"> • Bed should be connected to wall and floor as one and made with materials easily disinfected <p><i>NOTE:</i> Seclusion beds (from Moduform) with no clearance between bottom of the bed and floor and require locking is not recommended because unsafe for patients and staff.</p>
Stretcher-chair (for ICU and early mobilization)	<ul style="list-style-type: none"> • All power control • Power-drive recommended • Weight capacity at least 440- 500 lbs • Mattress is vinyl material for disinfection and can use with friction-reducing devices • Highest flat position is 46 inches for lateral transfer • Positions include: flat, recline, chair, tilt-in-space to prevent patient sliding down, and/or full vertical to stand patient up stand up • BOTH arm rests drop down for lateral transfers • Adjustable foot rests • Seat belts • Wheel brakes • Battery backup • Go into Trendelenburg • Manual CPR release • IV pole and O2 holder • Adequate clearance underneath the stretcher/chair for patient lifts to go under during transfer <p>3 options: SaraComblizer by Arjo, All Purpose Chair by Hausted, and TMM5 Stretcher-chair by Transmotion</p>
Cribs- infant to toddler	<ul style="list-style-type: none"> • Bed is height-adjustable easily; lowest height between 23 to 26 inches (for CPR and to place topper to reduce reaching too high above the shoulder) • Controls can be accessed by foot pedals • Bed rails raise/lower smoothly, easily, & QUIETLY with 3 height ranges, ability to drop & pull up • Easy/ safe access to raise/ lower head of bed without reaching or risk of pinching fingers • Safe braking system • Storage underneath • O2 holder

	<ul style="list-style-type: none"> • Scale (not for newborn) • Light-weight topper option, easily disinfect
Recliner in patient room	<ul style="list-style-type: none"> • 500 lb capacity and seat width 23.5 inches • Can go into Trendelenburg • Transfer arms on <u>BOTH</u> sides and fold up towards the back of the chair • All controls, including 1 stop brake, are pedals and accessed by foot at side of recliner (no bending or stooping by staff) • Push bar at back of chair • Adequate clearance underneath the recliner for patient lifts to go under during transfer <p>Consider: Accord by Wieland distributed by Southern Medical Solutions</p>
Main door entrances in corridors	<ul style="list-style-type: none"> • Must-automatically open/close for all wheeled equipment to move through easily i.e. bed, wheelchair, stretcher, food carts • Access control to open doors should be easily accessed by staff
Bathroom in patient room	<ul style="list-style-type: none"> • Large enough to facilitate the use of wheelchair and other safe patient handling and mobility equipment with fewer corners to negotiate • Toilet: Floor-mounted and elevated height at least 17 inches • Shower: Foldable bench at least 300 lb capacity; Hand-held shower head; Enough slope on floor to drain water • Handrails: Foldable handrails available, i.e. between the toilet and sink
Public bathroom	<ul style="list-style-type: none"> • Place handicap bathroom near the entrance to reduce distance traveled by visitors or patients who have mobility limitation and potential falls
Flooring	<ul style="list-style-type: none"> • Flush thresholds at entrances of ALL rooms/ areas to allow easy movement of all wheeled equipment to be used • Cleanable and wear-resistance for the location • Smooth transition shall be provided between different flooring materials • Slip resistance • Balancing softness/ firmness of flooring material for supporting maintenance of gait, postural stability, and balance; reducing fatigue/ falls, facilitating movement of wheelchairs and other wheeled equipment including beds and lifts • Floor pattern to reduce falls, i.e., no pattern, small pattern (less than 1 inch wide) or large pattern (wider than 6 inches) • Floor contrast – avoid high-contrast patterns on floor surface as may be associated with more patient falls • Floor reflectivity – avoid high gloss to ↓ glare; use non-wax flooring or matte finish instead
Sign at patient room	<ul style="list-style-type: none"> • Electronic door signs connected to EMR • Incorporate BMAT score and fall risk
Building main entrance	<ul style="list-style-type: none"> • Storage space for wheelchairs & lifts to assist with vehicle transfers • Lift available to assist with vehicle & floor transfers
Ambulatory section	<ul style="list-style-type: none"> • Floor-based lift with scale for transfers between wheelchair, recliner, bed, stretcher, exam room, & floor • Non-powered active standing device to assist with transfers
RFID	<ul style="list-style-type: none"> • Capability in whole building to track equipment location and usage
Video monitoring	<ul style="list-style-type: none"> • Capability for falls safety/sitter reduction
Storage	<ul style="list-style-type: none"> • At point of care

Computer Workstations

Based on ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations, evidence/current literature, and expert opinions

Type of Workstation	Essential features for safety, comfort, and work efficiency
Wall-mounted, in patient room	<ul style="list-style-type: none"> • Two separate, height adjustable (retract, protract, and swivel ability) arms for the monitor and keyboard tray to accommodate standing and sitting for all users. One fixed link arm and one articulating arm to allow height adjustability. All features should be adjustable WITHOUT knobs or levers. • Ensure the monitor arm is rated to support the weight of the monitor (i.e. there is weight difference between a 22" flat screen monitor and All-in-One monitor) • For standing and sitting: top of monitor should be separately adjustable to accommodate user's standing and seated eye height, including the use of progressive lenses (42 to 72 inches from the floor); keyboard tray should be separately adjustable to accommodate the user's standing and seated elbow height (22 to 47 inches from the floor). • Use a single platform keyboard/mouse tray with minimal "bounce" and at least 25 inches wide to accommodate a keyboard and mouse on the same platform. Ideally keyboard tray should be able to flip up when not in use. • Consider storage for small equipment, i.e. medication scanner and log-in swipe on a separate work surface tray, which can be mounted on the track or near the workstation.
Outside and/or between two patient rooms	<p>With an alcove:</p> <ul style="list-style-type: none"> • The work desk surface height should be no higher than 29" so that staff can work in seated position using regular task chairs • Place the monitor on height-adjustable monitor arm (desk- or wall- mounted.) • Ensure the monitor arm is rated to support the weight of the monitor (i.e. there is weight difference between a 22" flat screen monitor and All-in-One monitor). If using All-In-One the bar beneath should be removed. • Single platform keyboard/mouse tray with minimal "bounce" and at least 25 inches wide to accommodate a keyboard and mouse on the same platform. <p>Without an alcove:</p> <ul style="list-style-type: none"> • Use a height adjustable/retractable wall mounted keyboard tray and monitor arm system
Providers' work areas With multiple computers	Refer to Standards for Computer Workstations at Duke , for the proper height set up of computer workstations.
HUC/ Front desk/ registration	<p>For Inpatient:</p> <ul style="list-style-type: none"> • Keyboard tray, height adjustable monitor arm, and sufficient space for the communication equipment. <p>For Outpatient:</p> <ul style="list-style-type: none"> • L-shaped configuration, with the return used for computer and height adjustable keyboard tray. The forward facing desk should be between 17-22 inches deep; or • Straight desk 17 inches deep, with a height adjustable keyboard tray; or • Inverted V-shaped cutout configuration
Seating options:	<p>At computer workstations:</p> <ul style="list-style-type: none"> • Use standard height task chair with essential adjustable features at computer workstations. • In shared work areas, in addition to adjustable features, chairs used by multiple users should be rated for 24/7 use and with casters for non-carpeted flooring, such as the RFM nursing station chair. • For 24 hr. labs, use 24/7 chairs for labs, such as the RFM multi-shift chair. • Visit Duke Ergonomics for the lists of recommended essential chair features and chairs for greater than 4 hours use. Note: Aeron chair by Herman Miller is NOT one that is recommended, as it does not comply with the ANSI standard for computer workstations.

Labs:		
<ul style="list-style-type: none"> • The same computer recommendations above for seated and standing workstations apply to labs. • Use easily height adjustable work surfaces • Work surfaces should provide adequate thigh clearance underneath (thin work surface, no drawers) • Sufficient space for feet and knees should be available under works surfaces. Also consider work surface cutouts to position employees closer to equipment, ie microscopes, water baths • Avoid rails/storage shelves and drawers below the front edge of bench • Bench heights should be adjustable, especially where there is prolonged standing. 		
Recommended seated work heights:		
	Microscope use	Easily height adjustable with bench cutouts
	Cryostat	Should be height adjustable
	Precision work requiring micromanipulation	Easily height adjustable
	Light assembly such as pipetting	27.5-31 inches
	Coarse/medium work such as microtomy	26-28.5 inches
Recommended standing work heights:		
	Light assembly work	38-42 inches
	Heavy work (requiring downward force)	35-39 inches