To learn more about using this tool, refer to the Section 5 in the Safe Patient Handling and Mobility: A Toolkit for Program Development 2025 at: https://www.nvha.net/safe-patient-handling-and-mobility-toolkit/

Safe Patient Handling & Mobility Equipment Purchasing Checklist

The purpose of this checklist is to provide guidance to assist healthcare organizations and safe patient handling and mobility (SPHM) program coordinators and committees in the:

- Selection and purchase of overhead/ceiling, portable floor-based lifts and sit-to stand lifts, and lift slings that are made from flexible materials and
- Development of equipment and sling management and safety processes to facilitate safe use of SPHM technology and reduce the risk of adverse patient events.

More detailed information about SPHM equipment and slings including considerations for appropriate use, periodic inspection and maintenance of lifts and slings, and regulations and standards related to design and installation of SPHM technology, can be found in ***Section 5*** and ***Tools 5b & c.***

This document provides general information that may be considered when selecting and purchasing SPHM lift equipment and slings. This checklist is *not* all inclusive and should not be used as a substitute for specific advice from a suitably qualified professional and/or SPHM technology manufacturer's instructions.

Health care facilities are encouraged to obtain a copy of ISO 10535:2021 and ask patient lift vendors to demonstrate compliance with this and any other applicable standards required during the SPHM technology selection process.

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Introduction

There are many variables to consider when selecting, purchasing (or renting), implementing and evaluating safe patient handling and mobility (SPHM) equipment and accessories to ensure that the goals of a SPHM are met. The checklist was created as a guide for health care organizations and caregivers involved in the selection and purchase of SPHM equipment and accessories. It is intended to be used as part of a comprehensive SPHM program plan.

The checklist can be adapted as needed for community-based settings.

The checklist incorporates information from ergonomics and medical equipment design standards and guidelines and from reference materials published in peer reviewed journals, together with the author's experience in developing SPHM programs, purchasing and installation of SPHM equipment in a variety of health care facilities.

Selection of SPHM equipment should occur after the identification and prioritization of patient handling-related hazards. This approach ensures that technology is aligned with and supports the achievement of SPHM program objectives. Technology selection should be informed by an evaluation of its suitability for specific patient handling and care tasks; the characteristics and clinical needs of the patient population (including both physical and cognitive factors); the environment in which the equipment will be used; and the work systems within which the equipment will operate.

This check list is **not** all inclusive. Other stakeholders who are impacted by the SPHM program such as equipment vendors, purchasing staff, facilities engineering, maintenance, and clinical technology staff, infection prevention and control, wound care, environmental services and staff who will use the equipment and members of the multidisciplinary SPHM committee or team will also provide valuable information. A collaborative approach helps to ensure that the equipment choice made is one that fits your patient, staff, facility's design, and organization's needs.

When selecting any medical device, including patient handling equipment, it's important to follow basic ergonomic design principles. This means confirming that the device suits the physical, perceptual, and cognitive abilities of most users to ensure safe and efficient operation, enhancing patient comfort.[1,2]

In health care the SPHM equipment user population includes staff who provide direct patient care, support care staff such as environmental services and maintenance, and patients or residents and their families, especially in the home care setting.

It is also important that a SPHM program and the equipment selected will 'fit' the future needs of the organization, e.g. a changing patient population, changing surgical procedures or medical treatment protocols, facility design changes (new building, renovations or movement of units/depts.) etc., so that the maximum return on investment of the equipment purchase is achieved.[3]

Remember to 'Try Before You Buy'. Conduct structured trials of SPHM equipment with users before purchase to determine the best fit for patients, staff, and the physical work environment, etc. Consider the following when evaluating SPHM equipment (or any other medical device):[3-5]

- Effectiveness of device/system – does it fulfill the work-related needs and functions of the clinician using it (or needs of the user) and clinical goals?
- Efficiency of use.
- Acceptance by intended users of the system.
- Comfort is associated with the operator's use of the system.
- Potential safety or ergonomics related hazards or risk of error during use and anticipated misuse of a device. Ensuring safety and ergonomics related hazards are not created.
- Needs and costs related to support processes/systems., e.g. training, maintenance, infection control, etc.
- Integration with other medical devices, furniture, overall clinical systems and with the physical layout within other departments if the equipment is transported and used in multiple care and diagnostic areas. Consider the impact of the equipment within the work system 'upstream' and 'downstream' from the point of use.

A. Basic Ergonomics Design Principles for SPHM Equipment:				
Usability Factors	**Considerations**	**Yes**	**No**	**Notes**
1. Designing for the User - Physical Capabilities [6-8] Goal: Design within physical capabilities for at least a majority of users (90%)	a. Provide Adjustability.			
	b. Allow for neutral working postures (ability to use proper body mechanics) when operating or using equipment e.g., working with arms in front of body between knuckle and waist height.			
	c. Ensure easy reach distance to access controls for hands and feet.			
	d. Avoid static postures especially when combined with force.			
	e. Ensure acceptable force to activate hand/finger/foot controls.*			
	f. Ensure minimal grip force to hold hand controls or lever mechanisms e.g., raising the head of a stretcher when loaded, lowering side rails on beds and gurneys.*			
	g. Ensure acceptable force to maneuver, push or pull equipment such as floor lifts, stretchers and beds. Consider floor covering; entryways; slopes uneven floors and caster type. Consider the forces needed to operate lifts manually if a powered drive system fails.*			
	h. Ensure minimal repetitive motion is required to operate equipment especially if combined with forceful motions e.g., using a hand crank or foot pump mechanism when operating equipment.			
	i. Ensure that there is no contact stress on soft tissue when using equipment e.g. from sharp edges and ensure potential pinch points are guarded on all moving parts (for employees or patients).			
	j. Prevent or minimize transmission of vibration from equipment to operator, e.g. from powered tools or motors.			
2. Designing for the User – Perceptual, Cognitive/ Mental Capabilities [2,9]	a. When activating equipment controls ensure that feedback to indicate if action is correct or incorrect is immediate, visible, and meaningful (e.g., light comes on, or equipment does not operate).			
	b. Equipment operation errors can be easily reversed.			
	c. Procedures (menus and navigation) if present are logical and intuitive e.g. use of electronic scales on a lift device.			

A. Basic Ergonomics Design Principles for SPHM Equipment:				
Usability Factors	**Considerations**	**Yes**	**No**	**Notes**
Goal: Equipment is intuitive to use & user friendly thus reducing training time and risk of operator error.	d. Equipment controls, and displays are consistent – consider standardization between groups of equipment *and* between units or departments if appropriate.			
	e. Device Control and Display functions are clearly communicated: i. Control type is appropriate for function/use* ii. Labels are legible, consistent and adjacent to corresponding control iii. Comprehensible icons or pictograms iv. Activation of controls and information on displays meet population stereotypes v. Redundant coding systems are used (e.g., shape, size, color) vi. Consider impact of lighting, glare and viewing distance (bifocal use considered) if displays must be read e.g. operating a lift in low light conditions.			
	f. Controls are designed to prevent accidental activation, e.g. not too close together or too easily activated.			
3. Some Other Considerations Related to Usability of the Equipment and Operator Training Needs [3,4,10]	a. Consider the impact of standardizing or not standardizing the type, design, and functionality of equipment and slings chosen within a facility e.g., using more than one brand of ceiling lift motor and/or slings from a variety of manufacturers may increase the risk of operator or user error and increase the time to conduct and cost of staff training.			
	b. When determining training costs, time, and competency needed to ensure safe and error free use of the equipment etc., consider: i. What level of competency is required to operate the equipment? ii. What specialist training/knowledge/competency is required to ensure the completion of the SPHM task or process safely? iii. What level of peer communication is required for the safe completion of the SPHM task? iv. What learning tools may be needed e.g. patient assessment protocols, checklists, algorithms, information related to the patients' SPHM needs and that are posted in the patient room, etc.?			

**For information about grip force requirements refer to References 6 and 8 and B.3. below.*

Note – some of the following questions are applicable to powered equipment only

B. Design Considerations Applicable to Powered Lift Equipment (Ceiling, Floor, Sit to Stand/Stand Assist Lifts)[10,11,12]			
1. General **Refer to Sections *C* and *D* for additional consideration specific to Floor, Sit to Stand/Stand Assist and Ceiling, Lifts**	**Yes**	**No**	**Notes**
a. What is the maximum weight capacity of a motor?			
b. Does the lift meet ISO 10535 load specifications? i.e., i. The lift should not be able to lift more than X 1.5 the maximum load ii. The lift safety factor is a minimum x 2 for maximum load			
c. Will the device stop operation if load or weight capacity is exceeded?			
d. Is weight capacity marked on the motor?			
e. What is the lifting range i.e. the range of travel from hanger bar connection point in its highest and lowest position?			
f. Is there an emergency stop control (must be red)? i. Is it clearly visible during operation, accessible and easy (physically, intuitively) to use? ii. Can the emergency stop be easily reset (e.g., consider reach distance to reset emergency pull cord mechanisms that are activated accidentally when environmental services personnel cleaning the lift motor)?			
g. Are all operating controls labelled to indicate their intended function?			
h. Is there a manual override control if the battery loses power e.g., alternate mechanism to lower the patient safely? i. Is it clearly visible during operation, accessible and easy (physically, intuitively) to use? ii. Is there protection against free falling?			
i. Do performance requirements such as the rate of lifting and lowering and powered horizontal movement meet ISO 10535 design specifications? Note - the rate (velocity) of lifting and lowering the hanger bar when connected to the motor strap shall not exceed 0,15 m/s when loaded or 0,25 m/s when unloaded.[10]			
h. Is the speed of operation satisfactory for staff and patients?			
i. Are there any design features that could cause a risk of entrapment and/or squeezing hazard for the caregiver and/or patient? (ISO 10525:2021 details specific design specifications for these risks)			
j. Noise & vibration i. What is the noise level when in operation? ii. Can audible alarms be heard when the device is being operated? iii. The noise and vibration levels comply with the standards set by ISO 10535:2021.			
k. Design of grips, handles, and pedals/foot controls comply with the ergonomics design specifications set by ISO 10535:2021.			
l. Is there automatic shut-off if hoist strap (if present) is twisted?			
m. Is the soft start/stop (smooth acceleration/deceleration)?			

B. Design Considerations Applicable to Powered Lift Equipment (Ceiling, Floor, Sit to Stand/Stand Assist Lifts)[10,11,12]			
1. General **Refer to Sections *C* and *D* for additional consideration specific to Floor, Sit to Stand/Stand Assist and Ceiling, Lifts**	**Yes**	**No**	**Notes**
n. Can the lift motor and all components be used in wet and humid environments (bathrooms, showers, bathing areas or pools, outside of buildings) if applicable?			
o. Is a scale incorporated or can a portable scale unit be attached to the lift (must load -bearing safety requirements defined in ISO 10535)			
p. If a lift is operated by a remote control, is the lift and its remote identifiable both in the user instructions and on control/lift labels?			
q. Portable lifts e.g., folding lifts, and lift motors. Handles are provided so that two or more people can carry the device if it weighs more than 22 lbs. or safe handling instructions are provided			
r. Do hydraulic and/or pneumatic components (if present) conform to ISO 10535 design specifications?			
s. Are there any application limitations?			
t. Does the motor/lift system have features that are not available on other products? If so, what are they?			
u. Does the motor/ lift system have other 'smart' technology features such as: i. Digital displays with built-in diagnostics and service reminders for maintenance? ii. Lift counter to track use? iii. Battery status indicator to indicate level of charge? iv. Software support to track use, location, maintenance needs etc?			
w. What is the life expectancy of equipment and parts? *Applicable to all equipment and slings and equipment accessories*			
x. Information provided by the equipment/sling manufacturer i. Does device information provided in pre-sale information; user and service information meet ISO 10535 requirements? ii. The healthcare environment in which the lift or slings should be used is specified e.g., hospital intensive/critical care; hospital general; long-term care; home care; outpatient/ambulatory care?			
w. Other operational safety features comply with design specifications set by ISO 10535:2021 (as applicable) such as: • Prevention of single-fault failure • Prevention of inadvertent detachment of a hanger bar during normal use • Vertical and horizontal stopping distances • Safety of hold-run-functions • Safety of robotic features e.g., combined sensing and controlled actuation technology; information and communication technology; autonomous operation. • Safe movement of a lift or motor if motorized horizontal movement fails • Safety requirements if a lift is to be operated by a 'patient' (e.g., in a home care setting)			

B. Design Considerations Applicable to Powered Lift Equipment (Ceiling, Floor, Sit to Stand/Stand Assist Lifts)[10,11,12]			
2. Hanger or Spreader Bar	**Yes**	**No**	**Notes**
a. Is the load capacity of the hanger bar at least 1.5 x the maximum load of the lift?			
b. What type of hanger bar does the lift have e.g., 2, 3 or 4 sling connection points; configuration shape is X or H 4 point or 3-point pivot configuration; configuration is specialized e.g., 8-point frame?			
c. Does the configuration (shape, size and number of connection points) meet your patient handling task needs e.g., for bariatric, pediatric patients etc.? Are several configurations offered?			
d. Is the width of the hanger bar adjustable? If 'yes' is the range of adjustment marked on the hanger bar and can adjustment be made easily?			
e. Does the design of the mechanism for attaching a *sling* to the hanger bar prevent accidental unhooking or release during use of the lift?			
f. Are edges, corners, surfaces on the hanger bar that will be in contact with the sling attachment point smooth –i.e., there are no sharp edges or burrs that could damage the sling connection point and/or protruding or pinch points that may cause injury to caregiver or patient?			
g. Are the hanger bar connection points large enough to allow the sling (e.g. a loop) attachment to be seated in the connection point without risk of shearing, crushing, trapping e.g. multiple loops on a sling can be easily seated in the hanger bar connection point with locking device closed correctly?			
h. If the hanger bar detaches from a lift: i. Is it easy to remove and reattach (consider grip force and manual dexterity required)? ii. Can it be easily handled and stored (consider weight of the bar and size for storage as relevant)? iii. Does it meet load testing requirements as required by ISO 10535? iv. Is the maximum load capacity of the hanger bar indicated on the hanger bar? v. The brand and specific model of lift if the hanger bar is for use with a specific lift only?			
i. Does the hanger bar allow enough clearance for taller/wider patients when being moved in sling?			
j. Is the year and month of manufacture indicated on the hanger bar?			
k. The manufacturer clearly states in the instructions for use and/or on the hanger bar, information about i. The type(s) and design(s) of slings, e.g. number of connection points, dimensions and material of connection means, which can be used in combination with the hanger bar? ii. Information that indicates that if the maximum load/weight capacity of a lift motor, hanger bar and sling vary then the lowest maximum load will always be used? ***Refer to Section E for more information on Slings and Hanger Bar compatibility and safety.***			

B. Design Considerations Applicable to Powered Lift Equipment (Ceiling, Floor, Sit to Stand/Stand Assist Lifts)[10,11,12]			
3. Handset or Controller	**Yes**	**No**	**Notes**
a. Are function keys easily understood on control device (intuitive)?			
b. Is it easy to tell if the control is upside down or right-side up?			
c. Are forces to operate controls acceptable? [10] That is if operated using: • a finger - 1.12 lbf (5 N) • hand/arm – 23.6 lbf (105 N) • a foot – 67.4 lbf (300 N) Forces required to operate control functions on pneumatic hand controllers (ceiling lifts) can be higher than electrically powered controls. Consider the user population e.g., those with arthritis or with reduced grip capacity and ease of use. NOTE: For lifts operated by persons with disabilities or other non-professionals, ISO 21856:2022 can be used as a guideline			
d. Is there a place to secure the hand control to the lift when attaching a sling to the device and assisting or maneuvering the patient?			
e. Is it resistant to water damage and droppage?			
f. If the control is a wireless device – will it interfere with other equipment? *Refer to FDA requirements for wireless medical devices.*[29]			
4. Battery	**Yes**	**No**	**Notes**
a. What is the type of battery used e.g. Lithium Ion?			
b. Is there a battery status indicator?			
c. How long will the battery operate before needing to be recharged e.g. how many patient lifting tasks can be completed?			
d. What is the battery recharge time?			
e. What is the expected life of a battery?			
f. Can a 'dead' battery be replaced with a fully charged battery or does the equipment need to be plugged in to charge?			
g. Will extra batteries be needed e.g., one is being charged and one is loaded in the lift ready for use?			
h. Is there an automatic shutdown of power on the equipment when not in use to save energy and battery life?			
i. What is the battery replacement cost?			
j. Does the manufacturer offer a recycling program for used batteries?			
k. What is the weight of the battery (floor-based lift systems)?			

B. Design Considerations Applicable to Powered Lift Equipment (Ceiling, Floor, Sit to Stand/Stand Assist Lifts)[10,11,12]			
5. Other	**Yes**	**No**	**Notes**
a. What are the primary SPHM tasks that can be performed when using the lift equipment/slings and does this meet identified needs? *Primary SPHM tasks:* i. Seated transfers between surfaces ii. Horizontal/supine transfers iii. Re-positioning in bed/surface e.g. turning, boosting, proning iv. Standing/Sit-to-stand transfers v. Bathing vi. Toileting vii. Holding a limb or body part viii. Assisted walking/ambulation ix. Bathroom access x. Lifting from the floor (Fall recovery)			
b. Are there special features of the equipment or product not offered by comparable products e.g. equipment has multiple SPHM functions such as a sit to stand device that also converts to a walking aid or a low based floor lift that offers an ambulating and weighing function?			
c. Consider environmental impact and energy-efficiency			

C. Design Considerations Applicable to Powered Floor & Sit to Stand/Stand Assist Lifts [3,5,10, 12,13]			
1. Portable Floor Based Lift Systems	**Yes**	**No**	**Notes**
a. Is the lift or height adjustment mechanism powered?			
b. Can the device be easily maneuvered in area of use to ensure safe and efficient operation e.g. caregiver and/or patient posture is not constrained? Consider: • Required diameter of turning circle • Clearance through doorways/in the bathroom/elevators/in other depts. • Clearance of leg support *under* beds (especially motors) and chairs • Height of leg supports/size of casters • Adjustability of base to allow the legs to fit *around* chairs, bed motors, commodes, etc. • Sufficient vertical height to perform lifting task on beds, exam and imaging tables.			
c. Are base legs by power or manual control?			
d. Is high force required to start pushing the device?			
e. Is high force required to sustain movement of the device? Consider: • Distance to be pushed • Force to control equipment when turning corners • Force required to push equipment on carpet, over thresholds, on uneven or sloping and/or slippery floors and gratings • Steering mechanism peak and sustained push force turning etc (Turning force should not be greater than 1.40 ft-lbs/1,9 N.m - ISO 10535)			

C. Design Considerations Applicable to Powered Floor & Sit to Stand/Stand Assist Lifts [3,5,10, 12,13]			
1. Portable Floor Based Lift Systems	**Yes**	**No**	**Notes**
f. Does the diameter of the caster assist to minimize force required to push the equipment (in general, larger casters require less force to push/pull and maneuver)?			
g. Are caster materials and size suitable for floor type?			
h. Can brakes be easily activated and released with foot?			
i. Is powered steering or steering assist provided? If so, is the function easy to use e.g., speed and direction of travel can be easily controlled by the user etc.? *Refer to B.1.w.*			
j. Handle design – can operator maneuver equipment using vertical handles and neutral body postures?			
k. Can the device be used to lift/transfer a patient from car?			
l. Stability – Can the device be easily pulled over – tipped with and without load?			
m. **Additional considerations for Sit to Stand/Stand Assist Devices:** • Does the device safely accommodate taller and shorter patients? • Do leg or shin pads have adequate range of adjustment to accommodate to be positioned below the knees of patients of various stature? • Can the depth of the foot plate be adjusted? • Is a leg strap available if needed? • If the foot plate is removable? If so, is it easy to remove (consider access to remove and weight of plate)? • Is the width of the footplate and space between device frame enough to allow a patient to stand comfortably (e.g., consider use with Bariatric patients)? • Does arm rest or handles allow the patient to use neutral hand and arm postures?			

D. Design Considerations Applicable to Overhead or Ceiling Lift System Components [3,10, 11,13-16]			
1a. Facility Structure and Space Considerations & Track Configuration	**Yes**	**No**	**Notes**
a. Are overhead/ceiling lifts to be installed in new construction or the existing facility (retrofit)? (*This may impact the mounting systems and track configuration that can be used)*			
b. Can they be installed in the ceiling or installed as wall mount systems? i. Are there structures in and above a ceiling or behind walls such as, HVAC and electrical systems, and/or multilevel ceilings, soffits, or radius walls that make installation challenging or prohibitive? Is asbestos and/or lead abatement needed? • Work with the ceiling lift manufacturer and Facility Engineering to determine feasibility for and the type of installation. Perform pre-installation walkthrough to confirm full understanding and consensus of design drawing(s) and installation conditions. • During a walkthrough, access the space above the ceiling lid/cover plate to view mechanical, HVAC, and fire systems components, within the lift installation area is typically required plus access to structural blueprint drawings etc.			

D. Design Considerations Applicable to Overhead or Ceiling Lift System Components [3,10, 11,13-16]			
1a. Facility Structure and Space Considerations & Track Configuration	**Yes**	**No**	**Notes**
c. Is there enough vertical clearance (from beds, gurneys or other surfaces to ceiling height) to allow minimum lifting range required for use of lifting equipment? Consider the: • Combined vertical measurement of the installed track lift motor, and hanger bar when fully retracted in the motor, and bed, stretcher and chair heights at lowest height from floor. • Consider clearance needed for privacy curtains, medical gases delivery systems, exam lighting, and sprinkler heads, etc. • Check clearance if detachable weigh scale is to be used with a lift. • Vertical clearance needed will be greater for lifting bariatric patients (patients of size).			
d. Is there enough clearance to operate the motor in relation to wall mounted fixtures i.e., horizontal clearance such as headwalls, booms, wall mount televisions? Consider access to a patient in full bed traction; Posey beds etc.?			
e. What is the maximum working load of the tracking system? • Consider installation of 1000 lbs. capacity track to accommodate current and future lifting needs for patients of size.			
f. What configuration is available and best for patient handling tasks to be performed: i. Full room coverage vs. straight track? ii. Curved, turntable, access into bathroom, other? iii. Single motor; 2 motors mounted on traverse rail; or dual motors on rotating turntable?			
g. How will track be configured to cover larger spaces e.g., 2-bed patient rooms; into adjacent bathroom etc? i. Is it feasible (consider cost, fire code requirements, etc.) to track through door walls or other load bearing walls? ii. Will connection points between a long span of track and/or turntables/switch track work easily and reliably?			
h. Can ceiling lift tracks be moved or reconfigured after they are installed to accommodate changing needs in the future?			
i. Does the hanger bar pose a safety hazard to staff and/patients when not in use e.g., staff could hit their head on the bar etc.? If yes, review use of a wall hook system to store hanger bar is a safer position when attached to the motor.			
j. Can the lift motor and hanger bar be quickly and easily removed from a patient room (e.g., by facilities maintenance) if it poses a safety issue for a patient, e.g. patients in medical units who are violent? *Note: overhead lifts are not recommended for use in behavioral health units or care areas where patients can self-harm.*			

D. Design Considerations Applicable to Overhead or Ceiling Lift System Components [3,10, 11,13-16]			
1b. Gantry Frames	**Yes**	**No**	**Notes**
Refer to c - j above. For single track mobile gantry frames: i. How easily does the gantry collapse (lower and decrease in width) to allow portability within a room or transfer to another room when not in use as needed? ii. Are brakes easy to apply and release? iii. Does the support base of the frames create a trip hazard?			
2. Overhead/Ceiling Lift Motor	**Yes**	**No**	**Notes**
a. Are motors required to lift patients who weigh over 500-600 lbs.? Consider current and future needs for non-mobile patients of size.			
b. Does the system have low friction wheels or trolley (minimal effort required to move lift along track)?			
c. Are there any application limitations?			
3. Portable Overhead/Ceiling Lift Motors (moved from room to room as needed)	**Yes**	**No**	**Notes**
a. Refer to ***Batteries*** below for questions about charging			
b. What is the weight and size of the motor unit? *Refer to 1.B.q.*			
c. Can the motor be easily detached and attached to the overhead rail system without staff standing on step stools or chairs etc.?			
d. Is a cart offered to store and transport the motor from room to room?			
4. Battery *Also refer to Section B.4.*	**Yes**	**No**	**Notes**
a. How is lift motor recharged? i. Continuous Charge (Lift charges anywhere on the rail and does not have to be returned to a charging station) ii. Automatic Return to Charge (Lift returns automatically to charging station when caregiver pushes a button iii. Charging station or specific area on rail for charging (caregiver is required to return lift to charging station to charge) • Can the handset be easily 'knocked' off the charging station or is there a feature e.g. magnetic 'lock' to prevent accidental removal thus preventing the battery from being charged? • Ensure location of charging station is easily accessible to staff (e.g. not hindered by wall mount computer stations) and located at a height that allows 90% of the staff population to use neutral body postures to access the handset and charging station, i.e. not lower than 39" or over 55" from the floor [6,7] Charging options will depend on electrical requirements - consider whether you need power outlets closer to the ceiling, above the ceiling, or hard-wired into standard or emergency power.			.

D. Design Considerations Applicable to Overhead or Ceiling Lift System Components [3,10, 11,13-16]			
5. Hanger/ Spreader Bar *Refer to B.2.*	**Yes**	**No**	**Notes**
6. Handset or Controller *Refer to B.2.*	**Yes**	**No**	**Notes**
Ceiling Lift System Installation			
7. Installation Preparation	**Yes**	**No**	**Notes**
a. Who will conduct a structural engineering inspection and provide authorized structural drawings and calculations for the new lift installation specific to the facility?			
b. What building, electrical, fire and seismic codes must be met? *Also refer to Regulatory Requirements H.*			
c. Who will install the tracking system – employees of the vendor or other contractors?			
d. How are the installers trained and certified by the lift system manufacturer? Have vendor provide applicable documentation?			
e. Are the installers licensed and bonded to work in your state? Have vendor(s) provide proof of insurance etc.?			
f. Ask the vendor if ceiling lift installation meets any safety design standards e.g., at a minimum the ISO 10535:2021. Assistive products — Hoists for the transfer of persons — Requirements and test methods.?			
8. Room Preparation – Pre-& Post Installation	**Yes**	**No**	**Notes**
Consider: • Communication about installation activity etc., to staff, patients, families *Pre-Install -* • Relocation of patient to appropriate site • Removal of beds, equipment, privacy curtains • Secure area from staff and patients and meet infection control containment requirements • Consider impact of construction activities, noises etc., in areas where all staff/patients cannot be removed (e.g., ICU, emergency) • Design work procedures/work plan to accommodate *Installation-* • How will lift and track system be verified as being installed correctly etc? *Post Install -* • Cleaning of room • Undo lockout • Replace beds and equipment • Replace privacy curtains etc. • Site safety inspection(s) prior to use of room and to ensure compliance of the installation with design drawing(s) and manufacturer's instructions			

D. Design Considerations Applicable to Overhead or Ceiling Lift System Components [3,10, 11,13-16]			
8. Room Preparation – Pre-& Post Installation	**Yes**	**No**	**Notes**
Post Install - • Perform operational test to verify lift functionality (all functions are verified) including battery charging function; warning/status indicator lights work; full extension and recoils of strap • Inspection of lift strap and all components for damages or missing connector pieces • Documentation of installation completion and approval for use • Also refer to Environment of Care and Life Safety codes (Joint Commission /CMS) accreditation standards or related standards required by other regulatory entities			
9. Other Safety Considerations	**Yes**	**No**	**Notes**
a. If concrete drilling is required, ensure location of electrical, gas, and water lines are known?			
b. Is there is the risk of asbestos disturbance?			
c. Are there confined space requirements (per OSHA standards)?			
d. What lockout considerations are required to work on room consider electrical, gas, etc.?			
e. Is there a staging area for ceiling tracking materials and equipment?			
10. Load Testing	**Yes**	**No**	**Notes**
a. What is the vendor load testing policy or recommendations post installation prior to use?			
b. Will all room covering overhead track systems, joints and attachments used for lifting be tested?			
c. What is the test load e.g. maximum weight plus x%? Testing should be conducted for static and dynamic loads.			
d. Will load test be administered by installers in the presence of administration and facilities personnel and other authorities as necessary?			
e. What is the recommended routine load testing schedule?			
f. Can in-house maintenance staff perform this testing?			
g. Will the vendor provide training re this procedure?			
h. Per ISO 10535:2021 • Maximum deflection of any horizontal track used in the construction of a hoist system shall not be more than 1 mm in every 200 mm of track length. • When a track, installed in accordance with the manufacturer's instructions, is loaded with the maximum load, the deflection between each set of fixings of the track shall be recorded in the test report.			

D. Design Considerations Applicable to Overhead or Ceiling Lift System Components [3,10, 11,13-16]			
10. Load Testing	**Yes**	**No**	**Notes**
i. US Dept. of Veterans Affairs Installation and Relocation Checklist for Ceiling Mounted Patient Lifts recommendations for post installation load testing i. Verification of any "soft start" or "soft stop" features and that lifting speed does not exceed 2.5 inches per second with "zero" load. ii. Verification of load testing and deflection testing at the manufacturer's specified maximum rated lift capacity. iii. Verification of any "soft start" and "soft stop" features and that lifting speed does not exceed 1.5 inches per second under maximum rated lift capacity. iv. Verification of function of emergency stop at maximum rated lift capacity. ***v.*** Verification of emergency lowering feature at maximum rated lift capacity.			
11. Other - Post Installation	**Yes**	**No**	**Notes**
a. Are stops present as needed to prevent motor traverse rails contacting wall mounted equipment etc.?			
b. Are all fasteners and set screws properly tightened on the trollies and rails/tracks?			
c. Is rail/track free of gaps (unless required by design)?			
d. Do rail turntables, exchangers, gate alignment function correctly, and safety block installation is correct (if present).			
e. Is track clean and clear of all debris? (Use manufacturers recommended cleaning materials to avoid damage to the motor case and other components.)			
f. Who should certify the installation e.g. a structural engineer?			
g. Confirm that the manufacturer's operating and maintenance manuals for this lift have been received and distributed to appropriate departments etc.			

E. Equipment Design Considerations: Slings [5, 10, 17-26]			
1. Sling and Hanger Bar Compatibility *(Also refer to Section 5, Appendix F)*	**Yes**	**No**	**Notes**
a. Are slings compatible for use with the overhead/ceiling, floor, and/or sit to stand lift equipment to be purchased? In the sling/lift manufacturer's instructions for use (and on the sling label if feasible), information is provided that states which type of sling can be used in combination with a lift hanger bar. This includes the type(s) and design(s) of slings e.g., connection type, number of connection points, dimensions, and the type of material that is used to connect a sling to a hanger bar When possible, standardization of brands/models of lifts, hanger bars and slings is recommended within a setting to reduce the risk of healthcare worker error and simplify training.			

E. Equipment Design Considerations: Slings [5, 10, 17-26]			
1. Sling and Hanger Bar Compatibility (Also refer to Section 5, Appendix *F*)	**Yes**	**No**	**Notes**
b. If a lift and sling are from different manufacturers, has the sling manufacturer/ supplier provided a compatibility statement? If there is no compatibility statement or purchasers/users are unsure about compatibility, perform a compatibility check. As stated in ISO 10535:2021: "Any organization that purchases lifts and sling shall make sure that the combination(s) is/are safe either by requiring compatibility documentation for the combination(s) from the manufacturer(s) or by performing compatibility testing themselves, hereby transferring the responsibility for a safe combination to the organization"			
Factors to consider when checking sling/hanger bar compatibility			
c. Sling and hanger bar attachment/connection design. *(Also refer to 1.2. Hanger Bar)* i. ***Slings with clip attachments*** must *only* be used with a hanger bar that is designed for a clip system. Does the sling clip attach securely to the attachment point of the lift's hanger bar? Can it be easily inadvertently "knocked off" when a patient is being lifted in the sling? Note: Clip attachments vary in design (e.g., size and shape of the keyhole).			
ii. ***Slings with loop attachments*** must *only* be used with a hanger bar that is designed for a loop system. Do the sling loops fit securely onto the hanger bar attachment? Make sure to perform check with the maximum number of loops that may be placed into an attachment or connection point. *Clip and loop slings should never be used interchangeably.*			
d. Is the sling compatible with the style of lift hanger bar that will be used (e.g., hanger bars with 2, 3, 4, 5, 6, and/or 8-point connections) and shapes (e.g., X or H shape with 4-point connections)?			
e. Check the sling's function when attached to the lift system(s) to be used and under load. i. Does the design of the sling and hanger bar combination allow the patient to be positioned safely and comfortably as needed to meet the patient's physical and clinical needs? Check the following: • Does the hanger bar allow enough clearance for taller/wider patients when being moved in the sling? • Does the sling provide sufficient support for the person being lifted? • Does the hanger bar and sling combination allow for sufficient lifting range to complete SPHM tasks? • If using a floor-based lift system, does the design of the sling when attached to a hanger bar change the center of gravity or affect the lift's stability?			
f. Can the operator of the lift able to attach a sling to a hanger bar using minimal hand and finger force?			

E. Equipment Design Considerations: Slings [5, 10, 17-26]			
2. General	**Yes**	**No**	**Notes**
a. What type of sling is available and required? Consider: • Function - seated; toileting/hygiene; supine/flat or repositioning; limb; ambulation; amputee sling etc. • Cleaning requirements and related costs - Single patient use/disposable , washable slings or slings that can be wiped clean. • The primary and specialty SPHM tasks that are to be performed with a lift and sling system.			
b. For slings that are used for patients transfers in a seated position (i.e., seated slings), what styles are available and required (e.g., allow for toileting and hygiene; need for head/postural support; the type of leg support needed - split leg support, narrow, standard, or wide widths or no split leg etc.)			
c. What size or range of sizes of slings should be available? Sling sizing is based on assessment of the patient's body shape (i.e., weight; height; torso and head length; torso/girth width and proportion; functional abilities; and clinical needs, etc.). Manufacturers provide essential body dimensions for each style of sling *(Refer to Section 5)*.			
d. Do slings meet the specialized needs of specific patient populations, such as a pediatric, orthopedic, bariatric population; patients with sensory deficits or disturbance; patients attached to medical devices (e.g., intravenous line, catheters, feeding tube, chest tube, tracheotomy; monitors, orthopedic supports (e.g., halo brace, thoracic-lumbo-sacral-orthosis (TLSO) brace, traction of extremities)?			
e. For each type and style of sling to be purchased/used, what are the contraindications for use (e.g., a seated sling may not be used for a patient with a pelvic fracture or post hip surgery; a soft repositioning sling may to be used to lift/move a patient with an uncleared spine)?			
f. How many of each type of sling is needed? Consider cost, usage, storage, restock delivery time to units, and available laundry system or cleaning process, damage and loss, etc. *Refer to 5.e. (Laundry/Cleaning) below*.			
3. Labels	**Yes**	**No**	**Notes**
a. Is the information provided on sling labels easy to read and meaningful for the user population? Consider impact of lighting, glare, and viewing distance (bifocal use considered) if labels to be read (e.g., accessing and using a sling in low light conditions).			
b. Is the sling size/weight capacity clearly and easily identified e.g., color-coding and/or icons with key body dimensions indicated and text is used to indicate size?			
c. Is the maximum weight or load clearly marked on a sling?			
d. Are there instructions to indicate if a sling is designed only to be used on one dedicated type of hanger bar?			
e. Is a symbol for cleaning and/or written cleaning instructions included on the sling label?			
f. Is there a symbol or text that refers the carer to the instructions for use of the sling?			

E. Equipment Design Considerations: Slings [5, 10, 17-26]			
3. Labels	**Yes**	**No**	**Notes**
g. Is the manufacturer's company name, website, address, telephone, and country of origin indicated?			
h. Is there a serial or batch numbering or bar code system?			
i. Is there a place to mark or indicate 'date of first use' on a sling?			
j. Can customized labels be added to the slings by the vendor e.g. identifying a specific facility and/or unit?			
4. Safety	**Yes**	**No**	**Notes**
a. Are there instructions for proper use of slings provided by the manufacturer that include at least the following information (some of which may also be included on a sling label)? i. Sling and hanger bar compatibility information. *Refer to E.1. above.* ii. The type of patient handling task the sling is suited for e.g., seated, supine etc. and specific instructions for sling use including application, adjustment and removal. iii. If sling is unsuitable for a specific disability or clinical condition/contraindications for use iv. That an SPHM risk assessment should be performed to ensure that the correct size, type and shape of sling are used for the patient. v. A warning to always inspect a sling before use.			
vi. A warning not to use a damaged or badly worn sling vii. Indicates if a non-washable sling should not be laundered and if it has it must not be used viii. Information about the materials used in the sling fabric. ix. The information listed in 3 a-g			
b. Have slings be tested per 10535:2021 requirements for: i. Durability? ii. Static loading?			
5. Laundry/Cleaning & Disinfection *(Also refer to Section 5)*	**Yes**	**No**	**Notes**
a. If using **washable** slings: Where will washable slings be laundered – external or in-house laundry? Consider how they will be collected e.g. with regular linens to be laundered or in separate bags/containers.			
b. What are the laundering requirements for reusable slings? i. Washing temperature required ii. Special drying requirements e.g. no high heat dry? iii. Can slings tolerate washing in chlorine (bleach) and peroxide-based cleaning agents? iv. Can slings be laundered with other linens? v. Can slings be laundered in compliance with the Centers for Disease Control (CDC) Guidelines for Environmental Infection Control in Health-Care Facilities?[26]			

E. Equipment Design Considerations: Slings [5, 10, 17-26]			
5. Laundry/Cleaning & Disinfection *(Also refer to Section 5)*	**Yes**	**No**	**Notes**
vi. Are laundering instructions available from the vendor? vii. Slings do not shrink more than 5 % of their length and width and viii. Labels remain readable by users with normal eyesight or corrected-to-normal eyesight after a sling is laundered per the manufacturer's instructions			
c. If using **single-patient/disposable use** slings: i. Is there identification on a sling that indicates that they must not be laundered? ii. Do slings have some type of symbol that indicates if the sling has been laundered (e.g., a label that changes color if laundered)? iii. How will they be disposed of? Are there cost/environmental/regulatory factors to consider?			
d. If using **wipeable** slings: i. What types of sanitizer or disinfectant can be used to wipe down or clean a sling? ii. Can the manufacturer show that their recommended cleaning methods, etc., meet FDA published guidelines for reprocessing non-critical medical devices? iii. Is the wipe down (with approved disinfectant) of slings, belts, and transfer devices that do touch patient's skin an acceptable practice? iv. How easily can the slings be cleaned (consider effectiveness of cleaning stitched seams, rope, and Velcro attachments, etc.)? *v. See b vii & viii above*			
e. What is the sling management process? *Refer to Section 5 for more information.* Reusable (washable) slings: i. Process to send slings to be laundered ii. Time to send and return clean slings to/from the laundry to a patient care unit/dept. (consider service provided at weekends and holidays) iii. Process of returning laundered slings to the facility <u>For all slings:</u> i. Delivery and stocking of clean slings in patient care areas ii. Inventory PAR stock requirements at point of use iii. Storage of slings in care area and ease of access by healthcare worker iv. Processing of damaged slings v. Resources for implementation and management of the sling management process vi. Involving all appropriate departments (e.g., environmental services, materials management, infection control, wound ostomy, nursing, etc.) vii. Develop inventory and tracking systems for equipment and slings			
f. Do specialty slings such as ambulating harnesses require special washing protocols, e.g. placement in a mesh bag for laundering?			

E. Equipment Design Considerations: Slings [5, 10, 17-26]			
5. Laundry/Cleaning & Disinfection *(Also refer to Section 5)*	**Yes**	**No**	**Notes**
g. Have you completed a cost-benefit analysis when choosing reusable vs disposable/SPU slings? Consider: • Volume of use immediate and future (as use of SPHM technology increases). • Delivery and return time to/from laundry and facility and restock delivery time to units for reusable slings. Is there insurance/CMS reimbursement of single use or bariatric slings? • Budget percentage for loss/theft and replacement/repair.			
6. Other	**Yes**	**No**	**Notes**
a. What material are slings made of e.g. synthetic, blend or natural fibers? Are they a solid material, mesh, padded or have a rigid component?			
b. Can the slings be left under the patient's body when in bed and/or in a chair without compromising the patient's skin? If yes, does the manufacturer provide evidence (as tested by a third-party) to support this claim?			
c. Is information provided about flammability of the fabric/material used, if relative to use?			
d. Do slings have positioning handles for correct sling and patient positioning?			
e. Are custom-made specialty slings available?			
f. What is the warranty on the slings?			
g. How long will reusable slings last? (Note this will depend on how they are laundered or cleaned and disinfected)			
h. What is the replacement/repair policy including turnaround time and costs?			
i. What is the sling trade-in policy?			
j. Is there a sling inspection process in place? *Refer to Section 5 and Tools 5 b and c.*			
F. Equipment Management			
1. Storage Equipment and Supplies (Hanger Bars and Slings)	**Yes**	**No**	**Notes**
a. What is the storage "footprint" requirements?			
b. Can staff access the equipment easily and efficiently? Consider time to access and ease of transporting the equipment to where task is being performed			
c. Is storage available with easy access to electrical outlets to charge equipment and/or equipment batteries (as applicable)?			
2. Infection Control Considerations [3,18] For *Slings* refer to Section *E*	**Yes**	**No**	**Notes**
a. Can equipment be cleaned easily?			

F. Equipment Management			
2. Infection Control Considerations [3,18] For *Slings* refer to Section *E*	**Yes**	**No**	**Notes**
b. What chemicals can be used to clean equipment that can be wiped clean? What information does the manufacturer supply?			
c. Is the wipe down (with approved disinfectant) of slings, belts and transfer devices that do touch patient's skin an acceptable practice?			
d. Has the infection prevention control officer approved decontamination procedure for all equipment and accessories etc.?			
e. If 1 lift motor is to be shared between 2 treatment areas or beds - consider if caregivers will take the time to clean the motor between each use e.g., in a busy acute care unit?			
3. Maintenance Considerations [3,10,18,16,24] *Also refer to S 5 Appendix B and Tool 5c*	**Yes**	**No**	**Notes**
a. What preventative maintenance and inspection is required and how often? Consider: ▪ The recommended standard interval for cleaning tracks on ceiling lift systems ▪ The recommended standard interval for cleaning motors, moving parts; wheels and casters.			
b. Can this be done by facilities maintenance staff?			
c. Can facilities maintenance staff perform emergency maintenance?			
d. Will the vendor or representative provide training and orientation for facilities maintenance with equipment training?			
e. How difficult is the device to maintain/service? Consider: ▪ Access and clearance for facility maintenance techs/Biomed & IT personnel ▪ Time and effort to diagnose/troubleshoot problem ▪ If special tools are required			
f. What is the availability of replacement and spare components, cost and time to delivery?			
g. What is the procedure for replacing defective parts, or getting replacement and spare components? Do you have to buy parts from the vendor, or can you buy parts at a local supplier or store? Some sales representatives stock their own parts, whereas others rely on the Manufacturer to supply parts. How long will it take to receive ordered parts?			
h. Is loaner equipment available if repairs are extensive or replacement parts are required? If so, how quickly can it be delivered and placed into service?			
i. Does the environmental impact & disposal cost of equipment and accessories such as batteries need to be considered?			

G. Vendor Service [3,18,27]			
1. Overall *Also refer to D. Ceiling Lift Installation*	**Yes**	**No**	**Notes**
a. Obtain references from vendor and contact other facilities (possible check the Better Business Bureau) about their experience with purchase, training and after service. b. Check with your organization's Purchasing Dept. about group purchasing plan discounts or criteria that may apply to the equipment purchase. c. If this product is currently in the facility and/or vendor is or has provided services – evaluate product performance including maintenance record and vendor service provided.			
2. Local Consultant/ Representative Information	**Yes**	**No**	**Notes**
a. How many years of experience with sale and distribution of SPHM equipment does the local consultant/rep have? Be specific to the type of systems you wish to purchase, e.g. ceiling lift systems.			
b. How long has the current representative worked with the SPHM equipment manufacturer or distributor?			
c. How many customer representatives are in the state?			
d. How many clients do they serve in the state?			
e. Can the company provide data on the success of using their equipment? Can they provide references?			
f. What other hospitals in the state have this equipment? Will they talk to you about their experience and attest to the quality, timeliness and satisfaction with their work for the installation lift and transfer equipment?			
3. Manufacturer Information	**Yes**	**No**	**Notes**
a. How many years of experience does the manufacturer have in lift/transfer equipment production?			
b. How long has the manufacturer conducted business in the state?			
c. Does the manufacturer/vendor provide service technicians? Note the contact information of those who respond to service calls.			
4. Specific to SPHM Equipment Purchase	**Yes**	**No**	**Notes**
a. Has the device or equipment/slings been evaluated in a published study by an independent third-party organization?			
b. Can they provide information about usability testing conducted when designing the equipment/slings?			
c. Has the device been listed on the FDA product recall or safety alert list at http://www.fda.gov/Safety/Recalls/default.htm[28]			
d. What is the equipment trial evaluation period?			
e. What is the new equipment delivery time?			
f. What is the life expectancy of equipment and parts? Compared to similar products?			

G. Vendor Service [3,18, 27]			
4. Specific to SPHM Equipment Purchase	**Yes**	**No**	**Notes**
g. Is there an option to rent or lease equipment? Is so what are the lease terms?			
h. What is the vendor trade-in policy?			
i. Does the vendor offer bariatric or larger versions of the standard equipment?			
j. If the manufacture changes the design of slings and/or equipment hardware in the future: i. What is the customer notification period related to a change in device and/or sling design? ii. What assistance/service will the manufacturer or vendor provide related to replacing equipment components and training if applicable?			
5. After Service	**Yes**	**No**	**Notes**
a. What is the average on-site response time for service?			
b. What is the equipment warranty or guarantee for length of service?			
c. Are there any limitations related to the warranty?			
d. What is the warranty for batteries and motors, slings and other 'soft' goods, etc.?			
e. Will the manufacturer or vendor notify customers when an upgrade for equipment and accessories is needed or available?			
f. What are the terms or policy for upgrading equipment etc.?			
g. Will the manufacturer or vendor notify customers about recalls?			
6. Training *Also refer to Section 6*	**Yes**	**No**	**Notes**
a. Will training be provided by the vendor or manufacturer representative? If 'Yes', i. Will training be conducted on all shifts? ii. Does training include hands-on competency-based skills with return demonstration? iii. Is the vendor qualified to provide clinical competency-based training related to use of the lift device and slings e.g., patient assessment protocols; ability to address specific clinical challenges and SPHM needs? iv. Is there a fee for this service?			
b. What training materials are provided for the facility to use? Consider availability of training videos, aids, or on-line training support			
c. Will the vendor return and train new employees and/or provide refresher training periodically? If 'yes', is there a fee for this service?			
d. Will vendor provide any special orientation and training for doctors or other specialty groups, e.g., therapists; maintenance, etc.?			

H. Regulatory Requirements [10, 28, 29]			
1. Federal, State, Local	**Yes**	**No**	**Notes**
a. Do lifts and slings meet design FDA regulations for medical devices e.g. many patient handling devices are considered Class 1 Medical Devices by the FDA. ISO 10535 is a recognized consensus standard by the FDA as applied to Patient Transfer Devices; both AC-powered and non-AC-powered patient care lifts, thus manufacturers of such devices should meet ISO 10535:2021 requirements.			
b. Are there any Joint Commission, CMS or other Federal agency regulations to consider regarding the use and storage of the equipment?			
e. Are there any other federal and/or state agency regulations to consider e.g., OSHA, state/county/city building, electrical and fire codes? If using equipment and slings in the operating room environment check if specific OR fire standards apply. Review compliance for National Fire Protection Association (NFPA) codes for fire sprinklers systems; access to electrical and safety systems etc.			
f. *Electrical*: Many patient handling devices are manufactured 'offshore' in Canada or Europe. Determine per your state, county and city fire codes etc., what safety certification is acceptable for medical electrical devices. For example, the typical acceptable designation in the US is the UL rating from the Underwriters Laboratories. https://www.ul.com/look-ul-safety-mark-you-buy However, there are other International Electromagnetic Commission (IEC) https://iec.ch/homepage electrical standards that medical devices must conform. *Your facilities engineering/clinical technology department should be able to assist you to determine these requirements. Other standards related to the design, testing, manufacture and use of lifts and slings are listed in ISO 10535:2021.*			
g. Are there personnel assigned who will be responsible for monitoring and acting on upgrade or recall notices for equipment or software within the facility or healthcare organization? *Refer to Resources.*			

I. Patient & Facility Considerations When Choosing SPHM Equipment and Slings			
1. General	**Yes**	**No**	**Notes**
Determining what and how much lift equipment is needed in a care environment and how to prioritize purchase and installation depends on many factors – *Refer to Sections 2, 3, 4, 5 & 7 and associated tools for more information.* The following resources provide useful recommendations for SPHM equipment coverage/quantity, recommendations by clinical unit/area, and for user trials of equipment: • The Facility Guidelines Institutes Patient Handling and Movement Assessments (PHAMA) 2019, provides useful recommendations for Overhead lift Coverage Recommendations by Clinical Unit/Area, design specifications and more. https://www.fgiguidelines.org/wp-content/uploads/2022/10/Patient-Handling-and-Mobility-Assessments.pdf • The Veterans Heath Administration - various resources https://www.publichealth.va.gov/employeehealth/patient-handling/index.asp			

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