Managing Time and Resources for a Successful Patient Move

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UNIVERSITY OF NEW MEXICO HOSPITALS

Barbara and Bill Richardson Children's Hospital and Critical Care Pavilion
Albuquerque, New Mexico

The Barbara and Bill Richardson Pavilion (BBRP) at UNM Hospitals opened at 7 a.m. Saturday, June 9, 2007, and it didn't take long for the hospital staff to have to swing into action. At 7:08 a.m., an ambulance pulled up to the emergency room entrance and delivered the new facility's first patient, a victim of a motor vehicle accident with serious injuries. The accident victim was taken into UNM's brand new trauma center, which is also New Mexico's only Level One Trauma Center.

Shortly after that, hospital staff started moving all the patients and equipment from the old ER into the new facility and completed the move by 8:30 a.m. The new pavilion is also the home of New Mexico's first 24/7 dedicated pediatric emergency room, and the pediatric ER staff accepted the unit's first patient at 8:15 a.m.

On Saturday, hospital staff members moved ER patients, adult intensive care unit patients, and pediatric patients. On Sunday, faculty and staff moved new moms and their babies, soon-to-be moms, and babies from the newborn intensive care unit.

Altogether, the UNM safely transferred about 220 patients to the BBRP over the weekend. The faculty and staff who carried out the move had been rehearsing the patient transfer for months.

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Abstract

Construction is approaching completion. Opening day has been scheduled. But how will you pull off a major facility move-in, what will it cost and when should you start ? This is the story about the planning process and resources needed to move into a new Children's Hospital Critical Care Pavilion. With a ticking clock for demolition of the old building, the sequence was carefully mapped to fully fit-out the new facility with new equipment and furnishings and vacate the old premises and relocate the patients, staff, supplies and equipment over a four day period. Members of a recent "Move Team" will describe their plans, the schedule, the costs and the results that led the way to a success.

1. Learn when to organize a move team and how to engage support of internal and external resources.
2. Understand the costs of equipment and added staff to continue care in a 24/7 environment.
3. Learn what was planned and what surprises occurred on move-day and how the team responded.
4. Share post occupancy evaluation topics related to the design and patient care.

Introduction

During the construction phase of a large project there are numerous parallel paths being executed to get from current operations to the opening of a new building. This discussion highlights the three paths of 1) Operations, 2) Building Readiness and 3)Transition Planning.

1. Operations Planning

For the University of New Mexico Hospital the opening of the Bill and Barbara Richardson Pavilion was a major transition of improving the quality and expanding capacity for caring for many of the region's most critical patients. The excitement and can-do spirit of the UNMH staff drove the quest and urgency to open the building as soon as possible. Over a year in advance of opening the departments were asked to prepare detailed business plans to identify current and future projections of staff, equipment, patients, furniture, and document any tie these to census and revenue projections and hiring plans. These business plans, once finalized became the basis for all decision support related to the departments. Since opening the business plans have been a great basis of context for operations, staffing and evaluating patient census and capacity.

2. Building Readiness

The presentation will highlight the floor by floor occupants and give an overview of the resources involved on the owner's side to prepare the building. Owner furnished systems included Division 17 nurse call, communication, information systems, signage, furniture, equipment, and security.

The UNMH facilities staff dedicated 3 FTE's plus they had Jacobs Facilties Manaagement on site working as project managers. The construction team was Jaynes/JE Dunn and local architects were Design Collaborative Southwest (DCSW). Perkins and Will Architects were consulting architects during the design phase of the project.

The building readiness details related to medical equipment are expanded on below.

Equipment Planning

During planning the key to successful management is managing change - equipment will change over the course of a project and over the life of the building. Owners are asked to provide decisions regarding models of major imaging equipment during planning for example, and that may be too early for the procurement decisions to occur to ensure the latest and greatest technology. To proceed in the absence of known decisions requires stewardship through the planning and procurement process to successfully negotiate between the needs of the planning and construction team and the desires of the clinical staff. Managing this gap is the key to keeping the design and construction teams moving while preserving the ability for medical institutions to stay at the forefront of care.

This team, Equipment Collaborative (EC) was hired during construction and began with a previously prepared equipment list and began to triage requests for information (RFI) and submittals coming from the construction team with regard to contractor and owner furnished equipment. EC's team began with a full review of the list and reviewed the architectural, mechanical, electrical and plumbing drawings and casework submittal to identify any areas that needed to be addressed to accommodate the equipment. EC gathered vendor drawings and facilitated a mockup to resolve headwall, light, column and boom options and select vendors. The list was also revalidated to maximize reuse. Other cost reduction options were presented to the executive team to consider reducing plans for operating lights in every ICU for example and replace with a simpler procedure light. Equipment drawings prepared during CD's were used for installation and supplemented with updated vendor installation drawings.

Owner provided equipment such as sterilizers, headwalls, or other ASE vendor submittals were reviewed and approved prior to fabrication. As responsive as vendors can be, at times submittals do come back not matching the plans or provisions and if approved can cause delays and change orders when these items arrive in the field. This occurred on headwalls and required two rounds of edits to ensure the rough-ins would work in the back to back conditions on inpatient floors. It can be the equipment planner or someone on the team or the owners side who needs to review the submittal for infrastructure and clinical needs and work with the vendor to resolve discrepancies, routing final copies to the owner, A/E team and the contractor. This step in the process is the most critical to ensuring the product being provided will work with the space as constructed. Vendor involvement during construction is very valuable and should be coordinated through the equipment planner and A/E team. Meeting with the construction team to review delivery schedule and define early rough-ins like ceiling support plates and conduct pre-delivery inspections facilitates collaboration on owner furnished contractor installed equipment.

Equipment Procurement and Logistics Planning

Managing the medical equipment procurement and installation process can be accomplished through a variety of methods on projects including: 1) Hospital provides complete services utilizing internal biomedical, facilities or procurement staff or 2) A blended mix of internal and external resources each providing services within their area of expertise, and 3) a full turnkey approach to outsourcing a large project to a medical equipment planning firm. The BBRP project utilized option 2 – a blended mix of internal and external resources. For more information on the various options see ASHE PDC white paper published in 2008 entitled Managing Methods for Projects Medical Equipment, Design and Procurement, published by Lisa Charrin and Janet Sisolak, Project Director at M. D. Anderson Cancer Center.

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A blended approach to resources has been utilized often when internal resources are capable but where capacity is strained to handle the demands to follow a project from planning through procurement phases. This approach can be one of the most successful approaches provided a proactive and detailed plan is devised to avoid gaps in services or an overload of responsibilities on one or more resources. Internal resources must also allocate time to their day to day responsibilities and acknowledge the time requirements for stocking, training, testing, asset tagging and other demands to participate in activation and transition planning.

Usually 18 -24 months prior to opening the building construction begins to focus on the owner furnished contractor installed equipment. This type of equipment usually is defined as fixed equipment or architecturally significant equipment. University or public owned hospitals have to proceed with established procedures for issuing bids in order to finalize selections.

To illustrate the balance of procurement decisions that will need to be made on a project is to prioritize any products that are considered architecturally significant equipment (ASE) such as surgical booms, procedure lights, headwalls, and imaging systems. ASE equipment comprises approximately 30% of the total asset on most large expansion projects and many of these systems have parts that must arrive early in construction. Although major medical equipment often comprises the largest share of the equipment budget (70-80%) it represents a much smaller portion of the overall assets. The largest share of procurement work is in the non-ASE which include many of the hospital standard products such as carts, hampers, beds, wheelchairs, benchtop equipment, etc. The non-ASE orders will account for 70-80% of the volume yet only comprise about 20-80% of the equipment budget. These orders can have building implications if products bought are bigger than the space allows (refrigerators) or they have different power or data requirements than planned. Proactive planning to verify products will fit and plug in is an essential element to procuring these items and can be overlooked if a resource is comparing only features and pricing of a product. The sheer volume of goods and the details of specifying options, accessories, and defining new versus reuse requires time and organization to stay on budget, on schedule and to ensure the items have a place and will fit and plug in..

The definition of the scope and the time commitments needed to manage and execute the procurement and installation management services is often greatly overshadowed by the building construction and readiness tasks. Equipment lists prepared during planning may have established a manufacturer or model as the basis of planning and changes in model can create changes – some minor and others more extensive for power, structure, or other rough-in requirements. The key is to connect the assumptions of the building plans to the purchasing specifications to ensure changes are minimized or at least understood during the selection phase. The details of preparing requisitions, obtaining quotes, preparing bid specs, and providing tracking reports of orders and deliveries can take a full time employee or more depending on the size of a project. Most major projects have in excess of 10,000 items – of which that can translate to 300 to 400 orders assuming products are consolidated into packages to gain advantages for quantity discounts. If each department is responsible for handling their own orders, discounts usually drop due to quantities and there is a chance for coordination issues on the receiving and installation impact of more orders. A large project often is a prompt for the hospital to review standard products and gather this information into a consolidated list.

For the University of New Mexico's BBRP project, the hospital outsourced the procurement and construction coordination of Architecturally Significant Equipment to Equipment Collaborative, Inc.(EC) EC also prepared a comprehensive list of the non-ASE equipment and established a budget and quantified reuse to reduce the budget based on available funding. The initial budget

was $25 million and EC reduced to $20 million which included a contingency. The project was procured under budget at $18.9 million.

Internal procurement resources at UNMH
UNMH had 2 hospital buyers who assisted in issue of requests for proposals, evaluations and executing the purchase orders. These buyers also conducted all other routine ordering of capital equipment by the hospital. Additionally an asset management staff member was assigned to the project for half time to assist in managing the list of purchased and received equipment being ordered by each department.

Clinical Acceptance / Biomedical Engineering Planning
The UNMH campus lead was Darren Shotwell, who led the planning and execution of preparing all equipment for relocation and conducting final acceptance testing for new equipment. The project required full time dedication to the project to work with the architects, equipment planners, and to consult on product specification, selection and installation. With opening date approaching the plan to pull forward all regularly scheduled performance maintenance checks allowed the clinical engineers to have blocks of time to allocate to the opening of the building.

The plan included 3 basic fundamentals for success

- Regular scheduled PM's (450) completed
  - to maintain quality standard requirements of 95% completed.
  - hired 2 temp. bio-med technicians for 4 weeks prior to move
- New equipment installs and check-in/safety checks
  - assigned 3 out of 5 UNM Clinical Engineering technicians for efficiency and accuracy.
  - Director and CE supervisor assisted (avg 14 hr/day x 4 weeks)
  - Utilized warehouse space to unbox, prepare, affix biomedical asset tags, test and make equipment ready for transport.
- Hired 6 temp bio-med technicians to transfer and install relocated equipment, assist the Nursing move teams.
  - Hired 6 temporary bio-med technicians for 3 days (Friday, Saturday, Sunday, with the latter 2 days being the move).
  - A total of 12 bio-technicians and the dept director for coordination.
  - We formed 3 teams of bio-med technicians

The biomedical engineering teams comprised of the following:

- De-install team (3)
- Transfer team (6)
- Install team (3)
- Having the teams divided, allowed the appropriate time required for each team to focus on responsibilities and reduce lost time traveling between buildings.
- Biomed Related budget of $75,000 would be required to pay for temporary bio-med technicians, OEM additional charges for weekend coverage, certification of Flow hoods and new OR room's (9), Clinical Engineering overtime for technicians:
- Actual – $65,000 but Philips provided extra support at no cost – value added for ongoing support services. (Costs $100K)

Another key to moving the extensive number of intensive care beds was advanced planning that included a hospital wide initiative for a new physiological monitor system.

- They determined where to install a year before the move to facilitate the training of nursing staff and where to wait and where a "leap frog" strategy would work.

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- Emergency department was outfitted with all new monitors. The department was tripled in size and it was determined as a level one trauma center to outfit all rooms including the trauma bays, emergency, triage, fast track and pediatric bays with full physiological monitoring.
- NBICU (Newborn ICU) & ICN (Intensive Care Nursery) departments. installed new patient monitors (24)
- All new beds were outfitted with a patient monitor
- Monitors took 8 minutes per bed to install
- All new wall channels and brackets were hung in the new facility – no reuse planned.

The ambitious time frame to move the inpatient units was made possible by the dedication of resources from the clinical engineering team. Equipment moved with the patient and the nursing team. Patients included neonates, antepartum and postpartum mothers and adult intensive care, and pediatric acute care and intensive care patients. Patients were transferred in their bed or bassinets, or warmer and remained attached to their ventilators, pumps, etc. as needed during transport. Biomed was at the bedside at both origin and destination to ensure disconnect and reconnects supported continuity of care. Transfer teams pushed or accompanied the movers with other sensitive equipment along the move route.

Cost summary of Move and Logistics:

- Mover/Warehouse – issued a single request for proposal which was awarded to a single agent Graebel, Albuquerque.
- Warehouse space provided by Graebel, Albuquerque was 16,000 sf at peak/ 8,000 square feet was average beginning 15 months in advance of construction. Warehouse staged headwalls and other owner furnished contractor installed equipment to assist with phased deliveries. Dense racking systems were used to increase vertical storage space.
- Total warehouse, deploy costs: $330,000 Warehouse costs ended up running 15% higher than bid due to longer storage time and more handling/inventory verification. The relocation labor was lower due to the speed of executing the move. The final result was the combined mover/warehouse costs were 4% under budget for mover costs.
- Preparation: rent-a-crates: $30,000
- Relocation: labor, materials: $132,000
- Mover project management: $120,000
- Fixed equipment procurement/installation/relo management: $380,000 (Movable by UNM)
- Move Consulting: $250,000
- Biomedical Engineering: $70,000

3. TRANSITION PLANNING

Transition planning began over 2 years in advance of opening with the requests for proposal phase to identify the services needed, interview and select the consulting team of Equipment Collaborative who provided equipment planning and transition planning services. Coordinating Moving Systems worked as part of the EC team. A master schedule was assembled for activating the building and draft of committees outlined and agreement reached on overall plan and sequence of decisions. The expanded team of internal resources who would be involved in the meetings were invited and informed they would be participants but detailed planning was held off until after the New Year which officially began planning 18 months in advance of the project opening.

Teams included:

- Activation Oversight Committee (already in place at UNMH for overseeing the project.) Members included CEO, COO, CNO, CFO, CIO, Director of Facilities and Chief Medical Officer.
- Executive Directors were engaged as lead representatives for recommendations and decisions for their respective areas.
- Support Service Directors from pharmacy, lab, housekeeping, security, clinical engineering, facilities, nutrition, lab, imaging, etc. were engaged to evaluate impact on current operations and to prepare plans for operations and transition to the new building.

Activation Coordinators were involved and assigned for every unit and they attended bi-weekly meetings during the planning phase. Their responsibilities included:

- Key implementer for successful execution of their department's move in plan and financial plan
- Develop/Review staffing plan
- Equipment, Signage, computers, phones, furniture, security, mock-ups, training, supplies, etc.
- Move Prep – label and ensure exact locations for items being moved and/or installed in the new building

Schedule:
A master migration schedule was established to complete the move during the 10 day period between owner turnover and demolition start day. A detailed task and resource loaded schedule was prepared, sorted, color coded and distributed to all support providers during the transition planning phase. Updates were issued and support departments were expected to make plans for staffing to execute the fit out and relocation. The PowerPoint shows examples of the schedules including a move calendar.

Pre-move activities:

Mock runs were conducted with unit directors support personnel and plans identified for various contingency and scenario planning. Elevators and move paths were clearly documented and scheduled and move path routes were assigned for each unit from origin to destination.

Pre-move database collection was the responsibility of the activation coordinators to help collect names, office numbers, phone numbers and insert new assigned rooms.
This database was the source of planning for IT and supported the move process to account for everyone's from / to locations.

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Pre-move packets for every employee were distributed with pre-printed labels of their from and to locations and move instructions were included. A call list and frequently asked questions were also distributed. All mover team members were provided a set of plastic cards with emergency contact list information for ease of access. Communication planning was setup and a move-command center was activated.

Two-way radio communications were used by the key move team members and administration. These included a couple of channels reserved for administration and emergency personnel and a general channel for calling from origin to destination the status of patient movement. In addition the move team and supervisors had separate communication channels to contact the move teams. Staffing included 8 on-site move consultant team members plus move supervisors and up to 50 hired movers who were split into a red team and a blue team to denote origin vs destination. Movers were fed and remained on the job from start to finish with scheduled breaks. At all times there were teams of movers available to cover pre and post move items. A dedicated team of computer and phone disconnect and reconnect team members worked independent on the specific tasks to stay in pace with the unit move. Any non-essential phones or computers were moved during a pre-move phase the night before the unit moved.

EMS and referring hospitals and healthcare providers received advanced notice and were oriented to the new location. Public relations handled all external and internal communications to announce the project to the patients and the community. Members of the media were on site the morning of the move and photography was documented of the exciting day.

Members of Pharmacy, Dietary, Housekeeping were all integral parts of the preparation and relocation of patients on move day. Maintaining patient medication doses, dietary schedules, and ensuring all patients belongings were accounted for were primary focuses.

Patient care planning included nursing and physician plans to determine staffing and the procedures to properly assess and transport patients. The plan was to double the nursing and support staff on move days. Each patient had one nurse who travelled from origin to destination. Radios were used for the origin charge nurse to call the destination and report that patient bed 24 was moving and the destination bed assignment was given. A final assessment was made of the patient prior to movement and sign off was done in the form of a “ticket to ride”. At any time anyone on the transport team could call as time out if they were concerned about anything that would compromise the care. The move went successful and all contingency plans for plan b were generally not needed but nice to have had.

Move details and statistics:

- Emergency Department had pre-moved and were virtually moved within the first hour. Life flight helipad was painted with a black x when the new pad opened.
- MICU moved over one hour and 20 minutes. General pace was to move one patient, get settled and call for next patient.
- SICU moved similarly as did Trauma and Neuro ICU’s.
- Newborn ICU and Intermediate Care nursery babies were moved in their warmers or bassinets and were accompanied by their nursing team and respiratory care therapists. Move laborers assisted with pushing other durable equipment. Once the baby was settled in the new unit, patient families were escorted to the new unit and brought to the bedside.
- Families followed the movement of the patient and were escorted from the old to the new unit.

- Peds Acute Care moved patients in cribs and their beds or wheelchairs with families accompanying the patient. Each child or parent was given option of cutting a ribbon on their new door. The pace was to move a patient out about every 7 to 8 minutes calling ahead with radios by bed number such as "Bed 81 to bed 22 and Bed 79 to bed 23".
- The new pediatric OR's opened a week after the patient beds opened and within the 18 months of being open the census has grown and they have activated rooms that were built but not equipped.

LESSONS LEARNED

Training:
In hindsight more time for training would have made a difference in a couple of key units where the environment of care changes were significant. Given the tight schedule they did not have time to do mock-runs in the new units, conduct training, etc. This would be a recommendation for any project. Nurse call system in particular required more training especially in units that had a minimal call system in the old facility. It was unsettling at first for some clinical staff used to working in an all open ward to now being on a large floor plate of private rooms. They have investigated options for some type of communication system to find other caregivers on the unit. Training on central monitoring was an issue on one unit. Although training had been in place on individual monitors, one intensive care unit did not have experience with using central monitoring since a nurse was at every bedside. The new larger unit offered the ability to pull up another babies vitals while at the bedside of another and these features were not well understood. By the end of 4 months everyone felt extremely comfortable in the new unit.

Door/Hardware:
The building's automation system and connectivity with the doors has been an issue that could have been worked through with more activation time. The initial occupancy was delayed one week for the same issue but post-occupancy they report still having issues with the systems.

Hardware selection and specification– noise from doors closing near newborn and intensive care areas has been a source of complaint. Noise monitors were added in the Newborn ICU. Durability of some hardware in addition to noise is being addressed by changing out hardware less than 18 months after opening.

Noise:
In addition to the hardware noise, some of the areas around nurse stations and lobbies are noisy. No solution has been identified yet for modifications.

Lobby Space / Family Space:
The building has very spacious and consistently sized family waiting areas for adult and pediatric patients. Following occupancy, the waiting areas for pediatric families are unused most of the time as they are provided accommodations in the patient room. Adult ICU families need more space and accommodations for food and personal belongings. The adult ICU areas are also on the second floor and the bridge connecting to the main hospital meets the new building in the center of this waiting space. The traffic includes staff, families and emergency adult patients who are wheeled passed the waiting space across the bridge to the adult portion of the hospital. Better flow and discreet space for various needs would have been better. The families need more privacy and less distractions to reduce stress.

Entry Lobby:

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The front door was planned for a drop off and entry point, however with most patients self parking and a great deal of clinic patients parking in the adjacent parking structure, the design and attention of the entry point would have benefited from more review. A high amount of traffic comes through the garage, through a side door, and tracks across the lobby level to the existing building.

Ceiling Furr-downs
In the Newborn ICU ceiling furr-downs were added at intermediate points in the center hall and they blocked the visual signal lights of the nurse call. Modifications to lower the warning lights were completed following move in.

CONCLUSION
Projects can successfully be delivered using internal resources, external resources or a blended approach to managing the building readiness and transition planning. The key to that success is proactively identifying tasks and resources and managing the timing of decisions and executing the plan based on multiple scenario and contingency plans.

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