

October 2012

# Foodservice

**equipment & supplies**

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# THE CENTRAL KITCHEN at The Johns Hopkins Hospital in Baltimore

A 30,000-square-foot central kitchen with cook-chill technology and pods supports staff who prepare 13,000 meals daily for patients on 125 specialized diets and food for employees and guests.

By Donna Boss, Contributing Editor



Photo by Albin Khouw





**W**hen Johns Hopkins Hospital administrators committed to expanding and enhancing patient services, a new central kitchen became essential for receiving, storing, preparing and producing food for the entire campus. A 30,000-square-foot facility — the size of one and a half football fields — opened partially in January 2012 and fully in April 2012. The central kitchen includes centralized produce preparation, cook-chill food prep and packaging, hot food production and assembly pods for patient trays.

The net result is that the hospital's foodservice systems now operate at a heightened level of technological advancement. The kitchen's design helps improve customer satisfaction by enhancing food quality and offering various forms of service, including patient room service. The hospital's contract foodservice provider, Sodexo, provides more than 13,000 meals daily to patients on 125 specialized diets as well as to employees and visitors dining in the employee break room and various nonexternal-branded retail operations. Directing this massive operation is Leo Dorsey, foodservice director of the department of food and clinical nutrition, and resident district manager for Sodexo.

Construction of a new patient building complex was the main impetus to expand and centralize the hospital's foodservice operation. Opened in April 2012, the new building sits on 5 acres and features 33 operating rooms, expansive adult

## KEY PLAYERS

- **Foodservice Director, Department of Food and Clinical Nutrition at Johns Hopkins, and Resident District Manager for Sodexo:** Leo Dorsey
- **Assistant Director, Food and Clinical Nutrition Department:** Helen Mullan, RD, LD, with Sodexo
- **Executive Chef, Department of Food and Clinical Nutrition:** Jake Fatica, with Sodexo
- **Project Manager, Department of Food and Clinical Nutrition:** Julie Branham, MS, RD, LDN, with Sodexo
- **Architect:** Perkins + Will, Washington, DC, office
- **Foodservice Consultants:** Porter Khouw Consulting, Crofton, Md.; Albin Khouw, principal; Roberta Hofmeister, project manager
- **Equipment Dealer:** Performance Interiors (Sodexo)
- **Construction:** Roy Kirby, Baltimore
- **Engineering:** Burdette, Koehler, Murphy & Associates, Baltimore

## Equipment Key

1. Mop sink
2. Wall-mounted hose reel
3. Floor trough
4. Storage shelving unit
- 4a. Dunnage shelving unit
- 4b. Mobile [walk-in] shelving unit
- 4c. Wall-mounted shelf
- 4d. Double overself
- 4e. Caged storage shelving unit
5. Blade storage cabinet
6. Waste receptacle w/ mobile dolly
7. Four-person trim station
- 7a. Work station
8. Evaporator coil
9. Food dicer
10. Belt food slicer
- 10a. Automatic slicer w/ conveyor
11. Food cutter
- 11a. Cutter/dicer
- 11b. Vertical cutter/mixer
- 11c. Horizontal mixer
- 11d. Hand mixer
12. Transfer conveyor
13. Tray dolly
- 13a. Chill crate/ dolly
- 13b. Glass/cup rack dolly
14. Mobile worktable
- 14a. Worktable w/ sink
- 14b. Worktable
- 14c. Worktable w/ drawers
- 14d. Mobile equipment table
15. Carrot/cucumber peeler
- 15a. Melon peeler/de-seeder/dicer
- 15b. Pineapple top/tail machine
16. Wash system
17. Two-compartment deep sink w/ foot pedals
- 17a. Three-compartment sink
- 17b. Production sink
- 17c. Hand sink w/ soap & towel dispenser
18. Basket turntable
19. Basket
20. Disposer w/ control panel
21. Food processor
22. Tomato corer
23. Packing table w/ scales
24. Vacuum bagger w/ clipper
25. Centrifuge
26. Wall-mounted printer shelf
- 26a. Printer
- 26b. Scanner
27. 20-qt. tabletop mixer
- 27a. 60-qt. mixer
- 27b. 80-qt. mixer
28. Electrical drop cord
29. Mobile roll-in rack
30. Tray scaler w/ lazy susan
31. Horizontal wrapper
32. Walk-in complex
- 32a. Walk-in refrigerator
33. Chiller/cook tank
- 33a. Pump fill station
34. Dual kettle control panel
35. Roll-in & rack oven
36. Roll-in oven rack
37. Mobile double convection oven
38. Table-mounted pot/utensil rack
39. Water meter
40. 40-gal. tilting braising pan
41. Exhaust ventilator
42. S/s wall panel
43. 100-gal. tilt kettle w/ agitator
44. Combi oven
45. Water filter system
46. Fire suppression system
47. 40-gal. tilting steam kettle
- 47a. 60-gal. tilting steam kettle
48. Two 20-qt. kettle assembly
49. Two-burner range
- 49a. Six-burner countertop range
50. Baker's table
51. Countertop char broiler
52. Mobile refrigerated equipment base
53. Countertop griddle
54. Mobile fryer battery w/ filter & dump
- 54a. Mobile fryer w/ filter
55. Mobile reach-in freezer
- 55a. Undercounter refrigerator/freezer w/ drawers
- 55b. Drop-in refrigerated display
- 55c. Mobile reach-in refrigerator
56. Mobile base cover rack
57. Heated plate dispenser
58. Double-stacked speed oven/mobile stand
- 58a. Single-speed oven/mobile stand
59. Pasta cooker
- 59a. Double-stacked convection steamer
60. Shelf-mounted ticket holder
61. Hot/cold tray delivery cart
- 61a. Tray cart
62. Room service cart
63. Mobile retrieval cart
64. Tray assembly counter
- 64a. Tray starter
- 64b. Tray assembly conveyor
65. Four-slot toaster
66. Microwave
67. Drop-in hot food well
68. Induction charger
69. Beverage table
70. Mobile refrigerated prep station
71. Heat lamp

A glass walkway connects the hospital to the garage. The central kitchen sits on the basement level of the garage. Photo courtesy of Johns Hopkins Medicine.





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## facility design project of the month

and pediatric emergency departments, 7 pharmacies, and diagnostic imaging facilities. The complex contains 560 private patient rooms in 2 towers: the Charlotte R. Bloomberg Children's Center, with 205 private inpatient rooms, named in honor of New York mayor Michael Bloomberg's mother who died at age 102 in 2012; and the Sheikh Zayed Tower, with 355 private inpatient rooms for cardiovascular and critical care, named in honor of the late father of the president of the United Arab Emirates, His Highness Sheikh Khalifa bin Zayed Al Nahyan.

The new central kitchen, located on Orleans Street on the south side of campus, also supplies meals to patients in the Weinberg building. Another kitchen, built in the 1960s, serves about 400 patients daily in 4 other buildings. The new central kitchen also provides bulk food to the old kitchen, to the employee break room located across a hallway from the central kitchen and to retail operations located throughout campus.

"We designed our new kitchen for maximum efficiency and to best meet the nutritional needs of our patients," says Dorsey, who joined Sodexo 21 years ago and came to Johns Hopkins 11 years ago. "We installed the most technically advanced food-processing equipment, including machines that can peel and chop vegetables and fruit in record time, such as peeling a melon in six seconds. No longer must employees perform this and other such functions by hand."

In addition, cook-chill equipment allows Johns Hopkins to store food for up to two weeks, and computer software enables staff to fulfill individual patients' dietary needs while avoiding foods to which they are allergic. "We now accommodate 125 different types of diets and have seen a growing number of patients with food allergies — even allergies that we haven't seen before — that we have to track carefully," says Julie Branham, MS, RD, LDN, project manager for the department of food and clinical nutrition.

### Room Service

The hospital offers "At Your Request," a proprietary, Sodexo-developed, room service-style meal plan available 12 hours a day for oncology, medical, pediatric and obstetric patients and their visitors. Patients order from a call center, and staff deliver within one hour. "We're limited only by the patients' health," says Jake Fatica, executive chef at Johns Hopkins and also with Sodexo. "Patients can order as if they were dining at a restaurant." If patients aren't able to use the call center, nutrition assistants help them order and send their meal requests wirelessly to the kitchen using a tablet computer. The hospital also offers traditional tray service for patients who are unable to take advantage of room service for various health reasons.

"Working closely with the owner, operator and members of the architectural and engineering team, we took a holistic approach to defining the goals and expectations of the





Producing meals for At Your Request orders requires a six-burner range, refrigerated base, flattop griddle, charbroiler, pasta cooker, fryers, double-stacked and single accelerated-speed ovens and refrigeration.

Photo by Albin Khouw

project and translating them towards practical, tangible and measurable design solutions that resulted in improvement and highly efficient operation,” says Albin Khouw, principal of Porter Khouw Consulting.

“Since the space dedicated for the central kitchen as well as the multideck parking garage was already built, our approach in developing an efficient layout centered around three major points of service: delivery of products, distribution of prepared food, and waste management,” Khouw continues. “The location of the two service elevators dictated where we would locate our central dry and refrigerated storage. The point where finished products are distributed to various locations throughout the hospital grounds is dictated by access to the towline, used to transport prepared food in hot/cold insulated carts to multiple points of service. Finally, soiled trays and other waste products returning via the towline are received directly near the warewashing and trash-holding area. The design ensured that soiled products will never cross and possibly contaminate food-preparation and production areas.”

The entire central kitchen sits below grade under a multideck parking garage, which was built as part of the master plan for the new towers and campus revitalization. It is accessible to the rest of the Johns Hopkins campus via a series of tunnel connections and the programmable towline system, which carries carts with dirty trays and dishes from the buildings to the kitchen, transports bulk food to the older kitchen in what is called the “historical” part of campus, distributes bulk food to retail and catering operations, and delivers other items such as linens and medical supplies.

Working in a prebuilt space required some manipulation of the area. “A crawl space was created by raising the entire kitchen floor by approximately 16 inches from its base foundation,” Khouw says. “This crawl space allowed all the utilities, including plumbing, electrical and gas connections, to be run from below.”

“The ceiling heights were a challenge,” says Roberta Hofmeister, project manager for Porter Khouw Consulting. “For instance, one refrigeration manufacturer had to come in to fit the equipment into the space.”



In addition, a single-duct chase was designed to run all exhaust ventilator ducts out of the kitchen space and through eight levels of a multideck parking garage. "We didn't have a choice about this because there was only one shaft in the original building design," Hofmeister says. "But it was an engineering challenge because we didn't want the horizontal run to be too long."

### Food-Safe Handling of Ingredients

Food and supply deliveries come to the loading dock on a floor above the kitchen. Staff load pallets of products onto an elevator bank and take them down to the basement level and place them into a staging refrigerator in the bulk walk-in complex or a dry-storage room. "A lot of process planning addressed economies of scale and safety to make sure we can handle food in safe environments from the moment it is received, through the production process, and until it is served," Dorsey says.

The entire walk-in complex comprises nine compartments, which have unsecured and secured areas. Only staff with the appropriate credentials can access the secured compartments. "The warehouse manager controls all bulk storage and the release of items to the dedicated day-storage areas," Dorsey says. "This allows us to control the quality and security of the food items."

Before production in the temperature-controlled (35 degrees F) produce-prep room begins, a manager requisitions the necessary ingredients from the manager in charge of the bulk-storage refrigerator. In the prep room, which resembles a large commissary-style system, the flow begins with staff preparing produce using a trim table, vegetable-washing system (1,000 pounds of spinach per hour), dicers (1,000 tomatoes per hour), choppers for onions, carrots and peppers, and peelers for melons and cucumbers. Staff use a bagger for packaging the finished products, which they store in the finished produce compartment. Other staff can requisition the prepped produce for garde manger, which takes place in another production area in this central kitchen. Staff can also requisition products for the other kitchen in the historical area and for satellite retail locations.

"We've done a lot of analysis to be cost effective, not only for the main campus but for smaller facilities as well," Dorsey says. "Eventually we will also be able to ship products to our smaller hospitals in the system, which will help them reduce overall costs and expenses."

### Prepping Garde Manger

In the temperature-controlled garde manger area, staff use production sinks, a food processor, mixers and slicers to assemble chicken and tuna salads, slice meats, and prepare other cold items. Some of the products used in garde manger come from the food bank that holds items made using the cook-chill system. What's more, to further increase

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In the hot production kitchen, a two-burner range, tilting trundle kettle, upright kettle, roll-in rack oven and double-stacked convection ovens support baking, finishing of protein items and bulk vegetable preparation. The exhaust speed of cooking hoods can be modulated depending on how much cooking is occurring below. Photo by Albin Khoury

efficiency, the wrapping and packaging equipment here places cellophane around packages for grab-and-go items.

In the hot production area, a two-burner range, tilting kettles, an upright kettle, double-stacked convection ovens, fryers, charbroilers, combi ovens and a roll-in rack for baked goods support production. Staff also use nearby 80-quart and 60-quart mixers to make items such as mashed potatoes and dough. Some items that staff prepare in the hot production area go directly to the pods and some to the blast chiller for future use.

In the adjacent cook-chill area, staff use 100-gallon kettles with agitator attachments to make sauces, soups and other liquid items. After they are cooked, they are released into a pipe that connects to bags from which oxygen is removed. Other items are packaged in a similar manner. A sealer closes the bags, which staff then place into a basket held in a chiller/cook tank. Staff then crank up the basket and move it into a mobile container that is easily rolled to the food bank, which contains a blast chiller. "Though the food bank can store cook-chill food for more than two weeks, we only keep it for a maximum of two weeks. Some products don't hold well for more than a couple of days and because of our

## FACTS OF NOTE

- **Ownership:** The Johns Hopkins Hospital, part of Johns Hopkins Medicine, a \$6.5 billion integrated global health enterprise that operates 6 academic and community hospitals, 4 suburban healthcare and surgery centers, and has more than 2.6 million outpatient encounters per year
- **Headquarters:** Baltimore
- **The Johns Hopkins Hospital Foodservice operated by Sodexo:** All patient foodservice, retail foodservice and catering in a total of nine buildings
- **Opened:** The central kitchen opened in January 2012 with staff training and service of patients in the Weinberg building. Full operation began in late April 2012.
- **Scope:** The kitchen serves The Johns Hopkins Hospital, which is licensed for 1,051 beds; the new \$1.1 billion, 1.6 million-square-foot patient care building with dual 12-story towers opened in April 2012. The kitchen and its older counterpart, another 30,000-square-foot kitchen, prepares nearly 13,000 meals daily for inpatients and for customers in the nonexternal-branded food venues.
- **Size of the Central Kitchen:** 30,000 sq. ft., located in the sublevel of the Orleans Street Garage
- **Size of Employee Break Room:** 1,400 sq. ft.
- **Total Annual Sales:** Not available
- **Central Kitchen Operating Hours:** 5:30 a.m. to 10 p.m.
- **Staff:** Not available
- **Cost of Central Kitchen and Weinberg galleys:** Not available
- **Equipment Investment:** Not available
- **Website:** [www.hopkinsmedicine.org](http://www.hopkinsmedicine.org)





quantity, we rarely keep food for long in the food bank," Dorsey says.

Staff use spray washers on hose reels to clean and sanitize the equipment. "The floor troughs have a disposer to help grind food so it can easily flow out into the sanitary line," Hofmeister says.

### Production at the Pods

Four cooking pods, all the same design, allow staff to work within defined spaces that hold everything they need for tray assembly and require minimal movement on their part to place items in their proper places. Staff use a reach-in freezer, fryer battery, six-burner range, flattop griddle, charbroiler, pasta cooker, microwave oven, toaster and double-stacked and single-speed ovens to cook requested items. Shelving holds condiments while refrigerators hold yogurt, beverages and other cold items that staff assemble on trays and place in carts.

**Top:** Cook-chill equipment includes two 100-gallon kettles with mixer attachments. Floor troughs contain disposers to enhance sanitation.

**Middle:** Drop-down outlets assist staff in garde manger as they use various mixers to produce cold menu items.

**Bottom:** In the dishroom, two flight-type dishmachines allow staff to keep up with demand.

*Photos by Albin Khour*





Two pods support a traditional tray-assembly model that works in tandem with a spoken menu. For this service style, hosts on patient floors help patients make selections and enter the orders using tablet computers, which transmit the information to a call center. The call center releases information to a printer in the kitchen, which prints out the order for staff to use in preparing meals.

To prepare the patient trays, staff place hot items on a plate heated with a pellet, and choose from cold and ambient temperature items nearby. They place trays in a hot/cold cart that other staff members walk to support rooms on the floors. Once at the patient floor units, carts are attached to a docking station that helps to both boost the temperatures of the hot food and chill the cold food before the patients receive their meals.

The other two pods support Sodexo's At Your Request room service-style model. With this system, patients look at menus in their rooms and phone their selections into a call center that resides in the central kitchen. Call center attendants type orders into a computer, press a button and the order prints at the appropriate pod. Golf cart-style vehicles powered by electricity then tow the carts to the patient

floors. "We have to use this process because the meals are time sensitive," Dorsey says. Foodservice guarantees — unless there is an emergency — no more than one-hour delivery time from a patient's call to final delivery. Support

**A staff member driving an electric golf cart-like vehicle tows the cart holding food for At Your Request room service orders.**

*Photo by Albin Khouw*



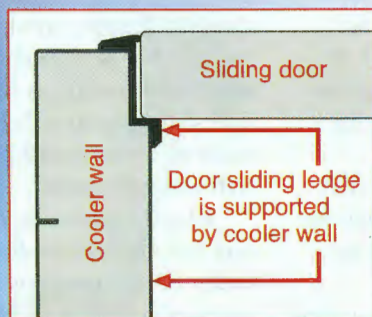
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On a patient floor in the Weinberg building, a 700-square-foot galley allows staff to assemble and/or retherm meals for patient consumption.

Photo by  
Albin Khouw

rooms have speed ovens for heating late trays and nontraditional meals.

"All towers offer room service," Dorsey says. "But patients must be pre-qualified to use this system. For example, patients who are too sick won't use the system."

### Cool Features Shine

"Since this project only involved the back-of-house central production kitchen, one of the highlights from an interior perspective is how bright the kitchen is," Khouw says. "Light-colored epoxy floors, fiber-reinforced plastic that lines the wall panels, and fluorescent light fixtures give the kitchen a daylight appearance throughout the day. Employees are much happier and more productive working in an environment that is bright and fresh."

Another notable feature is the insulated paneling that encloses the cold rooms for produce processing and garde manger. This insulation keeps the rooms at proper temperatures.

For wares, staff use separate retrieval carts to avoid cross-contamination. On the patient floors, staff place soiled wares into the retrieval carts and send them down to the basement level in elevators. Once on the ground floor, the carts are connected to the towline, an in-ground rail system that carries them on a track between the hospital buildings and the central kitchen. Staff use radio-frequency technology to track the carts to ensure they get to the proper destination.

Staff receive the retrieval carts from a spur located in the corridor to the left of the dishroom and break down the carts at dishtables located along the southern side of the dishroom. The staff empty retrieval carts and move them north to be loaded into the pass-through cart washer and into storage.

"Energy conservation and labor management in a 30,000-square-foot kitchen is not an option but rather a key component in the design," Khouw says. "The use of a parallel refrigeration rack system, which is more energy efficient, provides added benefit or redundancy in case a compressor should fail. Also, variable fan-drive motor/controls allow cooking hoods to modulate their exhaust speed depending on how much cooking is occurring below the hood. In addition, fryers allow waste-oil reclamation. Careful consideration was made to create spatial adjacencies that promote cosharing of staff and synergism."

Johns Hopkins is world renowned for its excellent health-care and advanced medical technology. As one might expect at a facility of this enormous size and scope, systems are continuously reviewed and adjusted, and the foodservice is no exception.

"This operation is very complex with multiple moving parts serving a population with multiple needs," Dorsey says. "We must be on top of our game at all times. This is a huge challenge, and we've had to reevaluate all our systems and equipment usage to ensure they work in the real world. We're very fortunate that this hospital is willing to make the investment so we can do our jobs well." **FE&S**