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Transforming St. Francis Hospital's Emergency Department: Split-Flow Design Improves Patient Satisfaction, Experience



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It's no secret that Colorado's population, and that of El Paso County in particular, is booming. The U.S. Census Bureau estimated that El Paso County's population grew by 10.6 percent between 2010 and 2016, with the population continuing to grow. St. Francis Medical Center is one of two hospitals that make up Penrose-St. Francis Health Services, part of Centura Health, in Colorado Springs and serves all of El Paso County. Since 2008 the emergency department, a Level III trauma center, has experienced a 50% increase in patient volume and now serves 47,000 patients per year.

In response to this growing population and increasing patient volumes, SFMC undertook a major expansion resulting in a four-story 168,000-square-foot addition that increases the number of beds in the level III NICU, provides 10 new operating rooms, and features a brand-new, state-of-the-art trauma Level III emergency department. Through extensive research and a highly collaborative design process, the ED moved to a split-flow model of care, significantly improving staff efficiency and patient satisfaction while reducing patient wait times. This was achieved through early triage to assess the severity of illness and the particular needs of the patient, more accurate patient room assignments, clarified wayfinding, improved ease of patient/family communication with staff, and improved organization of staff stations and resource layout. All this in an ED that is as beautiful as it is efficient and functional.

• **Design process.** The design team underwent an immersion experience in which they shadowed and observed the operations within the existing ED for a 12-hour period that overlapped with a staff shift change. One key observation during the immersion process was the limitation of the existing pod model. The geometry of the pod model compromised staff interaction and collaboration due to the limited ability of the staff to see and interact from one staff work area to the next, inherently creating silos.

In addition to immersion, a design advisory group also was formed; it consisted of key personnel including ED physicians, managers, nursing staff, the architect, the engineering consultants and the general contractor. This DAG undertook tours of other EDs that represented various flow and organizational models, including traditional triage, split-flow, direct bedding, on-stage/off-stage, inner core and ballroom models. During these site visits, the DAG was able to speak directly with nurses and physicians to see and hear first-hand how their ED was performing. The design team then applied those lessons learned to the new design.

Finally, the DAG tested the models against one another through paper simulations, mockups and scenarios run with staff and physicians.

• **The move to the split-flow care model.** Through the collaborative exploratory predesign process patient volumes, department statistics and patient experience

Project Location: Colorado Springs

ED Features:

- Split-flow design
- IPD tri-party agreement facilitating a highly collaborative design process with owner, design team, general contractor and trade partners
- Four intake rooms/ESI assessment
- Six super track exam rooms
- CT and X-ray with internal results waiting
- Linear ballroom at main ED with 27 exam rooms, one trauma room and two resuscitation rooms
- Six observation rooms (less than 24 hours)
- Shell space for growth of observation and exam rooms
- Four behavioral health rooms with family waiting, patient shower/restroom in a secured area
- Dedicated trauma elevators from lower level ambulance bay with direct access to ED and OR levels
- Local artwork
- Daylighting

Owner: Penrose-St. Francis Health Services and Centura Health

General Contractor: GE Johnson Construction Co.

Subconsultants:

Emergency Department Consultants: Zilm & Associates & X32 Healthcare

Structural Engineering: MGA Structural Engineers

Mechanical, Electrical and Plumbing Engineering:

The RMH Group

Civil Engineering: Kiowa Engineering

Landscape Architecture: Ground Logic

Soils and Testing: Kumar & Assoc.

Size: Expansion gross area: 168,580 SF; ED area: 79,045 SF

Cost: \$100 million (for the entire expansion including renovations, parking garage, ED, NICU, additional operating rooms and FF&E)

Delivery Method: Integrated Project Delivery with multiparty agreement

Design: September 2015-October 2016

Construction: May 2017-February 2019

Design Team: RTA Architects



RTA Architects and Time Frame Images
The waiting room at the new St. Francis Medical Center ED features natural daylight and mountain views.

were also evaluated. As a result, the team determined a split-flow model, utilizing an intake process to assign a patient's Emergency Severity Index, would be a key design element.

An important feature to provide the ESI assessment are four intake rooms, which incorporate throughput flow utilizing an on-stage/off-stage door configuration. Patients are called directly from the primary waiting area into one of the four intake rooms, where patients' vitals are taken and their ESI is as-

sessed. The patient is then taken directly into the super track, or main ED. The super track contains six exam rooms set up identically to the main ED exam rooms, thus improving staff efficiency. "The super track is like an urgent care on steroids, combining the best of both an urgent care and a full-service ER," remarked Dr. Michael Roshon, M.D., PhD, medical director of clinical transformation. "Patients are quickly assessed and treated, like in an urgent care, with resources of the ER readily available if needed." Other features of the new ED include an ED-dedicated CT and X-ray, results waiting, staff work areas illuminated by natural daylight from an overhead skylight, and a waiting room that features mountain views.

• **Project goals met.** "As an emergency physician, the ED design is as close to perfect as I have seen with triage, fast-track, an internal waiting area, and other areas designed to integrate seamlessly for the patient and our staff," said Penrose-St. Francis Health Systems President and CEO Brian Erling, M.D.

1. Goal 1, expanded number of beds to serve a growing population: The number of patient beds in the new ED was almost doubled over the previous ED design.

2. Goal 2, decreased patient wait times and increased patient satisfaction: The average wait time decreased to just 10 minutes (door-to-doctor). The SFMC ED has also seen a 30% increase in patient satisfaction since its opening. \\\

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