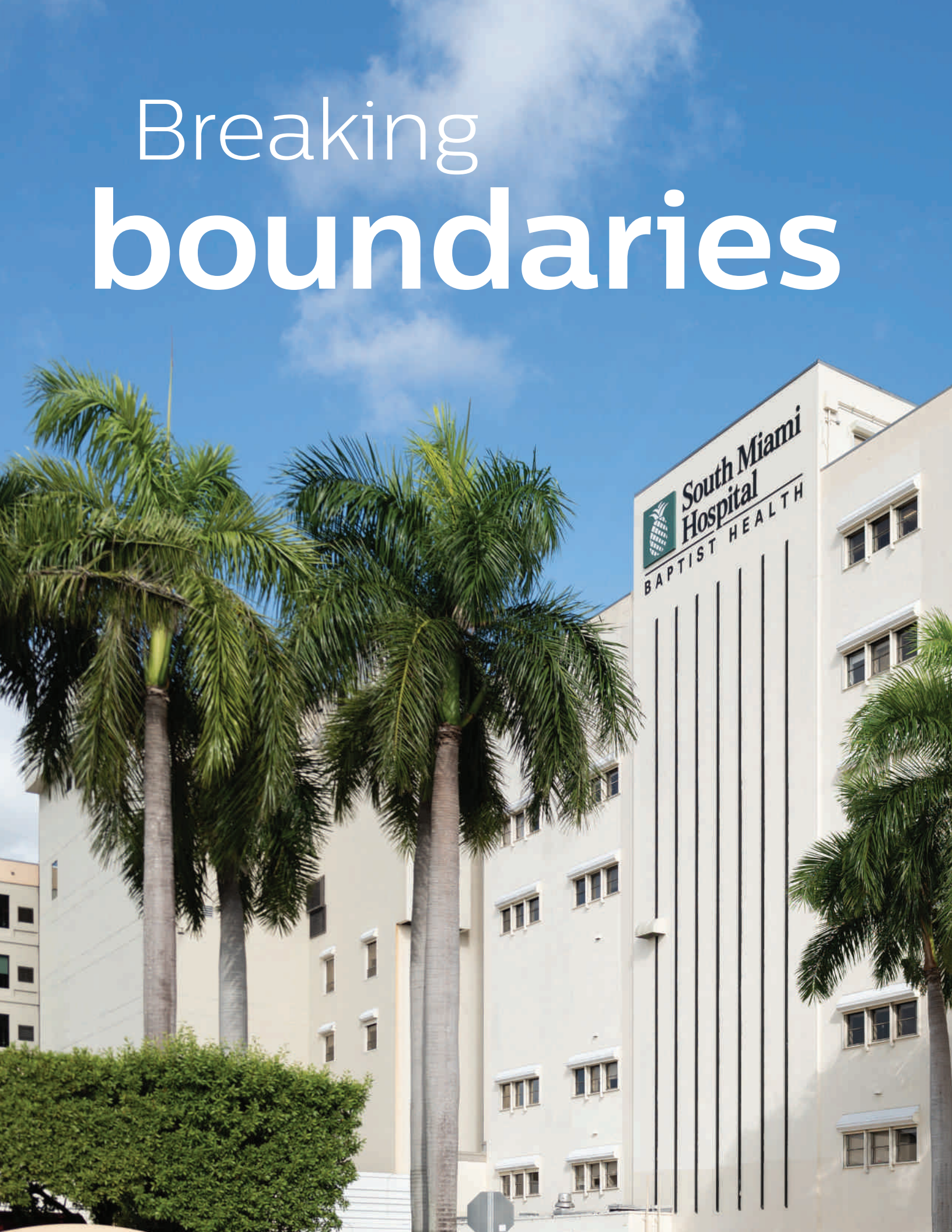
Baptist Health South Florida

Breaking Boundaries:

Taking eICU into New Care Settings

PHILIPS

Breaking boundaries



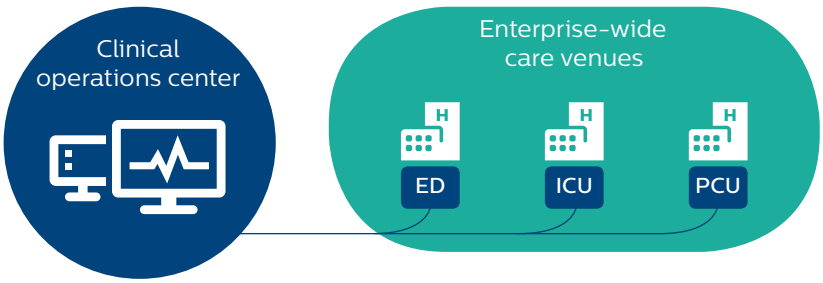
Taking eICU into New Care Settings

Leveraging Philips eICU program, Baptist Health South Florida managed to:

- Reduce hospital mortality by 23%[3]
- Decrease mortality and length of stay for patients in progressive care units[5]

As a pioneer in the field of ICU telemedicine, Baptist Health South Florida knows the importance of innovation and leveraging technology to improve the quality of healthcare. In 2005, it became the first health system in the Southeast to establish an eICU to remotely monitor critically ill patients. Since then, tele-ICU adoption has significantly grown across the country and Baptist Health has also expanded its eICU Program far beyond its original intent. From its origins in the intensive care unit (ICU), the telehealth program has evolved into a clinical operations center, scaling as patients age and diseases become more complicated. Furthermore, by investing in the right technology framework and clinical expertise, the Baptist Health eICU helped paved the way for other telehealth programs.

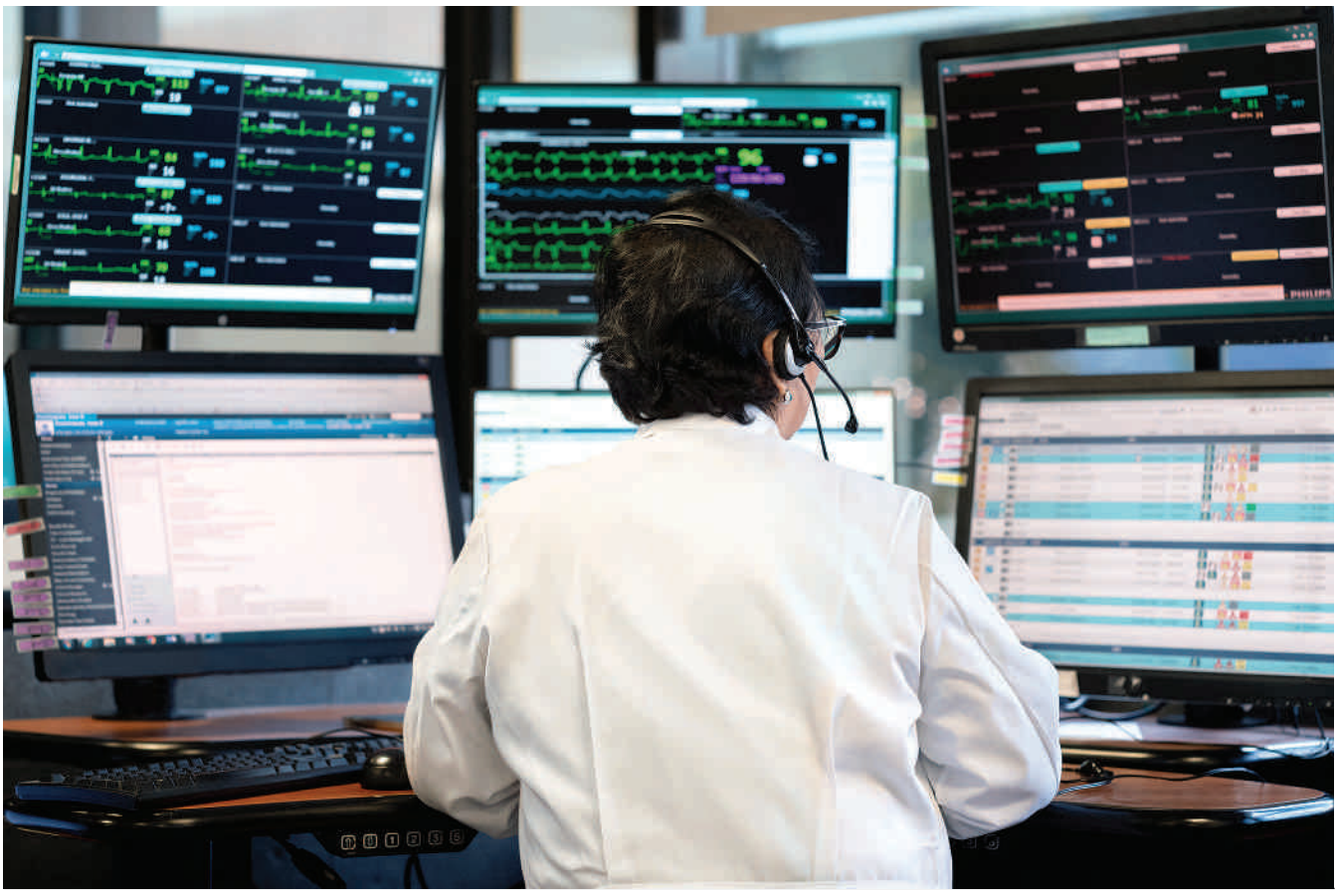
Communication and collaboration across distances and care venues



Seeing a growing demand for critical care services

Improved life expectancy, a growing aging population, and enhanced healthcare delivery have all contributed to rising demand for critical care services in the United States, even as the supply of critical care specialists falls.[1] The care of critically ill patients accounts for a large portion of national healthcare costs, with more than 5.7 million patients admitted annually to ICUs in the U.S. and annual costs exceeding $82 billion annually.[2] "The ICU is a significant portion of the budget of every hospital – it holds their sickest patients and that's where the hospital spends the most resources on the care of their patients," says Louis T. Gidel, M.D., PhD, FCCP, Chief Medical Informatics and Quality Officer at Baptist Health South Florida.

Baptist Health initially explored eICU as a way to standardize care delivery across all critical care units throughout the health system. At that time, only about half of the system's hospitals had 24/7 bedside intensivist coverage, and there was not a good process in place to ensure standardization of care and adherence to best practices. The Baptist Health eICU now monitors six hospitals and 16 units across the health system, including ICUs, progressive care units, and emergency departments. While the original concept of Baptist Health's eICU program was simply to augment the limited number of critical care physicians and nurses, it has since evolved to become a more complete monitoring system that utilizes the latest technology and clinical decision support tools to provide the best care possible to all patients.



Improving capacity management with an integrated virtual care center

Telehealth in general and eICU in particular are important components of the virtual hospital strategy that health systems throughout the country are increasingly adopting. Virtual care serves patients across the entire care continuum, from virtual visits for low-acuity conditions to remote patient monitoring for chronic care management to specialty care like tele-ICU.

A recent study by the Institute of Healthcare Improvement found that ICUs are the highest cost area of hospitals and pose the greatest risk for hospital-acquired infections, and that bottlenecks in ICUs can have a very negative impact on hospital-wide patient flow.[7] What occurs in the ICU can therefore have a downstream impact which can further exacerbate cost pressures. The eICU Program can help address these issues by using advanced clinical decision support (CDS) tools to improve patient flow by identifying which patients can be discharged sooner, opening up beds, and preventing bottlenecks. It can help create capacity by focusing clinicians on the patients who need them most to reduce mortality, maximize adherence to clinical best practices, and shorten length of stay. It can also optimize existing capacity by helping to ensure the right resources are in the right place at the right time to remove bottlenecks within and across facilities.

eICU helps improve outcomes in support of the quadruple aim[9]

Creating a clinical operations center to improve outcomes and efficiency

Baptist Health used a phased approach to eICU integration, gradually bringing its network of hospitals live and creating a centralized "clinical" operations center by introducing the new technology and workflows. Baptist Health's eICU implementation delivered a significant reduction in patient length of stay, without increasing the need for more critical care beds or associated staffing costs.

Baptist Health has also seen increased efficiency among staff. "The automated acuity of the eICU software allows our clinical staff, nurses, and physicians to manage workflows so instead of hunting through which cases need to be managed, we can go directly to where we are needed most, as set by the algorithms of that acuity score. This makes us more efficient and puts resources where they are most needed," says Dr. Eduardo Martinez-Dubouchet MD, Associate Medical Director, eICU Baptist Health South Florida.[4]

This has led to significantly improved patient outcomes. In 2012, a three-year study of Baptist Health's eICU was published in the journal Critical Care Medicine.[3] It reviewed 24,656 adult eICU patients and showed:

14% decrease in the severity-adjusted length of stay in the hospital,

13% decrease in the length of stay in the ICU,

23% decrease in mortality after tele-ICU implementation as compared to before implementation.[3]

Furthermore, as tele-ICU was implemented in additional care venues beyond the ICU, total tele-ICU operational costs diminished **from $2,300 to around $750** per patient stay.[4]

Extending the eICU's reach through telepharmacy

One novel initiative born from the Baptist Health eICU is that of telepharmacy. The impetus for having a pharmacist in the eICU was to ensure the same level of care for all patients in all monitored units, and to provide an extra layer of clinical expertise by leveraging scarce clinical pharmacist resource. The telepharmacist provides an extra set of eyes in the eICU for clinical pharmacy issues in much the same way as the eICU doctors and nurses support their respective areas. Importantly, the telepharmacists do not represent a duplication of services delivered at the bedside, but rather a complement. They are an important, readily available resource for the bedside clinical pharmacists, nurses, and the eICU doctors as needed or requested. This has been particularly helpful during emergency situations when ICU patients are deteriorating rapidly and complex interventions are needed.

The scope of the telepharmacist role has also expanded in recent years to home care. For patients being discharged from hospital to home, adequate medication reconciliation can be especially challenging. During this transition phase, patients can be particularly vulnerable and many home care clinicians have limited knowledge necessary to safely reconcile complex medication regimens. Baptist Health South Florida is one of the only home care agencies in the nation offering free consultations with a pharmacist by phone or two-way audio conference. It is especially beneficial for patients with multiple conditions, a recent hospitalization, or who had a recent fall. By utilizing the telepharmacist, it took the burden of medication reconciliation off of the home care nurses and physical therapists. Patients were also very grateful to have access to expert consults, and readmission rates for home care patients have been consistently lower than national rates.

Expanding into progressive care units

While there are many studies about the effects of telemedicine in the ICU, which has helped fuel the growth of tele-ICU programs nationwide, Baptist Health was one of the first health systems to expand tele-ICU coverage to patients in progressive care units (PCUs). PCUs manage patients who need an "intermediate" level of care – more oversight than what is typically provided in general wards, but less than in an ICU.[5] Baptist Health recognized that by expanding its eICU Program to monitor PCU patients, it could provide a high standard of care at a lower cost than in the ICU.

Evidence supports the rationale for this expansion of eICU services. A study conducted by Baptist Health's tele-ICU department analyzed outcomes and quality measures from 19,530 inpatients at six of its hospitals. It found significantly decreased mortality and a shorter length of stay in tele-ICU patients in the PCU setting, even though the PCU telemedicine patients were older and had higher disease severity and risk of mortality.[6] The study showed how effective an enterprise-wide approach could be and how telehealth innovation could be deployed across much broader hospital populations than ICU patients. "Once you have built this [eICU] platform with your ICUs and once you have built the team and established the correct workflows to affect patient outcomes, the natural evolution is to take these telehealth services and expand them to other areas of the health system," says Dr. Martinez-Dubouchet.[4]

Improving performance data analysis with interactive reporting tools

As eICU has matured, one way Baptist Health has augmented its program is through use of Philips' separate reporting tool, eSearch, which is designed to capture eCareManager data from discharged patients and to support reporting, ad-hoc analysis, tracking, graphing, and exporting for use with other health system data. It transforms raw clinical data into actionable patient level insights, and its on-demand queries allow for near real-time operational adjustments in sync with quality and performance metrics.

Baptist Health has been using eSearch since October 2016 to send monthly reports to every ICU, which enables each unit to better understand how they are performing relative to each other and where they can improve. By increasing visibility and transparency around data such as vent days, eSearch better enables each ICU to actually improve results. The detailed graphs of results also opened the door for the eICU to take a more active role in patient care and vent weaning.

The objective of eSearch is to enable customers to measure, track, and analyze their critical care performance, including:

- Operational performance metrics
- Identification of best practices
- Treatment utilization reviews
- Establishment of comparative norms, benchmarking
- Longitudinal studies

Realizing the value in Philips partnership

By investing in the right technology framework and clinical expertise, the Baptist Health eICU Program has helped pave the way for other telehealth programs. While the original concept was simply to augment the limited number of critical care physicians and nurses, it has grown into a complete monitoring system that uses cutting edge technology and clinical decision support tools to provide the best care possible to all patients.

"By focusing on outcomes and decreasing healthcare costs and volume, I think this eICU program has helped position us for the future of accountable care," says Dr. Martinez-Dubouchet. "This has been a partnership which has provided us with both the necessary tools and context. But it is much more than just the software and tools. It is a group of hospitals that share best practices."[4]

Adds Dr. Martinez-Dubouchet, "The partnership with Philips has allowed both of us to innovate at the same time… just as Philips has helped us use the services that they've provided, we've also helped them understand what has been more useful to develop within the eICU platform, and where changes have made it friendlier to integrate the platform into our system."[4]

> "Our partnership with Philips has been incredibly valuable for both sides . . . not only to demonstrate the value of what we do, but also to show us so many other ways in which we can innovate."
>
> Philipp Ludwig, Chief Operating Officer, Clinical Enterprise Corporate Vice President

Baptist Health Telehealth Program

Launched in December 2005

- Enhanced surveillance (ICU, PCU, ED) – clinical analytics
- 24/7 Intensivists & Critical Care Nurses
- Telepharmacists – 7 days a week
- 24/7 Transfer & Logistics center

Paved the way for…

- Telestroke
- Telepsychiatry
- Home Care Telepharmacy
- Tele-endocrinology
- Tele-NICU
- Teletriage
- Virtual Sepsis Unit
- Virtual Sitter
- Remote ED consults
- Direct to Consumer services
- Emergency Operations

About Baptist Health South Florida

Baptist Health South Florida is the largest healthcare organization in the region, with 11 hospitals, nearly 23,000 employees, more than 4,000 physicians and more than 100 outpatient centers, urgent care facilities and physician practices spanning across Miami-Dade, Monroe, Broward and Palm Beach counties. Baptist Health has internationally renowned centers of excellence in cancer, cardiovascular care, orthopedics and sports medicine, and neurosciences. In addition, it includes Baptist Health Medical Group; Baptist Health Quality Network; and Baptist Health Care On Demand, a virtual health platform. A not-for-profit organization supported by philanthropy and committed to our faith-based charitable mission of medical excellence, Baptist Health has been recognized by Fortune as one of the 100 Best Companies to Work For in America and by Ethisphere as one of the World's Most Ethical Companies. For more information, visit BaptistHealth.net/Newsroom and connect with us on Facebook, Instagram, Twitter and LinkedIn.

About Royal Philips

Royal Philips (NYSE: PHG, AEX: PHIA) is a leading health technology company focused on improving people's health and enabling better outcomes across the health continuum from healthy living and prevention, to diagnosis, treatment and home care. Philips leverages advanced technology and deep clinical and consumer insights to deliver integrated solutions. Headquartered in the Netherlands, the company is a leader in diagnostic imaging, image-guided therapy, patient monitoring and health informatics, as well as in consumer health and home care. Philips' health technology portfolio generated 2017 sales of EUR 17.8 billion and employs approximately 74,000 employees, with sales and services in more than 100 countries. News about Philips can be found at www.philips.com/newscenter.

About Philips eCareManager

Philips eCareManager software is the 510(k)* cleared technology at the core of eICU, enabling effective patient population management. eCareManager takes all patient data and translates it into meaningful information that helps providers identify patients most at-risk at any given moment and then allocates resources accordingly. As a centralized database, it ensures care teams, both bedside and remote, always have access to the same information for effective care coordination.

*510(k) indicates Food and Drug Administration (FDA) registered cleared

1. Pastores SM, Kvetan V. Shortage of intensive care specialists in the United States: Recent insights and proposed solutions. *Revista Brasileira de Terapia Intensiva.* 2015;27(1):5-6
2. Society of Critical Care Medicine, http://www.sccm.org/Communications/Critical-Care-Statistics
3. Willmitch B, Golembeski S, Kim SS, Nelson LD, Gidel L. Clinical outcomes after telemedicine intensive care unit implementation. *Journal of Critical Care Medicine.* 2012; 40(2): 450-454.
4. Interview with Dr. Eduardo Martinez-Dubouchet MD, Associate Medical Director, eICU Baptist Health South Florida
5. Armaignac DL, Saxena A, Rubens M, Valle CA, Williams LS, Veledar E, Gidel LT. Impact of Telemedicine on Mortality, Length of Stay, and Cost Among Patients in Progressive Care Units: Experience from a Large Healthcare System. Journal of Critical Care Medicine. 2018; 46(5): 728-735.
6. Ibid
7. IHI Achieving Hospital Wide Patient Flow 136, 137: http://www.ihi.org/resources/Pages/IHIWhitePapers/OptimizingPatientFlowMovingPatientsSmoothlyThroughAcuteCareSettings.aspx
8. Willmitch B, Golembeski S, Kim SS, Nelson LD, Gidel L. Clinical outcomes after telemedicine intensive care unit implementation. Journal of Critical Care Medicine. 2012; 40(2): 450-454.
9. Bodenheimer T, Sinsky C. From triple aim to quadruple aim: care of the patient requires care of the provider. Ann Fam Med. November/December 2014;12:573-576. doi: 10.1370/afm.1713.

www.philips.com