

**PHILIPS**

Consulting

White paper



Optimizing telemetry  
utilization to reduce  
length of stay and  
**improve patient capacity**

# Executive summary

Recent studies indicate telemetry monitoring is often used to monitor patients who do not have a clinical need for it. Telemetry overuse often results in extended length-of-stay (LOS), unnecessary testing and increased costs for devices, supplies, and staff time, and can negatively impact sustainability efforts. Nonessential telemetry use also increases the number of non-actionable alarms and unit noise, which in turn contributes to staff alarm fatigue and may influence negative patient responses on the HCAPS survey in relation to the ‘quietness around my room’ question. In addition, overuse of telemetry limits organizational capacity, leading to delayed admissions and unnecessary work.<sup>1,2,3</sup>

Performance improvement in the area of telemetry utilization is challenging and many institutions discover it requires a change in culture and practice. However, the effort has substantial benefit. Optimizing telemetry

utilization and workflow can provide increased capacity, improved efficiency, decreased length of stay, reduced workforce costs, and reduced device and supply use. The bottom line can include a solid return on investment.



# Telemetry utilization and capacity

Ideal patient capacity in an organization is characterized by a complex yet steady rhythmic flow through the institution. It begins at the access points including the emergency department, transfer center, direct admissions, and surgery and continues to discharge. In order to accommodate incoming patients, those already in-house need to flow efficiently through the system.

While much attention has been paid to alleviating issues at pain points like emergency department boarding and early discharge, less time has been spent evaluating the myriad of inpatient processes where bottlenecks may occur,<sup>4</sup> including telemetry utilization.

As related to telemetry, the **disruption in patient flow** can be linked to a number of factors, including:<sup>1,3,5,6</sup>

- **Overuse/overordering** of telemetry monitoring
- **Lack of education** regarding the evidence based guidelines for telemetry
- Inadequate system design to **control telemetry initiation** (order entry/engineering controls)
- Lack of or inadequate system design **to discontinue telemetry**

Any or all of these factors contribute to patients being placed on telemetry who have no clinical reason for such monitoring, often resulting in the inability to remove patients from it in a timely manner. Regardless of the reason, or combination of reasons, what develops is a **decrease in the organizational capacity to admit patients from access points and an increase in cost of care, LOS, and staff work.**

**Disruption in patient flow can be linked to:**



**overuse/  
overordering**  
of telemetry monitoring.<sup>5</sup>



**Lack of  
education**  
regarding the evidence based  
guidelines for telemetry.<sup>1</sup>



**Inadequate  
system design**  
to control telemetry initiation  
and discontinuance of  
telemetry.<sup>3,6</sup>



# Strategies to improve telemetry utilization

Strategies to improve telemetry utilization differ from organization to organization due to the contrasting factors impacting telemetry use, process for admission and ordering telemetry, and institutional culture. A key starting point for development of a successful change management strategy for telemetry utilization is to map the end-to-end telemetry workflow process. A second step is to assess the appropriate use of telemetry via an audit to establish a baseline and to understand the possible ROI of a performance improvement project.

Additional workflow mapping, utilization assessment, interviews with key stakeholders, and observation of telemetry use, will create a fuller picture of the overall organizational process and culture. However, once the initial telemetry workflow map and audit are completed, there should be enough information to begin to craft a strategy to reduce the amount of telemetry used in the organization. There are many strategies that can be applied to improving telemetry utilization including:<sup>1,3,5,6,7,8,9,10</sup>

- Development of **standardized protocols** based on published evidenced-based guidelines and key stakeholder input for initiating telemetry
- Use of the electronic health record (EHR) to create a **standardized order-set for initiation of telemetry** that requires use of items from published recommendations or a specific override document
- **Additional education and updating** on the importance of appropriate telemetry use, impact and benefits, and current evidence-based practice
- Development of a **“gate-keeper”** model where all telemetry has to meet given criteria or be reviewed prior to initiation – generally done in cooperation with a clinician overseeing bed control
- Development of a **timed reminder to reassess** telemetry need

- Development of an **automated telemetry discontinuation order** if not purposefully reviewed (time limited orders)
- Initiation of a **nurse-driven telemetry discontinuation protocol**, considered in collaboration with providers, for patients who have not had an event over a given period of time
- Initiation of a **telemetry review as part of provider rounding**, with the express desire to remove patients from telemetry who no longer meet criteria
- Use of **alterative monitoring strategies** (i.e. early warning systems) for patients who do not meet telemetry criteria, but might be at risk for some deterioration

The correct strategy, or combination of strategies, is contingent upon the results of the organizational assessment, culture, and openness to change. Implementing a performance improvement project should begin with a pilot and follow some version of the PDSA (plan-do-study-act) model. The project lead should be an internal or external expert with experience in managing change. Regardless of the strategies implemented, the project must include a plan to:

- **Embed the change**
- **Monitor near miss/adverse event reporting**
- **Incorporate telemetry ordering guidelines and expectations into onboarding**
- **Review and update the criteria annually**

The creation of a Telemetry Dashboard is ideal to track daily telemetry use and other key performance indicators (KPIs) for capacity and flow. This dashboard can become a part of the monthly quality performance reporting and can be used to evaluate the sustainability and impact of the changes over time.

# Successful outcomes

There are a number of examples referenced herein that illustrate successful telemetry utilization performance improvement projects. Each successful project was custom designed for the specific organization. One well-designed and well-documented project was by Dressler and his colleagues.<sup>3</sup> Their project was launched and then monitored over time for impact. The end results included a 47% decrease in the duration of telemetry monitoring, 43% decrease in telemetry orders written, 70% overall decrease in telemetry with no adverse patient events, and a cost savings of \$4.8 million.<sup>10</sup> Dressler and colleagues also reported improvements in patient flow from the emergency department.

Chong-Yik, et al. (2018),<sup>11</sup> created a performance improvement project that found 76.5% of telemetry days in their audit were not appropriate and produced no arrhythmias on the inappropriate monitoring days. The study also found their organization could save over \$500,000 annually by optimizing telemetry use.

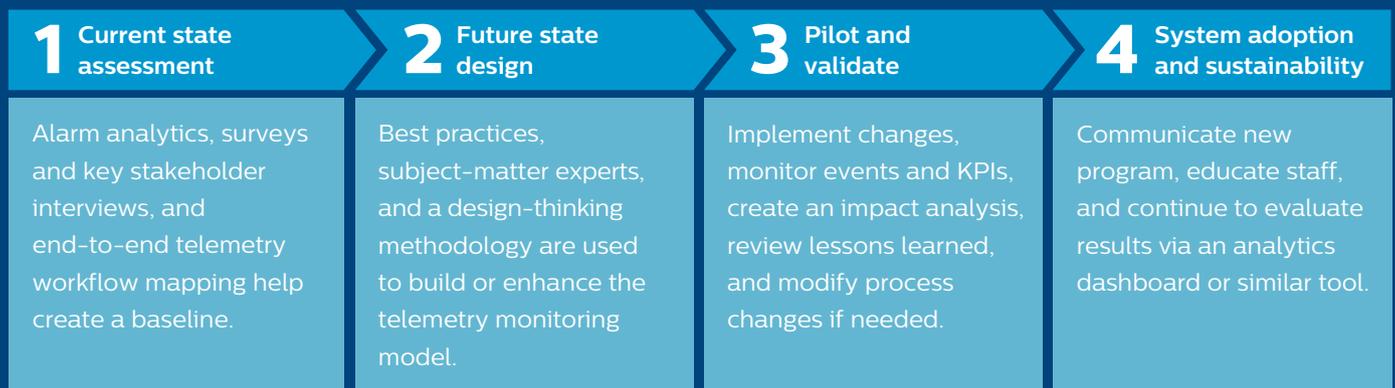
This team identified additional savings through cost avoidance of unnecessary consults, labs, and 12 lead ECG procedures.

One of the most recent publications, Chahine, et al. (2019),<sup>1</sup> revealed a 23.1% decrease in the use of telemetry as they implemented their interventions. Their interventions included a multifaceted education program and a process for reconciliation of telemetry orders on transfer out of the ICU.

Recent Philips projects have produced similar assessment data suggesting that up to 90% of telemetry in a non-cardiac telemetry unit did not meet published guidelines.

All of these success stories share some commonalities. These include baseline audits, rigorous data collection and management, use of published best practice guidelines, and targeted interventions. The ability to create this level of impact requires a strong performance improvement structure, but the results are telling.

**Our Philips clinical consultants provide guidance on alarm and noise management, telemetry utilization and capacity planning, process and workflow improvement, and more. The below approach is used for telemetry programs, with customization to meet each institution's needs.**



# Conclusions

Performance improvement in the area of telemetry utilization is not simple and may require a change in culture and practice. However, when successfully done, the work can help improve patient flow and release needed capacity.

Telemetry optimization also can produce significant ROI based on cost savings and cost avoidance through decreased LOS, elimination of unnecessary staff hours, decreased unneeded testing, and supply savings. An additional area of savings which is not always considered is the costs associated with the battery disposal process - which also has an impact on the environment



Decreased length of stay



Elimination of unnecessary staff hours



Decreased unneeded testing



Supply savings

## About the author

**John C. Davanzo, MBA, BSN, RN, CEN, CHSE, NEA-BC, FACHE** brings extensive expertise in hospital operations, workflow, and process redesign. He has led a number of consulting engagements related to telemetry optimization. His clinical expertise includes emergency care, pre-hospital care, and pediatric and adult ICU care. He is a regular presenter on various topics including healthcare efficiency, use of simulation in healthcare, and emergency preparedness. He is a Fellow in the American College of Healthcare Executives. John is a consulting manager with Philips and can be reached at [john.davanzo@philips.com](mailto:john.davanzo@philips.com).

## Learn more

Through collaborative and people-focused engagements, Philips Healthcare Transformation Services can help develop innovative solutions to solve your most complex challenges of care delivery. We can help you achieve meaningful and sustainable improvements in clinical excellence, operational efficiency, care delivery, and financial performance to improve value to your patients. For more information, please visit [www.philips.com/healthcareconsulting](http://www.philips.com/healthcareconsulting).

## References

1. Chahine, J., Thapa, B., Gosai, F., Abdelghaffar, B., Al-Ashi, S., Maroo, A., et al. (2019). Interventions to decrease overuse of cardiac monitoring (telemetry) when transitioning from the intensive care unit to the regular nursing floor. *Cureus*. 11(3). <https://doi.org/10.7759/cureus.4311>
2. Beier, M., Morgan, D.J., & Gulati, M. (2015). Educating residents why less is more with telemetry. *JAMA Internal Med*. 175(5): 864-865. <https://doi.org/10.1001/jamainternmed.2015.0234>
3. Dressler, R., Dryer, M.M., & Coletti, C. (2014). Altering overuse of cardiac telemetry in non-intensive care unit settings by hardwiring the use of American Heart Association guidelines. *JAMA Internal Med*. 174(11): 1852-1854. <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1906998>
4. Faulkner, L. (2020, Jan 20). Three strategies for improving emergency department flow, crowding [blog post]. *Managed Healthcare Executive*. Retrieved from <https://www.managedhealthcareexecutive.com/news/three-strategies-improving-emergency-department-flow-crowding>
5. Maduke, T., Qureshi, B., Goite, Y., Gandhi, K., Bofarrag, F. Liu, L., et al. (2019) Monitoring the use of a telemonitor: A resident run quality improvement initiative decreases inappropriate use of telemonitor in a community hospital. *Cureus*. 11(11). <https://doi.org/10.7759/cureus.6263>
6. Henriques-Forsythe, M.N., Ivonye, C.C., Jamched, U., Kamuguisha, L.K.K., Olejeme, K.A., and Onwuanyi, A.E., (2009). Is telemetry overused? Is it as helpful as thought? *Cleveland Clinic Journal of Medicine*. 76(6): 368-372. <https://doi.org/10.3949/ccjm.76a.07260>
7. Stoltzfus, K.B., Bhakta, M., Shankweiler, C., Mount, R.R., & Gibson, C. (2019). Appropriate utilisation of cardiac telemetry monitoring: a quality improvement project. *BMJ Open Quality*. <https://doi.org/10.1136/bmj-joq-2018-000560>
8. Brug, A.M., Hudson, K.M., Moore, R., & Chakraborti, C. (2018). Choosing telemetry wisely: a survey of awareness and physician decision-making regarding AHA telemetry practice standards. *Journal of General Internal Medicine*. 34(4): 496-497. <https://doi.org/10.1007/s11606-018-4769-z>
9. Sandau KE, Funk M, Auerbach A, Barsness, G.W., Blum, K., & Cvach, M. et al. (2017). Update to practice standards for electrocardiographic monitoring in hospital settings: a scientific statement from the American Heart Association Circulation. 136(19):e273-e344. <https://doi.org/10.1161/CIR.0000000000000527>
10. Monegain, B. (2014, Sep 6). How IT helped Christiana Care save \$4.8M. *Healthcare IT News*. Retrieved from <https://www.healthcareitnews.com/news/how-it-helped-christiana-care-save-48m>
11. Chong-Yik, R., Bennett, A.L., Milani, R.V., & Morin, D.P. (2018). Cost-saving opportunities with appropriate utilization of cardiac telemetry. *American Journal of Cardiology*. 122:1570-1573. <https://doi.org/10.1016/j.amjcard.2018.07.016>

