

Title: A data-driven, care-centric approach to nurse staffing

BACKGROUND: Nurse managers often allocate excessive non-productive time during schedule creation, resulting in overtime & understaffing issues. Discussions with nursing leaders revealed a lack of understanding of how much non-patient care time could be utilized during the scheduling process while preserving the resources needed for patient care.

METHODS: To optimize resource allocation when creating nursing schedules, a simple mathematical modeling approach that considers required patient care resources & various factors that prevent employees from participating in patient care, including orientation, leave, & other scenarios, can determine the maximum amount of replacement (non-productive) time that can be scheduled each week while ensuring the necessary resources for patient care are preserved. This approach can help nurse managers make more informed scheduling decisions, maximize resource utilization & deepen the understanding of their budget. Leveraging care-centric modeling and the expertise of informatics nurses can help to facilitate increased communication and collaboration between nursing and finance.

DISCUSSION: The nursing FTE budget is the foundation of staffing & scheduling operations. The budget calculates the resources needed to provide the desired level of care for an expected volume of patients & the amount of time off & education employees are expected to take. Variations in available resources impact the capacity to provide patient care, time off, education, orientation, & leave.



Interrelated mathematical & informational layers can be used to describe the budgeting, scheduling, & staffing processes. Resource variances in the Budget & Position Control layers will flow through to the Schedule & Staffing layers. The resources available in the staffing layer heavily influence patient outcomes & a variety of quality, safety, & financial metrics.

Care-Centric Modeling

Care-Centric Modeling is a resource allocation model that considers the resources required for patient care, orientation, leave, & other scenarios that prevent employees from independently participating in patient care. By deducting these variables from the available resources, we can determine the number of hours that can be allocated each week for non-patient care shifts while reserving the resources needed for patient care.

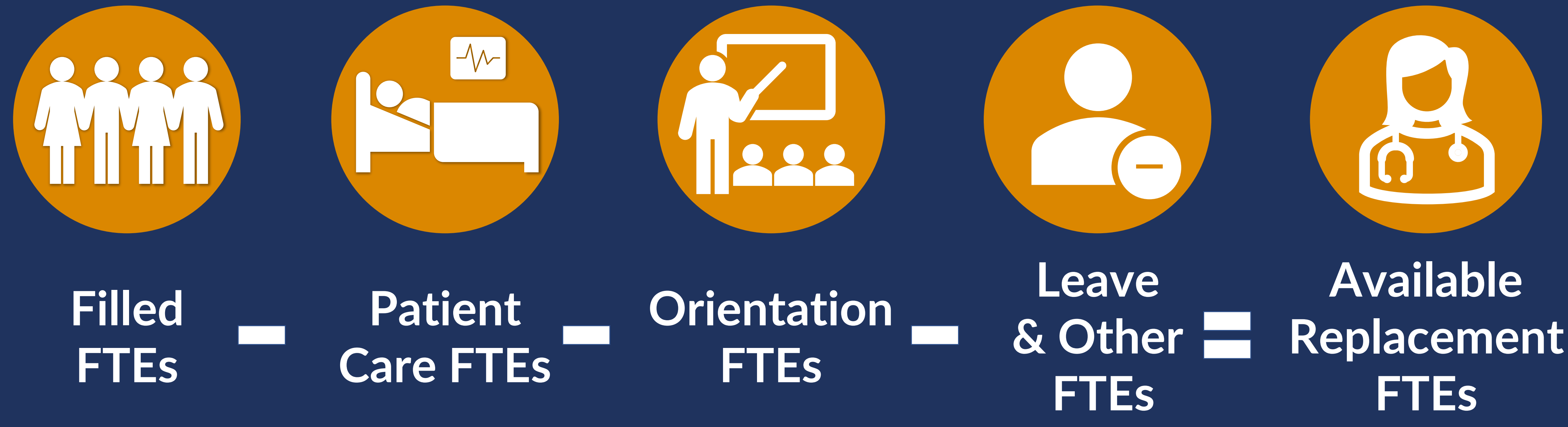


This approach prioritizes patient care needs while defining the resources available for non-patient care shifts.

Scheduling more than the available replacement hours will create unfilled shifts at the bedside.

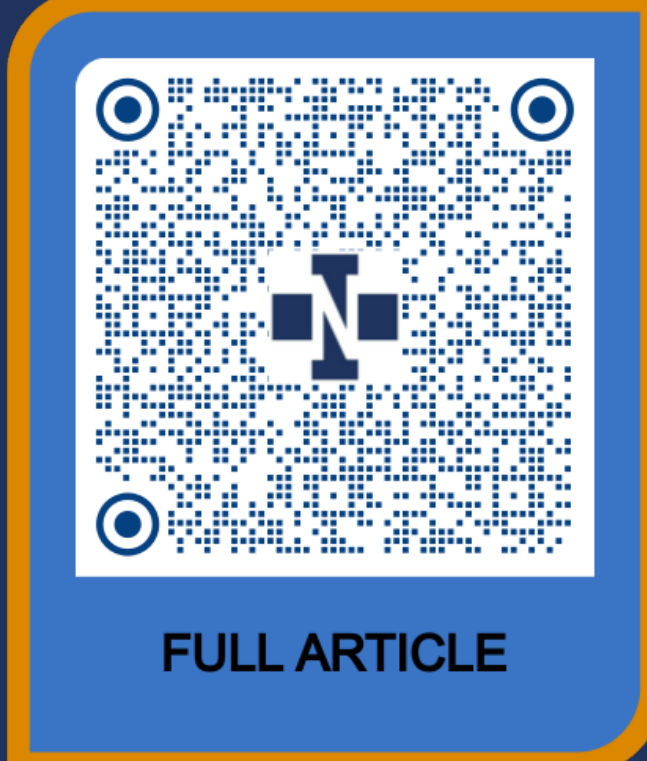
As the resources available to provide time off & education decrease, our capacity for delivering safe & effective care decreases.

Solve nurse understaffing with a data-driven, care-centric approach.



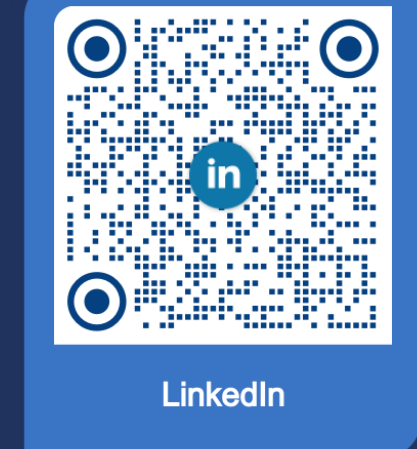
Simplified Care-Centric Modeling Calculations

Budgeted FTEs	Vacant FTEs	Vacancy Rate	Filled FTEs	-	Patient Care FTEs	-	Orientation FTEs	-	Leave + Other FTEs	=	Available Replacement FTEs	Available Replacement Hours / Week	Average Weekly Call In Hours	Net Available Replacement Hours / Week	Net Available Replacement 12-Hour Shifts / Week
30	0.00	0.0%	30.00	-	25.50	-	0.00	-	0.00	=	4.50	180	0	180	15
30	2.25	7.5%	27.75	-	25.50	-	0.00	-	0.00	=	2.25	90	84	6	0.5
30	3.00	10.0%	27.00	-	25.50	-	0.00	-	0.00	=	1.50	60	84	-24	-2
30	3.00	10.0%	27.00	-	25.50	-	2.70	-	0.90	=	-2.10	-84	84	-168	-14
30	4.71	15.7%	25.29	-	25.50	-	1.80	-	0.90	=	-2.91	-116.4	0	-116.4	-9.7

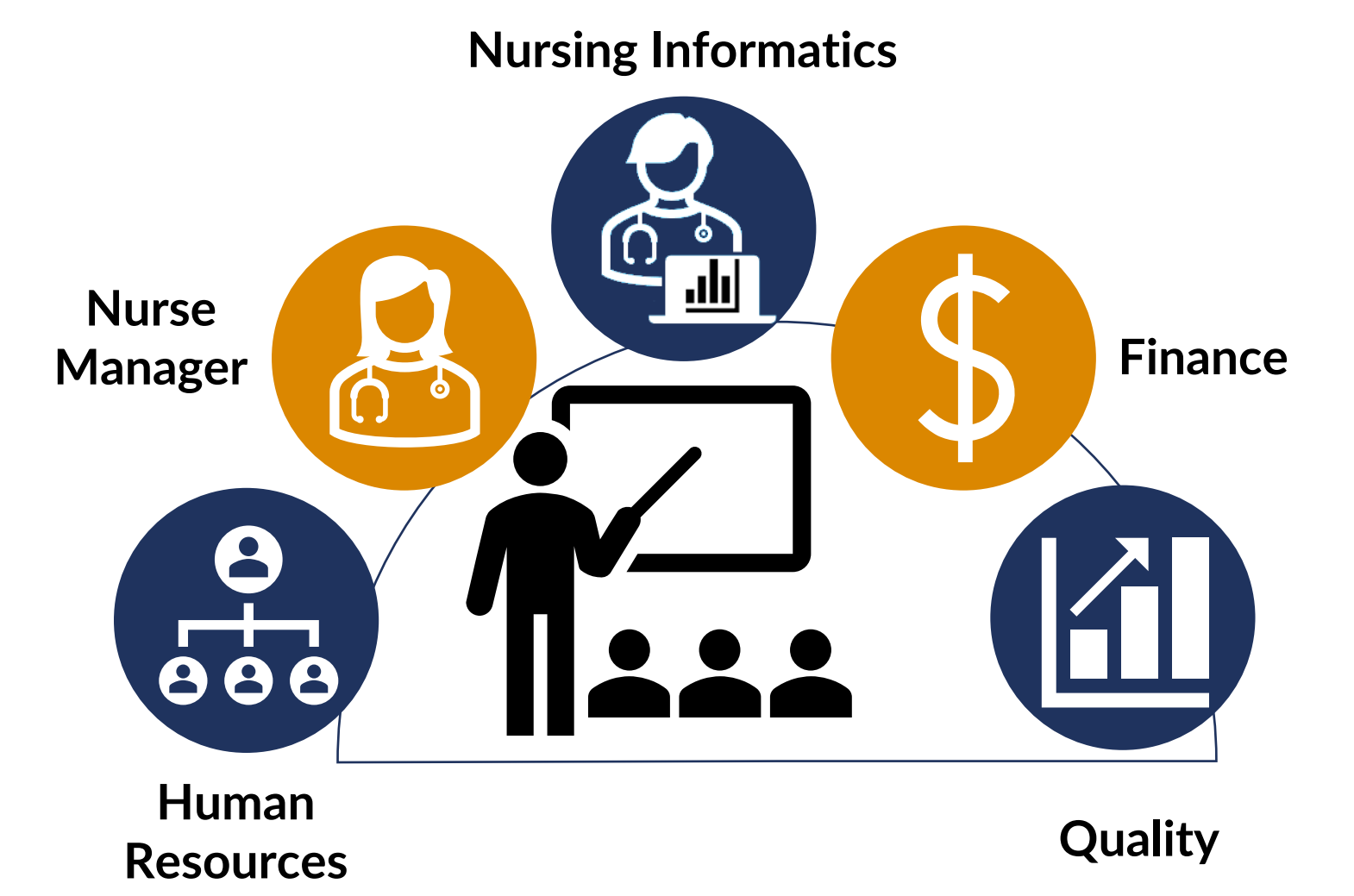


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Effective Workforce Management Teams



Informatics nurses leading multidisciplinary teams comprised of the nurse manager & representatives from finance, human resources, & quality could help guide the use, synthesis, & analysis of care-centric modeling, finance, quality, & position control data to better understand factors impacting nursing care delivery & outcomes.

This effective workforce management team could then provide assessments & recommendations to leadership on the source of problems & suggestions for mitigating the issues.

This team's work could help facilitate communication & collaboration between nursing & finance. By evaluating the data in FTEs, hours, & shifts, the analysis can act as a Rosetta Stone with the FTEs that finance prefers & the hours & shifts that make more sense to nursing.

Calculating this data for all skills on all units & aggregating it for executive leadership would provide powerful insights & assessments into the facility's capacity for patient care, time off, & education.

This is a low-overhead, high-impact process. The work can easily be accomplished with Excel & the expertise of the team members.

This approach represents an opportunity to optimize resource utilization while improving the quality of patient care & healthcare work environments. The informatics nurse can play a crucial role in leading these efforts, utilizing their expertise in systems & data analysis & their ability to bridge the gap between nursing & finance. By working collaboratively, the team can develop, recommend, implement, & evaluate strategies that could improve staffing, recruitment & retention, reduce burnout, enhance patient outcomes, & improve the cost-effectiveness of nursing care delivery.

CONCLUSION: Healthcare leaders & professional organizations must facilitate more debate, discussion, understanding, & research around the mathematics of nursing care delivery so we can accurately determine our nursing resource needs. By accurately assessing the shortfall, we can determine the effectiveness of proposed solutions, such as virtual nursing, robotics, artificial intelligence & tele-sitting, to close the resource gap & make better-informed decisions on the optimal allocation of available resources.

With their expertise in nursing & data & systems analysis, informatics nurses can play a crucial role in facilitating communication, collaboration, & education between nursing, finance, human resources, & quality improvement. They can also guide a more data-driven, care-centric, evidence-based, holistic approach to nursing finance & workforce management.

Nursing possesses the expertise to solve this problem, & we can look to our roots for inspiration. Florence Nightingale's groundbreaking use of data during the Crimean War was critical in establishing nursing as a scientific profession, saving innumerable lives, & transforming healthcare worldwide.

To address current staffing challenges, we can follow in Nightingale's footsteps by leveraging the power of data to understand our nursing workforce better, driving changes that lead to more effective workforce management. Additionally, we can provide simple, data-driven tools & education to empower nursing leaders to better advocate for their patients & staff while ensuring the optimal allocation of available nursing resources, resulting in healthier working environments & high-quality patient care. By adopting this approach, informatics nurses and nursing leaders can drive positive changes in nursing finance & workforce management that improve healthcare for all.