

Global hospital bed utilization crisis

A different approach

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ABSTRACT

الأهداف: اختبار الأثر الحسن في استخدام أسرة المستشفيات من قبل الطبيب .

الطريقة: تم إجراء دراسة اترابية استطلاعية خلال الفترة من 1 يناير 2009 وحتى 31 مارس 2009م في قسم الطب الباطني (DIM) – مدينة الملك عبد العزيز الطبية KAMC – الرياض – المملكة العربية السعودية. أجريت مقارنة بين وحدتي التعليم السريري (CTU) بطريقة المقابلة المباشرة. يوجد 3 استشاري في كل وحدة وفرت وحدة التحكم CTU الرعاية المعيارية، بينما تم تصميم وحدة التداخل بحيث توفر الطبيب – الاستشاري بشكل أفضل. تم تقييم 3 نتائج وهي تحويل المريض إلى مستشفى آخر، وخروج المريض في عطلة نهاية الأسبوع، وإجمالي التنويم في المستشفى. أجري التحليل الإحصائي بواسطة الحاسبة الإحصائية الإلكترونية في مركز الطب المبني على البراهين.

النتائج: تم تقييم 334 مريض من أجل تنويمهم بواسطة الوحدتين وذلك في قسم الطوارئ. فحصت وحدة التحكم 183 مريض حيث تم تحويل 6 مريض إلى مستشفى آخر، وتنويم 177 مريض. فحصت وحدة التداخل 151 مريض، حيث تم تحويل 39 مريض منهم لمستشفى آخر، وتنويم 112 مريض. خرج 48 مريض في عطلة نهاية الأسبوع خلال هذه الفترة الزمنية. وخرج 21 مريض منهم من قبل وحدة التحكم CTU، و 27 مريض من قبل وحدة التداخل CTU. أظهر تحليل الاحتمالات النسبية لمعدل تحويل المرضى لمستشفى آخر ومعدل خروجهم في عطلة نهاية الأسبوع نتائج جوهرية لصالح وحدة التداخل.

خاتمة: تم برهان الأثر الإيجابي في استخدام أسرة المستشفيات من قبل الطبيب – الاستشاري وذلك عند تقييم تنويم المريض، أو تحويله لمستشفى آخر، أو خروجه خلال أيام الأسبوع وعطلة نهاية الأسبوع في قسم الطب الباطني في مدينة الملك عبد العزيز الطبية.

Objectives: To test the effect of improved physician availability on hospital bed utilization.

Methods: A prospective cohort study was conducted from 1st January 2009 to 31st March 2009 in the Division of Internal Medicine (DIM), King Abdul-Aziz Medical City (KAMC), Riyadh, Kingdom of Saudi Arabia. Two clinical teaching units (CTU) were compared head-to-head. Each CTU has 3 consultants. The CTU-control provides standard care, while the CTU-intervention was designed to provide better physician-consultant availability. Three outcomes were evaluated: patient outsourcing to another hospital, patient discharge during weekends, and overall admissions. Statistical analysis was carried out by electronic statistics calculator from the Center for Evidence-Based Medicine.

Results: Three hundred and thirty-four patients were evaluated for admission at the Emergency Room by both CTU's. One hundred and eighty-three patients were seen by the CTU-control, 6 patients were outsourced, and 177 were admitted. One hundred fifty-one patients were seen by the CTU-intervention: 39 of them were outsourced, and 112 were admitted. Forty-eight weekend patient discharges occurred during this period of time: 21 by CTU-control, and 27 by CTU-intervention. Analysis for odds ratio in both the rate of outsourcing, and weekend discharges, showed statistical significance in favor of the intervention group.

Conclusion: The continuous availability of a physician-consultant for patient admission evaluation, outsourcing, or discharge during regular weekdays and weekends at DIM, KAMC proved to have a positive impact on bed utilization.

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Good bed utilization is a continuing challenge for any hospital administration and its staff. This important issue is not a new one. The literature offers glimpses how it has been observed since the 1950's and 1960's.¹ Overcrowding is probably one of the most difficult challenges to good bed utilization. It affects all services within the medical institution, from the emergency room to the medical and surgical wards. It can be noticed in the private and governmental sectors, and it is truly a worldwide phenomenon. In the Kingdom of Saudi Arabia (KSA), we identified only one study on bed utilization in the literature.² The King Abdul-Aziz Medical City (KAMC) in Riyadh, KSA is the largest among the 4 National Guard Health Affairs centers in the Kingdom. Its bed capacity reaches approximately 800. Despite this capacity, the institution has been under increasing bed management pressure. Patient boarding in the emergency room has become prevalent, and finding an available bed for needy patients is becoming more problematic. Many proposed solutions were put forward to alleviate the increasing burden of patient overcrowding. One of them is patient outsourcing, or transfer between medical centers. It is a complex strategy that offers potential help for hospital overcrowding, but also has its own pitfalls.³ The KAMC recently adopted this strategy by signing a formal agreement with a private hospital permitting the transfer of stable medical patients needing admission. The Division of Internal Medicine (DIM) bears 35-40% of total patients' admissions to KAMC. This study was initiated by the DIM in order to improve bed utilization and limit patient crowding.

Methods. The DIM in KAMC is composed of 12 consultants, and 6 assistant-consultants. The work-system is based on the concept of a team called the clinical teaching unit (CTU). Each CTU is composed of 3 consultants, one assistant-consultant, and residents or interns, as the hospital is a teaching institution. Consultants in each CTU work independently, each one has inpatient duties with regular on-calls, and covers his or her outpatient clinics. Their hospital availability is during working hours on weekdays, and for rounds during weekends, if on-call only. A new concept of "better consultant availability" was proposed during a problem-solving meeting. The core idea is to have an Internal Medicine Consultant available in the hospital premises from 8:00 A.M. to 5:00 P.M. every day of the week, including weekends. The hypothesis is: better consultant availability will facilitate patients' transfer, admission, discharge, care, and ultimately alleviate patient overcrowding. A prospective cohort study design was put forward for the duration of 3 months from 1st January to 31st March 2009 in the DIM, Department of Medicine, KAMC, Riyadh, KSA. Two CTUs were compared head-to-head: a traditional one, CTU-control, provides standard care as defined,

and CTU-intervention was designed into distinct inpatient and outpatient sides. One consultant will cover all outpatient clinics, while 2 consultants provide weekday and weekend inpatient care. Both CTUs had an equal number of assistant-consultants, residents, and interns. Three outcomes were evaluated: outsourcing (patient transfer from KAMC to private hospital), patient discharge during weekends from KAMC, and overall admissions to KAMC. Approval to conduct this study was obtained from the Ethics Committee at our institution.

The statistical difference (*p*-value) between the 2 CTUs was calculated by "Stats Calculator" provided by the Center for Evidence-Based Medicine, University of Toronto, Canada (<http://ktclearinghouse.ca/cebm/practise/ca/calculators/statscalc>).

Results. During the study period, the total number of patients evaluated for possible admission, or transfer by both CTUs was 334. The CTU-control cared for 183 patients, and 151 patients were seen by the CTU-intervention.

Outsourcing. Patient transfer from KAMC to a private hospital. After evaluation in the emergency room, 45 patients were transferred from the institution, 6 at the initiative of the CTU-control, and 39 by CTU-intervention. With the new CTU-intervention, the odds ratio (OR) of transferring patients (with 95% confidence interval [CI]) is: 7.8 (3.2-19.1), *p*<0.0001.

Patient weekend discharges. There were 48 patients discharged from KAMC during the weekend, 21 by CTU-control, and 27 by CTU-intervention. The statistical analysis showed an OR of 2.0 and a 95% CI of 1.0-3.7, *p*=0.034.

Overall admissions to KAMC. Patients who, for medical reasons could not be outsourced were subsequently admitted to KAMC. Their total number was 289. The distribution between the 2 CTUs shows a clear difference between them in favor of the CTU-intervention. Indeed, only 112 patients were admitted to KAMC under the care of CTU-intervention, while CTU-control admitted 177 patients during the same period of time.

Discussion. The challenges of hospital bed management are multiple, with overcrowding considered as one of the most severe. It is a global health issue, and recently it has been receiving more attention. Some might think overcrowding affects only the emergency rooms, but that is not the case. Indeed, it is creeping toward many wards and facilities of medical institutions.⁴ Hospital overcrowding degrades patient care to the point of bad medical practice.⁵ Patients have to wait longer to see a health care provider, or have their needed test carried out. It puts an increasing work load and pressure on the hospital staff.⁶ Physicians, nurses, technicians,

and other specialists can be stretched thin. The end result is further declination in quality of care. Some specialists in the field even question the ethical validity of medical practice in such overcrowded conditions.⁷ Hospital administrators, physicians, and other staff members are scrambling everywhere to find solutions for the worsening trend of overcrowding and its detrimental consequences. More specialized institutes and academic centers are working on finding new ways, and better results in the hospital bed utilization field.^{8,9} More ideas and experiences are put forward by different institutions to solve this mushrooming problem. Some proposed the establishment of a "Fast Track Program" in the Department of Emergency Medicine where patients are evaluated, and disposed in a quicker fashion than usual.¹⁰ Others offered a more comprehensive approach to the problem, like dealing with capacity planning, reduction in introduced variation, and work segmentation.¹¹ With the complexity of the overcrowding issue, and the multiplicity of the proposed solutions, experts in the field seem to agree on one central theme: the need for strategic capacity planning for hospital beds.¹²

At KAMC, the challenge of hospital overcrowding has become more evident lately. Some of the proposed strategies to alleviate overcrowding are outsourcing to other hospitals and building more medical centers, thus, adding to current bed capacity. The first proposed solution might be helpful in the short run, but does not offer a concrete way out of the overcrowding problem. While building more hospitals seems attractive, we have to warn, however, that such a solution comes with its own challenges in terms of professional staffing and financial burden. Additionally, we have to pay special attention to the Roemer effect: the more hospital beds are available, the faster they will be filled.¹³

The first outcome of the study was outsourcing utilization. As a reminder, the purpose of the agreement between the 2 institutions is to provide an alternative admitting service to our crowded wards. The new intervention shows a clear statistically significant difference compared to the traditional approach. The second outcome was weekend discharges, where again the intervention group did better overall than the control group with a statistically significant difference, although less impressive than the transfer data one. In the final outcome, the intervention team cut down admissions by approximately one third than that of the control group. The difference between the 2 groups was substantial (65 patients in 3 months), and this translates to 65 vacant beds badly needed for critically ill patients, and the clinical significance of such a finding is obvious.

Despite the fact that the study met its expected outcomes, we also have good reasons to believe that this new intervention had better approval rating by patients, resident-physicians, and nursing staff. Furthermore, we also believe that the intervention was beneficially

cost-effective to the institution. Finally, it is worth mentioning that reluctance to embrace such a novel idea and resistance to its implementation might hamper any potential of its success. More research is needed into these important related issues.

The limitations of this study were: on the physicians' side, few consultants expressed their full support in participation, and on the patient side, indeed, not all patients agreed to hospital transfer from one facility to another.

In conclusion, the continuous availability of a physician-consultant during regular weekdays and weekends for the DIM in KAMC has shown a positive impact on bed utilization. We clearly demonstrated that having better physician availability contributed to better rate of patient transfers and weekend discharges, thus, reducing the number of admissions and hospital overcrowding. We believe this novel intervention holds a promising future within our institution, and probably elsewhere in KSA.

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References

1. Haldeman JC. Hospital needs for a growing America. *J Am Osteopath Assoc* 1962; 61: 618-624.
2. Nour El Din MM. Bed utilization fluctuations at the university hospital in Eastern Saudi Arabia and their impact on hospital cost. *J Egypt Public Health Assoc* 2006; 81: 43-57.
3. Young S. Outsourcing: two case studies from the Victorian public hospital sector. *Aust Health Rev* 2007; 31: 140-149.
4. Kunz Howard P. Overcrowding: not just an emergency department issue. *J Emerg Nurs* 2005; 31: 227-228.
5. Cameron PA. Hospital overcrowding: a threat to patient safety? *Med J Aust* 2006; 184: 203-204.
6. Proudlove N, Boaden R, Jorgensen J. Developing bed managers: the why and the how? *J Nursing Manag* 2007; 15: 34-42.
7. Agrawal S. Emergency department crowding: an ethical perspective. *Acad Emerg Med* 2007; 14: 751-754.
8. Altman S, Shactman D. More beds for boomers. A top 10 list of reasons why hospitals will continue to expand capacity. *Mod Healthc* 2004; 34: 32.
9. Pogue JF. A narrowing door: hospitals, faced with ever-growing demand, may have to consider admission alternatives. *Healthc Leadersh Rep* 2004; 12: 15-16.
10. Combs S, Chapman R, Bushby A. Evaluation of Fast Track. *Accid Emerg Nurs* 2007; 15: 40-47.
11. Walley P, Silvester K, Steyn R. Managing variation in demand: lessons from the UK National Health Service. *J Healthc Manag* 2006; 51: 309-320.
12. Coddington DC, Moore KD, Stephens DC Jr. Capacity planning seeing the forest for the trees. *Healthc Financ Manage* 2003; 57: 50-57.
13. McGinley PJ. Beyond healthcare reform: reconsidering certificate of need laws in a managed competition system. *Florida State University Law Review* 1995; 23: 141-168. Available from URL: www.law.fsu.edu/journals/lawreview/issues/231/mcginley.html