Title: Reduced mortality with hospital pay for performance in England.
Citation: New England Journal of Medicine, November 2012, vol./is. 367/19(1821-8), 0028-
Author(s): Sutton M, Nikolova S, Boaden R, Lester H, McDonald R, Roland M
Abstract: BACKGROUND: Pay-for-performance programs are being adopted internationally
despite little evidence that they improve patient outcomes. In 2008, a program called
Advancing Quality, based on the Hospital Quality Incentive Demonstration in the United
States, was introduced in all National Health Service (NHS) hospitals in the northwest region
of England (population, 6.8 million).METHODS: We analyzed 30-day in-hospital mortality
among 134,435 patients admitted for pneumonia, heart failure, or acute myocardial infarction
to 24 hospitals covered by the pay-for-performance program. We used difference-in-
differences regression analysis to compare mortality 18 months before and 18 months after
the introduction of the program with mortality in two comparators: 722,139 patients admitted
for the same three conditions to the 132 other hospitals in England and 241,009 patients
admitted for six other conditions to both groups of hospitals.RESULTS: Risk-
adjusted, absolute mortality for the conditions included in the pay-for-performance program decreased
significantly, with an absolute reduction of 1.3 percentage points (95% confidence interval
[CI], 0.4 to 2.1; P=0.006) and a relative reduction of 6%, equivalent to 890 fewer deaths
(95% CI, 260 to 1500) during the 18-month period. The largest reduction, for pneumonia,
was significant (1.9 percentage points; 95% CI, 0.9 to 3.0; P<0.001), with nonsignificant
reductions for acute myocardial infarction (0.6 percentage points; 95% CI, -0.4 to 1.7;
P=0.23) and heart failure (0.6 percentage points; 95% CI, -0.6 to 1.8;
P=0.30).CONCLUSIONS: The introduction of pay for performance in all NHS hospitals in
one region of England was associated with a clinically significant reduction in mortality. As
compared with a similar U.S. program, the U.K. program had larger bonuses and a greater
investment by hospitals in quality-improvement activities. Further research is needed on how
implementation of pay-for-performance programs influences their effects. (Funded by the
NHS National Institute for Health Research.).

Title: Risk-adjusted mortality: problems and possibilities.
Citation: Computational & Mathematical Methods in Medicine, 2012, vol./is. 2012/(829465),
Author(s): Shine D
Abstract: The ratio of observed-to-expected deaths is considered a measure of hospital
quality and for this reason will soon become a basis for payment. However, there are drivers
of that metric more potent than quality: most important are medical documentation and
patient acuity. If hospitals underdocument and therefore do not capture the full "expected
mortality" they may be tempted to lower their observed/expected ratio by reducing "observed
mortality" through limiting access to the very ill. Underdocumentation occurs because
hospitals do not recognize, and therefore cannot seek to confirm, specific comorbidities
conferring high mortality risk. To help hospitals identify these comorbidities, this paper
describes an easily implemented spread-sheet for evaluating comorbid conditions
associated, in any particular hospital, with each discharge. This method identifies
comorbidities that increase in frequency as mortality risk increases within each diagnostic
grouping. The method is inductive and therefore independent of any particular risk-
adjustment technique.
Available from National Library of Medicine in Computational and Mathematical Methods in
Medicine
Title: Development of a cardiologist delivered service leads to improved outcomes following admission with acute coronary syndromes in a large district general hospital.

Citation: Acute Cardiac Care, March 2012, vol./is. 14/1(1-4), 1748-2941;1748-295X (2012
Author(s): Ng Kam Chuen MJ, Schofield R, Sankaranarayanan R, Crowe C, Helm K, Lane

Abstract: BACKGROUND: East Lancashire Hospitals NHS Trust reorganized its services in October 2007 with acute admissions sent to one site which allowed the development of a 24/7 Consultant delivered cardiology service.METHODS: A retrospective analysis of all patients admitted with an acute coronary syndrome between two periods: Group 1: October 2006 to September 2007 and Group 2: October 2007 and September 2008. We looked at the following end points - length of stay, in-hospital and 30 day all cause mortality.RESULTS: 633 patients in group 1 and 748 patients in group 2. There was significant reduction in length of stay from a median (IQ range) 7 (5-11) days to 5 (3-9) days; P<0.0001. The in-hospital mortality reduced from 15.8% (n=100) to 7.6% (n=56); P<0.0001. The mortality at 30 days reduced from 15.2% (n=96) to 8.3% (n=62); P<0.0001. These reductions remained significant after adjustment for demographic and risk factor variables.CONCLUSION: A 24/7 Consultant Cardiologist delivered cardiac care is associated with marked reductions in all cause mortality following admission with acute coronary syndromes. This improvement occurred with a significant reduction in hospital length of stay.

Title: Preventable hospital mortality: learning from retrospective case record review.

Citation: JRSM Short Reports, November 2012, vol./is. 3/11(77), 2042-5333 (2012 Nov)
Author(s): Sorinola OO, Weerasinghe C, Brown R

Abstract: OBJECTIVE: To determine the proportion of hospital deaths associated with preventable problems in care and how they can be reduced.DESIGN: A two phase before and after evaluation of a hospital mortality reduction programme.SETTING: A district general hospital in Warwickshire, England.PARTICIPANTS: In Phase 1, 400 patients who died in 2009 at South Warwickshire NHS Foundation Trust had their case notes reviewed. In Phase 2, Trust wide measures were introduced across the whole Trust population to bring about quality improvements.MAIN OUTCOME MEASURES: To reduce the crude mortality and in effect the risk adjusted mortality index (RAMI) by 45 in the three years following the start of the programme, from 145 in 2009 to 100 or less in 2012.RESULTS: In total, 34 (8.5%) patients experienced a problem in their care that contributed to death. The principal problems were lack of senior medical input (24%), poor clinical monitoring or management (24%), diagnostic errors (15%) and infections (15%). In total, 41% (14) of these were judged to have been preventable (3.5% of all deaths). Following the quality improvement programme, crude mortality fell from 1.95% (2009) to 1.56% (2012) while RAMI dropped from 145 (2009) to 87 (2012).CONCLUSION: A quality improvement strategy based on good local evidence is effective in improving the quality of care sufficiently to reduce mortality. Available from National Library of Medicine in JRSM Short Reports

Title: Do stroke patients who arrive at hospital outside of normal hours receive a lower standard of care and have higher mortality?

Citation: International Journal of Stroke, December 2012, vol./is. 7/(3-4), 1747-4930
Author(s): Campbell J., Hoffman A., Bray B., Roughton M., Kavanagh S., Rudd A., Tyrrell

Abstract: Introduction: We present data from Stroke Improvement National Audit Programme (SINAP) comparing mortality and quality of care for patients who arrive at hospital within normal hours and out of hours. SINAP is a prospective database of acute stroke patients, documenting processes of care over the first 72 hours. Method: We compared several quality of care indicators and mortality at 30 days, for patients who arrived within normal hours (Monday-Friday 8 AM-6 PM) and for those who arrived outside these hours. Quality of care was defined according to time from arrival at hospital to interventions (e.g. CT scan) and whether the patient received thrombolysis where eligible. Mortality is based on data linkage with a national database of registered deaths. In comparing results across the two groups, our data were adjusted for age, gender, level of consciousness in the
first 24 hours and Oxford Community Stroke Project (OCSP) classification. Results: 44,982 stroke patients were newly admitted to 130 hospitals (April 2010-January 2012). Out of hours care is significantly associated with longer arrival at hospital to stroke unit times, longer CT scan delays and lower rates of thrombolysis. The 30 day mortality rate was higher for patients who arrived at hospital out of hours (P = 0.008). Conclusion: Patients with acute stroke who arrive outside normal hours wait longer for key interventions and are less likely to be thrombolysed. These patients were less likely to survive to 30 days post-admission, although the sample size required for statistical significance is very high.

Title: Excess weekend mortality in hospitals: A result of higher severity of illness at the time of admissions?

Citation: Value in Health, November 2012, vol./is. 15/7(A299), 1098-3015 (November 2012)

Author(s): Paudyal P., Shephard-Walwyn T., Gericke C.A.

Abstract: OBJECTIVES: To examine the relationships between urgent care activity and mortality among patients admitted to hospital on weekends compared to weekdays.

METHODS: A retrospective analysis was performed of all emergency acute care admissions in England between April 2009 and March 2011 using National Health Service Hospital Episode Statistics data. Hospital mortality among patients admitted on weekends as compared to weekdays was analysed using the following measures; (1) overall deaths; (2) deaths within and after three days of admission (3) deaths among patients with higher risk conditions and lower risk conditions. The higher risk conditions consisted of 103 Primary Diagnosis codes (ICD-10) which accounted for 74% of hospital deaths in England; the remaining codes were categorised as lower risk conditions. RESULTS: There were 10,221,500 emergency hospital admissions during the two-year study period; 23.8% of the patients were admitted on weekends. A total of 391,938 patients died in hospital. Weekend admission was associated with significantly higher mortality as compared to weekday admission (Odds Ratio 1.11, 95% CI 1.10-1.12). Mortality within three days of admission (early deaths) was also higher for patients admitted on weekends (OR 1.16, 95%CI (1.14-1.17) and this difference persisted for both higher and lower risks conditions. However, when early deaths were excluded from the analysis, mortality was not affected by weekend admission. CONCLUSIONS: As mortality after three days of admission was not affected by weekend admission, it is probable that the weekend admission effect on mortality is largely due to higher disease severity at admission on weekends rather than a consequence of shortfalls in quality of care on weekends as postulated in previous studies.

Title: Does integrated emergency care reduce mortality and non-elective admissions? A retrospective analysis.

Citation: Emergency Medicine Journal, March 2012, vol./is. 29/3(208-12), 1472-0205;1472-0205

Author(s): Boyle A, Fuld J, Ahmed V, Bennett T, Robinson S

Abstract: OBJECTIVES: The authors reconfigured the emergency care system of Addenbrookes Hospital, Cambridge. The medical admissions unit and the emergency department (ED) have been combined into one emergency assessment unit. This paper aims to determine if reconfiguration has reduced non-elective hospital admissions and reduced mortality for non-elective admissions.DESIGN: A retrospective 'before and after' study in a teaching hospital. Routinely collected data were used to evaluate the effectiveness of this approach. Setting One acute trust in the UK. Main outcome measures Inhospital mortality rates and standardised admission ratios (SAR) between 2003 and 2009.RESULTS: There was a significant trend towards improved survival, both for non-elective admissions and deaths in the ED (z=3.92; p>0.001), despite the age and acuity of patients increasing. There was a marked decrease in the SAR. Formal complaints, incident reports and the proportion of patients leaving before treatment declined, whereas the proportion of patients re-admitted as an emergency within 28 days did not change.CONCLUSIONS: Integrating emergency care within a hospital reduces hospital admissions, is associated with reduced inhospital mortality and a better quality of care. Available from Highwire Press in Emergency Medicine Journal
30-day risk-standardized mortality and readmission rates after ischemic stroke in critical access hospitals

Citation: Stroke, October 2012, vol./is. 43/10(2741-2747), 0039-2499;1524-4628 (October

Author(s): Lichtman J.H., Leifheit-Limson E.C., Jones S.B., Wang Y., Goldstein L.B.

Abstract: BACKGROUND AND PURPOSE: The critical access hospital (CAH) designation was established to provide rural residents with local access to emergency and inpatient care. CAHs, however, have poorer short-term outcomes for pneumonia, heart failure, and myocardial infarction compared with other hospitals. We assessed whether 30-day risk-standardized mortality rates (RSMRs) and risk-standardized readmission rates (RSRRs) after ischemic stroke differ between CAHs and non-CAHs.

METHODS: The study included all fee-for-service Medicare beneficiaries 65 years of age or older with a primary discharge diagnosis of ischemic stroke (International Classification of Diseases, 9th revision codes 433, 434, 436) in 2006. Hierarchical generalized linear models calculated hospital-level RSMRs and RSRRs, adjusting for patient demographics, medical history, and comorbid conditions. Non-CAHs were categorized by hospital volume quartiles and the RSMR and RSRR posterior probabilities in comparison with CAHs were determined using linear regression with Markov chain Monte Carlo simulation.

RESULTS: There were 10 267 ischemic stroke discharges from 1165 CAHs and 300 114 discharges from 3381 non-CAHs. The RSMRs of CAHs were higher than non-CAHs (11.9%±1.4% vs 10.9%±1.7%; P<0.001), but the RSRRs were comparable (13.7%±0.6% vs 13.7%±1.4%; P=0.3). The RSMRs for the 2 higher volume quartiles of non-CAHs were lower than CAHs (posterior probability of RSMR higher than CAHs=0.007 for quartile 3; P<0.001 for quartile 4), but there were no differences for lower volume hospitals; RSRRs did not vary by annual hospital volume.

CONCLUSIONS: CAHs had higher RSMRs compared with non-CAHs, but readmission rates were similar. The observed differences may be partly explained by patient characteristics and annual hospital volume. 2012 American Heart Association, Inc.

Available from Ovid in Stroke

Title: Hospital spending and inpatient mortality

Citation: Value in Health, June 2012, vol./is. 15/4(A20), 1098-3015 (June 2012)

Author(s): Romley J., Jena A., Goldman D.

Abstract: OBJECTIVES: Evidence shows that high Medicare spending is not associated with better health outcomes at a regional level and that high spending in hospitals is not associated with better process quality. The relationship between hospital spending and inpatient mortality is less well understood. We seek to determine the association between hospital spending and risk-adjusted inpatient mortality.


RESULTS: For each of 6 diagnoses at admission-acute myocardial infarction, congestive heart failure, acute stroke, gastrointestinal hemorrhage, hip fracture, and pneumonia- patient admission to higher-spending hospitals was associated with lower risk-adjusted inpatient mortality. During 1999 to 2003, for example, patients admitted with acute myocardial infarction to California hospitals in the highest quintile of hospital spending had lower inpatient mortality than did those admitted to hospitals in the lowest quintile (odds ratio, 0.862 [95% CI, 0.742 to 0.983]). Predicted inpatient deaths would increase by 1831 if all patients admitted with acute myocardial infarction were cared for in hospitals in the lowest quintile of spending rather than the highest. The association between hospital spending and inpatient mortality did not vary by region or hospital size. Limitation: Unobserved predictors of mortality create uncertainty about whether greater inpatient hospital spending leads to lower inpatient mortality.

CONCLUSIONS: Hospitals that spend more have lower inpatient mortality for 6 common medical conditions.
Title: Development of an in-hospital standardized mortality ratio for emergency department-sensitive conditions
Citation: Canadian Journal of Emergency Medicine, May 2012, vol./is. 14/(S31-S32), 1481-
Author(s): Berthelot S., Stelfox H.T., Lang E.
Abstract: Introduction: The Canadian Institute for Health Information (CIHI) estimates for each Canadian hospital four types of hospital standardized mortality ratio (HSMR), but none of them specifically captures the outcomes of admitted patients with conditions on which emergency physician management would be expected to have an impact (emergency-sensitive conditions). We propose to develop a HSMR specific to emergency-sensitive conditions as one tool for measuring ED care performance. Methods: To develop a HSMR specific to emergency-sensitive conditions, we first aim to identify those conditions by conducting a mixed method study in two steps: 1) an expert panel of emergency care providers and managers (n = 12) will be presented with the 65 diagnosis-related groups (DRGs) included in the CIHI HSMR and will be asked to select DRGs reflecting emergency-sensitive conditions using a modified Delphi method and 2) a stratified random sample of emergency physicians selected through the Canadian Association of Emergency Physicians membership list will be surveyed to test the face validity of the emergency-sensitive conditions selected by the expert panel (n = 70, with a 70% response rate, seeking 80% agreement on emergency-sensitive conditions, 95% CI +/- 5, 7%). Results: We have developed two Web-based instruments: one to poll our panelists and another to survey a group of emergency physicians. The panelist tool contains a nine-level rating scale for each 65 DRGs measuring the extent to which each one is considered an emergency-sensitive condition by the panel. We are recruiting panelists from multiple backgrounds (emergency physicians, emergency nurses, care providers from different specialties, and health care managers). Consensus panel ratings and survey results will be subsequently presented. Conclusions: The development of an emergency-sensitive conditions list will enable the calculation of the first in-hospital standardized mortality ratio related to emergency care. This HSMR will improve understanding of ED performance.

Title: Efficacy of a rapid response team on reducing the incidence and mortality of unexpected cardiac arrests
Citation: Trauma Monthly, May 2012, vol./is. 17/2(270-274), 2251-7464;2251-7472 (May
Author(s): Sabahi M., Fanaei S.A., Ziaee S.A., Falsafi F.S.
Abstract: Background: Rapid Response Teams (RRTs) assess patients during early phases of deterioration to reduce patient morbidity and mortality. Objectives: This study aimed to evaluate the ability of earlier medical intervention by a RRT prompted by clinical instability in patients to reduce the incidence of and mortality from unexpected cardiac arrest at our hospital. Patients and Methods: A nonrandomized, population-based study before 2008 and after 2010 introduction of the Rapid Response Teams in a 300 bed private hospital. All patients were admitted to the hospital in 2008 (n = 25348) and 2010 (n = 28024). RRT (One doctor, one senior intensive care nurse and one staff nurse) attended to clinically unstable patients immediately with resuscitation drugs, fluid, and equipment. Response was activated by the bedside nurse or doctor according to predefined criteria. Main outcome measures were incidence and outcome of unexpected cardiac arrests. Results: The incidence of unexpected cardiac arrest was 17 per 1000 hospital admissions (431 cases) in 2008 (before RRT intervention) and 12.45 per 1000 admissions (349 cases) in 2010 (after intervention), with mortality being 73.23% (274 patients) and 66.15% (231 patients) respectively. After adjustment for case mix the intervention was associated with a 19% reduction in the incidence of unexpected cardiac arrest (odds ratio 0.81, 95% confidence interval 0.65-0.98). Conclusions: The RRT was able to detect preventable adverse events and reduce the mortality and incidence of unexpected cardiac arrests. Copyright 2012, Kowsar Corp. All rights reserved.
Title: Mortality reduction associated with structure, process, and management redesign of a hospital medicine unit
Citation: Journal of Hospital Medicine, March 2012, vol./is. 7/(S77-S78), 1553-5592 (March
Author(s): Stein J., Mohan A., Payne C., Castle B., Burleson M., Methvin A., Rykowski J.,
Abstract: Background: Opportunities exist to re-create hospital units as effective and
reliable microsystems. We used specific structure, process, and management design
features to relaunch a hospital medicine unit: 1. Unit-based physician teams, 2. Structured
Interdisciplinary Bedside Rounds (SIBR) 3. Unit-level performance data and 4. Unit co-
management by nurse and physician co-directors. Unit-based physician teams were hospital
medicine resident teams whose patients were cohorted almost exclusively to the intervention
unit and covered in-hospital 24 hours per day. SIBR is a team-based, patient-centered
model of care which synthesizes a daily plan of care at the bedside using standardized
inputs from the physician, bedside nurse, and patient or family, while also using a quality-
safety checklist. Methods: Using a time series analysis with a concurrent control (Figure
presented) we examined the effect on mortality in the 12 months before and after the
intervention. The intervention unit was a 24-bed medical teaching unit within a 579-bed
tertiary care hospital and the control unit was a 50-bed medical unit in a separate 550-bed
community teaching hospital within the same health system. The number of deaths and
discharges to inpatient and home hospice were extracted from administrative databases and
was compared using negative binominal regression. The number of hospital admissions was
accounted for by using the natural log of hospital admission as an offset variable. Results:
Mortality in the intervention unit fell 73% immediately post-intervention, from 1.00 per 100
admissions to 0.27 (p<0.005). In the control unit, a 34% lower mortality rate was observed,
from 0.80 per 100 admissions to 0.53, but was not statistically significant (p=0.229). The
number of discharges to hospice did not change significantly in either unit. The number of
admissions in the intervention unit increased from a mean of 131 to 146 per month (p=0.03),
while the number of admissions in the control unit decreased from a (Figure presented)
mean of 280 to 263 per month (p=0.03). Conclusions: A large reduction in mortality was
temporally associated with a redesign of a hospital medicine unit. The redesign featured
structure, process, and management changes all aimed at creating standardized, team-
based, patient-centered care, and management accountability. Interpretation of findings is
limited by the quasi-experimental design and the possibility of unrecognized confounders.
Further research should delineate the precise mechanisms through which the redesign of a
hospital medicine unit affects mortality and other quality metrics.

Title: Effect of telehealth on use of secondary care and mortality: findings from the
Whole System Demonstrator cluster randomised trial
Citation: BMJ, 2012, vol./is. 345/7865(16), 0959-8154
Author(s): Steventon, Adam, Bardsley, Martin, Billings, John
Abstract: OBJECTIVE: To assess the effect of home based telehealth interventions on the
use of secondary healthcare and mortality. DESIGN: Pragmatic, multisite, cluster
randomised trial comparing telehealth with usual care, using data from routine administrative
datasets. General practice was the unit of randomisation. We allocated practices using a
minimisation algorithm, and did analyses by intention to treat. SETTING: 179 general
practices in three areas in England. PARTICIPANTS: 3230 people with diabetes, chronic
obstructive pulmonary disease, or heart failure recruited from practices between May 2008
and November 2009. INTERVENTIONS: Telehealth involved remote exchange of data
between patients and healthcare professionals as part of patients’ diagnosis and
management. Usual care reflected the range of services available in the trial sites, excluding
telehealth. MAIN OUTCOME MEASURES: Proportion of patients admitted to hospital during
12 month trial period. RESULTS: Patient characteristics were similar at baseline. Compared
with controls, the intervention group had a lower admission proportion within 12 month
follow-up (odds ratio 0.82, 95 per cent confidence interval 0.70 to 0.97, P=0.017). Mortality
at 12 months was also lower for intervention patients than for controls (4.6 per cent v 8.3 per
cent; odds ratio 0.54, 0.39 to 0.75, P<0.001). These differences in admissions and mortality
remained significant after adjustment. The mean number of emergency admissions per head also differed between groups (crude rates, intervention 0.54 v control 0.68); these changes were significant in unadjusted comparisons (incidence rate ratio 0.81, 0.65 to 1.00, P=0.046) and after adjusting for a predictive risk score, but not after adjusting for baseline characteristics. Length of hospital stay was shorter for intervention patients than for controls (mean bed days per head 4.87 v 5.68; geometric mean difference -0.64 days, -1.14 to -0.10, P=0.023, which remained significant after adjustment). Observed differences in other forms of hospital use, including notional costs, were not significant in general. Differences in emergency admissions were greatest at the beginning of the trial, during which we observed a particularly large increase for the control group. CONCLUSIONS: Telehealth is associated with lower mortality and emergency admission rates. The reasons for the short term increases in admissions for the control group are not clear, but the trial recruitment processes could have had an effect.


Title: Derivation and validation of a risk adjustment model for predicting seven day mortality in emergency medical admissions: mixed prospective and retrospective cohort study.
Citation: BMJ, 2012, vol./is. 344/7856(15), 0959-8154
Author(s): Goodacre, Steve, Wilson, Richard, Shephard, Neil
Abstract: OBJECTIVES: To derive and validate a risk adjustment model for predicting seven day mortality in emergency medical admissions, to test the value of including physiology and blood parameters, and to explore the constancy of the risk associated with each model variable across a range of settings. DESIGN: Mixed prospective and retrospective cohort study. SETTING: Nine acute hospitals (n=3 derivation, n=9 validation) and associated ambulance services in England, Australia, and Hong Kong. PARTICIPANTS: Adults with medical emergencies (n=5644 derivation, n=13762 validation) who were alive and not in cardiac arrest when attended by an ambulance and either were admitted to hospital or died in the ambulance or emergency department. INTERVENTIONS: Data were either collected prospectively or retrospectively from routine sources and extraction from ambulance and emergency department records. MAIN OUTCOME MEASURES: Mortality up to seven days after hospital admission. RESULTS: In the derivation phase, age, ICD-10 code, active malignancy, Glasgow coma score, respiratory rate, peripheral oxygen saturation, temperature, white cell count, and potassium and urea concentrations were independent predictors of seven day mortality. A model based on age and ICD-10 code alone had a C statistic of 0.80 (95 per cent confidence interval 0.78 to 0.83), which increased to 0.81 (0.79 to 0.84) with the addition of active malignancy. This was markedly improved only when physiological variables (C statistic 0.87, 0.85 to 0.89), blood variables (0.87, 0.84 to 0.89), or both (0.90, 0.88 to 0.92) were added. In the validation phase, the models with physiology variables (physiology model) and all variables (full model) were tested in nine hospitals. Overall, the C statistics ranged across centres from 0.80 to 0.91 for the physiology model and from 0.83 to 0.93 for the full model. The rank order of hospitals based on adjusted mortality differed markedly from the rank order based on crude mortality. ICD-10 code, Glasgow coma score, respiratory rate, systolic blood pressure, oxygen saturation, haemoglobin concentration, white cell count, and potassium, urea, creatinine, and glucose concentrations all had statistically significant interactions with hospital. CONCLUSIONS: A risk adjustment model for emergency medical admissions based on age, ICD-10 code, active malignancy, and routinely recorded physiological and blood variables can provide excellent discriminant value for seven day mortality across a range of settings. Using risk adjustment markedly changed hospitals’ rankings. However, evidence was found that the association between key model variables and mortality were not constant. [Abstract]
Title: Weekend admission to hospital has a higher risk of death in the elective setting than in the emergency setting: a retrospective database study of National Health Service hospitals in England.

Citation: BMC Health Services Research, 2012, vol./is. 12/87, 1472-6963

Author(s): Mohammed, Mohammed A., Sidhu, Khesh S., Rudge, Gavin

Abstract: BACKGROUND: Although acute hospitals offer a twenty-four hour seven day a week service levels of staffing are lower over the weekends and some health care processes may be less readily available over the weekend. Whilst it is thought that emergency admission to hospital on the weekend is associated with an increased risk of death, the extent to which this applies to elective admissions is less well known. We investigated the risk of death in elective and elective patients admitted over the weekend versus the weekdays.

METHODS: Retrospective statistical analysis of routinely collected acute hospital admissions in England, involving all patient discharges from all acute hospitals in England over a year (April 2008-March 2009), using a logistic regression model which adjusted for a range of patient case-mix variables, seasonality and admission over a weekend separately for elective and emergency (but excluding zero day stay emergency admissions discharged alive) admissions.

RESULTS: Of the 1,535,267 elective admissions, 91.7 per cent (1,407,705) were admitted on the weekday and 8.3 per cent (127,562) were admitted on the weekend. The mortality following weekday admission was 0.52 per cent (7,276/1,407,705) compared with 0.77 per cent (986/127,562) following weekend admission. Of the 3,105,249 emergency admissions, 76.3 per cent (2,369,316) were admitted on the weekday and 23.7 per cent (735,933) were admitted on the weekend. The mortality following emergency weekday admission was 6.53 per cent (154,761/2,369,316) compared to 7.06 per cent (51,922/735,933) following weekend admission. After case-mix adjustment, weekend admissions were associated with an increased risk of death, especially in the elective setting (elective Odds Ratio: 1.32, 95 per cent Confidence Interval 1.23 to 1.41); vs emergency Odds Ratio: 1.09, 95 per cent Confidence Interval 1.05 to 1.13).

CONCLUSIONS: Weekend admission appears to be an independent risk factor for dying in hospital and this risk is more pronounced in the elective setting. Given the planned nature of elective admissions, as opposed to the unplanned nature of emergency admissions, it would seem less likely that this increased risk in the elective setting is attributable to unobserved patient risk factors. Further work to understand the relationship between weekend processes of care and mortality, especially in the elective setting, is required. [Abstract] Available from National Library of Medicine in BMC Health Services Research

Title: Weekend hospitalization and additional risk of death: an analysis of inpatient data.

Citation: Journal of the Royal Society of Medicine, 2012, vol./is. 105/2(74-84), 0141-0768

Author(s): Freemantle, N, Richardson, M, Wood, J

Abstract: OBJECTIVE: To assess whether weekend admissions to hospital and/or already being an inpatient on weekend days were associated with any additional mortality risk.

DESIGN: Retrospective observational survivorship study. We analysed all admissions to the English National Health Service (NHS) during the financial year 2009/10, following up all patients for 30 days after admission and accounting for risk of death associated with diagnosis, co-morbidities, admission history, age, sex, ethnicity, deprivation, seasonality, day of admission and hospital trust, including day of death as a time dependent covariate. The principal analysis was based on time to in-hospital death.

PARTICIPANTS: National Health Service Hospitals in England.

MAIN OUTCOME MEASURES: 30 day mortality (in or out of hospital).

RESULTS: There were 14,217,640 admissions included in the principal analysis, with 187,337 in-hospital deaths reported within 30 days of admission. Admission on weekend days was associated with a considerable increase in risk of subsequent death compared with admission on weekdays, hazard ratio for Sunday versus Wednesday 1.16 (95 per cent CI 1.14 to 1.18; P < .0001), and for Saturday versus Wednesday 1.11 (95 per cent CI 1.09 to 1.13; P < .0001). Hospital stays on weekend days were associated with a lower risk of death than midweek days, hazard ratio for being in hospital on Sunday versus
Wednesday 0.92 (95 per cent CI 0.91 to 0.94; P < .0001), and for Saturday versus Wednesday 0.95 (95 per cent CI 0.93 to 0.96; P < .0001). Similar findings were observed on a smaller US data set. CONCLUSIONS: Admission at the weekend is associated with increased risk of subsequent death within 30 days of admission. The likelihood of death actually occurring is less on a weekend day than on a mid-week day. [Abstract] Available from National Library of Medicine in Journal of the Royal Society of Medicine

Title: Consultant cover and mortality among hospital patients
Citation: British Medical Journal, 2012, vol./is. 344/, 17561833
Author(s): McCartney, Margaret
Abstract: Record in progress Dr Foster's assertions that inpatient mortality is linked to the level of out of hours consultant cover is based on a flawed analysis of the data, argues the author. [Journal abstract]

Title: Developing a summary hospital mortality index: retrospective analysis in English hospitals over five years
Citation: BMJ (Clinical research ed.), 2012, vol./is. 344/(e1001), 1756-1833 (2012)
Author(s): Campbell M.J., Jacques R.M., Fotheringham J., Maheswaran R., Nicholl J.
Abstract: To develop a transparent and reproducible measure for hospitals that can indicate when deaths in hospital or within 30 days of discharge are high relative to other hospitals, given the characteristics of the patients in that hospital, and to investigate those factors that have the greatest effect in changing the rank of a hospital, whether interactions exist between those factors, and the stability of the measure over time. Retrospective cross sectional study of admissions to English hospitals. Hospital episode statistics for England from 1 April 2005 to 30 September 2010, with linked mortality data from the Office for National Statistics. 36.5 million completed hospital admissions in 146 general and 72 specialist trusts. Deaths within hospital or within 30 days of discharge from hospital. The predictors that were used in the final model comprised admission diagnosis, age, sex, type of admission, and comorbidity. The percentage of people admitted who died in hospital or within 30 days of discharge was 4.2% for males and 4.5% for females. Emergency admissions comprised 75% of all admissions and 5.5% died, in contrast to 0.8% who died after an elective admission. The percentage who died with a Charlson comorbidity score of 0 was 2% in contrast with 15% who died with a score greater than 5. Given these variables, the relative standardised mortality rates of the hospitals were not noticeably changed by adjusting for the area level deprivation and number of previous emergency visits to hospital. There was little evidence that including interaction terms changed the relative values by any great amount. Using these predictors the summary hospital mortality index (SHMI) was derived. For 2007/8 the model had a C statistic of 0.911 and accounted for 81% of the variability of between hospital mortality. A random effects funnel plot was used to identify outlying hospitals. The outliers from the SHMI over the period 2005-10 have previously been identified using other mortality indicators. The SHMI is a relatively simple tool that can be used in conjunction with other information to identify hospitals that may need further investigation.
Title: Does the use of a "track and trigger" warning system reduce mortality in trauma patients?
Citation: Injury, December 2011, vol./is. 42/12(1455-1459), 0020-1383;1879-0267
Author(s): Patel M.S., Jones M.A., Jiggins M., Williams S.C.
Abstract: Introduction: Despite the lack of robust evidence, numerous different "track and trigger" warning systems have been implemented. These have only been validated in an emergency medical admissions setting. The Modified Early Warning Score (MEWS) is the chosen track and trigger system used in the University Hospitals of Leicester trauma unit, but has not been validated in trauma patients. A considerable proportion of all trauma admissions are elderly patients with proximal femoral fractures and significant comorbidities. Early recognition of physiological deterioration and prompt action could therefore be lifesaving in this patient group. Aim: To identify whether the implementation of the MEWS system coupled with a critical care outreach service resulted in a reduction in mortality in a busy trauma unit. Method: A retrospective study. The MEWS system was implemented in all trauma and orthopaedic wards at the Leicester Royal Infirmary in the summer of 2005. The numbers of emergency trauma inpatient admissions and deaths from January 2002 to December 2009 were obtained. The diagnosis, primary procedures and cause of death, if known, were noted. Comparisons were made pre- and post-MEWS. Student's t-test was used for statistical analysis. Results: 32,149 patients were admitted (55% male; 45% female). Overall there were 889 deaths (77% female; 33% male, P < 0.0001). The in-hospital mortality rate for orthopaedic trauma patients was 2.8% throughout the 7-year study period. 61% of those who died were admitted with proximal femoral fractures. The modal age group with the highest mortality was 81-90 years. Overall, females had a considerably greater mortality rate than males. The mortality rate was lower post-MEWS in males (1.82-1.418%; P = 0.214), females (4.871-3.364%; P = 0.108) and all patients (3.215-2.294%; P = 0.092), but this was not statistically significant. Conclusion: The use of a track and trigger warning system has not led to a statistically significant reduction in mortality in trauma patients. In view of the apparent lack of clinical effectiveness of the MEWS/outreach partnership, the cost effectiveness of this initiative needs to be questioned. Possible reasons for these findings include: failure of the MEWS to be correctly applied, inadequate action once the threshold is triggered, or unsuitability of this tool for this patient population. A better system for identifying and treating elderly, medically unwell trauma patients with co-morbidities needs to be developed. 2011 Elsevier Ltd. All rights reserved.

Title: Comparing the USA, UK and 17 Western countries' efficiency and effectiveness in reducing mortality.
Citation: JRSM Short Reports, July 2011, vol./is. 2/7(60), 2042-5333 (2011 Jul)
Author(s): Pritchard C, Wallace MS
Abstract: OBJECTIVES: To test the hypothesis that the USA healthcare system was superior to the NHS and 17 other Western countries in reducing feasible mortality rates over the period 1979-2005.DESIGN: Economic inputs into healthcare, GDP health expenditure (GDPHE) were compared with clinical outputs, i.e. total 'adult' (15-74 years) and 'older' (55-74 years) mortality rates based upon three-year average mortality rates for 1979-81 vs. 2003-2005. A cost-effective ratio was calculated by dividing average GDPHE into reduced mortality rates over the period.SETTING: Nineteen Western countries' mortality rates compared between 1979-2005.PARTICIPANTS: Mortality of people by age and gender.MAIN OUTCOME MEASURES: A cost-effective ratio to measure efficiency and effectiveness of healthcare systems in reducing mortality rates. Chi-square tested any differences between the USA, UK and other Western countries.RESULTS: INPUT: The USA had the highest current and average GDPHE; the UK was 10th highest but joint 16th overall, still below the Western countries' average. Output: Every country's mortality rate fell substantially; but 15 countries reduced their mortality rates significantly more than the US, while UK 'adult' and 'older' mortality rates fell significantly more than 12 other countries. Cost-effectiveness: The USA GDPHE: mortality rate ratio was 1:205 for 'adults' and 1:515 for 'older' people, 16 Western countries having bigger ratios than the US; the UK had second
The greatest ratios at 1:593 and 1:1595, respectively. The UK ratios were >20% larger than 14 other countries. CONCLUSIONS: In cost-effective terms, i.e. economic input versus clinical output, the USA healthcare system was one of the least cost-effective in reducing mortality rates whereas the UK was one of the most cost-effective over the period. Available from National Library of Medicine in JRSM Short Reports

Title: Multiple component patient safety intervention in English hospitals: controlled evaluation of second phase. Citation: BMJ, 2011, vol./is. 342/(d199), 0959-535X;1756-1833 (2011)

Author(s): Benning A, Dixon-Woods M, Nwulu U, Ghaleb M, Dawson J, Barber N, Franklin

Abstract: OBJECTIVE: To independently evaluate the impact of the second phase of the Health Foundation’s Safer Patients Initiative (SPI2) on a range of patient safety measures. Design A controlled before and after design. Five substudies: survey of staff attitudes; review of case notes from high risk (respiratory) patients in medical wards; review of case notes from surgical patients; indirect evaluation of hand hygiene by measuring hospital use of handwashing materials; measurement of outcomes (adverse events, mortality among high risk patients admitted to medical wards, patients’ satisfaction, mortality in intensive care, rates of hospital acquired infection). Setting NHS hospitals in England. PARTICIPANTS: Nine hospitals participating in SPI2 and nine matched control hospitals. INTERVENTION: The SPI2 intervention was similar to the SPI1, with somewhat modified goals, a slightly longer intervention period, and a smaller budget per hospital. RESULTS: One of the scores (organisational climate) showed a significant (P = 0.009) difference in rate of change over time, which favoured the control hospitals, though the difference was only 0.07 points on a five point scale. Results of the explicit case note reviews of high risk medical patients showed that certain practices improved over time in both control and SPI2 hospitals (and none deteriorated), but there were no significant differences between control and SPI2 hospitals. Monitoring of vital signs improved across control and SPI2 sites. This temporal effect was significant for monitoring the respiratory rate at both the six hour (adjusted odds ratio 2.1, 99% confidence interval 1.0 to 4.3; P = 0.010) and 12 hour (2.4, 1.1 to 5.0; P = 0.002) periods after admission. There was no significant effect of SPI for any of the measures of vital signs. Use of a recommended system for scoring the severity of pneumonia improved from 1.9% (1/52) to 21.4% (12/56) of control and from 2.0% (1/50) to 41.7% (25/60) of SPI2 patients. This temporal change was significant (7.3, 1.4 to 37.7; P = 0.002), but the difference in difference was not significant (2.1, 0.4 to 11.1; P = 0.236). There were no notable or significant changes in the pattern of prescribing errors, either over time or between control and SPI2 hospitals. Two items of medical history taking (exercise tolerance and occupation) showed significant improvement over time, across both control and SPI2 hospitals, but no additional SPI2 effect. The holistic review showed no significant changes in error rates either over time or between control and SPI2 hospitals. The explicit case note review of perioperative care showed that adherence rates for two of the four perioperative standards targeted by SPI2 were already good at baseline, exceeding 94% for antibiotic prophylaxis and 98% for deep vein thrombosis prophylaxis. Intraoperative monitoring of temperature improved over time in both groups, but this was not significant (1.8, 0.4 to 7.6; P = 0.279), and there were no additional effects of SPI2. A dramatic rise in consumption of soap and alcohol hand rub was similar in control and SPI2 hospitals (P = 0.760 and P = 0.889, respectively), as was the corresponding decrease in rates of Clostridium difficile and meticillin resistant Staphylococcus aureus infection (P = 0.652 and P = 0.693, respectively). Mortality rates of medical patients included in the case note reviews in control hospitals increased from 17.3% (42/243) to 21.4% (24/112), while in SPI2 hospitals they fell from 10.3% (24/233) to 6.1% (7/114) (P = 0.043). Fewer than 8% of deaths were classed as avoidable; changes in proportions could not explain the divergence of overall death rates between control and SPI2 hospitals. There was no significant difference in the rate of change in mortality in intensive care. Patients' satisfaction improved in both control and SPI2 hospitals on all dimensions, but again there were no significant changes between the two groups of hospitals. CONCLUSIONS: Many aspects of care are already good or improving
across the NHS in England, suggesting considerable improvements in quality across the board. These improvements are probably due to contemporaneous policy activities relating to patient safety, including those with features similar to the SPI, and the emergence of professional consensus on some clinical processes. This phenomenon might have attenuated the incremental effect of the SPI, making it difficult to detect. Alternatively, the full impact of the SPI might be observable only in the longer term. The conclusion of this study could have been different if concurrent controls had not been used.

Full Text:

Title: Large scale organisational intervention to improve patient safety in four UK hospitals: mixed method evaluation.
Citation: BMJ, 2011, vol./is. 342/(d195), 0959-535X;1756-1833 (2011)
Author(s): Benning A, Ghaleb M, Suokas A, Dixon-Woods M, Dawson J, Barber N, Franklin
Abstract: OBJECTIVES: To conduct an independent evaluation of the first phase of the Health Foundation's Safer Patients Initiative (SPI), and to identify the net additional effect of SPI and any differences in changes in participating and non-participating NHS hospitals.DESIGN: Mixed method evaluation involving five substudies, before and after design.SETTING: NHS hospitals in the United Kingdom.PARTICIPANTS: Four hospitals (one in each country in the UK) participating in the first phase of the SPI (SPI1); 18 control hospitals.INTERVENTION: The SPI1 was a compound (multi-component) organisational intervention delivered over 18 months that focused on improving the reliability of specific frontline care processes in designated clinical specialties and promoting organisational and cultural change.RESULTS: Senior staff members were knowledgeable and enthusiastic about SPI1. There was a small (0.08 points on a 5 point scale) but significant (P < 0.01) effect in favour of the SPI1 hospitals in one of 11 dimensions of the staff questionnaire (organisational climate). Qualitative evidence showed only modest penetration of SPI1 at medical ward level. Although SPI1 was designed to engage staff from the bottom up, it did not usually feel like this to those working on the wards, and questions about legitimacy of some aspects of SPI1 were raised. Of the five components to identify patients at risk of deterioration--monitoring of vital signs (14 items); routine tests (three items); evidence based standards specific to certain diseases (three items); prescribing errors (multiple items from the British National Formulary); and medical history taking (11 items)--there was little net difference between control and SPI1 hospitals, except in relation to quality of monitoring of acute medical patients, which improved on average over time across all hospitals. Recording of respiratory rate increased to a greater degree in SPI1 than in control hospitals; in the second six hours after admission recording increased from 40% (93) to 69% (165) in control hospitals and from 37% (141) to 78% (296) in SPI1 hospitals (odds ratio for “difference in difference” 2.1, 99% confidence interval 1.0 to 4.3; P = 0.008). Use of a formal scoring system for patients with pneumonia also increased over time (from 2% (102) to 23% (111) in control hospitals and from 2% (170) to 9% (189) in SPI1 hospitals), which favoured controls and was not significant (0.3, 0.02 to 3.4; P = 0.173). There were no improvements in the proportion of prescription errors and no effects that could be attributed to SPI1 in non-targeted generic areas (such as enhanced safety culture). On some measures, the lack of effect could be because compliance was already high at baseline (such as use of steroids in over 85% of cases where indicated), but even when there was more room for improvement (such as in quality of medical history taking), there was no significant additional net effect of SPI1. There were no changes over time or between control and SPI1 hospitals in errors or rates of adverse events in patients in medical wards. Mortality increased from 11% (27) to 16% (39) among controls and decreased from 17% (63) to 13% (49) among SPI1 hospitals, but the risk adjusted difference was not significant (0.5, 0.2 to 1.4; P = 0.085). Poor care was a contributing factor in four of the 178 deaths identified by review of case notes. The survey of patients showed no significant differences apart from an increase in perception of cleanliness in favour of SPI1 hospitals.CONCLUSIONS: The introduction of SPI1 was associated with improvements in one of the types of clinical process studied (monitoring of

Title: High mortality of older patients admitted to hospital from care homes and insight into potential interventions to reduce hospital admissions from care homes: the Norfolk experience.

Citation: Archives of Gerontology & Geriatrics, November 2011, vol./is. 53/3(316-9), 0167-

Author(s): Ong AC, Sabanathan K, Potter JF, Myint PK

Abstract: There is a high mortality rate in patients admitted to hospitals acutely from care homes. In a retrospective case analysis study of 3772 older people admitted to the Department of Medicine for the Elderly between January and June 2005, 340 (9.0%) were from care homes, and 93 (27.3%) of the residents died during the index admission. Nearly 40% of these deaths occurred within 24h of admission indicating a high level of less appropriate admissions. Investigating eight nursing homes which admitted the highest number of patients from one primary care trust revealed that the most cited reasons for admission were the lack of advance care plans, access to General Practitioners (GPs) out of hours, as well as general access to palliative care and specialist nurses, and poor communication between patient, relatives, GPs, hospitals and care home staff. Our findings provide some useful insight into the factors that need to be addressed to avoid unnecessary or inappropriate admissions from care homes for better end of life care in aging societies.

Background: In 2008 Henry Ford Health System launched its “No Harm Campaign,” designed to integrate harm-reduction interventions into a systemwide initiative and, ultimately, to eliminate harm from the health care experience.

Methods: The No Harm Campaign aims to decrease harm events through enhancing the system’s culture of safety by reporting and studying harm events, researching causality, identifying priorities, and redesigning care to eliminate harm. The campaign uses a comprehensive set of 27 measures for harm reduction, covering infection-, medication-, and procedure-related harm, as well as other types of harm, all of which are combined to comprise a unique global harm score. The campaign’s objective is to reduce all-cause harm events systemwide by 50% by 2013. A wide range of communication processes, from systemwide leadership retreats to daily e-mail news sent to all employees and physicians, is used to promote the campaign. In addition, the campaign is on the intranet “Knowledge Wall,” where monthly dashboards, meeting minutes, and best practices and the work of our teams and collaboratives are documented and shared.

Results: From 2008 through 2011, a 31% reduction in harm events and an 18% reduction in inpatient mortality occurred systemwide.

Discussion: Building infrastructure, creating a culture of safety, providing employee training and education, and improving work process design are critical to systemwide implementation of harm-reduction efforts. Key actions for ongoing success focus on leadership, disseminating performance, putting everyone to work, and stealing ideas through national and local collaborations. A financial model was created to assess cost-savings of reducing harm events; early results total nearly $10 million in four years.

Title: Hospital strategies for reducing risk-standardized mortality rates in acute myocardial infarction.

Citation: Annals of Internal Medicine, May 2012, vol./is. 156/9(618-26), 0003-4819;1539-4819;1539-4819

Author(s): Bradley EH, Curry LA, Spatz ES, Herrin J, Cherlin EJ, Curtis JP, Thompson JW,

Abstract: BACKGROUND: Despite recent improvements in survival after acute myocardial infarction (AMI), U.S. hospitals vary 2-fold in their 30-day risk-standardized mortality rates (RSMRs). Nevertheless, information is limited on hospital-level factors that may be associated with RSMRs.OBJECTIVE: To identify hospital strategies that were associated with lower RSMRs.DESIGN: Cross-sectional survey of 537 hospitals (91% response rate) and weighted multivariate regression by using data from the Centers for Medicare & Medicaid Services to determine the associations between hospital strategies and hospital RSMRs.SETTING: Acute care hospitals with an annualized AMI volume of at least 25 patients.PARTICIPANTS: Patients hospitalized with AMI between 1 January 2008 and 31 December 2009.MEASUREMENTS: Hospital performance improvement strategies, characteristics, and 30-day RSMRs.RESULTS: In multivariate analysis, several hospital strategies were significantly associated with lower RSMRs and in aggregate were associated with clinically important differences in RSMRs. These strategies included holding monthly meetings to review AMI cases between hospital clinicians and staff who transported patients to the hospital (RSMR lower by 0.70 percentage points), having cardiologists always on site (lower by 0.54 percentage points), fostering an organizational environment in which clinicians are encouraged to solve problems creatively (lower by 0.84 percentage points), not cross-training nurses from intensive care units for the cardiac catheterization laboratory (lower by 0.44 percentage points), and having physician and nurse champions rather than nurse champions alone (lower by 0.88 percentage points). Fewer than 10% of hospitals reported using at least 4 of these 5 strategies.LIMITATION: The cross-sectional design demonstrates statistical associations but cannot establish causal relationships.CONCLUSION: Several strategies, which are currently implemented by
relatively few hospitals, are associated with significantly lower 30-day RSMRs for patients with AMI. PRIMARY FUNDING SOURCE: The Agency for Healthcare Research and Quality, the United Health Foundation, and the Commonwealth Fund. Available from EBSCOhost in Annals of Internal Medicine

Title: Association between implementation of an intensivist-led medical emergency team and mortality.
Citation: BMJ Quality & Safety, February 2012, vol./is. 21/2(152-9), 2044-5415;2044-5423
Author(s): Karvellas CJ, de Souza IA, Gibney RT, Bagshaw SM
Abstract: PURPOSE: To evaluate the impact of implementation of a dedicated intensivist-led medical emergency team (IL-MET) on mortality in patients admitted to the intensive care unit (ICU). METHODS: All adult ward admissions to the ICU between July 2002 and December 2009 were reviewed (n=1920) after excluding readmissions and admissions for <24 h. IL-MET hours were defined as 8:00-15:59 (Monday to Friday). The following periods were analysed: period 1: 1 July 2002-31 August 2004 (control); period 2: 1 September 2004-11 February 2007 (partial MET without dedicated intensivist); and period 3: 12 February 2007-31 December 2009 (hospital-wide IL-MET). RESULTS: During all three periods, there were no significant differences in length of stay or mortality (IL-MET vs non-IL-MET hours, p>0.1 for all). On multivariate analysis, Acute Physiology and Chronic Health Evaluation (APACHE) II score and age were independently associated with mortality in all three periods (p<0.05 for all). During period 3, there was a non-significant trend towards decreased mortality if admitted during IL-MET hours (OR 0.73, 95% CI 0.51 to 1.03, p=0.08). However, this result likely reflects the observed increase in mortality during non-IL MET hours rather than improved mortality during IL-MET hours. CONCLUSION: In a single centre experience, implementation of an IL-MET did not reduce the rate of in-hospital death or lengths of stay. Available from Highwire Press in BMJ Quality and Safety

Title: The relationship between in-hospital mortality, readmission into the intensive care nursing unit and/or operating theatre and nurse staffing levels
Citation: Journal of Advanced Nursing, 2012, vol./is. 68/5, 0309-2402
Author(s): Diya, Luwis, Heede, Koen Van den, Sermeus, Walter, Lesaffre, Emmanuel
Abstract: Record in progress: The aim of this article was to assess the relationship between (1) in-hospital mortality and/or (2) unplanned readmission to intensive care units or operating theatre and nurse staffing variables. Adverse events are used as surrogates for patient safety in nurse staffing and patient safety research. A single adverse event cannot adequately capture the multi-dimensional attributes of patient safety; hence, there is a need to consider composite measures. Unplanned readmission into the postoperative Intensive Care 'nursing unit and/or operating Theatre and in-hospital mortality can be viewed as measures that incorporate the effects of several adverse events. The authors conducted a Bayesian multilevel analysis on a subset of the 2003 Belgian Hospital Discharge and Nursing Minimum Data sets. The sample included 9,054 patients who underwent coronary artery bypass surgery or heart valve procedures from 28 Belgian acute hospitals. Two proxies of patient safety were considered, namely postoperative in-hospital mortality in the first postoperative intensive care unit and unplanned readmission into the intensive care and/or operating theatre (including mortality beyond the first postoperative intensive care unit) after the first-operative intensive care nursing unit. The results were, there is an association between in-hospital mortality and/or unplanned readmissions and nurse staffing levels, but the relationship is moderated by volume and severity of illness respectively. In addition, the relationship differs between the two endpoints. The conclusion was, higher nurse staffing levels on postoperative general nursing cardiac surgery units protected patients from unplanned readmission to intensive care units or operating theatre and in-hospital mortality. Cites numerous references. [Journal abstract] Available from EBSCOhost in Journal of Advanced Nursing
Effective hospital strategies for reducing risk-standardized mortality rates in acute myocardial infarction

Circulation, November 2011, vol./is. 124/21 SUPPL. 1, 0009-7322 (22 Nov 2011)


Abstract: Background: Despite recent improvements in survival after acute myocardial infarction (AMI), hospitals nationally vary 2-fold in their 30-day risk-standardized mortality rates (RSMRs); nevertheless we have limited information on hospital-level factors that may influence patient outcomes. Accordingly, we sought to identify hospital strategies that were associated with significantly lower RSMRs. Methods: We surveyed 537 hospitals (reflecting a 91% response rate) to determine whether each of several strategies were in use. We used weighted multivariate regression using data on patients from Centers for Medicare & Medicaid Services to determine the association between hospital strategies and hospital RSMR. Results: In multivariate analysis, several hospital strategies were significantly associated with RSMRs (average RSMR 15.4%). These included having monthly meetings between hospital clinicians and emergency medical services (EMS) to review AMI cases (absolute rate reduction (ARR) in RSMR 0.70%), having cardiologists always on site (ARR 0.51%), having pharmacists round on patients with AMI (ARR 0.43%), having an organizational environment where clinicians are encouraged to creatively solve problems (ARR 0.93%) and where the effectiveness of changes in care are consistently evaluated (ARR 0.33%). We also found that cross-training critical care nurses for the catheterization laboratory and having nurse champions(s) without physician champions was associated with higher RSMRs. Despite the effectiveness of some strategies, only a minority of hospitals were using these approaches. Conclusions: Several strategies are associated with significantly lower 30-day risk-standardized mortality rates patients with AMI RSMR. According to the Number of Key Strategies Used (Non-parametric test for trend : P < 0.001). Available from Highwire Press in Circulation

Hospital characteristics and mortality in elderly heart attack

Intensive Care Medicine, September 2011, vol./is. 37/(S223), 0342-4642

Author(s): Garcia Bellon A.M., Gonzalez Gonzalez A.M., Gaitan Roman D., De Mora Martin

Abstract: INTRODUCTION/OBJECTIVES. Meet management plan and predictors of mortality in elderly patients with myocardial infarction. METHODOLOGY. We reviewed all patients >75 years with myocardial infarction in 2009, on admission, 6 and 12 months after discharge. RESULTS. 103 patients (p), 52 men. Mean age: 80.21 years (men) and 80.31 years (women). Initial diagnosis: STEMI (15.5%) and NSTE-ACS (84.5%). 62.1% had TIMI e5. Killip class: I-II 85.4% 14.6% III-IV. Echocardiography was performed in 68% of p. Coronary angiography was performed in 35 p, 3 p without significant coronary lesions, 17 p 3-vessel disease. The culprit vessel was: TCI (5 p), DA (15 p), CD (5p) and CX (7p). PCI was performed in 26p. 8 p was used in thrombolysis. 1 p underwent coronary bypass surgery. Drugs at discharge: aspirin (96.8%), clopidogrel (76.9%), beta-blockers (62.7%), calcium antagonists (38.2%), nitrates (70.2%), statins (96.8%), ACEI/ARB (82.9%). 9 pts died in plant (6 cardiogenic shock, multiorgan failure 2 and 1 malignant arrhythmia), one of them, culprit vessel revascularization in income (DA) in the context of 3-vessel disease. The only predictor of hospital mortality with statistical significance were age (OR 1.32 (95% CI 1.11-1.58)). CONCLUSIONS. Our study shows the high complexity of managing these patients, because their high comorbidity associated with diffuse coronary artery disease in most cases and with a high rate of resource consumption and hospital complications. Available from EBSCOhost in Intensive Care Medicine
Association between weekend hospital presentation and sepsis mortality

Citation: Academic Emergency Medicine, May 2011, vol./is. 18/SUPPL. 1(S143), 1069-1070

Author(s): Powell E.S., Khare R.K., Courtney D.M., Feinglass J.

Abstract: Background: Mortality differences in weekend and weekday admissions have been observed in a variety of conditions that require aggressive early intervention, including myocardial infarction and stroke. It is unknown if there is a difference in early inpatient sepsis mortality in patients presenting to the emergency department (ED) on the weekend vs. weekdays. Objectives: Our objective was to determine if there was a difference in early inpatient mortality (death on or before second hospital day) in patients with sepsis when presenting to the ED on the weekend when compared to weekdays. Methods: Cross-sectional analysis of 114,601 ED admissions with a principal diagnosis of sepsis, severe sepsis, or septic shock (sepsis) from 575 hospitals in the 2008 Nationwide Inpatient Sample. Weekend admission was defined as ED presentation starting at 12am on Saturday until 11:59 pm on Sunday. Univariate association of sepsis admission time of weekend vs. weekday with early inpatient mortality was evaluated by chi-square test. A random effects logistic regression model of early inpatient mortality was done. We adjusted for comorbidities using standard methodologies, and according to previous methods, we also adjusted for the hospital annual ED sepsis case-volume, age, sex, payer-status (Medicare, Medicaid, private insurance or self-pay), and weekend admission. Results: Overall early inpatient sepsis mortality was 7.1%. The unadjusted early inpatient mortality rates for patients admitted on the weekend and weekday were 7.5% and 6.9% (p<0.001), respectively. The risk-adjusted odds ratio of early inpatient mortality of weekend vs. weekday admissions was 1.05 (95% CI 1.03-1.14, p=0.002). Conclusion: After adjustment for patient characteristics including significant co-morbid conditions, there was a significant relationship between septic patients admitted on the weekend vs. weekdays and early inpatient mortality. Patients admitted on the weekend had a 5% increased odds of early inpatient mortality compared to patients admitted on the weekdays.

Available from EBSCOhost in Academic Emergency Medicine

Using inpatient mortality differential from weekend admission to identify the role of hospital structures: The case of ischemic stroke

Citation: Journal of General Internal Medicine, May 2011, vol./is. 26/(S215-S216), 0884-0885

Author(s): Hanchate A.D., Schwamm L., Hylek E.

Abstract: BACKGROUND: A challenge in identifying factors underlying differences in hospital outcomes is the potential confounding from differences in unobserved patient characteristics across hospitals. Taking the case of hospitalizations for acute ischemic stroke, for which inpatient mortality (IM) rates are high and vary widely by hospital, little is known about the role of hospital structures, i.e., the setting in which care is delivered. To estimate the impact of hospital structures, we use a unique study design based on exploiting the within-hospital variation in IM between weekday and weekend admissions, thereby attenuating the confounding from unobserved patient differences across hospitals.

METHODS: Discharge and American Hospital Association data were merged for all hospitalizations for ischemic stroke (N=234,408) from all hospitals (N=407) from four states (2005-07 for FL, MA and NJ, and 2006-08 for AZ). We only included Emergency Department (ED) admissions that did not result in transfer to another hospital and excluded admissions for patients aged < 18, non-ischemic strokes and in hospitals without AHA data. We examined hospitals with >25 weekend admissions. We estimated a discharge-level hierarchical (hospital fixed effects) regression IM model, including interactions of weekend admission and hospital structure indicators. Patient risk factors were based on patient demographics and secondary diagnosis codes. We report the ratio of weekend/weekday adjusted IM for hospitals with a structure (e.g., bed capacity level). RESULTS: We examined 106,146 ischemic stroke admissions from 188 hospitals, of which 27% were during a weekend. While there was no significant difference in overall weekday-weekend IM (weekend=4.5%; weekday=4.4%; p=0.36), variation across hospitals was considerable: the median hospital-level ratio of weekend/weekday IM was 1.04 with an interquartile range of
0.66 to 1.38. In contrast, differences between patient risk factors of weekend/weekday patients were smaller, with interquartile range of expected IM of 0.94 to 1.06. We examined ten hospital structure indicators (see Table); of these three were associated with higher excess weekend IM—hospitals with a) absence of hospitalists providing care (excess weekend IM ratio=1.33, p<0.01), b) safety-net hospital (ratio=1.15, p=0.06), and c) <80 ED daily volume (ratio=1.31, p=0.08). 27%of weekend admissions were in hospitals that exhibited one of these three structures. CONCLUSION: Absence of hospitalists, safety-net status and lower emergency department daily volume were associated with significant excess inpatient mortality from weekend admission for ischemic stroke. (Table presented).

Available from National Library of Medicine in Journal of General Internal Medicine

Title: Long term acute care hospital transfer rate is independently associated with in-hospital mortality and length of stay

Citation: American Journal of Respiratory and Critical Care Medicine, May 2011, vol./is. 183/1 Meeting Abstracts, 1073-449X (01 May 2011)

Author(s): Hall W.B., Willis B., Medvedev S., Carson S.S.

Abstract: Introduction/Rationale: Recently, the National Quality Forum (NQF) adopted the measures of observed and risk-adjusted in-hospital mortality rates and observed and risk-adjusted intensive care unit length of stay (LOS) as indicators of quality. These indicators have been questioned by several key organizations including the ATS because they may be impacted by individual hospital practices independent of quality. Transfer rates to Long Term Acute Care Hospitals (LTACs) vary greatly among hospitals. We hypothesize that LTAC transfer rates independently affect observed and risk-adjusted hospital mortality and length of stay among patients requiring prolonged acute mechanical ventilation (PAMV). Methods: We employed a cross sectional study design using a secondary analysis of data reported to the University Healthcare Consortium (UHC), an alliance of > 90% of the non-profit academic hospitals in the United States. Hospitals with >100 registered beds that reported data to the UHC in 2008 and 2009 were included. The data were obtained from medical and surgical ICU adult patients who were ventilated for >=96 hours, a prominent component of the "Ventilator Support Product Line" reported to participating hospitals. Using linear regression analysis, we measured the association between in-hospital mortality and LTAC transfer rate, adjusting for expected mortality using the UHC risk adjustment model. Similar analyses were conducted for hospital LOS. The impact of LTAC transfer rate on reported mortality index (observed/expected mortality) and LOS index (observed/expected LOS) were also assessed. Results: A total of 145 hospitals were included in the analysis, averaging 510 PAMV patients per hospital during the study period. Mean +/- SD in-hospital mortality was 23.8 +/- 6.5%, and mean observed LOS was 30.3 +/- 9.1 days. The mean LTAC transfer rate was 15.4 +/- 13.6%. The mean mortality index was 0.90 +/- 0.21 and LOS index was 1.12 +/- 0.28. In multivariate regression analysis, LTAC transfer rate is a significant predictor of in-hospital mortality (p=0.0001), independent of expected mortality. (Table 1) Additionally, LTAC transfer rate is a significant predictor of hospital LOS (p=0.0001), independent of expected LOS. LTAC transfer rate explains 14% of the variation between hospitals in mortality index and 33% of the variation between hospitals in LOS Index. Conclusion: LTAC transfer rate has a significant impact on mortality and LOS indices reported as quality benchmarks for patients requiring prolonged acute mechanical ventilation. This provides one example of the significant limitations of using in-hospital mortality and LOS as reported quality measures. (Table presented).

Available from Highwire Press in American Journal of Respiratory and Critical Care Medicine
Title: Intensivist-led on-call service: Key step in mortality reduction
Citation: Critical Care, April 2011, vol./is. 15/(S166-S167), 1364-8535 (11 Apr 2011)
Author(s): Harris N.J., Kilner H., Krishnamurthy A., Bishop P.
Abstract: Introduction: We conducted an audit to determine whether a change to a dedicated intensivist rota in our district general hospital ICU improved patient outcome. Our unit, like many others around the country, had historically been covered out of hours by anaesthetists rather than specialists in intensive care medicine. This audit therefore had potentially far-reaching implications for many other similar ICUs in the UK. Methods: We conducted a retrospective analysis on data obtained from the ICNARC database, patient notes, drug charts and ICU charts over two cycles. The first ran from 1 December 2008 to 31 January 2009, when the conventional on-call consultant rota was still in operation. The second ran from 1 January 2010 to 31 March 2010, following implementation of a dedicated intensivist rota. Our primary outcome measure was unit mortality. We analysed a further eight parameters as indirect markers of good clinical practice. These were tidal volume, urine output, glycaemic control, lactate, mixed venous oxygen, and appropriate prescription of gastric protection, antibiotics and venous thromboembolism prophylaxis. Results: Patient demographics were similar between the two cohorts under investigation, but the mean admission APACHE II score was found to be significantly lower following the rota change, as shown in Table 1. This reduced inpatient unit mortality from 39% in cycle 1 to 25% in cycle 2. However, the change to an intensivist rota made little difference to our markers of good clinical practice. Conclusions: Our study suggests that the improvement to unit mortality was secondary to patient selection, rather than a fundamental change in clinical practice within the ICU. This indicates that a dedicated rota, in which consultant intensivists lead on out-of-hours referrals, reduces the number of inappropriate admissions to the ICU.
Available from National Library of Medicine in Critical Care

Title: Mandatory national public reporting did not reduce mortality for acute myocardial infarction and heart failure
Citation: Journal of the American College of Cardiology, April 2011, vol./is. 57/14 SUPPL. 1(E1218), 0735-1097 (05 Apr 2011)
Author(s): Joynt K., Chandra A., Jha A.
Abstract: Background: Public reporting of hospital performance has been widely touted as a tool to drive improvements in health care quality. While public reporting may improve performance on processes of care, whether it improves patient outcomes remains unclear. Understanding the impact of public reporting on patient outcomes is central to determining its value as a policy tool. Methods: Using national inpatient Medicare data from 2002-2008, we examined outcomes for over 17 million patients. We compared trends in 30-day mortality rates between publicly reported cardiovascular conditions (CHF and AMI) and non-reported cardiovascular conditions (atrial fibrillation (AF) and stroke), and performed linear spline analyses to determine if trends in mortality changed as a function of the implementation of public reporting in late 2004. Results: We found that, overall, there were small but significant improvements in mortality for CHF and AMI between 2002 and 2008, while mortality worsened slightly for AF and stroke. However, mortality improvements began prior to the onset of public reporting for both AMI and CHF and actually slowed after the institution of public reporting. Conclusion: These findings offer little evidence that the improvements in outcomes for AMI and CHF over the past decade are due to public reporting and raise concerns about the utility of relying on public reporting as a major driver of improvement in clinical outcomes. (Table presented).
Title: Challenges in assessing hospital level stroke mortality as a quality measure: Association of ischemic, hemorrhagic or total hospital stroke mortality rates

Citation: Stroke, March 2011, vol./is. 42/3(e249), 0039-2499 (01 Mar 2011)

Author(s): Xian Y., Pan W., Peterson E.D., Holloway R.G.

Abstract: Background: Public reporting efforts often profile hospitals based on overall stroke mortality rates. Yet the 'mix' of stroke cases may impact on this rate. Specifically, hemorrhagic strokes are less common but face much higher mortality than ischemic strokes. Our goal was to assess the degree to which hospital stroke mortality rankings varied whether one assessed hemorrhagic vs. ischemic vs. total stroke outcomes. Methods: Using the 2006 New York Statewide Planning and Research Cooperative System data, we examined hospital riskadjusted ischemic, hemorrhagic and total (combined) stroke inhospital mortality rates. Observed and expected mortality rates were calculated using AHRQ Inpatient Quality Indicator Software and hospital ranks were based on their observed/expected ratio. Levels of agreement among top, middle, and bottom hospital performance groups (top 10th, middle, bottom 90th) were assessed using kappa statistic. Results: Overall in-hospital mortality for ischemic, hemorrhagic and total stroke mortality rates were 7.4%, 27.4%, and 12.2%, respectively. Comparing ischemic vs. hemorrhagic stroke mortality, there was weak correlation in percentile rates ($r=0.39$, Figure 1) and poor agreement in hospital performance groups (kappa=0.24). Total hospital percentile rankings were slightly more correlated with hemorrhagic stroke (kappa=0.55) and ischemic stroke mortality ratings (kappa=0.69) but many hospitals still switched classification depending on mortality metrics. Conclusions: Hospital stroke mortality ratings varied considerably depending on whether ischemic, hemorrhagic or total stroke mortality rates were used. Future efforts should consider providing data on separate stroke types and outcomes.

Title: Reduction in hospital-wide mortality following implementation of a rapid response team program

Citation: American Journal of Respiratory and Critical Care Medicine, May 2010., 181/1

Author(s): Beitler J.R., Chong D.H., Bails D.B., Hurdle K., Link N.

Abstract: Rationale: Implementing a rapid response team (RRT) has been shown previously to reduce mortality and cardiopulmonary arrests outside the intensive care unit (ICU). Yet the utility of RRTs remains in question as any reduction in mortality outside the ICU has been offset by increased mortality within the ICU, as decompensated patients are transferred to the ICU without altering their deteriorating clinical course. No non-pediatric study to date has demonstrated a reduction in hospital-wide mortality following implementation of an RRT program. Methods: A retrospective cohort design with historic controls was used to determine the effect of an RRT program on hospital-wide mortality and outside-the-ICU cardiopulmonary arrest codes. All patients except prisoners admitted to a tertiary referral public teaching hospital between January 12003 and December 31, 2008 were included. A total of 78,992 patients pre-intervention (January 1, 2003 through December 31, 2005) and 81,037 patients post-intervention (January 1, 2006 through December 31, 2008) were evaluated. The RRT was introduced over a four-month period beginning February 2006. Patients admitted during the month prior to starting the RRT program and throughout its introduction were included in the post-intervention group. The a priori primary outcome was hospital-wide mortality. Secondary outcomes defined a priori were mortality outside the ICU and cardiopulmonary arrest codes outside the ICU. Results: A total of 937 rapid responses were called during the three-year post-intervention period. Forty-seven percent of RRTs were activated for reasons other than pre-specified vital signs criteria. Hospital-wide mortality decreased from 15.1 to 13.4 deaths per 1,000 discharges following introduction of the RRT program ($p = 0.003$). Similarly, mortality outside the ICU decreased from 7.4 to 4.6 deaths per 1,000 discharges ($p < 0.001$). Cardiopulmonary arrest codes outside the ICU decreased from 3.5 to 1.7 codes per 1,000 discharges ($p < 0.001$). Conclusion: Implementation of an RRT program was associated with a significant reduction in hospital-wide mortality, outside-the-ICU mortality, and outside-the-ICU cardiopulmonary arrest codes. (Table Presented).
Title: Reduction in hospital mortality over time in a hospital without a pediatric medical emergency team: limitations of before-and-after study designs.
Citation: Archives of Pediatrics & Adolescent Medicine, May 2011, vol./is. 165/5(419-23),
Author(s): Joffe AR, Anton NR, Burkholder SC
Abstract: OBJECTIVE: To determine whether hospital mortality has decreased over time in a hospital that has not introduced a pediatric medical emergency team (PMET). DESIGN: Retrospective observational study. SETTING: Quaternary children's hospital. PARTICIPANTS: All pediatric inpatient separations (defined as any discharge, including death) during 10 fiscal years. MAIN OUTCOME MEASURES: We searched our hospital administrative database to determine the number of pediatric inpatient separations and deaths, and we searched the hospital switchboard and pediatric intensive care databases to determine ward code and cardiopulmonary arrest rates. Relative risks (RRs) with 95% confidence intervals (CIs) and logistic regression compared results over time. RESULTS: During the periods of the 2 PMET studies showing a reduction in hospital mortality, we found a decrease in hospital mortality: for 1999-2002 vs 2002-2006, 212 deaths among 14 161 patients (1.50%) vs 219 of 26 767 (0.82%), RR, 0.55 (95% CI, 0.44-0.69); for 2000-2005 vs 2005-2007, 300 deaths among 29 497 patients (1.02%) vs 98 of 14 005 (0.70%), RR, 0.69 (95% CI, 0.55-0.86). During the periods of the 3 PMET studies showing no change in or not examining hospital mortality, we found no significant change in hospital mortality. The annual odds ratio for survival was 1.13 (95% CI, 1.09-1.16). There were no changes in ward code and cardiopulmonary arrest rates over time. CONCLUSIONS: We found a reduction in hospital mortality over time in a children's hospital without a PMET. This demonstrates the limitation of before-and-after study designs, and we hypothesize that multiple co-interventions account for the decrease in mortality. Whether a PMET could have reduced mortality further is unknown. Available from Highwire Press in Archives of Pediatrics and Adolescent Medicine

Title: Off-hours admission and mortality in two pediatric intensive care units without 24-h in-house senior staff attendance.
Citation: Intensive Care Medicine, November 2010, vol./is. 36/11(1923-7), 0342-4642;1432-4642;1;1432-4642;
Author(s): Peeters B, Jansen NJ, Bollen CW, van Vught AJ, van der Heide D, Albers MJ
Abstract: PURPOSE: To compare risk-adjusted mortality of children non-electively admitted during off-hours with risk-adjusted mortality of children admitted during office hours to two pediatric intensive care units (PICUs) without 24-h in-house attendance of senior staff. DESIGN: Prospective observational study, performed between January 2003 and December 2007, in two PICUs without 24-h in-house attendance of senior staff, located in tertiary referral children's hospitals in the Netherlands. METHODS: Standardized mortality rates (SMRs) of patients admitted during off-hours were compared to SMRs of patients admitted during office hours using Pediatric Index of Mortality (PIM1) and Pediatric Risk of Mortality (PRISM2) scores. Office hours were defined as week days between 8:00 a.m. and 6:00 p.m., with in-house attendance of senior staff, and off-hours as week days between 6:00 p.m. and 8:00 a.m., Saturdays, Sundays and public holidays, with one resident covering the ICU and senior staff directly available on-call. RESULTS: Of 3,212 non-elective patients admitted to the PICUs, 2,122 (66%) were admitted during off-hours. SMRs calculated according to PIM1 and PRISM2 did not show a significant difference with those of patients admitted during office hours. There was no significant effect of admission time on mortality in multivariate logistic regression with odds ratios of death in off-hours of 0.95 (PIM1, 95% CI 0.71-1.27, p = 0.73) and 1.03 (PRISM2, 95% CI 0.76-1.39, p = 0.82). CONCLUSION: Off-hours admission to our PICUs without 24-h in-house attendance of senior staff was not associated with higher SMRs than admission during office hours when senior staff were available in-house. Available from EBSCOhost in Intensive Care Medicine
Title: Reducing in-hospital cardiac arrests and hospital mortality by introducing a medical emergency team

Citation: Intensive Care Medicine, January 2010, vol./is. 36/1(100-106), 0342-4642;1432-4642;1432

Author(s): Konrad D., Jaderling G., Bell M., Granath F., Ekbom A., Martling C.-R.

Abstract: Purpose: To prospectively evaluate the implementation of a rapid response team in the form of a medical emergency team (MET) with regard to cardiac arrests and hospital mortality. Methods: Prospective before-and-after trial of implementation of a MET at the Karolinska University Hospital, Stockholm, Sweden. All adult patients, apart from cardiothoracic, admitted to the hospital were regarded as participants in the study. A control period of 5 years and 203,892 patients preceded the 2-year intervention period of 73,825 patients. Main results: Number of MET calls was 9.3 per 1,000 hospital admissions. Cardiac arrests per 1,000 admissions decreased from 1.12 to 0.83, OR 0.74 (95% CI 0.55-0.98, p = 0.035). Adjusted for age, sex, hospital length of stay, acute/elective admission as well as co-morbidities, MET implementation was associated with a reduction in total hospital mortality by 10%, OR 0.90 (95% CI 0.84-0.97), p = 0.003. Hospital mortality was also reduced for medical patients by 12%, OR 0.88 (95% CI 0.81-0.96, p = 0.002) and for surgical patients not operated upon by 28%, OR 0.72 (95% CI 0.56-0.92, p = 0.008). For patients fulfilling the MET criteria: Thirty-day mortality pre-MET was 25% versus 7.9% following MET compared with historical controls. Similarly, 180-day mortality was 37.5% versus 15.8%, respectively. Conclusions: Implementing the MET team was associated with significant improvement in both cardiac arrest rate and overall adjusted hospital mortality. Significant reductions in hospital mortality for un-operated surgical patients as well as for medical patients were also seen. Thus, introduction of the MET seemed to improve outcome for hospitalized patients. Available from EBSCOhost in Intensive Care Medicine