OBSERVATION UNITS AS SUBSTITUTES FOR HOSPITALIZATION OR HOME DISCHARGE
Saul Blecker; Keith Goldfeld; Joseph Ladapo; Stuart Katz. NYU School of Medicine, New York, NY. (Tracking ID #1936943)

BACKGROUND: Observation units have been associated with quality care at relatively low cost. However, studies of the economic impact of observation units have compared their cost to hospitalization without considering an alternative disposition following an emergency department (ED) visit, i.e., discharge to home. There is evidence from other clinical interventions that increased availability of services can increase overall utilization even in the absence of improvements in quality. This same supply-induced demand may shift patients who would otherwise be discharged home to be admitted to observation units following an ED visit. To determine the potential for alternative post-ED dispositions for these patients, we studied ED visits for chest pain that resulted in discharge to observation units.

METHODS: We identified all ED visits for chest pain in 2009-2010 from the National Hospital Ambulatory Medical Care Survey, a nationally representative sample of ED visits in the United States. First we developed a predictive model for likelihood of hospitalization versus discharge to home for visits to hospitals without an observation unit. Variables considered as predictors for the model included demographic characteristics, comorbid conditions, vital signs, and ED characteristics. The model was validated among patients with chest pain who were cared for at hospitals with observation services and subsequently either hospitalized or discharged. Probability of hospitalization was categorized as: hospitalization likely (p(hospitalization>0.75)), discharge likely (p(hospitalization)<0.25)), and intermediate (0.25<p(hospitalization)<0.75) to reflect clinical uncertainty. These categories were then applied to patients who were admitted to an observation unit to predict likely disposition if observation services had not been available.

RESULTS: This study included 2,071 ED visits for chest pain, representing 8,257,881 ED visits in the United States. Of these visits, 31.7% resulted in hospitalization while 13.4% led to an observation unit admission; 51.9% of visits were at facilities with available observation services. In the final prediction model, a number of variables were significantly associated with subsequent hospitalization, including age, use of oxygen, history of heart failure, and recorded urgency at triage. The model had fair discrimination in both the training (c-statistic=0.77) and validation (c-statistic 0.73) datasets. The positive predictive value for hospitalization was 80% while the predictive value for discharge was 85% (71% and 84%, respectively, for the validation dataset). Among visits subsequently admitted to the observation unit, the model predicted 7% as hospitalization likely, 32% as discharge likely, and 61% as intermediate.

CONCLUSIONS: One third ED visits for chest pain that resulted in an observation unit admission were for patients who would have been discharged to home had the observation unit not been available. Economic evaluations of observation units must consider the potential cost of increased utilization related to patients who otherwise may have been discharged. Policies such as Medicare's recently adopted "Two Midnight Rule", which was implemented to curb payment for short stay hospitalizations and will likely result in an increased number of hospital observation unit beds, may have the unintended consequence of increasing the total number of patients treated in the hospital following an ED visit.
EFFECT OF FINANCIAL INCENTIVE FOR COLORECTAL CANCER SCREENING ADHERENCE ON APPROPRIATENESS OF COLONOSCOPY ORDERS

Thomas B. Morland¹; Marie Synnestvedt²; Steven Honeywell²; Feifei Yang²; Katrina Armstrong³; Carmen E. Guerra². ¹Geisinger Medical Center, Danville, PA; ²Hospital of the University of Pennsylvania, Philadelphia, PA; ³Massachusetts General Hospital, Boston, MA. (Tracking ID #1935049)

BACKGROUND: There is some evidence that financial incentives may help physicians achieve higher rates of preventive health screenings among their patients. However, it is unclear whether these incentives affect the appropriateness of screening tests physicians order. In July of 2010 the University of Pennsylvania Health System implemented a performance incentive for general internists based upon achieving target screening adherence rates for several cancers, including colorectal cancer (CRC). Providers were eligible for $1,000 for achieving a 50% adherence rate and an additional $2,000 for achieving an 80% adherence rate for all applicable tests. The primary objective of our study was to determine whether implementation of the performance incentive was associated with an increase in potentially inappropriate screening colonoscopy orders for patients with life expectancies <4 years. We also assessed whether providers with high rates of CRC screening adherence had a higher proportion of colonoscopy orders for patients with life expectancies <4 years vs. providers with low rates of screening adherence.

METHODS: Electronic records of visits with participating providers were queried for screening colonoscopy orders during the last year prior to the incentive program (pre-intervention period) and the first year of the incentive program (post-intervention period). Using a previously validated mortality prediction model, orders were classified as "inappropriate" if patients’ 4-year expected mortalities were >50%. A chi-square test was conducted to compare the proportion of orders that were "inappropriate" during the pre-intervention period vs. the post-intervention period. A t-test was also performed comparing the mean risk scores of patients receiving colonoscopy orders during the pre-intervention period vs. the post-intervention period. Logistic and linear regressions were also performed, controlling for age, race, marital status, and gender. In a second analysis, we compared the proportion of "inappropriate" orders for providers with the highest and lowest proportion of screening colonoscopy orders (defined as the top 20% and bottom 20%), respectively.

RESULTS: The study population included screening colonoscopy orders for 1057 patients in the pre-intervention period and 1021 patients in the post-intervention period across 23 providers participating in the financial incentive. Patients were on average 58.03 years of age and 61% were female. Only 0.6% (n=6/1057) of screening colonoscopy orders in the pre-intervention period and 0.6% (n=6/1021) of screening colonoscopy orders in the post-intervention period were deemed “inappropriate.” There was no significant difference in the mean risk scores or the proportions of "inappropriate" orders between the pre- and post-intervention periods. Linear regression found no effect of time period upon risk score. There was no significant difference between the proportions of orders that were "inappropriate" among orders by high rate providers vs. low rate providers.

CONCLUSIONS: We found no evidence that a performance incentive based upon colonoscopy adherence rate led to a significant increase in inappropriate orders for screening colonoscopies. Our model is limited in that it only identifies orders that are inappropriate due to patients’ age, functional status, smoking, body mass index, and multiple comorbidities.
BETTER INFORMED PATIENTS ARE LESS LIKELY TO CHOOSE PERCUTANEOUS CORONARY INTERVENTION FOR STABLE ANGINA

Michael B. Rothberg1; Senthil K. Sivalingam2; Reva Kleppel2; Bo Hu1; Marc Schweiger2. 1Cleveland Clinic, Cleveland, OH; 2Baystate Medical Center, Springfield, MA. (Tracking ID #1937449)

BACKGROUND: Patients with chronic stable angina often believe that percutaneous coronary intervention (PCI) will prevent a myocardial infarction or extend life, even though their cardiologists do not believe this. The extent to which cardiologists contribute to this misperception is unknown. One possibility is that patients do not receive complete information about the procedure. We reviewed consent conversations to assess the level of informed decision making and its association with choosing to have PCI.

METHODS: Using the Verilogue Point-of-Practice Database, which includes visits with >600 physicians in 9 geographic regions throughout the U.S., we searched outpatient/non-acute visit transcripts audio-taped between August 2008 and August 2012 for mention of PCI, cardiac catheterization, angiogram or stent placement. We limited transcripts selected to those that included consent discussions with a cardiologist. Two investigators reviewed each transcript to identify the 7 elements of decision making required for a complex medical decision, using the framework developed by Braddock, et. al. The 7 elements include discussion of the 1) patient's role in decision making, 2) nature of the decision 3) the alternatives 4) pros and cons of the alternatives 5) uncertainties associated with the decision 6) assessment of the patient's understanding and 7) exploration of patient preference. We also assessed the cardiologists' recommendation and the patient's decision regarding catheterization and PCI (cath/PCI). Because these procedures are usually done at the same time, patients give consent for both procedures at once. We assessed the association between the decision to undergo cath/PCI and specific elements of informed decision making, angina severity, and physician recommendation. Finally, we assessed the association between completeness of informed decision making, defined as the number of elements of informed decision making present in the conversation, and the patient's decision to undergo cath/PCI in a logistic regression model.

RESULTS: The final dataset included 27 cardiologists in conversations with 60 patients (median 2 patients per cardiologist, range 1 to 6). Cardiologists were all male, had been in practice for an average of 20.5 years (range 8 to 34), and 2/3 belonged to a private office-based group practice. Mean patient age was 66 years, 70% were male and 75% were white. Of the 60 discussions, 4 (7%) included all 7 elements of informed decision making; 28% met a more restricted definition of procedure, alternatives and risks. In just over half (52%) there was some discussion of the patient's role in decision making. Discussion of the clinical issue was present in 97% of discussions, but discussion of alternatives (27%) and uncertainties (10%) were uncommon. Assessment of patient understanding and exploration of preferences each occurred in 65% and 73% cases, respectively. At the end of the visit, 44 (73%) patients chose to undergo PCI. Physicians made recommendations in 49 cases and patients followed the recommendations in 90% of cases. In univariate analysis, the proportion of patients choosing cath/PCI was lower when there was discussion of 1) uncertainty associated with the decision (17% vs. 80%, p<0.01), 2) the patient's role in decision making (61% vs. 86%, p=0.03), and 3) discussion of the alternatives (31% vs. 89%, p<0.01). The proportion choosing cath/PCI was lower, but not statistically so, when the physican assessed patient understanding (67% vs. 86%, p=0.11) and explored patient preference (68% vs. 88%, p=0.13). Anginal symptoms were present in 81% of patients, but limited activity in only 28% of patients. Presence of symptoms was not statistically associated with choosing cath/PCI (p=0.44), but patients whose symptoms limited activity were more likely to choose cath/PCI (94% vs. 71%, p=0.06). In multivariable analysis, better informed patients were more likely to choose not to undergo cath/PCI (OR=2.7 for each additional element of informed decision making, 95% CI 1.2 to 6.2, p=0.02).

CONCLUSIONS: In consent conversations between cardiologists and patients with stable angina, informed decision making is often incomplete. More complete discussions are associated with patients choosing not to undergo cath/PCI. Efforts to involve patients in shared decision making for cath/PCI might also reduce resource utilization.
IMPACT OF A BEHAVIORAL ECONOMICS INTERVENTION ON CONTROL OF HYPERTENSION AMONG VERY POOR, PREDOMINANTLY MINORITY ADULTS: A RANDOMIZED TRIAL

Martin F. Shapiro1, 6; Suzanne B. Shu2; Noah J. Goldstein2, 3; Craig R. Fox2, 3; Estivali S. Villa1; Martiniano Flores1; Sitaram Vangala1; Chi-Hong Tseng1; Braden Mogler7, 8; Stewart B. Reed9; Ronald G. Victor4, 5; Jose J. Escarce1, 6; UCLA, Los Angeles, CA; 2UCLA, Los Angeles, CA; 3UCLA, Los Angeles, CA; 4Cedars-Sinai Health System, Los Angeles, CA; 5Cedars-Sinai Health System, Los Angeles, CA; 6UCLA, Los Angeles, CA; 7UCLA, Los Angeles, CA; 8Charles R. Drew University of Medicine and Science, Los Angeles, CA; 9Columbia University, New York, NY. (Tracking ID #1936163)

BACKGROUND: Effective hypertension (HTN) control requires timely diagnosis, appropriate therapy, and long-term adherence. Poor HTN control contributes substantially to cardiovascular risk and racial/ethnic health disparities. We conducted a randomized trial of two interventions to improve blood pressure (BP) control among poor Latino and African American adults attending Federally Qualified Health Clinics in Los Angeles: provision of a home BP monitor and monthly BP checks to the control group, vs. provision of contingent payments and an "identity intervention" to the intervention group in addition to the control treatments.

METHODS: Consenting adults with BPs ≥149 mm systolic (SBP) and/or ≥94 mm diastolic (DBP) on two consecutive visits to the clinic, using a standardized measurement protocol, were randomized into control (CONT) or intervention (INT) conditions. Research staff did not interact with clinicians caring for subjects regarding BP control. Both groups were given educational materials on HTN and home BP monitors and training in their use. CONT received $20 at each of months 1-6 if they returned for BP checks. INT were administered a survey to identify potential reasons to stay healthy or live longer (e.g. people in their lives, responsibilities to others, life goals and activities they enjoy) and were given personalized calendars with pictures of loved ones or representations of their activities/goals. They received $10 at months 1-6 for returning, but an additional $5 per item if they brought their calendar and BP monitor to a visit, and up to 3 lottery tickets at each visit (expected value: $7 per ticket) if they 1) recorded HTN medication use on the calendar most days, 2) measured BP on most days, and 3) if BP was normal or improved from the previous visit. Finally, at each visit through 6 months, INT received contingent payments of $2 per mm of SBP and DBP improvement up to normalization of BP (139/89), to a maximum of $50 per visit; if BP was normalized, minimum payment was $30. A research associate also spent time with INT at months 1-6 discussing what improved BP would mean for their loved ones, goals, and activities. Both groups received $20/visit for coming in for BP checks at 9 and 12 months. Summary statistics (mean, median, standard deviation and frequency distribution) were generated for demographic, social, behavioral and clinical characteristics. Repeated measurement analyses were carried out using logistic mixed effects models for the primary endpoints of change in control of SBP and DBP at 6 and 12 months.

RESULTS: Of 207 subjects randomized, 83% completed 6 months follow-up and 75% completed 12 months. Analyses including or excluding those lost to follow-up and with or without covariates other than baseline BP yielded similar results. Subjects were mean age 53.7 years, 51% male, 59% ≤12 years education, 21% employed, 75% household income < $10,000, 64.8% Latino and 33.2% Black, 59% born outside the US, 41% diabetic, 69% with ≥1 major chronic disease other than HTN; 41% had recently gone without health care because they needed money for food, clothing or housing; 22% had gone without food, clothing or housing because they needed money for health care. Experimental groups did not differ in these characteristics. Mean baseline BP was 162.3(14.5)/91.6(14.2) mm in INT and 161.8(14.1)/88.7(12.8) mm in CONT. At 6 months, mean BP was 141.9(16.6)/81.1(13.9) mm in INT and 146.1(18.9)/80.4(15.0) mm in CONT. In multivariable analysis controlling for baseline BP, age, gender, education, race/ethnicity, born in US and diabetes, SBP control was achieved at 6 months in 57.1% of INT and 40.2% of CONT (p=.033) . By 12 months, 39.5% of INT and 35.0% of CONT had normal range SBPs (p=.729). DBP fell by lesser amounts: nearly half were normal at baseline and over 70% at 6 and 12 months. There was a trend toward greater DBP control at 6 months in intervention subjects (p=.080), but not at 12 months. At 6 months, INT improved relative to CONT in HTN medication adherence (Morisky Score) (p=.027) and in 2 measures of social support (someone to help with chores, and number of close friends with whom they felt at ease, both p<.04). Groups did not differ in patient activation scores. There was a trend toward more improvement in physical health (SF-12) in INT (p=.058).

CONCLUSIONS: We observed a 17 percentage point greater improvement in SBP control at 6 months in the group receiving contingent payments and the identity intervention compared to those receiving home BP monitors and monthly BP checks alone. This very encouraging result was not sustained once the intervention ended. Further research is needed to determine which component(s) of the intervention contribute to improvement, which characteristics predict benefit, and whether extending one or both interventions would sustain the improvement seen in this study, as well as to identify additional measures to further improve BP control in this highly disadvantaged population.
SURROGATE MARKERS, COMPOSITE END-POINTS, DISEASE-SPECIFIC MORTALITY, OR ALL-CAUSE MORTALITY? A SURVEY TO UNDERSTAND THE RELATIVE VALUE CLINICIANS PLACE ON DIFFERENT OUTCOMES
Tanner Caverly; Allan V. Prochazka; Rodney A. Hayward; Daniel Matlock. 1University of Michigan Medical School, Ann Arbor, MI; 2University of Colorado, Aurora, CO. (Tracking ID #1939177)

BACKGROUND: When weighing the importance of a risk reduction found in a clinical trial, clinicians and patients need to consider the clinical significance of what was reduced. Improvements in surrogate and composite outcomes, for example, do not necessarily imply meaningful improvement in patient-oriented outcomes. Improvement in all-cause mortality is ideal, since it reflects the overall effect of therapies on mortality, but most trials are not large enough to assess this outcome. We conducted a survey that varied the type of benefit observed in hypothetical drug trials to evaluate the extent to which clinician perceptions changed based on the outcome evaluated. We hypothesized that perceptions would be relatively insensitive to the type of outcome reported in the hypothetical trials.

METHODS: Our survey consisted of 4 scenarios that were identical except for differences in the type of outcome: surrogate, composite, disease-specific mortality, or all-cause mortality (Table 1). Each participant received all 4 scenarios which were separated by unrelated questions in order to minimize direct comparisons. They were asked to rate the extent to which each scenario provided proof that the new drug might help people. Answers were on a 1-10 risk perception scale (ranging from 1=no proof to 10=good proof).

Surveys were distributed during educational conferences to 3rd and 4th year medical students at a single academic institution, to internal medicine residents at two institutions, and to faculty in the division of general internal medicine at one institution. In addition, a national group of clinician-researchers with evidence based medicine expertise took an online version of the survey. We analyzed the distribution of responses for the 4 scenarios in two ways: 1) using analysis of variance to identify differences in the mean response between scenarios and 2) using simple descriptive statistics to evaluate how participants rated each question relative to their responses on the other 3 questions. We also used analysis of variance to examine how differences between mean responses on the all-cause mortality question and the disease-specific mortality question varied by level of training.

RESULTS: We received 546 completed surveys for analysis (response rate: 87% for medical students [273/313]; 80% for internal medicine residents [148/185]; 67% for general medicine faculty [118/175]; and 41% for the group of experts [7/17]). On average, participants rated the composite outcome as more valuable than the other types of outcomes (Table 1). Overall, 51% rated improvement in a surrogate marker as equal to or more valuable than an improvement in all-cause mortality, and 79% rated improvement in a composite outcome containing a surrogate marker as equal to or more valuable than improvement in all-cause mortality. 80% rated improvement in stroke-related mortality as equal to or more valuable than an improvement in all-cause mortality. Mean differences in responses on the all-cause mortality question and the disease-specific mortality question varied by level of training (medical students rated improvement in stroke mortality an average of 1.5 points higher than improvement in all-cause mortality; residents 1.2 points higher; general medicine faculty 0.6 points higher; and experts 1.7 points lower).

CONCLUSIONS: Many clinicians in our sample over-value improvement in surrogate and composite outcomes and under-value improvement in all-cause mortality. This raises concerns that clinical decisions may not reflect the actual value of the intervention, especially if clinicians are exposed to information that emphasizes clinically less important outcomes.

Table 1. Mean response on a 1-10 scale when 546 medical students and physicians asked to "Rate the extent to which this provides proof that the new drug might help people." (1 = "no proof" and 10 = "good proof")

<table>
<thead>
<tr>
<th>Category</th>
<th>Question</th>
<th>N</th>
<th>Mean (s.d.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surrogate outcome</td>
<td>A large randomized trial shows that a new drug lowers serum levels of a risk factor known to be associated with an increased risk of death from stroke.</td>
<td>546</td>
<td>4.6 (2.2)</td>
</tr>
<tr>
<td>Composite outcome (containing surrogate outcome and patient-oriented outcomes)</td>
<td>In a large randomized trial, people in the new drug group experienced decreased rates of the combined primary end-point (non-fatal stroke, death, or elevated levels of a risk factor into the high risk category for stroke).</td>
<td>545</td>
<td>6.6 (2.1)</td>
</tr>
<tr>
<td>Disease-specific mortality</td>
<td>In a large randomized controlled trial, fewer people died from stroke in the new drug group than in the placebo group.</td>
<td>540</td>
<td>6.4 (2.1)</td>
</tr>
<tr>
<td>All-cause mortality</td>
<td>In a large randomized controlled trial, fewer people died from any cause in the new drug group than in the placebo group.</td>
<td>540</td>
<td>6.2 (2.3)</td>
</tr>
</tbody>
</table>

Participants were told that all of the trials were statistically significant from large randomized trials with excellent validity and generalizability.

Differences between group means are statistically significant at *p < 0.001* on ANOVA.
WE TORTURE THEM BEFORE THEY DIE, EVEN THOUGH WE KNOW THAT THEY ARE GOING TO DIE: THE INFLUENCE OF HOSPITAL POLICIES AND CULTURE ON ETHICAL DNR DECISION MAKING IN THE US AND UK
Elizabeth Dzeng¹,²; Michael P. Kelly²; Sydney M. Dy¹; Thomas J. Smith¹; Martin Roland²; Stephen Barclay²; David M. Levine¹. ¹Johns Hopkins School of Medicine, Baltimore, MD; ²University of Cambridge, Cambridge, United Kingdom. (Tracking ID #1939234)

BACKGROUND: Physicians face ethical challenges when there are conflicts between autonomy and beneficence, which is defined as acting in the best interest of the patient. Shared decision-making, where the patient and doctor form a partnership to decide on treatment plan, has emerged as a model on the spectrum in between medical paternalism and patient autonomy. In the United States, there are significant variations in hospital policies regarding Do Not Resuscitate (DNR) decision-making. In the United Kingdom, it is standard practice for doctors to make unilateral decisions to institute a DNR order in situations where survival is unlikely. The aim of this study is to explore how doctors in the US and UK balance autonomy and beneficence in decisions regarding DNR status at the end of life and how their ethical values and clinical approach are shaped by their institution’s culture and legal frameworks.

METHODS: Semi-structured in-depth interviews were conducted with 58 internal medicine doctors across four sites (New York, Baltimore, Seattle and Cambridge, England), who were routinely involved in DNR conversations with end of life patients. Participants were purposively sampled by stage of training and medical subspecialty to provide a wide range of perspectives and contribute to understanding emerging patterns and themes. Interviews lasted on average 60 minutes and were audio-taped and transcribed. Transcripts were analyzed and double coded using thematic analysis with an interpretive approach.

RESULTS: 13-16 doctors participated at each site. Approximately equal numbers of senior faculty, junior faculty, fellows and residents were interviewed. Experienced doctors at all sites generally felt comfortable engaging in shared decision-making and when clinically appropriate, making more paternalistic recommendations against resuscitation. However, there was greater variation amongst residents and fellows that was site specific. At each hospital, there appeared to be a dominant mode of decision-making that impacted trainees' perspectives on DNR decision-making. Although hospital policies primarily dictate whether patient preferences should be honored, trainees at hospitals with policies that prioritize patient autonomy often interpreted them to mean that they should not provide clinical recommendations. They felt compelled to offer choice even if the chance of successful resuscitation was negligible. In contrast, trainees at hospitals that had policies that encouraged paternalism or shared decision-making, which included the hospital in the UK and one in the US, felt more comfortable expressing clinical judgment against resuscitation when appropriate. Trainees at hospitals that prioritized autonomy more frequently perceived conflict between honoring autonomy and acting with beneficence and recalled more conflicts with patients regarding preferred decision.

CONCLUSIONS: Institutional norms and policies influence how doctors develop their professional attitudes and practices regarding DNR decision-making. Doctors at the American hospital that encouraged shared decision-making, had attitudes and beliefs about DNR decision-making that were more similar to British doctors than doctors at the other American sites. Hospitals characterized by higher levels of shared decision-making and paternalism provided an environment where trainees felt more comfortable withholding resuscitation when success was unlikely and in doing so, experienced fewer patient conflicts.