**Supplemental Table 6**

1. **Cost Outcome Description**
2. **Patient-Related Outcomes Data**
3. ***P* values**
4. **Cost Outcomes Description**

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| **Study** | **Practice** | **Definition of Cost** |
| Bates et al. 1997 | CPOE | Charges from clinical database for tests ordered per admission |
| Bridges et al. 2012 | CPOE | Cost of tests performed |
| Fang et al. 2014 | CPOE | Mean cost per patient-day from laboratory database |
| Feldman et al. 2013 | CPOE | Charges per patient-day |
| Le et al. 2015 | CPOE | Cost of tests performed |
| Lippi et al. 2015 | CPOE | Costs according to 2015 reimbursement fees |
| Probst et al. 2013 | CPOE | Mean cost of tests ordered per patient |
| Tienery et al. 1993 | CPOE | Charges per admission |
| Waldron et al. 2014 | CPOE | Full cost of tests |
| Nightingale et al. 1994 | CDSS | Direct cost per patient-day |
| Poley et al. 2007 | CDSS | Costs of laboratory requests |
| Tierney et al. 1988 | CDSS | Patient charges |
| Baral et al. 2001 | Education | Patient charges |
| DellaVolpe et al. 2014 | Education | Institutional cost |
| Froom et al. 2012 | Reflex | Cost to HMO |
| Dickerson et al. 2014 | Test Review | Costs of send-out requests |
| Janssens et al. 2015 | Combined | Cost of all tests in a panel |
| White et al. 2013 | Combined | Charges per test |

1. **Patient-Related Outcomes Data**

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| **Study** | **Practice** | **Intervention** | **Patient-Related Outcomes data** |
| Bridges et al. 2014 | CPOE | Redundant test alert | "…there were no statistically significant differences in test priority…mortality, disposition after discharge from hospital…" |
| Fang et al. 2014 | CPOE | Display of test cost | "…the mean length of stay remained the same throughout our study period…" |
| Hwang et al. 2002 | CPOE | CPOE replacing non-CPOE | Patient length of stay (# nights spent in hospital) significantly decreased (p=0.049); no significant difference in appropriateness of patient stay. |
| Paegler et al. 2013 | CPOE | Redundant test alert | "Limits on laboratory orders within the context of computerized order entry decreased laboratory utilization without adverse effects on mortality [mortality rates] or length of stay [PICU length of stay and hospital length of stay]." A significant decrease in both PICO length of stay and hospital length of stay was observed during the post-intervention period. No significant difference observed in mortality rate per 100 discharges. |
| Tierney et al. 1993 | CPOE | CPOE replacing non-CPOE | "Although quality [of care] is difficulty to measure, we found no evidence that the workstations reduced quality of care (as indicated by post discharge care [analyzed as re-admissions and outpatient visits and charges 1 and 3 months after discharge])…"; Mean length of stay was 0.89 day shorter for intervention group (p = 0.11). |
| Roukema et al. 2008 | CDSS | Proposed testing | Patients in intervention group experienced longer times in the ED, however the difference was not statistically significant. |
| Barazzoni et al. 2002 | Test Review | Test review | "…over the whole study period no change in pre- and post-operative mortality rates was observed." |
| DellaVolpe et al. 2013 | Education | Education | "There was no significant difference in mortality rate pre-intervention and post-intervention."; "…the decrease in ABGs after the protocol implementation did not increase hospital mortality or hospital length of stay between study cohorts." |
| Thakkar et al. 2015 | Education | Education | Differences in length of stay and in-hospital mortality were not significantly different between pre- and post-intervention groups. |
| Calderon-Margalit et al. 2005 | Combined Practice | Education + Feedback + LTU | "…the 30-day readmission rates and in-hospital mortality rates did not differ significantly between these two study period [pre- and post-intervention]". |
| Larochelle et al. 2014 | Combined Practice | CDSS + CPOE + Education | "…there was an absolute increase of 34% in the proportion of patient receiving guideline-concordant testing…Twelve months following start of the intervention, the percentage of patients receiving guideline-concordant cardiac biomarker testing was estimated to be 95.5%, an absolute increase of 38.4% from the expected baseline." |
| Vegting et al. 2012 | Combined Practice | CPOE + Education + Feedback | "No evident changes occurred for mortality and hospital readmissions…"; "…the average values for HbA1c [surrogate patient outcome measure] did not change…"; "Perhaps, quality of care was improved because unnecessary tests are known to increase patient discomfort and lead to more false-positive results." |
| Vidyarthi et al. 2014 | Combined Practice | Education + Feedback | "There was no substantial increase in readmission rates or mortality [measured as total number of inpatient death during a calendar year], respectively, over the years of the intervention…" |
| Wang et al. 2002 | Combined Practice | CDSS + Education + LTU | "There were no significant changes in length of stay, readmission to intensive care, hospital mortality, or ventilator days." |

1. ***P* values for studies that could not be included in meta-analysis**

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| **Study** | **Practice Category** | ***P* values** |
| Georgiou et al. 2011 | CPOE | Faster turn-around-time for result reporting (*P* < 0.001) |
| Horn et al. 2013 | CPOE | Reduction in number of test (for 5 lab tests out of 27 assessed) (*P* < 0.001) |
| Hwang et al. 2002 | CPOE | Reduction in number of tests (for 1 of 4 lab tests assessed) (*P* < 0.05) |
| Procop et al. 2015 | CPOE | Reduction in number of tests (*P* < 0.0001) |
| Westbrook et al. 2006 | CPOE | Non-significant redution in number of tests (p = 0.228) and turn-around-time (*P* = 0.218) |
| Howell et al. 2014 | CDSS | Reduction in number of tests ordered *(P* < 0.05) |
| Roukema et al. 2008 | CDSS | Tests more frequently ordered (*P* < 0.001) (study targetd under-utilization) |
| Bonaguri et al. 2011 | Reflex | *P* value not reported |
| Tampoia et al. 2007 | Reflex | Reduction in number of "second-level" tests: anti-ENA (*P* = 0.001), and anti-dsDNA (*P* = 0.001) ("first level" number of tests unchanged ANA *P* = 0.56) |
| Wu et al. 1999 | Reflex | *P* value not reported |
| Chu et al. 2013 | Test Review | Reduction in number of tests (*P* = 0.001), reduction in cost (*P* = 0.001) |
| Miller et al. 2014 | Test Review | *P* value not reported |
| Chonfhaola et al. 2013 | Education | *P* value not reported |
| Gama et al. 1992 | Feedback | Reduction in clinical chemistry tests (*P* < 0.001) and hematology tests (*P* < 0.05); and reduction in revenue expenditure (*P* < 0.001) |
| Verstappen et al. 2004 | Feedback | Reduction in number of tests (*P* *= 0.005)* |
| Verstappen et al. 2004 | Feedback | Significant redution in number of "group A" tests (*P* = 0.013), but not "group B" tests (*P* = 0.29) |
| Winkens et al. 1992 | Feedback | Reduction in number of tests (*P* < 0.001) |
| Gilmour et al. 2015 | Combined Practice | Reduction in number of tests: fT4 (*P* < 0.0001) and fT3 (*P* < 0.0002) |
| Hutton et al. 2009 | Combined Practice | Reduction in number of tests (*P* < 0.005) |
| Larochelle et al. 2014 | Combined Practice | *P* value not reported |
| Lum et al. 2006 | Combined Practice | *P* value not reported |
| MacPherson et al. 2005 | Combined Practice | Reduction in number of tests *P* values ranging from 0.051 to < 0.0001 |
| Riley et al. 2015 | Combined Practice | *P* value not reported |
| Roggeman et al. 2014 | Combined Practice | *P* value not reported |
| Rosenbloom et al. 2005 | Combined Practice | Reduction of number of tests ( *P* = 0.04), Reduction in expenditures (*P* < 0.001) |
| Spiegel et al. 1989 | Combined Practice | Reduction in number of tests (2 of 4 repeat lab testing) (*P* < 0.005) |
| Vegting et al. 2012 | Combined Practice | Reduction in costs spent on laboratory tests (*P* < 0.02) |
| Vidyarthi et al. 2014 | Combined Practice | *P* value not reported |
| Wang et al. 2002 | Combined Practice | *P* value not reported |
| Warren et al. 2013 | Combined Practice | *P* value not reported |