(N = 2000) and a test set (N = 4486). A proportion of glucose and HbA1c specimens were mismatched by randomly switching either HbA1c or glucose results. The outcome of interest was correct classification of vials as either ‘mismatched’ or ‘mismatched’. The outcome was predicted using a Bayesian network that encoded probabilistic relationships among analytes, self-reported diabetes status and a latent ‘mismatch’ variable. Performance was compared against an established approach LabRespond via area under the receiver-operating characteristics curves (AUCs). An AUC = 1.0 and 0.5 represents perfect prediction and random guessing respectively. RESULTS: The network was predictive of glucose and HbA1c mismatches that produced 20 mg/dL glucose and 1 point HbA1c discrepancies between true and mismatched scores (AUC = 0.84 (+/-0.03)). The network also identified errors among those self-reporting diabetes (N = 329) AUC = 0.81 (+/-0.02) and predicted self-report of diabetes diagnosis AUC = 0.95 (+/-0.01). The network also performed better (z = 12.04, p < 0.001) than LabRespond (AUC = 0.76 +/- 0.01). CONCLUSION: A Bayesian network that models probabilistic relationships among analyte values can accurately identify mismatched specimens. The algorithm is best at identifying mismatches that result in a clinically significant magnitude of error. Information about diabetes diagnosis acted to reduce uncertainty in a mismatch. Decision analysis may be have direct application in reducing cost at point-of-care.

**PDB80**

**REDUCING COSTS AND IMPROVING OUTCOMES BY REDUCING MEDICAL ERRORS: A COMPARISON OF EXPERTS WITH PROBABILISTIC LABORATORY ERROR DETECTION IN A POPULATION OF PRE-DIABETICS**

**Doctor JN1, Strylewicz G2**

1University of Southern California, Los Angeles, CA, USA; 2University of Washington, Seattle, WA, USA

**OBJECTIVE:** Human evaluation of laboratory errors is a costly standard of practice. Automating error detection may reduce costs and improve patient outcomes. To compare an automated probabilistic approach (Bayesian network) to human expert error detection in a pre-diabetic population. **METHODS:** Two test sets (A and B) each N = 60 were generated from the results of the Diabetes Prevention Program (DPP). Glucose values were randomly drawn from a pre-diabetic distribution and expected HbA1c score was estimated by the DPP based formula: HbA1c = 4.22 + 0.1604 × Glucose. In each test set, 37% of the HbA1c scores were mismatched to generate vial labeling errors. Eleven experts recruited from the American Academy of Clinical Chemists and a Bayesian network evaluated the results to detect mismatched vials. Six and five experts were assigned to test sets A and B respectively. Receiver-Operating Characteristics (ROC) curves were generated for each expert and for the Bayesian network and area under the curves (AUCs) were compared via null hypothesis testing. An AUC = 1 and 0.5 represents perfect prediction and random guessing respectively. **RESULTS:** The Bayesian network was predictive of glucose and HbA1c mismatches in both Test Set A (AUC = 0.86 (+/-0.05)) and Test Set B (AUC = 0.93 (+/-0.04)). Expert performance was on average worse in Test Set A (AUC = 0.74 (+/-0.07)) and B (AUC = 0.76 (+/-0.07)). Individual analysis revealed that the network performed significantly better (z < 1.96, p < 0.05) than 7 of the 11 experts; in no case did the network perform worse than the experts. **CONCLUSION:** A Bayesian network that models probabilistic relationships among analyte values is often better than laboratory experts at identifying laboratory errors. This suggests that an automated program may help reduce costs and improve patient outcomes in the laboratory.

**PHC1**

**A COST COMPARISON OF CARDIAC SURGERIES BY CHOICE OF FIBRIN SEALANT**

**Narayan S1, Stemplewski S2, Conner TM1, Tucker M4, Shander A4**

1Baxter Healthcare Corporation, Westlake Village, CA, USA; 2Premier Inc, Charlotte, NC, USA; 3Outcomes Research Consulting, Austin, TX, USA; 4Englewood Hospital and Medical Center, Englewood, NJ, USA

**OBJECTIVE:** Fibrin sealants are efficacious in reducing perioperative bleeding during a variety of surgical procedures, which may result in decreased hospital costs and lengths of stay (LOS). This study sought to compare hospital costs and LOS by three fibrin sealants used in cardiac surgical procedures. **METHODS:** Data were extracted from a large U.S. hospital-based, service-level comparative database. Procedures were identified using principal ICD-9 codes. Patients who received either FloSeal® only or one of two comparison products (Gelfoam® + thrombin or Surgicel® + thrombin) and were discharged from hospital between April 1, 2003 and September 30, 2006 were included. Costs were considered from the hospital perspective and were derived from either reported actual costs or an estimated calculation of costs-to-charges from the Medicare Cost Report. Regression modeling with log transformation was employed to compare differences in fixed hospital costs (those insensitive to volume), variable costs (those sensitive to volume), and postoperative LOS. Control variables included age, gender, All Patient Refined-Diagnosis Related Group severity codes, region, hospital teaching status, bed size, population served (urban or rural), and primary payer. **RESULTS:** A total of 35,672 discharges were included. The regression models showed that patients who received Gelfoam + thrombin had higher fixed and variable costs (+21% and +40%, p < 0.01, respectively) and Surgicel + thrombin had higher fixed and variable costs (+18% and +14.5%, p < 0.01, respectively) compared to FloSeal. In terms of fixed costs, this amounted to an additional $21,803 for Gelfoam + thrombin and an additional $19,208 for Surgicel + thrombin. In variable costs, this amounted to an additional $26,609 for Gelfoam + thrombin and $22,181 for Surgicel + thrombin. All three cohorts had similar postoperative LOS. **CONCLUSION:** FloSeal demonstrated cost reduction in hospital stays for cardiac procedures, compared to two other fibrin sealants. Given small margins achieved by hospitals today, cost-effective surgical aids with better or similar outcomes should be considered in surgical service lines.

**PHC2**

**A COMPARISON OF COSTS ASSOCIATED WITH SPINAL SURGERIES BY CHOICE OF FIBRIN SEALANT**

**Narayan S1, Stemplewski S2, Conner TM1, Tucker M4, Shander A4**

1Baxter Healthcare Corporation, Westlake Village, CA, USA; 2Premier Inc, Charlotte, NC, USA; 3Outcomes Research Consulting, Austin, TX, USA; 4Englewood Hospital and Medical Center, Englewood, NJ, USA

**OBJECTIVE:** Fibrin sealants are used in a variety of surgical procedures to reduce wound bleeding. This may consequently decrease hospital costs and lengths of stay (LOS). This study sought to compare costs and LOS following fibrin sealant use during spinal surgery. **METHODS:** Data were extracted from a large U.S. hospital-based, service-level comparative database. Procedures were identified using principal ICD-9 codes. Patients who received either FloSeal® only or one of two comparison products (Gelfoam® + thrombin or Surgicel® + thrombin) and were discharged from hospital between April 1, 2003 and September 30, 2006 were included. Costs were considered from the hospital perspective and were derived from either reported actual costs or...
an estimated calculation of costs-to-charges from the Medicare Cost Report. Regression modeling with log transformation was employed to compare differences in fixed hospital costs (those insensitive to volume), variable costs (those sensitive to volume), and post-operative LOS. Control variables included age, gender, All Patient Refined-Diagnosis Related Group severity codes, region, hospital teaching status, bed size, population served (urban or rural), and primary payer. RESULTS: A total of 82,788 discharges were included. The models demonstrated that patients who received Gelfoam + thrombin had higher fixed and variable costs (+6.1% and +7.3%, respectively, p < 0.01) and Surgicel + thrombin patients had higher fixed and variable costs (+18% and +10%, p < 0.01, respectively) compared to FloSeal only. In terms of fixed costs, the predicted increase was $15,956 for Gelfoam + thrombin and $18,639 for Surgicel + thrombin patients. In terms of variable costs, the predicted increase was $25,413 per Gelfoam + thrombin and $24,909 per Surgicel + thrombin patient. Surgicel+ thrombin patients also had higher (+6%, p < 0.01) post-operative LOS compared to FloSeal patients. CONCLUSION: FloSeal demonstrated significant cost reductions and post-operative LOS, compared to other commonly-used products. Limited prospective reimbursements based on a DRG system make it necessary for health care providers to consider more cost-effective surgical aids for spinal surgeries.

COST-EFFECTIVENESS MODELING OF DENTAL IMPLANT 1ST LINE STRATEGY VERSUS BRIDGE
Berestniak A1, Bouchard P2, Renouard P1, Bourgeois D1, Jeanneret MH4
1Data Mining International, Geneva, Switzerland, 2University Denis Diderot, Paris, France, 3Centre d’Implantologie, Paris, France, 4University Lyon 1, Villeurbanne, France, 5University Paris-Descartes, Paris, French Guiana

OBJECTIVE: We assessed the cost-effectiveness of dental implant 1st line strategy versus fixed partial denture (and denture) in patients suffering from one single missing tooth.

METHODS: The model used a simulation decision framework over a 20-year period. Potential treatment switches can occur every 5 years. Transition probabilities came from literature, epidemiological reports or expert opinions. They have been programmed using specific distribution ranges to simulate the patients and practice variability, and to take into account parameters uncertainty. Direct medical costs have been assessed according to a specific cost survey in France. Probabilistic sensitivity analyses were conducted using 5000 Monte-Carlo simulations generating confidence intervals of model outcomes.

RESULTS: The cost distribution indicates a peak at €3000 for the bridge strategy. The distribution for the implant strategy is more flat, showing the maximum ranging from €2500 to €3500. The model simulations establish that total mean cost of the bridge 1st line strategy is €4385 per patient over 20 years (minimum: €1850; maximum: €17,267), providing 69% of success rate. Total mean cost of the implant 1st line strategy is €3517 per patient over 20 years (minimum: €1990 Euros; maximum: €10,221 Euros), with 92% of success rate. Differences are statistically significant for both total mean costs (p < 0.001) and success rate (p < 0.001).

CONCLUSION: This modeling approach is the very first robust model in the field of implantology. Implant as the 1st line strategy appears to be the “dominant” strategy, considering the lower overall costs and the higher success rate.

COST-EFFECTIVENESS ANALYSIS OF THROMBOPROPHYLACTIC STRATEGIES OVER ONE YEAR AFTER TOTAL KNEE REPLACEMENT IN VETERAN PATIENTS
Raisch DW1, Campbell HM1, Khan N2, Taylor Z2, Becker T1
1Department of Veterans Affairs Cooperative Studies Program, Albuquerque, NM, USA, 2University of New Mexico, Albuquerque, NM, USA

OBJECTIVE: For 20 years, thromboprophylactic strategies (TSs) have been used after total hip replacement (THR). Our objective was to conduct a comprehensive cost effectiveness analysis (CEA) of TSs for THR from the health payer perspective.

METHODS: We extracted national data for Veteran patients receiving THR, including 1-year follow-up of all health care utilization and complications of venous thromboembolic events (VTE: deep vein thrombosis, pulmonary embolism), thrombocytopenia, bleeding, and death. Diagnostic codes were used to identify most complications. A comparative CE model, incorporating fondaparinux, was developed. Incremental cost-effectiveness ratios (ICERs) were calculated to compare TSs. Life-years gained (LYG) were calculated using actuarial tables for life expectancy. Since fondaparinux was rarely used in the VA, we applied rates from published trials and used our data to estimate proportional increases in complication rates for fondaparinux from day 50 through one year. We applied VA costs. Fondaparinux costs were based upon mean costs of outcomes of the other TSs. One-way sensitivity analyses (SA) were performed by incorporating the mean probabilities of DVT in the other TSs into the least-costly TS or decreasing the costs of complication arms by one standard deviation in all but the least-costly TS.

RESULTS: There were 1722 patients, 90 VTEs, and 48 deaths. Dalteparin was dominant; the least-costly per patient with fewest VTEs ($18,850, 2.4%) compared to warfarin ($19,965, 2.7%), enoxaparin/ warfarin ($24,809, 21.6%), and fondaparinux ($20,759, 5.2%). Thus, ICERS indicated more costs and more events with other TSs. Deaths occurred in 2.4% of dalteparin patients versus 2.3% for enoxaparin and, estimated, 1.0% for fondaparinux, thus ICERS for LYG were $35,754/LYG and $6381/LYG, respectively. Dalteparin and other treatments were dominant over warfarin (2.9% deaths) and enoxaparin/warfarin (6.0% deaths) for LYG. Each SA showed dalteparin remained the least-costly TS per VTE avoided. CONCLUSION: Dalteparin was slightly more effective and less costly.

COST-EFFECTIVENESS ANALYSIS OF THROMBOPROPHYLACTIC STRATEGIES OVER ONE YEAR AFTER TOTAL KNEE REPLACEMENT IN VETERAN PATIENTS
Campbell HM1, Raisch DW1, Taylor Z2, Khan N2, Becker T1
1Department of Veterans Affairs Cooperative Studies Program, Albuquerque, NM, USA, 2University of New Mexico, Albuquerque, NM, USA

OBJECTIVE: There is a lack of cost effectiveness (CE) analyses of thromboprophylactic strategies (TSs) for total knee replacement (TKR) that incorporate outpatient care, long-term follow-up, or complications besides venothrombotic events (VTE: deep vein thrombosis, pulmonary embolism). The objective was to assess the CE of TSs for TKR from the health payer perspective including complications of VTE, hemorrhage, thrombocytopenia, and death.

METHODS: We searched national Veterans Affairs (VA) datasets for all health care use, outcomes and VA costs for patients receiving TKR within one year. Our follow-up was one year. Diagnostic codes were used to identify complications. Life-years gained (LYG) were calculated using actuarial