

Proceedings From Innovations in Health Care: A Quality Improvement and Research Forum

The following abstracts were presented as posters during “Innovations in Health Care: A Quality Improvement and Research Forum,” held during the Wisconsin Medical Society’s 2016 Annual Meeting, April 2 in Madison, Wisconsin. Medical students, residents and physicians presented their research in the areas of Health Care Delivery, Accessing and Finance; Health Care Ethics; and Healthy Care Quality and Population Health. The abstracts denoted with an asterisk (*) were selected as the “most promising research” by attendees.

HEALTH CARE DELIVERY, ACCESSING AND FINANCE

To Examine the Effects of the Implementation of a Medical Scribe on the Productivity and Efficiency of a Primary Care Physician*

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Background: Many physicians have a practice that uses an ambulatory electronic health record (EHR) system. The use of medical scribes, however, is not as widespread, and few studies have been done to assess the effects of medical scribes on productivity in the primary care setting.

Methods: A health care system located in the Midwest implemented a pilot project that involved employing medical scribes for use by a family medicine physician. Data were collected and analyzed from the 12 months prior to the 3 months after employing the medical scribe.

Results: On average, after implementation of the medical scribe, the patients seen per hour increased 11.3%, relative value units (RVU) per visit decreased 1.5%, and RVU per hour increased 9.4%.

Conclusions: Implementation of a medical scribe increased patient volume but did not lead to a significant increase in direct revenue for the primary care physician.

Cost-Effectiveness, Regionalization of NICUs, and Alternative Preventive Options*

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Background: Technological innovation is a major contributor to rising health care costs in the United States. Managing the use of such technologies may be desirable to control such expenditures. Economic evaluation using cost-effectiveness analysis (CEA) can be a useful approach. This study evaluates the cost-effectiveness of neonatal intensive-care units (NICUs) with other alternative health care interventions, and explores whether regionalization of NICUs can help improve health outcomes.

Methods: CEA was used to compare NICUs, tocolytic agents, prenatal care, and teenage family planning services. Cost-effectiveness was measured using incremental cost per life saved and incremental cost per low birth weight (LBW) birth averted.

A preliminary regression model was used to evaluate how neonatal mortality varied among NICUs. Data were collected on neonates admitted to 14 level III NICUs in Wisconsin and Wisconsin residents to Duluth, Minnesota. Data on neonatal mortality were obtained from the Wisconsin Department of Health Wisconsin Interactive Statistics on Health (WISH) database. NICU volume (2003-2004) and

proportion of very low birth weight (LBW) infants at each unit provided as proxies to model regionalization.

Results: NICUs were the most effective and most costly option. Teenage family planning services were the most cost-effective program when reduction in neonatal mortality was the outcome measure. Tocolytic agents were the most cost-effective method when reduction in LBW births was the outcome measure.

Volume and proportion of LBW patients were negatively correlated with mortality ($P = .089$ and $P = .03$, respectively), suggesting regionalization of NICUs may be favorable.

Conclusions: Although NICUs “rank among the most expensive services of all hospital care” they remain necessary as one of the only postpartum interventions available for neonates. Such a combination of effectiveness and cost presents policymakers with a difficult dilemma, highlighting the need for accurate economic appraisals in evaluating varying health improvement services. Hopefully, such evaluation can inform and facilitate decision-making to provide meaningful solutions to rising health care costs.

Validation and Implementation of Portable Audiometric Screening for Ototoxicity

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Background: Cancer patients receiving chemotherapeutic medications may experience hearing loss due to the ototoxic effects of the medications administered, thus making ototoxicity monitoring done by audiologists necessary throughout their treatment. These additional appointments present increased costs to the patients, increased time

spent traveling between clinics, increased time spent in waiting rooms, and an increased likelihood of missed follow-up monitoring. Portable automated audiometry applications have recently been developed for devices such as iPads, which would allow patients to avoid the challenges listed, as they would undergo point-of-care ototoxicity testing within cancer centers and be referred for further testing only when absolutely necessary.

Methods: Commercially available tablet-based automated audiometric applications were trialed in an outpatient audiology clinic. Patients presenting for formal audiometric evaluations had hearing thresholds obtained using 1 of 3 tablet-based audiogram applications and results were compared to those hearing thresholds from conventional audiometry testing. This allowed us to assess the reliability and validity of the tablet-based application compared with conventional audiometry testing.

Results: Descriptive analysis showed that of the 3 automated audiometric applications trialed, the Eartrumpet application provided the most accurate hearing thresholds when compared to conventional audiometry testing. Thirty-five patients were enrolled using Eartrumpet and 93% of threshold values were within 10dB of the conventional test thresholds. Thirty-five patients also were enrolled using the Hearing Test application. However, only 73% of threshold values were within 10dB of the conventional test thresholds. Finally, 37 patients trialed the Audiogram application, resulting in 77% of threshold values within 10dB.

Conclusions: Portable tablet-based audiometric testing applications, specifically the EarTrumpet application, may represent promising tools for point-of-care ototoxicity screening. Further testing in patients receiving ototoxic chemotherapeutic treatments is planned to discern if point-of-care screening is accurate and feasible in this specific patient population.

Same-Day Cancellations in Elective Surgeries: What Do They Cost?

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Background: The purpose of this project is to review methods that have been employed to

reduce same-day cancellations and examine the rate of same-day elective surgical cancellations at Clement J Zablocki VA Medical Center. The eventual goal is to determine the cost to the hospital, and others, that these cancellations have and to suggest improvements to prevent these cancellations.

Methods: The data gathered was from in-person interviews with hospital staff and from a surgical service cancellation rate report from July 1, 2014 to July 1, 2015.

Results: The results of this study showed that there was an overall 15% (9% unavoidable plus 6% avoidable) cancellation rate, which is above the national average of 9.9%. The cost from lost staff hours on a same-day cancelled case was determined to be about \$420/hour. The total costs of a same-day cancelled orthopedic cases was anywhere from \$2020 to \$3320.

Conclusions: One of the weaknesses of this VA data is that it lacked the information to determine when the cancellations were made from the time of scheduled surgery, so it couldn't be determined whether the cancellation was made on the same day or if it was cancelled several days beforehand. However, due to the significant potential cost of these cancellations, it should be recommended that the recording method for tracking cancelled elective surgical cases be edited to more accurately determine the cost to the institution of these cancellations. Once the true cost is determined, a cost-effective solution can be put forward to help correct the problem.

Advance Care Planning Commercial Insurance Program, Feasibility Study

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Background: As the focus on end-of-life care has increased, it has become apparent that special conversations by trained facilitators, called advance care planning (ACP), will be instrumental to getting individuals to fill out advance directives and to communicate their wishes to their families ahead of catastrophic health events. Research has confirmed the beneficial outcomes of having these conversations. Coverage of these conversations and coordination with palliative and hospice care have not been addressed within the general insured population. WPS developed a pro-

gram to address these gaps and scale up coverage to all insured.

Methods: WPS worked with established pathways in the Wisconsin Medical Society's Honoring Choices Wisconsin program to coordinate with trained facilitators. Internally, the insurer modified the claims system to process claims correctly and made modifications to the insurance certificates to allow for this coverage. Plans are underway for coordination with the other major end-of-life supportive care measures, palliative care, and hospice care.

Results: As of the end of 2015, coverage for ACP was put in place. Methods for identifying people likely to benefit in the near term from ACP have been developed. Outcomes have yet to be measured.

Conclusions: Research has established the value of ACP. Developing a program to provide insurance coverage for ACP as well as coordination with coverage of other end-of-life supportive care, will be instrumental in scaling up utilization of these services in an optimal fashion. The feasibility of the initial steps to enable commercial insurance coverage for a general population have now been accomplished.

HEALTH CARE ETHICS

Assessing the Risk of Donor-Derived Malignancy From Donors With Primary Malignant Glioma

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Background: The mismatch of organ demand vs. supply in the United States has resulted in a critical shortage of donor kidneys. Here we assess the transmission risk associated with kidneys from donors with glioblastoma multiforme (GBM) and highlight their role in addressing the organ crisis.

Methods: We reviewed data spanning 1985 to 2001 and involving 268 organs from 69 GBM donors from the United Network for Organ Sharing (UNOS), registries in the UK, England, Wales, and Northern Ireland (UEWI), and the Australia and New Zealand Registry (ANZDOR) with a mean follow-up between 36 and 60 months. We compared 1200 potential cases of GBM out of 8000 cases

of primary brain tumors, based on a prevalence of 15.1% and compared that to 23 confirmed extraneural metastasis (ENM) of GBM in a study by the Armed Forces Institute of Pathology (AFIP). We compiled 161 instances of ENM and compared the differential frequencies of metastasis to various tissues.

Results: There were zero reported cases of donor-derived tumor transmission (DDT) in the recipients of 115 total organs from donors with GBM, according to combined data from UNOS and UEWI. There were zero reported cases of DDT in the recipients of 153 organs from 46 donors with GBM between, according to ANZDOR data. Comparing an estimated 1200 patients with GBM to 23 histology-confirmed ENM yielded a 1.9% rate of ENM. Of 161 instances of ENM, 36%, 34%, 14%, 13%, and 3% were found in lymphatic lung, bone, hepatic, and renal tissue, respectively.

Conclusions: The data synthesized here highlights a possibly overestimated risk of tumor transmission following kidney transplantation from a donor with GBM. In the face of an increasingly critical organ shortage and given the sobering loss of quantity and quality of life for waitlist patients, our threshold for the acceptable risk for GBM donor kidneys cannot remain static.

The Role of the Physician in Advance Care Planning

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Background: The American Medical Association Code of Medical Ethics states that “physicians should routinely engage their patients in advance care planning.” The focus on the ACP process instead of completion of a legal document is effective for various patient populations and increases the congruence of a patient’s desired care with the actual treatments received. This research identifies ACP quality measures, areas for ACP improvement, and barriers and catalysts to ACP implementation.

Methods: PubMed search terms: “Advance Care Planning” [MeSH] OR “advance care planning,” “Attitude of Health Personnel” [MeSH], “Respecting Choices” OR “Honoring Choices.” Article types: Systematic Reviews, Randomized Controlled Trial.

Quality measures: National Quality Forum, Institute for Healthcare Improvement, Centers for Medicare and Medicaid Services. The content and resources were reviewed and augmented by members of the Wisconsin Medical Society advisory group and Honoring Choices Wisconsin.

Results: In the 17 groups or solo practitioners reporting on Physician Quality Reporting System (PQRS) Measure 47 Advance Care Plan in 2013, a mean of 52.6% of patients ≥ 65 years old had an advance care plan, discussion, or health care agent documented in the medical record (SD 32.77%). In La Crosse County, Wisconsin, 90% of 400 adults who died in 2007-2008 had an advance directive, which was available in the medical record 99.4% of the time. A common physician catalyst to patients having ACP is the belief that physicians should initiate the discussion. A common physician barrier is difficulty defining the right moment.

Conclusions: Physicians can incorporate ACP into their practice by learning how to (1) start the ACP conversation as part of routine patient care, (2) explore patients’ goals, values, and beliefs related to medical care, (3) integrate ACP into the health care system, and (4) activate an advance directive. Performance improvement continuing medical education in ACP can support physicians in choosing the appropriate interventions and quality measures to track their progress.

HEALTH CARE QUALITY AND POPULATION HEALTH

Consumer Engagement Through Improved Health Literacy

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Background: One of every 3 Americans struggles with health literacy, including understanding how to read a prescription label, following discharge instructions, or effectively using health services. The Wisconsin Health Information Organization (WHIO) collaborated with Wisconsin Health Literacy and

Covering Wisconsin to help newly insured adults, and others likely to have lower health literacy, better understand their role in achieving good health and health care, how the quality of health care may affect their health, and the importance of choosing the right primary care provider.

Methods: The project was conducted in 13 urban and rural counties, plus an 8-county control group. Activities included (1) creating health-literate fact sheets on understanding health insurance, picking a physician, and evaluating health care; (2) training for community organizations to disseminate fact sheets; (3) interactive workshops for consumers; and (4) hospital and health insurer health literacy assessments to identify patient/member education opportunities.

Results: This work is in progress, but to date includes development of 16 fact sheets including “Choosing a Doctor” and “What is Preventive Care?”; staff training at a wide variety of organizations about health literacy and distribution of the fact sheets; health literacy assessments of a hospital, insurance company, and health care quality comparison website; and leading 20 educational workshops with underserved populations, including pre- and postsurveys.

We are in the process of analyzing results, completing a pre- and postintervention survey of the population served by the organizations trained to disseminate the fact sheet, and completing 6-month follow-up of workshop attendees.

Conclusions: This project successfully developed and distributed health materials intended for a broad audience of varied literacy levels and conducted trainings with health care organizations about use of these materials. Early feedback is promising; final data collection and analysis are in process.

Assessing the Health Impact of the Kinnickinnic River Corridor Neighborhood Plan

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Background: The Kinnickinnic (KK) River on Milwaukee’s south side currently is undergo-

ing a transformation led by the Sixteenth Street Community Health Centers (SSCHC). Initial phases of the restoration have begun, and the plan includes restoring the concrete-lined, flood-prone river to a more natural state, with a lower flood risk, a bike path, community gardens, and environmental programming in an effort to create a healthier environment and promote wellness. The purpose of this work is to evaluate the impact of this environmental programming on the health of the community.

Methods: We used ArcGIS to identify SSCHC patients who live within an approximately 1-square-mile neighborhood surrounding the river, and a control population that lives at least 1 mile away from the planned restoration. A baseline community health assessment is being conducted using indicators from the electronic medical record (EMR) and census-level data, and these indicators will be followed over the course of the river revitalization.

Results: Initial results from the baseline assessment show a similar prevalence in adults of overweight (34.3% vs 34.1%), obesity (45.2% vs 46.2%), asthma (12.1% vs 13.2%), depression (8.4% vs 8.8%) and hypertension (28.4% vs 27.3%), as well as similar levels of HbA1c control under 9.0 (73.4% vs 71.8%) between the KK River group and the control group, respectively.

Conclusions: We hypothesize that over time our analysis will show gradational improvements in both the mental and physical health of the community living near the KK River due to improved access to functional green spaces, environmental programming initiatives, a cleaner environment, and improved ecosystem services. This work will add to the body of literature showing the impact of the built environment on health in a low-resource neighborhood, and describes a process through which providers can use EHRs and other technology to evaluate programming and monitor population health.

SEEDS: A Mental Health Treatment Program

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Background: Latina adolescents have the highest rate of depression compared with other girls in the United States and disproportionately high rates of anxiety, suicidal ideation, and suicidal attempts. Since chronic stressors influence mental health adversely, it is necessary to identify stressors that are unique to the Latina experience. The way in which an adolescent copes with a negative stressor can be protective or harmful; therefore, programs aimed at improving coping skills can lead to improved mental health.

The Self-Esteem, Empowerment, Empathy, and Discovery of Self (SEEDS) program seeks to reduce mental health disparities in at-risk Latina youth through establishing a mental health treatment group at a Federally Qualified Community Health Center in Milwaukee, Wisconsin.

Methods: A pilot group therapy intervention (20 weeks) and a second intervention (15 weeks) were conducted weekly by a psychotherapist. Each group was comprised of 12 female participants, 12-17 years, who met the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* criteria for adjustment disorder, anxiety, bipolar disorder, and/or depression and were referred by their health care providers. Validated scales—including Screen for Child Anxiety Related Disorders (SCARED) to measure anxiety, PHQ9 for depression, Rosenberg Scale for self-esteem, and Responses to Stress Questionnaire for coping—were administered pre- and postintervention. Perceived Stress Scale, Bicultural Stress Scale, and a Stigma scale were administered at one time point.

Results: The SEEDS groups demonstrated a significant reduction in the Social Anxiety subscale of SCARED ($P < .005$). Perceived stress was positively correlated with anxiety ($P < .0005$); and inversely with self-esteem ($P < .05$). Though statistically insignificant, the trial demonstrated findings in the expected direction including improved self-esteem, reduced depression, and lowered overall anxiety. Increased stigma was associated with increased depression and anxiety, and lower self-esteem. The Bicultural Stress Scale identified family and discrimination stress as most prevalent.

Conclusions: Findings suggest that SEEDS is

a useful intervention for at-risk Latina youth. Results will be used to improve subsequent SEEDS groups to meet the specific needs of this Latina population.

A Review of Medical Device Regulation from the Perspective of TAVR

Implementation

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Background: Aortic stenosis (AS) is the most common valvular disease in the United States and European Union (EU). Until recently, surgical aortic valve replacement (SAVR) was the only option for patients with aortic stenosis who required an intervention. Transcatheter aortic valve replacement (TAVR) is a less invasive procedure and increases treatment options to patients. The implementation of TAVR varied significantly between the United States and Europe, providing an extraordinary example to explore medical device regulation and its impact on patients.

Methods: A literature review was performed using PubMed and supplemented with Google and government databases from 2002 to 2015, using search criteria including TAVR and medical device regulation in the EU and United States. Fifteen journal articles fit the criteria and were used to examine the reasons for, and discuss the impact of the delayed implementation of TAVR in the United States relative to the EU.

Results: From the organizational set-up of each system, to the rigor of data needed for approval, to the transparency with which each process is conducted, the US and EU systems vary greatly. In broad strokes, the US system can be characterized as more conservative and bureaucratic, and the EU system as faster, using private for-profit companies, but with lower evidence thresholds. It can be estimated that 144,674 patients in the United States may have benefited from TAVR during the 4-year delay period.

Conclusions: Ultimately, we must weigh the cost of delayed approval times with the need for certainty in safety and efficacy. Though it is impossible to say which system is better for patients in the long term, we can learn from

examples like TAVR to continue to optimize all aspects of patient care.

Appropriateness Dimension of Quality*

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Background: Over 90% of existing quality measures focus on the underuse of effective care. However, evidence shows that approximately 60% of Medicare spending is tied to supply sensitive care (overuse). Measuring the appropriateness of physician decision making may help highlight the negative impact of overuse on quality. We propose a framework for defining appropriateness across four dimensions: Low Value, Marginal or No Value, Misaligned Value, and Relative Value (Cost-Effective).

Methods: Technical specifications were developed using diagnosis and Current Procedural Terminology (CPT) codes for individual measures as follows:

- Low Value: Members having a low value intervention as a percentage of members who could have had a low value intervention for each of seven low value measures.
- Marginal Value: Rate of marginal interventions per member population.
- Misaligned Value: Members who had advanced care planning as a percentage of members with advanced solid organ cancer.
- Cost-Effective: Members who had a home sleep study as a percentage of members who had any sleep study.

Each measure was run using the Datamart Version 13 WHIO data set for the 2 years ending March 31, 2015. We included commercial, Medicare, and Medicaid claims for members with an imputed primary care provider located in Wisconsin. The mean and 95% confidence interval were calculated for each of the 20 largest Wisconsin health care systems and to create a Wisconsin benchmark.

Results: When the performance of the 20 Wisconsin health providers is compared, there is variation in the results across systems. The best performer scored significantly

higher than the Wisconsin benchmark on 7 measures, while the poorest performer scored significantly lower than the Wisconsin benchmark on 5 measures. Four systems demonstrated performance above the state average on the majority of the measures. Sixteen systems scored at or below the state average on the majority of the measures.

Conclusions: Incorporating claims-based measures of appropriateness may provide a more robust characterization of quality or health care value. Moving forward, the goal is to look for possible associations between traditional quality measures and appropriateness metrics.

Bringing the Team on Board: Using Visual Management Boards as a Quality Improvement Tool

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Background: Government insurers and third-party payers are tracking population health quality measures. We incorporated Lean visual management for our clinic quality measure of breast cancer screening. We integrated care team members to improve current performance, adhere to our previsit planning process, and the goal to improve mammography.

Methods: We created a previsit planning process (PVP) and placed a dry-erase board in the clinic. In rows by primary care physician (PCP), we showed (1) percentage of patients who completed mammograms in the prior month, (2) percentage over the past 12 months, and (3) number of patients due for mammogram and with appointments in the upcoming month. During the office visit, medical assistants (MA) updated the board for those patients seen by the PCP and due for mammography with the action plan—either mammogram ordered, declined, or external result found. Periodically, MA-PCP huddles were observed for adherence, which were recorded on the monthly calendar as a visual audit board. Processes were marked as follows: green for 100% adherence, red for less than 100%, and white for absence of audit.

Results: Our clinic mammography rate increased from 73% to 77% as a rolling 12-month average. The rate of PVP adherence reflected this trend by starting at 16.43% and increased to 66.32% due to our auditing process. Both PCP and MA groups reported with 75% agreement through anonymous surveys that the Lean visual board was an important tool to address gaps in care.

Conclusions: We integrated the care team using a visual board as a central repository to improve our clinical quality metric for mammography. Team feedback led to effective processes by utilizing more concurrent, real-time, patient-centered data for mammography on our visual board and an audit process. This reinforced an efficient PVP. We anticipate higher mammography rates as we move forward with this team-based approach to improving quality measures.

Developing Successful Resident Quality Improvement Projects*

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Background: Quality improvement (QI) education in residency training has become critical for ongoing residency program accreditation, preparation for maintenance of certification requirements, and preparation for employment in a health care environment that demands quality outcomes. However, few reports describe residency training programs that result in resident QI projects that are truly successful and sustainably implemented.

Methods: In 2009, the University of Wisconsin (UW) psychiatry residency program developed a post-graduate year 3 (PGY-3) QI curriculum that now includes a 15.5-hour didactic course, completion of a QI project under the guidance of a QI faculty supervisor over the course of 1 year, presentation of a Morbidity and Mortality case, and participation in a UW Hospital Peer Review meeting. Residents use an internally devel-

oped QI workbook to guide their QI project work. The percentage of resident QI projects to date that have been sustainably implemented was calculated. The QI Knowledge Assessment Tool (QIKAT) was used to assess the effectiveness of the curriculum in increasing resident knowledge and skills in QI in the first 2 cohorts of resident participants. UW Health Sciences Institutional Review Board exemption was granted for this project.

Results: Eighteen of 19 resident QI projects thus far have been sustainably implemented. Our curriculum significantly improved QI knowledge and skills as measured by the QIKAT in the first 16 resident participants ($P=0.0053$).

Conclusions: Residents are able to implement successful QI projects when given appropriate resources. Possible important factors in this success include longitudinal duration of QI rotation, resident protected time, weekly meetings with faculty QI project supervisors, residents being kept accountable via required project presentations, incentivization of QI project work via opportunities for publication and via offering of American Board of Psychiatry and Neurology Maintenance of Certification credit, and development of rotation evaluations that reward sustainability of projects.

Improving Sexual Health Behavior Discussions Between HIV Patients and Providers at an Academic Infectious Disease Clinic

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Background: People living with HIV are at increased risk for acquiring and transmitting sexually transmitted infections (STIs). Clinics have sought to improve secondary prevention of genital and extra genital STIs through the development of screening interventions, however, primary prevention strategies such as provider-initiated prevention counseling remain a major area for improvement.

Methods: Collaborating with providers, patients, and the HIV Community Advocacy Council (CAC), we developed an anonymous, bilingual, and gender-identity inclusive survey assessing (1) demographic data, (2) sexual health behaviors, (3) perceptions of provider

discussions, (4) knowledge on HIV and STI transmission, and (5) attitudes toward sexual health discussions. Patients attending a single, university-affiliated outpatient clinic who were HIV-positive and 18 or older were invited to complete the survey after completion of a routine medical visit.

Results: Between May 1, 2015 and June 30, 2015, 115 patients were invited to complete the survey and 105 (91%) responded. Seventy-two percent of patients reported any sexual activity in the past year, with 84% of this group reporting at least 1 unprotected sexual encounter. For anal receptive sex, 27 of 39 (63%) reported unprotected intercourse, and 57% reported any provider discussion. For anal insertive sex, 21 of 38 (55%) reported unprotected intercourse, with 62% reporting any provider discussion. Including oral and vaginal sex, we observed an overall trend of decreased unprotected sex as reported provider discussions increased. Patients reporting unprotected sex had higher favorable or neutral attitudes towards sexual health conversations (76%) compared to the overall sample (69%).

Conclusions: We identified unprotected anal insertive and receptive intercourse as important areas to focus on improving patient provider discussions. Next steps include matching patient and provider goals, analyzing clinic workflow processes, piloting a lay language nonjudgmental script with the CAC, implementation, and repeating a follow-up survey to monitor our intervention.

Effectiveness of Reach Out and Read in Wisconsin Clinics

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Background: Reach Out and Read improves children's development and health by encouraging parents to share books with their children. Primary care providers give age-appropriate books at well-child visits and provide anticipatory guidance on reading. Reach Out and Read's efficacy is supported by more than 15 independent, peer-reviewed journal articles. This study measured changes in parent attitudes and behaviors around early literacy

following participation in Reach Out and Read in Wisconsin clinics.

Methods: A paper survey of early literacy attitudes and behaviors was administered to parents of children ages 6 months to 5 years in 36 Wisconsin clinics. Ten clinics were established Reach Out and Read sites (intervention group); 26 clinics were in the process of developing Reach Out and Read programs (control group).

Results: Parents at clinics with Reach Out and Read programs were more likely to read with a child before the age of 6 months compared with parents who had not participated (OR=1.58, 95% CI 1.05-2.38). These results were strengthened after exclusion of Dane County clinics (OR=1.77, 1.09-2.88). Parents were more likely to view reading as preparing their children for kindergarten, read more often with their children, and have more books in the home, although these increases were not statistically significant. Paradoxically, the odds of parents reporting reading as a bedtime habit were lower among those who participated in Reach Out and Read.

Conclusions: This study found mixed evidence in support of the effectiveness of the program outside of academic settings. Differences between these results and those from national studies of Reach Out and Read may be related to different assessment methods, differences in program implementation and fidelity, or differences between control and intervention clinic patient populations. We conclude that in community settings in Wisconsin, Reach Out and Read is effective. Further research is needed to determine the extent of this effectiveness.

Morbidity and Mortality of Inferior Vena Cava Filter Placement: Validation of Data Capture in Clinical Data Warehouse

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Background: The purpose of this study is to compare patient data acquired from manual chart review to automated data extraction from the Clinical Data Warehouse (CDW) in order to determine the accuracy of these tools.

Methods: A retrospective review of patients undergoing inferior vena cava (IVC) fil-

ter placement from 2006 to 2013 was performed after institutional review board approval was obtained. Two hundred patients were selected randomly from an institutional quality assurance/quality improvement database. Demographic and filter complication data was extracted manually from the EMR. Complications were validated by reviewing progress notes, imaging, and imaging reports. The CDW data was extracted using CPT and International Classification of Diseases Ninth Revision (ICD-9) codes. EMR and CDW data were compared for accuracy. Time required for manual and automated data retrieval was noted.

Results: One hundred one male and 99 female patients with a mean age of 62 (range 23-101) and mean follow-up of 2.5 years (range 0-9.3) were reviewed. There were 81 permanent, 112 retrievable, and 7 convertible filter placements, with 47 attempted filter retrievals, 5 conversions, and 4 failed retrievals. The complication rates from the EMR were filter strut penetration 13%, IVC occlusion 4.5%, and recurrent pulmonary embolism (PE) 2.5%. From the CDW data, we found a 9% rate of recurrent PE, 1.5% IVC occlusion, and 8% mechanical complications due to vascular device. Comparing the data from the EMR and CDW, patient gender had an agreement kappa with 95% CI of 0.98 (0.95, 1), recurrent PE 0.13 (-0.07, 0.33), mechanical complication 0.13 (-0.03, 0.28) and IVC occlusion 0 (0, 0). Age had a concordance correlation coefficient with 95% CI of 0.981 (0.976, 0.987). There was perfect agreement for filter placement and retrieval dates. Overall time was reduced by 80% using the data extraction software.

Conclusions: i2b2 and the Honest Broker tool are effective methods for data collection and identifying patient cohorts. They significantly decrease time spent on data extraction.

Virtual Surgery Evaluation of Septoplasty and Turbinectomy Contributions to Decreasing Nasal Resistance in a Patient With Chronic Nasal Obstruction

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Background: Septal deviation and inferior turbinate hypertrophy are common causes

of nasal airway obstruction (NAO). Surgical treatment for NAO often involves a combination of septoplasty (to correct the septal deviation) and turbinectomy (to reduce the inferior turbinate). Currently, due to the lack of objective measures to quantify NAO symptoms, these surgeries are recommended based on clinical examination alone, which is prone to observer bias, and consequently results in suboptimal clinical outcomes.

Methods: We applied virtual surgery to systematically investigate the contributions of septoplasty and turbinectomy to decreasing nasal resistance in 1 NAO patient. A 3-dimensional anatomic model representing the nasal cavity was built from presurgery computed tomography scans. Geometry-deforming software (Mimics™ and Sculptor™) were used to create models that systematically varied the nasal septum location and the inferior turbinate size. Computational fluid dynamics techniques were used to simulate nasal airflow and quantify nasal resistance.

Results: Our results revealed that a 1.2-mm reduction along the length of the inferior turbinate decreased nasal resistance by 28% in the left cavity, and that additional inferior turbinate reduction provided almost no further decrease in nasal resistance. As expected, moving the septum towards the left cavity reduced the resistance of the right cavity.

Conclusions: We conclude that, while septoplasty was essential to improve nasal patency in the right cavity, moving the septum to the left did not increase the left cavity resistance significantly. Therefore, aggressive inferior turbinectomy is not recommended for this patient, and the extent of turbinectomy should be simply to provide enough space for moving the septum laterally. This study illustrates how computational modeling and virtual manipulation of the nasal geometry are useful to investigate nasal physiology and for planning surgical approaches that minimize nasal resistance in NAO patients.

In Silico Docking of Alkylphosphocholine Analogs to Human Serum Albumin May Predict Partitioning and Pharmacokinetics

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Background: Shown to display prolonged selectivity and retention in 55 in vivo rodent cancer, human cancer, and cancer stem cell models, CLR1404 was selected as a broad-spectrum, tumor-targeting platform to be further evaluated in human clinical trials. Currently, 2 CLR1404 analogs – I¹²⁴-CLR1401 for positron emission tomographic (PET) imaging, and I¹³¹-CLR1404 for therapy and single-photon emission computed tomographic (SPECT) imaging – are enrolled in 5 clinical trials spanning multiple academic research centers, and I¹²⁴-CLR1404 is currently being evaluated in phase II trials as a GBM PET-imaging agent. The fluorescent analogs CLR1501 (green fluorescence) and CLR1502 (near infrared) were created for real-time tumor cell visualization.

Methods: In an effort to understand how the structures of alkylphosphocholine (APC) analogs impact binding and pharmacokinetics, we performed in silico docking analysis, in vitro and in vivo partitioning experiments, and in vivo half-life studies.

Results: Plasma partitioning studies suggest binding of CLR1404 analogs predominantly to albumin. Crystal structure information on structurally similar molecules, and in silico modeling using CLR1404 analogs, suggest high-affinity binding to 7 distinct sites on human serum albumin. We demonstrate through binding assays and pharmacokinetic studies using rodents that high-affinity binding to albumin, along with physicochemical properties, predict distribution and clearance kinetics for CLR1404 analogs more effectively than either alone.

Conclusions: CLR1404 represents a new class of synthetic APC analogs useful as broad spectrum, tumor-selective molecular imaging and therapy agents in human cancers. Combined application of these chemically identical APC-based radioisotopes, and an understanding of the distribution and clearance kinetics, will enable personalized dual-modality cancer therapy by using I¹²⁴-CLR1404 and fluorescent APC for tumor imaging, and for planning follow-up I¹³¹-CLR1404 therapy.

Helping Hands: An HIV Peer Mentoring Program at Sixteenth Street Community Health Centers

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Background: There are approximately 1.1 million people living with HIV/AIDS (PLWHA) in the United States. Studies demonstrate that poor engagement in medical care led to HIV/AIDS-related morbidity and mortality. In Wisconsin, more than 50% of new HIV infections in 2014 occurred in Milwaukee County, with racial and ethnic minorities disproportionately affected. The HIV Department at Sixteenth Street Community Health Centers (SSCHC) has been actively involved in reducing this disparity. The purpose of this project is to increase the quality of the services that the SSCHC HIV Department provides its HIV patients by creating a peer-mentoring program for PLWHA, which will re-engage HIV patients that are intermittent users of the health care system back into treatment. The ultimate goal is to reduce and prevent further transmission of HIV infection.

Methods: In order to evaluate the degree to which the HIV community would be receptive to the idea of a peer-mentoring program, a Community Readiness Assessment (CRA) was conducted. The elements of the CRA included (1) identifying the issue, (2) identifying and clearly defining and delineating the community, (3) preparation of interview questions for key community respondents (HIV positive patients incompletely engaged in care), (4) conduction and transcription of these interviews, (5) scoring of interviews, (6) and member validation and feedback (by HIV positive patients completely engaged in care).

Results: 15 in-depth interviews were conducted and transcribed. Scored results from the CRA are intended to gain an understanding of the HIV community's knowledge of efforts, leadership, community climate, and

resources that address HIV patients unengaged in medical care. Results will be presented to the HIV Department's Consumer Advisory Board members for feedback and validation regarding the main themes affecting the HIV community of the south side of Milwaukee. All of these elements will guide the ongoing development of the Helping Hands program.

Conclusions: Incomplete engagement in HIV care is common in the United States. Helping Hands is a peer-mentoring program envisioned to guide untreated HIV patients towards engagement in care with the help of peers who have been through similar HIV-related experiences.

Use of Interpreter Services in Limited English-Proficient Pediatric Encounters

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Background: Previous research indicates that limited English-proficient (LEP) patients are marginalized within the US health care system. They face difficulties navigating the system and communicating with providers, which may result in adverse health outcomes. With a growing population of Americans who speak languages other than English at home, it is imperative to better understand how interpreter service use impacts the delivery of health care. Although much work has been done on the use of interpreter services in adult populations, there is limited understanding of the use of these services in the pediatric health care setting. We conducted interviews with pediatricians and family practice physicians to understand how and when they use interpreters in pediatric encounters; their perspectives are on facilitators barriers to communicating with LEP pediatric patients.

Methods: We conducted semi-structured interviews with 6 family physicians and 5 pediatricians in the UW Health system. Physicians were recruited via e-mails and letters, and an appointment was set up to interview physicians who expressed interest. The interviews took approximately 30 minutes, during which physicians were asked how they experience LEP pediatric encounters

over a set of 10 semi-structured interview questions. Audiotapes from each interview were transcribed verbatim and coded for analysis. Two coders reviewed the transcripts and proposed codes, and a final list of codes, along with their definitions, was confirmed. Two coders then coded all transcripts using the final list of codes. Themes were developed using content analysis.

Results: Preliminary results suggest a number of important themes at the pediatric patient, patient family, provider, and interpreter levels. Physicians described the ways in which they use particular types of interpreter services (in-person, telephone, video) in pediatric encounters and how the different types compare to one another, including benefits and drawbacks of each type. They identified strategies for using interpreter services and described what quality interpreting looks like to them, including comparisons between linguistic and cultural conduit interpreting. Physicians identified facilitators and barriers to their communication with LEP pediatric patients and their families, such as issues of availability and accessibility of interpreter services.

Conclusions: Physicians identified a number of facilitators and barriers with regard to the use of interpreter services in pediatric encounters. Results were similar to those found when interviewing providers about adult encounters, with the exception that pediatricians expressed a greater obligation to use professional interpreters to protect vulnerable children. By increasing our understanding of the challenges and dynamics among LEP pediatric patients, their families, providers, and interpreters, the themes identified will help to inform efforts to improve the quality of health care delivery provided to LEP patients and families in the UW Health system.

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