



**MPOG Retreat**  
**Friday, October 12, 2018**  
**Hyatt Regency, San Francisco, California**

### Attendance

- 120 Participants
- Slides and recordings (if available) of the presentations can be accessed on our [website](#)
- CME credit (5.75 credits) are available for those that attended the meeting. Please follow the link to complete the evaluation and receive your certificate: [Survey Link](#)

### Welcome and State of MPOG: Dr. Sachin Kheterpal

- Happy 10<sup>th</sup> year anniversary!
- Achievements have included diversity of hospitals, practice patterns, data involved
- Research
  - Range of efforts have spanned from health services research to bioinformatics
  - Initiative for Multicenter Pragmatic Anesthesiology Clinical Trials (IMPACT) is under way
- Quality Improvement
  - ASPIRE measures adopted/adapted by ASA, Epic, non-MPOG hospitals
  - Focus on measures that matter; leading meaningful performance measurement in anesthesiology
- Technical Upgrades
  - Applications – MPOG Case Viewer/Case Validation, Data Diagnostics, Import Manager
  - Surgical Registry Integration – NSQIP, STS Thoracic/Cardiac
  - Centralized statistics server

### Achieving the Promise of Digital Health: Are We There Yet? If Not, When....and How Dr. Robert Wachter

- Patient safety was the initial catalyst for implementing health IT: goal was to prevent medication errors due to poor handwriting. Medication errors still occurring due to alert fatigue with health IT. Did we go down the wrong path?
- #1 goal in 2015: Digitalization of US healthcare (implementation of EHRs)
- Digitalization allows for infinite distribution of a perfect copy of record at no cost: decreases social communication factor in medicine. No longer need to walk to another department (radiology) to receive x-ray/information
- #1 goal today (2018): Deliver high value care; how does health IT fit with this goal?
- Four stages of health IT:
  - 1) Digitalization of the record (largely complete)
  - 2) Connect the parts (hospitals to hospitals; PCPs to hospitals; third party apps to enterprise systems)- In progress
  - 3) Gleaning meaningful insights from data: In infancy- MPOG is doing this
  - 4) Convert these insights into action that improves value: still opportunity in this area as well



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### Prospective Study of Perioperative Experience and Recovery (PROSPER)

Dr. Sachin Kheterpal

- **Active Information** – patient surveys/reported outcomes
- **Passive** – activity, step counts, geolocation, heart rate
- **Enrollment**
  - **Fliers** – add your institution’s logo, place in preoperative clinic locations
  - **Passive enrollment** – very little daily work; surgeons motivated to help
- **Regulatory**
  - **IRB** – innovative/flexible with multicenter approach
- **Digital Phenotypes** – can use complex algorithms to assess recovery trajectories following surgery

### Digital Phenotyping: Dr. Tomas Insel

- Healthcare is ripe for innovation: “looking for duct tape”
- Tech giants and startups are changing the ecosystem of health research
- Where funding is happening: Money is beginning to flow into healthcare from tech companies (less from public sector like the NIH), which changes the culture of how science is done
- Brain disorders
  - Despite all the fantastic science there has not been a big change in M&M
  - Years lost to mental disorders accounts to about 1/3 of that of all diseases
  - Suicide rate is increasing
  - Alzheimer’s is enormously costly and the prevalence is increasing
  - Why have we done so badly?
    - Diagnostic system is broken
    - 60% are not in the care system
    - Quality is poor (fragmented, episodic and reactive)
    - Measurement is broken... this is a place where technology can help
- Smart phones have come a long way, much more powerful than just 10 years ago
- Computational power, ubiquity, and use is stunning for smartphones
  - 70 daily checks and 2600 daily touches – mind-boggling and worrying
- Digital phenotyping: new type of biomarker
  - Speech, voice, step counter, GPS (patients don’t like when companies use it),
  - Human computer interaction: how you use the keyboard
  - Digital fingerprint: how they are typing – leading forensic tool in cyber security
  - Collecting reaction-type features -> process through ML -> digital phenotypes
  - Another way we can do this is to look at digital exhaust (Google Takeout) – amazingly revealing (also deemed creepy)



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- Companies look at how you type and not what you type
- Neurocognitive tests
- Completely passive
- What you need to be successful: Value: three Es (efficacy, engagement, and efficiency), Trust: (Transparency, Agency, Responsibility)

### Best of MPOG Abstracts

- **Randy Blank** – Outcomes following one-lung ventilation
  - Key limitation to prior studies has been the use of bundled ventilation strategies rather than dissecting into components
  - Currently not known in the literature, is exactly what OLV ventilation is
  - Primary Aim: Does adherence to putative LPV regimen predict improved outcomes
    - $OLV = V_T \leq 5\text{ml/kg}$ , application of PEEP
    - Compared matched controls, adherence to LPV regimen for OLV patients has increased, but no statistically significant association with improved outcomes
    - Response surface plots of risk (z-axis) vs. PEEP (x) and VT (y),
  - Conclusions
    - LPV as currently defined does not seem to be inherently protective
    - Compared to PEEP and VT, modified driving pressure seems more strongly associated with complications
    - Need for future studies with increased STS-MPOG integration, larger sample sizes needed to adequately assess response surface plots
- **Kai Kuck** – Enhanced Observational Study (EOS)
  - Inaugural MPOG enhanced observational study examining postoperative pain
  - Utilized data from institutions with consistent data uploaded between 2012-2016
    - Starting study population ~9 million, final analytic study population ~1 million
  - Missing postoperative data for some contributing institutions
  - Summary of Results:
    - 70% of patients are still taking opioids at 3-month follow-up
      - 50% among patients not reporting pain at surgical site
    - Slight decrease in opioid use over time; differences by race and gender
    - Number of non-opioids used intra-operatively (n=1) has not changed over time
    - About 2/3 of patients come in with chronic pain; 70% of patients still taking it at 3-month postop
    - Will continue to look at trends over time by institution; identify missing data by institutions and examine further risk factors



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- Questions:
  - How did you capture the 3-month data?
    - Each participating institution had resources to conduct 3-month follow-up
  - Did you ask why the patients are using opioids?
    - Selected for patients undergoing major operations
- **Mike Aziz** – Optimized Opioid Management or Usual Treatment to Reduce Opioid Use Following Surgery (Pragmatic Trial)
  - Problem – opioids overprescribed following surgery; patient engagement on this issue remains limited
  - Study Rationale – though a tailored approach to acute postoperative pain, overall use and residual availability of opioids following discharge can be significantly decreased
  - Hypotheses – through a tailored approach to postoperative opioid management
  - Design – pragmatic multicenter RCT; ~1600 opioid naïve patients undergoing elective surgical procedures, randomized 1:1 to tailored approach to postop pain vs. usual management
    - Intervention – receive opioid education at time of enrollment, and managed by prescribing team using shared decision model and multi-modal approach with opioid limited up to a 5-day supply
    - Control – no other interventions beyond usual preop/postop care
  - Outcomes:
    - Primary – OME use of opioids 30 days postop
    - Secondary – complications, pain scores, patient satisfaction
  - Innovation – this trial will engage patients and establish efficacy of interventions, rather than just observe practice patterns
  - Progress on **Study** – pilot data has been collected to test the App which will be used to collect data
- **Michael Burns** - Automated Anesthesiology Current Procedure Technology (CPT) Code Assignment
  - Anesthesiology CPT code prediction based on machine learning algorithms
  - Problem that this addresses is that there is a delay in receiving billing data from institutions uploading to MPOG
  - Implemented a machine learning and natural language processing to predict top 3 probable CPT codes based on procedure text
  - Natural language processing allows you to construct variables from text that can be fed into the machine learning model
  - Train machine learning models on portions of the full dataset
  - Created 7 unique machine learning and deep learning models – wanted a model with 95% accuracy



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- Summary:
  - Developed an automated real-time anesthesiology CPT assignment tool
  - Successfully implemented CPT prediction tool into research and quality workflow
  - Both research and quality CPT assignment functions in real time
  - Perhaps this is useful for billing and reimbursement teams – found instances of under billing at University of Michigan
  - Next step is to expand to surgical CPT codes and ICD 9/10 codes
- **Amy Shanks** – Automated Detection of Blood Pressure Artifact in Electronic Intraoperative Records
  - Significant limitation to observational studies using automated captured physiologic monitoring data
  - Artifacts – a-line flushes, clamped lines
  - Studies of IOH significantly hindered when poor artifact reduction is used
  - Through implementation of a rule-based Blood Pressure Artifact Algorithm (BPAA) using MPOG data, a significantly greater sensitivity/specificity for detecting blood pressure artifact (as assessed by expert clinician review) is achieved compared to other published artifact reduction algorithms.
  - These results have implications for all future studies analyzing relationship between intraoperative blood pressure, including intraoperative hypotension (IOH) and outcomes.
  - Future studies of intraoperative EHR blood pressure data must employ standardized blood pressure artifact reduction algorithms to ensure scientific validity.

**MPOG Development / QI Update: Nirav Shah, MD**

- Coordinating Center has been working over the past year to build the measures that were prioritized by the Quality Committee per the Call for Measures survey- December 2017
  - TOC 03, PONV 02, CARD 02 built;
  - PUL 03 in progress
  - MIPS 44: Build cancelled as site documentation is not conducive for generating meaningful results
  - Need Preop/PACU data to build remaining measures identified in survey:
    - PONV in PACU
    - PACU Pain Scores
    - Alternative hyperglycemia measure
- Coordinating Center is working to obtain preop/PACU data from sites now; a few sites have already begun to contribute this data



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- Currently 24 measures published to the dashboard: CARD 01 was retired this year
- Transfusion Toolkit released and available on the MPOG website for sites interested in working on transfusion management/stewardship
- Provider feedback emails currently distributed to approximately 3100 providers/month
  
- Coordinating Center has decided to discontinue the QCDR program as of 2019 in an attempt to focus efforts on programs that serve a larger portion of the membership and that align with the QI mission.
- That said, MPOG will be continuing to offer MOCA Part IV credit for anesthesiologists participating in the provider feedback email activity.
- Primary goals for 2019:
  - Continue to gather preop/PACU data
  - Improve Data Direct Functionality
  - Outcome measures

**The Celebrated Fall of the P Value: Time for a New Paradigm: Dr. Elizabeth Whitlock**

- Null hypothesis significance testing versus estimation approach
  - Null hypothesis significance testing is classical dichotomous approach between difference or not (significance)
  - Estimation approach deals with meaningfulness – focus on study design and bias
- Fisherian vs. Gossetian statistics
  - “Fisherian” significance – historical way to thinking about significance (p-value)
  - “Gossetian” significance – efficacy, value, strength and robustness of the signal
    - Weigh the cost/benefit of the old way versus cost/benefit of the new way
- Odds ratios from epidemiologic studies of association are different from odds ratios for prediction
  - “A single measure of association such as an odds ratio does not meaningful describe a marker’s ability to classify subjects”
- Summary:
  - Think about clinically meaningful significance for your patients (costs, lives, function) as opposed to a p-value significance
  - Examine effect sizes – how strong is the association
  - Consider bias and study design



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### MPOG QI Story: Dr. Timur Dubovoy

- Described the QA and QI programs within the anesthesia department of Michigan Medicine
- Explained out ASPIRE metrics and reporting are incorporated into the QI process: failed cases reviewed by Quality Champion and ACQR using review template. Subset of cases sent for additional review by departmental Patient Safety/QI Committee.
- A few ASPIRE metrics have been included in the OPPE reports for the anesthesia department: PUL 01, NMB 02, TEMP 03
- When choosing metrics for use in OPPE, need to ensure the measures meet the following criteria:
  - Relevant to clinical practice
  - Objective criteria to determine good vs. bad performance
  - Include a meaningful sample size
  - Reported frequently
  - High level of compliance

### MPOG Feedback: Dr. Leif Saager

**Q:** Why is there a lack of publication of the PCRC studies? When or should we go back and modify the proposals?

**A:** In the very early beginning we were overly excited about the studies and we didn't have the variables to do the analysis. Some of them are still in process. But it takes time because of the complexity of the data. We completely agree with you that we should be more productive and put out more papers. We are very optimistic about the future because there are many projects that are in the process of manuscripts.

**Q:** How is MPOG going to handle running 1-10 million cases on the stats server? We will need a lot more processing power and memory.

**A:** Thank you for your feedback. The stats server is a new thing for MPOG and we are trying to be as responsive in improving the process. Yes we need to get better at this. We need to get more power onto this.

**Q:** It's very difficult to share data between different MPOG institutions. It is very difficult to get a shared server space at an outside institution. He would be happy to pay for server access at MPOG if possible.

**A:** We have BAA agreements to test with cloud servers. We will need volunteers to test this out. We will never be able to keep up. We will discuss this at the executive board meeting. Perhaps we should offer a "watering hole" for non-MPOG projects for collaboration.



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**Q:** Will you consider having non MPOG members do studies?

**A:** Traditionally you need to be a MPOG member to do research. As long as you have someone sponsor a study, you can do a MPOG study.

**Q:** How have people been using local institutional data for hypothesis driven research? How are you at Michigan making it accessible to your clinical faculty?

**A:** Michigan institutional dataset uses an internal research committee. No study at Michigan can go forward without presenting the research project to our internal research committee. PCRC is modeled after our internal research committee.

**Q:** Typically he does a lot of SQL queries on the local database. Is there any place that individual institutions can share SQL code?

**A:** We love to hear that idea. We currently do not have a process to store these queries.

**Q:** When institutions extract our local data from MPOG? How do people back identify it?

**A:** All the identifiers are in each institutions local database.

**Q:** A lot of the projects at an institution need longer term outcomes available in STS, NSQIP, etc. However, the local champions are not eager to share their surgical outcomes? Does MPOG have a relationship with each surgical database?

**A:** Currently we are successful by making local connections with the surgical champion for a national database. If a study uses surgical data registry, the surgeon will be included in the study. At a national level of the surgical registry it's a challenge. We have approached them. They will give informal letters of support but encourage you to reach out to a local champion.





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**Measuring Variability in Intraoperative Opioid Use Via Oral Morphine Equivalents**  
**Dr. Douglas Colquhoun**

- Review opioid equivalency measures in MPOG
  - First step, pick out the opioids and routes
  - Run that through our equivalency conversation factor
  - Creates a OME number
  - Compare similar cases
  - Adjust for case length
  - Adjust for patient factors
  - These go into the ASPIRE dashboard
- Considering variability and not benchmarks
  - Our threshold is typically 90%. This allows 10% to be outlier cases.
  - For everyone over 90% we don't make differentiations between the providers. Where is the opportunity to change our practice then? These is a role to start talking about variability
  - Differences of 1-2% are not significant until VERY HIGH sample size and that is the differences we see.
    - This is the case where we could discuss variability.
- Implications for MPOG research
  - Limitations of OME
    - Designed as clinical concept designed around giving one opioid for another
    - Route of administration makes a big difference in potency
    - Drugs with very long or very short half-lives is poorly reflected
    - All of this is dependent of accurate documentation at source
  - OMEs are already used as part of the EOS study
  - Research is demanding sophisticated handling of our data.
  - Goal is to build summary measures with are useful
    - What is the percentage of a cases and epidural is used?
    - What is the average MAC of anesthesia for a case?