Department of Pediatrics Faculty Meeting
Date: Oct. 23, 2018

- cpmV/Q&S Organization Review and FY2018 Q&S Results Update: Lane Donnelly
- CE/Target- Based Care update: Andy Shin
• **Peggy Han**  
  Clinical Assistant Professor  
  Division of Critical Care Medicine

• **Sharon Joo**  
  Clinical Instructor  
  Division of Hospital Medicine

• **Lianna Marks**  
  Clinical Assistant Professor  
  Division of Hematology/Oncology
• Anca Pasca
  Assistant Professor
  Division of Neonatology

• Sneha Ramakrishna
  Instructor
  Division of Hematology/Oncology
PMP Workshop – Doing Scholarly Work in CE Line

Focus: Opportunities in
- Advocacy
- Education
- Research

Panel
- Mentors and resources
- “Success stories” from CE faculty

When
- Monday October 29 – Noon – Clark Center

ALL FACULTY/ALL LINES ARE WELCOME
Research Advisory Committee

- Research Advisory Committee will address Departmental support and infrastructure for research trainees and faculty
- Application letters should address the reasons for interest in serving on the Committee and should be submitted to Eunice Delumen
- Deadline: Friday November 9th, 2018
Winners of the 2018 Infectious Diseases Society of America BugBowl!

Coralee Del Valle Mojica, Matt Hitchcock, Nathan Lo, Chitra Punjabi
2018 AAMC Mid-Career Women Faculty Leadership

Tandy Aye  
Peds Endocrinology

Jennifer Carlson  
Adolescent Medicine
The Juul Curriculum Is Not the Jewel of Tobacco Prevention Education

Jessica Liu, and Bonnie Halpern-Felsher, Ph.D.*

Division of Adolescent Medicine, Department of Pediatrics, Stanford University, Stanford, California

In 2015, Juul Labs, Inc. created a new electronic vaping device called Juul. Juul uses disposable pods that contain propylene glycol, glycerin, flavorings, benzoic acid, and salt-based nicotine, among other constituents.[1] Each pod contains 59 mg of nicotine and is flavored with a variety of flavors, including mango, fruit medley, and crème brûlée.[1]

The combination of Juul’s rising popularity and successful marketing has allowed Juul to occupy 68% of the electronic cigarette (e-cigarette) market.[2] Juul Labs argues that their devices are intended as smoking-cessation aids for adults only.[1] However, recent evidence shows that both adolescents and young adults recognize Juul, and between 12% and 16% had ever used a Juul.[3,4]

In an effort to reduce youth use of Juul, Juul Labs announced that they are investing $30 Million to prevent underage vaping, and developed and piloted their own curriculum in schools.[5] Studies of past efforts from companies to provide tobacco education have found that industry-sponsored curricula are ineffective, and instead create a positive image of the industry while also subtly promoting smoking.[5–7] We then reviewed the Juul Curriculum and their memorandum of agreement available as of September 2018.

Lack of Adherence to Best Practices

The Juul Curriculum lacks a number of components that research has shown to be most effective in reducing youth tobacco use. First, the Juul Curriculum never discusses the tobacco, nicotine, e-cigarette, or Juul industries. In no place do they discuss the role that these industries have played in promoting tobacco/nicotine use, nor do they use any counter-marketing techniques to change attitudes towards the tobacco/nicotine industry.[8] Importantly, there is little mention specifically of the Juul product throughout all of their curriculum. Instead, most of the curriculum is focused on e-cigarettes more generally or on social pressures and stress not related to tobacco or nicotine use.

The lack of specifically mentioning “Juul” is of great concern, since there is early anecdotal evidence that youth do not consider Juul to be an e-cigarette, and thus might not attribute the messages concerning e-cigarettes to Juul. The omission of Juuls specifically could be an effort to keep the Juul name in a more positive light. As the company sponsoring the Curriculum, it would be economically detrimental to want to deter its next generation of youth from smoking.

Key Points

Question How and why are California adolescents and young adults using new pod-based electronic cigarettes (e-cigarettes)?

Findings This survey study of 445 adolescents and young adults revealed similar changes (40%) of experiencing negative health and social consequences from using pod-based and/or other types of e-cigarettes. Among 33 adolescents and young adults reporting any loss of autonomy from nicotine, there was no difference in mean Hooked On Nicotine Checklist scores between those using pod-based and other e-cigarettes.

Abstract

IMPORTANCE Electronic cigarettes (e-cigarettes) are the most commonly used tobacco product among adolescents and young adults, and the new pod-based e-cigarettes (also known as Juul) may put adolescents and young adults at increased risk for polytobacco use and nicotine dependence.

OBJECTIVE To build an evidence base for perceptions of risk from and use of pod-based e-cigarettes among adolescents and young adults.

DESIGN, SETTING, AND PARTICIPANTS In a survey study, a cross-sectional analysis was performed of data collected from April 6 to June 20, 2018, from 445 California adolescents and young adults as part of an ongoing prospective cohort study designed to measure the use and perceptions of tobacco products.

EXPOSURES Use of pod-based e-cigarettes, e-cigarettes, and cigarettes.

MAIN OUTCOMES AND MEASURES Ever use, past 7-day use, and past 30-day use, and co-use of pod-based e-cigarettes, e-cigarettes, and cigarettes; use of flavors and nicotine in pod-based e-cigarettes; use of pod-based e-cigarettes, e-cigarettes, and cigarettes; and associated perceptions of risks, benefits, and autonomy.

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2018 PCHA-UHA RLC and SCMGRC Research Grant Awardees

Nicolas Cuttriss

**Topic:** Obesity Management

Implementation and Feasibility of Project ECHO® for Type 1 Diabetes (ECHO T1D) for Stanford Community Providers

Megen Vo

**Topic:** HIV Pre-Exposure Prophylaxis (PrEP)

Preparing to PrEP: An EHR Support System and Virtual Clinic Delivering Specialized Primary Care to Support HIV Pre-Exposure Prophylaxis (PrEP) for Adolescents and Young Adults
Bruce Buckingham
Winner of
JDRF David Rumbough Award
International Society for Pediatric and Adolescent Diabetes Prize (ISPAD) for Innovation in Pediatric Diabetes Care
David Maahs
Editor in Chief for the 2018 ISPAD Guidelines
Co-Authors: Bruce Buckingham, Korey Hood, Diana Naranjo
Endocrine Bone Clinic

Monica Grover and Laura Bachrach
Department of Pediatric Faculty meeting
10.23.2018
Why do we care?

• Pediatric osteoporosis is common but under recognized
• Provide comprehensive care for long term health
• Become center of excellence for pediatric bone health
Bone bank is built in childhood & adolescence
Reduced Peak Bone Mass increases fracture risk

Heaney RP. *Osteoporosis Int* 2000; 11: 985-1009
Vertebral fractures can be asymptomatic
Bone Threats in children with chronic diseases

- Genetics
- Malnutrition
- Inactivity
- Inflammation
- Glucocorticoids
- Endocrine
Who is at risk?

- Inflammation – IBD, Rheumatological disorders, celiac disease, cystic fibrosis
- Immobilization- Cerebral palsy, Duchene muscular dystrophy
- Glucocorticoid induced osteoporosis
- Acute Lymphoblastic Leukemia
- Solid organ transplantation
- Anorexia Nervosa
Pediatric Osteoporosis is a Clinical Diagnosis

• Vertebra compression fractures (+/- DXA)

  OR

• Low BMC/BMD & long bone fractures
  – 2 or more by age 10
  – 3 or more by age 19

Gordon CM. J Clin Densitometry 2014
Evaluation and Treatment

• High index of suspicion and screening

• Non pharmacological therapy

• Pharmacological if fragility fractures present
  – Bisphosphonates works in all (except AN)
We are here to help

- Refer to Endocrine (bone clinic)
- Welch, ? Sunnyvale and SB
- Bonehealth.stanfordchildrens.org
- Expand to multidisciplinary clinic

Laura Bachrach  Monica Grover
With collaboration and support
The NIH Undiagnosed Diseases Network

Jon Bernstein
October 23, 2018
Twelve clinical sites, a coordinating center, a sequencing core, a metabolomics core, two model organisms screening centers, and a central biorepository
UDN Core Capabilities

• Access to clinicians across specialty areas
• Expertise and technology to perform multi-omics profiling (genome, metabolome, microbiome, transcriptome, immune system)
• Standardized procedures for data acquisition and sharing
  – PhenoTips
• Tissue banking
• Model organism cores – fly, worm and fish
Solving Medical Mysteries
Through Team Science

Applications Received
2780

Applications Under Review
344

Participants Accepted
1179

Participants Evaluated
907

Participants Diagnosed
236

Current, October 22, 2018
Effect of Genetic Diagnosis on Patients with Previously Undiagnosed Disease


ABSTRACT

BACKGROUND
Many patients remain without a diagnosis despite extensive medical evaluation. The Undiagnosed Diseases Network (UDN) was established to apply a multidisciplinary model in the evaluation of the most challenging cases and to identify the biologic characteristics of newly discovered diseases. The UDN, which is funded by the National Institutes of Health, was formed in 2014 as a network of seven clinical sites, two sequencing cores, and a coordinating center. Later, a central biorepository, a metabolomics core, and a model organisms screening center were added.

METHODS
We evaluated patients who were referred to the UDN over a period of 20 months. The patients were required to have an undiagnosed condition despite thorough evaluation by a health care provider. We determined the rate of diagnosis among patients who subsequently had a complete evaluation, and we observed the effect of diagnosis on medical care.

RESULTS
A total of 1319 patients (53% female) were referred to the UDN, of whom 601 (40%) were accepted for evaluation. Of the accepted patients, 192 (32%) had previously undergone exome sequencing. Symptoms were neurologic in 40% of the applicants, muscular/ligamentous in 10%, immunologic in 7%, gastrointestinal in 7%, and endocrinologic in 6%. Of the 382 patients with a complete evaluation, 132 received a diagnosis, yielding a rate of diagnosis of 35%. A total of 15 diagnoses (11%) were made by clinical review alone, and 98 (74%) were made by exome or genome sequencing. Of the diagnoses, 21% led to recommendations regarding changes in therapy, 37% led to changes in diagnostic testing, and 36% led to variant-specific genetic counseling. We defined 31 new syndromes.

CONCLUSIONS
The UDN established a diagnosis in 132 of the 382 patients who had a complete evaluation, yielding a rate of diagnosis of 35% (funded by the National Institutes of Health Common Fund).

‘Disease detectives’ crack cases of 130 patients with mysterious illnesses

‘Disease detectives’ crack cases of 130 patients with mysterious illnesses

Erin Allday | Oct 10, 2018 | Updated Oct 10, 2018 8:48 pm

Stanford Children’s Health helping families facing unknown diseases

The New York Times

Finding Answers for Patients With Rarest of Rare Diseases

By The Associated Press

Oct. 10, 2018
The UDN - First two years

• 35% of patients were diagnosed – 32% of patients had previously undergone genome sequencing
• 21% of diagnoses results in a change in management
• **31 new syndromes were discovered**

• Average cost of diagnostic procedures for diagnosed patients pre UDN $305,428
• Average cost of the UDN evaluation for these patients $18,903
Presented at 2 days of age with hyperammonemia, lactic acidosis and hypoglycemia. Non-diagnostic exome sequencing.

*ATP5D c.245C>T p.Pro82Leu*
“Share early, share often. Collaborate across institutions, disciplines, patients, and parents... For finding too small to be publishable, sum to the Web... Get the information out there.”

—Matthew Night and Matt Wilsey

This section of the website includes pages about individuals who participate in the UDL Registry. These pages will help to find and connect others with the same or similar conditions.

- Genes of Interest:
  - ARMS1/17 Gene
  - ASXL2 Gene
  - CACNA5A Gene
  - CCD40L Gene
  - DINH1L1 Gene
  - DUXZ2 Gene
  - MACC1 Gene
  - TBR2 Gene
  - ZBTB34 Gene

The participant pages include the following information:
- Genetic changes
- Symptoms
- Medical history
- Treatments, procedures, and medications
Model Organism Core

Wan Hee Yoon, Sharayu Jangam, Michael Wanger, Hugo Bellen
Metabolomics profiling

Outlier analysis revealed elevated fatty acids, acylcarnitines, and TCA cycle components (Isocitrate, Malate, Pyruvate) ⇒ may indicate a mitochondrial defect
How to work with the UDN

- Email – undiagnosed@stanford.edu
- Can refer patients to the study
- Can follow patients during study evaluation
- Recruiting through 2022
STANFORD CHILDREN’S HEALTH
FY2018 QUALITY & SAFETY UPDATE

Lane F. Donnelly MD, CQO
Agenda

• LPCH Q&S Structure
• FY2018 Quality & Safety Performance
\[ \text{Value} = \left\{ \frac{\text{Outcomes (Q&S)}}{\text{Cost}} + \text{Experience} \right\} \]
Center for Pediatric & Maternal Value

cpmV

“Helping us get better all of the time.”
Agenda

• LPCH Q&S Structure
• FY2018 Quality & Safety Performance
<table>
<thead>
<tr>
<th>FYTD Performance</th>
<th>FYTD Value</th>
<th>Indicator</th>
<th>Last Updated</th>
<th>Current Value</th>
<th>Target</th>
<th>Trend Line</th>
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<tr>
<td>Safety</td>
<td>8</td>
<td>SSE Aggregate</td>
<td>Aug-18</td>
<td>0</td>
<td>≤ 2</td>
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<td>Safety</td>
<td>45</td>
<td>CLABSI Aggregate</td>
<td>Aug-18</td>
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<td>HAPI Aggregate</td>
<td>Aug-18</td>
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<td>≤ 2</td>
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<td>Safety</td>
<td>91</td>
<td>HAC Aggregate (Hospital Acquired Conditions)</td>
<td>Aug-18</td>
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<td>≤ 9</td>
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<td>Safety</td>
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<td>Hand Hygiene</td>
<td>Aug-18</td>
<td>Inpatient: 85.6%</td>
<td>Inpatient: 90%</td>
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<tr>
<td>Safety</td>
<td>13</td>
<td>Codes Outside ICU</td>
<td>Aug-18</td>
<td>0</td>
<td>≤ 2</td>
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<tr>
<td>Data N/A</td>
<td>Data N/A</td>
<td>Influenza Vaccination</td>
<td>Aug-18</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ambulatory: N/A</td>
<td>Ambulatory: 25%</td>
<td>N/A</td>
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<tr>
<td>Timeless + Efficiency</td>
<td>121</td>
<td>ED Time to Admit</td>
<td>Aug-18</td>
<td>105</td>
<td>120 mins</td>
<td></td>
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<tr>
<td>Effectiveness</td>
<td>93.8</td>
<td>Patient/Family Satisfaction - Pediatric Inpatient Likelihood to Recommend Hospital</td>
<td>Aug-18</td>
<td>95.5</td>
<td>92.4</td>
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<td>Patient Centeredness + Equity</td>
<td>83.7</td>
<td>Patient/Family Satisfaction - OB Inpatient Likelihood to Recommend Hospital</td>
<td>Aug-18</td>
<td>78.8</td>
<td>87.9</td>
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<td>92.1</td>
<td>Patient/Family Satisfaction - Clinics Likelihood to Recommend Practice</td>
<td>Aug-18</td>
<td>91.6</td>
<td>92.0</td>
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<tr>
<td>Patient Centeredness + Equity</td>
<td>95.0</td>
<td>Patient/Family Satisfaction - Ambulatory Surgery Likelihood to Recommend PAC/PU</td>
<td>Aug-18</td>
<td>94.9</td>
<td>95.2</td>
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<tr>
<td>Effectiveness</td>
<td>67th percentile</td>
<td>Broad Spectrum Antimicrobial Use</td>
<td>Q1 2018</td>
<td>51st percentile</td>
<td>75th percentile</td>
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<td>Effectiveness</td>
<td>0.73</td>
<td>Mortality O:E Ratio</td>
<td>Q1 2018</td>
<td>0.97</td>
<td>In Control</td>
<td></td>
</tr>
</tbody>
</table>
SSE Definition

- Deviation from best practice care
- Causation
- Significant patient harm or death

- SPS – National Definition
The SEC Algorithm

Was there a deviation from generally accepted performance standards (GAPS)?

- Yes
  - Did the deviation reach the patient?
    - Yes
      - Did the deviation cause moderate to severe harm or death?
        - Yes
          - Serious Safety Event
        - No
          - Precursor Safety Event
    - No
      - Near Miss Safety Event
  - No
    - Not a Safety Event

Identifying Deviations from GAPS

Deviations from generally accepted performance standards are determined by comparing actual performance to expected performance. Internal practice expectations do not always reflect industry practice expectations in protecting patients from harm. Consideration of performance expectations should include external as well as internal sources such as:

- Internal policies, procedures, or protocols
- Nationally recognized best practices and standards of care
- Industry-imposed practice mandates and requirements
- Professional practice standards
- Objective review by other experts
- Organization’s obligation to best protect the patient from harm

If any of the above are answered yes, proceed with safety events classification.

Considering “Known Complications”

A known complication is an adverse outcome supported in literature as a potential risk related to a procedure, treatment, or test that is not present before the patient care encounter and occurs as a result of patient care.

If an event is perceived to be a known complication, the Known Complications Test can be used to confirm the event as a complication and to determine if providers did everything possible to prevent the negative outcome. If the patient experienced a “known complication,” consider the following:

1. Was the procedure, treatment, or test appropriate and warranted based on nationally recognized standards of care?
2. Was the complication a known risk, was it anticipated before to proceed, and was the standard of care applied to mitigate the risk?
3. Was the complication identified in a timely manner (i.e., at the time of the occurrence)?
4. Was the complication treated according to the standard of care and in a timely manner?

If the answer to all 4 questions is yes, the event is considered a known complication and not a Safety Event. If the answer to any question is no, the event is a Safety Event. Proceed in defining the classification based on the level of harm to the patient.
<table>
<thead>
<tr>
<th>Code</th>
<th>Level of Harm</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>SSE 1</td>
<td>Death</td>
<td>A deviation in GAPS resulting in death</td>
</tr>
<tr>
<td>SSE 2</td>
<td>Severe Permanent Harm</td>
<td>A deviation in GAPS resulting in critical, life-changing harm with no expected change in clinical status; includes events resulting in permanent loss of organ, limb, or vital physiologic or neurologic function. Example: - Wrong site procedure resulting in removal of healthy limb - Missed diagnosis of stroke resulting in permanent impairment - Uterine rupture resulting in loss of uterus - Anoxic brain injury resulting in permanent brain damage - Incorrect radiologic contrast dosing resulting in need for permanent dialysis</td>
</tr>
<tr>
<td>SSE 3</td>
<td>Moderate Permanent Harm</td>
<td>A deviation in GAPS resulting in significant harm with no expected change in clinical condition yet not sufficiently severe to impact activities of daily living or business functioning; includes events that result in permanent reduction in physiologic reserve, disfigurement, and impaired or aided sense or function. Examples: - Incorrect radiology contrast dosing resulting in reduced renal function - Inadvertent injury to spleen during abdominal surgery requiring removal of the spleen - Delay in treatment of limb ischemia requiring fadotomy that results in minimal loss of function but disfiguring scars - Inappropriate intra-arterial medication injection resulting in loss of a finger, other than the thumb or 2nd finger which may qualify the event as SSE 2</td>
</tr>
<tr>
<td>SSE 4</td>
<td>Severe Temporary Harm</td>
<td>A deviation in GAPS resulting in critical, potentially life-threatening harm yet lasting for a limited time with no permanent residual; requires prolonged transfer to a higher level of care/monitoring, transfer to a higher level of care for a life-threatening condition, or an additional major surgery, procedure, or treatment to resolve the condition. Examples: - Induced condition that requires resuscitation - Unrecognized fluid overload that progresses to pulmonary edema requiring transfer to the ICU for treatment - Failure to diagnose respiratory insufficiency resulting in temporary intubation where earlier recognition of the condition would have avoided the intubation - Preventable fall with hip fracture that requires surgical repair - Retained object that requires return to the operating room</td>
</tr>
<tr>
<td>SSE 5</td>
<td>Moderate Temporary Harm</td>
<td>A deviation in GAPS resulting in significant harm lasting for a limited time; requires a higher level of care/monitoring or an additional minor procedure or treatment to resolve the condition. Examples: - Failure to treat a low potassium level that results in an arrhythmia requiring administration of intravenous anti-arrhythmic drug, but with continued arrhythmia requiring extended monitoring and a higher intensity of care. - Incorrect dose of Dilaudid for pain resulting in oversedation and requiring transfer to ICU for treatment and monitoring after Narcan was ineffective in treating. - Failure to routinely assess IV site resulting in an infection at IV site or (septic phlebitis) requiring extensive surgical incision and drainage to resolve. - Incision made on the right knee instead of the left knee during a scheduled knee replacement surgery.</td>
</tr>
</tbody>
</table>
FY18 Serious Safety Events (SSE)

FY18 Cumulative YTD

<table>
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<tr>
<th>Status</th>
<th>Current Value</th>
<th>Target</th>
<th>% Reduction from FY17</th>
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<tbody>
<tr>
<td></td>
<td>9</td>
<td>≤ 22</td>
<td>63%</td>
</tr>
</tbody>
</table>

Note: Lower is better

Data Source: Care Event Reporting

Note: Lower is better
SSEs Over Time

Monthly Serious Safety Events (SSEs)

- Culture of Safety Survey Facilitated Sessions
- Integration of Mission Zero into Packard 2.0 Training
- Culture of Safety Action Local Action Planning and Monitoring
- New SSE Declaration / RCA Process
- 2017 Culture of Safety Survey

Data Source: iCare Event Reporting

Lucile Packard Children’s Hospital Stanford

Stanford Medicine
SSE Timeline

- Incident
- Incident Report
- SSE Declaration
- Root Cause Analysis
- Action Plan

Current:
- Mean = 4.3 days
- Goal = mean ≤ 7 days
- Goal = mean ≤ 30 days

100% < 30 days (mean 26 days)

Mean:
- Mean = 40 days
- Mean = 108 days

Goal:
- Goal = < 30 days
- Goal = < 30 days
SSE Determination

Number of days to determine an SSE

Goal (7 days)

Process Change
RCA Action Plan Development

**Number of days from SSE determination to RCA #2**

Goal (30 days)

**Process Change**
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<td>12</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>4</td>
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HAC Aggregate (Hospital Acquired Conditions)

March 2017 - August 2018

FY18 begins
FY18 Quality Core Goal Progress to Date
Hospital Acquired Conditions (HAC)

FY18 Cumulative YTD

<table>
<thead>
<tr>
<th>Status</th>
<th>Current Value</th>
<th>Target</th>
<th>% Reduction from FY17</th>
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<tbody>
<tr>
<td></td>
<td>91</td>
<td>≤ 108</td>
<td>34%</td>
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</table>

Note: Lower is better
Central Line Associated Blood Stream Infection (CLABSI)

**August 2018**

<table>
<thead>
<tr>
<th>Current Value</th>
<th>Target</th>
<th>% Reduction from FY17</th>
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<tbody>
<tr>
<td>3</td>
<td>≤ 5</td>
<td>30%</td>
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</table>

Note: Lower is better

[Graph showing CLABSI rates and cumulative infections]
CLABSI Enterprise-Wide Reduction

Problem Statement
LPCH CLABSI rates continue to be higher than NHSN and SPS collaborative mean rates. Despite multiple interventions, our overall rates remain unchanged, with the highest rates occurring in the CVICU and NICU.

Background
CLABSI reduction is in direct alignment with the organizational quality core goal of HAC reduction, and ultimately preventing patient harm. The NICU and CVICU both have the highest CLABSI rates among the institution, but likely due to different root causes. Operational factors, Safety Culture and Leadership and Practice Standardization, or lack thereof all play a role in CLABSI risk.

Target State: SMART Goal
Decrease the number CLABSI across LPCH to <2/1000 line days in FY2018.

Current State: Identify Target / Actual / Gap

Analysis

Key Drivers

SAFETY CULTURE / ACCOUNTABILITY

DATA/TRANSPARENCY

PRACTICE STANDARDIZATION/OPERATIONS

Sustain Plan

Activity to sustain Owner Sustain method and frequency Report to

CLABSI Steering Committee

HAC Steering Committee

QSS

Reliability Level:

(1) High reliance on checklists, standardized rounds, or other mechanisms to support implementation.

(2) Procedures: Embedded standard work, reminders, constraints, shared governance, built-in quality, automated systems, fail-safes, physical structure, social norms, "mindfulness"

Maturity Bars:

0: Untested concept

1: Early tests / PDCA

2: Multiple PDCA cycles

3: Early implementation

4: Working well in operation

Barrier

Progress

Abandoned
Implementation of Countermeasures and CLABSI Rate

RPI #1: Blood Cultures, Needleless Connectors, and IV Tubing Changes
RPI #2: CHG Bathing, Scrub the Hub/Curos, Protection of the Central Line Environment, and Heparin Flushing
RPI #3: Bundle Round Process (Auditing) by the CNS group
RPI #4: Bundle Round Elements Education (combined with RPI #2 topic education)
Real Time Bundle Compliance Dashboard - Live!
Are medications being delivered via the appropriate line?

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<th>med_type</th>
<th>central</th>
<th>peripheral</th>
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<td>81,064</td>
<td>14,983</td>
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<tr>
<td>central_preferred</td>
<td>80,540</td>
<td>25,454</td>
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<tr>
<td>peripheral_preferred</td>
<td>1,135,066</td>
<td>664,593</td>
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</tr>
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</table>
Line Access vs CLABSI Risk

Mean Line Access / Day

- CLABSI 14.853
- Non-CLABSI 11.590

- Wilcoxon test
- p-value < 2.2e-16
Summary

Q&S FY2018

- Serious Safety Events (SSE) down 63% compared to FY2017
- Hospital Acquired Conditions down 34% compared to FY2017
- CLABSI (line infections) down 30% compared to FY2017
- SSE determination time down 10 X compared to FY2017
- Root Cause Analysis time down 4 X compared to FY2017
Target Based Care

Leveraging EHR-Derived Benchmarks to Reduce Postoperative Length of Stay

Andrew Shin MD
Clinical Associate Professor, Pediatrics (Cardiology)
Massive variation in clinical practice

High rates of inappropriate care

Striking inability to “do what we know works”

Unacceptable rates of preventable care-associated patient injury and death

Significant amounts of waste, leading to rising prices that limit access to care
Anatomy of a Integrative Care Pathway

Significant time commitments
Limited resources
Cultural challenges
Disagreement – Poor fit
Unknown benefit

Aggregate Experience

Planning

Identify clinical champions, Coordinate stakeholder teams
Analysis of the problem
Fishbone analysis
Determine drivers
Review of evidence, guidelines
Determine benchmark
Develop pathway

Implementation

Tailor to local environment, Communication, coordination, Training
Implementation
Review and audit
Feedback

One pathway

Clinical Effectiveness Program at Stanford
TARGET BASED CARE at STANFORD

Building on Achievable Benchmarks in Care (ABC’s)
Differing Mental Constructs: Practitioners predicted widely contrasting length of stays (LOS) for the same surgeries
Why Targets May Be Beneficial

Differing Mental Constructs: Families receive disparate information about what to expect of their child’s hospitalization
Intervention and Smart Aim

- In the absence of objective benchmarks for the treatment of pediatric surgeries, we developed a clinical effectiveness intervention to promote a shared mental model between healthcare providers by providing clinical targets derived based on historical data deployed at the point of care.

- **SMART AIM: To reduce postoperative LOS by 10% in patients undergoing elective surgeries at LPCH in the first year following the intervention**
Hypothesis

Providers with shared mental model of hospital goals would decrease variation and improve outcomes in patients recovering from congenital heart surgery

Outcome Metrics

**Primary:** Ventilator duration, Intensive Care days, Total Hospital Days

**Secondary:** Total Hospital Cost, Family Satisfaction

**Balancing:** Reintubation, <48 hr ICU readmission & 30 day readmission rates
Intervention

Candidate Operation → Historical Cohorts Developed from EHR → Benchmark Targets Displayed at Point of Care
Intervention: Aggregate Patient Data at the Point of Care
Summary of Projects to Date

• From 9/2016 - 1/2018 we enrolled 313 patients from 3 surgical subspecialties representing 14 surgeries.

• 72% patients met and outperformed the established clinical targets.
Summary of Projects to Date

**Congenital Heart Surgery**
- Atrial Septal Defect Repair
- Ventricular Septal Defect Repair
- Atrioventricular Canal Repair
- Arterial Switch Operation
- Coarctation of Aorta Repair
  - < 30 days
  - > 30 days
- Tetralogy of Fallot Repair
  - Valve-sparring
  - Transannular Patch
- Unifocalization of MAPCAs
- Bidirectional Glenn Operation
- Fontan Completion
- Truncus Arteriosus Repair
- Stage 1/Norwood Palliation

**Solid Organ Transplantation**
- Heart Transplantation
- Kidney Transplantation
- Liver Transplantation

**Neuroscience**
- Craniosynostosis Repair
  - Open procedure
  - Endoscopic procedure
- Posterior Fossa Tumor Resection (Tumor-specific)
  - With EVD
  - Without EVD
- Chiari Malformation Repair

**Orthopedic Surgery**
- Spinal Fusion – Idiopathic Scoliosis
- Spinal Fusion – Neuromuscular Scoliosis
- Supracondylar Fracture Repair
Summary of Projects to Date

Congenital Heart Surgery (n=227)
Postoperative LOS was 6.0±3.3 vs 8.4±6.0, p<0.001

Neurosurgery (n = 50)
Postoperative LOS was 3.5±1.4 vs 3.9±1.4, p=0.06

Orthopedic Surgery (n = 36)
Postoperative LOS was 3.8±0.9 vs 4.6±1.2, p<0.001
## Results

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
<th>P-Value</th>
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</thead>
<tbody>
<tr>
<td><strong>VSD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to Extubation (days), mean (SD)</td>
<td>0.85 (1.37)</td>
<td>0.14 (0.48)</td>
<td>0.02</td>
</tr>
<tr>
<td>Postoperative ICU LOS (days), mean (SD)</td>
<td>2.67 (1.63)</td>
<td>1.67 (1.51)</td>
<td>0.009</td>
</tr>
<tr>
<td>Total postoperative LOS (days), mean (SD)</td>
<td>6.2 (1.50)</td>
<td>4.62 (1.50)</td>
<td>0.001</td>
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<tr>
<td><strong>TOF - Valve-sparring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to Extubation (days), mean (SD)</td>
<td>1.42 (1.02)</td>
<td>0.13 (0.35)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Postoperative ICU LOS (days), mean (SD)</td>
<td>3.58 (1.46)</td>
<td>2.00 (0.93)</td>
<td>0.001</td>
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<tr>
<td>Total postoperative LOS (days), mean (SD)</td>
<td>7.37 (2.00)</td>
<td>5.33 (1.11)</td>
<td>0.001</td>
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<tr>
<td><strong>Coarctation &gt; 30 days</strong></td>
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<td></td>
</tr>
<tr>
<td>Time to Extubation (days), mean (SD)</td>
<td>0.56 (0.53)</td>
<td>0 (0)</td>
<td>0.01</td>
</tr>
<tr>
<td>Postoperative ICU LOS (days), mean (SD)</td>
<td>2.78 (1.39)</td>
<td>2.71 (0.76)</td>
<td>0.92</td>
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<tr>
<td>Total postoperative LOS (days), mean (SD)</td>
<td>6.11 (2.57)</td>
<td>4.43 (1.27)</td>
<td>0.01</td>
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</table>
Results

Pre-intervention (Baseline state)

Post-intervention

Better
Results

Average 25% reduction in postoperative hospital length of stay

Annualized hospital days saved: 159 days

Annualized ICU days saved: 92

Estimated cost savings: $2.5 million annualized cost savings
Results: Decrease Variation

Length of Stay following VSD repair

UCL 3.9
CL 3.0
LCL 2.1
Results – National Comparisons - STS

Coarctation of Aorta
VSD
TOF
AVC
ASO
GLENN
FONTAN
TRUNCUS
NORWOOD

STS (High Volume Centers)
Pre-Intervention
Post-Intervention
Results – Safety: Balancing Metrics

- Reintubation Rates
- Readmission to CVICU
- 30 Day Readmission
Clinical Effectiveness Family Satisfaction

Measure A: How well was your child's pain controlled?
Measure B: To which degree did doctors keep you informed using language you could understand?
Measure C: To which degree did you feel ready to have your child discharged?
Measure D: What is your overall rating of care given at this hospital?
Measure E: What is the likelihood of you recommending this hospital to others?
Operating Room Block Utilization FY16 & FY17

The chart shows the block utilization and number of cases from August 2015 to August 2017. It indicates a trend of increasing block utilization and number of cases over the fiscal years.
Results

<table>
<thead>
<tr>
<th>Total Cases</th>
<th>Number of Eligible Cases</th>
<th>Number of Completed Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>232</td>
<td>185</td>
<td>162</td>
</tr>
</tbody>
</table>

- Percent Eligible Cases: 79.7%
- Percent Completed Cases: 87.6%

- Hospital Days Saved: 159
- ICU Days Saved: 97

PostOp LOS Target Achievement Distribution

- Met Target: 71%
- Over But Near Target: 25%
- Did Not Meet Target: 21%

Choose a service line: Heart Center, Neurosurgery, Orthopedics

- Patients scheduled for any Clinical Effectiveness associated surgery are considered for eligibility.
- Eligibility for any clinical effectiveness program depends on patient diagnosis, acuity and surgical outcome.
- PostOp LOS targets are surgery-specific and based on historic LOS medians.
- A case is considered ‘Over but near target’ if the observed inpatient LOS is over by less than 30% of target.
Clinical Effectiveness Core Team

Andrew Shin
Clinical Effectiveness

Claudia Algaze
Cardiology

Ling Loh
Analytics

Whitney Chadwick
Information Services

Jean Chantra
Analytics

Kate Steffen
Intensive Care

Hannah Bassett
Hospital Medicine

Joe Kim
Hospital Medicine

Rebecca Claure
Perioperative

May Wu
Pharmacy