Neonatal Antibiotic Stewardship

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Disclosures

• Dr. Dukhovny serves as faculty and consultant for Vermont Oxford Network

• Most antibiotics are not FDA approved for neonates
Objectives

• To define what antibiotic stewardship means in the NICU

• To assess your NICU/hospital current practices with respect to antibiotic stewardship

• To identify and apply key resources available to build/enhance antibiotic stewardship programs
Variation in antibiotic use in NICU

Figure 1 from Schulman et al. *Pediatrics* 2015.
Antibiotic Stewardship

- “coordinated interventions designed to improve and measure the appropriate use of [antibiotic] agents by promoting the selection of the optimal [antibiotic] drug regimen, including dosing, duration of therapy, and route of administration” (PIDS, SHEA, IDSA)

- Many components to an Antibiotic Stewardship Program (ASP):
  - Right antibiotic
  - Right dose
  - Right duration
  - Right patient

- Some (many) patients are getting unnecessary exposure to antibiotics in the NICU
  - But…“Babies are sick and vulnerable to infection”
Antibiotic Exposure in Well Appearing Newborns

Total Live Births 8371

Births ≥ 35 wks 7943

- Not well-appearing Admitted to NICU 717
- Well-appearing Admitted to Nursery 7226

- Evaluated for EOS 1062
- Empiric Antibiotics 588

- 14.7% of well appearing infants
- 12.7% of total live births

Figure 2 from Mukhopadhyay et al. J. Perinatology 2013
Introduction of Early Onset Sepsis Risk Calculator (Kaiser) – Blood Cultures

Figure 1 from Kuzniewicz et al. *JAMA Pediatrics*. 2017
Introduction of Early Onset Sepsis Risk Calculator (Kaiser) – Antibiotics

Figure 2 from Kuzniewicz et al. *JAMA Pediatrics*. 2017
We Are Over-treating premies: 22-28 weeks, NRN Study

Early Onset Sepsis Incidence: 0.5% 2.5%

<table>
<thead>
<tr>
<th>TABLE 5 Antibiotic Use in Low-Risk and Comparison Infants Surviving &gt;12 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N (Column %) or as Shown</strong></td>
</tr>
<tr>
<td>Antibiotics for ≥5 d starting within 72 h</td>
</tr>
<tr>
<td>Antibiotics in the absence of EOS</td>
</tr>
<tr>
<td>Antibiotics in the absence of positive EOS culture (cases and contaminants)</td>
</tr>
<tr>
<td>Antibiotics in the absence of a positive blood or CSF culture result, NEC, or SIP ≤7 d</td>
</tr>
<tr>
<td>No. infants given prolonged early antibiotics per EOS case</td>
</tr>
</tbody>
</table>

Table 5 from Puopolo et al. *Pediatrics*. 2017
Variation Persists

Low Risk Group (0.5% EOS)

High Risk Group (2.5% EOS)

Figure 1 from Puopolo et al. Pediatrics. 2017
What are the downsides to Antibiotics?

- Increasing resistant organisms - can be helped by modified use of antibiotics  
  Marston et al. *JAMA* 2016

- NICU Problems:
  - NEC from prolonged empiric antibiotics  
    Cotten et al. *Pediatrics* 2009
### Antibiotics and NEC in ELBWs

**Table 5 from Cotten et al. Pediatrics 2009**

#### Multivariate Logistic Regression Analysis of Antibiotic Duration and NEC or Death

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Duration of Initial Empirical Antibiotic Treatment (Odds per Day)</th>
<th>P</th>
<th>Prolonged Initial Empirical Antibiotic Treatment (Odds per Day)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEC or death (total, N = 3883; with outcome, n = 884)</td>
<td>1.04 (1.02–1.06)</td>
<td>&lt;.01</td>
<td>1.30 (1.10–1.54)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>NEC (total, N = 3899; with outcome, n = 427)</td>
<td>1.07 (1.04–1.10)</td>
<td>&lt;.001</td>
<td>1.21 (0.98–1.51)</td>
<td>.08</td>
</tr>
<tr>
<td>Death (total, N = 3882; with outcome, n = 631)</td>
<td>1.16 (1.08–1.24)</td>
<td>&lt;.001</td>
<td>1.46 (1.19–1.78)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

ORs were adjusted for study center, gestational age, small-for-gestational age status, gender, black race, 5-minute Apgar score of <5, rupture of membranes for >24 hours, outborn, prenatal steroid treatment, intrapartum antibiotic treatment, maternal hypertension, maternal hemorrhage, and multiple birth. The total numbers of infants shown represent the numbers of infants with nonmissing outcome and covariate data who were included in each model.
What’s the downside to Antibiotics?

• Increasing resistant organisms - can be helped by modified use of antibiotics Marston et al. JAMA 2016

• NICU Problems:
  • NEC from prolonged empiric antibiotics Cotten et al. Pediatrics 2009
  • Change individual AND NICU flora (resistance)
  • Long term effects?
  • COSTS!!!
## Table 5 Cost and Resources Utilization

<table>
<thead>
<tr>
<th></th>
<th>CDC2002, n = 920</th>
<th>CDC2010, n = 476</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost for all evaluations, $ (1000 LB≥36)</td>
<td>253,724 (34,843)</td>
<td>132,843 (18,967)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Cost from inadequate GBS, $ (1000 LB≥36)</td>
<td>51,329 (70,49)</td>
<td>386 (55)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Median total cost per patient (IQR), $</td>
<td>293 (188–371)</td>
<td>292 (164–365)</td>
<td>.71</td>
</tr>
<tr>
<td>Total triage hours for all evaluations (1000 LB≥36)</td>
<td>1361 (187)</td>
<td>864 (123)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Total triage hours from inadequate GBS (1000 LB≥36)</td>
<td>215 (29.5)</td>
<td>1.1 (0.2)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Median triage hours per patient (IQR)</td>
<td>1.4 (0.4–2.9)</td>
<td>1.8 (0.5–3.2)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>No antibiotics</td>
<td>0.8 (0.3–2)</td>
<td>0.7 (0.3–1.9)</td>
<td>.06</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>1.8 (1.1–3.1)</td>
<td>2 (1.3–3.3)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Return visits (% of total evaluated)</td>
<td>75 (8.2)</td>
<td>58 (12.2)</td>
<td>.02</td>
</tr>
<tr>
<td>No antibiotics</td>
<td>15 (1.6)</td>
<td>2 (0.4)</td>
<td>.07</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>59 (6.4)</td>
<td>56 (11.8)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

IQR from 5% to 95%.

*Reasons for repeat visits included IV restart (49 in CDC2002 and 54 in CDC2010), repeat CBC count (17 in CDC2002 and 2 in CDC2010), start of antibiotic therapy due to abnormal I/T ratio or chorioamnionitis diagnosed in mother later by obstetrics (5 in CDC2002 and 2 in CDC2010), and repeat cultures for a false-positive blood culture (4 in CDC2002 group).
What’s the downside to Antibiotics?

- Increasing resistant organisms - can be helped by modified use of antibiotics  Marston et al. *JAMA* 2016
- NICU Problems:
  - NEC from prolonged empiric antibiotics  Cotten et al. *Pediatrics* 2009
  - Change individual AND NICU flora (resistance)
  - Long term effects?
  - COSTS!!!
- Asthma risk with exposure in the 1st year of life  Mara et al. *Pediatrics* 2009
- Mitigate benefits of breastfeeding  Korpela et al *JAMA Peds* 2016
- 90% of adult patients with cancer receive antibiotics in last week of life  Juthani-Mehta et al *JAMA* (viewpoint) 2016
How Top Restaurants Rate on Reducing Use of Antibiotics in Their Meat Supply

SEPTEMBER 2017
Reducing **Unnecessary** Antibiotic Exposure Works!

- Vancomycin reduction strategy in the NICU  
  Chiu et al. *PIDJ* 2011
- Inpatient pediatrics ASP programs  
  Smith et al. *JPIDS* 2015
  - Reduce antibiotic utilization
  - Decrease costs
  - Reduce prescribing errors
- ASP implementation using different components  
  Nguyen-Ha et al *Pediatrics* 2016
  - Education
  - Restriction on prescribing antibiotics
  - Audits
  - Clinical practice guidelines
- No increased safety concerns noted
CDC Core Elements for ASP

- Leadership support
- Accountability
- Drug expertise (i.e. pharmacy/physician leaders)
- Policies to support optimal antibiotic use (i.e. clinical consensus)
- Tracking
- Reporting/Sharing
- Education
Partnership for NICU Antibiotic Stewardship Born

- In 2016, Vermont Oxford Network (VON) initiated an internet-based quality improvement collaborative (iNICQ) “Choosing Antibiotics Wisely”
- In part, motivated by tremendous variation in antibiotic use among CA NICUs (Schulman et al. *Pediatrics* 2015) and *Choosing Wisely* in Newborn Medicine list (Ho et al. *Pediatrics* 2015)
  - “Avoid routine continuation of antibiotic therapy beyond 48 hours for initially asymptomatic infants without evidence of bacterial infections”
- CDC joined as a partner
- 167 centers (mostly in the US) joined iNICQ
iNICQ Choosing Antibiotics Wisely
2016, 2017, 2018

- Webinars (6-9/year)
  - Topic content
  - QI content
  - Coaching
- Antibiotic Stewardship Toolkit
  - Potentially better practices
- Day audits of policies/stewardship/practice (2/year)
- On the ground team work
- Network of learning
  - Web based
  - Discussion list-serve
Goals of being part of iNICQ

• Different for every center
• Follow the Institute for Health Care Improvement (IHI) Model for Improvement to do on the ground, multi-disciplinary work
• Participating centers have a range of expertise doing QI work
Northwest Improvement Priority: Antibiotic Stewardship (NW IPAs)

- Kaiser Sunnyside Portland, OR
- Legacy Randall Children’s Hospital Portland, OR
- Legacy Salmon Creek Salmon Creek, WA
- Oregon Health & Science University Portland, OR
- Peace Health Southwest Vancouver, WA
- Peace Health Sacred Heart Eugene, OR
- Providence Portland Portland, OR
- Providence St. Vincent Portland, OR
- Asante Rogue Regional Medical Center Medford, OR
- Salem Hospital Salem, OR
- St. Charles Bend, OR
Who are the NW IPAs?

• ALL 11 NICUs in Oregon and Southwest Washington
  – the remaining hospitals/birthing centers in the region provide care to well newborns, as well as triage and stabilize newborns with issues
• ~50,000 live births/year regionally
• All hospitals are members of VON
NW IPAs History

- Dec 2015 – conversations started
- Jan 2016 – joined VON Choosing Antibiotics Wisely iNICQ as a collaborative
- Nov 2016 – Inaugural in person meeting
- Jan 2017 – continued 2017 iNICQ participation with support for part of this work was provided by the Healthcare Associated Infections Program of the Oregon Public Health Division with funding from the CDC Epidemiology and Laboratory Capacity Grant
Overall Aims

• Build an ongoing regional collaboration among the 11 NICUs in the region in order to help reduce morbidity and mortality in our patient population

• Develop a partnership with the Oregon Health Authority (OHA), March of Dimes, Oregon Perinatal Collaborative (OPC) and other local/regional organizations to help optimize neonatal care and outcomes
Antibiotic Stewardship
SMART AIM

• Decrease the number of antibiotic doses per newborn per NICU per month by 10% (from baseline) by December 2016

• Have at least 8 of 11 centers participate in group activities by June 1, 2016
SMART AIM: To decrease the median antibiotic utilization rate (antibiotics/newborn/participating hospital/month) by 10% (from baseline year of 2016) in 2017

**Key Drivers**

- **Collaboration**
  - Continue to work together and share ideas as 11 NICUs
  - Set up a venue for communication
  - Set up additional teleconferences focused on regional antibiotic stewardship work

- **Stewardship**
  - Enroll in iNICQ 2016 as a region
  - Begin on the ground antibiotic stewardship work at each individual center
  - Determine AND share AUR

- **Partnership**
  - Partner with other state and regional organization involved in perinatal health and antibiotic stewardship
    - Oregon Health Authority (OHA)
    - March of Dimes
    - Oregon Perinatal Collaborative (OPC)
    - Oregon Pediatric Improvement Partnership (OPIP)
<table>
<thead>
<tr>
<th>PDSA Cycle</th>
<th>Time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>December 2015</td>
<td>Engaged leaders from each of the 11 NICUs regarding possible collaboration</td>
</tr>
<tr>
<td>2</td>
<td>January 2016</td>
<td>Joined VON iNICQ Choosing Antibiotics Wisely Initiative Year 1 as a collaborative (NW IPAs)</td>
</tr>
<tr>
<td>3</td>
<td>Spring 2016</td>
<td>Assigned coaches to each of the 11 centers in NW IPAs</td>
</tr>
<tr>
<td>4</td>
<td>June 2016</td>
<td>Formed a regional listserv for communication and idea sharing - <a href="mailto:NWIPACHOOSEWISELY2016@LIST.UVM.EDU">NWIPACHOOSEWISELY2016@LIST.UVM.EDU</a></td>
</tr>
<tr>
<td>5</td>
<td>Summer 2016 - ongoing</td>
<td>Engaged state agencies (OHA, March of Dimes, OPC) as partners (OHA committed funding for all 11 NICUs to join the year 2 of Choosing Antibiotics Wisely Collaborative)</td>
</tr>
<tr>
<td>6</td>
<td>November 2016</td>
<td>With funding from local stakeholders, including the March of Dimes, Doernbecher Children’s Hospital, Northwest Newborn Specialists/Mednax, and Salem Hospital</td>
</tr>
<tr>
<td>7</td>
<td>January 2017</td>
<td>Joined VON iNICQ Choosing Antibiotics Wisely Initiative Year 2 as a collaborative (NW IPAs)</td>
</tr>
<tr>
<td>8</td>
<td>January 2017</td>
<td>Started monthly VON Day patient level audits for the NW IPAs in order to understand the patient/center level antibiotic practice</td>
</tr>
<tr>
<td>9</td>
<td>Spring 2017</td>
<td>Initiated conversations with OPIP regarding the NWIPAs joining their organization to help build the momentum towards a collaborative and capitalize on the infrastructure of OPIP (<a href="http://www.oregon-pip.org/">http://www.oregon-pip.org/</a>)</td>
</tr>
<tr>
<td>10</td>
<td>September 2017</td>
<td>2nd NW IPAs in person meeting (Salem, OR)</td>
</tr>
</tbody>
</table>
## Measures

<table>
<thead>
<tr>
<th>Measure Type</th>
<th>Description</th>
<th>Number of NICUs participating</th>
<th>Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUR (CDC definition)</td>
<td>Monthly measure of AUR (number of antibiotic days per 1,000 patient days)</td>
<td>All</td>
<td>NW IPAs Leadership</td>
</tr>
<tr>
<td><strong>Process Measure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% centers participating in NW IPAs group activities</td>
<td>Participation in each of the NW IPAs activities described above outside of the VON webinars</td>
<td>All</td>
<td>NW IPAs Leadership</td>
</tr>
<tr>
<td><strong>Balancing Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC</td>
<td>VON Nightingale measure (VLBWs)</td>
<td>All</td>
<td>VON Nightingale</td>
</tr>
<tr>
<td>Any infection</td>
<td>VON Nightingale measure (expanded database)</td>
<td>All</td>
<td>VON Nightingale</td>
</tr>
<tr>
<td><strong>Family Centered Care Measure</strong></td>
<td>Not yet developed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Value Measure</strong></td>
<td></td>
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</table>
Practically Speaking…

- Every NICU in the NW IPAs were tasked with:
  - Joining the VON Collaborative
  - Putting together a local multi-disciplinary antibiotic stewardship team
  - Developing a SMART Aim
  - Starting PDSA cycles to decrease their unnecessary antibiotic utilization
  - Participate in NW IPAs activities
  - Determine/share their Antibiotic Utilization Rate (AUR)* with NW IPAs

- NW IPA Leadership:
  - Organization and structure for collaborative QI
  - Coaching to the teams

*CDC definition of antibiotic days per 1,000 patient days
Results
Individual AURs for NW IPA Centers: Jan 2015 – May 2017

- Y-axis (left) – AUR
- Y-axis (right) – total patient days for NW IPAs
- X-axis – month/year
- Thick dark blue line - combined AUR of participating centers in NW IPAs
- Individual lines – NW IPAs individual centers monthly AUR
Combined AUR for NW IPAs: Jan 2015 – May 2017

- Y-axis (left) – AUR
- Y-axis (right) – total patient days for NW IPAs
- X-axis – month/year
- Thick dark blue line – combined AUR for NW IPAs

~25% reduction from baseline in antibiotic utilization
VON Day Audit

NW IPA | All VON
-------|-------
Feb 2016 | Nov 2016 | Mar 2017 | Nov 2017

% of infants on antibiotics

OHSU
Types of Antibiotics:
NW IPAs Jan-Dec 2017 Day Audits

Antibiotics Used

- Ampicillin
- Aminoglycoside
- Vancomycin
- Cefepime
- Cefotaxime
- Fluconazole
- Metronidazole
- Nafcillin
- Meropenem
- Imipenem
- Other antibacterial agent
- Amoxicillin
- Penicillin
- Oxacillin
- Clindamycin
- Ceftriaxone
- Cefazolin
- Other antifungal agent
- Linezolid
- Cefotaxime
- Meropenem

# of babies

0 10 20 30 40 50 60 70 80 90 100

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Sample Report Sent to Each Center
(along with excel template):

NW IPAs AUR Report

Oregon Health & Science University
January 2015-December 2016
AUR of 9 out of the 11 centers in the NW IPAs from January 2015-December 2016

Notes: (a) 1 center only started data collection in August 2015; (b) only 4 centers have data through December 2016

The thick dark blue line represents the overall AUR for all the centers reporting (NW IPAs Monthly AUR)
The thick dark blue line represents the overall AUR for all the centers reporting. The other dark thick line represents the AUR for your center (OHSU).
Please note that this is not a risk adjusted graph. If your center median is above the NW IPAs, then you are utilizing more antibiotics than the other 9 centers represented. If it is below the NW IPAs, than you are averaging less.
Each center should set its own goal line (that should be realistic and attainable – 150 was set arbitrarily for purposes of demonstration).
NICU ASP Strategies

- Implementation of Early Onset Sepsis Calculator
- Engagement of the Mother-Baby Units
- Shortening the time of rule out from 48 to 36 hours (some to 24 hours)
- IT interventions – hard stops
- Engaging the families in conversation
- Education of staff
- Multidisciplinary
  - Pharmacy
  - Microbiology lab
  - ID
Discussion

• NW IPAs have successfully engaged all 11 NICUs in the region in collaboration and participation around antibiotic stewardship

• All 11 centers have been able to determine their AUR*  
  • Labor intensive (getting better)  
  • Not risk adjusted

• 2017 iNICQ participation for NW IPA centers was supported in part by the Healthcare Associated Infections Program of the Oregon Public Health Division with funding from the CDC Epidemiology and Laboratory Capacity Grant

• First collaborative QI project in region that includes all NICU participation

*CDC definition of antibiotic days per 1,000 patient days
Next Steps

• Initial antibiotic stewardship has a lot of low hanging fruit to decrease the AUR, but…
  – Need to understand the AUR with respect to:
    • Within and between center variation
    • Relationship to census
    • Risk adjustment
    • Setting reasonable benchmarks

• 50% of births in Oregon are covered by the 9 NICUs in the state…what about the other 50% of births in Oregon (and SW WA)
Collaboration & Partnership

• All 11 centers are working together and planning to expand their work beyond antibiotic stewardship
• Sharing data, strategies, and learning from each other
• Partnership with a number of state organizations:
  • Oregon Health Authority (OHA)
  • March of Dimes
  • Oregon Perinatal Collaborative (OPC)
  • Oregon Pediatric Improvement Partnership (OPIP)
  • Vermont Oxford Network (VON)
Northwest Neonatal Improvement Priority Alliance
Summary

• There is A LOT of antibiotic use in the NICU and A LOT of variation around the use
• As a regional collaborative, we were successfully able to reduce our AUR by ~25%...BUT
  – Lots of variation persists
  – What can/should we do next?

• Business case for antibiotic stewardship?
  – Resources are being reduced, BUT antibiotics in the NICU are cheap, so have to think a little beyond their costs
What Can You Do?

• NICU/Newborn Level
  – What are your antibiotic prescribing practices?
  – How does your microbiology lab work?
  – Do you track them?

• Hospital Level
  – Is there an antibiotic stewardship program?
    • Adult vs. Pediatric
    • Data (NHSN AU/AR Modules)

• System/State
  – What are other centers doing?
  – Does your state department of public health have funding and support?
Figure 1 from American Nurses Association White Paper & CDC “Redefining the Antibiotic Stewardship Team” 2017
www.nursingworld.org
Acknowledgements

• The work of the NW IPAs is on behalf of the Antibiotic Stewardship Teams in the 11 individual sites

• NW IPAs Leadership
  – Wannasiri “Awe” Lapcharoensap, MD (OHSU)
  – Howard Cohen, MD (Salem Hospital)
  – Stefanie Rogers, MD (Providence St. Vincent)

• Infectious Disease/Control Support
  – Judith Guzman-Cottrill, DO (OHSU)
  – Dawn Nolt, MD MPH (OHSU)

• Support
  – Oregon Health Authority with funding from the CDC Epidemiology and Laboratory Capacity Grant
  – March of Dimes (Joanne Rogovoy)

• Collaborators:
  – Vermont Oxford Network (Madge E. Buus-Frank, DNP, APRN-BC, FAAN)
  – Oregon Pediatric Improvement Partnership (Colleen Reuland)
  – Oregon Perinatal Collaborative (Aaron Caughey, MD PhD)
NW IPAs Team and Collaborators

• Just the team leaders are listed here, although there are over 90 participants between the 11 sites (including physicians, nurses, nurse practitioners, pharmacists, parents, fellows and medical students)
  • Kaiser Sunnyside (Portland, OR)
    • Tonia Berberich, RN, Hillsty Nicholson, MD, Milette Oliveros, MD
  • Legacy Randall Children’s Hospital (Portland, OR)
    • Sean Sweeney, DO
  • Legacy Salmon Creek (Salmon Creek, WA)
    • Bret Freitag, MD
  • Oregon Health & Science University (Portland, OR)
    • Dmitry Dukhovny, MD MPH, Robert Schelonka, MD
  • Peace Health SW (Vancouver, WA)
    • John Evered, MD, Wadnnasiri Lapcharoensap, MD, Tiffany Wright, NNP
  • Peace Health Sacred Heart (Eugene, OR)
    • Mike Colasurdo, MD
  • Providence Portland (Portland, OR)
    • Fred Baker, MD, Michael Garcia, PharmD, Tiffany Transue, RN, AnneMarie West, RN
  • Providence St. Vincent (Portland, OR)
    • Stefanie Rogers, MD
  • Asante Rogue Regional Medical Center (Medford, OR)
    • Katie Towns, DO, Tiffany Price, RN, Barbera Herzog Taft, RN
  • Salem Hospital (Salem, OR)
    • Howard Cohen, MD, Cindy Davis, NNP, Ryan Lam, MD
  • St. Charles (Bend, OR)
    • Robert Pfister, MD
Thank You!
Questions/Comments
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