Predictive Analytics and the Impact on Nursing Care Delivery

Session 2, March 5, 2018

Whende M. Carroll, MSN, RN-BC - Director of Nursing Informatics, KenSci, Inc.
Nancee Hofmeister, MSN, RN, NE-BC – Senior VP, Chief Nursing Officer – Evergreen Health

www.himssconference.org

DISCLAIMER: The views and opinions expressed in this presentation are those of the author and do not necessarily represent official policy or position of HIMSS.
Conflict of Interest

Whende M. Carroll, MSN, RN-BC
Master of Science in Nursing, Nursing Informatics

Nancee Hofmeister, MSN, NE-BC
Master of Science in Nursing, Nursing Administration

Have no real or apparent conflicts of interest to report.
Agenda

• Predictive Analytics:
  ▪ Defined
  ▪ The Nurse’s Role
  ▪ Driving Value

• Predictive Analytics: Impact on an Organization
  ▪ Demonstrate the use of predictive analytics in clinical, educational, and administrative nursing roles
  ▪ Show the impact to the organization each application can have

• Predictive Analytics: Key Takeaways
Learning Objectives

• Define predictive analytics and outline nurses’ role
• Discuss the impact that predictive analytics can have on an organization
• Explore how nurses can use predictive analytics to drive value
Predictive Analytics: Defined

• **Mathematical computations** that analyze **historical data** from multiple sources to **predict future events**

• A **machine approach** to refine those data, **using knowledge** to **extract hidden value** from **newly discovered patterns**

• **Dynamically** informs **data-driven decision-making** to know **what will happen, when and what to do about it**
Predictive Analytics: Defined

How do we make decisions in healthcare?

• **Yesterday and Today** > Traditional Tactics
  • Uninformed – No data
  • Guessing – Some data (maybe)
  • Descriptive – Data-driven dashboards

• **Today and Tomorrow** > Emerging Models
  • *Predictive* - Adding a machine model to structure data to forecast
  • *Prescriptive* - Taking a recommended action based on predictions
Predictive Analytics: Defined

The Data Healthcare Analytics & Value Spectrum

Descriptive: What Happened?
Diagnostic: Why did it happen?
Predictive: What, Why & When will it happen?
Prescriptive: What will we do about it?

Hindsight: Hindsight
Hindsight: Insight
Foresight: Foresight

Value of Insights to Improve Nurses’ Decision Making

Source: Adapted from Gartner Inc., 10/2016
Predictive Analytics: Defined

Types of Predictive Analytics

• Recency, Frequency, Monetary (RFM) Analysis
• Time Series Analysis
• Social Network Survival Analysis
• Machine Learning = Computer algorithms that improve automatically through experience
Predictive Analytics: Defined

The Process of Machine Learning

1. Get Data
2. Clean, Prepare & Manipulate Data
3. Train Model
4. Test Data
5. Improve
Predictive Analytics: Nurses’ Role

Artificial Intelligence is Altering Healthcare, but Not with “Magic”

Artificial intelligence holds many promises for healthcare providers, but it's unlikely to replace the need for highly-trained clinical minds.

Source: HealthIT Analytics, 11/27/17
Predictive Analytics: Nurses’ Role

• **Nursing Process** - expedites practice
• **Critical Thinking** - augments reasoning
• **Organized Thinking** - enhances structure
• **Clinical Decision Support** - assists capabilities

• **Individualizes Precision Care**
  • The Right Nurse → The Right Patient → The Right Care → The Right Time
Predictive Analytics: Nurses’ Role

• Early Diagnosis of Disease States: Sepsis
• Manage Disease Progression: Congestive Heart Failure
• Impede Patient Deterioration: Rapid Response
• Improve Patient Flow: Care Planning
• Decrease Length of Stay/Readmissions: Care Coordination
• Match Staffing to Patient Demand: Efficiency
Predictive Analytics: Nurses Driving Value

Nursing Informatics

Technology Enables Value-Based Nursing Care

Roy L. Simpson, RN, C, DPNAP, FAAN

Predictive Analytics: Nurses Driving Value

How Nurses Add Value to Healthcare = The Quadruple Aim

• Managing Populations → Improves quality care and health outcomes
• Controlling Costs → Decreases low-value tasks, waste and inefficiencies
• Improving Patient Satisfaction → Allows more beneficial time with patients
• Improve Nurses’ Satisfaction → Transforms the nursing workforce
Predictive Analytics: Nurses Driving Value

“Improves nursing care practice through better, data-driven decision making at the point of care to deliver safe, quality, individualized, efficient care for populations, decrease costs, and enhance the experience of both patients and nurses”
Clinical Applications

• **Predicator of deteriorating patients**
  – Modified Early Warning System (MEWS)
  – Maternal Early Warning Trigger (MEWT)
  – Emergency Severity Index (ESI) Scoring
# MEWS Scoring Parameters

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse Rate</strong> (bpm)</td>
<td>&lt;40</td>
<td>40-50</td>
<td>51-100</td>
<td>101-110</td>
<td>111-129</td>
<td>&gt;130</td>
<td></td>
</tr>
<tr>
<td><strong>Respiratory Rate</strong></td>
<td>&lt;9</td>
<td>9-14</td>
<td>15-20</td>
<td>21-29</td>
<td>&gt;/= 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>&lt;35.1</td>
<td>35.1-36</td>
<td>36.1-38</td>
<td>38.1-38.5</td>
<td>&gt;38.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Systolic BP</strong></td>
<td>&lt;71</td>
<td>71-80</td>
<td>81-100</td>
<td>101-199</td>
<td>&gt;/=200</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>O2Sat</strong></td>
<td>&lt;84</td>
<td>84-87</td>
<td>88-92</td>
<td>93-100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Modified Early Warning System (MEWS)

<table>
<thead>
<tr>
<th>MEWS</th>
<th>HR</th>
<th>Systolic BP</th>
<th>RR</th>
<th>O₂ Sat</th>
<th>Temp</th>
<th>UOP</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>112</td>
<td>18</td>
<td>82</td>
<td>36.5</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>121</td>
<td>95</td>
<td>17</td>
<td>96</td>
<td>36.6</td>
<td>250</td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>120</td>
<td>126</td>
<td>65</td>
<td>95</td>
<td>36.7</td>
<td>300</td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>107</td>
<td>152</td>
<td>39</td>
<td>100</td>
<td>37.2</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>112</td>
<td>137</td>
<td>36</td>
<td>94</td>
<td>36.4</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>110</td>
<td>124</td>
<td>20</td>
<td>100</td>
<td>36.3</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>105</td>
<td>110</td>
<td>20</td>
<td>92</td>
<td>37.2</td>
<td>100</td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>102</td>
<td>110</td>
<td>22</td>
<td>98</td>
<td>36.6</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>78</td>
<td>92</td>
<td>20</td>
<td>98</td>
<td>35.8</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>108</td>
<td>99</td>
<td>16</td>
<td>97</td>
<td>37.4</td>
<td>150</td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>102</td>
<td>120</td>
<td>20</td>
<td>88</td>
<td>37</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>122</td>
<td>146</td>
<td>16</td>
<td>96</td>
<td>39.7</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>116</td>
<td>103</td>
<td>18</td>
<td>98</td>
<td>35.4</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>94</td>
<td>97</td>
<td>18</td>
<td>99</td>
<td>35.5</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>109</td>
<td>101</td>
<td>16</td>
<td>100</td>
<td>39.4</td>
<td></td>
<td></td>
<td>Rapid</td>
</tr>
<tr>
<td>MEWS Score</td>
<td>Recommended RN Action Items</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-2</td>
<td>* Follow routine monitoring as ordered</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 3          | * Assigned RN rechecks vital signs for accuracy  
* Collaborate with charge RN to reassess patient and confirm score  
* Consider increasing frequency of vital signs as appropriate |
| 4          | * Assigned RN rechecks vital signs for accuracy  
* Collaborate with charge RN to reassess patient and confirm score  
* Consider increasing frequency of vital signs as appropriate |
| 5          | * Assigned RN rechecks vital signs for accuracy  
* Collaborate with charge RN to reassess patient and confirm score  
* Consider calling Rapid Response  
* Inform Physician  
* Increase Vital Signs frequency to every 1 hours x3 and confirm score each time  
* If patient remains “5” for three consecutive readings, consider transfer to higher level of care |
| >=6        | * Assigned RN rechecks vital signs for accuracy  
* Collaborate with charge RN to reassess patient and confirm score  
* Call Rapid Response and Physician STAT if physician is not already involved  
* Recommend transfer to higher level of care |
Code Blue Outside the CCU

Monthly Code Blue Outside CCU Trend

2013
Rapid Response Team Development
2014
NEWS Available to STAT team
2015
Centralized Pulse Oximetry
2016
Organizational Code Blue training
NEWS Available to all RNs
2017
#### Maternal Early Warning Trigger (MEWT)

- Validated by the California Maternal Quality Care Collaborative (CMQCC)
- Screens for the four major causes of maternal morbidity
- Low false positive

<table>
<thead>
<tr>
<th>Severe Abnormal Trigger: If any ONE (1) of these are present for greater than 20 mins - CALL PROVIDER IMMEDIATELY</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Heart Rate greater than 130 – Sustained, excludes pushing</td>
</tr>
<tr>
<td>- Respiratory Rate greater than 30</td>
</tr>
<tr>
<td>- Mean Arterial Pressure (MAP) less than 55</td>
</tr>
<tr>
<td>- Oxygen saturation less than 90% on room air</td>
</tr>
<tr>
<td>- Nursing is clinically concerned with patient status</td>
</tr>
</tbody>
</table>

**Complete screening each shift or when patient’s condition changes**

<table>
<thead>
<tr>
<th>Maternal Trigger</th>
<th>Screening Criteria (Circle the identified trigger, as applicable)</th>
<th>Check all that apply below ↓</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Temperature</strong></td>
<td>Greater than or equal to 38°C / 100.4°F OR Less than or equal to 36°C / 96.9°F</td>
<td></td>
</tr>
<tr>
<td>2. <strong>Fetal Heart Rate</strong></td>
<td>Greater than 160 bpm (baseline, gestational age greater than or equal to 20 weeks)</td>
<td></td>
</tr>
<tr>
<td>3. <strong>Respiratory Rate</strong></td>
<td>Greater than 24/min or less than 10</td>
<td></td>
</tr>
<tr>
<td>4. <strong>O2 Saturation</strong></td>
<td>Less than or equal to 94% on room air</td>
<td></td>
</tr>
<tr>
<td>5. <strong>Blood Pressure</strong></td>
<td>Systolic greater than 155 or less than 80 Diastolic greater than 105 or less than 45</td>
<td></td>
</tr>
<tr>
<td>6. <strong>Pain</strong></td>
<td>Sudden onset, increasing, unusual for diagnosis or normal clinical course, noted in new location</td>
<td></td>
</tr>
<tr>
<td>7. <strong>Altered Mental Status</strong></td>
<td>Confusion, agitation, combativeness, dizziness, shoddiness of breath</td>
<td></td>
</tr>
</tbody>
</table>

**Are any two (2) of the above present?**

- If YES repeat assessment within 20 to 30 minutes. If trigger is sustained, CONTACT PROVIDER and consider the following appropriate pathway on the back of this screening tool. Continue with screening every 20 to 30 minutes, as indicated.

- If NO, STOP HERE & wait next assessment.

<table>
<thead>
<tr>
<th>Time of Provider Assessment (for patients with ≥ 2 sustained triggers).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>0-15min</td>
</tr>
<tr>
<td>16-30min</td>
</tr>
<tr>
<td>&gt;30min</td>
</tr>
</tbody>
</table>

**Additional Comments:**

- Was the triggers pathway followed? **Yes** | **No**
- Which trigger pathway selected (check all that apply) **HTN** | **OB Hem** | **Sepsis** | **Cardiopulmonary**
- **Final status of this patient:** (summarize below):

---

**Evergreen Health**

**Maternal Trigger Screening Tool (MEWT)**

**Worksheet only – Not Part of Medical Record**

---

**Rev 6-22-17**
Emergency Severity Index (ESI) Score

- Used widely across the country to triage ED patients
- 1 to 5 levels - 1 requiring the most immediate attention (cardiac arrest) while 5 least attention (rash)
- 70% of patients are triaged to level 3 per research done on ESI
- Tool developed based on algorithm to predict a patient’s severity of illness
Administrative Application

Inpatient Staffing Demand
Emergency Department Demand Prediction
Inpatient Staffing Demand
Intelligence of Efficient Staffing

[Diagram showing utilization trends and staffing metrics with labels for Demand staffing, Actual staffing, Retrospective average, Projected staffing, and Scheduled staff.]
Managing the Cost of Nursing Efficiently

Better patient outcomes occur with the right caregiver, at the right place, at the right time.

Six months after implementing Cerner Clairvia
- Nursing overtime and double time dropped 8.4% and saved 2,000 hours

https://www.cerner.com/client-achievements/childrens-hospital-los-angeles-clairvia

#HIMSS18
Emergency Department Prediction

• The KenSci product will provide the following KPI’s:
  • We will predict the number of patients arriving in the ED and their associated acuities within the next 2, 4, 6, and 8 hours, as well as at 1 and 6-month intervals
  • We will provide the current and predicted average wait time in the waiting room and the median length of stay for patients in the ED
Real-time Prediction – Prediction only

PATIENTS ARRIVING  UPDATED EVERY 15 MINS.

<table>
<thead>
<tr>
<th>Patients per Hour</th>
<th>6:30 am</th>
<th>7:30 am</th>
<th>8:30 am</th>
<th>9:30 am</th>
<th>10:30 am</th>
<th>11:30 am</th>
<th>12:30 pm</th>
<th>1:30 pm</th>
<th>2:30 pm</th>
<th>3:30 pm</th>
<th>4:30 pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Current</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Predicted</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>
Real-time Prediction – Prediction and descriptive data display

ED OPERATIONS BOARD

PATIENTS ARRIVING  UPDATED EVERY 15 MIN.

<table>
<thead>
<tr>
<th>Time</th>
<th>Patients per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:30 pm</td>
<td>7</td>
</tr>
<tr>
<td>5:30 pm</td>
<td>10</td>
</tr>
<tr>
<td>6:30 pm</td>
<td>9</td>
</tr>
<tr>
<td>7:30 pm</td>
<td>9</td>
</tr>
<tr>
<td>8:30 pm</td>
<td>8</td>
</tr>
<tr>
<td>9:30 pm</td>
<td>8</td>
</tr>
<tr>
<td>10:30 pm</td>
<td>6.5</td>
</tr>
<tr>
<td>11:30 pm</td>
<td>6.5</td>
</tr>
<tr>
<td>12:30 am</td>
<td>3.5</td>
</tr>
<tr>
<td>1:30 am</td>
<td>3.5</td>
</tr>
</tbody>
</table>

CAPACITY
- Occupied: 36
- Available: 9
- Occupancy: 80%

DOOR TO CARE
- Longest: 429 mins
- Median: 42 mins

LENGTH OF STAY
- Longest: 17.8 hrs
- Median: 2.3 hrs

BOARDING TIME
- Longest: 207 mins
- Median: 51 mins
- Count: 5
Long-term Prediction

**EMERGENCY DEPARTMENT LOAD**

*Time Period: January 2018 - December 2018*

**LONG TERM FORECAST**

**STAFFING DETAIL**

**Patient Arrivals by Months**

**Patient Arrivals by Days**
Educational Application

Software helps predict employee retention

By Rachel Z. Arndt

Turnover among healthcare and social assistance workers is on the rise, with the rate inching toward one-third annually. Not only is turnover disruptive, it’s also resource-intensive, with providers spending tens of thousands on job searches and new employee training. Every time a nurse leaves and is replaced, for instance, a healthcare organization spends $37,700 to $58,400.

Part of the solution, according to data and analytics company Arena, comes upfront during the hiring process. Arena wants to keep providers from bearing the costs of turnover by improving retention rates. To do so, the company uses prediction models to cull from among a pool of applicants those most likely to stick with the job at hand and to be engaged, along with other metrics. Thanks to machine learning, the prediction models continu-

“Similar to the way Amazon uses your purchase data to predict what products you might want to purchase, Arena predicts how each person will improve outcomes like employee retention, patient satisfaction.”

MICHAEL ROSENBAUM

Arena

job applicant assessments, how likely each applicant is to improve certain metrics—including retention.

For example, for a client with two facilities across the street from each other—one for long-term care and the other for acute care—the Arena assessment, which takes about 15 to 30 minutes, asked each applicant if he or she was a leader in a community organization. Those who said yes were more likely to stay in their jobs at the acute-care facility and more likely to leave the long-term care facility.

But Michael Finn, Arena’s vice president of marketing, cautions against reading too much into individual questions, which may be more correlation than causation. Instead, Arena’s predictions come from data models. “The results of the predictions are better than any single correlation,” he said.

Since MultiCare Health System in the Pacific Northwest began using Arena in
Nursing Turnover is Costly

• National Average 14%
• Magnet Hospital Average 11.90%
• Average Cost $85,000
• 14 nurses = $1,190,000
• 178 nurse = $15,130,000
Prophecy Analytics

What sets Prophecy apart from other assessment tools is its ability to generate, aggregate, and analyze data to predict nurse success.

Unlike other solutions, Prophecy combines clinical, situational, and behavioral assessments to optimize analytics in three ways:

- Measure competency
- Measure job fit
- Measure education gaps
Clinical
Provides insight into job knowledge and critical skills you need a nurse to have on day one, specialty-by-specialty.

Situational
Utilizes video simulations to assess how a nurse candidate would respond in various clinical scenarios.

Behavioral
Assesses individual personality attributes to help determine appropriate roles and the best-fitting specialty.

This Assessment Includes:

Clinical
▶ Administering Medications
▶ Problem Solving
▶ Report Transitioning
▶ Critical Thinking
▶ Multitasking
▶ Assertiveness

Situational
▶ Patient Care
▶ Developing Patient Relationships
▶ Verbal Communication
▶ Patient Customer Service
▶ Patient Care Plan Management
▶ Conflict Resolution

Behavioral
▶ Accountability
▶ Honesty & Conscientiousness
▶ Conflict Resolution
▶ New Technique Application
▶ Managing Patient Care
▶ Change Adaptation
Where would training and education be needed?

<table>
<thead>
<tr>
<th>Details of Assessment Scores</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Situational Competence</strong></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>92%</td>
</tr>
<tr>
<td>Collaboration</td>
<td>83%</td>
</tr>
<tr>
<td>Conflict Resolution</td>
<td>90%</td>
</tr>
<tr>
<td>Critical Thinking &amp; Problem Solving</td>
<td>91%</td>
</tr>
<tr>
<td>Customer Service</td>
<td>100%</td>
</tr>
<tr>
<td>Honesty/Ethics</td>
<td>94%</td>
</tr>
<tr>
<td>Medication Accuracy &amp; Knowledge</td>
<td>99%</td>
</tr>
<tr>
<td>Patient Rapport</td>
<td>97%</td>
</tr>
<tr>
<td><strong>Medical / Surgical</strong></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>82%</td>
</tr>
<tr>
<td>Cardiovascular &amp; Pulmonary System</td>
<td>89%</td>
</tr>
<tr>
<td>Communication</td>
<td>73%</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>80%</td>
</tr>
<tr>
<td>Endocrine</td>
<td>81%</td>
</tr>
<tr>
<td>GI/GI Systems</td>
<td>91%</td>
</tr>
<tr>
<td>Med-Surg Pharmacology</td>
<td>84%</td>
</tr>
<tr>
<td>Neurological &amp; Integumentary Systems</td>
<td>82%</td>
</tr>
</tbody>
</table>
### Which specialties are statistically a best fit?

<table>
<thead>
<tr>
<th>Name</th>
<th>Best fit</th>
<th>Med/Surg</th>
<th>ICU</th>
<th>L &amp; D</th>
<th>ER</th>
<th>NICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rasheed Andrew</td>
<td>ICU</td>
<td>73%</td>
<td>84%</td>
<td>73%</td>
<td>72%</td>
<td>33%</td>
</tr>
<tr>
<td>Renda Mary</td>
<td>ER</td>
<td>49%</td>
<td>19%</td>
<td>30%</td>
<td>94%</td>
<td>29%</td>
</tr>
<tr>
<td>Richmond Russa</td>
<td>ER</td>
<td>21%</td>
<td>29%</td>
<td>19%</td>
<td>90%</td>
<td>25%</td>
</tr>
<tr>
<td>Rose Lily</td>
<td>Med/Surg</td>
<td>95%</td>
<td>88%</td>
<td>34%</td>
<td>28%</td>
<td>18%</td>
</tr>
<tr>
<td>Rundquist Niklas</td>
<td>ER</td>
<td>33%</td>
<td>30%</td>
<td>15%</td>
<td>85%</td>
<td>33%</td>
</tr>
<tr>
<td>Sadler Felicia</td>
<td>Med/Surg</td>
<td>61%</td>
<td>22%</td>
<td>23%</td>
<td>75%</td>
<td>22%</td>
</tr>
<tr>
<td>Sarbaugh Steve</td>
<td>ER</td>
<td>15%</td>
<td>62%</td>
<td>58%</td>
<td>73%</td>
<td>33%</td>
</tr>
<tr>
<td>Schultz Laurel</td>
<td>Med/Surg</td>
<td>94%</td>
<td>55%</td>
<td>83%</td>
<td>19%</td>
<td>60%</td>
</tr>
<tr>
<td>Sofiah Jandra</td>
<td>ICU</td>
<td>54%</td>
<td>95%</td>
<td>60%</td>
<td>18%</td>
<td>26%</td>
</tr>
<tr>
<td>Sonin Juhan</td>
<td>NICU</td>
<td>52%</td>
<td>85%</td>
<td>25%</td>
<td>61%</td>
<td>94%</td>
</tr>
<tr>
<td>Spangler Melissia</td>
<td>NICU</td>
<td>25%</td>
<td>21%</td>
<td>21%</td>
<td>50%</td>
<td>84%</td>
</tr>
<tr>
<td>Sparkman Lora</td>
<td>ICU</td>
<td>55%</td>
<td>95%</td>
<td>70%</td>
<td>44%</td>
<td>54%</td>
</tr>
<tr>
<td>Waicher Tony</td>
<td>ICU</td>
<td>29%</td>
<td>94%</td>
<td>73%</td>
<td>63%</td>
<td>21%</td>
</tr>
<tr>
<td>Warrier Divya</td>
<td>L &amp; D</td>
<td>69%</td>
<td>61%</td>
<td>75%</td>
<td>57%</td>
<td>22%</td>
</tr>
<tr>
<td>Wiese Elaine</td>
<td>ICU</td>
<td>78%</td>
<td>94%</td>
<td>61%</td>
<td>75%</td>
<td>61%</td>
</tr>
<tr>
<td>Wright David</td>
<td>ICU</td>
<td>39%</td>
<td>65%</td>
<td>61%</td>
<td>29%</td>
<td>47%</td>
</tr>
<tr>
<td>Zabbix Jack</td>
<td>Med/Surg</td>
<td>71%</td>
<td>24%</td>
<td>33%</td>
<td>18%</td>
<td>25%</td>
</tr>
<tr>
<td>Zabbix Jill</td>
<td>ER</td>
<td>62%</td>
<td>60%</td>
<td>41%</td>
<td>63%</td>
<td>35%</td>
</tr>
<tr>
<td>Zalesky Petr</td>
<td>ER</td>
<td>26%</td>
<td>25%</td>
<td>26%</td>
<td>70%</td>
<td>60%</td>
</tr>
</tbody>
</table>
Important Note

The report for the APS Behavioral assessment provides information about job applicants and/or employees in several different areas of interest. We recommend that the information contained within this report be viewed as only one source of information that can be used to help employees make decisions about potential (or existing) employees, and that no decision should be made based solely on the information contained within the report. Rather, we recommend using the results to identify areas that might benefit from further investigation during other portions of the selection or placement process, such as during an interview or during an applicant’s background review.

Recipient Name: 
Date of Exam: 07/06/2017
Exam ID: 2A661539-39CC-499C-8E83-71A9BDAAD75A

Company: EvergreenHealth
Exam Name: Personality, General Reasoning, Attitude, Engagement

Registered Nurse - Medical Surgical

Job Fit Score: 75\%(1) 07/06/2017

General Reasoning

- Favors repetitive tasks
- Favors complex intellectual challenges

- Learns new information at an average pace
- Many med-surg nursing roles may provide the ideal balance between routine issues and new challenges

Questions:
- Tell me about a time when you felt overwhelmed with a large patient load. How did you handle it?
- Give me an example of a time when you struggled to interpret information in a patient chart. What happened?
- Describe a time when you only had partial information about a patient case. How did you handle it?
Predictive Analytics: Key Takeaways

1. Definition:

Computer analysis of data using knowledge to extract valuable patterns to inform decision making

2. Nurses Role: *Use it!*

- Comprehend, embrace, implement
- Actionable, precision, decision making

3. How Nurses add Value: Serve the Quadruple Aim

- Better manage populations + Lower costs
- Improve the patient experience + Enhance nurse experience
Predictive Analytics: Key Takeaways

• Helps improve quality and outcomes

• Individualizes patient care = The 4 Rights

• It’s power is here right now and in the future

• Touches every nurse

• Cannot thrive in healthcare without nursing!
Predictive Analytics: Key Takeaways

"Why the change? Well, I could see where the future was going..."

Source: TimoElliot.com, No Date
Questions

- **Whende M. Carroll, MSN, RN-BC**
  Email: [whende@kensci.com](mailto:whende@kensci.com)
  Twitter: @whendemcarroll
  LinkedIn: [www.linkedin.com/in/whendemcarroll](https://www.linkedin.com/in/whendemcarroll)

- **Nancee Hofmeister, MSN, RN, NE-BC**
  Email: [NHofmeister@evergreenhealth.org](mailto:NHofmeister@evergreenhealth.org)
  LinkedIn: [https://www.linkedin.com/in/nancee-hofmeister-msn-rn-ne-bc-610b65127/](https://www.linkedin.com/in/nancee-hofmeister-msn-rn-ne-bc-610b65127/)

Thank you! Please complete online session evaluation