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Executive Summary

The Oregon POLST Registry experienced its largest volume of POLST forms in 2016, including more electronically-completed POLST forms than any other year. In 2016, the Registry business and operations team focused on advancing the technology behind the Registry, while maintaining all other operational needs (including answering over 5,500 phone calls and processing the largest form volume to date - just under 57,000 forms). The Emergency Call Center took more than 1,630 calls for POLST forms, with just over half coming from Emergency Departments throughout the State. The Registry has received, since its inception through 2016, just over 350,000 POLST forms for over 220,000 Registrants. In 2016, over 30,000 new Registrants were added to the Registry, and they came from every county in Oregon. Research has been robust, and has increased the understanding of POLST form completion, utilization, and outcomes.

The next year will include some important technical upgrades, as well as increases in the capacity to share documents amongst healthcare professionals. The Registry team remains grateful for the opportunity to serve Oregonians in this important way.

Regards,

Dana Zive, MPH
Director, Oregon POLST Registry

In Memoriam

Mary D. Hughes

Mary believed strongly in the power of POLST and championed the Registry from its inception. She will be missed, but her spirit will be kept alive through the thousands of people helped by the Registry.

Colin Scott

Colin served as a volunteer for the Oregon POLST Registry before his untimely death in 2016. He was a friend and asset to the Registry team and will be missed.
Introduction: POLST and the Oregon POLST Registry

In 1990, a task force was convened by the Center for Ethics in Health Care at OHSU with representatives from stakeholder health care organizations to develop a new method to translate patient preferences into actionable medical orders that follow patients across care settings. This led to the development of Physician Orders for Life Sustaining Treatment (POLST) form, and the POLST program. Since then POLST has become the standard of care for portable medical orders in most states, and programs are being developed throughout the country.

The Oregon POLST Registry project began in response to a need expressed by Emergency Medical Services (EMS) to access POLST orders when they arrived on the scene of a medical emergency, and could not immediately locate the original POLST form. The development of the Registry test and pilot systems were funded by a grant from The Greenwall Foundation, along with additional private philanthropy. The project was a collaboration of the Oregon POLST Task Force, the OHSU Center for Ethics in Health Care and the OHSU Department of Emergency Medicine. The legislature created and funded the Oregon POLST Registry effective July 1, 2009. The Registry is a public health registry within the Oregon Health Authority, and operated through contract with the OHSU Department of Emergency Medicine. The Registry office accepts and receives POLST forms from across all of Oregon.
Year by Year

Over the course of seven years the Oregon POLST Registry has gone from a pilot project to a well-established and nationally recognized leader in POLST registry development, implementation and operational excellence. Form submission (Figure 1), registry utilization (Figure 2), match rates (Figure 3), and requests for consultation with other states continue to grow with each passing year.

Figure 1. Cumulative POLST Forms Received by Year

Figure 2. ECC Calls by Year

Figure 3. ECC Calls Matched by Year
2016 in Review

Form Submission
In 2016 the Registry received 56,950 POLST forms via fax, eFax, mail, electronic secure files transfer, and CareAccord® direct secure messaging (Figure 4). Nearly four thousand more forms were submitted to the Registry in 2016 than in 2015, which is nearly twenty thousand more forms than in the Registry’s first full year of operations in 2010. Of the forms received, 42,820 (75.2%) were Registry Ready while 14,130 (24.8%) were Not Registry Ready.

Figure 4. Monthly Receipt of Forms in 2016
Not Registry Ready (NRR) Forms

In 2016 the Registry received 14,130 forms that were deemed NRR. Before processing, these NRR forms are separated into two categories: those with coversheets and those without. Of the NRR forms received, 9,102 (64.4%) included a coversheet and were able to be returned for correction. Those with coversheets were most often deemed NRR due to missing or illegible information in one or more required field.

5,028 (35.6%) were submitted without a coversheet. Without a coversheet no follow-up can be performed and the forms remain NRR and unable to be entered. This is a significant portion of NRR forms and has been an area of continuing education as resolution rates are hugely affected by the Registry’s ability to follow-up with senders (Figure 5). The percentage of NRR forms without sender information has fallen 4.6% since 2015 and the Registry team continues to support and remind senders to use coversheets to facilitate follow-up.

Figure 5. Sender Information and NRR Form Resolution
POLST Registry Hotline

In 2016 the POLST Registry Hotline, operated by the OHSU Emergency Communication Center (ECC), received 1,635 emergent calls. This represented the highest volume year to date. The median call time was under one minute at 53.89 seconds. 2016 calls by month followed the expected pattern with peak call volume occurring in the winter months.

Figure 6. ECC Calls Received by Month

![ECC Calls Received by Month](image)

Figure 7. ECC Caller Type by Month

![ECC Caller Type by Month](image)
Figure 8. ECC Calls Received by Month (match rates)
The Registry’s business office can be described as the hub of operations: all POLST forms are received and processed, where all registrant packets are printed, prepared and mailed, and thousands of non-urgent calls for POLST form requests and general information are taken. The business office is staffed with a small interdependent team that processes, on average, over 4,700 POLST forms each month. The figure below (Figure 9) illustrates the volume of work performed by this highly efficient group.

**Figure 9. 2016 by the Numbers**

- 56,950 Forms Entered
- 42,820 Forms Entered
- 3,019 Registry IDs Requested
- 5,257 Forms Requested
- 34,021 Packets Mailed
- 5,553 Calls Taken

2016
Utilization
In 2016, the OPR business office fielded over 5,500 calls with 2,088 non-urgent requests for POLST forms. OPR Business office calls are in addition to those received through the POLST Registry Hotline. 2016 saw continual steady utilization (Figure 10) along with one bulk request. A total of 5,257 individual forms were requested through the business office with a 31.4% match rate. The 2016 match rate dropped slightly from the previous year due to the very large bulk request received in July.

Figure 10. Non-Urgent (Business Office) POLST Form Requests by Month

![Business Office: Non-urgent POLST Requests by Month](image)

Figure 11. Calls (Business Office) Received by Month

![Business Office: Calls Received by Month](image)
Volunteers
In 2016 the Registry hosted 11 volunteers. Over the course of the year Oregon POLST Registry volunteers prepared and mailed over 34,000 packets (Figure 12). Registry packets include a letter, a Registry ID magnet and a set of three Registry ID stickers. The Registry team is truly grateful for the time and energy that volunteers contribute to the Registry’s mission.

Figure 12: Packets Prepared

Interested in volunteering or know someone who is? Information can be found on the Registry website at: www.orpolstregistry.org/contribute
Education and Outreach

Summary
In today’s changing healthcare system, full of new and innovative technologies, products, and techniques, the work of educators is never done. We continue to look for new opportunities for educational opportunities where we can impact a wide variety of providers - from the rural volunteer EMS provider, to the seasoned career EMT.

In addition to the other training events conducted by the OPR; the POLST Program, Oregon POLST Task Force, and members of the POLST Registry Advisory Committee, continue to provide invaluable assistance in educating health care professionals across the state.

Table 1. OPR Educational Events

<table>
<thead>
<tr>
<th>Event Date(s)</th>
<th>Presentation name/type</th>
<th>Presenter</th>
<th># of attendees</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/29/2016</td>
<td>Mary’s Woods Resident Health Fair</td>
<td>Jenny Cook</td>
<td>200</td>
</tr>
<tr>
<td>9/27/2016</td>
<td>Salem Fire EMS Training</td>
<td>Dana Zive</td>
<td>20-50</td>
</tr>
<tr>
<td>10/27/2016</td>
<td>Salem Fire EMS Training</td>
<td>Edgardo Peteros</td>
<td>20-50</td>
</tr>
<tr>
<td>9/23/2016-9/24/2016</td>
<td>Annual Oregon EMS Conference</td>
<td>Brittany Tagliaferro-Lucas</td>
<td>400</td>
</tr>
</tbody>
</table>

Bi-Annual Newsletters
Bi-annual newsletters were utilized again in 2016 to help keep clinics, hospitals, hospice and long-term care facilities up-to-date on Registry requirements and provide tips and best practices for submitting and requesting POLST forms for their patients. These newsletters are sent to over 1,000 different locations across the state allowing for far reaching education.
Collaborations and Special Projects

**e-POLST**

In April 2015, the Registry began to receive electronically completed POLST forms from a pilot project at OHSU, which had implemented an electronic form completion system with built-in education and tools to support form completion accuracy. The Registry continues to work with health systems, hospitals, and others who are implementing electronic POLST systems and we expect many more of these connections in the future.

This ePOLST system led to an increase in form volume, with electronically completed forms guaranteed to have required data elements for the Registry completed. In 2016, the proportion of forms completed electronically versus those uploaded as paper forms increased heavily in favor of electronic forms within health care systems using ePOLST. Another health system working with the same vendor prepared for ePOLST implementation in 2016 and went “live” in early 2017.

As ePOLST systems are developed, and the availability of direct secure messaging has evolved, the Registry has been able to generate technical abilities and products to match the changing technology. This will continue in the upcoming years.

**Registry Upgrade**

The Registry was built in 2009 and, while it has been a stable system, technology has changed. To this end, the Registry prepared in 2016 to upgrade and to include external data transmission pathways with both secure data transfer and the development of Application Programming Interfaces (APIs). Work will continue on these upgrades into 2017 (and likely beyond). A primary goal of this upgrade is to allow ePOLST systems to directly communicate with the Registry (bidirectional data flow) to be sure that a health system, or other ePOLST user, will be able to identify forms for patients that were completed outside of their institution.

In 2017, the Registry will connect with an information exchange focused on Emergency Department users to broaden the availability of POLST forms when they are needed most.
OREGON POLST REGISTRY

O PR Research Contributions
The Oregon POLST Registry provides an incredible opportunity to study many elements of POLST, including completion of forms, orders, changes in orders over time, and utilization of the system. In 2016, a number of research projects were completed and initiated.

2016 Projects Underway and Published Research
The following sections provide descriptions and current status of those projects.

Projects Underway

**Association between POLST completion and healthcare resource utilization.** A retrospective, cohort study of adult acute care patients who present to the Oregon Health & Science University (OHSU) Emergency Department (ED) examining differences in inpatient healthcare resource utilization among acute care patients based on care preferences documented on POLST forms. In addition, we will examine whether patients with POLST receive care that is consistent with their documented preferences, and whether timing of POLST review by clinicians influences these outcomes.

**Injured adults utilizing 911 services:** An AHRQ-funded, two State, seven County study of injury severity, resource utilization, field triage, and hospital treatment and outcome for patients aged 65 years or older utilizing 911 EMS services. This study combines 8 data sets, including EMS data, trauma registries, claims data, hospital discharge data, death registry data, and POLST Registry data.

**POLST in the Pediatric Population:** A joint project with Johns Hopkins using Registry data and death certificate data to evaluate POLST use in children. A manuscript from this project is currently under review.

Published Research

**The Oncology Specialist’s Role in POLST Form Completion**


*Data source(s): Oregon POLST Registry, Oregon Center for Health Statistics, Oregon Medical Board*

**The Role of Advanced Practice Registered Nurses in the Completion of Physician Orders for Life-Sustaining Treatment.**


*Data source(s): Oregon POLST Registry*
Implementation of a Novel Electronic Health Record-Embedded Physician Orders for Life-Sustaining Treatment System.


Data source(s): OHSU ePOLST system and Registry data

Physician Orders for Life-Sustaining Treatment Medical Intervention Orders and In-Hospital Death Rates: Comparable Patterns in Two State Registries.


Data Source(s): Oregon POLST Registry, Oregon Center for Health Statistics, West Virginia e-Directive Registry, West Virginia Department of Health and Human Resources
## 2016 Oregon POLST Registry Staff and Partners

**Volunteers:** Sakib Haque, Nghia Le, Vincent Lee, Edward Liljeholm, Farah Mehkri, Ahn Tuan Nguyen, Bao Tran Nguyen, Yennie Nguyen, Colin Scott, Charissa Yang, Elana Zuber

**Data Entry Specialists:** Julian Bermudez, Nicole Callison (Jan-Oct), Hannah Porter, Emily Pulliam, Milly Seely, Alana Talob, Beverly Thean

**Registry Technical Specialists:** Charissa Yang

**Program Coordinator:** Nicole Callison (Oct-Dec)

**Program Administrator:** Brittany Tagliaferro-Lucas

**Project Liaison:** Jenny Cook (Jan-July)

**Director:** Dana Zive

**State EMS Medical Director:** David Lehrfeld, MD

**State EMS & Trauma Systems Director:** Dana Selover, MD

**OHA Director:** Lynne Saxton

**Oregon Center for Health Statistics:** Jennifer Woodward, Joyce Grant-Worley, Karen Hampton
The Oregon POLST Registry Advisory Committee (PRAC) is charged with advising the Oregon Health Authority (OHA) regarding the implementation, evaluation, and operation of the POLST Registry. It is also charged with reviewing research proposals aimed at accessing Registry data and advising OHA on whether access should be granted (ORS 127.675). Through this role, the PRAC has been involved with reviewing Registry operations, the integration of ePOLST as a viable option for POLST submission, and reviewing research updates and proposals. The Registry staff has been instrumental in the success of the Oregon POLST Registry in collecting and disseminating vital information to involved stakeholders throughout our state.

Of note, while the PRAC provided incredible guidance throughout the Registry’s early years, open positions were no longer filled in 2016 as the POLST Registry Advisory Committee will come to a close in 2018. The Registry team remains grateful for their guidance.
### Table 3. Glossary of terms

<table>
<thead>
<tr>
<th>Terms in this report</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registry Forms or Registry Registrants:</td>
<td>Forms or registrants recorded in the Registry only, not all those received by the Registry office.</td>
</tr>
<tr>
<td>Not Registry Ready (NRR):</td>
<td>Forms received that are missing information to make them eligible for the Registry.</td>
</tr>
<tr>
<td>Not Registry Ready (NRR) - REQUIRED ELEMENTS ONLY:</td>
<td>Forms received that are missing any one or more of the REQUIRED data elements: First or Last Name, DOB, Signature, Date signed, Section A orders</td>
</tr>
<tr>
<td>Not Registry Ready (NRR) - Registry Unusable Only:</td>
<td>Forms received that are unable to be entered into the Registry but are still valid POLST orders. Includes copies that are illegible, copies that are too dark or too light, etc.</td>
</tr>
<tr>
<td>Active Forms:</td>
<td>Forms in the Registry that are ready to be searched.</td>
</tr>
<tr>
<td>Archived Forms:</td>
<td>Forms in the Registry that are no longer valid. These have been removed from searches.</td>
</tr>
<tr>
<td>Pending Forms:</td>
<td>Valid forms in the Registry that have been entered but have not been &quot;activated&quot; (double-checked to ensure accuracy, the last step before a form becomes searchable).</td>
</tr>
<tr>
<td>Active Registrants:</td>
<td>Registrants with searchable, active forms who are not known to be deceased and have not opted out.</td>
</tr>
<tr>
<td>Archived Registrants:</td>
<td>Registrants known to be deceased or those who have opted out of the Registry. Forms from these registrants are not searchable for healthcare professionals.</td>
</tr>
<tr>
<td>Updated Forms:</td>
<td>An updated form is one received for a patient already in the Registry, but with a more recent date.</td>
</tr>
<tr>
<td>Forms Received:</td>
<td>All forms received by the Registry, including NRR but excluding duplicate submissions</td>
</tr>
<tr>
<td>Valid Form Follow-up (VFF):</td>
<td>Valid form follow-up. This type of follow-up is used to clarify optional information that is too dark, too light, or illegible</td>
</tr>
<tr>
<td>Forms Created/Entered:</td>
<td>All forms entered into the Registry in a given timeframe but not necessarily searchable for healthcare professionals. This may include forms received in the previous month.</td>
</tr>
<tr>
<td>ECC Call Time Outliers:</td>
<td>Calls excluded from this data report due to excessive length. These calls are due to additional provider consult, online medical control requests, or operator error with call timer.</td>
</tr>
</tbody>
</table>
Workload and Call Profiles

Table 4. 2016 Workload Profile

<table>
<thead>
<tr>
<th>Registrants</th>
<th>2016</th>
<th>Total Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Created</td>
<td>30,591</td>
<td>222,117</td>
</tr>
<tr>
<td>Archived</td>
<td>6,615</td>
<td>66,969</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Forms</th>
<th>2016</th>
<th>Total Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received</td>
<td>56,950</td>
<td>351,368</td>
</tr>
<tr>
<td>Entered</td>
<td>42,820</td>
<td>280,372</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NRR forms</th>
<th>2016</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRR forms received</td>
<td>14,130</td>
<td>70,125</td>
</tr>
<tr>
<td>NRR forms received no sender</td>
<td>5,028</td>
<td></td>
</tr>
<tr>
<td>NRR forms received with sender information</td>
<td>9,102</td>
<td></td>
</tr>
<tr>
<td>Valid forms received*</td>
<td>4,138</td>
<td></td>
</tr>
</tbody>
</table>

*As of August, 2015 the Registry no longer tracks reason codes or resolutions of NRR forms received with NO sender info; NRR forms with NO sender info are still counted in the total NRR forms received

Time to Form Entry from Date of Receipt

- Mean: 5.68 calendar days
- Median: 5.56 calendar days

Table 5. 2016 Call Profile

<table>
<thead>
<tr>
<th>POLST Registry Hotline Call Data</th>
<th>2016</th>
<th>Total Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calls*</td>
<td>1,635</td>
<td>7,892</td>
</tr>
<tr>
<td>Matches</td>
<td>707</td>
<td>3,113</td>
</tr>
</tbody>
</table>

*Includes only calls not canceled

<table>
<thead>
<tr>
<th>Caller Type</th>
<th>2016</th>
<th>Total Overall</th>
<th>% of all Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS</td>
<td>381</td>
<td>1,861</td>
<td>23.6%</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>1,018</td>
<td>4,226</td>
<td>53.5%</td>
</tr>
<tr>
<td>Hospital Acute Care</td>
<td>207</td>
<td>1,498</td>
<td>19.0%</td>
</tr>
<tr>
<td>Other/Not Classified**</td>
<td>29</td>
<td>237</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

*Includes only calls not canceled

**While all calls are now classified, this was not standardized at outset.

<table>
<thead>
<tr>
<th>Length of Call^</th>
<th>2016</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>64.47 sec/ 1.07 min</td>
<td>62.93 sec / 1.05 min</td>
</tr>
<tr>
<td>Median</td>
<td>53.89 sec/ 0.90 min</td>
<td>52.54 sec / 0.88 min</td>
</tr>
<tr>
<td>Max Length</td>
<td>237.3 sec/3.95 min</td>
<td>223.6 sec / 3.73 min</td>
</tr>
</tbody>
</table>

*Excludes ECC call time outliers

Business Office Call Data*

<table>
<thead>
<tr>
<th>2016</th>
<th>Total Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Calls</td>
<td>23,136</td>
</tr>
<tr>
<td>General Calls</td>
<td>16,385</td>
</tr>
<tr>
<td>Form Request Calls</td>
<td>6,751</td>
</tr>
</tbody>
</table>

*Enhanced tracking of back office calls and form requests began 4/2011

Non-Urgent POLST Requests*

<table>
<thead>
<tr>
<th>2016</th>
<th>Total Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Forms Requested</td>
<td>11,852</td>
</tr>
<tr>
<td>Requests matched to Registrants</td>
<td>4,710</td>
</tr>
</tbody>
</table>

*Enhanced tracking of back office calls and form requests began 4/2011

As of August, 2015 the Registry no longer tracks reason codes or resolutions of NRR forms received with NO sender info; NRR forms with NO sender info are still counted in the total NRR forms received.

Heat Maps

Figure 13. New Registrants by County 2016 Heat Map
The map below illustrates the location of persons who registered their first POLST form with the Registry in 2016 and provided the Registry with address information. (Address information is optional.) New Registrants whose forms did not include address information, or who reside outside the state of Oregon, were not able to be mapped. Address information is pertinent for the Registry and allows for the mailing of a confirmation packet to the Registrant.
Figure 14. POLST Registry Hotline (ECC) Calls by County 2016 Heat Map
This map highlights the increased utilization of the Registry especially along the I-5 corridor. It is important to note that three counties (Gilliam, Sherman, and Wheeler) near the Oregon-Washington border are without an area hospital.