Targeted Advance Care Planning and Multi-Disciplinary Care Using Machine Learning

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Disclosure Information

• Vizient will insert this required Continuing Education information
Learning Objectives

• Describe a machine-learning model to identify patients at risk for mortality
• Explain how the model allows for more efficient use of resources such as in the area of coding and documentation improvement
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The Current Problem

- Advance Care Planning (ACP) is under utilized
- Only ~1/3 of American adults have completed an advance directive
- Current care processes and documentation are inadequate
- Medical complexity is increasing
- Providers are imperfect prognosticators
- Predictive models have now been developed to assist in clinician prognostication of patients and help identify patients that may benefit from advance care planning
What is Advance Care Planning

• Goals of Care are only part of the conversation
  − DNAR does not convey patient’s values/preferences/goals at the end of life

• Definition
  − “Advance care planning (ACP) is a process that supports adults at any age or stage of health in understanding and sharing their personal values, life goals, and preferences regarding future medical care”

• Goal
  − “The goal of ACP is to help ensure that people receive medical care that is consistent with their values, goals, and preferences”
Benefits of Advance Care Planning

• Support patient self-determination
• Document patient wishes
• Increase family awareness of patient preferences
• Increase patient satisfaction
• Decrease family burden and stress
• Increase likelihood of death at their preferred location
• Increase quality of care at the end of life
• Increase patient comfort and quality of life
Our Solution

• Utilize a validated machine learning model
• Identify high-risk patients to benefit from ACP
• Create a standardized ACP workflow
• Develop a standardized ACP documentation template
• Integrate a multi-disciplinary approach to improve quality of care and outcomes
Project Goals

• Document patient wishes, goals, and care preferences
• Increase family awareness of patient preferences
• Provide the right care at the right time in the right setting
• Increase quality of care at the end of life
• Increase patient comfort and quality of life
Machine Learning Model

- Developed by Duke Institute for Health Innovation
- Predicts risk of current inpatient, 30-day and 6-month mortality
- Based on available information up to the time of admission

Pre-Encounter Data
- Prior diagnoses
- Prior procedures
- Prior encounter information

Emergency Dept. Data
- Medication administration
- Laboratory data
- Vital signs
Workflow

Comorbidity and data assessed on admission → QI Admin reviews High Risk Patients Mon - Fri → Notification by Page/Email → Determine if ACP is appropriate → Yes → ACP Discussion with Patient/Surrogate Decision Makers → Document in .gmacp → No → No ACP intervention → Email reply with reason for exclusion → Pharmacy: Discharge Medication Reconciliation Case Management: Assist with discharge transition including: Medications on discharge, ACP note to facility, Duke Well referral. CDI/Billing: Detailed inpatient and post-discharge review → Pharmacy, Case Management, and CDI/Billing notified
Multidisciplinary Approach

• Case Management
  – Assist with discharge resources
  – Participate in ACP conversations
  – Forward ACP documentation to discharge facility

• Pharmacy
  – Complete discharge medication reconciliation

• Clinical Documentation Improvement
  – Review documentation to ensure patient’s condition and complexity is accurately reflected
Timeline

- Initiated pilot on hospitalist only general medicine teams for admissions 11/18/19 to 2/14/20
- Server updates and COVID-19 paused notifications until 3/26/20
- Pilot expanded to general medicine teaching teams on 3/26/20
# Non-Teaching Team Results

**Admission Dates:** 11/18/19 to 2/14/20

<table>
<thead>
<tr>
<th>Measure</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACP Note Completion Rate</td>
<td>52% (16 of 31 notifications sent)</td>
</tr>
<tr>
<td>Code Status Change from Full Code to DNAR</td>
<td>19% (6 of 31 notifications sent)</td>
</tr>
<tr>
<td>Average Days between notifications and ACP Note filed</td>
<td>0 to 1 day</td>
</tr>
</tbody>
</table>

Note: During this same time period, 16 cases were identified that would have met criteria for the Teaching Team and none of them had an ACP Note filed or a Code Status change from Full Code to DNAR.
## Non-Teaching Team Results
### Admission Dates: 3/24/20 to 6/30/20

<table>
<thead>
<tr>
<th>Measure</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACP Note Completion Rate</td>
<td>34% (28 of 82 notifications sent)</td>
</tr>
<tr>
<td>Code Status Change from Full Code to DNAR</td>
<td>15% (12 of 82 notifications sent)</td>
</tr>
<tr>
<td>Average Days between notifications and ACP Note filed</td>
<td>0 to 1 day</td>
</tr>
</tbody>
</table>
Teaching Team Results
Admission Dates: 3/24/20 to 6/30/20

<table>
<thead>
<tr>
<th>Measure</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACP Note Completion Rate</td>
<td>22% (20 of 93 notifications sent)</td>
</tr>
<tr>
<td>Code Status Change from Full Code to DNAR</td>
<td>13% (12 of 93 notifications sent)</td>
</tr>
<tr>
<td>Average Days between notifications and ACP Note filed</td>
<td>0 to 1 day</td>
</tr>
</tbody>
</table>
Lessons Learned

• Provider education and input is vital to any project
• Provider feedback continues to help improve and refine our process
• COVID-19 creates additional barriers and challenges to ACP
• Appropriate documentation allows easy reference and continuation of care conversations across different encounters and different providers
• Advance care planning practice patterns expand beyond our patient notifications
Key Takeaways/To Dos

• Takeaways
  – Use of a machine-learning model can aide in directing limited resources to a high-risk patient population
  – Use of a notification system and provider education can increase advance care planning utilization

• To Dos
  – Create an automated notification process
  – Analyze provider interviews to understand current barriers to ACP
  – Improve provider education
  – Expand project to other service areas
Questions?

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