Estimating Need for Advance Care Planning for Persons at End of Life with Cardiovascular Disease

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Advance care planning (ACP) is being advocated for persons with advanced disease that could lead to the person’s death within the next year. Persons with life-limiting cardiovascular disease (CVD) could benefit from ACP. Estimating the need for ACP can benefit from a better understanding of persons at end of life with CVD.

Purpose
To determine the demographics, co-morbidities, and type of care of persons at end of life with CVD in three District Health Authorities (DHA) in Nova Scotia (NS), Canada.

Setting
Study DHAs are: Capital Health (CH), Cape Breton (CB) and Colchester East Hants (CEH). CEH is the most rural and CH most urban. Together, they have 65% of population of NS of 940,000. Each has a Palliative Care Program (PCP).

Study Subjects
97,713 deaths in NS from 1998-2009. PCP enrollment findings (Table 3, Figure 5) are for deaths in the three study DHAs with data from 1996-2009 for CH and CB, and 2002-2009 for CEH.

Method
Data from the PCPs and registries of three provincial disease programs (Cardiovascular Health NS (CVHNS), Cancer Care NS, Diabetes Care Program of NS) were linked to the deaths. All causes of death recorded on death certificates were used; up to 13 causes are listed. International Classification of Diseases version 10 CVD causes of death are: I20-125, 148, 150. CVHNS registry diseases are: heart failure (HF: I50), unstable angina (UI: I22), acute myocardial infarction (AMI: I21), diabetes (I25, I48, I50). CVHNS registry data is based on in hospital deaths, collaboration with PCPs, and CVD cause of death were compared to being in the CVHNS registry. Sensitivity was 65.1%, and specificity 79.7.

Results
The percentage of all deaths that had a CVD cause of death decreased over time from 33% in 1998 to 29% in 2009. Persons who died of CVD were more likely to be male, and were older (78.6) than all deaths (74.6).

Table 1: Classifying CVD

<table>
<thead>
<tr>
<th>CVD cause of death</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>In CVHNS Registry</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Any Indication of CVD</td>
<td>6.6%</td>
<td>3.4%</td>
</tr>
<tr>
<td>CVD PCP Diagnosis</td>
<td>7.4%</td>
<td>2.4%</td>
</tr>
<tr>
<td>CVD cause of death</td>
<td>20.3%</td>
<td>27.5%</td>
</tr>
</tbody>
</table>

Persons with CVD as a cause of death had an average of 3.5 causes of death on their death certificate, compared to 2.9 for all decedents.

Figure 3: Number of Causes of Death

Among all deaths, 31.6% had a CVD cause of death. Among those in CVHNS registry, their additional causes were cancer (19.5%), diabetes (17.8%), renal (17.0%), chronic obstructive pulmonary disease (16.4%), dementia/Alzheimer’s (7.6%).

Table 2: CVD decedents in Cancer/Diabetes Registries

<table>
<thead>
<tr>
<th>Indication of CVD</th>
<th>In Cancer Registry</th>
<th>In Diabetes Registry</th>
<th>In Both Diabetes &amp; Cancer Registries</th>
</tr>
</thead>
<tbody>
<tr>
<td>In CVHNS Registry</td>
<td>30.0%</td>
<td>17.4%</td>
<td>14.6%</td>
</tr>
<tr>
<td>CVD cause of death</td>
<td>27.7%</td>
<td>13.6%</td>
<td>3.9%</td>
</tr>
</tbody>
</table>

Among those with any indication of CVD, PCP enrolment was highest in the most rural (CEH) (27.5%), and lowest in most urban (CH) PCP (20.3%).

PCP enrolment for persons with any indication of CVD increased over time in all three PCPs, at an overall rate of 1.7% annually from 11.5% in 1998 to 32.7% in 2009.

Figure 5: PCP Enrollment over time among persons dying of CVD

Among persons who died and were in the CVHNS registry, 75.7% died in the hospital, 11.1% in a nursing home, and 13.1% in their own home.

Figure 6: Place of Death

Conclusions
PCP enrolment for persons with CVD is increasing. The need for advance planning (ACP) for CVD, especially HF, has been established. Persons dying of CVD have other chronic diseases that should be considered in ACP. To decrease in-hospital deaths, collaboration with PCPs, chronic disease programs, and primary care is advised.

Acknowledgement
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