Barriers to Care for People with Chronic Health Conditions

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University of Calgary

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The ICDC is funded by Alberta Innovates – Health Solutions (formerly AHFMR) Interdisciplinary Team Grants Program
Presentation Overview

• Brief overview of Interdisciplinary Chronic Disease Collaboration (ICDC)

• Survey of barriers to care in patients with noncommunicable chronic diseases (NCDs)
  • background
  • purpose
  • design
  • analysis
  • results
  • policy implications

• Questions and answers

Focusing on electronic technologies
General Background on NCDs
What are noncommunicable diseases? (NCDs)

<table>
<thead>
<tr>
<th>Noncommunicable Diseases</th>
<th>Tobacco use</th>
<th>Unhealthy diets</th>
<th>Physical inactivity</th>
<th>Harmful use of alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease and stroke</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Diabetes</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cancer</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Chronic lung disease</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Almost 14 million people aged 30-70y die of NCDs each year

Many of these premature deaths are preventable
85% of these premature deaths occur in LMIC

WHO
The 9 global targets for NCD control

- Premature mortality from NCDs: 25% reduction
- Essential NCD medicines and technologies: 80% coverage
- Drug therapy and counseling: 50% coverage
- Diabetes/obesity: 0% increase
- Raised blood pressure: 25% reduction
- Tobacco use: 30% reduction
- Salt/sodium intake: 30% reduction
- Physical inactivity: 10% reduction
- Harmful use of alcohol: 10% reduction
Overview of Interdisciplinary Chronic Disease Collaboration (ICDC)
Background - Interdisciplinary Chronic Disease Collaboration (ICDC)

• Multidisciplinary group of researchers and decision makers focused on NCDs:
  • Diabetes
  • Hypertension
  • Chronic Kidney Disease
  • Vascular Disease (history of stroke or heart attack)

• Funded by the Alberta Innovates-Health Solutions (formerly AHFMR) Interdisciplinary Team Grants Program

• Original priorities incorporated feedback from AHS/AH

• Ongoing partnership between researchers and decision-makers

• Create new knowledge that will impact health care (and social) policies
ICDC Objective & Research Approach

**Objective:**
To improve the health of patients with or at risk of chronic disease by developing, implementing and evaluating novel interventions that will reduce the clinical and economic impact of chronic diseases.

**Three Phase Research Framework:**
Phase 1: Needs Assessment in Chronic Disease Care
Phase 2: Assessment of Patient Level Barriers
Phase 3: Policy-Related Interventions
Phase 2 Survey: Barriers to Care for People with NCDs
Survey on Barriers to Care for People with NCDs

The Issues:

• NCDs (including heart disease, stroke, diabetes and hypertension) result in significant morbidity, mortality and high health care costs

• effective treatments for NCDs are available but underused, resulting in an evidence-practice gap
Survey on Barriers to Care for People with NCDs

The Purpose:

• To understand current care and barriers to care among individuals with NCDs.

• To determine the association between aspects/features of health care delivery and adverse health outcomes in NCDs.

• To explore economic barriers to accessing health care and medications among patients with NCDs.

• Explore remote residence location as a potential barrier to care and the acceptability of existing information technology solutions in the care and management in NCDs.
Survey on Barriers to Care for People with NCDs

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Survey - Barriers to Care for People with Chronic Health Conditions

The Design:

• The survey sampling frame is the Canadian Community Health Survey (July-Dec 2011)
  • Annual survey across Canada conducted by Statistics Canada

• Survey administered by telephone in Jan / Feb 2012

• Sample of 1,849 respondents from:
  • Alberta
  • British Columbia
  • Saskatchewan
  • Manitoba
Phase 2 Survey: Barriers to Care for People with Chronic Health Conditions

Results...
Baseline Characteristics of Survey Respondents (1)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Total (n=1849) % (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>• Male</td>
<td>49.9 (46.0-53.8)</td>
</tr>
<tr>
<td>• Female</td>
<td>50.1 (46.2-54.0)</td>
</tr>
<tr>
<td><strong>Age Category (years)</strong></td>
<td></td>
</tr>
<tr>
<td>• 40 - 65</td>
<td>48.8 (45.7-52.1)</td>
</tr>
<tr>
<td>• 64 - 74</td>
<td>26.9 (23.9-29.8)</td>
</tr>
<tr>
<td>• 75+</td>
<td>24.3 (21.5-27.0)</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
</tr>
<tr>
<td>• Urban</td>
<td>82.5 (79.5-85.4)</td>
</tr>
<tr>
<td>• Rural</td>
<td>17.5 (14.6-20.5)</td>
</tr>
<tr>
<td><strong>Household Income</strong></td>
<td></td>
</tr>
<tr>
<td>• &lt; $30,000</td>
<td>21.8 (18.9-24.7)</td>
</tr>
<tr>
<td>• $ 30 - 54,999</td>
<td>27.4 (24.3-30.4)</td>
</tr>
<tr>
<td>• $ 55 - 94,999</td>
<td>24.9 (21.5-28.4)</td>
</tr>
<tr>
<td>• $ 95,000+</td>
<td>26.0 (22.3-29.6)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
</tr>
<tr>
<td>• Married/Common-law</td>
<td>66.9 (63.2-70.6)</td>
</tr>
<tr>
<td>• Widowed/Sep/Div/Single</td>
<td>33.1 (29.4-36.8)</td>
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<tr>
<td><strong>Level of Education</strong></td>
<td></td>
</tr>
<tr>
<td>• &lt;HS grad</td>
<td>21.3 (18.6-24.1)</td>
</tr>
<tr>
<td>• HS grade/Some Post-sec</td>
<td>22.0 (18.9-25.1)</td>
</tr>
<tr>
<td>• Post-sec grand (&lt;Bachelors)</td>
<td>37.7 (33.9-41.5)</td>
</tr>
<tr>
<td>• Bachelors degree or higher</td>
<td>19.0 (15.6-22.4)</td>
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</tbody>
</table>
Baseline Characteristics of Survey Respondents (2)

<table>
<thead>
<tr>
<th>Demographics</th>
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<tbody>
<tr>
<td><strong>BMI Category</strong></td>
<td></td>
</tr>
<tr>
<td>• Normal/Underweight</td>
<td>23.3 (19.8-26.7)</td>
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<tr>
<td>• Overweight</td>
<td>36.7 (32.5-40.8)</td>
</tr>
<tr>
<td>• Obese</td>
<td>40.1 (36.2-44.0)</td>
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<tr>
<td><strong>Province</strong></td>
<td></td>
</tr>
<tr>
<td>• British Columbia</td>
<td>44.5 (41.3-47.7)</td>
</tr>
<tr>
<td>• Alberta</td>
<td>31.7 (28.8-34.6)</td>
</tr>
<tr>
<td>• Saskatchewan</td>
<td>10.8 (9.4-12.1)</td>
</tr>
<tr>
<td>• Manitoba</td>
<td>13.0 (11.1-15.0)</td>
</tr>
<tr>
<td><strong>Race/ Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>• White</td>
<td>86.7 (83.5-89.9)</td>
</tr>
<tr>
<td>• Aboriginal</td>
<td>4.2 (2.9-5.5)</td>
</tr>
<tr>
<td>• Other</td>
<td>9.1 (6.0-12.2)</td>
</tr>
<tr>
<td><strong>Self-perceived Health</strong></td>
<td></td>
</tr>
<tr>
<td>• Excellent/very good</td>
<td>36.8 (33.0-40.6)</td>
</tr>
<tr>
<td>• Good</td>
<td>40.2 (36.1-44.2)</td>
</tr>
<tr>
<td>• Fair/ Poor</td>
<td>23.0 (20.1-25.9)</td>
</tr>
<tr>
<td><strong>Smoking Status</strong></td>
<td></td>
</tr>
<tr>
<td>• Current</td>
<td>17.6 (14.3-20.8)</td>
</tr>
<tr>
<td>• Former</td>
<td>51.6 (47.4-55.7)</td>
</tr>
<tr>
<td>• Never</td>
<td>30.8 (26.9-34.8)</td>
</tr>
</tbody>
</table>
Survey - Barriers to Care for People with Chronic Health Conditions

Survey Results –

Use of health care and general barriers to care

• > 95% of respondents reported having a regular doctor

• 72% of 'high-risk‘ respondents reported receiving the recommended testing appropriate for their condition(s)
Survey - Barriers to Care for People with Chronic Health Conditions

However, many potentially modifiable barriers:

• 68% of respondents do not have access to after-hours care from their doctor

• allied health care providers were present in over 25% of doctors offices, however few respondents reported direct involvement in their care

• many respondents were interested in seeing a nurse practitioner if the regular doctor was unavailable
Survey - Barriers to Care for People with Chronic Health Conditions

Policy Implications / Considerations:

• after-hours policy for primary care

• increasing use of allied health care providers in primary care, and allowing them to work to their scope in collaboration with primary care physicians
Data suggest that care of remote-dwellers may be worse

• Remote dwellers experience increased morbidity and mortality associated with chronic diseases such as CVD, DM, chronic respiratory illnesses and cancer

• Studies have linked increasing distance between the patient’s residence and the closest relevant medical specialist to be associated with these adverse outcomes

• Increased travel time to receive specialty care for such illnesses is recognized as a potentially reversible determinant of adverse outcomes
Quality of care and mortality are worse in chronic kidney disease patients living in remote areas

Diana Rucker1, Brenda R. Hemmelgarn2, Meng Lin1, Braden J. Manns3, Scott W. Klarenbach1, Bharati Ayyalasomayajula1, Matthew T. James2, Aminu Bello1, Deb Gordon4, Kailash K. Jindal1 and Marcello Tonelli5, for the Alberta Kidney Disease Network

1Department of Medicine, University of Alberta, Alberta, Canada; 2Department of Medicine, University of Calgary, Alberta, Canada; 3Department of Community Health Sciences, University of Calgary, Alberta, Canada; 4Alberta Health Services, Alberta, Canada and 5Division of Nephrology, University of Alberta, Alberta, Canada

Association between proximity to the attending nephrologist and mortality among patients receiving hemodialysis

Marcello Tonelli MD SM, Braden Manns MD MSc, Bruce Culleton MD MSc, Scott Klarenbach MD MSc, Brenda Hemmelgarn MD PhD, Natasha Wiebe MMath PStat, John S. Gill MD MSc, for the Alberta Kidney Disease Network

see commentary on page 826

Association between residence location and likelihood of kidney transplantation in Aboriginal patients treated with dialysis in Canada

M Tonelli1,2,3,4, B Hemmelgarn5,6, B Culliton5,6, S Klarenbach1,3, JS Gill7,8, N Wiebe1 and B Manns3,5,6, for the Alberta Kidney Disease Network

1Division of Nephrology, Department of Medicine, University of Alberta, Edmonton, Alberta, Canada; 2Division of Critical Care Medicine, University of Alberta, Edmonton, Alberta, Canada; 3Institute of Health Economics, Edmonton, Alberta, Canada; 4Department of Public Health Sciences, University of Alberta, Edmonton, Alberta, Canada; 5Division of Nephrology, Department of Medicine, University of Calgary, Calgary, Alberta, Canada; 6Division of Nephrology, Department of Medicine, Division of Nephrology, University of Calgary, Calgary, Alberta, Canada; 7Department of Geography, University of Calgary, Calgary, Alberta, Canada; 8Division of Nephrology, St Paul’s Hospital, Vancouver, British Columbia, Canada and 9Division of Nephrology, Tufts-New England Medical Center, Boston, Massachusetts, USA

Mortality of Canadians treated by peritoneal dialysis in remote locations

M Tonelli1,2,3,4, B Hemmelgarn5,6, B Culliton5,6, S Klarenbach1,3, JS Gill7,8, N Wiebe1 and B Manns3,5,6, for the Alberta Kidney Disease Network

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Technology #1: Teleheath
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?
What is telehealth?

- **our definition**: two-way interactions between doctor and patient, which replace a usual clinical encounter
Technology #2: mobile phones
SMS (text message) support
SMS (text message) support
SMS (text message) support
SMS (text message) support
SMS (text message) support

- educate
- send reminders
- engage
- empower
- a written record

• **our definition**: one-way message from provider to patient
## Characteristic by residence location

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total</th>
<th>Closest specialist is located in</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>same city as respondent's home</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N=565</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>different city than the</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>respondent’s home N=1281</td>
<td></td>
</tr>
<tr>
<td>Male sex</td>
<td>49.9</td>
<td>50.6</td>
<td>0.70</td>
</tr>
<tr>
<td>Age 75+</td>
<td>24.3</td>
<td>26.4</td>
<td>0.04</td>
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<tr>
<td>Education</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
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<tr>
<td>&lt; High School</td>
<td>21.7</td>
<td>15.6</td>
<td></td>
</tr>
<tr>
<td>University degree</td>
<td>17.9</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Household income</td>
<td></td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>&lt;$25,000</td>
<td>15.2</td>
<td>13.0</td>
<td></td>
</tr>
<tr>
<td>&gt;$70,000</td>
<td>37.8</td>
<td>45.3</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
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<td>0.004</td>
</tr>
<tr>
<td>White</td>
<td>87.0</td>
<td>82.8</td>
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<tr>
<td>Type of Chronic Condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>81.9</td>
<td>80.7</td>
<td>0.4</td>
</tr>
<tr>
<td>Diabetes</td>
<td>26.2</td>
<td>24.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Heart disease</td>
<td>21.4</td>
<td>19.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Stroke</td>
<td>7.9</td>
<td>7.0</td>
<td>0.4</td>
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<tr>
<td>Self-perceived Health</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Excellent/ Very Good / Good</td>
<td>77.1</td>
<td>80.3</td>
<td>0.05</td>
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<tr>
<td>Smoking Status</td>
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<tr>
<td>Never</td>
<td>30.8</td>
<td>38.3</td>
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</tr>
<tr>
<td>Occasional/Former/Daily</td>
<td>69.2</td>
<td>61.8</td>
<td></td>
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</table>
Remote-dwellers had more barriers to specialist care than urban-dwellers

<table>
<thead>
<tr>
<th></th>
<th>Closest specialist is located in</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>same city as respondent’s home</td>
<td></td>
</tr>
<tr>
<td>Barriers to primary care physicians</td>
<td>3.9</td>
<td>0.649</td>
</tr>
<tr>
<td>Barriers to specialist care</td>
<td>3.4</td>
<td>&lt; 0.0001</td>
</tr>
</tbody>
</table>

Of these, 10% vs 62% reported a time/distance/traffic related barrier to receiving specialist care
Survey - Barriers to Care for People with Chronic Health Conditions

- **Survey Results – Remote Dwellers**

- Remote-dwellers were more likely to experience adverse outcomes (ER visits; hospitalization for chronic diseases) than those living in urban areas. RR 2.13, p<0.01

- While remote dwellers with NCDs did not appear to experience barriers accessing primary care, many anticipated difficulty with accessing specialists, if such visits were required.
What would constitute “reasonable” travel time to see a specialist?

- Closest specialist in same city, N=565
- Closest specialist in different city, N=1281

<table>
<thead>
<tr>
<th>Time Interval</th>
<th>Closest Specialist Same City</th>
<th>Closest Specialist Different City</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤15 minutes</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>16-30 minutes</td>
<td>50%</td>
<td>45%</td>
</tr>
<tr>
<td>31-60 minutes</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>&gt;60 minutes</td>
<td>5%</td>
<td>25%</td>
</tr>
</tbody>
</table>
How much time would need to be saved before respondents would want to use it rather than in-person specialist visit?

- Closest specialist in same city, N=565
- Closest specialist in different city, N=1281
Remote-dwellers frequently reported distance as a potential barrier

<table>
<thead>
<tr>
<th>Closest specialist is located in</th>
<th>Transit related (no car/no public transit/nobody to drive me/ parking difficulties)</th>
<th>Cost/distance/traffic (weather/construction) related</th>
<th>Personal/family/work/waiting-time related</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>same city as respondent’s home N=565</td>
<td>-</td>
<td>-</td>
<td>52.2*</td>
<td>45.7*</td>
</tr>
<tr>
<td>a different city than respondent’s home N=1281</td>
<td>26.2</td>
<td>61.5</td>
<td>22.3*</td>
<td>33.1</td>
</tr>
<tr>
<td>P-value</td>
<td>0.725</td>
<td>&lt;0.0001</td>
<td>0.022</td>
<td>0.383</td>
</tr>
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</table>
**Interest in email P-value**

**Travel to see a specialist**
- Same city
- Different city

**Barrier to specialist**
- No
- Yes

**Own internet**
- No
- Yes

**Own cell phone**
- No
- Yes

**Sex**
- Male
- Female

**Age**
- 40-64
- 65-74
- 75+

**Education**
- <High School
- High School
- Post-secondary
- University degree

**Household income**
- <$25,000
- $25-39,999
- $40-70,000
- >$70,000

**Province**
- Alberta
- Manitoba
- Saskatchewan
- British Columbia

**Ethnicity**
- White
- Aboriginal/Other

---

**OR (95% CI)**

- Favours No Email
- Favours Email

---

**Favour No Email**

**Favour Email**

---

**Same city = 565**
**Different city = 1281**
Interest in SMS P-value

Travel to see a specialist
- Same city: Reference
- Different city: 1.21 (0.82, 1.76)

Barrier to specialist
- No: Reference
- Yes: 0.83 (0.53, 1.31)

Own internet
- No: Reference
- Yes: 2.05 (1.30, 3.22)

Own cell phone
- No: Reference
- Yes: 1.60 (1.08, 2.37)

Sex
- Male: Reference
- Female: 0.87 (0.60, 1.25)

Age
- 40-64: Reference
- 65-74: 0.81 (0.53, 1.23)
- 75+: 0.61 (0.38, 0.99)

Education
- <High School: Reference
- High School: 1.37 (0.81, 2.31)
- Post-secondary: 1.33 (0.85, 2.08)
- University degree: 2.31 (1.22, 4.37)

Household income
- <$25,000: Reference
- $25-39,999: 1.09 (0.61, 1.94)
- $40-70,000: 1.49 (0.84, 2.67)
- >$70,000: 2.05 (1.11, 3.77)

Ethnicity
- White: Reference
- Aboriginal/Other: 0.71 (0.36, 1.40)

Same city = 565
Different city = 1281
Information technology as a potential means for overcoming geographic barriers

• high proportion of respondents (>73%) possessed a computer with Internet access or a cell phone.

• high interest (>60% of respondents) in using telehealth or email to interact with a specialist even among those aged >65 years

• **policy implication:** electronic technologies and associated infrastructure should be further explored to assist with management of NCDs
Next steps

• More detailed work on patient wishes
  • which patients?
  • which technologies?
  • for which purposes?

• Deploy and pilot test potential solutions
Questions and Answers