Practice Points

May – Dec 2018

Volume 4

Quality of Care NL

The right intervention, for the right patient at the right time.

Choosing Wisely NL™

Helping clinicians and patients engage in conversations about unnecessary tests, treatments and procedures.

Who We Are

Quality of Care NL/Choosing Wisely NL (QCNL/CWNL) is a collaborative effort between the leading health care entities in Newfoundland and Labrador. We work to ensure the right treatments get to the right patients at the right time.

Our partnership with Choosing Wisely Canada builds upon established national guidelines and recommendations that cross all disciplines to support the reduction of low-value health care, particularly where harms outweigh benefits.

We engage with all stakeholders in health care to encourage uptake of evidence-based practice. We make it easier for physicians, nurse practitioners, allied health professionals, and pharmacists to determine the best courses of treatment along with their patients.

By promoting recommendations and guidelines, offering tools and resources, and implementing solutions, our work spans various areas of health care, including: Stroke, Antibiotics, Potentially Unnecessary Testing, and Imaging, just to name a few.

Our Partners

Our innovative approach enables us to work closely with all our partners, including:

Our Projects

These themes reflect the strategic direction of our partners and the priorities of the people of Newfoundland and Labrador, as set through a patient-oriented priority-setting process.

Stroke

Antibiotics

Potentially Unnecessary Testing

Imaging

Drug Utilization

Long-Term Care

Acute Care

Cancer Care
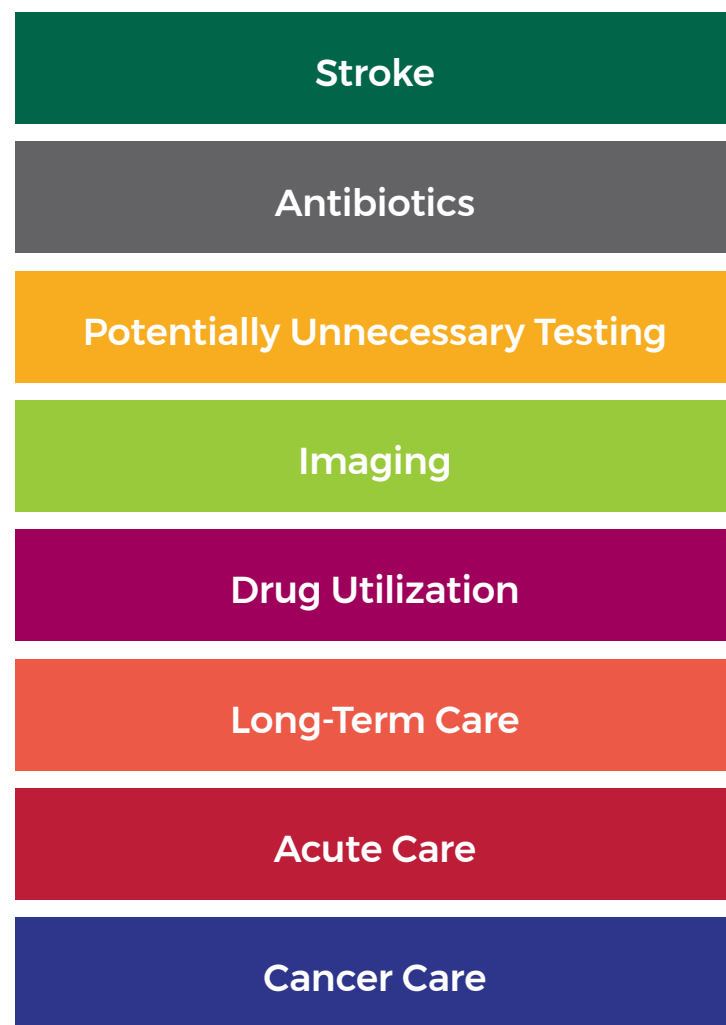
For more details on Quality of Care NL/Choosing Wisely NL or on any of our projects, please visit **qualityofcarenl.ca** or contact **pparfrey@qualityofcarenl.ca**

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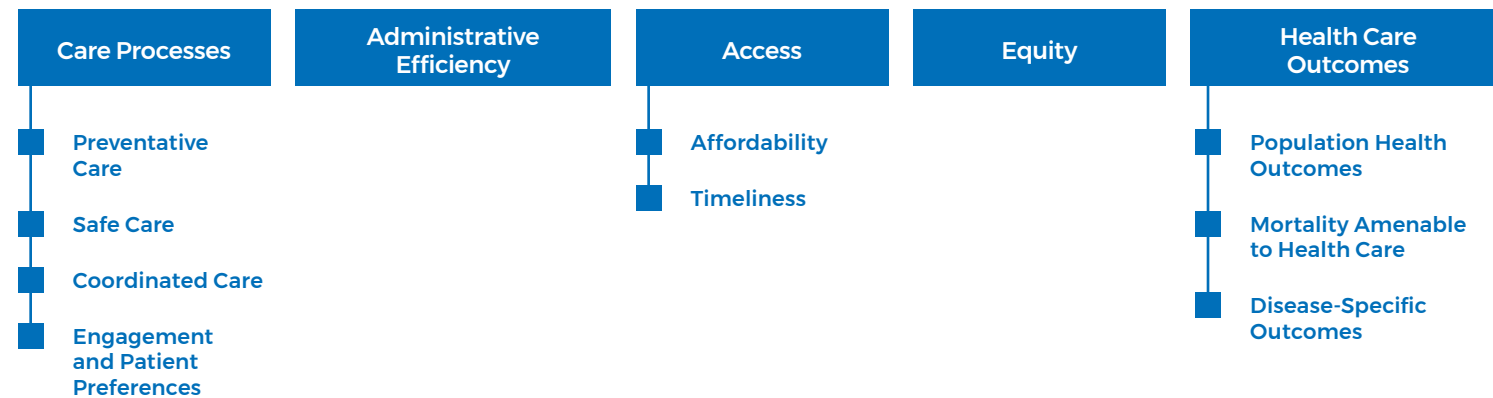
Value of Health Care Spending in NL

Objective

To determine the value of health care spending in NL and suggest interventions that would improve health outcomes and reduce costs.
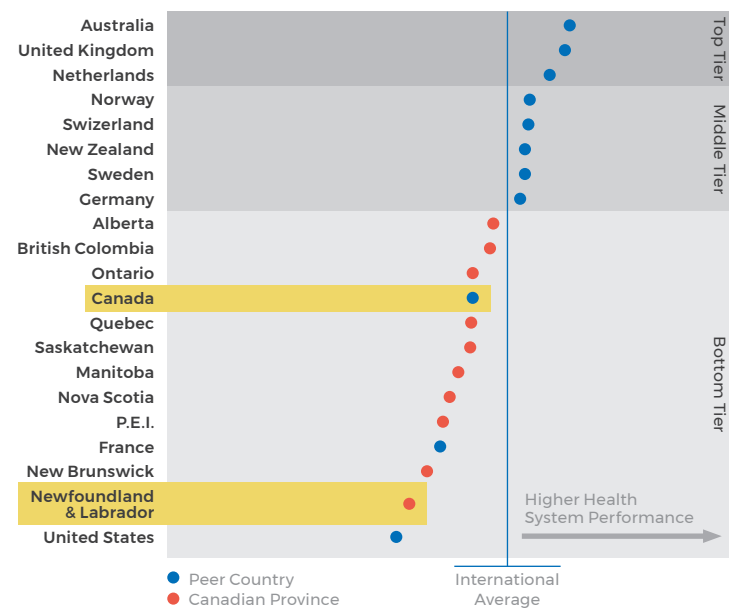
Methods

1. Provincial government health expenditure data for 2017 was obtained from the Canadian Institute for Health Information (CIHI).

2. Health system performance data was obtained from the C. D. Howe Institute and Commonwealth Fund.

   Reference: Busby C., Muthukumaran R., Jacobs A. "Reality Bites: How Canada's Healthcare System Compares to its International Peers". Essential Policy Intelligence C.D. Howe Institute. E-brief. Jan 25, 2018.

Health System Performance

Care Processes	Administrative Efficiency	Access	Equity	Health Care Outcomes
■ Preventative Care		■ Affordability		■ Population Health Outcomes
■ Safe Care		■ Timeliness		■ Mortality Amenable to Health Care
■ Coordinated Care				■ Disease-Specific Outcomes
■ Engagement and Patient Preferences				

Health System Scoring

● Peer Country
● Canadian Province
International Average
Higher Health System Performance

Difference from International Average for Health Care Outcomes

Difference Between the 11 Countries' Average and a Health System Score to Produce a Ranking Result
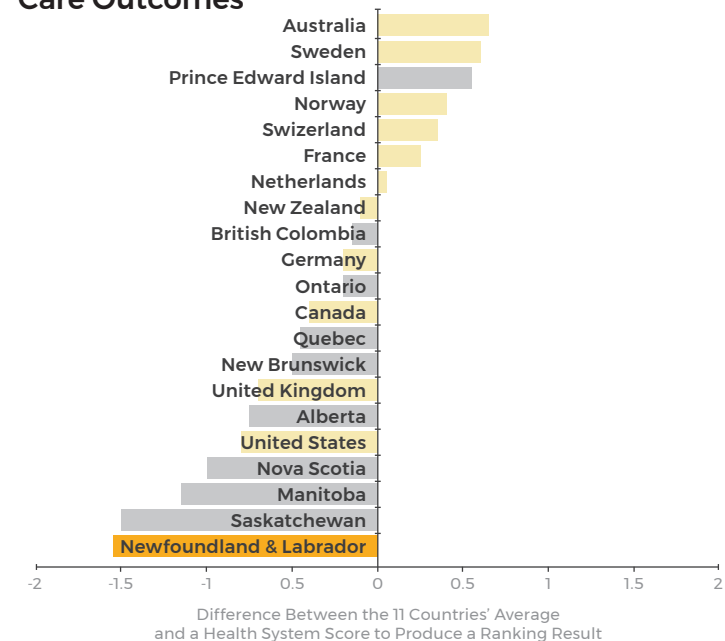
Health System Expenditure

Provincial Government Health Expenditure, 2017

Dollars per capita
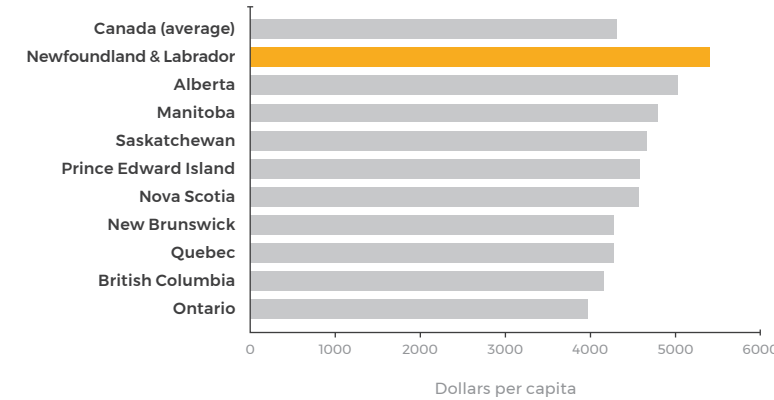
Provincial Government Health Expenditure Use, 2017

Dollars per capita

● Other   ● Other Professionals
● Administration   ● Physicians
● Public Health   ● Other Institutions
● Capital   ● Hospitals
● Drugs
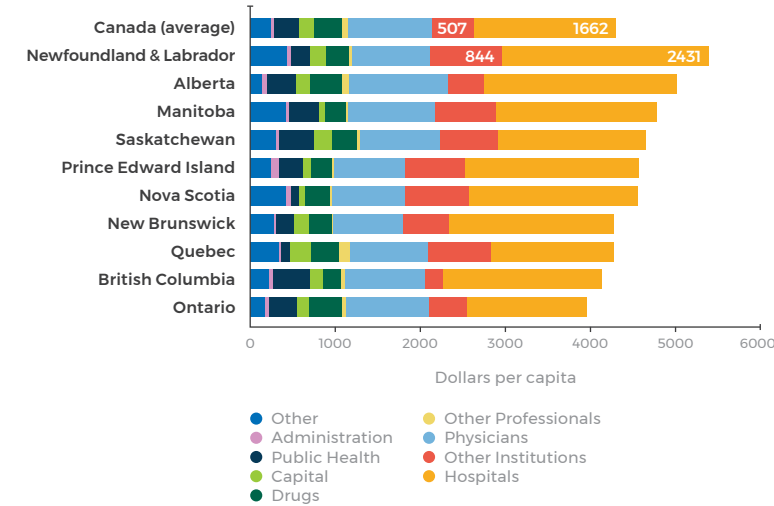
Provincial Government Spending on Institutional* Health Care
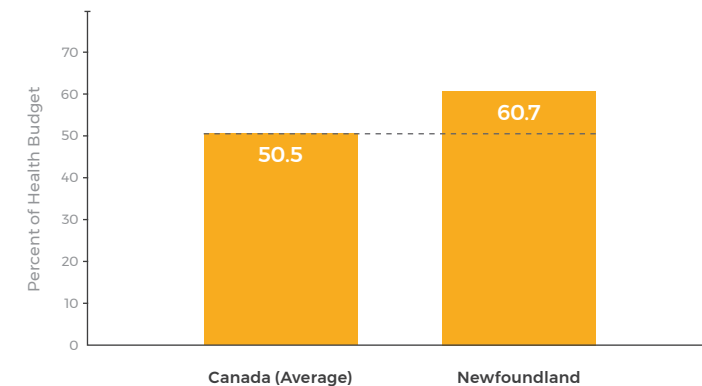
*Institutional health care includes hospitals, long-term care facilities, and personal care homes

Eight Major Interventions to Improve Health Outcomes and Reduce Costs

Social determinants
Spend more on the social determinants of health and do not increase the proportionate size of health care budget

Restructure health care
Fewer acute care hospitals and more community-based services locally (primary/emergency/long-term care)

Integrated health care
Enhance an integrated health care system with primary health care reform and e-technology

Unnecessary care
Reduce unnecessary interventions and tests

Quality of care
Improve access and quality of care by getting the right intervention to the right patient at the right time

Pharmacare
Enhance access to Pharmacare

Innovative health care
Knowledge translation of innovative health care delivery interventions proven in other jurisdections

Culture change
Improve the culture of support for the health care system

Conclusions

1. Health care quality in NL is not optimal.

2. NL has the highest provincial per capita expenditure on health care, driven by institutional spending.

3. Health care value (outcomes/costs) is poor in NL in comparison to other provinces.

4. Interventions are available to improve health outcomes and reduce costs.

Quality of Care NL

Demographic Change in NL

Practice Point

1. During the past 20 years substantial demographic change has occurred in NL and is predicted to continue for the next 20 years.

Method

1. Population data and projections were obtained from the Department of Finance, and analysed by age and region.

Provincial Demographics

Population

Percent Change

69

50

-5 -9 -5 -16 -18 -31

St. John's Region

Population

Percent Change

69 67

14 12 7 -12 -7 -3
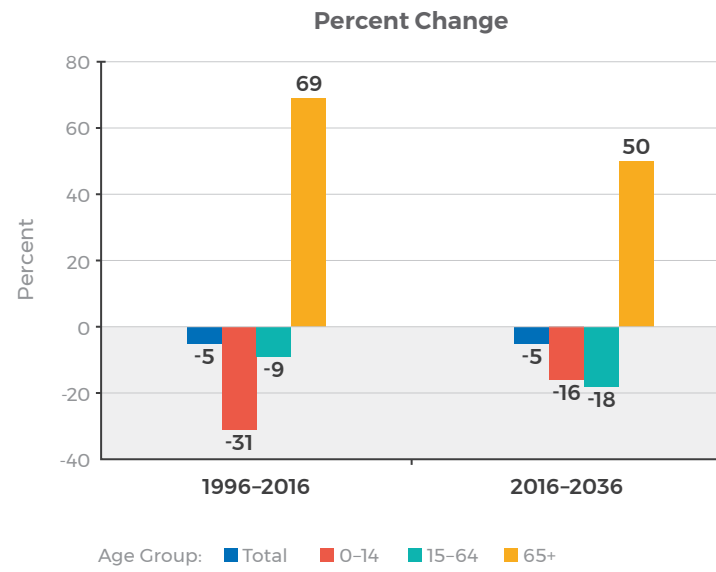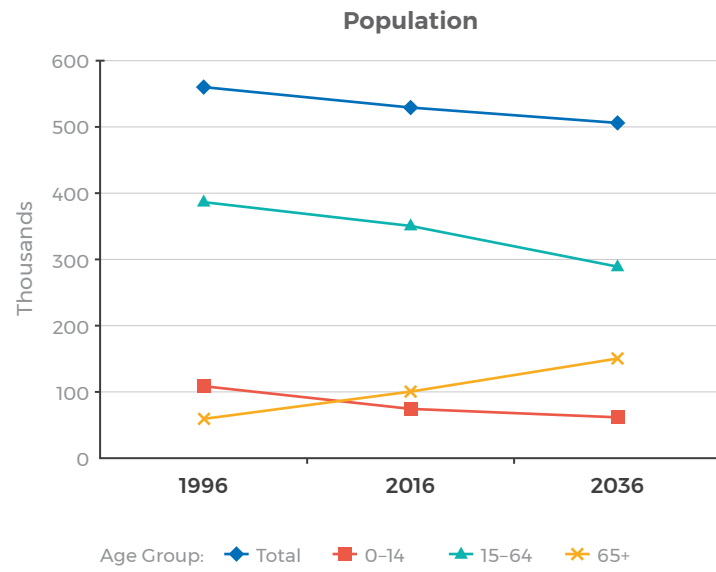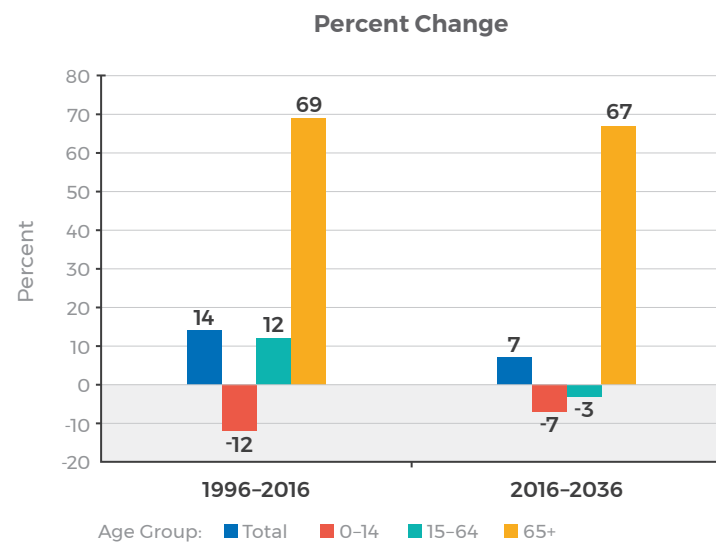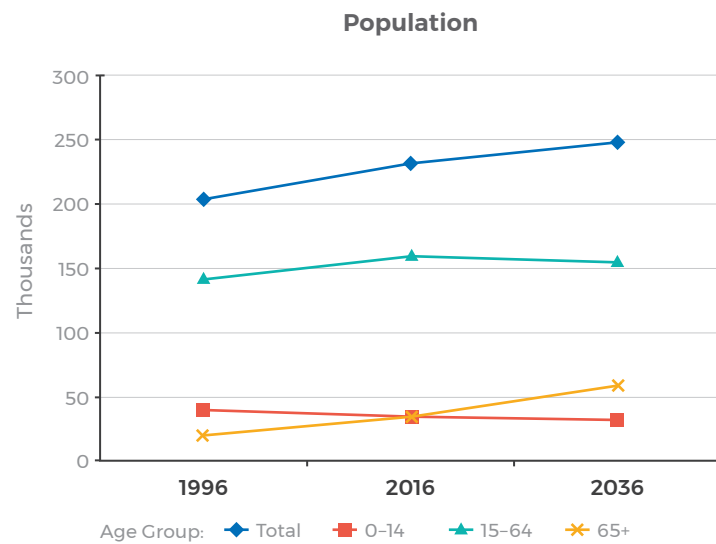
Tri-Peninsular Region of Eastern Health

Population

Percent Change

56 39

-5 -22 -15 -28 -33 -44

Central Region

Population

Percent Change

65 39

-17 -23 -15 -27 -33 -44

Western Region

Population

Percent Change

79 41

-15 -21 -13 -22 -29 -44

St. Anthony Region

Population

Age Group: ◆ Total ■ 0–14 ▲ 15–64 ✕ 65+

Percent Change

Age Group: ■ Total ■ 0–14 ■ 15–64 ■ 65+
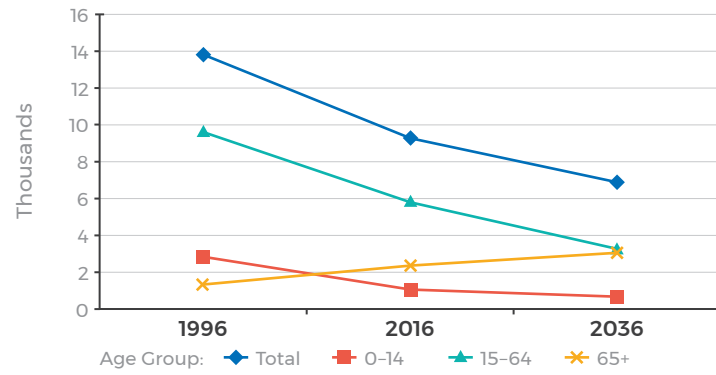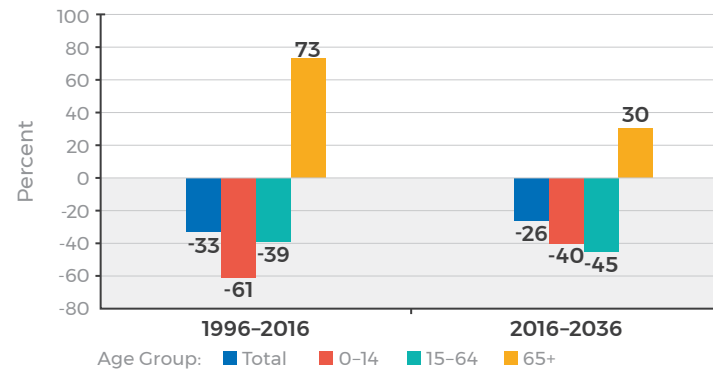
Labrador Region (Excluding West Region)

Population

Age Group: ◆ Total ■ 0–14 ▲ 15–64 ✕ 65+

Percent Change

Age Group: ■ Total ■ 0–14 ■ 15–64 ■ 65+
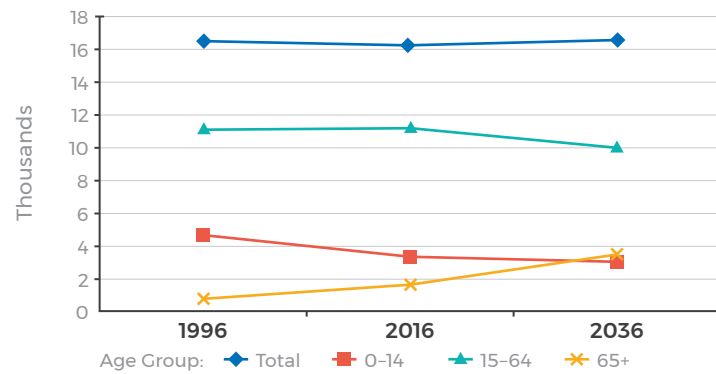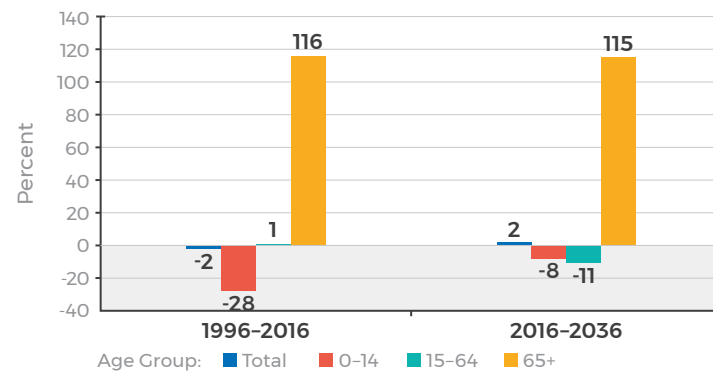
Labrador West Region

Population

Age Group: ◆ Total ■ 0–14 ▲ 15–64 ✕ 65+

Percent Change

Age Group: ■ Total ■ 0–14 ■ 15–64 ■ 65+
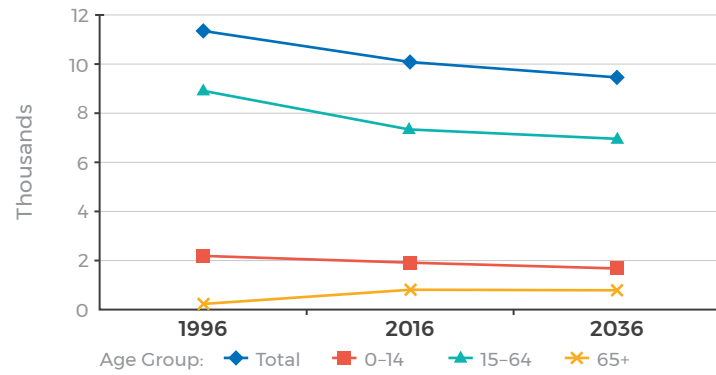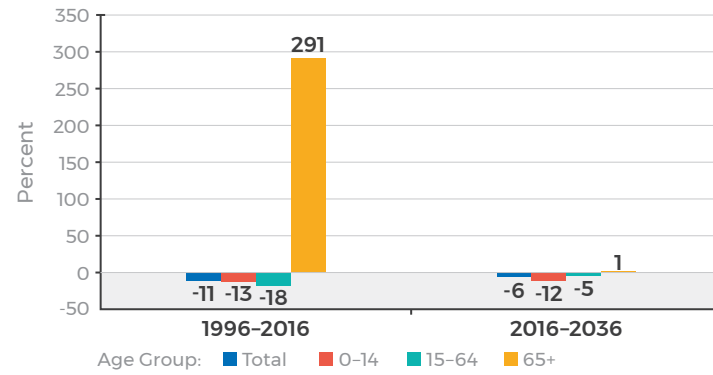
Conclusions

1. In most regions of the province the population is declining, particularly children, but the senior (aged 65 years and older) population is increasing.

2. Further regional demographic change will have important implications for the health care system in the provision of both acute care and long-term care services.

Annual Billings by General Practitioners by Age and Sex in NL

Objective

To define Fee for Service General Practitioners (GPs) practice by number of patient billings by age and sex.

Methods

1. De-identified billing records retained by NL Centre for Health Information were linked to NL Medical Association registry of GPs in fee-for-service practices for 2017. Data was not available for salaried GPs.

2. The definition of a high volume practice (by number, gender, or senior/aged 65 years and older) was defined as being the GPs in the top quintile of bills, when GPs were ranked by number of visits/billable procedures per year.

3. 440 GPs in NL billed more than 100 times per year.

Results

- 51% of GPs billed 80% of total bills.

Number of Bills by GPs in 2017
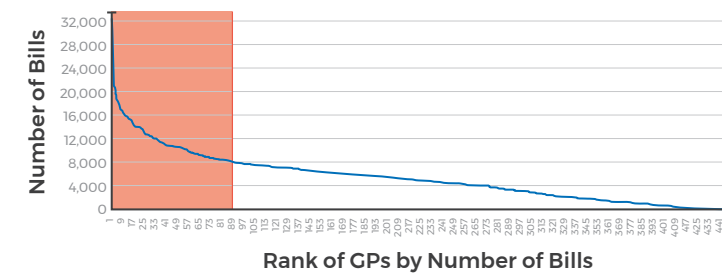
- Annual median number of bills per doctor was 4,783. The top quintile of doctors ranked by number of bills had more than 8,242 per year. Fifty-two doctors had more than 10,000 bills per year.

Number of Bills for Female Patients by GPs in 2017
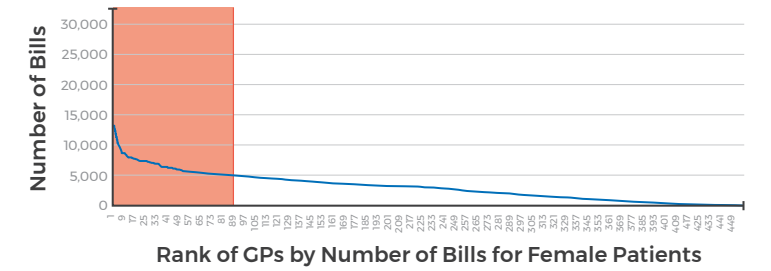
- Annual median number of bills for female patients was 2,999 per GP. The top quintile of GPs had more than 5,038 bills per year.

- When GPs were ranked by percentage of total bills for female patients, the top quintile had practices where 72% or more of the bills were for females.

Number of Bills for Senior Patients by GPs in 2017
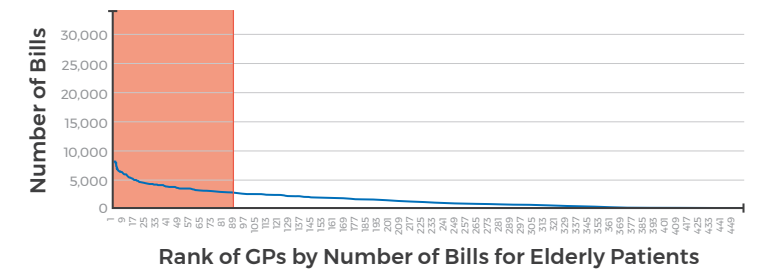
- Annual median number of bills for patients aged 65 years and older per GP was 1,143. The top quintile of GPs had more than 2,800 bills per year for patients aged 65 years and older.

- When GPs were ranked by percentage of total bills for patients aged 65 years and older, the top quintile had practices where 43% or more of the visits were by patients aged 65 years and older.

Conclusions

1. The top quintile of GPs defined as having a high volume practice billed more than 8,242 times.

2. The top quintile of GPs defined as having a high volume of female visits billed more than 5,038 times for females.

3. The top quintile of GPs defined as having a high volume of elderly patients billed more than 2,800 times for patients 65 years and older.

Low Thrombolysis Rates for Ischemic Stroke in NL

Canadian Stroke Best Practice Recommendation

1. Administer intravenous thrombolysis (tPA) for acute ischemic stroke within 4.5 hours of stroke onset.

Methods

1. The Provincial Stroke Measuring and Monitoring Working Group (Project 340) provided the data.

2. A Quality of Care NL implementation team visited Labrador-Grenfell, Central, and Western Health in 2017–18 to improve the process for administration of tPA.

3. Rate of thrombolysis was the number of tPA administrations divided by the number of ischemic strokes per year.

Results

- The provincial rate of thrombolysis increased slowly over the past four years from 6.5% in 2014–15, 8.2% in 2015–16, 8.9% in 2016–17, and 9.6% in 2017–18.

Percentage of Thrombolytic Therapy in Patients with Ischemic Stroke by Region
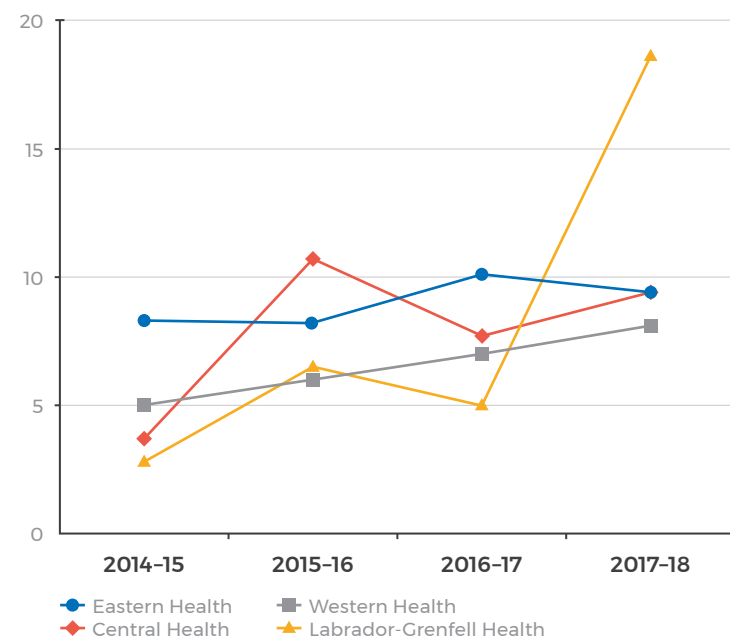
- In 2017–18 there were 72 tPA administrations in NL with the lowest rate in Western (8.1%) and highest rate in Labrador Grenfell (18.6%).

- The improvement in rate in Labrador-Grenfell in 2017–18 was statistically significant.

tPA Rate by Year and Region

	2014–15	2015–16	2016–17	2017–18
Eastern Health	8.3	8.2	10.1	9.4
Central Health	3.7	10.7	7.7	9.4
Western Health	5.0	6.0	7.0	8.1
Labrador-Grenfell Health	2.8	6.5	5.0	18.6

Conclusions

1. The rates of thrombolysis for ischemic stroke in NL are poor.

2. Labrador-Grenfell Health had a significant improvement in thrombolysis rates associated with development and implementation of CODE STROKE, a standardized, evidence-based, hyperacute stroke management protocol in collaboration with the Quality of Care NL implementation team.

Access to Cardiac Catheterization and Diagnosis of Critical Coronary Artery Disease (CAD) in Patients With ST Elevation Myocardial Infarction (STEMI) in NL

Guideline: American College of Cardiology/American Heart Association (ACC/AHA)

1. Patients with STEMI should have cardiac catheterization (CC) within 24 hours.

Practice Point

1. Randomized controlled trials demonstrate that patients who present with STEMI and have immediate CC ± revascularization have better clinical outcomes compared to conservative management.

Methods

1. To determine access to CC and the rate of diagnosis of critical Coronary Artery Disease (CAD), an analysis of patients with STEMI entered in the APPROACH database from 2007–2017 was completed.

2. Critical CAD was defined as ≥ 1 coronary artery with ≥ 70% stenosis or ≥ 50% stenosis of left main coronary artery.

Results

- During the past decade the annual number of CCs undertaken because of STEMI increased from 254 in 2008 to 324 in 2017, an increase of 27.6%.

Time to CC in Patients With STEMI (2014–2017)

46% of patients with STEMI had CC within 24 hours.
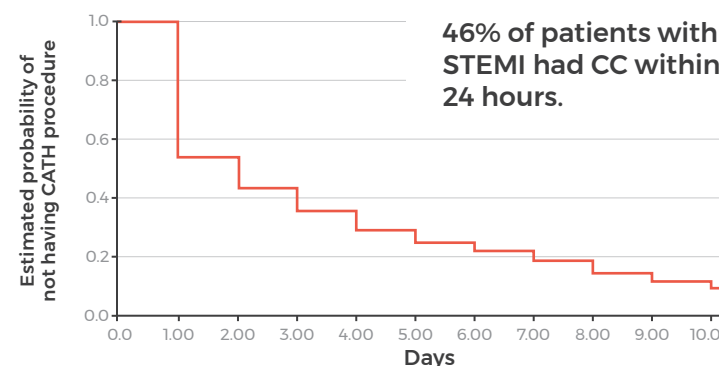
Percentage Diagnosed With Critical CAD in Male Patients With STEMI by Age
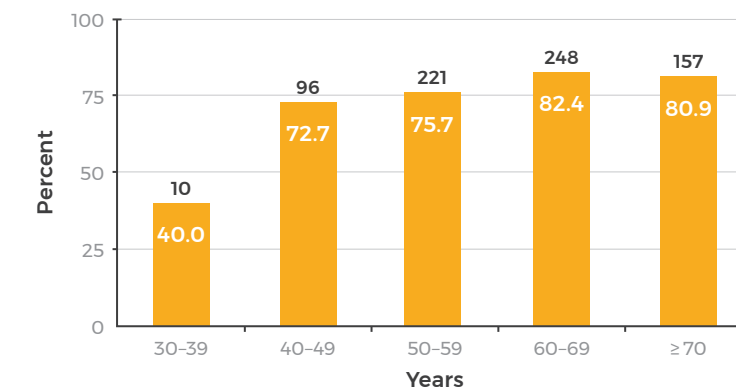
- The percentage of males diagnosed with critical CAD was 75.8% in 2007–2010 and 77% in 2014–2017.

Percentage Diagnosed With Critical CAD in Female Patients With STEMI by Age
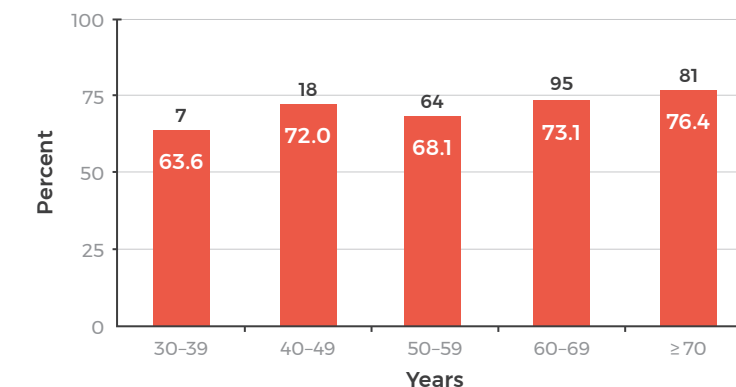
- In females, the percentage was 75.4% in 2007–2010 and 72.7% in 2014-2017.

Conclusions

1. Access to CC for STEMI within 24 hours was poor. The catheterization lab has created 7 day a week, 24-hour-a-day, emergency availability to improve access.

2. Interventions to improve transfer times for STEMI patients admitted outside the Health Sciences Centre will be implemented.

Diagnosis of Critical Coronary Artery Disease Using Cardiac Catheterization in Patients With Non-ST Elevation Myocardial Infarction (NSTEMI) or Unstable Angina in NL

Practice Points

1. Acute coronary syndrome is caused by STEMI, NSTEMI, and unstable angina. The differentiation between NSTEMI and unstable angina is the presence of elevated troponin levels in patients with NSTEMI.

2. For the diagnosis of acute myocardial necrosis (NSTEMI), elevation of high sensitivity troponin above 99 percentile of the upper reference value is required. Additionally, evidence for a serial increase or decrease ≥ 20 % is required if the initial level is elevated.

Methods

1. Patients in the APPROACH database who had cardiac catheterization (CC) for acute coronary syndrome indicated because of NSTEMI or unstable angina from 2007–2017 were analyzed.

2. Critical Coronary Artery Disease (CAD) was defined as ≥ 1 coronary artery with ≥ 70 % stenosis or ≥ 50 % stenosis of left main coronary artery.

Results

- During the past decade the number of CCs done for NSTEMI has increased from 525 in 2008 to 895 in 2017, an increase of 70.5%.

Percentage of Males and Females With NSTEMI Diagnosed as Having Critical CAD by Age (2014-2017)
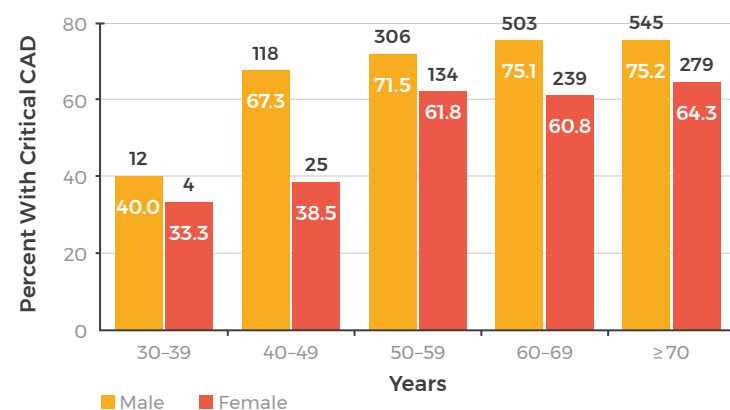
- The diagnosis of critical CAD in patients with NSTEMI is lower in females than males.

- During the past decade the number of CCs done for unstable angina decreased from 435 in 2008 to 323 in 2017, a decrease of 25.7%.

Percentage of Males and Females With Unstable Angina Diagnosed as Having Critical CAD by Age (2014–2017)
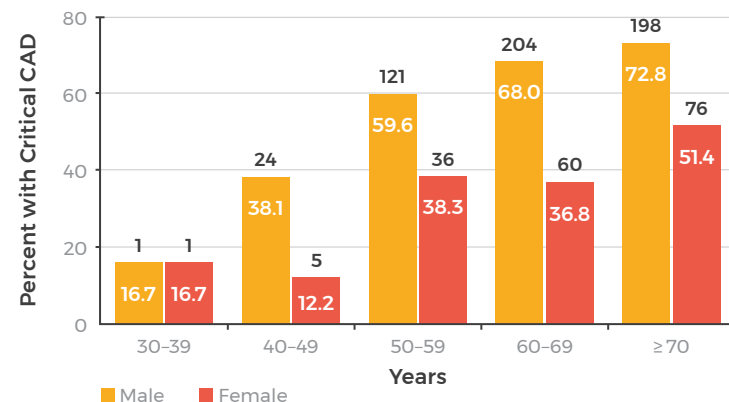
- Diagnosis of critical CAD in patients considered to have unstable angina was low in all females and in males less than 60 years of age.

Conclusions

1. In patients with atypical symptoms for NSTEMI, consideration should be given to alternate causes of elevated troponins prior to ordering a CC, particularly if there is solitary elevation of troponin levels, or serial levels do not reveal ≥20% change in levels, or conditions predisposing to demand ischemia are present.

2. In patients with stable vital signs diagnosed as having unstable angina, if there is no history of CAD, a coronary CT angiogram may be indicated, and if there is a history of CAD, a nuclear myoview study may define the risk of ischemia. CC may not be necessary.

Diagnosis of Critical Coronary Artery Disease Using Cardiac Catheterization in Patients With Stable Angina in NL

Choosing Wisely Canada Recommendation

1. Don't order or refer for percutaneous coronary intervention in patients with stable Coronary Artery Disease (CAD) who do not have high-risk features, are asymptomatic, or have not been on optimal medical therapy.

Practice Points

1. Typical angina is present when the following three criteria are present:
   a) retrosternal discomfort,
   b) provoked by exercise or stress,
   c) relieved by rest or NTG.
   The presence of one of the three criteria implies non-anginal chest pain with low probability of critical CAD, two criteria imply atypical angina with intermediate probability of critical CAD.

2. Exercise stress testing adds little to the probability of diagnosing critical disease in those without known CAD.

3. Myoview testing or coronary CT to identify patients at high ischemic risk improves the probability of diagnosing critical CAD with catheterization.

Method

1. All patients in the APPROACH database who had cardiac catheterization (CC) for stable angina from 2007–2017 were analyzed. Critical CAD was defined as ≥ 1 vessel with stenosis ≥ 70% or left main artery ≥ 50 %.

Results

- Over 11 years the average annual number of CCs done for stable angina was 901, with little difference in volume over time.

- From 2007–2010 the percentage with critical CAD was 55.0% and from 2014–2017 the percentage fell to 50%.

Percentage of Patients who had CC for Stable Angina Diagnosed with Critical CAD by Age and Sex (2014–2017)

Males

Females
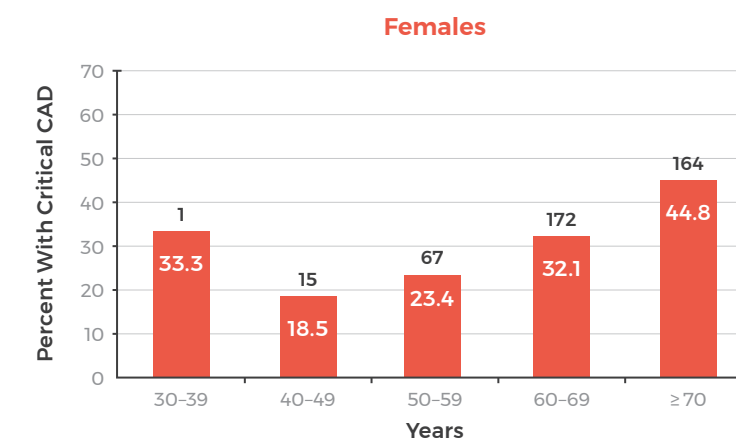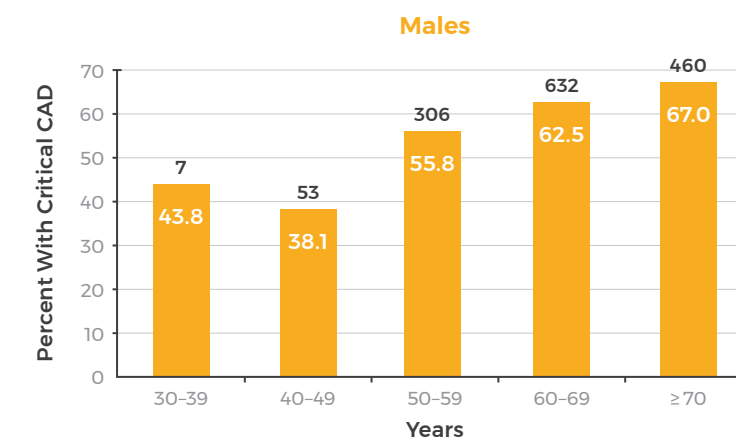
- The diagnosis of critical CAD is very poor in women and men aged less than 50 years, and poor in men aged 50 years and older.

- The percentage of males diagnosed with critical CAD decreased from 64.9% in 2007–2010 to 60.3% in 2014–2017. The percentage of females diagnosed decreased from 37.5% in 2007–2010 to 32.3% in 2014–2017.

Conclusion

1. CC should only be undertaken in patients with stable angina with high risk features on history or non-invasive testing, provided coronary revascularization is considered an option.

Change in Cardiology Practice in the Management of Critical Coronary Artery Disease in NL

Practice Point

1. The advent of drug eluting stents has increased the use of percutaneous angioplasty (PCA) and decreased use of coronary artery bypass surgery (CABG) in the management of critical Coronary Artery Disease (CAD).

Method

1. All patients in the APPROACH database who had cardiac catheterization (CC) from 2007–2017 were analyzed to determine the recommendations made after diagnosing critical CAD.

Results

- The average annual number of CCs was 2,902 over the 11 year period. The mean age increased from 61.3 ± 10.4 in 2007 to 64.5 ± 10.5 years in 2017.

## Percentage of Total Patients Who Had CC Aged ≥ 75 Years (2007–2017)
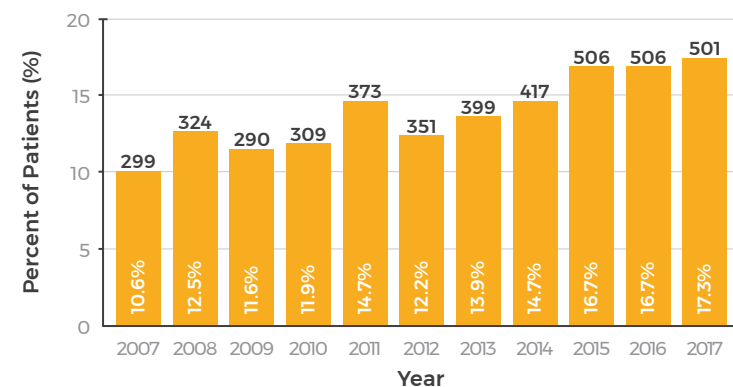
- Critical CAD was diagnosed in 1,356 procedures annually. The mean age of those diagnosed with critical CAD increased from 62.1 ± 10.2 in 2007 to 65.7 ± 10.1 in 2017. The percentage ≥ 75 years was 11.3% in 2007 and 20.2% in 2017.

- Little change in preponderance of males with critical CAD was observed: 73.2% in 2007 vs 72.2% in 2017.

Management of CAD (2007–2010 and 2014–2017)
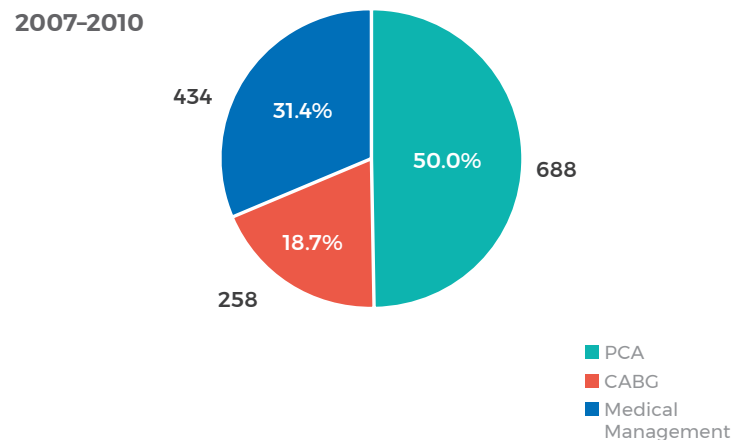
- Recommendation for PCA in 2014-2017 increased by 37.5% compared to 2007-2010, whereas recommendation for CABG decreased by 23.6% and recommendation for medical management decreased by 11.5%.

Conclusion

1. Cardiology practice in the management of critical CAD has changed over the past 11 years with an increase in age of diagnosis, substantially greater use of PCA and concomitant less use of CABG and medical management. Whether this change in practice has led to improved clinical outcomes without increased hospitalization is under investigation.

Utilization of Obstetric and Pediatric Acute Care Beds in NL

Practice Point

1. In 1976 there were 11,130 births in NL and in 2016 there were 4,424.

Methods

1. Data on beds, occupancy, and pediatricians were obtained from the Department of Health and Community Services and birth and length of stay data were obtained from NL Centre for Health Information for 2016–17.

2. Estimated number of beds required was calculated using the current obstetrics length of stay and an occupancy rate of 85% for obstetrics beds.

Current Obstetrics Acute Beds
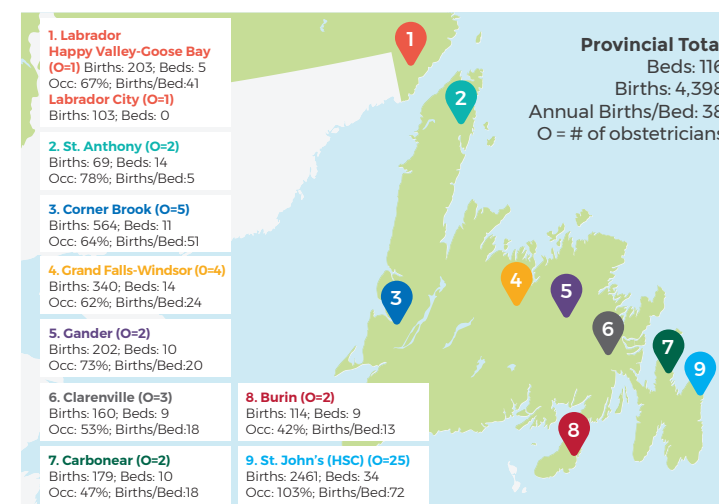
Required Obstetrics Acute Beds

Pediatricians by Population and Location

Location	Pediatricians July 2018	Population <15 years	Pediatricians per 1,000 children
St. John's*	57	35,498	1.6
Carbonear	2	5,400	0.4
Burin	1	2,454	0.4
Clarenville	2	3,325	0.6
Gander	4	5,979	0.7
Grand Falls	2	5,802	0.3
Corner Brook	7	10,140	0.7
St. Anthony	1	1,041	1.0
Goose Bay	0	3,356	0.0
Labrador City	0	1,921	0.0

Includes provincial services

Current and Required Pediatric Beds

Western Memorial Regional Hospital
Current
8 pediatric beds; occupancy unknown

Required
2 pediatric beds; 68% occupancy

Janeway Hospital
Current
29 pediatric ICU beds; 82% occupancy
22 pediatric medicine beds; 58% occupancy
20 pediatric surgery beds; 37% occupancy
8 mental health beds; 53% occupancy

Required (for 85% occupancy):
27 pediatric ICU beds
23 pediatric med/surg beds
5 mental health beds

Conclusion

1. Capacity for obstetric and pediatric acute care exceeds requirements based on current births and child population.

Utilization of Surgery Acute Care Beds in NL

Practice Points

1. Day surgery has increased over time.

2. For particular surgical procedures lower quality outcomes are associated with low volumes.

Methods

1. Data on beds and occupancy were obtained from the Department of Health and Community Services and surgery/length of stay (LOS) data were obtained from NL Centre for Health Information.

2. Required number of beds was calculated using the current acute surgery length of stay, 10% alternate level of care (ALC), and an occupancy rate of 85% for acute surgery beds.

Hospitalizations for Surgery and Day Surgery Visits

Current Surgery Acute Beds

1. Labrador
Happy Valley-Goose Bay (S/A = 2) Procedures: 136; Beds: N/A
1. Labrador City (S/A=2) Procedures: 60; Beds: N/A

2. St. Anthony (S/A = 5) Procedures: 259; Beds: N/A; Occupancy: N/A

3. Corner Brook (S/A = 16) Procedures: 1066; Beds: 53; Occupancy: 93%

4. Stephenville (S/A = 4) Procedures: 110; Beds: N/A; Occupancy: N/A

5. Grand Falls-Windsor (S/A = 8) Procedures: 565; Beds: 20; Occupancy: 89%

6. Gander (S/A = 7) Procedures: 882; Beds: 40; Occupancy: 89%

7. Clarenville (S/A = 3) Procedures: 190; Beds: N/A; Occupancy: N/A

8. Carbonear (S/A = 6) Procedures: 151; Beds: 8; Occupancy: 56%

9. Burin (S/A = 3) Procedures: 139; Beds: N/A; Occupancy: N/A

10. St. John's (S/A = 84) HSC Procedures: 5822; Beds: 167; Occupancy: 85% SC Procedures: 3493; Beds: 108; Occupancy: 70%

Provincial Beds: 396 surgery beds + approx. 20 of medical/surgical beds
Procedures = surgeries performed as inpatient by a surgeon
*S/A = number of surgeons and anesthesiologists

Required Surgery Acute Beds

1. Labrador
Happy Valley-Goose Bay Procedures: 136; Beds: 2
Labrador City Procedures: 60; Beds: 1

2. St. Anthony Procedures: 259; Beds: 6

3. Corner Brook Procedures: 1066; Beds: 32

4. Grand Falls-Windsor Procedures: 565; Beds: 13

5. Stephenville Procedures: 110; Beds: 3

6. Gander Procedures: 882; Beds: 21

7. Clarenville Procedures: 190; Beds: 4

8. Carbonear Procedures: 151; Beds: 4

9. Burin Procedures: 139; Beds: 4

10. St. John's HSC Procedures: 5822; Beds: 135 SC Procedures: 3493; Beds: 75

Provincial Beds: 300 surgery beds
*Stephenville beds based on LOS of 7 days

Conclusions

1. Most surgeries in the province are performed as day surgeries.
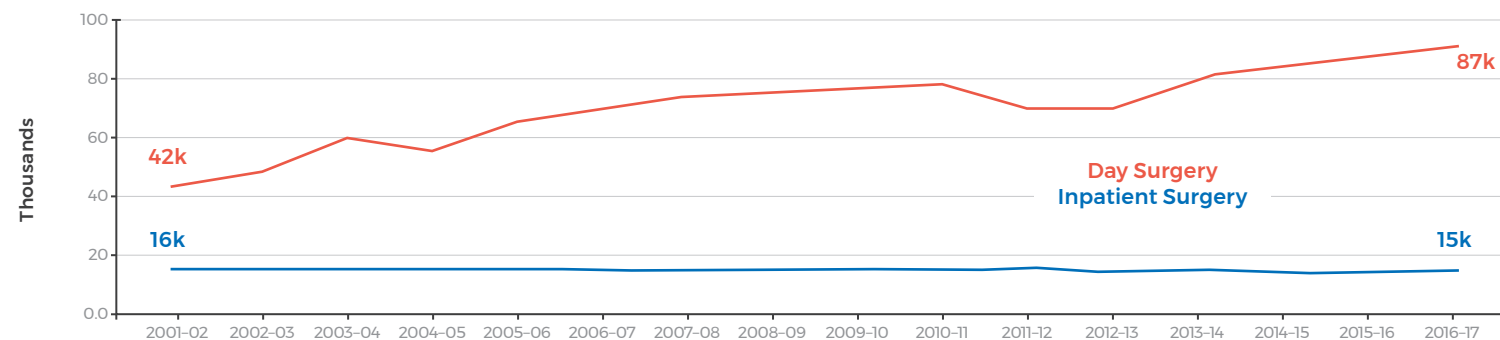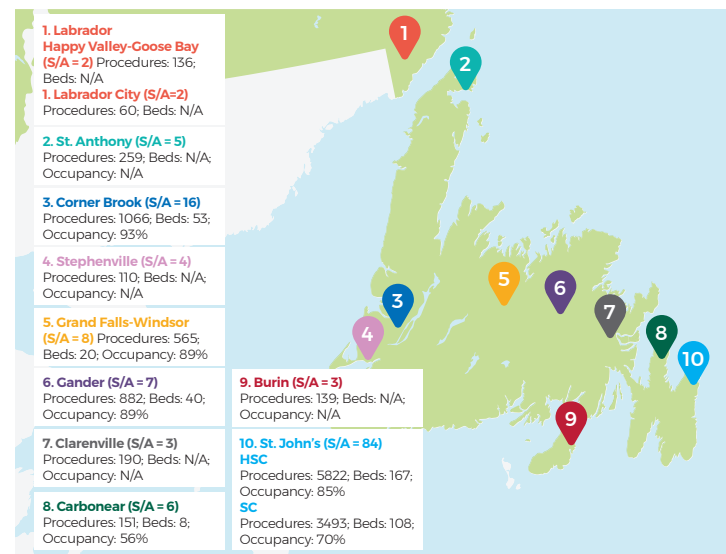
2. Capacity for surgery acute care exceeds requirements based on current volume of inpatient surgery.

Prolonged Time From Abnormal Screening Mammogram to Final Diagnostic Test

Guideline

1. The Canadian Partnership Against Cancer recommends the target times from abnormal mammogram to final diagnostic test:
   a) in those who had biopsy should be less than 7 weeks.
   b) in those who did not have biopsy should be less than 5 weeks.

Practice Point

1. The percentage of screening mammograms in Canada that are abnormal is less than 10%.

Method

1. Data on 59,377 screening mammograms performed in NL from 2014–2016 was obtained from breast screening database, diagnostic imaging data, pathology reports, laboratory data, and ARIA/Tumor Registry data (for those women who received a cancer diagnosis).

Results

- 5,214 (8.8%) of mammograms were abnormal, and 849 (16.3%) of these patients a had subsequent breast biopsy.

- Among those who required a biopsy the median number of tests undertaken was three and among those who did not require a biopsy the median number was two.

Time From Abnormal Screening Mammogram to Final Diagnostic Test in Those Who Did and Did Not Have a Biopsy in NL
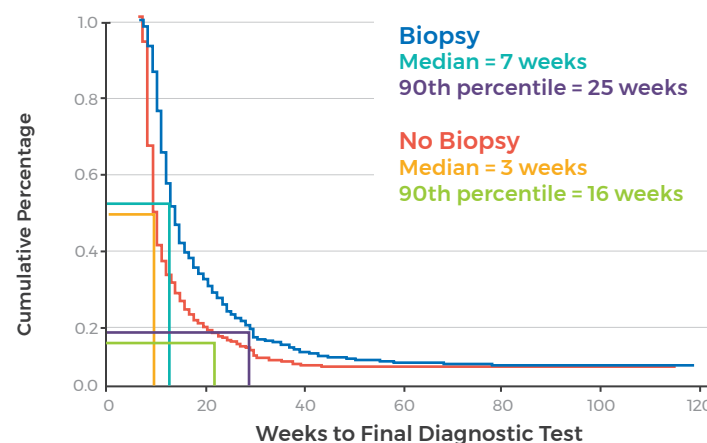
Biopsy
Median = 7 weeks
90th percentile = 25 weeks

No Biopsy
Median = 3 weeks
90th percentile = 16 weeks

Time From Abnormal Screening Mammogram to Final Diagnostic Test in Those Who Did and Did Not Have a Biopsy, by Region

Region	Number	Median weeks	90th centile	% achieved within 7 weeks
Biopsy Performed				
NL	845	7	25	47
Eastern	488	6.5	23	50
Central	185	10	37.4	18
Western	172	4	25	70

Region	Number	Median weeks	90th centile	% achieved within 5 weeks
No Biopsy				
NL	4,331	3	16	65
Eastern	2,457	3	18	67
Central	1,161	4	16	52
Western	713	2	9	80

- In those who had a biopsy, the median time from abnormal screening test to final diagnostic test differed significantly by region. 47% of patients were completed within the target time.

- In those who did not have a biopsy, the median time from abnormal screening to final diagnostic test differed significantly by region. 65% of patients were completed within target time.

- 406 patients who had a biopsy were diagnosed with cancer; 439 had benign lesions. 61% of those with cancer had diagnostic test within the target time; 34% of those with benign lesions had a diagnostic test within the target time.

Conclusions

1. The percentage of abnormal screening mammograms in NL is similar to that of Canada.

2. In NL, time from abnormal test to final diagnostic test was prolonged in 53% of those who had a biopsy and in 35% of those who did not. Rates varied by region, with the best rates in Western Health and worst in Central Health.

Improved Access to Colonoscopy — Impact of Utilization Review

Guideline

1. Access to colonoscopy should be guided by priority and optimal times have been defined by the Canadian Association of Gastroenterology.

   Priority 1 (Urgent): 0–14 days
   Priority 2 (Non Urgent): 0–60 days
   Priority 3 (Baseline Screening): 0–182 days
   Priority 4 (Surveillance): Variable

Practice Point

1. In 2016, Eastern Health met the recommended guidelines for colonoscopy for 44% of priority 1 patients; 52% of priority 2 patients; 36% of priority 3 patients.

Methods

1. Data was obtained from Community Wide Scheduler for five hospitals in Eastern Health (Burin, Carbonear, GB Cross, Health Sciences Centre (HCS) and St. Clare's (SC).

2. During 2017, utilization review was ongoing in three of five hospitals in Eastern Health (Burin, Clarenville, and Carbonear) and continued in the remaining two hospitals in 2018.

3. Access was compared for patients referred in 2016 (baseline) to patients referred in 2017.

Summary of Colonoscopy Data for Eastern Health (2017)

|	Status			
	Attended	Booked	Pending	Total
Priority 1	1,465	2	3	1,470 (10%)
Priority 2	4,665	133	33	4,831 (32%)
Priority 3	931	72	109	1,112 (7%)
Priority 4	1,715	345	5,476	7,536 (51%)
Total	8,776 (59%)	552 (4%)	5,621 (37%)	14,949

Comparison of 2016 and 2017 Data

Median Time to Colonoscopy (Days)						
	Priority 1		Priority 2		Priority 3	
	2016	2017	2016	2017	2016	2017
Tri-Peninsulas*	14	9	135	78	NA	119
St. John's**	22	20	41	40	211	132
Total	17	13	57	51	286	126

Percentage of Patients Meeting Benchmarks						
	Priority 1		Priority 2		Priority 3	
	2016	2017	2016	2017	2016	2017
Tri-Peninsulas*	52	68	32	40	25	64
St. John's**	36	41	63	63	47	60
Total	44	56	52	55	36	62

*Burin, Carbonear & GB Cross   **HSC & SC

Time to Colonoscopy Based on Priority Score (2017)
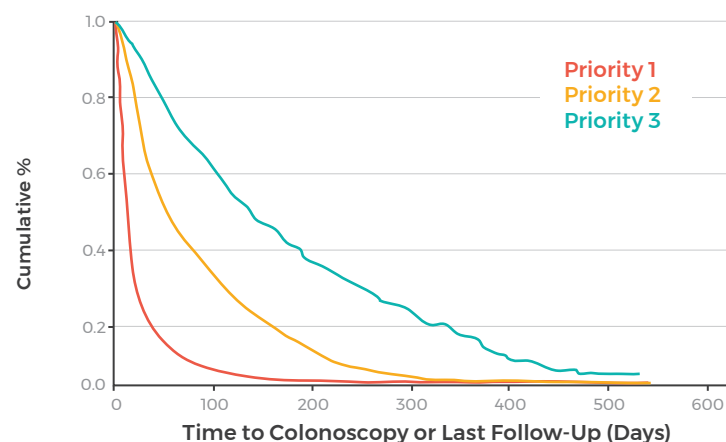
Conclusions

1. Access to colonoscopy, defined by priority, has significantly improved from 2016 to 2017, particularly in the peninsulas' hospitals. This improvement was associated with utilization review in these hospitals.

2. Access is still not optimal, however, changes resulting from 2016 review have not had time to induce change.

Demand for and Access to Orthopedic Interventions in St. John's

Guidelines From Bone and Joint Canada

1. Hip fractures should be fixated within 48 hours.

2. Knee and hip replacements should be undertaken within six months from decision to proceed to having the procedure.

Practice Points

1. By 2036 the number of people aged 65 years or older in NL will increase by 50% compared to 2016. In the St. John's region the number will increase by 67%.

2. Demand for knee and hip replacements will increase, as will the incidence of hip fractures.

Data (PI Dr. A. Furey)

• Referral data was collected from Central Intake database, joint replacement surgical data from Total Joint AC database and Cognos surgical cube for St. Clare's Hospital and Health Sciences Centre.

Annual Incidence of Hip Fractures and Proportion Fixated within 48 hours (2015–2018)
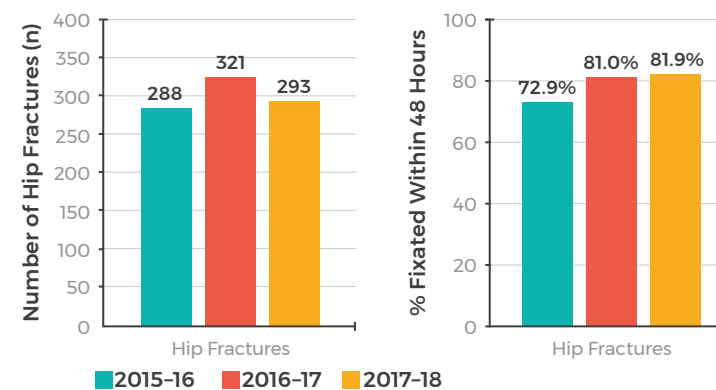
• Annual incidence of hip fractures is approximately 300 and approximately 80% are fixated within 48 hours.

Hip and Knee Replacements by Fiscal Year, Number Referred, Performed, on Waitlist (2012–13 to 2017–18)
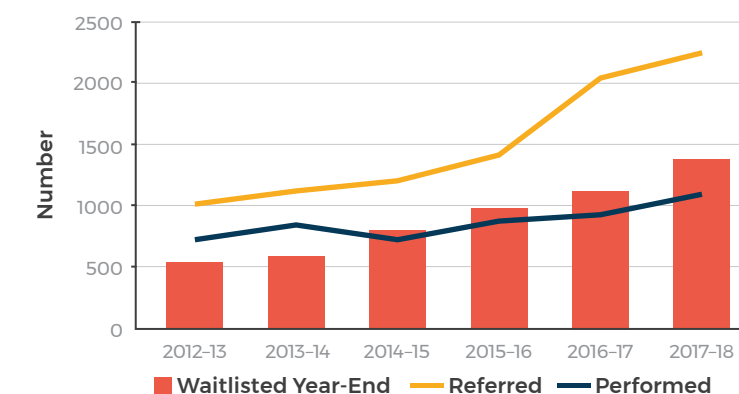
• Number of referrals increased by 185% from 2012 to 2018.
• Number added to the wait list increased by 161%.
• Number of replacements undertaken increased by 50%.
• In 2017–18, 63% of knee replacements and 75% of hip replacements were undertaken within 6 months of being placed on the wait list.

Conclusions

1. There is an inexorable increase in demand for joint replacement and limited capacity to meet the demand. Consequently, only 63% of knee and 75% of hip replacements are undertaken within the recommended time, and the waitlist increases annually.

2. There is constant incidence of hip fractures and 80% are fixated within the recommended time.

3. Demographic change will exacerbate delayed access for orthopedic interventions.

Evaluation of Remote Monitoring in Patients With Chronic Disease

Practice Points

1. Remote monitoring of patients with chronic disease may improve patient outcomes.

2. Electronic monitoring of patients with COPD and/or heart failure started in Eastern Health in 2016.

3. The enrollment of patients, equipment functioning, and threshold setting for intervention by Registered Nurse (RN) was difficult during the feasibility period.

4. In addition to monitoring blood pressure, oxygen saturation and weight, glucose monitoring was added in 2017.

Data

- Program data for a six month period 1 Sept 2017–28 Feb 2018.

Results

- 107 (27%) of 390 eligible patients refused to enroll.
- 171 (70%) of 245 patients who enrolled were referred.

Chronic Conditions Monitored

- COPD 41%
- COPD/HF 9%
- Diabetes 32%
- HF 18%

Percentage of Failed Readings

| | Blood Glucose | Blood Pressure | Oxygen Saturation | Weight |
| Percent | 3.6 | 2.7 | 1.5 | 3.3 |

- Failed readings were infrequent.
- 40 (16%) of 244 electronic units were replaced.
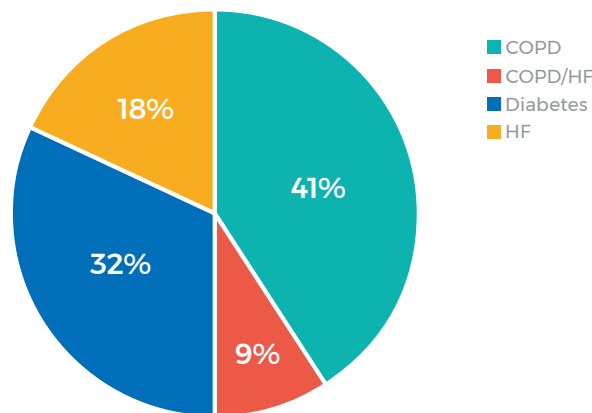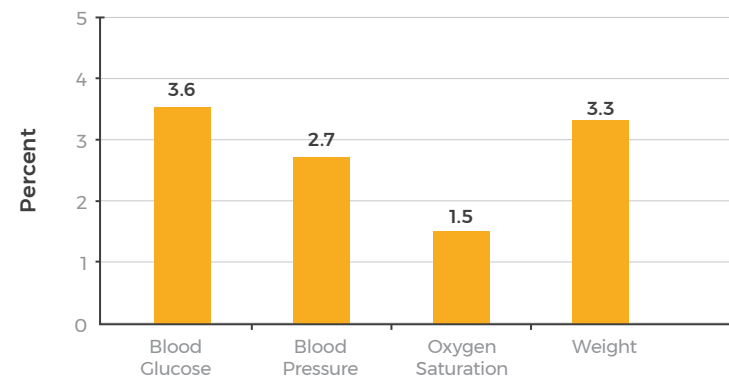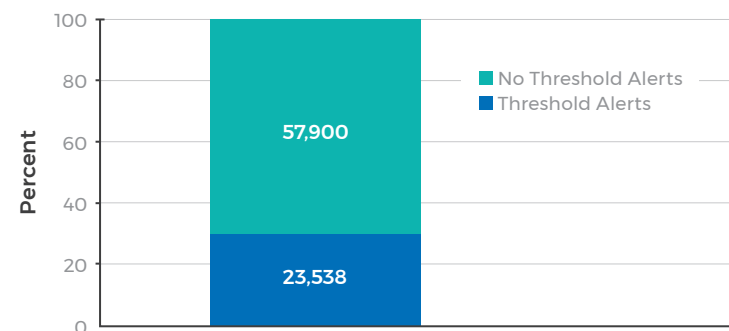
Measurements: 81,438

- No Threshold Alerts: 57,900
- Threshold Alerts: 23,538

- Threshold alerts were very frequent: 29% of measurements.

Perceptions of quality of life, health, self-management, symptom monitoring, knowledge, confidence, and activity limitations improved during the program, but deteriorated following discharge from the program.

Conclusions

1. Compared to the feasibility period in 2016, electronic units were more reliable and failed readings were less frequent, but threshold alerts continued at a high rate.

2. Perceptions of quality of life significantly improved during the program, which lasted 4–6 months, and deteriorated following discharge from the program.

3. Impact on hospitalization and emergency room visits is presented on page 21.

Remote Monitoring Reduced Days in the Hospital in Patients With COPD and/or Heart Failure

Objective

To assess the impact of Remote Monitoring (RM) on admissions, in-hospital days, and Emergency Room (ER) visits in patients with prior hospitalization or ER visit.

Practice Points

1. COPD and/or heart failure patients are at high risk of being re-admitted or attending the ER.

2. RM of weight, blood pressure, and oxygen levels together with reporting of symptoms to a centralized unit staffed by nurses may prevent hospital use.

Data

- 303 patients with COPD and/or heart failure were enrolled in RM Program.

- Data on hospitalizations and ER visits was obtained from Eastern Health Decision Support for the 12 months prior to enrollment in the program and for up to 12 months after enrollment.

- Time to event (admission or ER visit) for the two periods were calculated using Kaplan Meier.

Results

- 184 patients were admitted to hospital pre-RM and 127 after enrollment. The cumulative percentage admitted within the 12 months prior was 61% and post was 40%. The relative risk was not significantly different when comparing the two periods.

- The total number of admissions pre-RM was 289 and the rate of in-hospital bed use was 7.9 days per patient per year, compared to 215 admissions and a rate of in-hospital bed use of 6.9 days per patient per year post enrollment.

Incidence of Hospital Admissions Before and After RM
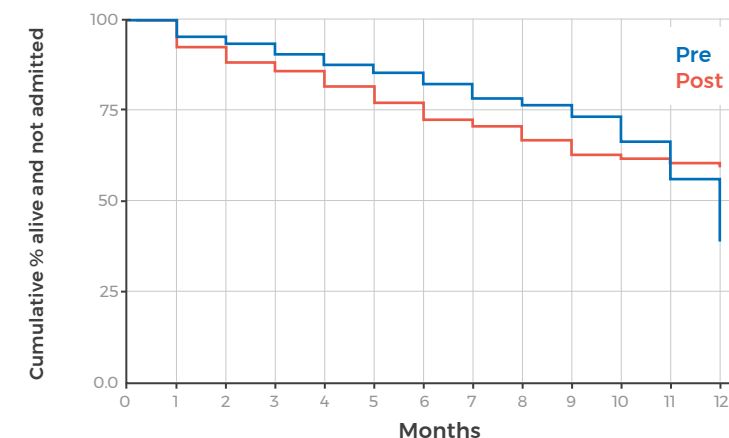
- Days of hospitalization were reduced by 12.7% post enrollment in RM.

- 279 patients visited the ER pre-RM and 224 after. The cumulative percentage that visited the ER in the 12 months prior was 92% compared to 71% post. The relative risk was non-significant.

- The total number of visits to the ER pre-RM was 1,154, a rate of 3.8 visits per patient per year, compared to 874 visits post enrollment, a rate of 3.3 visits per patient per year.

- ER visits were reduced by 13.2% post enrollment in RM.

Conclusions

1. RM in patients with COPD and/or heart failure did not decrease the risk of admission to hospital, but was associated with a 13% decrease in both in-hospital days and ER visits.

2. The success and sustainability of RM depends upon enrolling more patients at high risk of admission, and higher numbers of patients supervised per nurse.

In-Hospital Use for the 12 Months Before and After Remote Monitoring						
	Admissions N	N Patients Admitted	Mean Days Stay per Admission	Total Days in Hospital	Patient Months Follow Up	Days in Hospital/pt/Year
Pre-RM 303 pts	289	184	8.43	2,400	3,636	7.9
Post RM 303 pts	215	127	8.49	1,825	3,178	6.9

Incidence and Appropriateness of Admission to Long-Term Care Facilities in NL

Objective

To determine the annual incidence by region and clinical characteristics of clients admitted to Nursing Homes (NHs).

Data

- The initial Resident Assessment Instrument—Minimum Data Set (RAI-MDS 2.0 ©) completed on admission to NHs 1 Apr 2016–31 Mar 2017 for 1,045 incident clients.

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Results

- The annual incidence rate per 1,000 people aged 65 years and older was 9.3 and varied by region. Mean age was 81.2 years; 43% were aged 85 years and older; 61% were female; 33% were admitted because of reduced physical function only; 37% had severe impairment of cognition.

- Of 487 clients admitted because of impaired cognition or reduced physical function only 6.4% (N=31) did not have extensive to total dependence for activities of daily living and had intact or moderate impairment of cognition.
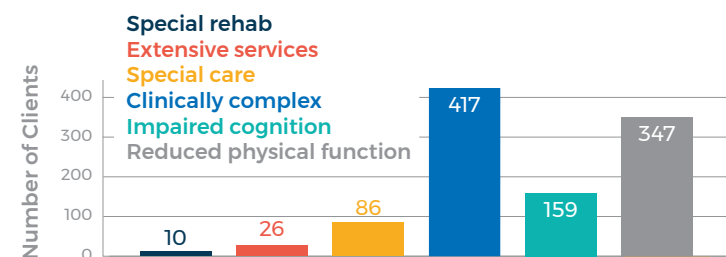
Conclusions

1. The incidence rate of clients admitted to NHs varied by region, with the highest rate in Central Health.

2. The degree of disability was such that the vast majority of clients required admission to a NH.

Age Distribution
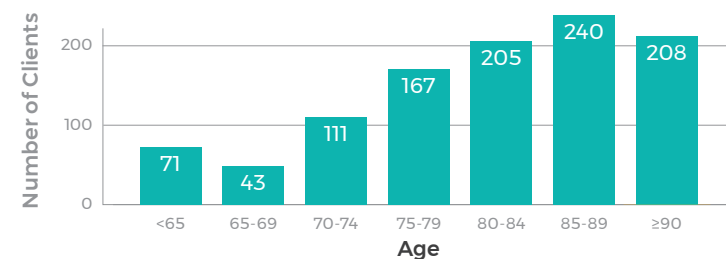
Primary Reason for Admission RUGs Hierarchical Category

Patient Characteristics by Region

	St. John's N = 297	Tri-Peninsulas N = 240	Central N = 268	Western N = 183	Labrador-Grenfell N = 57
Demographics					
N/1,000 people ≥ 65 yrs	8.68	8.27	11.34	9.11	9.99
≥ 85 yrs	43%	38%	44%	48%	37%
Female	62%	58%	62%	59%	40%
Reason for admission					
Impaired cognition	18%	10%	16%	13%	28%
Reduced Physical Function	28%	24%	43%	38%	37%
Other factors					
CHESS* scale zero	62%	47%	44%	55%	61%
Independent/some limitation activities of daily living	27%	21%	14%	16%	32%
Intact/mild to moderate impairment of cognition	65%	63%	65%	55%	76%

*CHESS (changes in health, end-stage disease and signs and symptoms):
A scale to detect frailty and health instability and was designed to identify residents at risk of serious decline.

Evaluation of Need for Nursing Home Beds in NL

Objective

To develop an analytics infrastructure to predict the need for long-term care beds in NL.

Practice Points

1. From 1996–2016 the number of people in NL aged 65 years and older has increased by 69% and is predicted to increase by a further 50% by 2036.

2. The population of St. John's aged 65 years and older is 31,288; tri-peninsula region is 26,952; Central region is 22,832; Western region is 18,439; Labrador-Grenfell region is 5,303.

3. Beds needed = Incidence x Survival.

4. The vast majority of client admissions to Nursing Homes (NHs) were appropriate in 2016–2017.

Data

- Data was obtained from the initial Resident Assessment Instrument—Minimum Data Set (RAI-MDS 2.0 ©) completed on admission to NHs in NL, 1 Apr 2016–31 Mar 2017.

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- Data was not available from Chancellor Park.

- Alternate Level of Care (ALC) in the acute care hospitals was obtained from CIHI.

Results

		St. John's	Tri-Peninsulas	Central	Western	Labrador-Grenfell
N incident clients	≥ 65 years	271	223	259	168	53
	< 65 years	26	17	9	15	4
N prevalent clients in NH ≥ 5 years		331	112	107	128	28
Beds needed *		947	621	692	509	149
Beds available		1,078	582	519	474	145
% ALC in acute care hospitals		12	14	27	34	19

*Assumptions: (a) Median survival for incident clients ≥ 65 years = 2 years
(b) Wait time reduced by 90 days
(c) Beds for prevalent clients ≥ 5 years unchanged presuming this rate stays stable

Rate of Long-Term Care Beds by Region
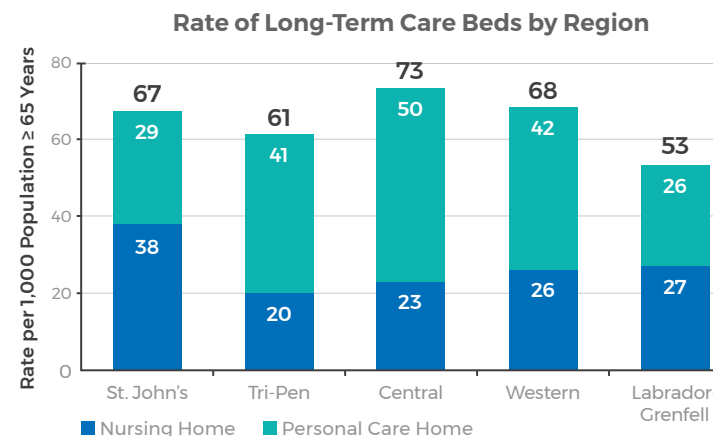
Conclusions

1. The high rate of ALC in acute care hospitals of Central and Western Health is linked to the deficit of NH beds available.

2. Compared to St. John's, Central and Western Health have a high rate of personal care homes and a low rate of NH beds. Restructuring of the long-term care sector will be necessary to improve the use of acute hospital care in NL.

3. An analytics platform to predict long-term care needs should be feasible using RAI data from the single entry system and on admission to institutional long-term care, together with survival, plus predictions of demographic change in the province and prevalence of long-stay patients.

Choosing Wisely NL

Antipsychotic Use in Long-Term Care Facilities in NL

Choosing Wisely Recommendation

1. Don't routinely use antipsychotics as first choice to treat behavioural and psychological symptoms of dementia.

Practice Points

1. People with dementia can become disruptive, behave aggressively, and/or resist care. Identify the cause of the behavior to make drug treatment unnecessary.

2. Health Canada has issued a black box warning for antipsychotic prescriptions in seniors, indicating that their use is strongly contraindicated and poses a significant risk to seniors, including premature death.

3. If prescribed when symptoms are severe, attempts at withdrawal/reduction should be made regularly.

Methods

1. Data was obtained from the Resident Assessment Instrument—Minimum Data Set (RAI-MDS 2.0 ©).
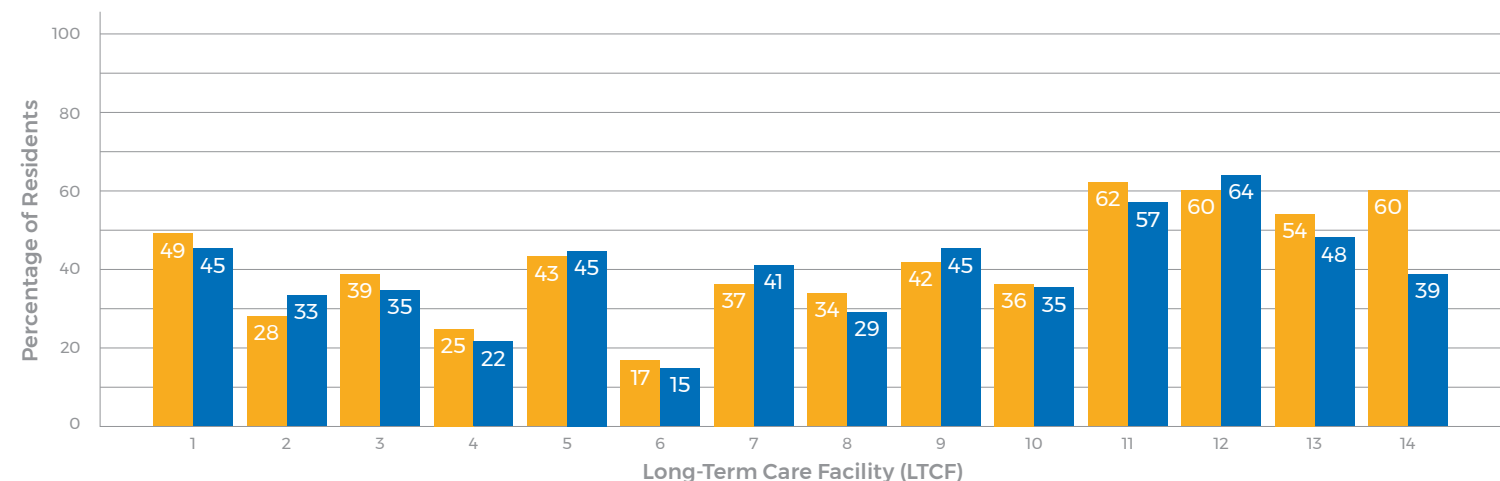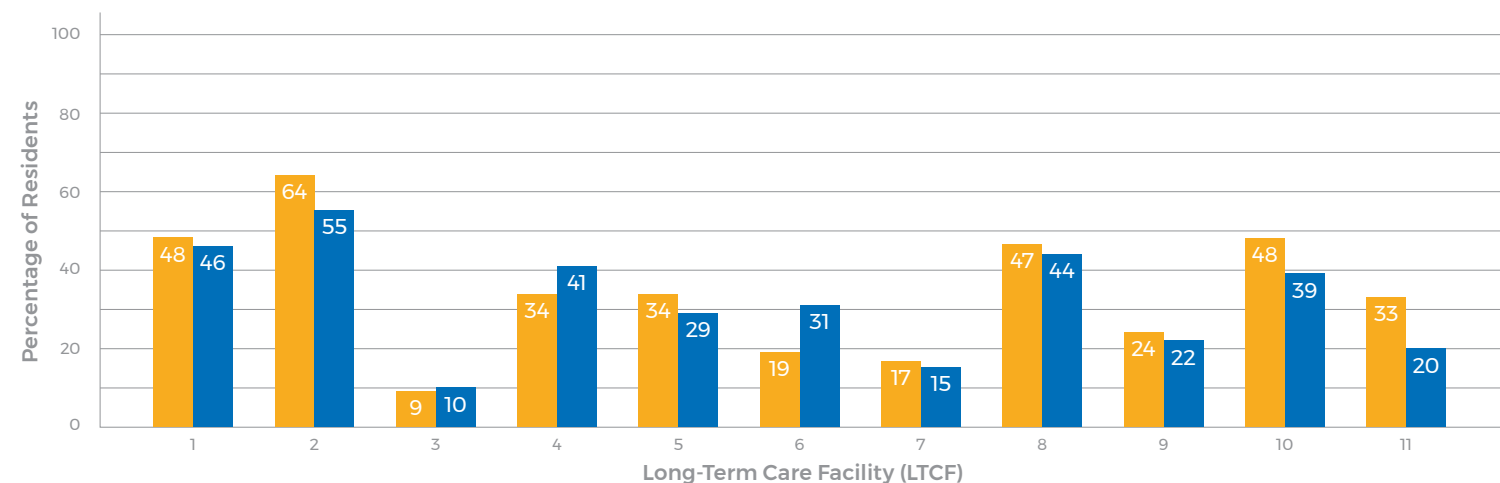
   RAI-MDS 2.0 © interRAI Corporation, Washington, DC, 1995, 1997, 1999. . Modified with permission for Canadian use under license to the Canadian Institute for Health Information. Canadianized items and their description © Canadian Institute for Health Information, 2017.

2. Analysis was performed to determine overall percentage of residents using antipsychotic drugs, as well as the percentage of residents receiving antipsychotics that were potentially inappropriate in each long-term care facility (LTCF).

Conclusions

1. There is a substantial use of antipsychotics in long-term care facilities in the province, the majority of which is inappropriate, with a high degree of variation between facilities.

2. Interventions to reduce the prescription of antipsychotics in long-term care are necessary.

3. These interventions should take into account the barriers to change that currently exist in long-term care facilities in the province.

Results

2016 ■ 2017

Percentage of Residents Receiving Antipsychotic Prescriptions in Eastern Health by LTCF

Percentage of Residents Receiving Antipsychotic Prescriptions in Central Health by LTCF

Percentage of Residents Receiving Antipsychotic Prescriptions in Western Health by LTCF
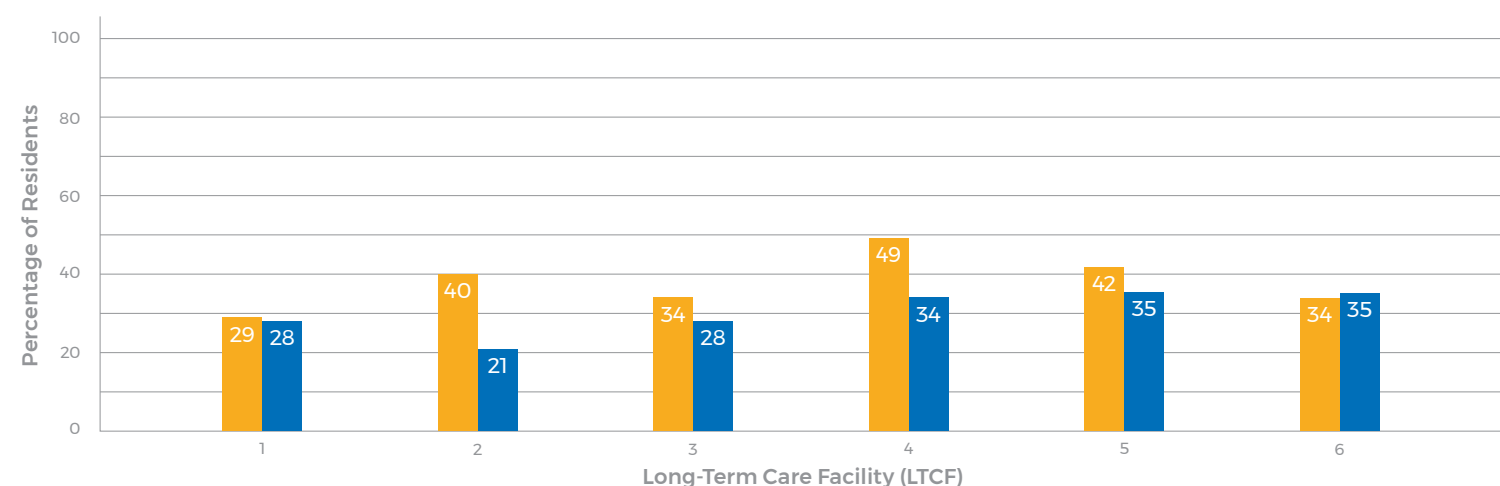
Percentage of Residents Receiving Antipsychotic Prescriptions in Labrador-Grenfell Health by LTCF
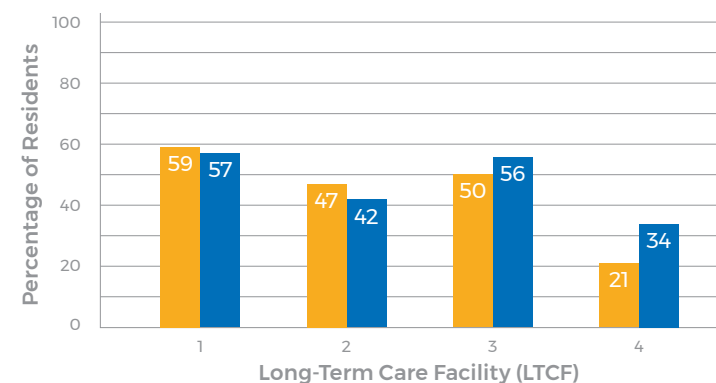
Percentage of Antipsychotic Prescriptions That Were Potentially Inappropriate by Regional Health Authority
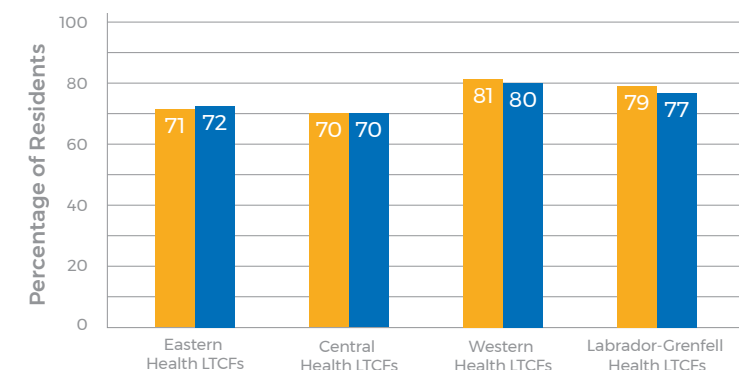
Choosing Wisely NL

Antipsychotic Prescriptions in Long-Term Care Facilities in Eastern Health by Provider

Choosing Wisely Recommendation

1. Don't routinely use antipsychotics as first choice to treat behavioural and psychological symptoms of dementia.

Practice Points

1. NL has the highest use of antipsychotics in long-term care facilities in Canada.

2. 38% of long-term care residents are prescribed antpsychotics province wide, with 73% deemed potentially inappropriate. Rates vary by facility and region.

Data

- Prescriptions of antipsychotics recorded in the pharmacy database from 1 Apr 2017 to 31 Sept 2018 for residents of 11 long-term care facilities in Eastern Health.

Results

- Of 15,642 prescriptions, 69% were written by General Practitioners (GPs) and 29% by Nurse Practitioners (NPs).

- Quetiapine was the most frequently prescribed agent, comprising 60% of total prescriptions.

- 15 GPs and five NPs wrote more than 200 prescriptions for antipsychotics over the 17-month period.

Volume of Antipsychotics Prescriptions by GPs

Volume of Antipsychotics Prescriptions by NPs

Conclusion

1. Audit and feedback will be undertaken to prescribers of antipsychotics in the long-term care setting.

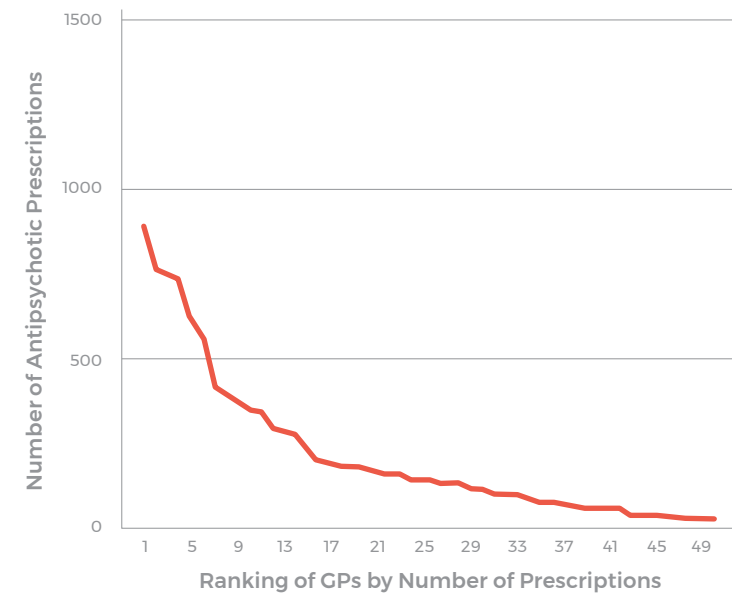---

Choosing Wisely NL

Antibiotic Use for Urinary Tract Infections in Long-Term Care Facilities in NL

Choosing Wisely Recommendation

1. Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract infection (UTI) symptoms are present.

Methods

1. Data was obtained from Eastern, Central and Western Health Infection Prevention and Control (IPAC) programs for 29 long-term care facilities.

2. The rate of antibiotic use was determined as the number of prescriptions per 10,000 resident days.

3. Appropriate use was based on the McGreer criteria.

Conclusions

1. There is a high rate of inappropriate antibiotic use for asymptomatic bacteriuria in long-term care facilities in NL.

2. Interventions to lower the use of antibiotics for asymptomatic UTIs are necessary.

■ Eastern Health　■ Central Health　■ Western Health

Rate of Residents Receiving Antibiotic Prescriptions per 10,000 Resident Days
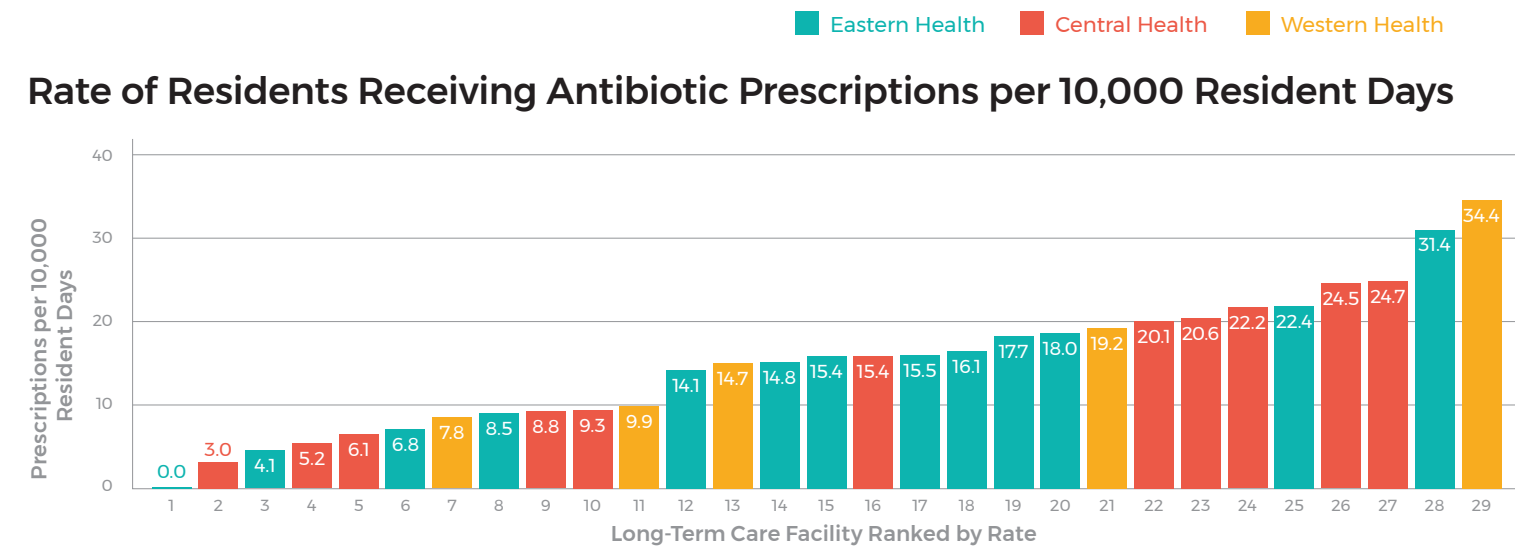
Percentage of Antibiotic Prescriptions That Were Potentially Inappropriate

Falls in Nursing Homes in NL

Impact of a Pharmacist-Administered Deprescribing Intervention on Nursing Home Residents: A Randomized Controlled Trial

Objective

To determine the incidence rates of falls in Nursing Homes (NHs) and the risk factors associated with these falls.

Practice Points

1. Falls cause more than 90% of hip fractures in the elderly, and 20% die within a year of their fracture.

2. Falls are associated with 40% of long-term care admissions.

Data

- The Resident Assessment Instrument—Minimum Data Set (RAI-MDS 2.0 ©) annual and quarterly assessments performed in NHs, which notes whether a fall has occurred in the prior 30 days. 11,353 assessments were performed on 3,453 individual residents from 1 Apr 2017 to 31 Mar 2018.

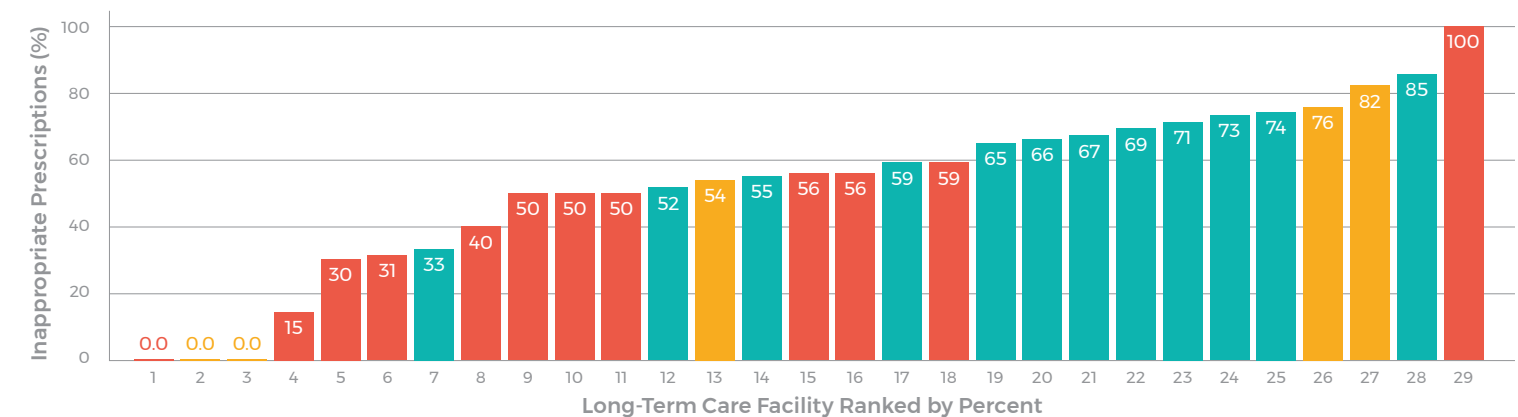   RAI-MDS 2.0 © interRAI Corporation, Washington, DC, 1995, 1997, 1999. . Modified with permission for Canadian use under license to the Canadian Institute for Health Information. Canadianized items and their description © Canadian Institute for Health Information, 2017.

- The rate of falls was determined by the number of individuals who had at least one fall reported in the last 30 days divided by the number of individuals who had at least one assessment per 100 individuals.

Results

- The monthly incidence rate of falls was 10%. 14.4% of residents reported a single fall in the last 30 days when all assessments were analyzed, while 7.6% reported more than one fall.

- The mean rate of falls in the prior 30 days was 22 per 100 residents. This rate varied by Regional Health Authority (RHA) and facility.

Conclusions

1. Falls occur frequently in NHs. A fall prevention program should be implemented in each NH with a focus on residents at risk of falling.

2. Independent risk factors for falls were a moderate to very high CHESS score: wandering behavior exhibited in 4 to 7 of the last 7 days; independent or supervised bed mobility; use of a cane, walker or crutch; unsteady gait in the last 7 days; hip fracture in the last 180 days; and daily antipsychotic use in the last 7 days.

Fall Rate by RHA (1 Apr 2017–31 Mar 2018)
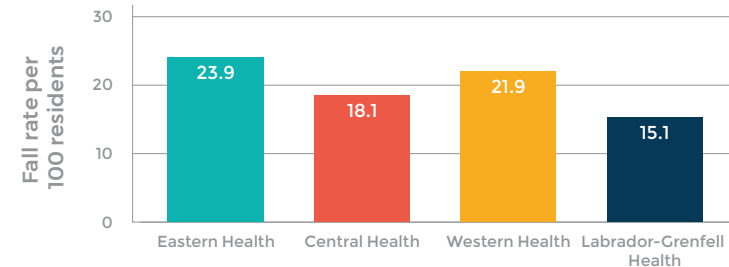
Fall Rate by Facility (1 Apr 2017–31 Mar 2018)
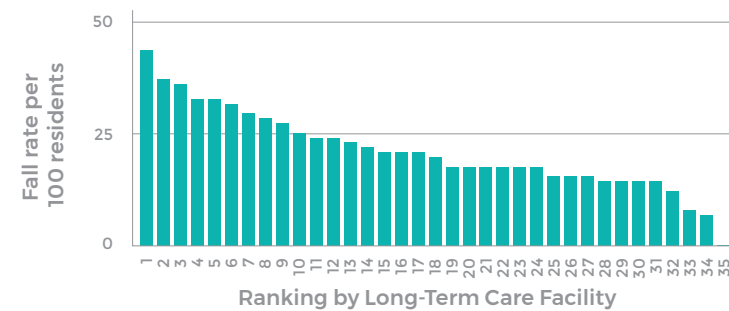
Independent Risk Factor for Falling in Multiple Logistic Regression

Risk Factor	N Residents with Risk Factor	Fall Rate	Relative Risk
Moderate to very high CHESS score	134	31	1.65
Wandering behavior in 4 to 7 of the last 7 days	273	41	2.93
Independent or supervised bed mobility	817	30	1.70
Use of a cane, walker or crutch	457	33	1.74
Unsteady gait in the last 7 days	936	32	3.05
Hip fracture in the last 180 days	22	72	11.58
Daily antipsychotic use in the last 7 days	704	28	1.65

Objective

To implement and assess whether a deprescribing initiative can safely reduce the number of unnecessary medications among long-term care (LTC) residents in NL.

Practice Points

1. Deprescribing is the process of intentionally stopping a medication or reducing its dose to improve the person's health or reduce the risk of adverse effects.

2. Aging is commonly accompanied by an increase in co-morbidities and medications, which can be associated with serious adverse drug reaction and interactions.

Methods (PI Dr. D. Kelly)

1. Residents on one unit of St. Patrick's Mercy Home were randomized to receive a deprescribing intervention or usual care. Nursing staff were educated about the deprescribing process and non-pharmacologic supports before the study began.

2. The intervention group received an in-depth medication review with a focus on deprescribing. Individualized plans to taper and discontinue medications were developed and discussed with prescribing physicians and the resident/family. Usual care residents received routine medication reviews.

3. Numbers of prescribed regular and as-needed medications were measured at baseline, three months and six months.

4. Resident Assessment Instrument (RAI) scales, including Cognitive Performance and Activities of Daily Living (disablement), were also measured. Types of medications deprescribed, as well as the number of recommendations made and accepted were recorded.

Medications Successfully Deprescribed at Three Months, by Class
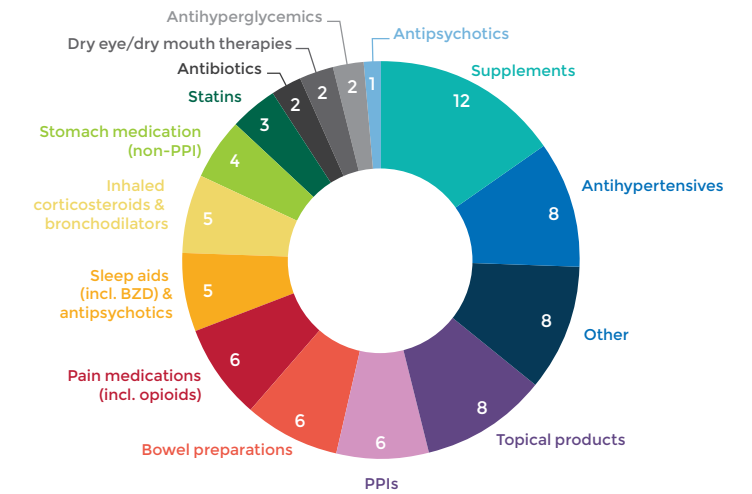
Average Number of Medications per Patient at Baseline, Three Months and Six Months
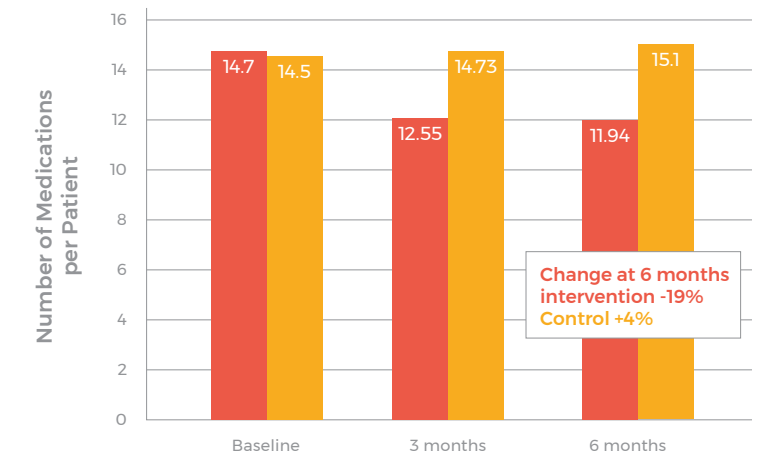
Conclusion

1. A pharmacist-administered deprescribing intervention in a nursing home ward significantly reduced the number of medications residents were talking by 2.78 medications per resident at six months.

Reduction in Potentially Unnecessary Biochemical Testing by General Practitioners in Eastern Health

Practice Points

1. Blood urea is not a necessary test to measure kidney function in stable patients.

2. Serum ferritin is likely not useful as a screening test for iron status in patients with normal hemoglobin and MCV/MCH, except maybe in females of reproductive age where oral iron may be prescribed.

3. Creatine kinase is no longer recommended for monitoring asymptomatic patients on statins.

4. Bilirubin and ALT are reasonable tests to evaluate liver function and AST is usually unnecessary.

5. Other than on occasions in the management of gout and cell breakdown disorders, uric acid is not usually clinically helpful.

6. LDH is generally indicated only in growth disorders and hemolytic anemia.

Methods

1. Tests ordered by General Practitioners (GPs) in Eastern Health were compared for last six months of both 2015 and 2017, and analyzed by GP. In August 2016, Eastern Health provided a new requisition form which omitted blood urea, AST and LDH. In 2017, Quality of Care NL provided academic detailing on blood urea, ferritin, creatine kinase and LDH.

2. High volume ordering was arbitrarily defined as 200 tests or more in six months.

3. GPs with less than 10 tests have been excluded.

Conclusion

1. The proportion and number of GPs who order high volumes of potentially unnecessary tests have decreased substantially comparing 2017 to 2015.

Number of Tests by GPs (2015 versus 2017)

■ Last six months of 2015   ■ Last six months of 2017
GPs with less than 10 tests have been excluded

Blood Urea Tests

Last 6 months of 2015 — 210 (54.6%) doctors ordered more than 200 tests

Last 6 months of 2017 — 54 (14.0%) doctors ordered more than 200 tests

Ferritin Tests

Last 6 months of 2015 — 65 (21.3%) doctors ordered more than 200 tests

Last 6 months of 2017 — 65 (21.3%) doctors ordered more than 200 tests

Creatine Kinase Tests

Last 6 months of 2015 — 60 (20.3%) doctors ordered more than 200 tests

Last 6 months of 2017 — 35 (11.9%) doctors ordered more than 200 tests

AST Tests

Last 6 months of 2015 — 18 (5.5%) doctors ordered more than 200 tests

Last 6 months of 2017 — 4 (1.2%) doctors ordered more than 200 tests

Uric Acid Tests

Last 6 months of 2015 — 41 doctors ordered more than 200 tests

Last 6 months of 2017 — 25 doctors ordered more than 200 tests

LDH Tests

Last 6 months of 2015 — 20 doctors ordered more than 200 tests

Last 6 months of 2017 — 2 doctors ordered more than 200 tests

Decrease in Antibiotic Utilization by General Practitioners in NL

Choosing Wisely Canada Recommendations

1. Don't use antibiotics for upper respiratory infections that are likely viral in origin, such as influenza-like illness, or self-limiting, such as sinus infections of less than seven days of duration.

2. Don't prescribe antibiotics in adults with bronchitis/asthma and children with bronchiolitis.

3. Don't use antibiotics in adults and children with uncomplicated sore throats.

4. Don't use antibiotics in adults and children with uncomplicated otitis media.

5. Don't prescribe antibiotics for asymptomatic bacteriuria (ASB) in non-pregnant patients.

Practice Point

1. The rate of antibiotic prescriptions per 100 inhabitants in Canada is 64. The rate in NL per 100 inhabitants is 95.5.

Method

1. Data was obtained from the NLPDP program for active patients aged 65 years and older (received at least one prescription for any drug) 1 Apr 2013–30 Mar 2018.

Results

- 84% (N = 236,235) of antibiotic prescriptions were provided by General Practitioners (GPs).

- There is **9.0% decrease** in the number of antibiotics prescriptions by GPs in 2017 compared to 2016.

Conclusions

1. During the past year, the volume of antibiotic prescriptions provided in the NLPDP program has decreased by 9.0%. However, antibiotic use remains high.

2. As part of an audit and feedback program, GPs will receive their personal data compared to their peers, both as an absolute volume and as a rate per 100 patients aged 65 years and older seen annually.

Number of Antibiotics Prescriptions Ordered by GPs by Fiscal Year

Ab rate/100 NLPDP active patients
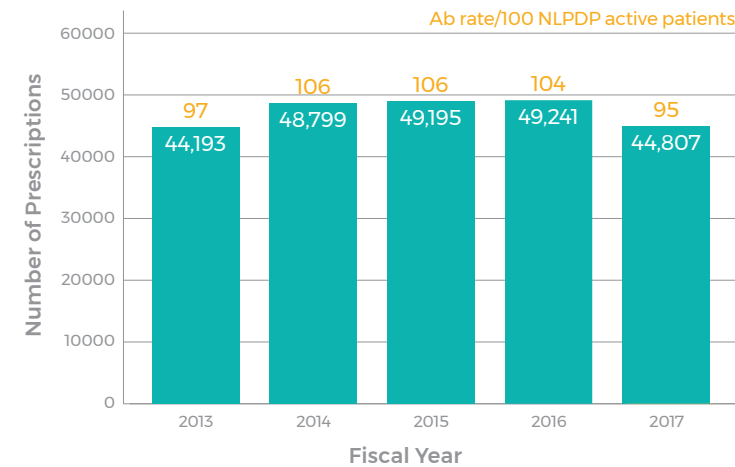
Note: The rate per 100 active patients in the NLPDP program is similar to that of NL per 100 inhabitants.

Rate of Antibiotics Prescription by GP

Rates per 100 NLPDP Active Patients 2017-18
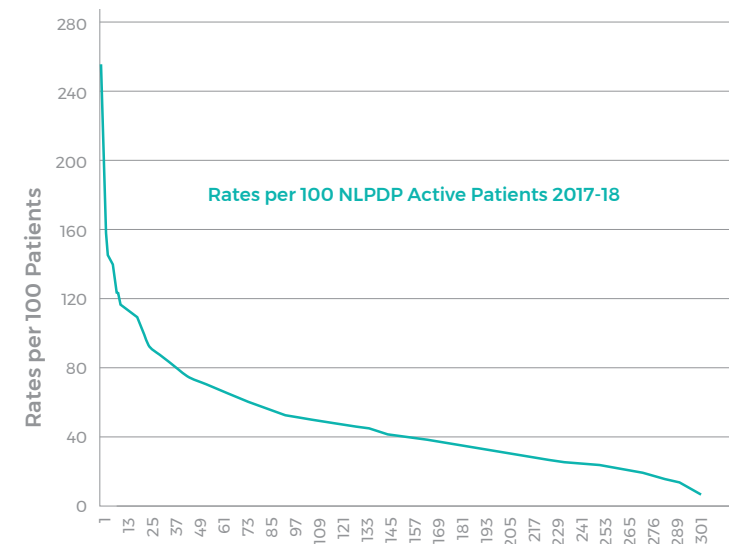
GPs with less than 10 antibiotics prescriptions are excluded

Limitation: some GPs may also have worked in Emergency Rooms (ER). Their rate includes both clinic and ER prescriptions.

Chest CT Scanning in NL

Choosing Wisely Recommendations

1. Don't perform CT screening for lung cancer among patients at low risk for lung cancer.

2. Don't perform chest CT angiography to evaluate for a possible embolism in patients with low clinical probability and negative results of a highly sensitive D-dimer assay.

Practice Points

1. CT scanning has been found to reduce lung cancer mortality in a well-defined population of patients at high risk for lung cancer defined by age 55–74, at least a 30 pack/year history of tobacco use, and smoking within the previous 15 years.

2. Unnecessary screening is associated with false-positive and false-negative results, incidental findings, over diagnosis, unnecessary anxiety and invasive procedures, and cumulative exposure to radiation that can cause cancer.

3. There is strong evidence that in patients with low likelihood of having a pulmonary embolus (PE) as determined by a clinical prediction rule and a negative highly sensitive D-dimer assay effectively excludes clinically important PE.

Data

- Evaluation of CTs reported on PACs for NL by Dr. Mark Hayward (2008-2017).

Results

- Of 86,971 CT scans done in NL in 2017, 23,868 (27.4%) were for chest CT.

- The rate of chest CT was 47 per 1,000 people.

- The number has increased by 45.4% over the past decade.

Chest CT Rate per 1,000 People by Region
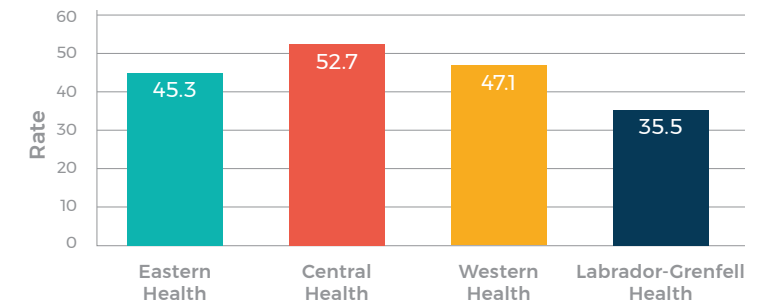
The highest rate of CT chest is in Central Health.

Conclusions

1. The rate of chest CT scanning in NL is high.

2. CT scanning for lung cancer should be used only in those who meet strict criteria for high risk of lung cancer.

3. CT angiography for PE is not indicated in patients with low clinical probability of PE and negative D-dimer.

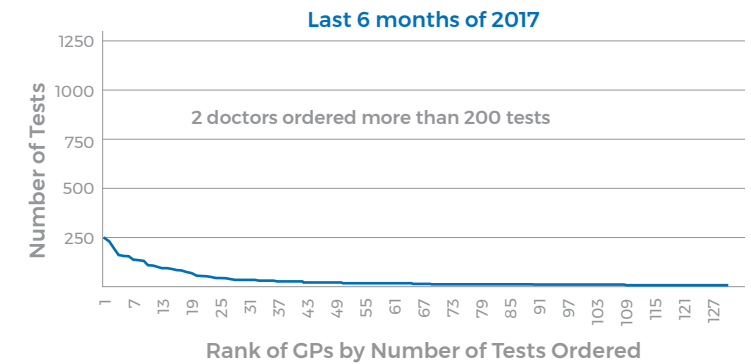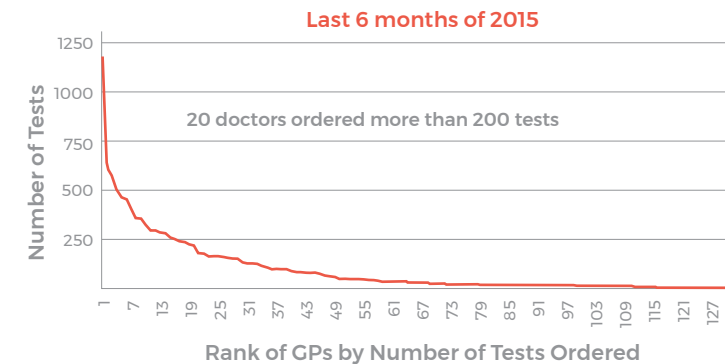# Decrease in Ferritin Testing in Patients with Normal Hemoglobin Level

Guideline

1. Ontario Association of Medical Laboratories guidelines states that screening of the general population for iron deficiency is not indicated.

Objective

To determine whether ferritin testing in patients with normal hemoglobin was undertaken predominantly in younger women with increased requirements for iron.

Practice Points

1. At-risk populations with clinical signs and symptoms and patients with microcytic anemia should be considered for testing. These include those with increased requirements (menstruating females, pregnancy, lactation, and growing infants and children), people with increased blood loss, decreased intake, or decreased absorption.

2. Serum iron, iron binding capacity, and percent saturation testing for iron deficiency is not encouraged because serum ferritin is preferable.

Method

1. Hemoglobin, iron saturation, and ferritin tests undertaken at Eastern Health by General Practitioners (GPs) in 2016 and 2017 were studied over four six-month periods. Academic detailing was undertaken with GPs in Eastern Health on ferritin testing in the first six months of 2017.

Results

Number of Hemoglobin Tests by Six Month Period in 2016 and 2017
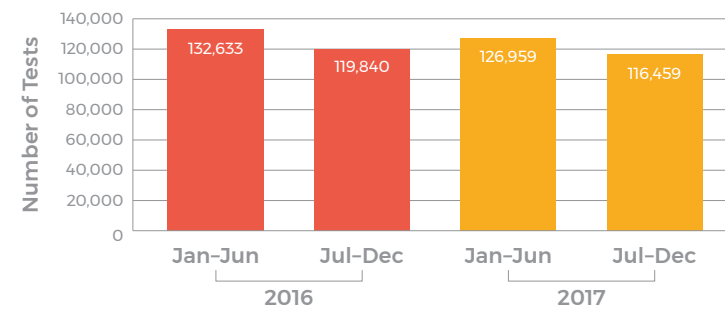
There was 4% drop in hemoglobin testing from 2016 to 2017

Number of Iron Saturation Tests by Six Month Period in 2016 and 2017
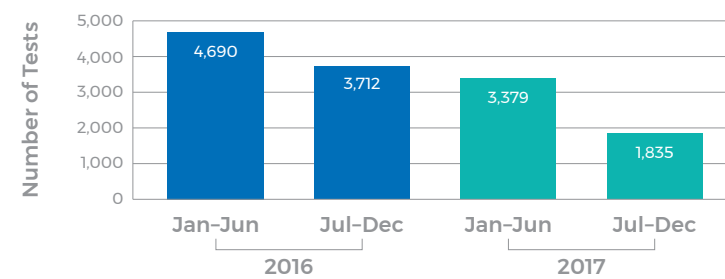
There was a 51% drop in iron saturation testing comparing Jul–Dec 2016 to Jul–Dec 2017

Number of Ferritin Tests by Six Month Period in 2016 and 2017
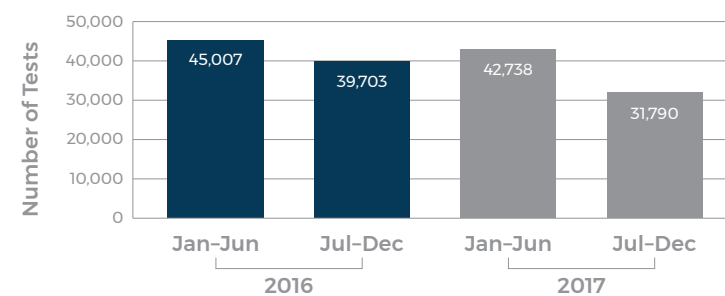
In Jul–Dec 2017, compared to Jul–Dec 2016, there was a 20% reduction in ferritin testing

Number of Ferritin Tests Ordered by GPs by Sex and Age in 2017 Who Had Normal Hemoglobin, MCV, and MCH
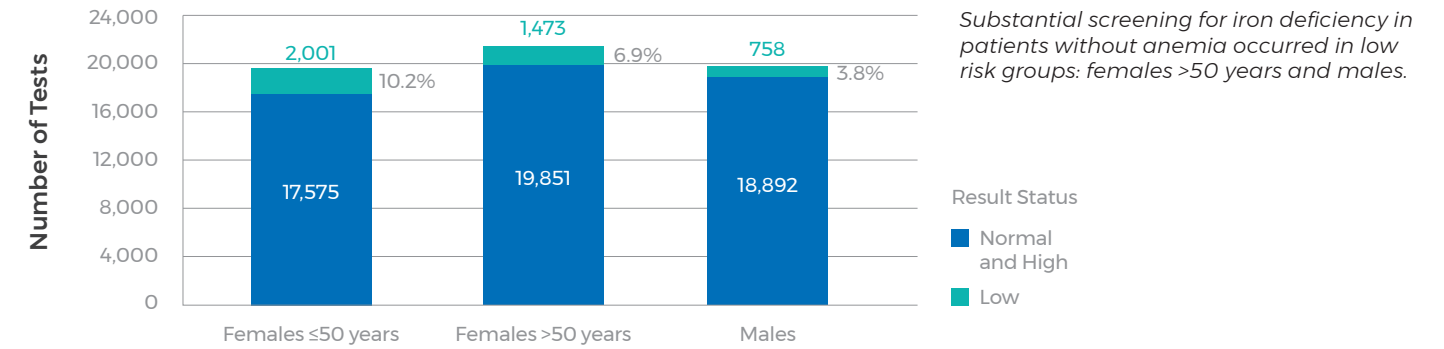
Substantial screening for iron deficiency in patients without anemia occurred in low risk groups: females >50 years and males.

Ferritin Testing in Male Patients and Females >50 Years With Normal Hemoglobin, MCV, and MCH by GP

80% of potentially unnecessary testing is ordered by **28% of GPs**
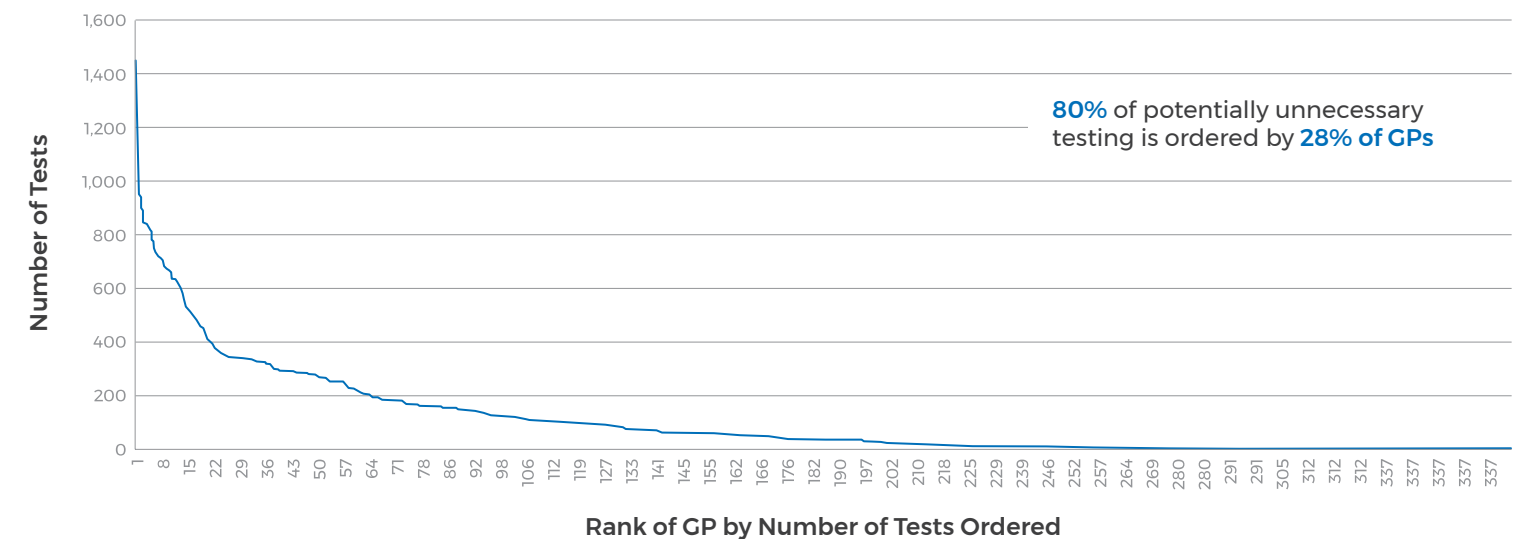
Conclusion

1. Iron deficiency screening using ferritin testing in non-anemic patients in the general population is being undertaken by some GPs and is not indicated unless the patient is in an at-risk group.

Proton-Pump Inhibitor Prescriptions by Nurse Practitioners in NL

Choosing Wisely Recommendation

1. Don't maintain long-term Proton-Pump Inhibitor (PPI) therapy for gastro-intestinal symptoms without an attempt to stop/reduce PPI at least once per year in most patients.

Practice Points

1. Long-term PPI use predisposes to enteric infection, fractures, pneumonia, acute interstitial nephritis, hypomagnesemia, vitamin B12 deficiency.

2. Patients with Barrett's esophagus, severe esophagitis, gastrointestinal bleeding or requiring Prednisone/NSAIDs use are exempt from this guideline.

3. For mild–moderate gastroesophageal reflux, PPIs may be necessary for 4–6 weeks.

4. For peptic ulcer disease, PPIs may be necessary for up to 12 weeks.

Methods

1. Using the NLPDP database, each patient's PPI therapy was observed for a period of one year starting with the first PPI prescription in the 2014–15 fiscal year.

2. The following PPI medications were considered: Rabeprazole, Omeprazole, Pantoprazole, Dexlansoprazole, Lansoprazole, Esomeprazole.

3. People on steroids were excluded: Prednisone.

4. People who were on NSAIDs for more than 75% of the time during the observation period were excluded: Ketorolac, Mefenamic acid, Ibuprofien, Ketoprofen, Diclofenac, Naproxen, Meloxicam, Indomethacin, Celecoxib.

Results

- 13,632 of 49,080 (27.8%) people aged 65 years and older were prescribed a PPI for 1 year or more.

- Prescribers included 706 General Practitioners (GPs) and 65 Nurse Practitioners (NPs).

Number of Patients Who Maintained PPI Therapy by NP for 1+ Year in 2014–2015 Fiscal Year

Number of Patients vs. NPs (n=26), from Higher Number to Lower Number

Number of Patients Who Stopped or Reduced Long-Term PPI Use for at Least One Month Within the One Year Period by NP
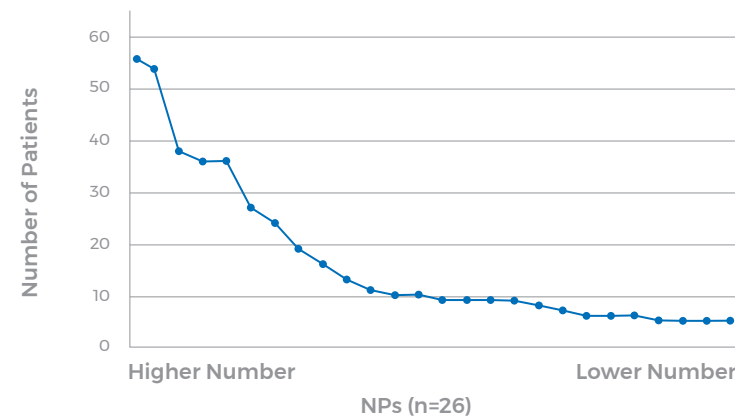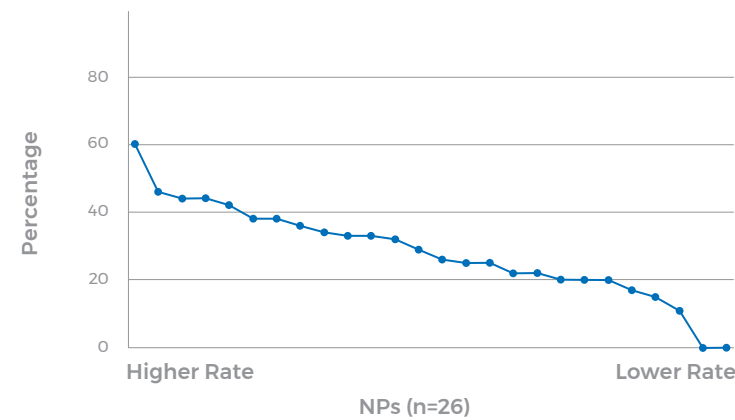

Percentage vs. NPs (n=26), from Higher Rate to Lower Rate

Conclusions

1. Long-term PPI use (more than one year) occurs frequently in patients aged 65 years and older. NPs account for 8.4% of prescribers.

2. Rates of long-term PPI use varied by NP and by GP.

3. A deprescribing coalition in NL (SaferMedsNL) will embark upon an effort to improve appropriate prescribing of PPIs.

Telehealth to Facilitate Services Related to Autism Spectrum Disorder for Families and Health Care Providers in Rural Areas of Western NL

Objective

To improve access for children diagnosed with Autism Spectrum Disorder (ASD) in rural areas to early intervention services.

Practice Points

1. Children diagnosed with ASD are eligible to receive early intervention services through an Applied Behavioural Analysis (ABA) process, traditionally provided face-to-face.

2. The three-day ABA training was provided to children in rural areas via Telehealth.

Data (PI Karen Tulk)

- Surveys were completed by 47 family members who participated at five peripheral training sites over three separate three-day training sessions in 2016.

- 78% of families were physically located at a peripheral site for training, at which no facilitator was present.

Results

Travel Required if No Telehealth
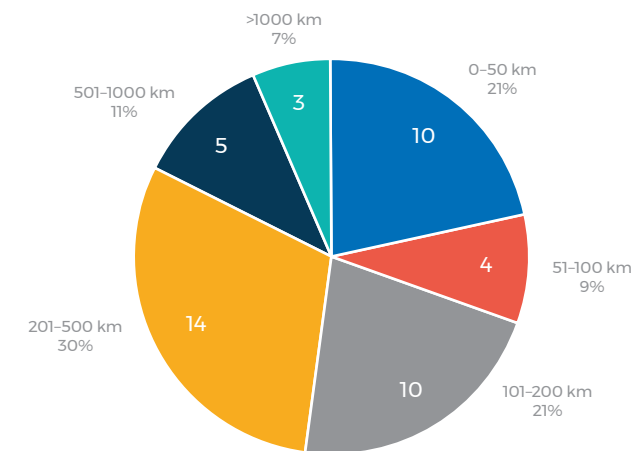
- Nearly half of the families (48%) would have had to travel more than 200 km if no Telehealth option was available.

Cost Savings to Family

14 — 30% $501–200; 16 — 35% $101–500; 15 — 33% <$100
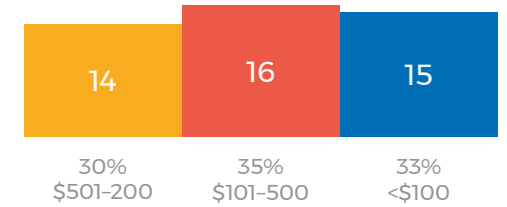
- Cost savings of more than $500 were estimated by 30% of families.

Telehealth vs. In-Person Health Care

7% No answer; 23% Telehealth worse; 32% The same; 38% Telehealth better
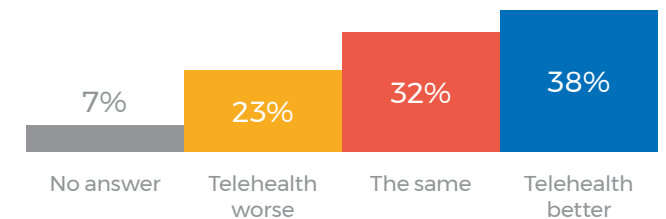
- 70% felt Telehealth was the same or better than in-person health care.

- 87% were moderately/strongly satisfied with program.

- 9% indicated a preference for training in-person.

- Although implementation of Telehealth training was initially challenging for facilitators, ultimately they were satisfied with it as a method of program delivery.

Conclusions

1. Telehealth is a viable method of delivery of the Applied Behavioural Analysis process to patients with Autism Spectrum Disorder.

2. Telehealth reduced travel and costs and was considered by the majority of families to be the same or as good as in-person health care.

Radiology Use by General Practitioners in Eastern Health

Practice Points

1. In 2017, NL had the second highest number of CT exams recorded per 1000 population among Canadian provinces, and ordering rates were 1.8 times higher in NL than in Alberta.

2. Across the country, wait times for these and other Diagnostic (DI) tests are long: in 2016, Canadians were estimated to wait 3.7 weeks for a CT exam, 11.1 weeks for an MRI exam and 4.0 weeks for an ultrasound test (USS).

3. While wait times at Eastern Health facilities for CT and MRI are reasonable, those for ultrasound are much longer than national averages.

4. The decision to order a DI test is often subjective, relying on clinician judgment.

5. Unfortunately, physicians currently have no way of knowing whether they order more or less DI tests than their peers, and this information may help inform these subjective decisions.

Methods (PI Dr. K. Aubrey-Bassler)

1. Radiology tests ordered by General Practitioners (GPs) in Eastern Health were obtained from the NL Centre for Health Information for the period 1 Apr 2016 to 31 March 2017.

2. Rate of ordering per physician was determined by the total number of tests ordered per 1,000 patients in their practice.

Results

DI Ordering Rates by GPs in Eastern Health 2016–2017

Mean = 1367
Std. Dev. = 428
N = 272

Mean DI tests per 1,000 patients (adjusted for patient characteristics)

- Wide variability was observed in the rates of DI test ordering between physicians.
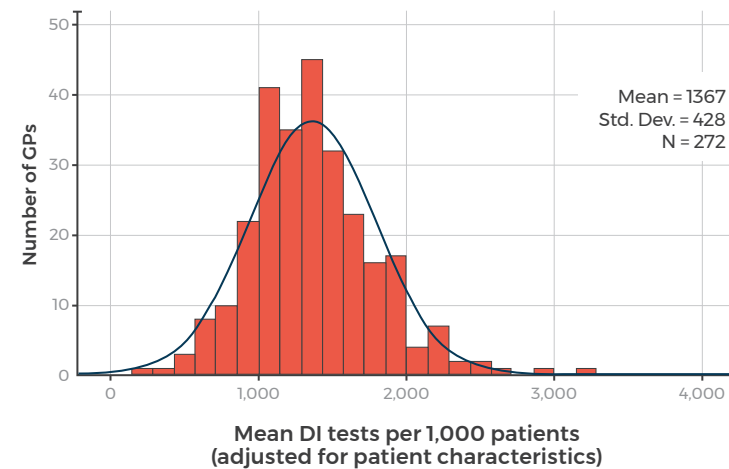
- The mean rate of tests ordered by GPs was 1,367 per 1,000 patients (approximately 1.4 per patient).

Conclusions

1. Quality of Care NL has developed an academic detailing program, including the presentation of clinician summary utilization reports, to encourage physicians to consider the appropriateness of care.

2. A randomized trial will be conducted to compare the effectiveness of the current utilization report with detailing (group 1) and without detailing (group 2), to a new format of utilization report with detailing (group 3) and without detailing (group 4) on diagnostic imaging ordering practices among General Practitioners.

Inherited Cardiac Disorders Causing Sudden Cardiac Death in NL

Guideline

1. International treatment guidelines for arrhythmogenic right ventricular cardiomyopathy (ARVC) suggest that Implantable Cardioverter Defibrillator (ICD) treatment should wait for abnormal cardiac tests and SHOULD NOT* be based on genetic information.

*The research conducted within this province shows that adult patients with ARVC caused by a mutation in the TMEM43 gene should have an ICD inserted before symptoms develop.
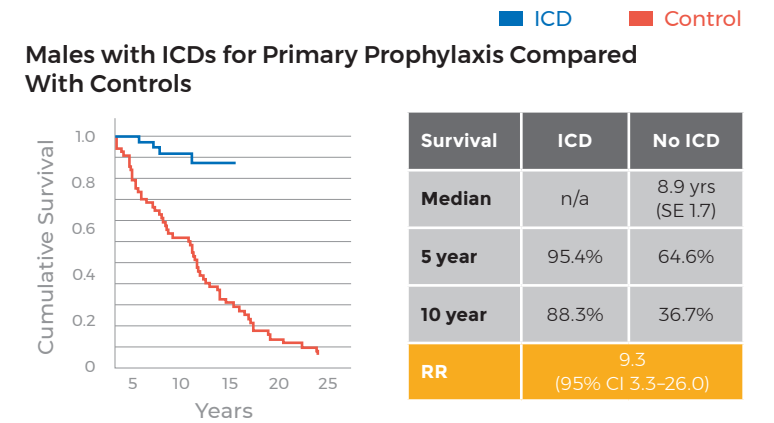
Practice Points

1. NL has a higher rate of Sudden Cardiac Death (SCD) than any comparable published series, and three times the rate when compared to an identically ascertained cohort in Ontario.

2. A combination of past medical records, large family trees, extensive cardiac testing and genomic laboratory work in NL led to the discovery of a gene (*TMEM43*) and a mutation (p.S358L) causing ARVC.

3. The natural history of this type of ARVC shows that it is often lethal at a young age particularly in men.

4. Other founder mutations causing cardiac disease (*PKP2, RYR2, TNNT2, TNN13*, etc.) also impact survival.

5. ICD implantation can prevent SCD in ARVC caused by *TMEM43* p.S358L.

6. Exercise worsens the disease outcome in ARVC caused by *TMEM43*.

Data (PI Dr. K. Hodgkinson)

1. Information on over 1000 NL families with inherited cardiac disease has been collected in the cardiac genetics clinic, which has been ongoing since 1996.

2. One set of 27 families (spanning thousands of individuals over 12 generations in some cases) had ARVC caused by the p.S358L mutation in *TMEM43*, resulting in the loss of many young lives.

Time to Death or Last Follow-Up From the Start of the Study in 148 ICD Individuals and 148 Matched Controls

■ ICD ■ Control

Males with ICDs for Primary Prophylaxis Compared With Controls

Survival	ICD	No ICD
Median	n/a	8.9 yrs (SE 1.7)
5 year	95.4%	64.6%
10 year	88.3%	36.7%
RR	9.3 (95% CI 3.3–26.0)	

Males with ICDs for Secondary Prophylaxis Compared With Controls

Survival	ICD	No ICD
Median	16.9 (SE n/a)	4.5 yrs (SE 1.4)
5 year	100%	50%
10 year	81.6%	25.4%
RR	9.7 (95% CI 3.2–29.6)	

Females with ICDs for Primary Prophylaxis Compared With Controls

Survival	ICD	No ICD
Median	n/a	25.5 yrs (SE 3.7)
5 year	96.7%	84.7%
10 year	88.2%	69.3%
RR	3.6 (95% CI 1.3–9.5)	
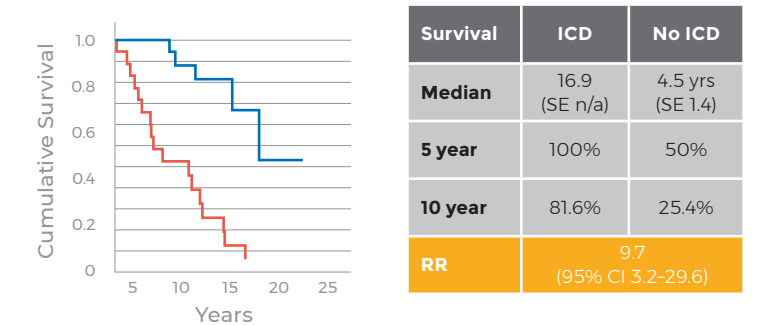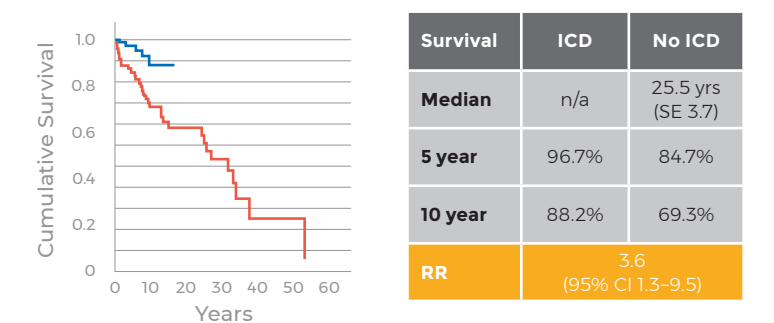
Conclusions

1. ARVC caused by a *TMEM43* p.S358L mutation is a lethal condition particularly in males. Primary prophylaxis with an ICD in male mutation carriers prolonged life expectancy by 31 years, and significantly improved survival in female carriers.

2. If international guidelines were applied to this population, hundreds would have died before treatment was offered.

Knowledge Translation: How Communicating Your Research Can Make All the Difference!

You've got an idea for a research project, but have you thought about who is going to use the results and how they're going to lead to real change?

There is typically an enormous delay between when knowledge is produced and when it has a real impact on the health care system (10+ years!). Engaging knowledge users throughout the lifecycle of a research project can:

- Increase their buy-in for the project.
- Ensure that knowledge will be shared with the right groups in a way that is timely and useful.

Knowledge Translation (KT) Questions

A	**Who** is going to use the findings? Knowledge users can include groups such as: · Patients · Policy and decision makers · Clinicians and other health care professionals
B	**Should** the information be shared with them?
C	**How** can we reach them effectively?

Phases of Effective KT

Integrated KT	Proactively identifying and working with knowledge users throughout the project
End of Study KT	Sharing results when the project is finished

KT Process

Evidence

▼

Data Visualization ▶ Communications

▼

Decisions

Strategies for sharing results with knowledge users can take many forms, including (but not limited to):

- EMAIL CAMPAIGNS
- PRINTED MATERIALS
- TARGETED ONE-PAGERS
- MASS MEDIA
- ACADEMIC DETAILING
- CONTINUING EDUCATION MODULES
- IT DECISION SUPPORT
- PUBLIC EVENTS
- ARTS-BASED STRATEGIES

Quality of Care NL/Choosing Wisely NL and NL SUPPORT are committed to providing **integrated** KT support to help reduce the 'study to bedside' gap and ultimately contribute to improvements in the delivery of health care by:
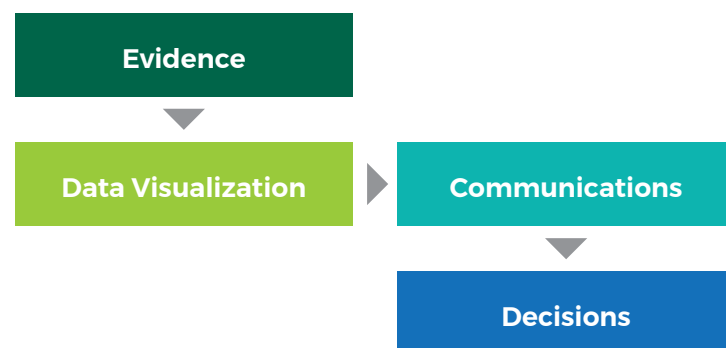
- Helping teams develop an integrated KT strategy.
- Connecting teams to appropriate knowledge user groups when feasible.
- Providing idea development and design support.
- Consulting on any KT-related questions that may arise.

If you would like to learn more about KT and how you use KT strategies to communicate your research, please contact: **pparfrey@qualityofcarenl.ca**

Patient Engagement: Involving Patients in Your Research and How it's Easier Than You Think!

What is Patient Engagement?

Quality of Care NL/Choosing Wisely NL and NL SUPPORT are part of a movement to create a research culture that achieves real-world impacts for users of the health care system in ways that are important to patients and their families. We strive to reflect patient priorities in our work by engaging with them at all stages of research. Think of it as research 'with' or 'by' members of the public rather than 'to', 'about' or 'for' them.

People with lived experience offer a perspective that can greatly impact the course and outcomes of a study. **Without a patient at the table, it is impossible to know how your research might impact them.**

Continuum of Engagement

EMPOWERING

COLLABORATING

INVOLVING

CONSULTING

INFORMING

Every level of engagement is important, but true engagement occurs at the higher levels of participation where patients can make decisions and direct research (i.e. collaborating and empowering).

"Patient partners can be a valuable member of the research team with ideas and insight that the research team would not necessarily bring to the table (an outside view)."
— Researcher

"I feel that the researchers really valued the patient partners and genuinely felt it was a critical element to project success. Our input really helped to shape the grant proposal."
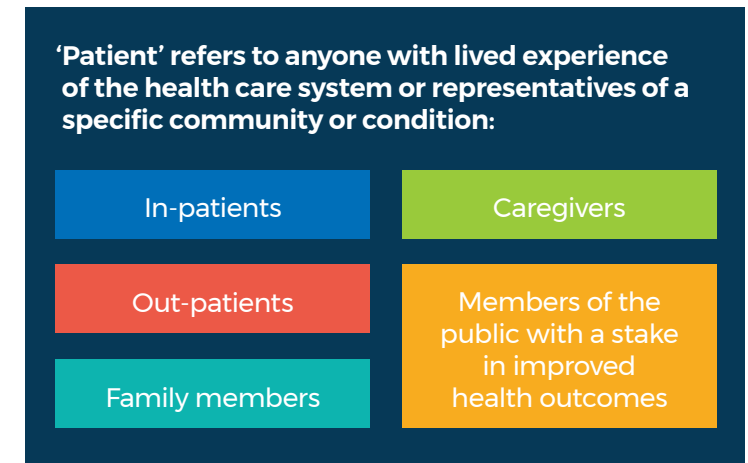— Patient partner

"They helped me adjust the questions to really ask what was important for my research question. I would never have known this as I do not live with this condition."
— Student

Tips for Patient Engagement/ Patient-Oriented Research

Engage early and often	involving patients from the outset will obtain the best outcomes
Set realistic expectations	make sure everybody knows what you expect of them and when
Have patience	building patient partner relationships takes time, but it is worth the wait

How can NL SUPPORT help you?

NL SUPPORT can:

- Provide useful tools and tips for planning your engagement strategy.
- Train you and your research team (including your patient partners!) on a variety of patient-oriented research topics.
- Connect you with prospective patient partners through our Patient Advisory Council and other networks.
- Help you develop your patient partner recruitment strategy.

'Patient' refers to anyone with lived experience of the health care system or representatives of a specific community or condition:

- In-patients
- Caregivers
- Out-patients
- Members of the public with a stake in improved health outcomes
- Family members

Are you wondering how to engage patients your research? For more information, please contact: **pparfrey@qualityofcarenl.ca**

Value and Economic Assessment of Translational and Personalized Medicine Initiative Projects

Practice Points

1. The Translational and Personalized Medicine Initiative (TPMI) was responsible for 39 projects in 2018.

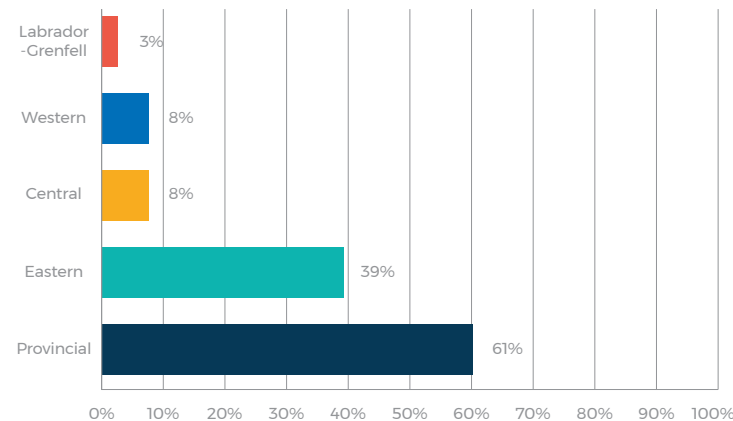2. 53% of projects involved evaluation of the health system.

Projects by Research Program

Genomics 13
NL Support 26
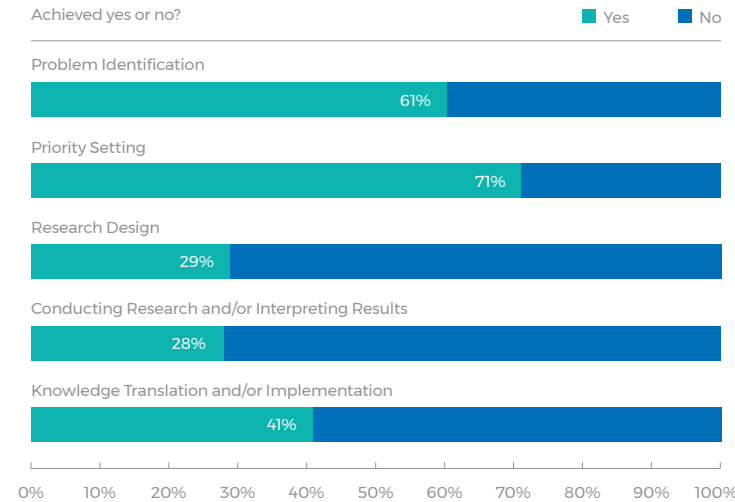Quality of Care NL 33
Choosing Wisely NL 28
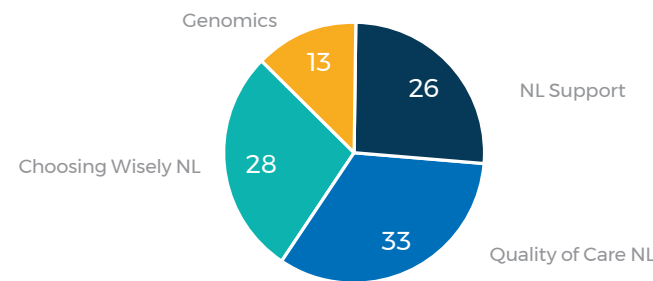
At the time of the assessment (April–June 2018):

- 5% of projects were in the preparation phase; 36% of projects were in the execution phase; 59% of projects were in the translation phase.

- In 33% of projects, a proposed practice/policy change has been implemented.

- In 23% of projects, an economic analysis has been planned.

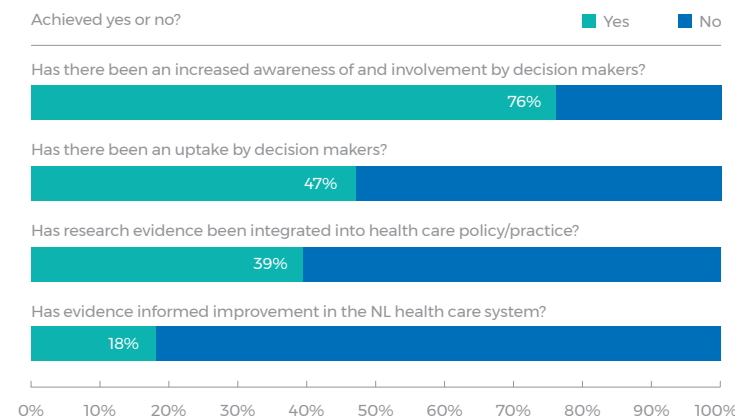- In 5 projects (13%), cost benefits have been demonstrated.
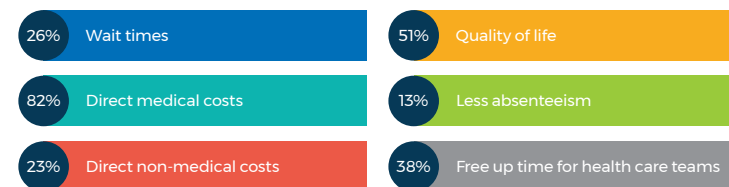
Regional Distribution

Region	%
Labrador-Grenfell	3%
Western	8%
Central	8%
Eastern	39%
Provincial	61%

Patient Engagement Within Projects

Achieved yes or no?   Yes   No

- Problem Identification — 61%
- Priority Setting — 71%
- Research Design — 29%
- Conducting Research and/or Interpreting Results — 28%
- Knowledge Translation and/or Implementation — 41%

Benefit of Projects to Decision Makers

Achieved yes or no?   Yes   No

- Has there been an increased awareness of and involvement by decision makers? — 76%
- Has there been an uptake by decision makers? — 47%
- Has research evidence been integrated into health care policy/practice? — 39%
- Has evidence informed improvement in the NL health care system? — 18%

Summary of Perceived Economic Improvements

- 26% Wait times
- 51% Quality of life
- 82% Direct medical costs
- 13% Less absenteeism
- 23% Direct non-medical costs
- 38% Free up time for health care teams

Conclusions

1. Expand projects to provincial scope.

2. Enhance patient engagement, knowledge translation, and economic evaluation.

How We Are Using Big Data and Why It Is Important!

- Big data analytics (BDA) is the process of examining large data sets to discover patterns, trends, and other information to help inform decision making.

- In health care, leveraging data to help make predictive decisions, rather than reactive ones, and to help determine future behaviors and trends will enable policy decisions that will influence better health outcomes.

BIG DATA
SOLUTIONS
TRANSLATION
EVIDENCE
ANALYSIS

TPMI
Infrastructure
NL Support
Centre for Health Informatics and Analytics
Programs
Quality of Care NL / Choosing Wisely NL
Translational Genomics

- BDA finds ways to make sense of the data. Finding useful, actionable information from the data and ways in which it can be communicated are often the keys to using data effectively.

- BDA that uses visual outputs often enables everyone from senior executives to clinical staff to absorb information so that practical interventions can be developed, implemented, and most importantly, sustained.

- Implementing solutions based on data can have a big impact on the appropriateness and effectiveness of clinical practices that are used every day in the health care system.

- The Centre for Health Informatics and Analytics (CHIA) infrastructure, housed within the Faculty of Medicine, is positioned to support the management, analysis and application of big data.
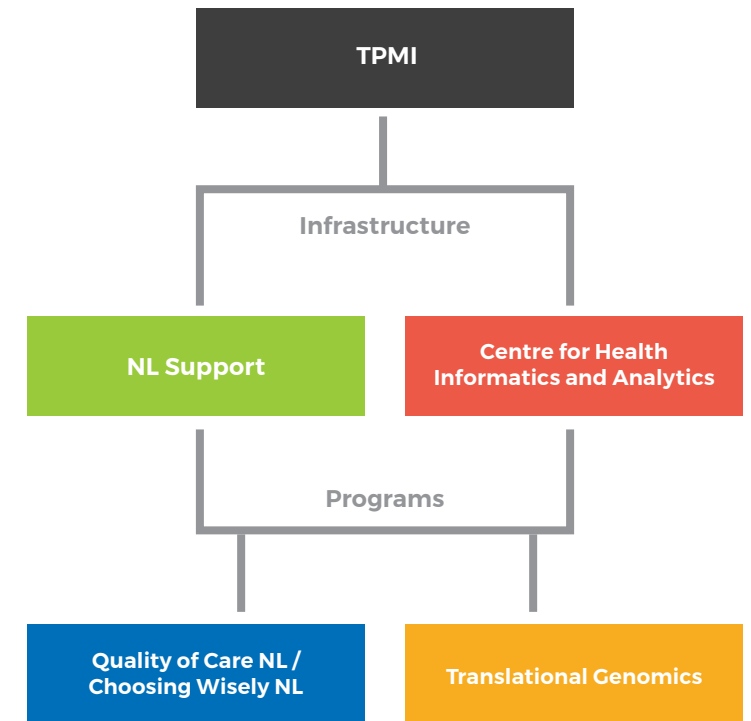
The Quality of Care NL/Choosing Wisely NL Team is leveraging the power of big data to deliver evidence-based research to doctors, nurses, allied health professionals, and health care policy and decision makers to kick start discussions and to develop interventions that can be implemented in scalable and sustainable ways.

Are you a decision maker within the health care system? Have you ever wondered if the policies and processes you have in place could be better? For more information on how the Quality of Care NL/Choosing Wisely NL Team can help you harness the power of your data, please contact: **pparfrey@qualityofcarenl.ca**

You work hard.

Give yourself some credits.

Quality of Care NL/Choosing Wisely NL is pleased to offer Continuing Medical Education credits for the completion of the following online, accredited modules:

Iron Testing
Antibiotics
Vascular Testing
Allergy Testing

Each module will take 30 minutes to complete and provide 0.5 assessment credits. Register online at: www.med.mun.ca/qualityofcarenl

To learn more, or for help with registration, please contact the Faculty of Medicine Office of Professional Development: (709) 864-3358 OR pdmed@mun.ca

Questions? Email pparfrey@qualityofcarenl.ca
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