EVALUATION OF THE ONTARIO STROKE NETWORK'S HYPERTENSION MANAGEMENT PROGRAM:
A MODEL FOR STROKE PREVENTION IN PRIMARY CARE SETTINGS

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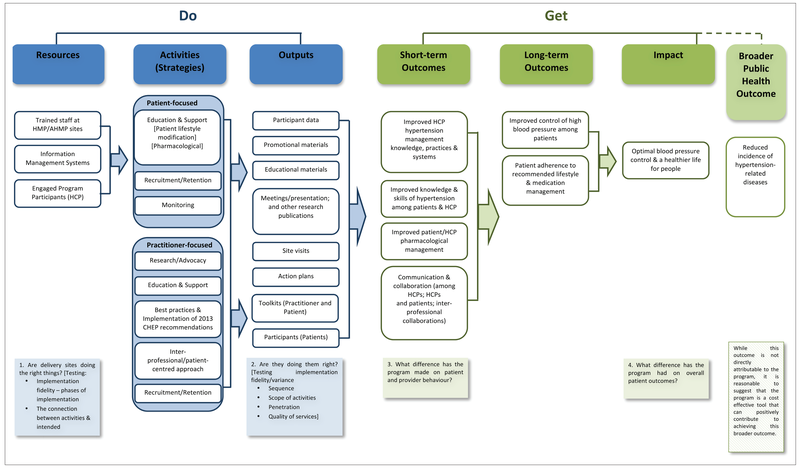
Based on DPRA Canada evaluation report, February 2015.

BACKGROUND

Since 2012, the Ontario Stroke Network (OSN) has delivered the provincial Hypertension Management Program (HMP). The HMP is modeled on Ontario's Chronic Disease Prevention and Management framework, and supports best practice care delivery as outlined in the Canadian Hypertension Education Program (CHEP) guidelines. The HMP goal is to improve cardiovascular disease prevention through a focus on hypertension. In 2013, the OSN undertook a comprehensive evaluation of the HMP to inform stakeholders on the effectiveness, ongoing sustainability, and feasibility for program expansion.

HMP Evaluation Logic Model



METHOD

A mixed-methods approach was used, including a quantitative HMP data repository analysis to evaluate changes from patient baseline of blood pressure (BP), relevant lab values and risk factor self-management. The qualitative evaluation involved site visits and surveys with participating health care providers (HCPs) and enrolled patients which further addressed experiences with program delivery.

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RESULTS

BP outcomes for HMP participants

Measures	Overall Total		Hypertension at Baseline		Elevated BP Readings at Baseline		Diabetes	
	N	Avg. or %	N	Avg. or %	N	Avg. or %	N	Avg. or %
Avg. BASELINE Systolic BP	5552	132.1	4601	131.4	639	136.6	1501	132.3
> 140 or > 130 with diabetes	5552	27.6%	4601	26.2%	639	36.3%	1501	50.8%
>140 and < 160 or >130 and < 150 with diabetes	5552	21.4%	4601	20.4%	639	28.0%	1501	35.9%
> 160 or > 150 with dx diabetes	5552	6.2%	4602	5.9%	639	8.3%	1501	14.9%
Avg. BASELINE Diastolic BP	5553	78.0	4602	77.2	639	83.4	1501	75.4
> 90 or > 80 with diabetes	5553	13.0%	4602	10.9%	639	26.6%	1501	31.3%
> 140 AND > 90 or >130 AND >80	5552	8.8%	4601	7.6%	639	16.3%	1501	22.8%
Avg. ENDPOINT Systolic BP	5676	131.4	4632	131.6	640	131.8	1518	130.8
> 140 or > 130 with diabetes	5676	23.6%	4632	24.1%	640	22.5%	1518	45.1%
>140 and < 160 or > 130 and < 150 with diabetes	5676	18.0%	4632	18.2%	640	17.7%	1518	32.8%
> 160 or > 150 with diabetes	5676	5.5%	4632	5.8%	640	4.8%	1518	12.3%
Avg. ENDPOINT Diastolic BP	5675	76.7	4631	76.3	640	80.4	1518	74.0
> 90 or > 80 with diabetes	5675	9.0%	4631	8.2%	640	15.6%	1518	24.3%
> 140 AND > 90 or >130 AND > 80 with diabetes	5675	5.9%	4631	5.4%	640	9.4%	1518	18.0%
Avg. INDIVIDUAL PATIENT CHANGE btw. Baseline and Endpoint SYSTOLIC	5551	-0.5*	4600	0.2	639	-4.7***	1500	-1.5**
Standard Deviation	5551	19.3	4600	19.5	639	17.4	1500	19.9
Avg. INDIVIDUAL PATIENT CHANGE btw. Baseline and Endpoint DIASTOLIC	5552	-1.2***	4601	-0.9***	639	-2.9***	1501	-1.4***
Standard Deviation	5552	10.9	4601	11.0	639	10.5	1501	11.3

* p < 0.5; ** P < 0.01; *** p < 0.0001

Change in BP is calculated between a patient's measurement at baseline and during the measurement taken in their last recorded HMP visit.

Overall the program had a statistically significant effect on program participants' BP; with HMP clients showing:

- average ↓ in **systolic BP of -0.5 mmHg**.
- average ↓ in **diastolic BP of -1.2 mmHg**.
- proportion of patients with **uncontrolled BP** (systolic BP > 140 and diastolic BP > 90), ↓ from **8.8%** at baseline **to 5.9%** at last follow-up.

Statistically significant reductions were noted in systolic and diastolic BP for patients with elevated BP and those with diabetes at baseline (p values ranged from <0.01 to <0.0001).

Additional observations:

- Interval between BP Follow-ups ↓ from average 5 to 2 months
- Lab data changes also observed overall for: **LDL** (**-0.3*****), **TC/HDL** (**-0.3*****), **eGFR** (**1.4****) & **ACR** (**-3.8****)

Level of provider confidence in performing different aspects of HTN management

Aspects of hypertension management	Very Confident	Somewhat Confident	Neutral	Low Confidence	N/A[1]
Obtain accurate office measurement of BP*	68.8% (22)	21.9% (7)	9.4% (3)	0.0% (0)	0.0% (0)
Optimize patient adherence with medication(s) prescribed for HTN*	40.0% (12)	43.3% (13)	13.3% (4)	3.3% (1)	6.3% (2)
Optimize patient adherence with lifestyle recommendations for HTN*	25.0% (8)	56.3% (18)	15.6% (5)	3.1% (1)	0.0% (0)
Assess overall global CVD risk*	40.6% (13)	34.4% (11)	21.9% (7)	3.1% (1)	0.0% (0)
Carry out follow-up BP readings*	62.5% (20)	31.3% (10)	6.3% (2)	0.0% (0)	0.0% (0)
Accurately diagnose HTN**	76.9% (10)	23.1% (3)	0.0% (0)	0.0% (0)	0.0% (0)
Prescribe effective antihypertensive medication(s)**	76.9% (10)	15.4% (2)	7.7% (1)	0.0% (0)	0.0% (0)

* Questions applicable to Nurses, Nurse Practitioners and Physicians. Number of surveys = 32.
** Questions Applicable to Nurse Practitioners and Physicians. Number of surveys = 13.

[1] In order to present a realistic confidence level for each item, "N/A" responses were not included in the calculations for the five rating categories. The values of "N/A" shown in the table below indicated the percentages of respondents unable to comment on specific items or activities. These figures can be useful for future planning when identifying areas that may require additional attention and/or support.

HCPs expressed:

- ↑ confidence in hypertension (HTN) diagnosis and treatment,
- ↑ understanding & compliance with CHEP guidelines,
- ↑ inter-professional communication, and
- felt successful in providing patients with the knowledge and skills for self-management of HTN.

RESULTS CONTINUED

Familiarity with the 2013 Canadian Hypertension Education Program (CHEP) Recommendations (n=35)

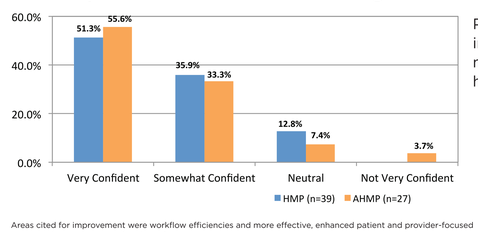
Participating HCPs were asked to rate their level of familiarity with the 2013 CHEP Recommendations. Over 91% of the respondents indicated that they were very familiar or somewhat familiar with the 2013 CHEP Recommendations, while two respondents rated their familiarity as neutral and one respondent was not very familiar with the 2013 CHEP Recommendations.

Familiarity	Survey Count	Percent
Very familiar	15	42.9%
Somewhat familiar	17	48.6%
Neutral	2	5.7%
Not very familiar	1	2.9%

HCP surveys also assessed how frequently providers screen for HTN, and how frequently nurses and physicians check the BP readings of patients diagnosed with hypertension:

- HTN Screening: 72% screen HTN at most or all visits (BP assessment or non-related episodic care)
- HTN Follow-up: 81% indicated BP readings of HTN patients are checked at most or all visits, whether during a HTN follow-up visit or non-related care
- Patient survey data tended to concur, indicating that BP was checked at most or all visits (77.8%)

Level of patient confidence to self-manage elevated BP/HTN



Patients reported greater confidence in abilities to monitor BP and address modifiable risk factors as a result of health information received.

Areas cited for improvement were workflow efficiencies and more effective, enhanced patient and provider-focused resources for providing health information.

DISCUSSION

Reduction in SBP (mmHg)	% Reduction in Mortality		
	Stroke	CHD	Total
2	-6	-4	-3
3	-8	-5	-4
5	-14	-9	-7

Small ↓ BP can have a significant impact

- Meta-analysis of 61 clinical studies indicated that each **2mmHg reduction in SBP is associated with a 6% reduction in mortality from stroke**[1]
- HMP BP and lab data outcomes are comparable to those observed in pooled data derived from 74 trials evaluating impact of behaviour counselling on CV risk factors (12-24 mos).[2]
  - **SBP** -2.03
  - **Total Cholesterol** -0.12
  - **DBP** -1.38,
  - **Glucose** -0.12

[1] Whelton, P.K., et. al (2002). Primary prevention of hypertension: Clinical and public health advisory from the National High Blood Pressure Education Program. JAMA, 288(15): 1882-1888.

[2] Lin, J. S. et al (2014). Behavioural Counselling to promote a healthy lifestyle in persons with CV risk factors: a systematic review. Annals of Internal Medicine, 161(8), 568-579.

CONCLUSIONS

Evaluation outcomes of HMP delivery were positive overall, showing benefit for HCPs and patients with hypertension.

Opportunities for improvement/enhancement:

- Improved integration of flowsheet clinical health data recording & reporting within existing eHRs
- E-tools for patients – improved access to disease-related health information + health data capture & integrated reporting capabilities
- Patient health information resources – identify strategies to provide improved practical, effective for use during HCP encounters, for ongoing access & referencing; make versions available in other languages

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