Vascular Risk Reduction: Addressing Vascular Risk
Vascular Risk Reduction (VRR)

Welcome!

• Presentation & Activities

• Focus: Managing known risk factors for vascular disease.

• Engage, collaborate and have fun!
Vascular Risk Reduction

Objectives:

• Discuss the impact of vascular disease in Canada.

• Identify non-modifiable, modifiable and manageable vascular risk factors.

• Describe appropriate management of known vascular risk factors.
Impact of Vascular Disease

Vascular Risk Round Up:

1. Volunteer reads Question card.
2. The person with the correct Answer card must wave it and read the answer aloud.
3. If correct, it will be his/her turn to read out the question on the Question card.
4. If not correct, everyone must agree on the correct answer, then ask the person with the correct Answer card to read out his/her question.
5. Play continues until all questions have been read, along with their correct answers.
Addressing Vascular Risk Factors
Vascular Disease & Risk Factors

Most vascular disease(s) can be prevented or managed by addressing the risk factors.

Why are risk factors such a big deal??
- Over 90% of Canadians have one or more risk factors.
- Almost every person you come across can have increased risk for vascular disease.
Non-Modifiable Risk Factors

- Age
- Gender
- Family History/Genetics
- Ethnicity
- Previous Event (Heart Attack, Stroke, etc)
What are some risk factors we can modify?
Modifiable Risk Factors

May also be called “Healthy Lifestyle Behaviors”

- Tobacco Use
- Physical Inactivity
- Poor Diet
- Obesity or Overweight
- Excess Alcohol
- Unmanaged Stress
- Lack of Sleep
“Manageable” Risk Factors

- Hypertension (High Blood Pressure)
- Dyslipidemia (High Cholesterol)
- “Metabolic Syndrome”
- Diabetes
- Cardiac Disease: Atrial Fibrillation
Hypertension (HTN)

• #1 risk for Stroke and major risk for Heart Disease
  • #1 risk of death and disability

• Manage HTN, by addressing modifiable risk factors (healthy lifestyle behaviours)

• Antihypertensive therapy should be strongly considered if blood pressure is not within target
Hypertension Targets

Hypertension diagnosis
(see detail document)

Non-diabetic
Target less than 140/90mmHg

Diabetic
Target less than 130/80mmHg

Very elderly
(older than 80 years)
Consider SBP target less than 150mmHg
Exogenous Factors That Can Elevate Blood Pressure

- Prescription Drugs:
  - NSAIDS, including Cox II inhibitors
  - Corticosteroids and anabolic steroids
  - Oral contraceptives and other hormonal therapy
  - Vasoconstricting/sympathomimetic decongestants
  - Calcineurin inhibitors (cyclosporins, tacrolimus)
  - Erythropoietin and analogues
  - MAOI’s – Monoamine Oxidase Inhibitors (Marplan, Nardil, Parnate)
  - Midodrine
Exogenous Factors That Can Elevate Blood Pressure

• Others
  Licorice Root
  Stimulants including cocaine
  Sodium
  Excessive Alcohol
  Sleep Apnea
Recommended Health Behaviours in Adults with Hypertension:

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce foods with added sodium</td>
<td>→ 2000 mg /day</td>
</tr>
<tr>
<td>Weight loss</td>
<td>BMI &lt;25 kg/m²</td>
</tr>
<tr>
<td>Alcohol restriction</td>
<td>≤ 2 drinks/day</td>
</tr>
<tr>
<td>Physical activity</td>
<td>30-60 minutes 4-7 days/week</td>
</tr>
<tr>
<td>Dietary patterns</td>
<td>DASH diet</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>Smoke free environment</td>
</tr>
<tr>
<td>Waist circumference</td>
<td>Men &lt;102 cm  Women &lt;88 cm</td>
</tr>
</tbody>
</table>
## Impact of Health Behaviours on Blood Pressure

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Systolic BP (mmHg)</th>
<th>Diastolic BP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet and weight control</td>
<td>-6.0</td>
<td>-4.8</td>
</tr>
<tr>
<td>Reduced salt/sodium intake</td>
<td>-5.4</td>
<td>-2.8</td>
</tr>
<tr>
<td>Reduced alcohol intake (heavy drinkers)</td>
<td>-3.4</td>
<td>-3.4</td>
</tr>
<tr>
<td>DASH diet</td>
<td>-11.4</td>
<td>-5.5</td>
</tr>
<tr>
<td>Physical activity</td>
<td>-3.1</td>
<td>-1.8</td>
</tr>
<tr>
<td>Relaxation therapies</td>
<td>-3.7</td>
<td>-3.5</td>
</tr>
<tr>
<td>Multiple interventions</td>
<td>-5.5</td>
<td>-4.5</td>
</tr>
</tbody>
</table>

Clinical Guideline: Methods, evidence and recommendations National Institute for Health and Clinical Excellence (NICE) May 2011
The treatment of hypertension is all about vascular protection

Statins are recommended in high risk hypertensive patients based on having established atherosclerotic disease or at least 3 of the following:

- Male gender
- 55 y or older
- Smoking
- Type 2 Diabetes
- Total-C/HDL-C ratio of 6 or higher
- Premature Family History of CV disease
- Previous Stroke or TIA
- LVH
- ECG abnormalities
- Microalbuminuria or Proteinuria
- Peripheral Vascular Disease

ASCOT-LLA Lancet 2003;361:1149-58
Medication Recommendations

- Low doses of multiple drugs may be more effective and better tolerated than higher doses of fewer drugs.

- A combination of two first line drugs may also be considered as initial treatment if SBP 20 mmHg above target or is DBP is 10 mmHg above target.
Treatment of Systolic-Diastolic Hypertension without Other Compelling Indications

TARGET <140/90 mmHg

Lifestyle modification

Initial therapy

- Thiazide diuretic
- ACEI
- ARB
- Long-acting CCB
- Beta-blocker*

Dual Combination

Triple or Quadruple Therapy

CONSIDER
- Nonadherence
- Secondary HTN
- Interfering drugs or lifestyle
- White coat effect

A combination of 2 first line drugs may be considered as initial therapy if the blood pressure is ≥20 mmHg systolic or ≥10 mmHg diastolic above target

*Not indicated as first line therapy over 60 y
HTN Treatment with Co-morbidities

**Antihypertensive (initial) Treatment w/ Co-morbidities**

- **CAD**
  - ACEI/ARB, beta-blocker, ACEI + (amlodipine, nifedipine, felodipine)
  - If beta-blocker is not tolerated or contraindicated, use CCB

- **Recent MI**
  - ACEi + beta-blocker (or ARB + beta-blocker)

- **Heart Failure**
  - ACEi/ARB + Beta-Blocker + Spironolactone and add Thiazide or loop diuretic for volume control
  - If microvascular complications or macrovascular disease
  - Suggest not using ACEi/ARB

- **Diabetes**
  - ACEi/ARB; Amlopidine/ Nifedipine/ Felodipine, thiazide diuretic; Combination ACEi/ARB + Dihydropyrimidine CCB
  - No treatment during acute phase unless severely elevated BP

- **Stroke**
  - 72 hours after stroke: ACEi + Diuretic
  - ARB is recommended if patient has proteinuria or albuminuria
  - Thiazides have little diuretic effect at very low GFR

- **Non Diabetic CKD**
  - ACEi/ARB, add thiazide for antihypertensive affect; Add loop diuretic for volume control

[www.albertahealthservices.ca](http://www.albertahealthservices.ca)
Vascular Protection for Hypertensive Patients: ASA

Low Dose ASA in patients $\geq 50$ years

*Caution should be exercised if BP is not controlled.*
*** Reminder ***

• ACE and ARB combinations are not recommended except for HTN with heart failure refractory to an ACE alone.
How do I monitor and follow up?

- Recommend regular home BP monitoring and keeping a log
- Ask about potential symptoms (dizziness)
- Encourage lifestyle modification at every visit
- Additional blood tests may include serum creatinine, potassium, HbA1C in patients with diabetes
Dyslipidemia

• High cholesterol can contribute to atherosclerosis

• Treatment targets are based on the level of risk
  - Known Vascular Disease or High cardiovascular risk (FRS > 20%)
    *Lifestyle modification + Statin therapy*

• For those not already treated and FRS 10-19%, Statin therapy will reduce risk
Dyslipidemia
Treatment Recommendations

Treatment stratified by Risk Features

- Low Risk
  - No high risk features
  - FRS < 10%
  - LDL < 5 mmol/L
    - Health Behavior Modification
    - No Statin Therapy

- Intermediate Risk
  - No high risk features
  - FRS 10-19%
  - LDL ≥ 3.5 mmol/L
    - Health Behavior Modification
    - Statin Therapy
  - LDL ≤ 3.5 mmol/L
    - Health Behavior Modification
    - No Statin Therapy

- High Risk
  - FRS ≥ 20%
  - Clinical vascular dz
  - AAA
  - Diabetes ≥ 40 yrs, or ≥ 15 yrs duration and age ≥ 30 yrs or microvascular dz
  - CKD
  - High risk HTN
  - Health Behavior Modification
  - Statin Therapy
Statins: “Myth Busting” for Patients

1. My cholesterol is normal, why do I need a statin?
2. Does changing my diet work as well as taking a statin?
3. What kind of side effects do statins have?
4. Is it true that statins cause serious muscle problems?
5. Is it true that statins can damage the liver?
6. Do I have to take a statin for the rest of my life?
7. Are natural health products a good option to statins?
8. If taking a statin, Do I have to take coenzyme Q10?
9. When is the best time of day to take a statin?
10. Is Lipitor more harmful compared to other statins?
Statins: “Myth Busting” for HCPs

1. Should statins be used in elderly patients?
2. If CK is elevated, should the statin be stopped?
3. If myalgias without CK elevation, should statin be stopped?
4. If not at LDL-C target with a statin, is adding a fibrate OK?
5. Does high-dose statin therapy increase risk of myopathy?
6. Do statins cause diabetes?
7. Do statins cause cognitive impairment?
8. Do statins cause cancer?
9. Does the dose of statin matter in primary prevention?
Metabolic Syndrome (aka Syndrome X)

May be diagnosed if ≥ 3 of the following conditions:

- Fasting Glucose >5.6 mmol/L
- Blood Pressure >130/85 mmHg
- Triglycerides >1.7 mmol/L
- HDL <1.0 mmol/L in men, <1.3 mmol/L in women
- Abdominal Obesity (Caucasians)
  - Waist Circumference >102 cm in men, >88 cm in women
Metabolic Syndrome – Cont’d

The good news... even modest improvements can improve health and reduce poor health outcomes

Research has shown:

↓ body weight 5-7% and ↑ physical activity to 150 mins/wk could reduce the risk of developing Type 2 DM in obese patients

Management includes targeting modifiable risk factors (diet, activity, weight) and monitoring blood glucose, cholesterol and blood pressure regularly
## Diabetes - Assessing Plasma Glucose

<table>
<thead>
<tr>
<th>Test Result</th>
<th>FPG (mmol/l)</th>
<th>OGTT (mmol/l)</th>
<th>HbA1C (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>FPG ≤ 6</td>
<td>OGTT &lt; 7.8</td>
<td>HbA1c &lt; 6</td>
</tr>
<tr>
<td>Impaired</td>
<td>6.1 ≤ FPG &lt; 7</td>
<td>7.8 ≤ OGTT &lt; 11.1</td>
<td>6 ≤ HbA1c ≤ 6.4</td>
</tr>
<tr>
<td>Diabetes</td>
<td>FPG ≥ 7</td>
<td>OGTT ≥ 11.1</td>
<td>HbA1c ≥ 6.5</td>
</tr>
</tbody>
</table>

*If one of these measurements was indicating diabetes without any hyperglycemia symptoms, the test should be repeated on another day to confirm the diagnosis*
Glycemic Control Targets

Glycemic control targets should be individualized based on the following:

- Age
- Diabetes duration
- Life expectancy
- Risk of severe hypoglycemia
- Presence or absence of cardiovascular disease

A target of HbA1c ≤ 7% is recommend in most patients with diabetes
Diabetes Management

Optimal glucose control is very important in diabetes treatment. Diabetes can be treated by:

1. Lifestyle Adjustments
2. Oral Antihyperglycemic medications
3. Insulin

Type 2 diabetes treatment should start with lifestyle adjustment; if lifestyle adjustment fails to achieve the target blood glucose after 2-3 months, antihyperglycemic medication should be started.
Diabetes – Medical Management

Diabetes treatment should be individualized based on the properties of the antihyperglycemic medications, e.g. efficacy, contraindications, side effects and risk of hypoglycemia

For more information on specific pharmacotherapy recommendations, go to the Canadian Diabetes Association 2013 Clinical Practice Guidelines at:

http://guidelines.diabetes.ca/
Atrial Fibrillation

Irregular rhythm / contraction of the atrium muscles

Why is it important to treat?

• Formation of blood clots \(\rightarrow\) Stroke / TIA
• Worsening of other cardiac conditions (i.e. heart failure)

When is it important to treat?

• Decision tools (CHADS2 or CHA2DS2-VASc)
• CCS Algorithm
Atrial Fibrillation: Treatment

The “CCS Algorithm” for OAC Therapy in AF

- If Age ≥ 65, consider OAC.
- If Prior Stroke or TIA or Hypertension or Heart failure or Diabetes Mellitus (CHADS₂ risk factors), consider OAC.
- If CAD or Arterial vascular disease (coronary, aortic, peripheral), consider ASA.
- If No Antithrombotic, consider ASA.

Consider and modify (if possible) all factors influencing risk of bleeding during OAC treatment (hypertension, antiplatelet drugs, NSAIDs, excessive alcohol, labile INRs) and specifically bleeding risks for NOACs (low eGFR, age ≥ 75, low body weight).

Canadian Journal of Cardiology
2014 30, 1114-1130 DOI: (10.1016/j.cjca.2014.08.001)
Atrial Fibrillation: Treatment (in the ED)

Is Patient Stable?

YES

Immediate Risk for Stroke?

NO

Low Risk
1. Clear onset <48 hours, or
2. Therapeutic OAC ≥3 wks

Pharmacological or electrical CV at 150-200 J
(Immediate anticoagulation in ED before CV not required)†

Antithrombotic therapy
- Initiate OAC upon discharge from ED (or continue current OAC) if age ≥ 65 or CHADS₂ ≥ 1
- Otherwise, initiate ASA if CAD or vascular disease
- Early expert follow-up to review long-term OAC

Rate control

Therapeutic OAC for 3 weeks before outpatient CV

Antithrombotic therapy
- Continue OAC for ≥4 weeks after CV
- Early follow-up to review long-term OAC

Trans-esophageal echocardiography (TEE) guided CV

Antithrombotic therapy
- Initiate immediate OAC† in ED and continue for ≥4 weeks if any “high-risk” features present* (see box above)
- Early follow-up to review long-term OAC

High Risk
No therapeutic OAC ≥3 weeks and one of:
1. Onset >48 hours or unknown, or
2. Stroke/TIA <6 months or
3. Mechanical or rheumatic valve disease.

Unstable – AF causing:
1. Hypotension, or
2. Cardiac ischemia, or
3. Pulmonary edema

Consider urgent electrical CV if rate control not effective

Antithrombotic therapy
- Initiate immediate OAC† in ED and continue for ≥4 weeks if any “high-risk” features present* (see box above)
- Early follow-up to review long-term OAC
Atrial Fibrillation: Treatment

Algorithm for Rate vs Rhythm Control for Patients With Symptomatic AF

Special circumstances in which to consider early rhythm control:
- Highly symptomatic
- Multiple recurrences
- Extreme impairment in QOL
- Arrhythmia-induced cardiomyopathy

SYMPTOMATIC AF

ATTEMPT RATE CONTROL:
β-blocker
Calcium channel blocker

SYMPTOMS RESOLVE

YES

CONTINUE RATE CONTROL

NO

MODIFY RATE CONTROL
CONSIDER RHYTHM CONTROL

Paroxysmal AF

Low burden recurrence
Pill in pocket anti-arrhythmic therapy
High burden recurrence
Maintenance anti-arrhythmic therapy
Catheter ablation

Persistent AF

Consider cardioversion
Symptoms improve, but AF recurs
Symptoms improve, and patient maintains sinus rhythm
Symptoms do not change in sinus rhythm and AF recurs

Observe. If AF recurs, determine if symptomatic

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Atrial Fibrillation: Treatment

Anti-coagulants

- NOACs (novel oral anticoagulant)
  - include Dabigatran (Pradex), Rivaroxaban (Xarelto) & Apixaban (Eliquis)
- Warfarin (Coumadin)

Rhythm and Rate control

- Beta-blockers, CCB’s (Digoxin), Amiodarone

*Individuals with atrial fibrillation have a risk of stroke that is 3 to 5 times greater than those without AF.*
Addressing Vascular Risk

Key Messages:
• Support Healthy Lifestyle Behaviours to reduce vascular risk
• Strongly consider antihypertensive therapy if blood pressure is not within target
• Base dyslipidemia treatment on level of vascular risk
  - Those with **High Cardiovascular Risk** or known **Vascular Disease** should be treated with **statin therapy**
• Optimal glucose control is important in diabetes treatment.
• Treat atrial fibrillation when indicated
Questions?
A Special Thanks to:

The Calgary & Lethbridge Vascular Risk Reduction Programs and the CvHS SCN - VRR RxEACH Project, for their support and collaboration.
References:

Canadian Cardiovascular Society:

C-CHANGE Clinical Resource Centre:
http://www.c-changecrc.ca/


Heart and Stroke Foundation of Canada:
http://heartandstroke.com
References:

Hypertension Canada (CHEP recommendations):
http://hypertension.ca

Vascular Risk Reduction Resource:
http://www.albertahealthservices.ca/10585.asp