Vascular Risk Reduction: Identifying Vascular Risk

June 5, 2015
Vascular Risk Reduction (VRR)

Welcome!

• Presentation & Activities

• Focus: Work together to discover ways to best implement vascular risk identification into your practice

• Engage, collaborate and have fun!
Vascular Risk Reduction

Objectives:

• Describe which clinical assessments may indicate vascular risk.

• Identify who to screen for cardiovascular risk assessment.

• Implement vascular risk assessments into clinical practice.
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.
Identifying Vascular Risk—Who Has BAD FAT?

Assess the following:

- **B**lood pressure
- **A**lcohol use
- **D**iabetes (yes/no)
- **F**ruits and vegetables
- **A**ctivity
- **T**obacco use
- **W**aist
- **H**eight
- **O**besity

*Every Patient visit!*
Identifying Vascular Risk-
Who Has HIGH RISK?

Diabetes
- 40 years or older
- 15 year duration and at least 30 y/o with MVD
Abdominal Aortic Aneurysm
Clinical evidence of atherosclerosis
- MI, coronary revascularization, stroke/TIA, PVD
Chronic Kidney Disease (CKD)
Hypertension (high risk): with 3 VRF
- Male, >55 y/o, smoker, LVH, family history of CVD, abnormal ECG, TC/HDL ratio >6, microalbuminuria
Identifying Vascular Risk

Who needs additional screening for vascular risk?

Labs?
Vascular Risk Assessment – Who to Screen

Who to Screen

- Males ≥ 40 years of age
- Females ≥ 50 years of age or postmenopausal
- Adults any age with any of the following risk factors:
  - Modifiable: smoking, diabetes, hypertension, obesity
  - Diseases: RA, SLE, psoriatic arthritis, ankylosing spondylitis, inflammatory bowel disease, COPD, HIV infection, CKD, AAA, ED
- At risk populations: People of First Nation and South Asian ancestry (consideration for screening at an earlier age)
Cardiovascular Risk Assessment: Who to Screen
Vascular Risk Assessment – How to Screen

How to screen for vascular risk?
Vascular Risk Assessment – How to Screen

What and how to screen?

- History and Exam
- Lab tests: LDL, HDL, TG, glucose, eGFR
- Complete Framingham Risk Score

FRS* < 5%
Repeat above Lab tests every 3-5 years

FRS ≥5%
Repeat above lab tests every year
Framingham Risk Score (FRS) Estimation of 10-year Cardiovascular Disease (CVD) Risk

Step 1 In the “points” column enter the appropriate value according to the patient’s age, HDL-C, total cholesterol, systolic blood pressure and if they smoke or have diabetes. Calculate the total points.

Step 2 Using the total points from Step 1, determine the 10-year CVD risk %.

Step 3 For subjects between 30 and 59 years – double cardiovascular disease risk percentage if cardiovascular disease is present in a first degree relative before 55 years of age for men and 65 years of age for women.

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Points</th>
<th>Risk points</th>
<th>Total points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>40-44</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>45-49</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>50-54</td>
<td>10</td>
<td>10</td>
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<tr>
<td>55-59</td>
<td>11</td>
<td>11</td>
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<tr>
<td>60-64</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>65-69</td>
<td>14</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>70-74</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>75+</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>HDL-C (mmol/L)</strong></td>
<td></td>
<td></td>
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<tr>
<td>&gt;1.6</td>
<td>-2</td>
<td>-2</td>
<td></td>
</tr>
<tr>
<td>1.3-1.6</td>
<td>-1</td>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>1.2-1.3</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0.9-1.2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>&lt;0.9</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total cholesterol</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;4.1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4.1-5.2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5.2-6.2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6.2-7.2</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>&gt;7.2</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Systolic blood pressure (mmHg)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;120</td>
<td>-2</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>120-129</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>130-139</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>140-149</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>150-159</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>160+</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Smoker</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Total Points</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Vascular Risk Assessment - FRS

**On-line:** The University of Edinburgh: Cardiovascular Risk Calculator

http://cvrisk.mvm.ed.ac.uk/calculator/calc.asp

**Mobile App:**

CCS – Lipid Guidelines
Vascular Risk Assessment – Cardiovascular Age

CV Age motivates people to achieve risk factor targets
Vascular Risk Assessment: Enhanced Lipid Reporting

- A laboratory-based solution for determination and reporting of CV risk
- Information required at point of ordering lipid profile to calculate CV risk (FRS):
  - FRS (10 year CVD risk) reported back with lipid results; recommendations to consider therapy based on 2012 guidelines

Objective:
- ↑ appropriate use of meds for dyslipidemia
- ↓ inappropriate use of lipid panels
- Use provincially to ↓ vascular morbidity

Demonstration project underway in Lethbridge
# Vascular Risk Assessment: Enhanced Lipid Reporting

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Flag</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVD 10-YR RISK</td>
<td></td>
<td></td>
<td>Site</td>
</tr>
<tr>
<td>CHOLESTEROL</td>
<td>2.49</td>
<td></td>
<td>mmol/L</td>
</tr>
<tr>
<td>HDL</td>
<td>1.29</td>
<td></td>
<td>0.0-1.7 mmol/L</td>
</tr>
<tr>
<td>TRIG</td>
<td>0.48</td>
<td></td>
<td>0.0-1.4 mmol/L</td>
</tr>
<tr>
<td>LDL</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NON-HDL</td>
<td>1.20</td>
<td></td>
<td>0.00-4.20 mmol/L</td>
</tr>
<tr>
<td>CVD RISK CALC</td>
<td>55.0</td>
<td></td>
<td><strong>High Risk</strong></td>
</tr>
<tr>
<td>CVD 10-YR RISK</td>
<td></td>
<td></td>
<td><strong>(FRS &gt;=20% or presence of High risk features)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Treatment targets: LDL-C &lt;=2.0 mmol/L or decrease by &gt;=50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Flag</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVD 10-YR RISK</td>
<td></td>
<td></td>
<td>Site</td>
</tr>
<tr>
<td>CHOLESTEROL</td>
<td>6.45</td>
<td></td>
<td>mmol/L</td>
</tr>
<tr>
<td>HDL</td>
<td>2.09</td>
<td></td>
<td>mmol/L</td>
</tr>
<tr>
<td>TRIG</td>
<td>4.49</td>
<td></td>
<td>0.0-1.7 mmol/L</td>
</tr>
<tr>
<td>LDL</td>
<td>2.3</td>
<td></td>
<td>0.0-2.4 mmol/L</td>
</tr>
<tr>
<td>NON-HDL</td>
<td>4.36</td>
<td>H</td>
<td>0.00-4.20 mmol/L</td>
</tr>
<tr>
<td>CVD RISK CALC</td>
<td>15.6</td>
<td></td>
<td><strong>Intermediate Risk</strong> (FRS 10 - 19%**</td>
</tr>
<tr>
<td>CVD 10-YR RISK</td>
<td></td>
<td></td>
<td><strong>Treatment advised if LDL-C &gt;= 3.5 mmol/L or</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-HDL-C &gt;=4.3 mmol/L or ApoB &gt;=1.2 g/L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Treatment targets: LDL-C &lt;=2.0 mmol/L or decrease by &gt;=50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>or Non-HDL-C &lt;=2.6 mmol/L or ApoB &lt;=0.8 g/L</td>
</tr>
</tbody>
</table>

- Lab report identifies risk and recommended guidelines
- If risk suitable for Statin it will be identified
Vascular Risk – What to do

Treatment stratified by Risk Features

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

Intermediate Risk
- No high risk features
  - FRS 10-19%
  - LDL ≥ 3.5mmol/L
    - Health Behavior Modification
    - No Statin Therapy
  - LDL < 3.5mmol/L
    - 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
Vascular Risk Assessment – Enhanced Lipid Reporting

- Blood pressure
- Alcohol use
- Diabetes
- Fruits and vegetables
- Activity
- Tobacco use

Waist
Height
Obesity
?
Labs?
BP Measurement Technique
VRA – How to Assess BP

Only clinicians specifically trained to measure BP accurately should assess BP.*

- Use standard measurement technique
  - Proper technique is critical!
- Recommended to use automated BP devices (OBPM)

Measure BP on both arms at least once (same position) to confirm similar readings

- If different readings, always use arm with higher reading for BP measurement
Blood Pressure Assessment:
Patient preparation and posture

Standardized Preparation:

Patient
• No acute anxiety, stress or pain.
• No caffeine, smoking or nicotine in the preceding 30 minutes.
• No use of substances containing adrenergic stimulants such as phenylephrine or pseudoephedrine (may be present in nasal decongestants or ophthalmic drops).
• Bladder and bowel comfortable.
• No tight clothing on arm or forearm.
• Quiet room with comfortable temperature
• Rest for at least 5 minutes before measurement
• Patient should stay silent prior and during the procedure.
Blood Pressure Assessment:
Patient preparation and posture

Standardized technique:

Posture

• The patient should be calmly seated with his or her back well supported and arm supported at the level of the heart.
• His or her feet should touch the floor and legs should not be crossed.
What’s wrong with this picture?
Blood Pressure Assessment:
Patient position
## What should we consider when taking an accurate BP?

<table>
<thead>
<tr>
<th>Consideration</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate cuff size</td>
<td>No strenuous exercise 2 hour prior</td>
</tr>
<tr>
<td>Rest for five minutes</td>
<td>Keep BP arm at heart level</td>
</tr>
<tr>
<td>Calm, comfortable environment</td>
<td>Cuff edge is 3 cm above elbow crease</td>
</tr>
<tr>
<td>No tight clothing on arm or forearm</td>
<td>Initial: 3 readings on both arms; f/u on arm with highest BP. If unable to get initial 3 readings use non-dominant arm</td>
</tr>
<tr>
<td>No crossing of legs</td>
<td></td>
</tr>
<tr>
<td>No talking during measurement</td>
<td>F/U-3 BP readings every 1-2 minutes; leave room after first successful reading</td>
</tr>
<tr>
<td>Ensure bladder/bowel is empty</td>
<td></td>
</tr>
<tr>
<td>No smoking/nicotine/caffeine/light activity 30min prior</td>
<td></td>
</tr>
</tbody>
</table>
## Arm Circumference

<table>
<thead>
<tr>
<th>Arm Circumference (cm)</th>
<th>Size of Cuff (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 18 – 26 cm</td>
<td>9 X 18 (child/small adult)</td>
</tr>
<tr>
<td>From 26 – 33 cm</td>
<td>12 X 23 (regular adult)</td>
</tr>
<tr>
<td>From 33 – 41 cm</td>
<td>15 X 33 (large adult)</td>
</tr>
<tr>
<td>&gt; 41 cm</td>
<td>18 X 36 (extra large adult)</td>
</tr>
</tbody>
</table>

- BP cuff too large = a low BP reading
- BP cuff too small = a high BP reading
Calibrated/Validated Equipment
BP thresholds for drug treatment*

* lifestyle modification is recommended for all regardless of BP

<table>
<thead>
<tr>
<th>Population</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>General population (including CKD)</td>
<td>140/90</td>
</tr>
<tr>
<td>Very elderly (&gt;80)</td>
<td>150</td>
</tr>
<tr>
<td>Diabetes</td>
<td>130/80</td>
</tr>
<tr>
<td>Very low CV risk</td>
<td>160/100</td>
</tr>
</tbody>
</table>

** Year of incorporation into CHEP recommendations
Office or Home Automated BP

Recommend use of office devices that measure without a healthcare professional present or home automated blood pressure measurements

When preformed with the correct procedure, the office automated BP that is ≥ 135/85 should be considered out of target.
Only Relying on Office Pressures misses out on White Coat and Masked Hypertension

- Office SBP mmHg
- Home or Daytime ABPM SBP mmHg

Masked HTN
True hypertensive
True Normotensive
White Coat HTN

Derived from Pickering et al. *Hypertension* 2002:40:795-796
The prognosis of masked hypertension

Prevalence is approximately 10% in hypertensive patients.

CV events per 1000 patient-year

- Normal 23/685
- White coat 24/656
- Uncontrolled 41/462
- Masked 236/3125

Home measurement of blood pressure

- Enables diagnosis of white coat and masked hypertension
- Assists early diagnosis of hypertension
- Improves prediction of cardiovascular prognosis
- Improves adherence to drug therapy
- Enables better blood pressure control
Home blood pressure measurement

• Home BP measurement is encouraged to increase patient involvement in care

• Which patients?
  – suspected diagnosis of hypertension
  – Suspected non adherence
  – Diabetes mellitus
  – Chronic kidney disease
  – White coat hypertension or effect
  – Masked hypertension

Average BP equal to or over 135/85 mmHg should be considered elevated
Some patients are not suitable for home monitoring due to:

- Anxiety
- Physical or mental disability
- Arm not suited to blood pressure cuff
- Irregular pulse or arrhythmias
- Lack of interest
Recommended home blood pressure monitors

- Monitors that have been validated as accurate and available in Canada are listed at [www.hypertension.ca/chs](http://www.hypertension.ca/chs) in the ‘device endorsements’ section
  - The boxes containing the device are also marked with

**Monitors A&D® or LifeSource®** Models: 705, 767, 767PAC, 767Plus, 774, 774AC, 779, 787, 787AC

**Monitors Omron®** Models: HEM-705 PC, HEM-711, HEM-741CINT

**Monitors Microlife® or Thermor®** (also sold under different brand names)
Models: BP 3BTO-A, BP 3AC1-1, BP 3AC1-1 PC, BP 3AC1-2, BP 3AG1, BP 3BTO-1, BP 3BTO-A (2), BP 3BTO-AP, RM 100, BP A100 Plus, BP A 100
## Vascular Risk Assessment – Diagnosis of Hypertension

<table>
<thead>
<tr>
<th></th>
<th>OBPM</th>
<th>ABPM</th>
<th>HBPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertensive Emergency</td>
<td>BP &gt; 200 or DBP &gt; 130</td>
<td>Mean awake BP ≥ 135 / 85</td>
<td>Average BP ≥ 135 / 85</td>
</tr>
<tr>
<td></td>
<td>Mean awake BP ≥ 135 / 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If no macrovascular</td>
<td>BP &gt; 180/110</td>
<td>Mean 24 hour BP ≥ 130 / 80</td>
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</tr>
<tr>
<td>target organ damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(TOD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP ≥ 140 / 90</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>If macrovascular TOD</td>
<td>BP ≥ 140 / 90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BP &gt; SBP 160 / 100 over 3 visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BP &gt; 140 / 90 over 4-5 visits</td>
<td></td>
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</tr>
</tbody>
</table>
Patients with high normal blood pressure (office SBP 130-139 and/or DBP 85-89) should be followed annually.
Criteria for the Diagnosis of Hypertension and Recommendations for Follow-up

**Diagnosis of hypertension**

**Non Pharmacological treatment**

- With or without Pharmacological treatment

*Are BP readings below target during 2 consecutive visits?*

**Yes**

- Follow-up at 3-6 month intervals *

**No**

- Symptoms, Severe hypertension, Intolerance to anti-hypertensive treatment or Target Organ Damage

*Symptoms, Severe hypertension, Intolerance to anti-hypertensive treatment or Target Organ Damage*

**Yes**

- More frequent visits *

**No**

- Visits every 1 to 2 months*

*Consider home blood pressure measurement in hypertension management, to assess for the presence of masked hypertension or white coat effect and to enhance adherence.*
Measuring Waist Circumference
VRR – How to Assess Waist Circumference

Men: < 102 cm
Women: < 88 cm
Waist Circumference:
An important vital sign:

<table>
<thead>
<tr>
<th>Region</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada &amp; US</td>
<td>&lt; 102 cm</td>
<td>&lt; 88 cm</td>
</tr>
<tr>
<td>Europid</td>
<td>&lt; 94 cm</td>
<td>&lt; 80 cm</td>
</tr>
<tr>
<td>South Asian/Chinese</td>
<td>&lt; 90 cm</td>
<td>&lt; 80 cm</td>
</tr>
<tr>
<td>Japanese</td>
<td>&lt; 85 cm</td>
<td>&lt; 90 cm</td>
</tr>
</tbody>
</table>

Video on waist measurement at [www.heartandstroke.ca](http://www.heartandstroke.com/site/c.ikIQLcMWJtE/b.3484281/k.515D/Healthy_living__Assess_your_weight.htm)
Vascular Risk Assessment

- Blood pressure
- Alcohol use
- Diabetes
- Fruits and vegetables
- Activity
- Tobacco use
- Waist
- Height
- Obesity
- Labs?
Identifying Vascular Risk

Key Messages:

• Assess all adult patients for vascular risk

• Complete a cardiovascular risk assessment on all appropriate individuals.

• Utilize recommended techniques and resources when completing assessments.
How can you implement Vascular Risk Assessment into your daily practice?

• Everyone at every patient visit?
• Identify who is HIGH RISK?
• Those requiring additional assessment?
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/


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

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