Hypertension CANADA

Hypertension in Diabetes

Management of hypertension in patients with diabetes

Updated 2015-

The full slide set of the
2015 CHEP Recommendations
are available at
www.hypertension.ca

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Hypertension in Diabetes: Key Messages

Up to 80% of people with diabetes will die of cardiovascular disease, especially stroke.

- Ensure people with diabetes are screened for HPT (BP ≥130/80 mmHg)
- Assess BP at all appropriate healthcare visits
- Encourage home BP monitoring with approved devices
- Pharmacotherapy and lifestyle modifications should be initiated concurrently
- Assess and manage all other vascular risk factors
- Enable sustained lifestyle modification and medication adherence

CHEP Recommendations

- Patients with diabetes are at high cardiovascular risk
- Most patients with diabetes have hypertension
- Treatment of hypertension in patients with diabetes reduces total mortality, myocardial infarction, stroke, retinopathy and progressive renal failure rates
- Treating hypertension in patients with diabetes reduces death and disability and reduces health care system costs
- In diabetes, **Target** BP <130 mmHg systolic and <80 mmHg diastolic
- The use of the combination of ACE inhibitor with an ARB should only be considered in selected and closely monitored people with advanced heart failure or proteinuric nephropathy

Hypertension in Patients with Diabetes

- Diabetes is a major health issue in Canada
  - Approximately 6.2% of adults have diabetes
- Most patients with diabetes have hypertension

STUDY	PREVALENCE
Canadian Health Measures Survey	74%
National Diabetes Surveillance System	63%
ON-BP	66%

- Most of the burden of disease is associated with type 2 diabetes

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Unpublished Data
www.ndss.gc.ca
CMAJ 2008;178:1441-1449
Can J Cardiol 2009;25:299-302

Hypertension is a Major Health Risk in Patients with Diabetes

- Between 60-80% of patients with diabetes will die of cardiovascular disease (CVD), particularly stroke
- Many deaths occur with no prior warning of heart disease
  - One third of myocardial infarctions (MI) occur without typical symptoms
- Up to 75% of CVD is caused by hypertension

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CDA Guidelines 2008
Can J Cardiol 2009;25:299-302

Proportion of Diabetic Complications Attributable to Hypertension

Complication	Proportion attributable to hypertension
Stroke	75%
End stage renal disease	50%
Coronary Artery Disease	35%
Eye disease	35%
Leg amputation	35%

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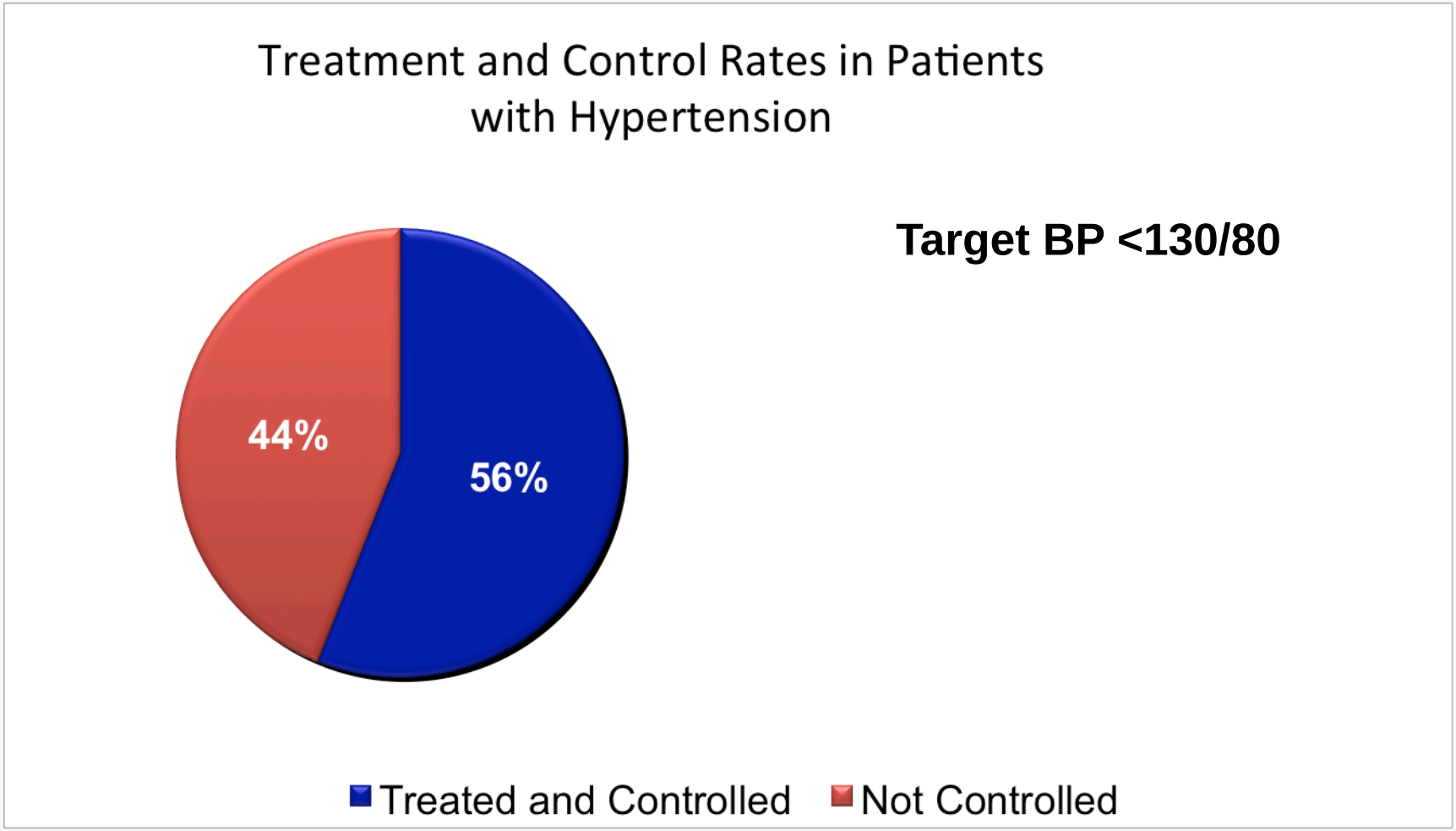
Can J Cardiol 2009;25:299-302

How well is HTN Managed in Canadians with Diabetes?



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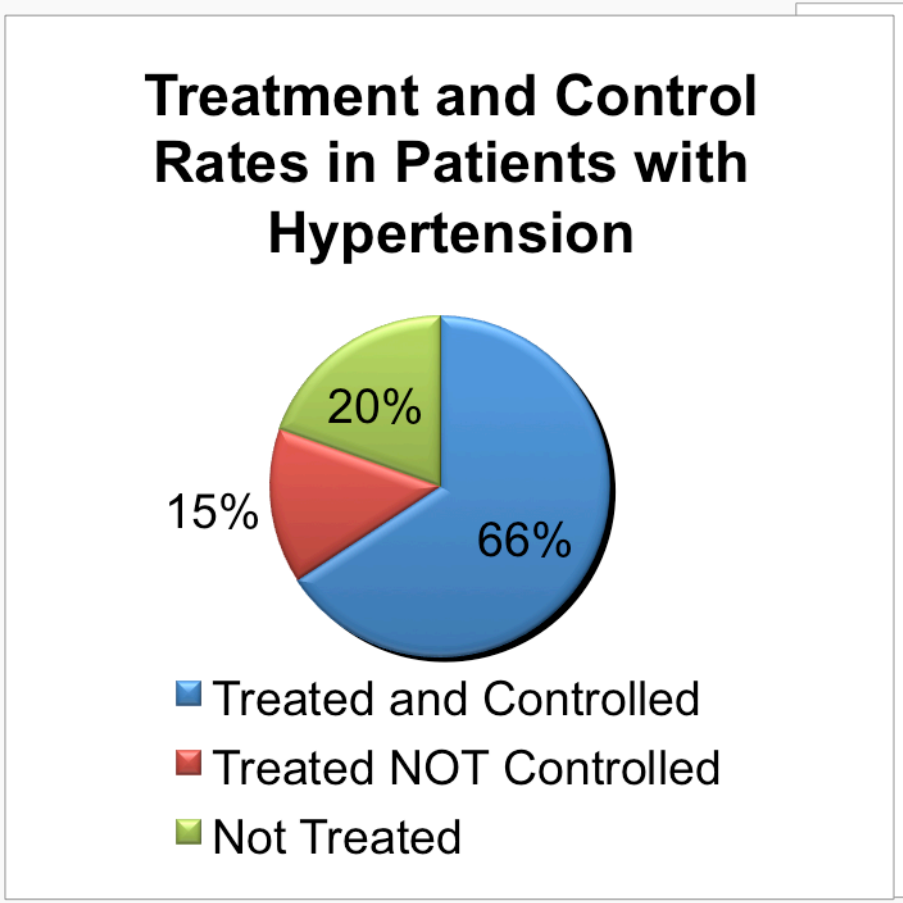
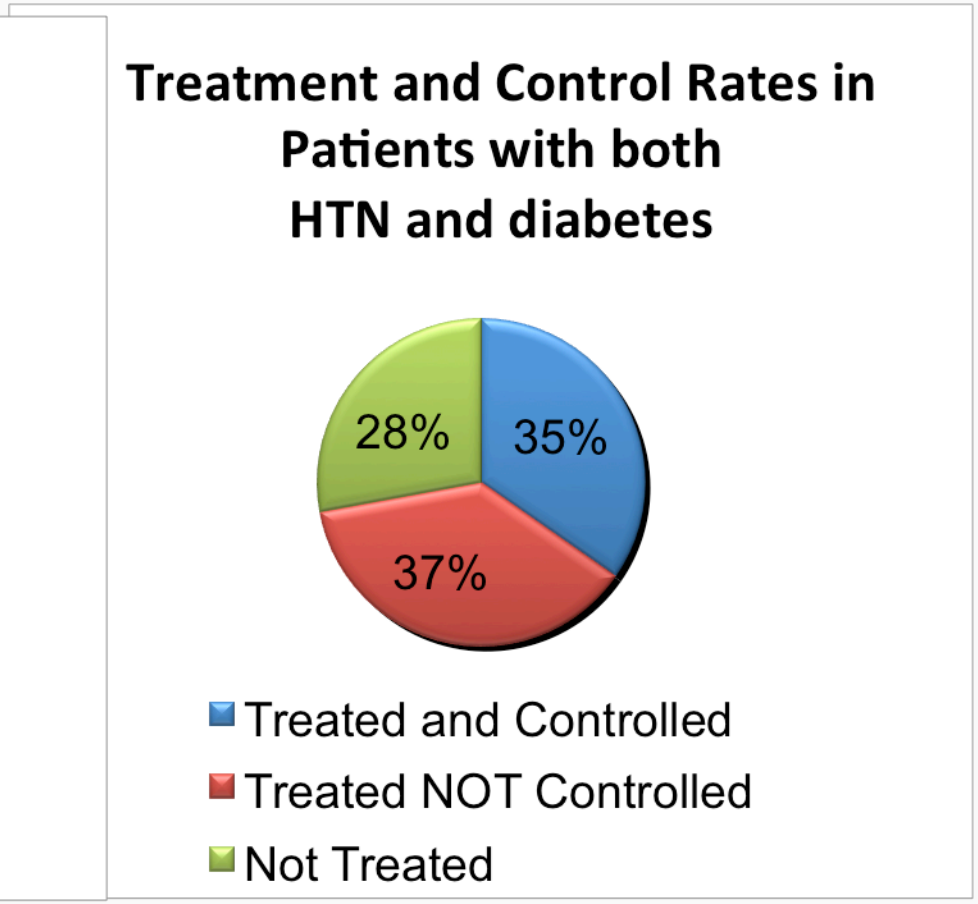
Canadian Health Measures Survey 2010; Unpublished data

How well is HTN Managed in Canadians with Diabetes?





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CMAJ, 2008;178:1441-49

Making the Diagnosis of Hypertension in Patients with HPT in Diabetes

BP ≥ 130/80 mm Hg

Confirmed on a second occasion in either the office, home or by appropriate ambulatory measurement

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Benefits of Managing HPT in Diabetes

- Randomized controlled trials of blood pressure lowering in patients with diabetes have demonstrated reductions in:
  - Death
  - Cardiovascular events
  - Eye disease
  - Kidney Disease

  …and improved quality of life (HOT study)

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Can J Cardiol 2009;25:299-302
Blood Pressure 1997;6:357-64

Benefits of BP Lowering in Diabetes

- Meta-analysis of 27 randomized trials showed intense BP reduction (i.e., by 6/4.6 mmHg) resulted in:
  - 36% reduction in stroke
  - 27% reduction in total mortality
  - 25% reduction in major cardiovascular events

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Arch Intern Med 2005;165:1410-1419

Benefits of BP Lowering in Diabetes (ADVANCE)

- Largest individual clinical trial to date of BP lowering in patients with diabetes
- Fixed dose combination therapy with perindopril/indapamide resulted in:
  - 9% reduction in composite of major macrovascular & microvascular events
  - 18% reduction in cardiovascular death
  - 14% reduction in total mortality

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Lancet 2007; 370:829-840

Healthcare System Benefits

- Treating hypertension in people with diabetes is a cost effective intervention
  - Treatment of HPT is less expensive than treating its complications:
    - Stroke
    - MI
    - Nephropathy
    - Retinopathy

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Can J Cardiol 2009;25:299-302
JAMA 2002;287:2542-2551

Why Target a BP <130/80 mmHg?

- CHEP & CDA recommend that patients with diabetes achieve & maintain a blood pressure < 130/80 mmHg
  - Diastolic target based on 2 RCTs
  - Systolic target based on 3 observational studies, most notably, normotensive ABCD
- New data – ACCORD BP

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BMJ 1998;317:703-713
Lancet 1998;351:1755-1762
Kidney Int 2002;61:1086-1097

ACCORD BP

- Designed to assess if a systolic BP target of <120 mmHg was superior to <140 mmHg in patients with diabetes
- Results
  - No significant benefit on primary composite outcome of nonfatal MI, nonfatal stroke or CV death
  - 41% reduction in total stroke
  - 37% decrease in non-fatal stroke
  - More “significant adverse events” in intensive arm
- For now, CHEP recommends no change to blood pressure target of < 130/80 mmHg

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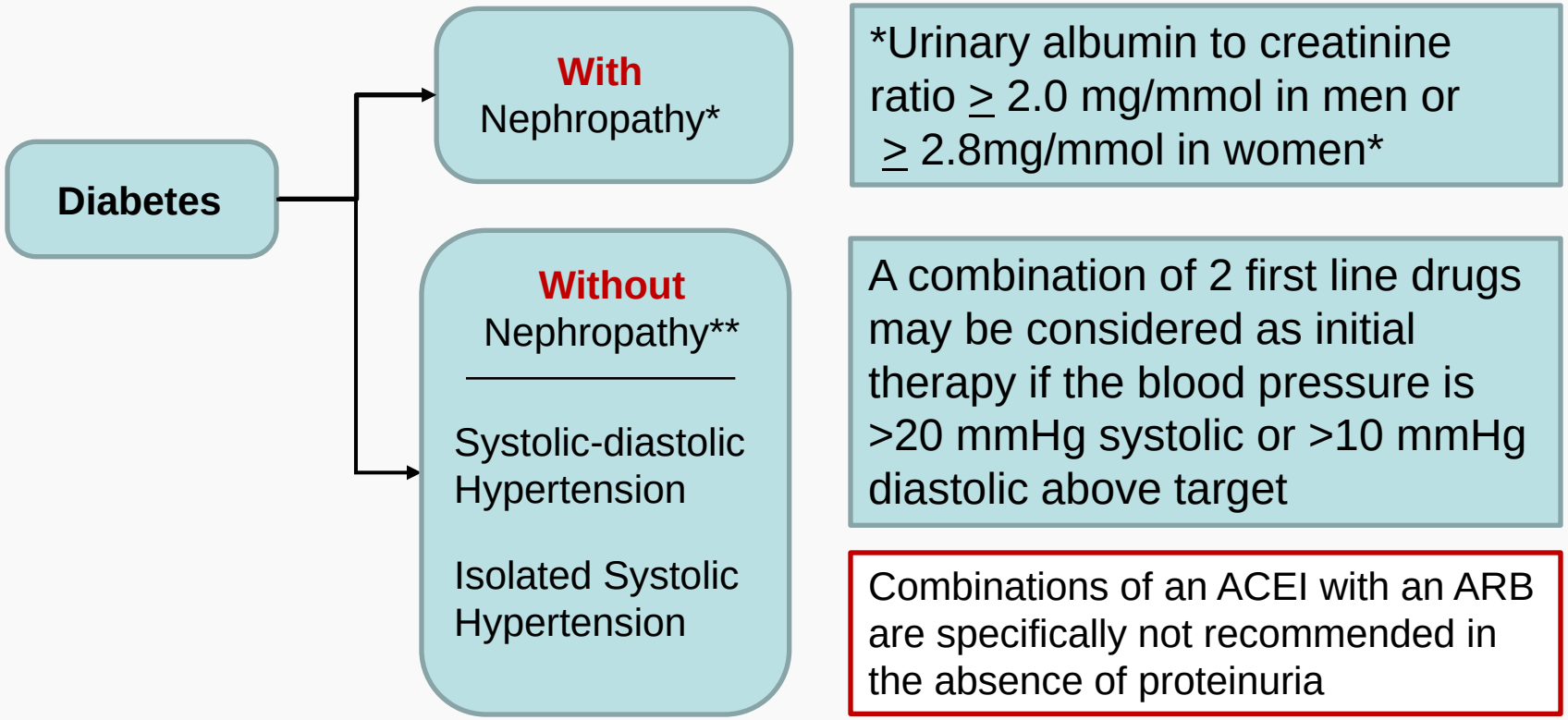
NEJM 2010;362:1575-85
CHEP 2012 Scientific Summary

Approach to HPT Management in Diabetes

- Pharmacotherapy & Lifestyle Interventions
  - CHEP & CDA recommend that pharmacotherapy & lifestyle interventions be initiated **concurrently** as soon as the diagnosis of hypertension is confirmed in a patient with diabetes
- Vascular Risk Reduction
  - Dyslipidemia, smoking cessation, hyperglycemia, antiplatelet therapy if appropriate
- Self Management Education
  - Self-monitoring of BP

Pharmacotherapy for Hypertension in Patients with Diabetes

Threshold equal or over 130/80 mmHg and Target below 130/80 mmHg



* Based on at least 2 of 3 measurements

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Pharmacotherapy of Hypertension in association with Diabetic Nephropathy

THRESHOLD equal or over 130/80 mmHg and TARGET below 130/80 mmHg

DIABETES **with** Nephropathy →

ACE Inhibitor **or ARB** →

Addition of a Dihydropyridine CCB is preferable to HCT

IF ACEI and ARB are contraindicated or not tolerated, SUBSTITUTE
- Long-acting CCB or
- Thiazide diuretic

3 - 4 drugs combination may be needed

If Creatinine over 150 µmol/L or creatinine clearance below 30 ml/min (0.5 ml/sec), a loop diuretic should be substituted for a thiazide diuretic if control of volume is desired

Monitor serum potassium and creatinine carefully in patients with CKD prescribed an ACEI or ARB

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Pharmacotherapy of Hypertension In Diabetes without Nephropathy

THRESHOLD equal or over 130/80 mmHg and TARGET below 130/80 mmHg

DIABETES **without** Nephropathy

→ 1. ACE Inhibitor or ARB or

2. Dihydropyridine CCB or Thiazide diuretic

→ Combination of first line agents

↓

Addition of one or more of: Cardioselective BB or Long-acting CCB

DHP: dihydropyridine

IF ACE Inhibitor, ARB, DHP-CCB and Thiazide are contraindicated or not tolerated,
SUBSTITUTE
- Cardioselective BB* or
- Long-acting NON DHP-CCB

Combinations of an ACE Inhibitor with an ARB are specifically not recommended in the absence of proteinuria

* Cardioselective BB: Acebutolol, Atenolol, Bisoprolol , Metoprolol

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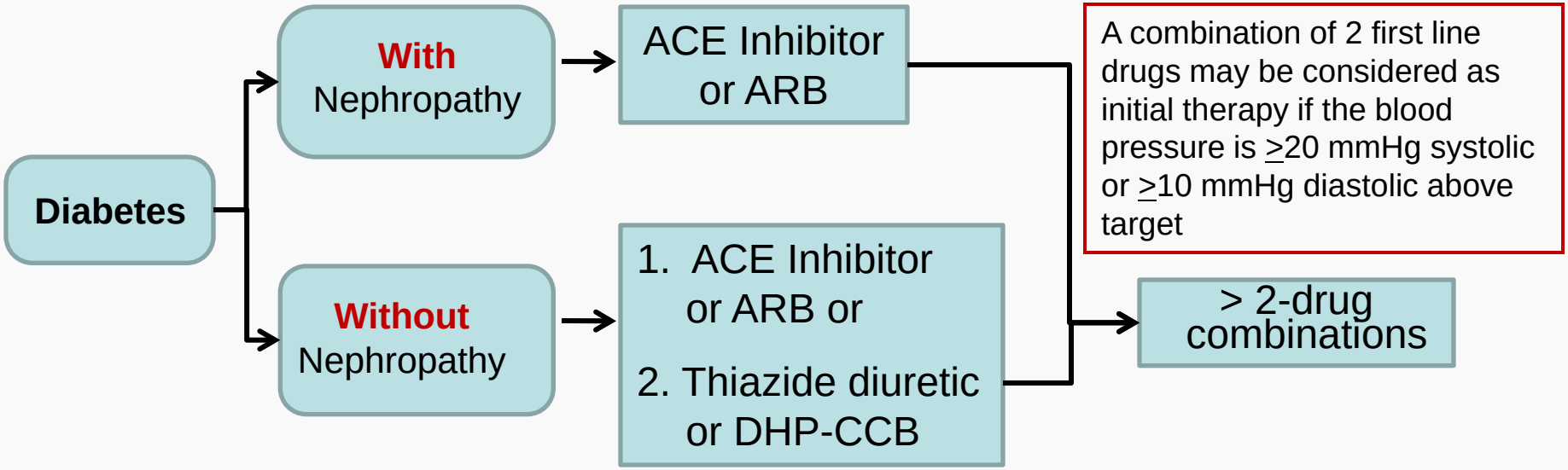
Pharmacotherapy for Hypertension in Patients with Diabetes – Summary

Threshold equal or over 130/80 mmHg and Target below 130/80 mmHg



Monitor serum potassium and creatinine carefully in patients with CKD prescribed an ACEI or ARB

Combinations of an ACEI with an ARB are specifically not recommended in the absence of proteinuria

More than 3 drugs may be needed to reach target values for diabetic patients

If Creatinine over 150 µmol/L or creatinine clearance below 30 ml/min (0.5 ml/sec), a loop diuretic should be substituted for a thiazide diuretic if control of volume is desired

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Follow-up Patients Not Meeting Target BP

- Patients with BP above target are recommended to be followed at least every two months
- Follow-up visits are used to:
  - Increase the intensity of lifestyle and drug therapy
  - Monitor the response to therapy
  - Assess adherence

Reducing Vascular Risk

- Dyslipidemia
- Smoking Cessation
- Hyperglycemia
- Antiplatelet therapy (in selected patients)

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CDA Guidelines 2008
Can J Cardiol 2009;25:299-302

People with Diabetes Considered at High Risk of a Cardiovascular Event

- Men age 45 or older, Women age 50 or older
- Men younger than age 45 & women younger than 50 who have 1 or more of the following:
  - Macrovascular disease including silent myocardial infarct or ischemia, or evidence of peripheral arterial disease, carotid arterial disease and cerebrovascular disease
  - Microvascular disease especially nephropathy and retinopathy
  - Family history of premature coronary or cerebrovascular disease in a first-degree relative
  - Extreme single risk factor such as low-density lipoprotein (LDL) greater than 5.0 mmol/L or systolic blood pressure greater than 180 mmHg
  - Have had diabetes longer than 15 years and is older than 30 years of age

Dyslipidemia Management
Reducing Vascular Risk

- Benefits of LDL reduction is well established in people with diabetes
- Every 1 mmol/L reduction in LDL reduced
  - Total mortality by 9%
  - Cardiovascular mortality by 13%
  - Major cardiovascular events by 21%
- CDA recommends a primary target: LDL < 2.0 mmol/L

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CDA Guidelines 2008
Lancet 2008;371;117-125

Smoking Cessation
Reducing Vascular Risk

- CDA & CHEP recommend living and working in a smoke free environment
- One year after stopping smoking, the risk of cardiovascular disease is lowered by nearly 50%, and continues to decline gradually

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Surgeon General's Report on Smoking and Health; 1990

Management of Hyperglycemia Reducing Vascular Risk

- Improved glycemic control in type 2 diabetes
  - Reduces risk of microvascular complications
  - Does not reduce major cardiovascular events

CDA Recommended Targets for Glycemic Control

	A1C	FPG or preprandial PG (mmol/L)	2-hour postprandial PG (mmol/L)
Type 1 and type 2 diabetes	≤ 7.0	4.0-7.0	5.0-10.0 (5.0-8.0 if A1C targets not being met)

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CDA Guidelines 2008.
NEJM 2005353:2643-2653.
NEJM 2008;358:2560-2572.

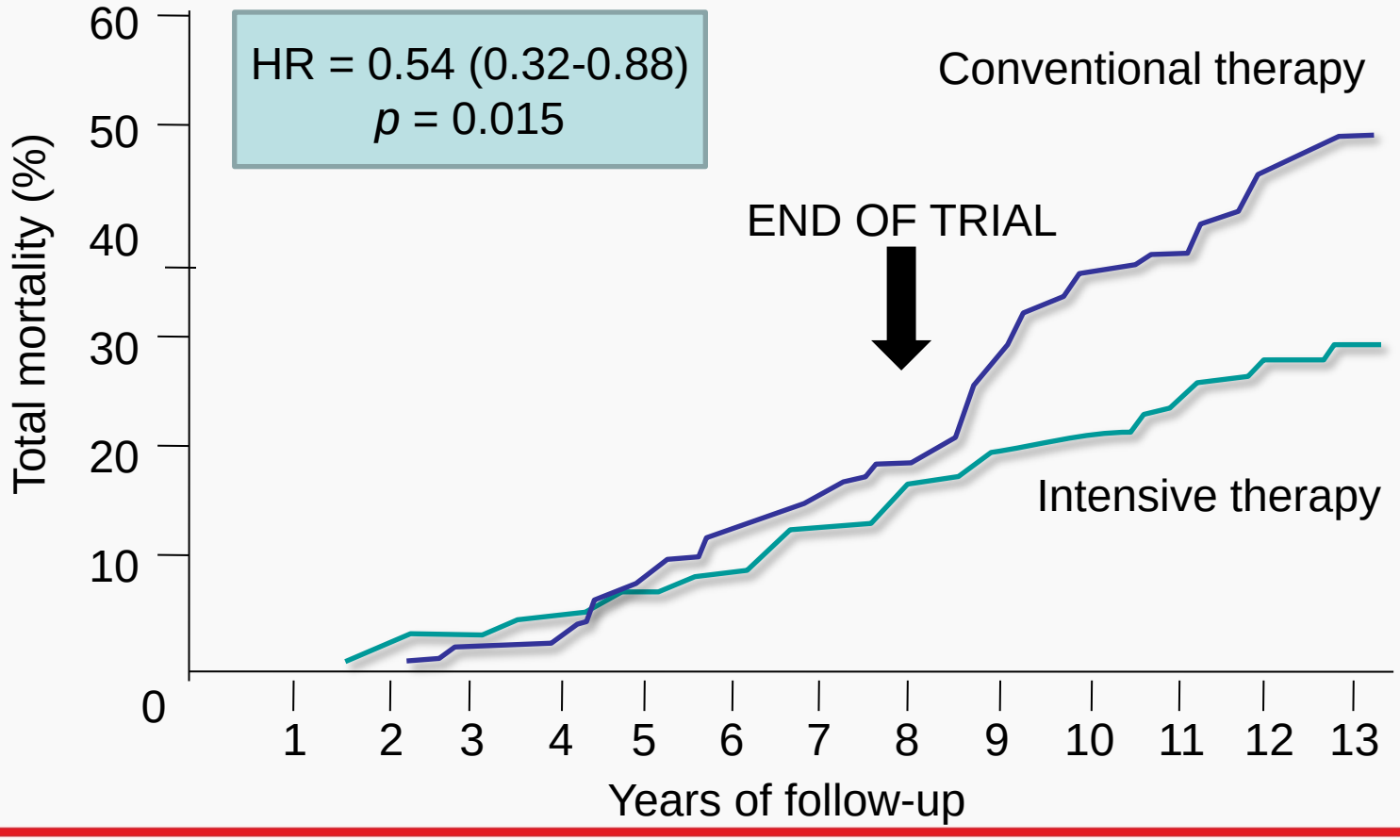
Antiplatelet Therapy
Reducing Vascular Risk

- CDA currently recommends:
  - The decision to prescribe antiplatelet therapy for primary prevention of cardiovascular events should be based on individual clinical judgment
- Recent studies in patients with diabetes have shown no benefit from ASA in the primary prevention of cardiovascular events

CDA Guidelines 2008
BMJ 2002;324:71-86
JAMA 2008;300:2134-2141
BMJ 2008;337:a1840; Lancet 2009;373:1849-1860

Steno-2 Study

Multi-factorial vascular protection (lifestyle, tight glucose control, RAAS, ASA, statins) in patients with diabetes & microalbuminuria



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NEJM 2008;358:580-591

Lifestyle Therapies in Hypertensive Adults

Intervention	Target
Reduce foods with added sodium	< 1500 mg /day
Healthy Diet	Canada's Guide to Healthy Eating DASH diet
Physical activity	30-60 minutes 4-7 days/week in addition to daily activities
Low risk alcohol consumption	≤ 2 drinks/day AND < than 14/week for men and < 9/week for women
Tobacco free environment	
Attaining and maintaining ideal body weight	BMI 18.5-24.9 kg/m^2
Waist Circumference -Europid - South Asian, Chinese	Men / Women <102 cm / <88 cm <90 cm / <80 cm

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CHEP 2011 Recommendations

Benefits of Lifestyle Interventions on Blood Pressure

- DASH diet
  - 11.4/5.5 mmHg
- Limiting Sodium Intake
  - 1800 mg/day decrease: 5.1/2.7 mmHg
- Reduction of Body Weight
  - 4.4 kg weight loss: 4.0/2.8 mmHg
- Regular Physical Activity
  - 3.8/2.6 mmHg
- Low Risk Alcohol Consumption
  - 3/2 mmHg

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NEJM 1997;336:1117-1124
Cochrane Database of Syst Rev 2004: CD004937
Arch Intern Med 1997;157:657-667
Ann Intern Med 136;493-503; Hypertension 2001;38:1112-1117

Sodium Recommendations

Age	Adequate intake mg/day	Upper limit mg/day
19 – 50	1500	2300
51 – 70	1300	2300
Over 70	1200	2300

The 2014 Canadian Hypertension Education Program (CHEP) recommends:

– To decrease blood pressure, consider reducing sodium intake towards 2,000 mg (5g of salt or 87mmol of sodium) per day

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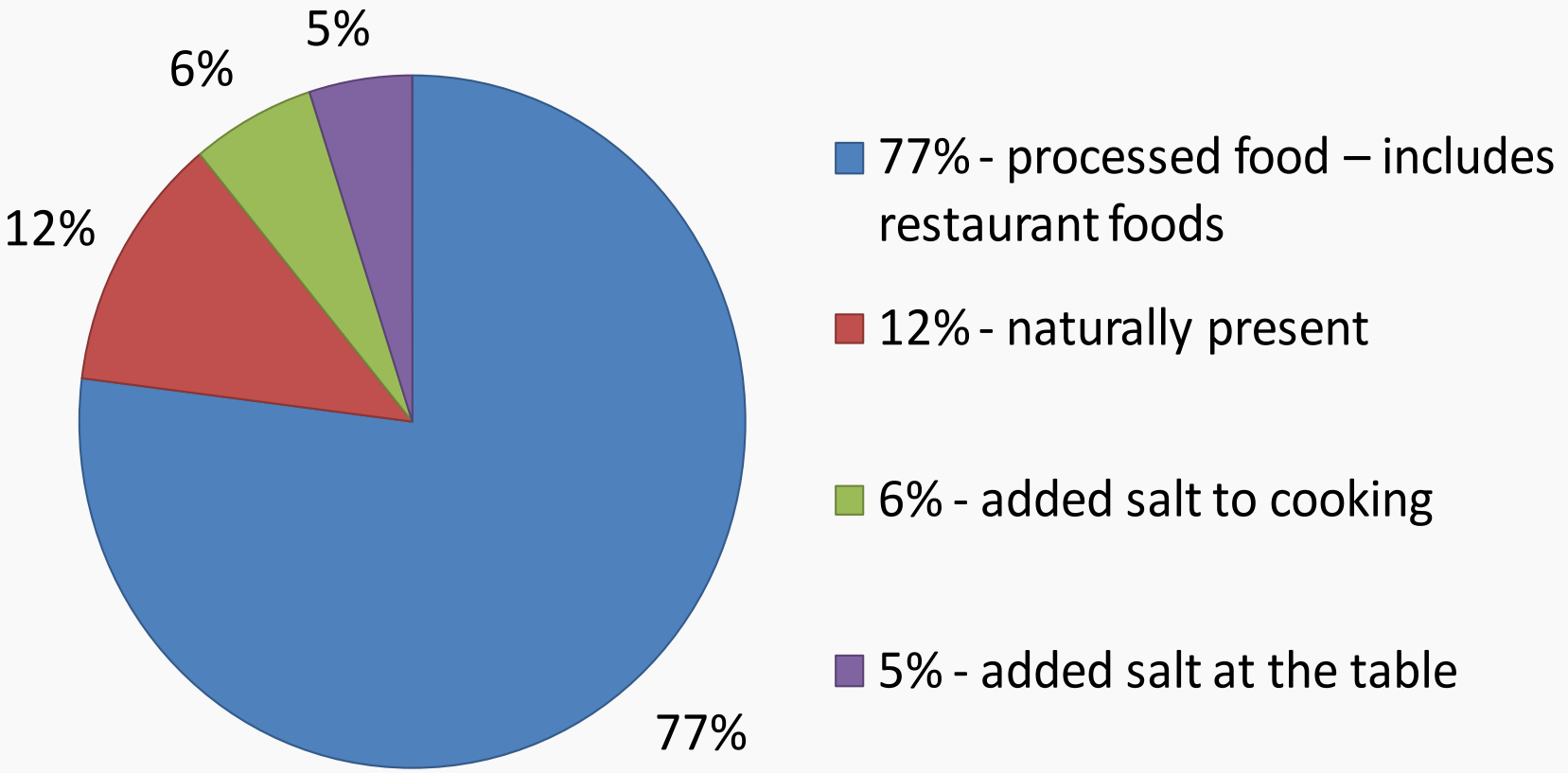
Dietary Sources of Sodium



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Statistics Canada – Health Reports May 2007; 82

To Reduce Sodium Intake

- Eat fewer processed canned and instant foods
- Choose fresh foods more often
- Limit salted snack foods, such as nuts, chips, popcorn
- Read labels & select lower salt options of similar foods
- Do not add salt to home cooking, use spices instead
- Take the salt shaker off the table

Self-Management of BP

- Self Monitoring of BP includes:
  - Using a Hypertension Canada approved device
  - Check BP twice daily, everyday for 1 week prior to healthcare provider visits
  - Information about the target BP =<130/80 mmHg
  - More information & video to support home measurement available at www.hypertension.ca

General Strategies to Improve Adherence

- Team-based health care incorporating a pharmacist
- Behavioral interventions
  - Telephone
  - Ongoing education & support
- Goal setting
- Patient participation in medical decision making & empowerment

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CHEP 2015 Scientific Update
Patient Educ Couns 2008;70:338-347
Patient Educ Couns 2007;69:93-99; NEJM 2008;358:580-591;
Med Care 2005;43:960-969; Patient Educ Couns 2009;79:227-282

Specific tools to improve Adherence

- Assess adherence to pharmacological and non-pharmacological therapy at every visit
- Teach patients to take their pills on a regular schedule associated with a routine daily activity e.g. brushing teeth.
- Simplify medication regimens using long-acting once-daily dosing
- Utilize fixed-dose combination pills
- Utilize unit-of-use packaging e.g. blister packaging
- Replacing multiple pill antihypertensive combinations with single pill combinations!

Special Populations

- CHEP recommendations regarding treatment of hypertension in people with diabetes do not differ for special populations as defined by age or ethno-cultural background
- Ethno-cultural minority groups frequently have poorly controlled hypertension & diabetes
  - First Nations, Inuit and Metis
  - South Asian peoples
- Aboriginal or ethno-cultural specific disease management programs may play a role in better management

For professionals

- Online course 15.5 “The Interdisciplinary Management of Hypertensive Patients”
- Sign up for free monthly news updates, featured research and educational resources
- Become a member for special privileges and savings

Resources Available Online

- www.hypertension.ca
  - Download current resources for the prevention and control of hypertension
  - To keep up to date with the latest evidence and resources
  - Have your patients sign up to access the latest hypertension resources
  - Tools and resources for healthcare professionals to use in educating other healthcare professionals, the public or patients about the risks of high dietary sodium in Canada.
- www.heartandstroke.ca/BP
  - To monitor home blood pressure and encourage self management of lifestyle
- http://www.hypertension.qc.ca/
  - Société québécoise d'hypertension artérielle
- www.diabetes.ca
  - CDA guidelines
- www.csep.ca
  - Canadian Physical Activity Guidelines
- www.dietitians.ca
  - Healthy Eating
- www.dialadietitian.org
  - Healthy Eating

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Hypertension & Diabetes Tools/Resources

- Educational tools for diabetic patients with hypertension and health care providers (HCP)
- Developed in conjunction with CDA, HSF, and DA
- Tools for patients (informational booklet + key messages)
- Tools for HCP (slide decks, key summaries, clinical summaries, scientific summary)
- Available at hypertension.ca