Quinte Health

Creating healthier communities. Together.

Queen's University

Heart&Stroke™

Stroke prevention

Medical therapy + Lifestyle Medicine

You can reduce your risk

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“Adopting healthy lifestyle behaviors can reduce stroke risk by more than 50%.”

Lifestyle Medicine- Why it matters

- Even with optimal medical therapy:
- 3-8% of patients with an ischemic stroke or transient ischemic attack (TIA) have a recurrent stroke within 1 year.
- TIA Outcomes: Up to 18-20% of TIA patients will die or have a recurrent stroke within 5 years, and around 23% live with increased disability.

Conventional secondary stroke prevention

- Antiplatelet therapy- ASA/ Clopidogrel
  - time dependent effect with massive early benefit in first week
    $\sim 60\%\ \ reduction\ in\ recurrent\ ischemic\ stroke\ within\ 6\ weeks$ up to 12 weeks
    After 3 month this benefit is not evident OR 0.97
- Established (Guideline-aligned): BP control (<130/80 individualized), statin/ezetimibe/PCSK9 as indicated, anticoagulation when appropriate, diabetes control, smoking cessation, weight management, limit alcohol, treat AF/OSA (for symptoms and BP).
- other risk factors such as large vessel disease and heart disease
- **90% of stroke risks are linked to modifiable factors**

Why stroke prevention is changing

Traditional prevention focused on:

- blood pressure control
- cholesterol lowering
- smoking cessation
- diabetes management
- anticoagulation for atrial fibrillation - Those still matter enormously
- Cardiac and hematologic/rheumatogic disorders- rare

Stroke prevention is shifting from a “treat isolated risk factors separately” model toward a more integrated cardiometabolic approach — targeting:

- visceral obesity
- insulin resistance
- chronic inflammation
- sleep disruption
- sedentary behavior
- metabolic syndrome

WHY lifestyle changes matter

- It targets the root causes:

1. Hypertension
2. Diabetes
3. Dyslipidaemia
4. Substance abuse, smoking
5. Abdominal Obesity
6. Psychosocial stress/Depression
7. Physical inactivity
8. Unhealthy diet
9. Alcohol use
10. Cardiac disease
11. Insomnia
12. Chronic inflammatory diseases
13. Cancer
14. Obesity, metabolic syndrome

which collectively accounted for 90% of stroke risk globally. (Interstroke study)

Education based interventions

- Education improved adherence vs usual care
  - OR 2.11 (short term)

Education + Enabling

Improved adherence

Improved control of risk factors:
BP, LDL reduction, lower HBA1c, weight loss…

Reduction in stroke and vascular events

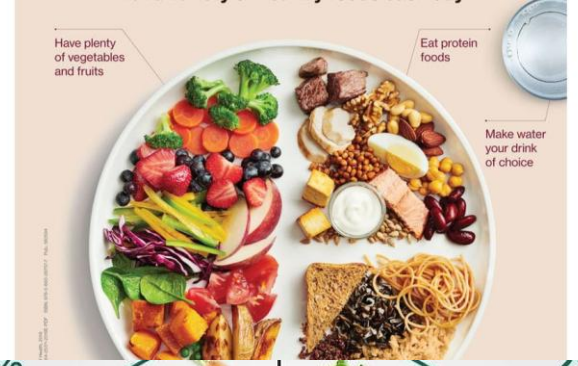
5A Model framework: Assess, Advise, Agree, Assist, Arrange

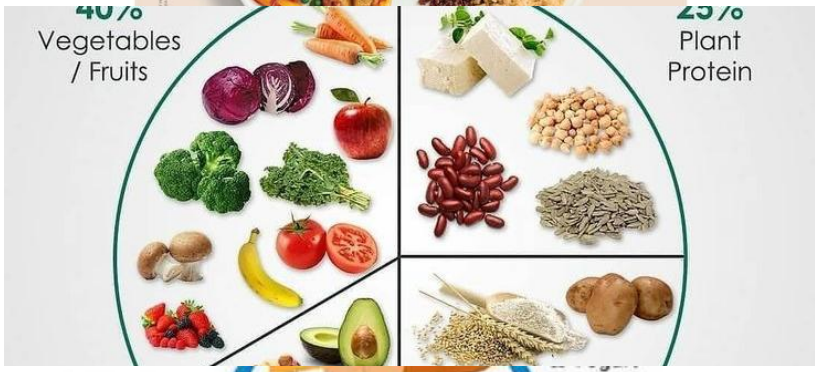
Addressing risk factors

- “Adopting healthy lifestyle behaviors can reduce stroke risk by more than 50%.”
- Suitable for primary and secondary prevention!

1. PILAR
Nutrition

- **Mechanism:**
    - improves BP, Lipids and insulin resistance
    - Reduces inflammation and arterosclerosis
- **Evidence:**
    - Mediterranean/DASH diets → ↓ stroke risk
    - **PREDIMED trial**: showed reduced cardiovascular events including stroke
    - Poor diet contributes to major stroke risk pathways
- **Key stat:**
    - Diet quality is directly linked to stroke incidence in cohort studies
- **Practical message:**
    - **Common message all : no processed food, no pop, low in refined sugar**
        - Emphasize:
            - Fruits, vegetables, whole grains
            - Low sodium
            - Healthy fats



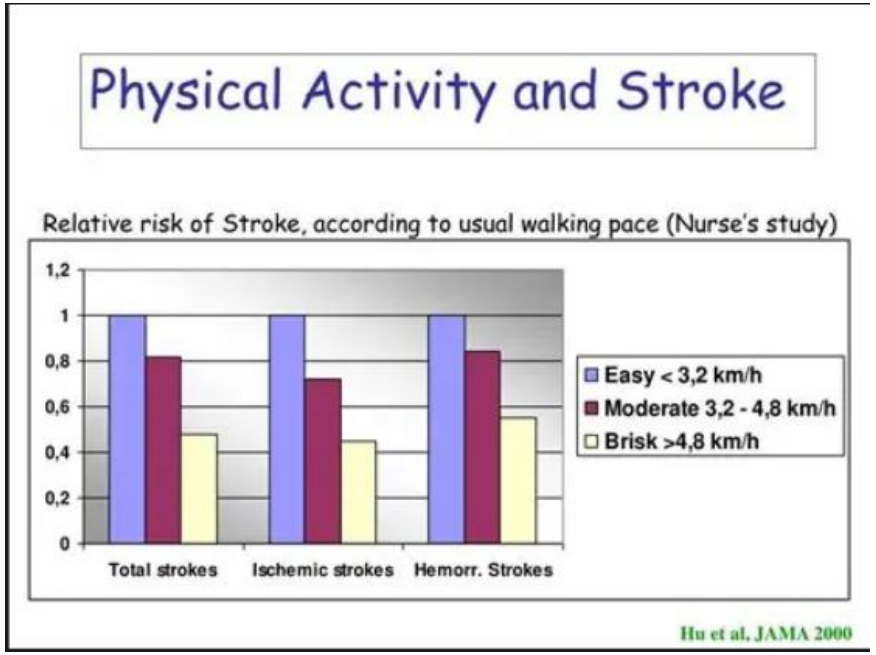


Evidence on diets

- Mediterranean diet associated with 29% CVD reduction over 4.8 years in patients with type 2 diabetes
- DASH4D trial (2025): DASH-style diet with sodium reduction lowered systolic BP by 4.6 mm Hg in adults with type 2 diabetes
- Look AHEAD trial: Participants achieving ≥10% weight loss or >2 metabolic equivalent increase in fitness experienced reductions in cardiovascular outcomes

2. PILAR physical activity

- **Mechanism:**
- ↓ BP
- ↑ insulin sensitivity
- Improves endothelial function
- **Evidence:**
- Physical activity → **20–30% reduction in stroke risk**
- Recommended: ≥150 min/week moderate exercise
- **Supporting study:**
- Lack of exercise is a major modifiable stroke risk factor
- **Secondary prevention relevance:**
- Improves recovery + reduces recurrence risk



3. PILAR Sleep

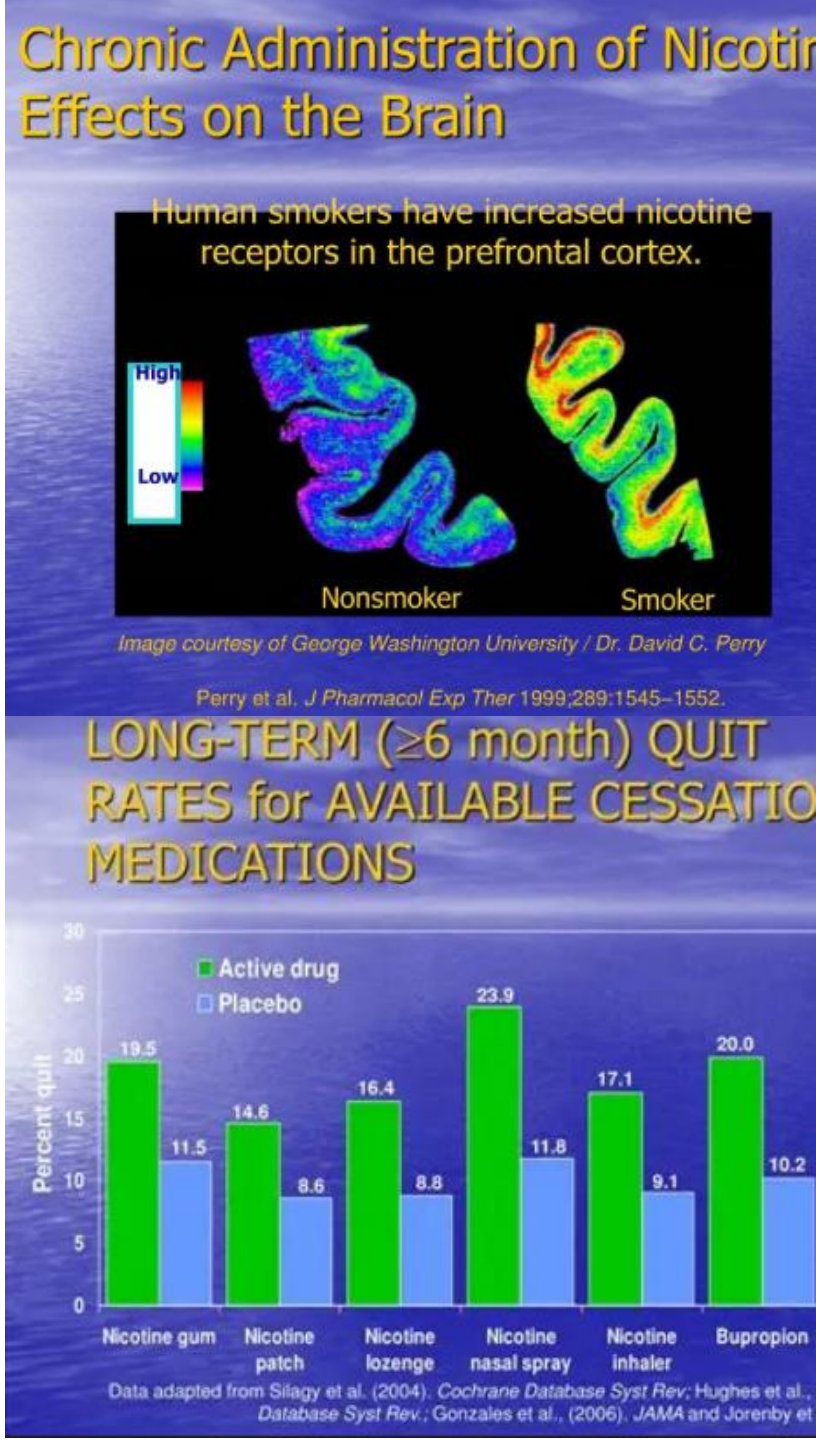
- Poor sleep → ↑ hypertension, inflammation, arrhythmias
- Sleep apnea strongly linked to stroke
- **Evidence:**
- Sleep disorders associated with:
  - Cardiovascular disease
  - Diabetes
  - Cognitive decline
- **Clinical takeaway:**
- Screen for:
  - Obstructive sleep apnea – sleep study
  - Insomnia
- Treatment:
  - CPAP
  - Cognitive behavioural treatment
    - Ottawa insomnia sleep clinic (OHIP covered)- 9 week 6 virtual group session
- **Book recommendations**:
  - Why we sleep – Matthew Walker
  - Say good night to insomnia – Gregg D. Jacobs

4. PILAR Stress management

- **Mechanism:**
- Chronic stress → ↑ cortisol → ↑ BP, inflammation
- Behavioral effects (poor adherence, smoking, inactivity)
- **Evidence:**
- Psychosocial stress is a recognized stroke risk factor
- **Interventions:**
- Mindfulness
- Cognitive behavioural therapy
- Relaxation training

5. PILAR Avoidance of risky substances

- **Includes:**
- Smoking
- Excess alcohol
- Drugs
- **Evidence:**
- Smoking → **~2× stroke risk**
- Risk declines after cessation (5–15 years)
- Alcohol, any amount caries a risk but is dose dependent.
- **Key message:**
- Smoking cessation = **one of the most powerful interventions**



6. PILAR Social connections

- **Mechanism:**
- Reduces stress, improves adherence
- Impacts mental health and recovery
- **Evidence:**
- Social isolation linked to worse cognitive and vascular outcomes

Integration of 6 PILARS

- **Powerful combined effect:**
- Cohort study:
  - Healthy lifestyle → **~44% lower stroke risk**
- Another large study: The Nurses' Health Study and Health Professionals Follow-up Study
  - Up to **~80% risk reduction** with 5 healthy behaviors
- Population data:
  - Higher lifestyle scores → significantly lower stroke prevalence
- 👉 Key teaching point:
- “Lifestyle factors don’t work in isolation—they are synergistic.”

Barriers to implementation

- Limited access to healthy food and safe environments for physical activity
- Insufficient training for healthcare professionals
- Time constraints in clinical practice
- Lifestyle counseling occurs in only ~34% of clinic visits despite clear evidence

GLP-1

- GLP-1 receptor agonists reduced stroke risk by **16% relative risk reduction**.
  - **Glucagon-like peptide-1 receptor agonists and stroke: A systematic review and meta-analysis of cardiovascular outcome trials-** . 2024 Oct;19(8):876-887.
    - **2024 Meta-analysis — 82,140 participants**
    - Total stroke: RR 0.85
    - Nonfatal stroke: RR 0.87
- Use in practice in parallel to lifestyle program especially in patient with high BMI and DM/ insulin resistance
- Issues:
  - insurance coverage: Ozempic- DM, Vigovy –obesity
  - Side effects: muscle mass reduction – important resistance training along side, monitoring with dexa scans (Dual-Energy X-ray Absorptiometry)
  - Other side effects: gallstone, pancreatitis, constipation (use magnesium), tachycardia, vision loss, diarrhea, GI upset
- Start low go slow best tolerated: 0.5mg/month change, often max dose not needed

CENTRAL ILLUSTRATION: Lifestyle Interventions to Support Primordial Prevention and Management of CKM Syndrome Stages 1 to 4

Stage 0

Children & Early Adulthood Prevention

- Dietary Intervention + Physical Activity reduces BMI in children
- Exercise leads to modest reduction in BMI
- Multicomponent health education in schools (Si! Program) reduces waist circumference & BMI in children

Stage 1

Weight Management & Metabolic Risk Prevention

- Caloric restriction → weight loss
- Low-fat diet + physical activity → ↓ T2DM risk
- Long-term weight loss is similar across reduced-calorie diets, regardless of macronutrient composition
- Sodium reduction & weight loss each → ↓ Hypertension risk

Stage 2

Metabolic Risk Reduction & Lifestyle Strategies

- Mediterranean Diet → ↓ CVD events
- DASH Diet → ↓ BP, greatest with low sodium intake
- Both protein & unsaturated fat diets are more effective than carbohydrate-rich diets → improved BP & lipids
- Aerobic + Resistance training → ↓ HbA1c; neither alone was effective

Stage 3

Subclinical CVD Management

- Lifestyle interventions incorporating a DASH-based diet & physical activity reduce noncalcified coronary plaque volume
- High-intensity exercise training reduces myocardial stiffness

Stage 4

Secondary Prevention in Clinical CVD

- Mediterranean diet → >70% ↓ recurrent cardiovascular events in post-MI patients
- Exercise + low-fat diet → ↓ myocardial ischemia and CAD progression
- High-intensity walk → ↑ 6MWT in PAD
- High-intensity training → ↓ AF symptoms

Shahid I, et al. JACC Adv. 2025;4(6):101788.

Lifestyle programs : example LifestyleRX

OHIP COVERED

VIRTUAL CLINIC BY LOCAL LIFESTYLE CERTIFIED MDS

- Bloodwork & email surveys about life and nutritional habits
- Assignment to Streams
  1) Diabetes/Insulin resistance
  2) metabolic syndrome
- Intake two 1 hour consults : Intake consult, safety assessment, then report review and goal setting & Action plan
- 12 weeks group sessions
- Assessment consult of progress
- Ongoing follow up every 3 months or monthly group follow up

What it drills down to

- Lifestyle modification should be first-line treatment in many chronic disease guidelines
- Weight loss of 5-10% produces clinically meaningful improvements in glycemic control (A1c reduction 0.6-1.0%) and stroke risk reduction
- Even without achieving weight loss goals, ≥150 min/week physical activity reduces diabetes incidence by 44% leading to direct impact of stroke risk reduction.
- Personalize interventions according to food availability, geographic location, and patient health status are needed.
- **Future Directions**
- Need for policy support and systems-level changes
- Enhanced medical education and competency training in lifestyle counseling
- Focus on underserved and most seriously impacted populations
- Integration of "whole person health" framework combining prevention with addressing root causes

Emerging Innovations in stroke prevention

- **Wearables and continuous monitoring**
  - Devices detect arrhythmias (afib), sleep disturbances
- **AI-assisted vascular risk prediction**
  - Machine learning models used to predict stroke risk, identify silent AF, analyse imaging for early vascular disease
- **Precision prevention**
  - Moving towards individualized profiling using inflammatory biomarkers, genetics, metabolic markers and imaging
- **Anti-inflammatory therapies**
  - There is growing interest in targeting inflammation directly in vascular disease prevention.

Canadian What's App Chat for LM providers (or LM curious) ....

CALM

WhatsApp group

THANK YOU

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