# Post-ACS Patient Education

Drinking from a Firehose Made Easy…ish

Travis Warner
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# Faculty/Presenter Disclosure

- Faculty:
  - Travis Warner, BSP, ACPR, BCPS, EPPh
    - Pharmacist, St. Boniface Hospital
- Relationships with commercial interests:
  - Grants/Research Support: Not Applicable
  - Speakers Bureau/Honoraria: Not Applicable
  - Consulting Fees: Not Applicable
  - Other:
    - Stocks in Aphria Inc., Aurora Cannabis Inc., Canopy Growth Corp. (medical marijuana producers)
    - Member of/treasurer for the Canadian Cardiovascular Pharmacists Network (CCPN), which produces clinical resources and educational events related to cardiovascular diseases for pharmacists and others, and receives the bulk of its funding via sponsorship and grants from industry

# Mitigating Potential Bias

- Potential bias in this talk is mitigated through a focus on evidence and reference to peer-reviewed research and guidelines wherever possible

# Learning Objectives

- Review the need for effective patient education and some of the benefits of effective education
- Discuss some of the barriers to effective transmission and retention of information by patients
- Explore approaches to patient education that may optimize its effectiveness and improve patient outcomes

# Determinants of Health

- Clinical healthcare services
- Genetic vulnerability
- Socio-economic characteristics
- Physical environment
- **Individual health behavior**

JAMA. 1993;270:2207-12.

# Patient-Centred Care & Decision-Making

# Patient-Centred Care

- The Institute of Medicine:
  - *"…a **partnership** among **practitioners**, **patients**, and their **families** ensures that decisions respect **patients' wants, needs, and preferences**, and that patients have the **education and support** they need to **make decisions** and **participate** in their own care, as well as participate in quality improvement efforts."*

Committee on Quality of Health Care in America. Crossing the Quality Chasm: A New Health System for the 21st Century. Institute of Medicine, National Academy Press; Washington, DC, USA: 2001.

# Patient-Centred Care & Decision-Making

- Patient-centred care places increased emphasis on **patient choice**
  - Models for healthcare decision-making:
    - Paternalistic
    - Informed choice
    - Shared decision-making

**Health literacy** refers to the combination of **skills** and **knowledge** that a person needs to possess in order to **access**, **understand** and **apply information** relating to his or her **health effectively** and **consistently**

J Card Nursing 2007;22(6):459-465.
https://abclifeliteracy.ca/health-literacy-fact-sheet

# Patient Decision-Making

- Patient capacity for **shared decision-making** evolves over time:
  - **initial** event & **emergent** care;
  - **hospitalization** & **inpatient** care;
  - impending **discharge**;
  - **transition** from hospital **to home**;
  - **rehabilitation** & **recovery**

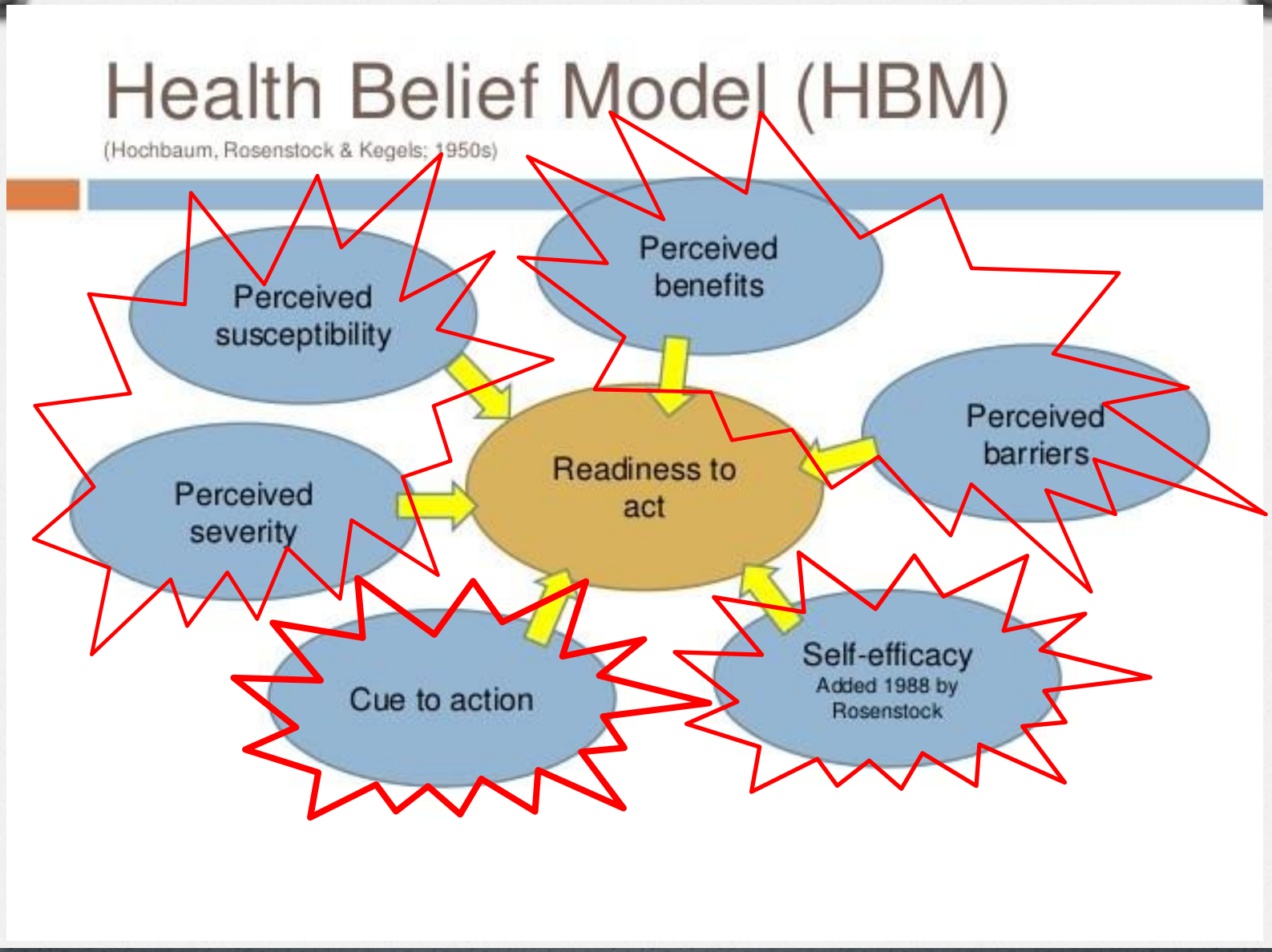
Increasing potential for patient decision-making

J Card Nursing 2007;22(6):459-465.

# Patient Decision-Making and the Health Belief Model

- Research on patient health choices revolves around the **Health Belief Model (HBM)**
  - Framework describing & predicting patient health-related decisions
- Likelihood that a patient will take **health-promoting action** dependent on factors such as perceived threat, self-efficacy, and cues to action…

Patient-Centred Care & Decision-Making



# Patient Education: Purpose & Benefits

# Who Provides Patient Education?

- **ALL healthcare providers** who provide care to and/or interact with patients
  - Nurses
  - Physicians
  - Pharmacists
  - Physiotherapists
  - Occupational Therapists
  - Physician/Clinical Assistants
  - …and so on

# Purpose of Patient Education

Patient **activation**:
The **knowledge**, **skills**, **confidence** and **inclination** to assume **responsibility** for **managing one's own health and health-care** needs

- With higher levels of activation, patients will better **understand** their **condition(s)** and associated **therapies**, required **actions** (and related **barriers**), and have increased **confidence** to take an active role in their own care
- Ultimately we want our patients to feel **empowered** and **engaged** in their care, which should lead to **improved health behaviors and outcomes**

# Benefits of Effective Patient Education

- Effective patient education may:
  - Improve patient **health literacy** and **activation**
  - Facilitate enhanced **communication** & **shared decision-making**
  - Assist in tailoring care to **patient preferences** (improved **value-choice agreement**)
  - Reduce healthcare **costs**
  - **Improve patient outcomes**

# Benefits of Effective Patient Education cont'd

- 2013 study assessing re-hospitalization for cardiopulmonary disease
  - patients with a **high degree of activation** were **less likely to be readmitted to hospital or visit an emergency department** within 30 days of discharge than those with a low level of activation
    - HR 1.93 (1.22-3.06) for rehospitalization for lowest vs highest activation

J Gen Intern Med 2014;29(2):349-55.

# Benefits of Effective Patient Education cont'd

- **US Preventative Services Task Force** report:
  - **Behavioral Counseling** to **Promote a Healthful Diet and Physical Activity** for Cardiovascular Disease Prevention in Adults Without Cardiovascular Risk Factors
    - …**behavioral counseling** interventions provide at least a small **benefit for reduction of CVD risk** in adults without obesity
    - …**improve healthful behaviors**, including beneficial effects on fruit and vegetable consumption, total daily caloric intake, salt intake, and physical activity levels
    - …**improvements in systolic and diastolic blood pressure** levels, low-density lipoprotein cholesterol (**LDL-C**) **levels**, body mass index (**BMI**), and **waist circumference**

JAMA 2017;318:167-174.

# Lower Costs with Improved Health Literacy

- 2013 analysis of patients within a health care system in Minnesota:
  - **patients most lacking in skills and confidence** to be actively engaged in their health care had **average costs** that were from **8 to 21 percent higher** compared to patients with the highest level of engagement
  - Effect persisted even after adjustment for "risk" of higher costs

Health Affairs 2013; 2:216-222.

# Benefits of Shared Decision-Making

- 2018 study in patients under consideration for destination therapy LVAD
  - Patients with **enhanced education** were **more knowledgeable** regarding LVADs when tested; reported **better agreement between stated values and treatment** choice; and were about ***1/3 less likely*** **to actually receive an LVAD** (53.9% vs 79.9%)

JAMA Intern Med 2018;178(4):520-529.

# Patient Education: Overview

# Components of Patient Education & Factors Affecting Information Transfer

- **Environment**
- Information **recipient(s)**
  - **patient**/caregiver/loved ones
- Education **provider(s)**
- Information **content**

# Environmental Factors

- Ideal setting for effective teaching should be quiet, comfortable, & free of distractions
- If there's excessive noise or distraction, move elsewhere

# Patient Factors

- Education level
- Literacy
- Language skills/language barrier
- Cultural & socio-economic factors
- Capacity for comprehension & recall
- Learning style
- Depth of related/pre-existing knowledge
- Age
- Sensory (visual/auditory) acuity
- Presence or absence of others
- Learning priorities
- Perceived importance of the material
- Physiological state (sleep deprivation, pain)
- Psychological state (e.g. anxiety/distress)

# Patient Literacy

- Nearly half (**48 percent**) of adult Canadians have **literacy skills below high school equivalency**
- About **17 percent** function at the **lowest level**, where individuals may, for example, be unable to read the instructions on a medication vial
- **65 percent** of **recent immigrants** (in Canada less than 10 years) and **63 percent** of **established immigrants** (in Canada more than 10 years) (measurements from Quebec) had **inadequate literacy** skills

http://www.conferenceboard.ca

# Learning Styles

- Individual patients may have a preference for **verbal**, **visual**, or **audiovisual** information
- Some may deal well with **abstract** concepts; others may require something more **concrete**
- Some may do well with an "information dump" while others may require more **discussion**, use of **mixed media**, and/or **repetition**
- Retention rates may differ greatly between patients presented with identical information due to individual learning style

# Illness & Cognitive Impairment

- **Acute illness** may significantly affect **cognition** and **memory**:
  - Study of elderly (70+ yrs old) patients without history of cognitive impairment admitted from community to hospital with acute illness
    - Nearly 1/3 (**31.5%**) displayed previously unrecognized **"low cognition" at discharge**
    - More than half (58%) displayed significant **improvement in cognition by 1 month post-discharge**

J Hosp Med. 2015;10(7):439-45.

# Sleep Deprivation

- Sleep deprivation leads to **decreased attention** and **poorer judgment and information recall**
- **Sleep duration and quality** in hospital is nearly universally **poor**
- Patients are often in a significantly **sleep-deprived state** when undergoing education

Psychol Bull. 2010;136(3):375–89.
Neuropsychiatr Dis Treat. 2007:3(5):553–67.
J Hosp Med. 2015;10(7):439-45.

# Stress & Anxiety

- **Attentional narrowing**
  - Stressful/emotional information will draw attention, **limiting mental resources** available for other information
- **State-dependent learning**
  - Recall is affected by **congruity** between **physical & psychological states** when learning and remembering
- Both **very high** *and* **very low anxiety** hamper memory performance – recall is best with **"moderate" anxiety!**

J R Soc Med. 2003;96:219-22.
Br J Soc Clin Psychol. 1979;18(2):245-55.

# Provider- & Content-Related Factors

- **Effective teaching practices** are a must
- Information must be optimized to be as **clear**, **organized**, and **comprehensible** as possible
- **Volume** of information should be kept to a minimum (as far as possible)
- Information formats should be chosen (and combined) for better recall:
  - visuospatial vs auditory-verbal vs multimedia
- Time is short!!

# The Four Habits Model

- Framework for **patient-centred healthcare encounters**
  - **Invest in the Beginning**
    - Create rapport quickly; elicit patient's concerns; plan the visit
  - **Elicit the Patient's Perspective**
    - Ask for the patient's ideas; elicit specific requests; explore the impact on the patient's life
  - **Demonstrate Empathy**
    - Be open to the patient's emotions; make empathic statements; convey empathy nonverbally
  - **Invest in the End**
    - Deliver information in terms of patient's original concerns; educate along with rationale, explain expected outcomes and options; summarize and review next steps; verify understanding; provide written information

https://www.ndep.nih.gov/assets/The-Four-Habits-Model-508.pdf
www.ucdenver.edu/academics/colleges/medicalschool/.../4%20Habits%20Model.pdf.

# Communication Best Practices

- **Openness**
  - Elicit and acknowledge patient perspectives, values, beliefs
  - Try not to appear curt or rushed
  - Adopt a friendly demeanor
- **Active Listening**
  - Attentive body language (open posture, eye contact), back-and-forth dialogue, open-ended questions
- **Speaking Plainly**
  - Assume low health literacy in most patients, avoid jargon

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Pharmacy (Basel). 2018;6(1):18.

# Optimization of Information Transfer

- Time management
- Structure & organization
- Teach-back
- Chunk-and-check
- Format & media
- Repetition & reinforcement

# Time Management

- Limited staff and demands of a busy work environment mean time may be short, and must be used **wisely**
  - Even so: effective patient-centred communication requires **understanding** a patient's situation and perspective, so an **exchange** is **necessary**
    - A patient self-reported story should only take 2-3 minutes
    - Shared decision-making should only take about 2 minutes in a 20 minute encounter
    - Patients may be redirected as necessary
- Keep information and explanations brief and **to-the-point**

Pharmacy (Basel). 2018;6(1):18.
Nelson AM. Improving Patient Satisfaction Now: How to Earn Patient and Payer Loyalty. Jones & Bartlett Learning; Burlington, MA, USA: 1997.

# Structure & Organization of Information

- Information should be **ordered logically**
  - If you're disorganized and scrambled, the patient will be far worse off!
  - **Explicit organization** (specified in advance) improves recall
- **First** and **last** items mentioned will be best-retained (**serial position effect**)
  - Combination of **primacy effect** and **recency effect**

J R Soc Med. 2003;96:219-22.
J Exp Psychol. 1964;64(5):482-88.

# Teach-Back, Chunk-&-Check

- The **teach-back method** requires a patient to **repeat back**, in his or her **own words**, what has just been presented
  - Proven to enhance understanding, recall, and adherence
  - Can combine with "show me method"
- **Chunk-&-check** breaks up large amounts of information into smaller pieces, and reviews each "chunk" before moving onto the next

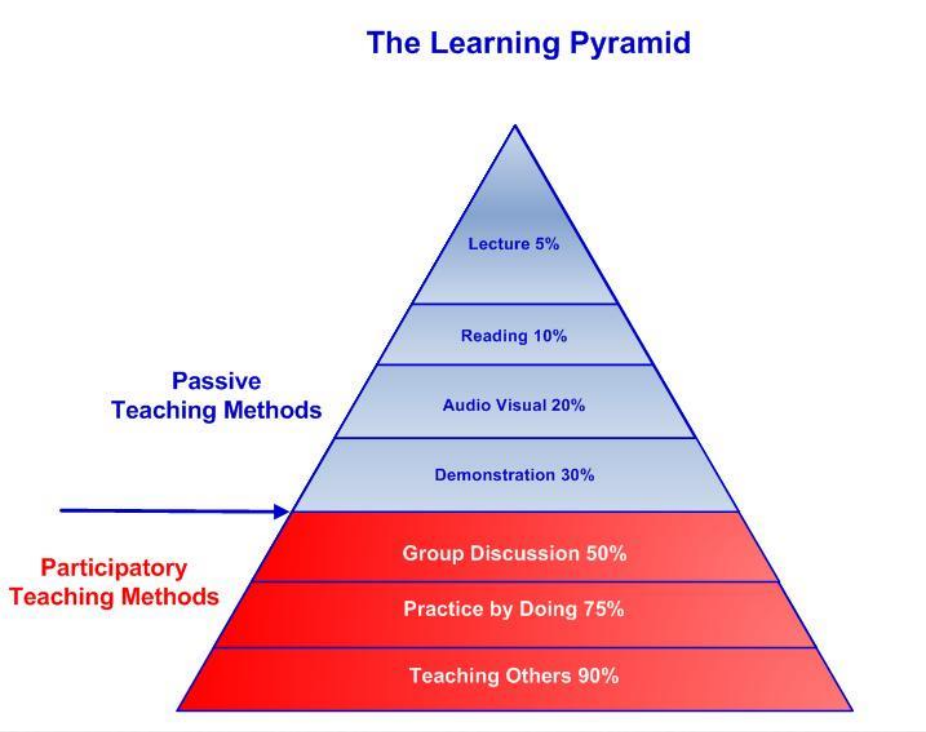
Agency for Healthcare Research and Quality. Available at: https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/healthlittoolkit2-tool5.html

# Teach-Back, Chunk-&-Check cont'd

- Try to ensure the review is not perceived as a "test":
  - "So that I know **I did a good job** teaching you, I will ask you a few questions…"
  - "If you were talking to a family member later today, what **would you tell them we talked about** here?"
  - "Just **to make sure I covered everything** I needed to with you, I am going to have you walk me through each step…"

# Format, Media, & Repetition

- **Retention** rates differ based on **method of delivery**




(Specific numbers and accuracy of this model are disputed)

# Format, Media, & Repetition

- Patients immediately forget 40-80% of medical information with which they're presented
  - And nearly half of what *is* remembered is remembered incorrectly!
- With **increasing information volume**, proportional **retention will decrease**
- **Written, visual,** and **multimedia** information is vital to ensure important information is not forgotten
  - Not only does this type of information have better retention than spoken words, it may revisited multiple times, further enhancing comprehension and recall

Exp Aging Res 1996;22:403-28.,
Rheumatol Rehabil 1979;18:245-55.
J R Soc Med 2003;96(5):219–222.

# Format, Media, & Repetition cont'd

- Visual information – **cartoons, diagrams, pictograms** – is retained better than verbal information
  - In one study, retention was 84% for pictures-plus-spoken information vs 14% for spoken information alone!
- Pictures are especially important in patients with **low literacy**

Patient Educ Couns. 1998;35(2):83-8.
Patient Educ Couns. 2006;61(2):173-90.

# Post-ACS Patient Education

# Setting the Stage

- Introductions and overview of the encounter ”prime” the patient to receive the information
- Assessment of patient information needs
  - Simply ask, “**How did you end up here** and **what’s your understanding of all that’s happened**?”
- Information can be presented in simple/low-complexity, or higher complexity terms, according to the patient’s health literacy and desires (as demonstrated by the patient and expressed in his/her own words) – but **simple/low-complexity** is always a **reasonable** choice!

# Speaking the Language

(video clip removed)

# Teaching References

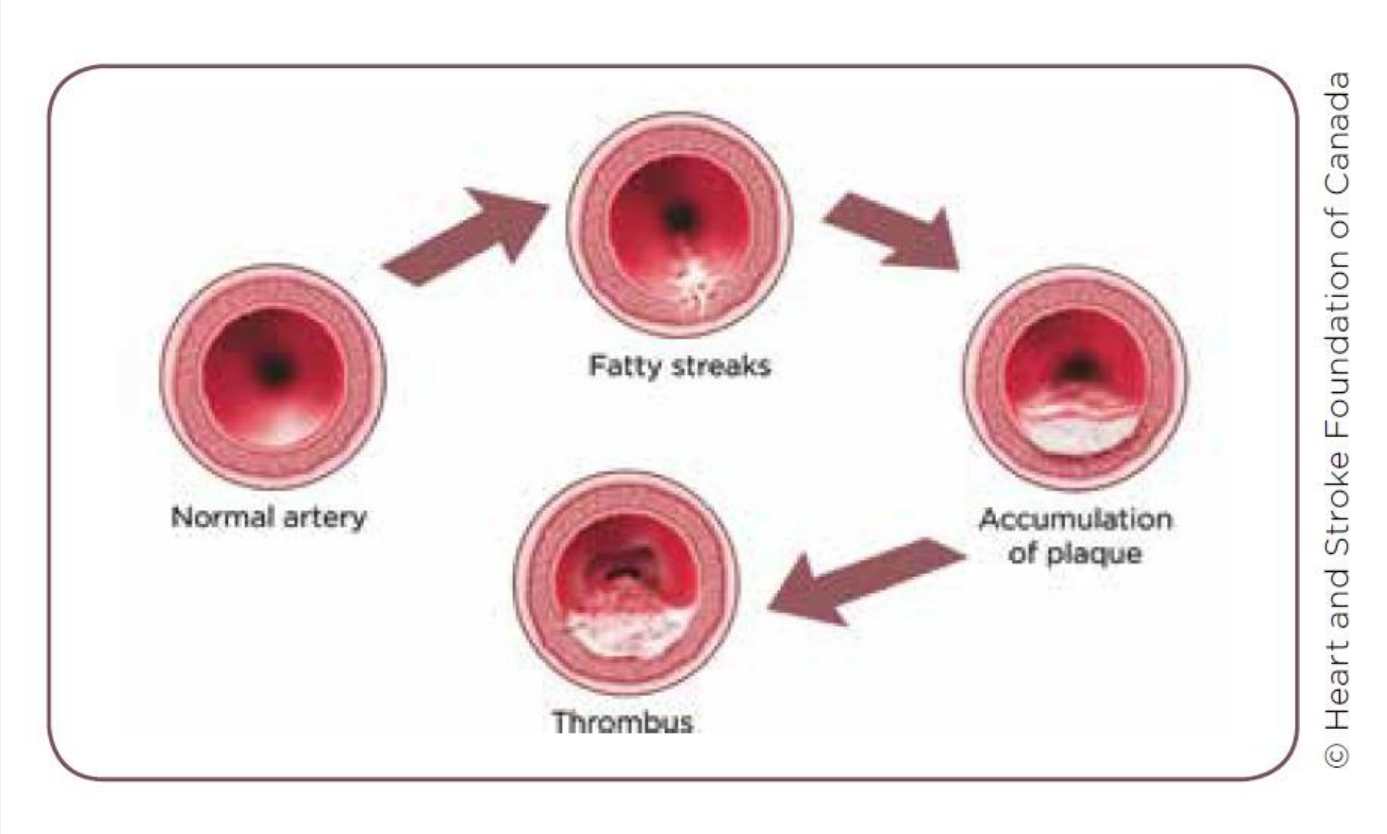

- Medication teaching sheets
  - WRHA-developed, Heart and Stroke Foundation (online)
- Other references
  - Physiotherapy-developed information sheets
  - others

# The Disease

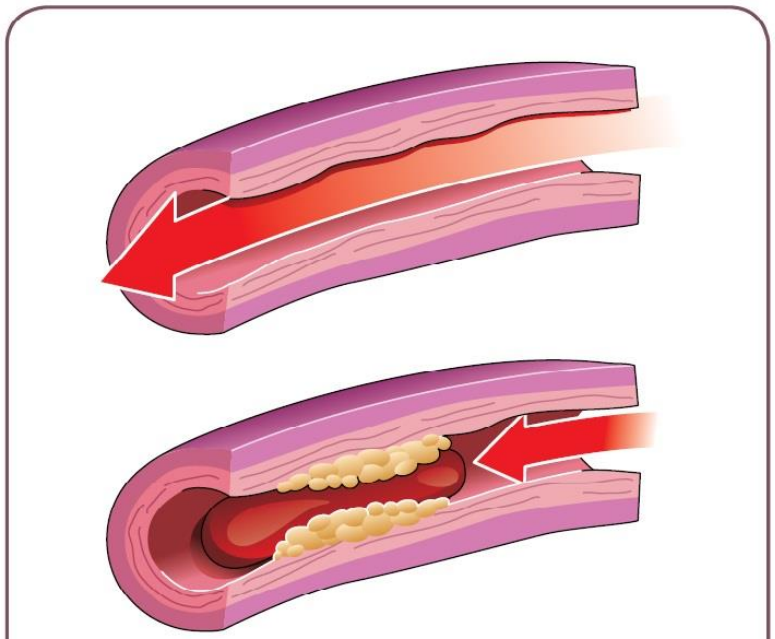
- Explanation of the patient's condition provides **context** for the rest of the discussion
  - It's vital that a patient understands the nature of his or her disease in order to make sense of the management!

- **Plaque** is a **waxy** substance that builds up on the inside of blood vessels. Sometimes it forms into something **juicy** like a **pimple** on the inside of a vessel, and those **juicy plaques** can sometimes **pop**… **blood is sticky** and **tends to stick** to anything that doesn't look like the normal inside of a blood vessel…

# From *Living Well with Heart Disease*



# From *Living Well with Heart Disease*



Normal blood flow through healthy artery (top) and blocked blood flow in artery with yellow plaque and red blood clot (bottom).

Image: iStock.com/jack0m

# From *Living Well with Heart Disease*

## WHAT ARE THE COMMON SIGNS OF HEART ATTACK?

**Chest discomfort**

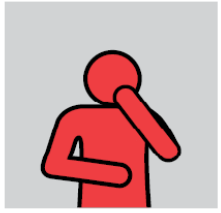
(uncomfortable chest pressure, squeezing, fullness or pain, burning or heaviness)

**Discomfort in other areas of the upper body**

(neck, jaw, shoulder, arms, back)

**Shortness of breath**

**Sweating**



**Nausea**

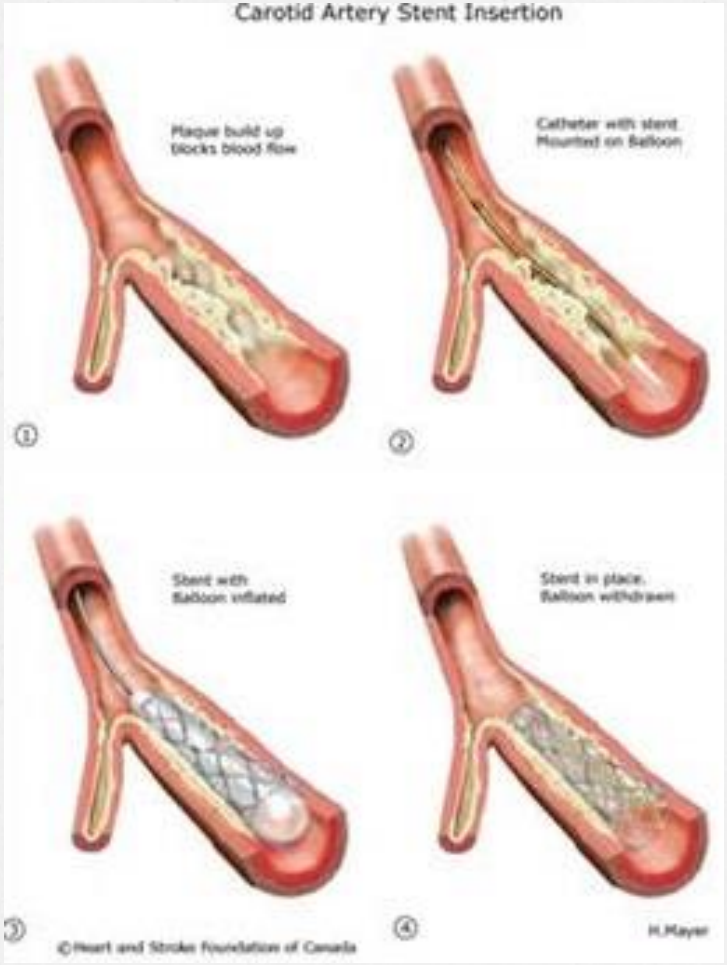
**Light-headedness**

# The Treatment(s)

- Medical management vs interventional (PCI or CABG)

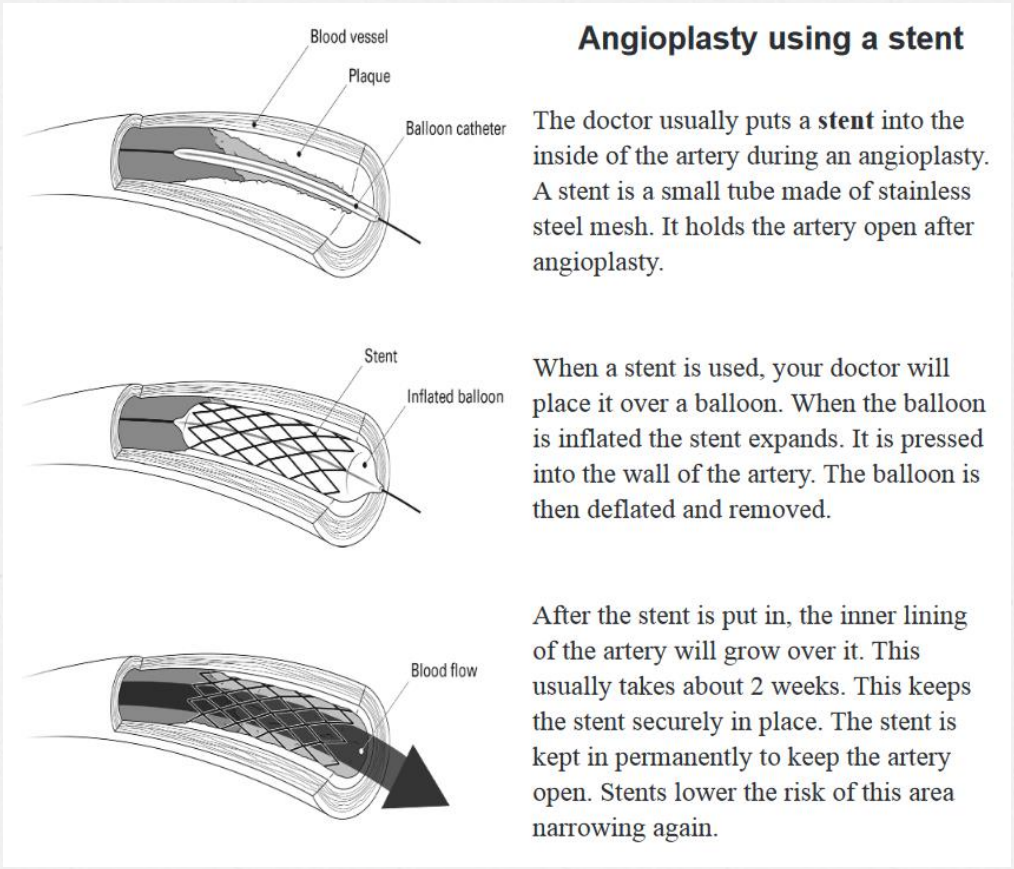
- The cardiologists who do angiograms are like **plumbers**…
- A **stent** is like a **tiny culvert** made of high-tech **chicken wire** – it looks like the spring from a pen
- **Bypass grafts** carry blood from an area with good blood supply to an area affected by **blockages**

# PCI: Heart & Stroke Foundation




http://www.heartandstroke.ca/heart/treatments/surgery-and-other-procedures/percutaneous-coronary-intervention

# Angioplasty: A guide for people living with heart disease (Peter Munk Cardiac Centre)




http://www.uhn.ca/PatientsFamilies/Health_Information/Health_Topics/Documents/Affairs_of_the_Heart_Angioplasty.pdf

# The Dangers of Denial

- 2016 study in patients with chronic heart failure
  - 100 patients assessed with the Nottingham Health Profile (NHP) questionnaire and Acceptance of Illness Scale (AIS)
    - **Low levels of acceptance** of illness scored **significantly higher** on the **energy**, **pain**, **emotional reaction**, **sleep**, **social isolation** and **mobility**
    - Failure to accept illness is associated with **poorer quality of life** in patients with chronic heart failure
    - Multivariate analysis showed that **acceptance of illness was the only independent predictor of quality of life** in all the NHP domains

Eur J Cardiovasc Nurs 2016;15(4):241-7.

# Medications & Medication Counselling

# Medications

- Nearly all of the medications given after a heart attack are "**forever**"
  - The disease is chronic, so the treatment has to be, too
  - Most people won't actually feel better when they take their medications, but they'll still be getting the benefits (**lower risk** of another heart attack, **living longer** and **healthier**)
  - Changes to lifestyle and diet are important, but **don't replace the benefits of medications**
- Complete medication teaching involves:
  - Review of regimen for each agent (drug name, dosing, purpose & effects, adverse effects & interactions)

# Medications - Classes

- Typical **post-ACS** medications:
  - Antiplatelets (DAPT)
  - Statin
  - Beta-blocker
  - ACE-inhibitor/ARB
  - Nitroglycerin

# Antiplatelets

- **In brief:**
  - Usually, ASA + another (clopidogrel, ticagrelor, prasugrel) – **ASA** (usually) **forever**
  - Antiplatelet drugs **make the blood less sticky**
    - If you have plaques in your arteries, and especially if you have stents, **your blood may try to stick** to a plaque or stent material and clog up the vessel…

# Antiplatelets cont'd

- **Purpose, effects:**
  - Antiplatelet drugs **make the blood less sticky**
    - If you have plaques in your arteries, and especially if you have stents, **your blood may try to stick** to a plaque or stent material and clog up the vessel…
  - **Do not to stop or interrupt** taking clopidogrel, ticagrelor, or prasugrel early unless approved to do so by a cardiologist. Ensure that the intended **duration of dual antiplatelet therapy** is **clear**
    - Missing doses of antiplatelets can result in a second heart attack, especially if missed soon after the first event
  - **ASA** will be a **lifelong** medication… other blockages in the heart arteries (even if they are not easily seen on the angiogram) may grow or become unstable in the future. ASA will lower the risk of these blockages leading to clots within the arteries and another heart attack

# Antiplatelets cont'd

- **Side effects, interactions:**
  - Because of their effects on clotting, antiplatelets increase **risk for minor bleeding or bruising.** This is often termed **"nuisance bleeding"** and does not require stopping the drug(s)
    - **Patients with: severe stomach pain**, **bloody vomit**, or **vomit that looks like coffee grounds**; **bloody or tarry black stools**; **bloody urine**; or **excessive bruising (especially if unprovoked)** should **seek medical attention** right away. The risk of any of these things happening is low, but patients must be aware of the potential so they can react without delay
  - Do not take any other medications (including OTC or herbal) containing ASA or that have (or may have) effects on bleeding/clotting. If in doubt, ask a pharmacist
    - **Acetaminophen is the painkiller of choice.** NSAIDs should be avoided if possible

# Antiplatelets cont'd

- **Pearls:**
  - If an NSAID must be taken, **avoid taking ASA and the NSAID at the same time**
    - Take **ASA at least 2 hours before** the NSAID
    - If an NSAID is needed regularly for pain control, **consider analgesic-dose ASA** (high risk of GI adverse effects, however)
  - Patients taking analgesic-dose ASA, chronic naproxen, or other high dose NSAID with DAPT should be strongly considered for **gut protection** with a PPI

# Antiplatelets cont'd

- **Pearls** cont'd:
  - Approx. 13% (less than **1 in 7**) chance of short episodes of **dyspnea** after starting **ticagrelor**
    - These episodes are usually **self-limiting** and rarely (1%) require stopping the drug
  - There is an approximately **1% chance** of developing a delayed, generalized, exanthematous and pruritic rash after starting **clopidogrel.**
    - If this occurs, it can be treated effectively with steroids without stopping clopidogrel. Alternatively, clopidogrel could be changed to an alternative agent (prasugrel or ticagrelor). In either case, **DAPT should not be interrupted**
  - **Prasugrel should NOT be used** in patients with a history of **transient ischemic attack or stroke** (also, dose adjust for >75 yrs old, <60 kg)

# Antiplatelets (abbreviated video)

(video clip removed)

# Antiplatelets – CCPN Video

- The **CCPN Dual Antiplatelet Patient Education video** may be found at:
  - **CCPN website:**
    - http://**ccpn.ca**/
  - **YouTube:**
    - Search for **Canadian Cardiovascular Pharmacist Network (CCPN)** or **Patient Education: Dual antiplatelet therapy (DAPT)**
  - **Facebook:**
    - https://www.facebook.com/CanadianCardiovascularPharmacistsNetwork/
  - **WRHA Cardiac Sciences website:**
    - http://www.umanitoba.ca/faculties/health_sciences/medicine/units/cardiac_sciences/acsnetwork.htm

# Statins

- **In brief**:
  - Patients with plaques in the arteries should take a **high-potency** statin at a **moderate-to-high** dose, if possible
    - Atorvastatin 40-80 mg
    - Rosuvastatin 20-40 mg
  - Statins are the **best thing we know of** for **slowing down – any maybe even stopping – plaque formation**
    - It's all about the **plaques**!
    - Plaque formation is a **life-long** process, to the treatment has to be life-long too

# Statins cont'd

- **Purpose, effects:**
  - Statins **slow down or stop plaque formation** in the arteries
  - Once a person has had a heart attack due to plaques in the arteries, a statin drug should be taken life-long **regardless of cholesterol levels** in the blood. Plaque formation is complicated and depends on more than the cholesterol level in the blood, and statins do more than just change cholesterol levels to prevent plaques. Other **medications and diet or lifestyle changes do not have the same effects as statins**
  - If the statin drug is stopped, its **protective effects** on plaque formation **will be lost**; therefore it should be a life-long medication post-MI

# Statins cont'd

- **Side effects, interactions:**
  - The large **majority of people experience no side effects from statins**
  - **New muscle soreness, achiness, cramping, or weakness** can sometimes be caused by statin drugs in some people. Muscle discomfort related to statins may feel similar to next-day muscle discomfort experienced after hard work or heavy lifting, but without an obvious cause. This is often **caused by higher than normal sensitivity to a particular statin drug.** It can often be **resolved by lowering the dose or changing to a different statin**

# Statins cont'd

- **Pearls:**
  - **Muscle adverse effects** may occur **without significant elevations in creatine kinase (CK)**
  - **Neurological effects** that have been attributed to statins such as memory impairment or cognitive decline are **not well established risks** according to available data
  - The risk of developing **glucose intolerance or diabetes** due to statin therapy is small and vastly **outweighed by the large cardiovascular benefits**
  - **Grapefruit and grapefruit juice**, especially in large amounts, can increase the risk of muscle adverse effects with some statins. This is not a significant interaction for rosuvastatin, pravastatin, or fluvastatin.
  - **Simvastatin** generally carries **greater risk of drug interactions** than other statins. Care should be taken to assess for drug interactions and adjust the dose accordingly for patients on simvastatin; alternatively, a patient could be changed to another agent.

Can J Cardiol 2011;27(5):635-62.
Can J Cardiol 2009;25:567-79.

# Beta-blockers

- **In brief:**
  - **Block** the effect of **stress hormones** on the heart muscle, which causes the heart to slow down and relax
  - The heart is like a marathon runner that never gets to stop. When it's been damaged or weakened we don't want it to overwork itself, so we force it to **slow down and not work too hard**
  - It's like your heart is idling too high, so we slow you down with these drugs

# Beta-blockers cont'd

- **Purpose, effects:**
  - This medication may help **prevent another heart attack**
  - Protect against **abnormal rhythms** that can occur after a heart attack. These abnormal rhythms can be dangerous
  - **Protect the heart muscle if it has been weakened**: The heart will become exhausted and further weakened if not protected from stress after it has been damaged. Protecting the heart with a beta-blocker may **help it get stronger** over time.
  - If doses are missed or the drug is stopped without medical advice, the heart rate may speed up or the heart may flip into an unhealthy rhythm

# Beta-blockers cont'd

- **Side effects, interactions:**
  - May **lower blood pressure**; can sometimes cause **dizziness**, especially when going from lying or sitting to standing position. This usually gets better over time as body gets used to the beta-blocker. Patients should be aware of this and change positions slowly, especially when the drug is new
  - Some people **may feel more tired** when they first start taking a beta-blocker. This **usually gets better with time** as the body gets used to the drug

# Beta-blockers cont'd

- **Pearls:**
  - Note that **beta-blockers may not be required lifelong** post-MI, particularly in patients with normal LVEF without another indication
  - Caution with 1st degree heart block; **contraindicated** in 2nd and 3rd degree **heart block** (in absence of pacemaker), **bradycardia**, **hypotension**; use caution when initiating in heart failure/low cardiac output state and in patients with reactive airway disease
  - **Intolerance due to bronchoconstriction is rare** aside from those with severe reactive airway disease. The risk is highest with non-cardio-selective agents or high dose cardio-selective agents.
  - If adherence is a concern then consider switching patient to a once daily beta blocker

# ACE-inhibitors, ARBs

- **In brief**:
  - Work against a hormone system that causes your blood vessels to squeeze, and your kidneys to hold onto water:
    - This **"unloads" the heart**
  - Relieve pressure on your heart and blood vessels over time
  - **Lower risk** of **heart attacks and death** over the **long term**

# ACE-inhibitors, ARBs cont'd

- **Purpose, effects:**
  - This medication will **help prevent another heart attack**
  - **"Unload" the heart** and make it easier to pump blood, mostly by lowering the blood pressure. This is a **strong protective effect** that prevents the heart muscle from weakening and **helps a weakened heart muscle get stronger.** Other types of blood pressure medications do not have the same protective effect

# ACE-inhibitors, ARBs cont'd

- **Side effects, interactions**:
  - Will **lower blood pressure**; can sometimes cause **dizziness**
  - **Non-productive cough or "tickle in the throat" is common with ACEIs**
    - Cough attributed to an ACEI should not be associated with other symptoms such as nasal congestion, and should persist regardless of health status, allergen exposure/antihistamine use, etc. The cough may present early after starting the drug, or may take several months to develop. A cough that is not persistent is not likely to be ACEI-related. ACEI-related cough may warrant a change to an ARB
  - May cause **hyperkalemia**, avoid using potassium based salt substitutes

# ACE-inhibitors, ARBs cont'd

- **Pearls:**
  - **Avoid** in **hyperkalemia**, **hypotension**, **acute kidney injury**, **bilateral renal artery stenosis**, **pregnancy or breastfeeding**; use **caution in severe renal dysfunction**
  - **Creatinine** should be measured **7-14 days after initiation of ACEI or ARB.** Frequent **serum potassium measurements** may be required if regimen includes both ACEI/ARB and aldosterone antagonist, especially in the presence of renal impairment

# Nitroglycerin

- **In brief:**
  - Open blood vessels to prevent or treat **heart pain**
    - Like a **fire extinguisher** for a fire
  - **Does NOT fix the underlying problem**

# Nitroglycerin cont'd

- **Purpose, effects:**
  - Should be **carried by patient and available at all times** post-MI in case it is needed
  - Can be thought of as a **"fire extinguisher" for heart pain**
  - Is available without a prescription in Canada
  - Instruct patient on **how and when to use**:
    - Spray once under the tongue when needed for heart pain
    - Repeat once after 5 minutes, if pain still present
    - If not relieved after 2 sprays, seek medical attention immediately and use a 3rd spray
  - Provide **instructions in writing**
  - Important to find out a **patient's own symptoms of a heart attack** and instruct them to use the nitrospray/tabs for those symptoms

# Nitroglycerin cont'd

- **Purpose, effects cont'd**:
  - Important to emphasize that, aside from use for stable angina (preventatively or when it is experienced), **the purpose of fast-acting nitroglycerin is to buy time** to get to the hospital – **it does not fix the underlying problem** if there is a new blockage in an artery
  - If a patient is not expected to have heart pain (i.e. has been fully revascularized), any incidence of **new heart pain is concerning**, even if it is completely resolved by nitrospray. In these cases, patients should be instructed to **contact their healthcare provider with little delay** if they experience heart pain

# Nitroglycerin cont'd

- **Side effects, interactions:**
  - Must not be used within **24 hours** of **sildenafil (Viagra®) or vardenafil (Levitra®)**, or within **48 hours** of **tadalafil (Cialis®)** due to risk of massive drop in blood pressure
  - May cause **lightheadedness** or **dizziness**; instruct patient to **sit down or lay down prior to administering** spray/tab. Headache is very common

# Adherence


"We combined all your medications into ONE convenient dose."
NICKEL

# Adherence

- Most **post-ACS medications** are taken **long-term**; this should be **emphasized** during counselling.
- Long-term medication adherence post-ACS is often very poor: various data have shown that generally **less than half of patients are adherent** to post-MI medications one year post-event
- Every effort must be made to increase the likelihood that patients will take their medications.
  - Good adherence is associated with good outcomes: adherence to all standard post-ACS medications has been associated with a 90% reduction in mortality 6 months post-event!

J Gen Intern Med 2008;23(2):216–218.
Circulation 2004;109:745–749.
Arch Intern Med 2007;167(6):540-50.

# Adherence cont'd

- Prompting mechanisms/reminders (apps, alarms, websites)
- Simplified/more convenient regimen
- Bubble backs, dosettes
- Patient education/comprehension
- Addressing affordability/cost
- Addressing adverse effects
- Addressing accessibility issues

Clinical Evidence 2011;04:220.
Am J Hosp Pharm 1992:49(7):1691-6.

# Cost

- Cost of standard post-ACS regimen can be **substantial**
- Cost concerns, particularly if affecting adherence to therapy, should be addressed whenever possible, and appropriate steps should be taken (enrollment in **Pharmacare**, change to **less expensive medications**, **discontinuation of non-essential medications**…)
  - Medication cost comparison:
    - https://medsconference.files.wordpress.com/2017/02/**price_comparison_of_common_rx_drugs**mb-2017.pdf

# Psychological Effects

- Approximately 1 in 6 patients will experience **unipolar major depression post-MI**, and approximately twice this number will experience **significant depressive symptoms**
- Post-MI depression may lead to **poor self-care** including **medication non-adherence**, and is an **independent risk factor for post-MI mortality**
- Patients should be advised to **seek professional help** if they experience symptoms of depression post-MI
  - Symptoms may include depressed mood, anhedonia, changes in appetite, insomnia or hypersomnia, lack of energy or feeling of exhaustion, psychomotor agitation or slowing, feelings of worthlessness or guilt, or suicidal ideation

JAMA 2001;286(13):1621-27.

# Sexual Dysfunction

- Both men (46%) and women (59%) report sexual dysfunction following an ACS event
- This issue is **under-addressed**
- Heart and Stroke's *Living Well with Heart Disease* book reviews sex and intimacy post ACS or heart surgery

JAMA Cardiol. 2016;1(7):754-64.

# Ongoing Informational Needs

- Not all information sources are equal…
- Heart and Stroke Foundation
- WRHA Cardiac Sciences
  - http://www.umanitoba.ca/faculties/health_sciences/medicine/units/cardiac_sciences/forpublic.htm
  - (google “Cardiac Sciences Manitoba”)

# Summary

- The challenges we face in doing effective post-ACS patient education are substantial, and various barriers to effective education exist
- By optimizing every aspect of the education, we can ensure maximum effectiveness; which, in turn, will ensure our patients have the best possible understanding and confidence about their conditions, better adherence to therapy, more participation and engagement in their own care, and – ultimately – **better outcomes**

END