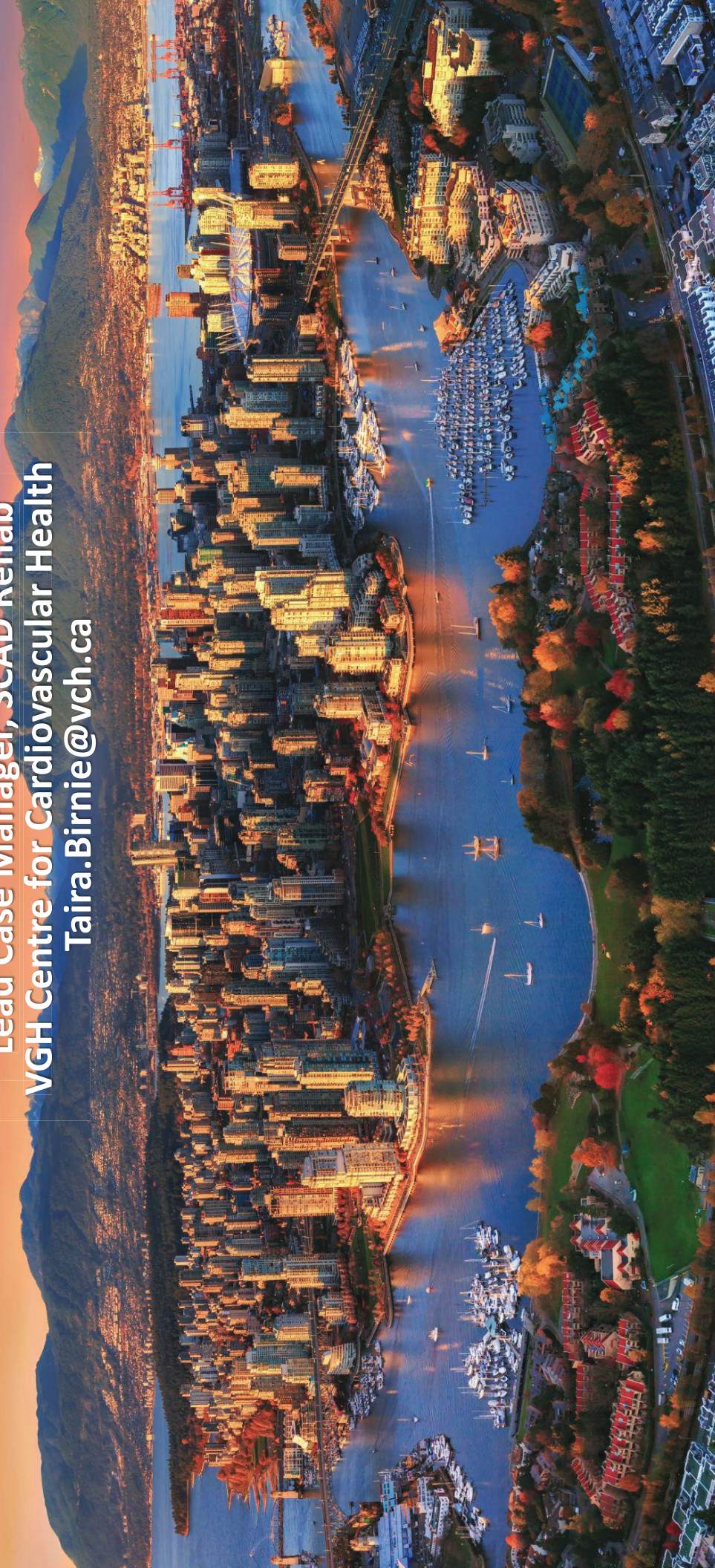


Vancouver SCAD Rehab

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OUTLINE

- SCAD 101
- Cardiac Rehab
- Considerations for return to physical activity and exercise post SCAD
- Resources

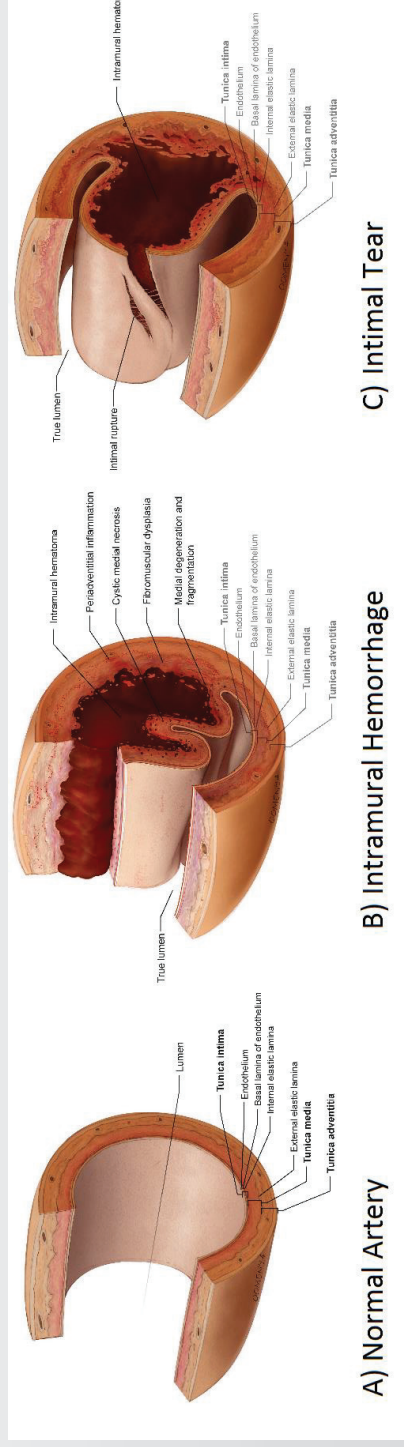


*The medical information presented today is an information resource only.
Please consult your health care provider your own personal medical
concerns/advice.*

What is SCAD?

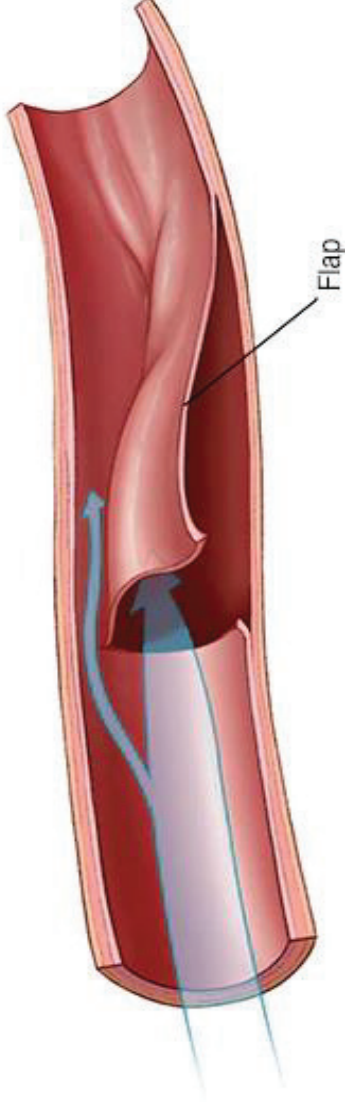
SCAD is an acronym for Spontaneous Coronary Artery Dissection.

SCAD is an important cause of myocardial infarction (MI/heart attack), particularly among younger women.

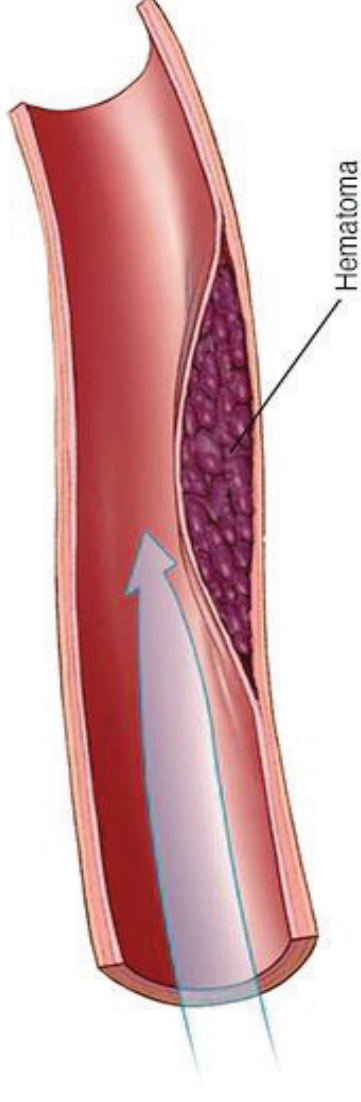


<<http://scad.ubc.ca>>

Blood flow through a cross section of artery with an intimal tear (flap)



Blood flow through a cross section of artery with an intramural hematoma (IMH)

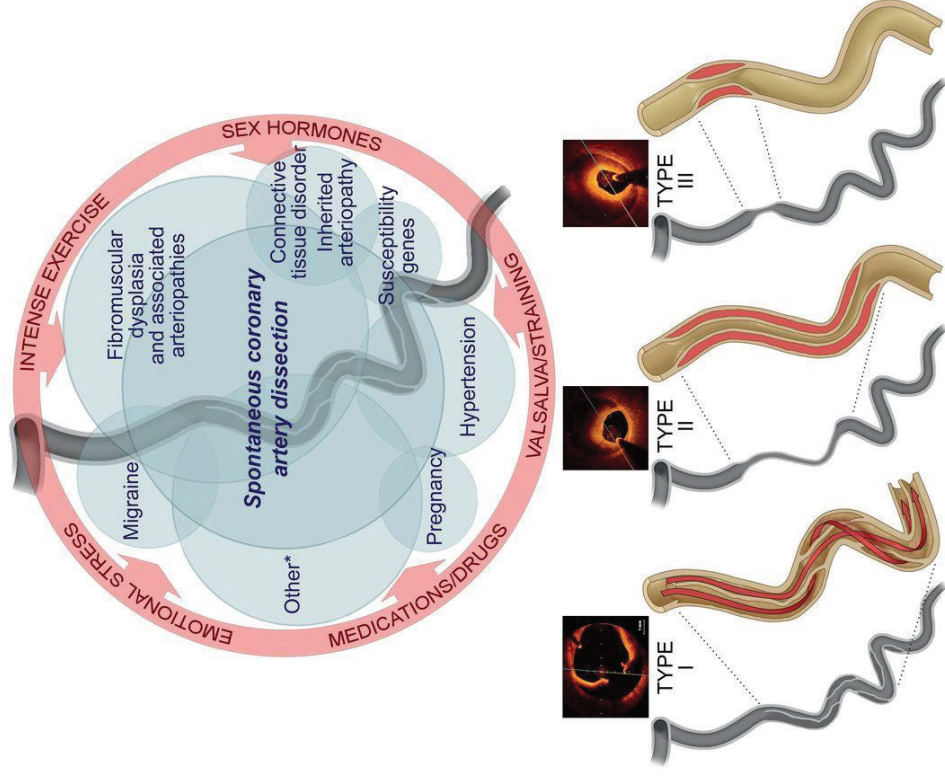


1) an **INTIMAL TEAR**:
spontaneous separation or tear of
the coronary artery wall

2) an **INTRAMURAL HEMORRHAGE**:
spontaneous bleed from the vaso
vasorum (small blood vessels in
the arterial wall)

In both scenarios, blood enters the
arterial wall and compresses the
lumen, blocking blood flow to the
heart

CENTRAL ILLUSTRATION: Associated Conditions, Inciting Factors, and Angiographic Diagnosis of Spontaneous Coronary Artery Dissection



Hayes, S.N. et al. J Am Coll Cardiol. 2020;76(8):961-84.

Risk Factors

Associated conditions with SCAD include:

- Intense emotional or physical stressors, including Valsalva & straining
- Predisposing arteriopathies including fibromuscular dysplasia, inherited connective tissue disease (ie. Ehler Danlos syndrome, Marfan's syndrome)
- Hormonal influences such as perimenopause, pregnancy
- Hypertension, preeclampsia
- Systemic inflammatory disease such as systemic lupus, Crohn's disease, polyarteritis, sarcoidosis
- Migraine
- Susceptible genes

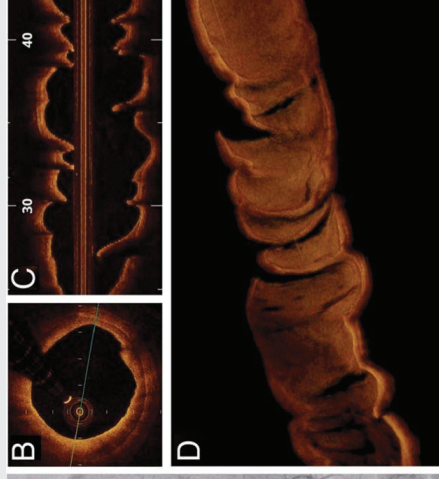
Fibromuscular Dysplasia (FMD)



Left: Renal artery FMD



Below: Iliac artery FMD



- FMD is a non-inflammatory, non-atherosclerotic disorder of the artery
- FMD can cause narrowing, aneurysm or dissection of the artery
- FMD appears to be frequently associated with SCAD (found in 72% of 168 patients with SCAD)
- Most commonly found in arteries of the head/neck (carotid/vertebral), kidney (renal) and legs (iliac/femoral)
- If evidence of FMD in head/neck, advised to avoid neck manipulations (ie. chiropractic) and high velocity activities causing excess head/neck movements

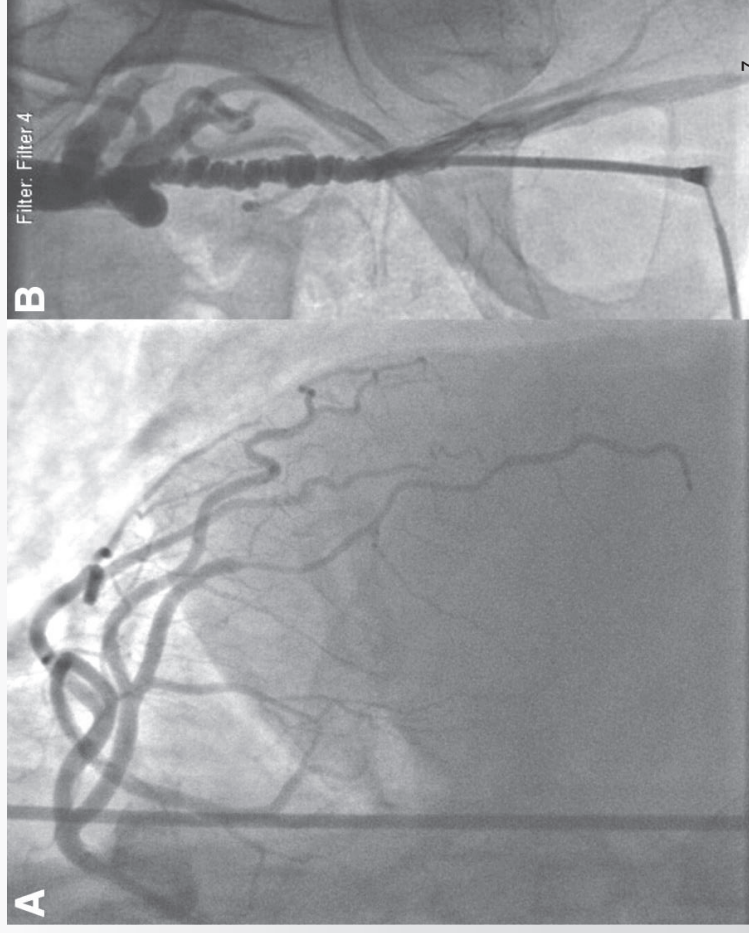
SCAD & FMD



From: Spontaneous Coronary Artery Dissection: Prevalence of Predisposing Conditions Including Fibromuscular Dysplasia in a Tertiary Center Cohort

J Am Coll Cardiol Intv. 2013;6(4):44-52. doi:10.1016/j.jcin.2012.08.017

Figure 2.
Long Dissection of LAD in Patient With Severe Iliac FMD
(A) Coronary angiogram showing long dissected mid left descending artery (LAD) with abrupt demarcation from normal proximal segment. **(B)** Left femoral angiogram showing severe left external iliac artery fibromuscular dysplasia (FMD) with classic string-of-beads appearance, with distinctive bands alternating with aneurysms.



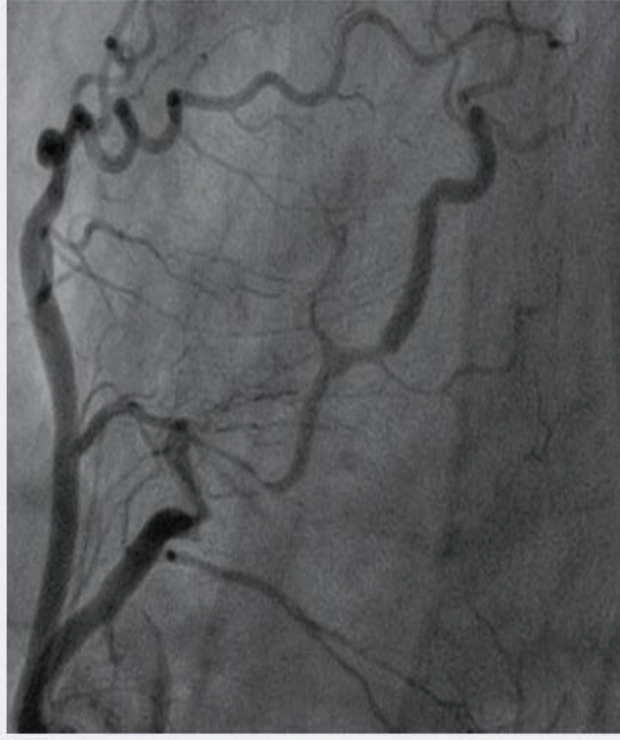
Copyright © The American College of
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VGH Centre for Cardiovascular Health – September 2020

Research involving 156 patients at Vancouver General Hospital/University of British Columbia found that 86.3 percent of SCAD lesions healed with conservative treatment and that 95 percent of the lesions healed after 30 days according to angiographic findings (JACC Cardiovasc Interv 2019;12[6]:518-27).

Conservative Management Preferred in Acute Management of SCAD

These angiograms are from the same female SCAD patient. The first angiogram was taken when she experienced SCAD, the second six months later following treatment with dual antiplatelet, beta-blocker and ACE inhibitor medications.



Source: Jennifer Lewey, MD; reprinted with permission.
VGH Centre for Cardiovascular Medicine – September 2020

Management of non-atherosclerotic SCAD

- Limited data specific for medical therapy in SCAD patients
- Follow therapy guidelines for MI (heart attack) and aortic dissection
- Medical therapy is for relief of symptoms and to prevent immediate complications and recurrent SCAD

ASA (+/- Plavix, Brillinta, Ticagralor) anti-platelet, prevents blood clots *if receive a stent, will take ASA PLUS another antiplatelet MINIMUM 1 year, then ASA alone for lifelong, DAPT (dual antiplt tx post SCAD: min 3 mos is often prescribed for conservative therapy as well)

BB betablocker (ie. Bisoprolol, Metoprolol) reduce arterial shear stress (slows heart rate, lowers blood pressure) *in an earlier retrospective study, shown to reduce recurrence of SCAD by 2/3 , although more recent data is not as strong – MORE TRIALS UNDERWAY

- **ACE and ARBs** *angiotensin-converting enzyme inhibitors & angiotensin receptor blockers, when there is significant LV dysfunction (EF ≤ 40%) after MI, (lowers BP)*
- **CCB calcium channel blockers, vasodilators** *(lowers blood pressure, relaxes arteries)*
- **STATIN** *has not been studied in NASCAD (non atherosclerotic coronary artery disease), used in patients with preexisting dyslipidemia*
- **NTG nitroglycerine** *may be useful in alleviating symptoms from vasospasm during acute SCAD events, vasodilator (lowers blood pressure)*

LIFELONG

Canadian SCAD Study (CanSCAD)



- Multicentre, prospective, observational study enrolling 750 SCAD patients from 22 North American centres from 2014 - 2018
- CanSCAD study, mean age SCAD patients 51.8 +/- 10.2, 88.5% women (55% postmenopausal) 87.7% Caucasian. ~1/3 had hypertension, 1/3 had NO cardiac risk factors
- 33% migraines, 20% anxiety, 20% depression
- 50.3% precipitating emotional stressor, 28.9% physical stressor
- 42.9% FMD, 4.5% peripartum state, 1.6% genetic disorders
- 86.4% were managed conservatively
- Of nearly 15% requiring PCI or CABG – no difference in postdischarge MACE compared to conservatively managed

* 28 SCAD studies

SPONTANEOUS CORONARY ARTERY DISSECTION A SYSTEMATIC REVIEW OF PHYSICAL AND PSYCHOSOCIAL RECOVERY

Introduction

- SCAD mainly affects women
- May occur in absence of risk factors
- Limited understanding of recovery

Aim

To determine the nature of the evidence regarding physical activity, cardiovascular risk factors, or associated factors, and the psychosocial impact of SCAD for SCAD survivors after hospital discharge.

Methods

A systematic review completed in accordance with PRISMA guidelines (Prospero CRD42021254798)

Results



Physical activity recommendations are conservative. There is limited evidence that when patients attend cardiac rehabilitation fitness improves

Chest pain is common following SCAD affecting up to 50% of patients.



Some people have high burden of psychosocial issues including post-traumatic stress disorder, suggesting a need for psychosocial counselling post event



25%
migraines



25.1%
fibromuscular dysplasia



31.8
hypertension



27.8%
dyslipidaemia

Risk factors are common including hypertension and dyslipidaemia

Conclusions



Cardiac rehabilitation might be of benefit, however tailored programmes are recommended.

There is an urgent need to develop and test programmes for recovery from SCAD

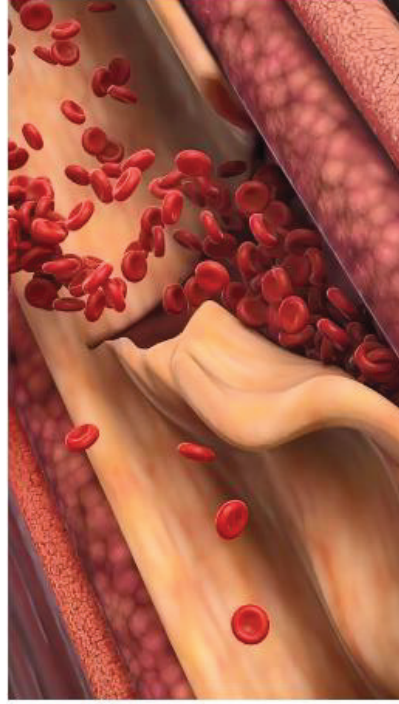
Based on 750 consecutive SCAD patients who had presented with heart attacks and were largely treated conservatively, long-term survival was “excellent” given a 3-year mortality rate of just 0.8% according to Dr. Jacqueline Saw, MD of Vancouver General Hospital, and colleagues of the CanSCAD cohort study MACE



SCAD Heart Attacks: Outcomes Not as Bad as Previously Feared

— Low 3-year MACE rates seen in a more representative spontaneous coronary artery dissection cohort

by Nicole Lou, Senior Staff Writer, MedPage Today October 17, 2022



Getting at the natural history of nonatherosclerotic spontaneous coronary artery dissection (SCAD), a prospective cohort study found the risk of longer-term recurrent dissections and other cardiovascular events to be lower than expected.

- MACE (major adverse coronary events) 14% over 3 years which includes 9.9% recurrent MI due to
- 3.5% extension of previous SCAD
 - 2.4% de novo (new) recurrent SCAD
 - 1.9% iatrogenic catheter induced dissection
- ** previously published MACE rates & mortality up to 30%, with recurrent SCAD in 15 -22% of patients**

JACC 2022; Saw J et al “Canadian SCAD cohort study: 3yr outcomes”

Benefits of Cardiac Rehab

One of the most clinically & cost effective therapeutic interventions in CVD management.

Reduces:

- All cause mortality by 13-26%
- Cardiac mortality by 26-36%
- Morbidity
- Unplanned admissions by 28-56%

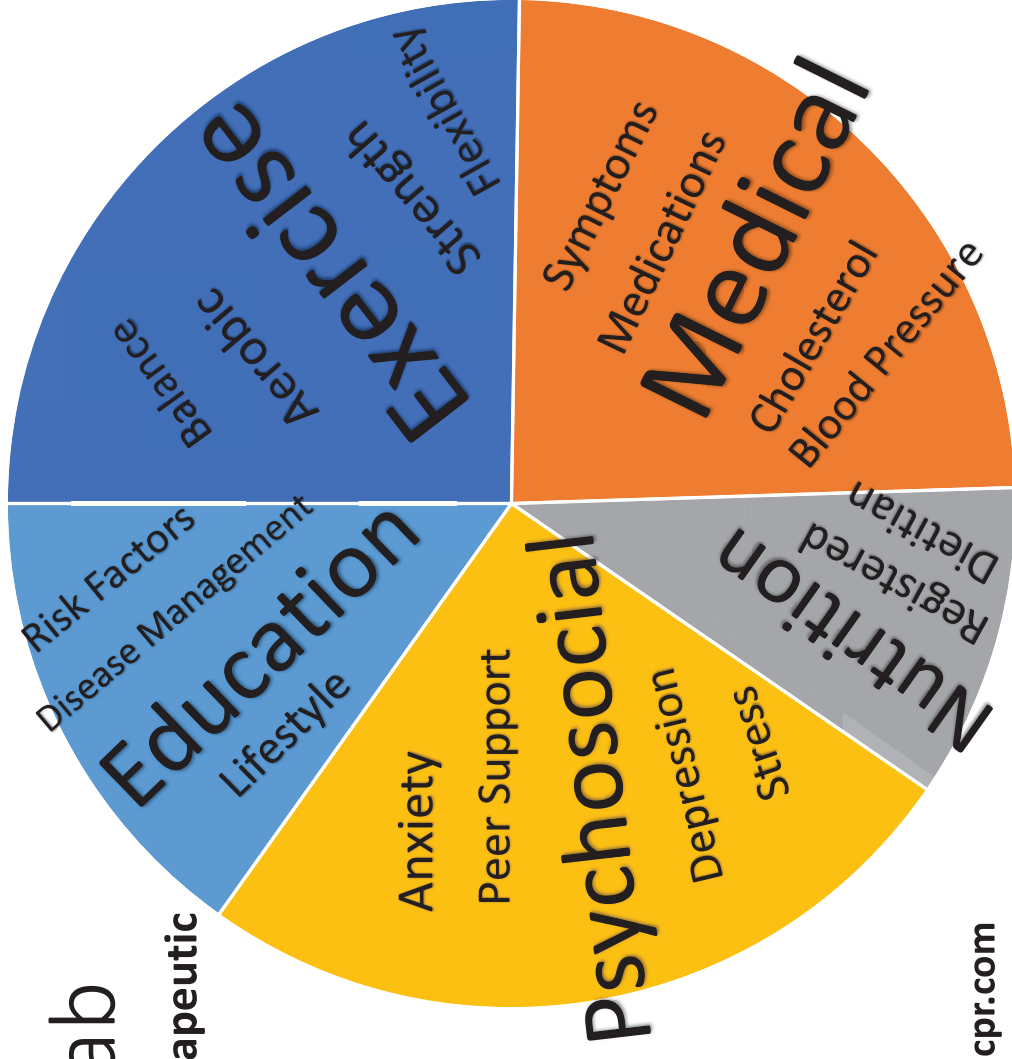
Improves:

- Quality of Life
- Functional Capacity

Supports:

- Return to work
- Development of self-management skills

www.bacpr.com



The First Dedicated Cardiac Rehabilitation Program for Patients With Spontaneous Coronary Artery Dissection: Description and Initial Results

[Annie Y. Chou, MD](#), [Roshan Prakash, MD](#), [Jennifer Rajala, MD](#), [Taira Birnie, BSc](#), [Saul Isserow, MD](#), [Carolyn M. Taylor, MD](#), [Andrew Ignaszewski, MD](#), [Sammy Chan, MD](#), [Andrew Starovoytov, MD](#), [Jacqueline Saw, MD](#)

- Warm-up and cool-down
- Weight training start low (2-12 lbs) and gradually increase
- Low resistance, high repetitions
- Avoid straining/valsalva
- HR 50-70% of heart rate reserve
- Goal BP \leq 130/80 mmHg

Can J Cardiol 2016; 32(4): 554-560

SCAD CR & 5 Year MACE

Table 7. Follow-up cardiovascular events in SCAD-CR cohort, compared with patients with SCAD who did not participate in SCAD-CR

Cardiovascular event	SCAD-CR cohort (n = 70)	Non-SCAD-CR cohort (n = 145)	<i>P</i>
Follow-up duration, years	3.8 ± 2.9	3.9 ± 4.1	0.86
MACE	3 (4.3)	38 (26.2)	< 0.001
Death	0 (0)	2 (1.4)	0.31
Recurrent myocardial infarction	0 (0)	32 (22.1)	< 0.001
Stroke	0 (0)	3 (2.1)	0.55
Revascularization	3 (4.3)	12 (8.3)	0.41
Angina hospitalization	2 (2.9)	8 (5.5)	0.50

Reduction in 5 yr. MACE with SCAD-CR group (4.3% vs 26.2%)

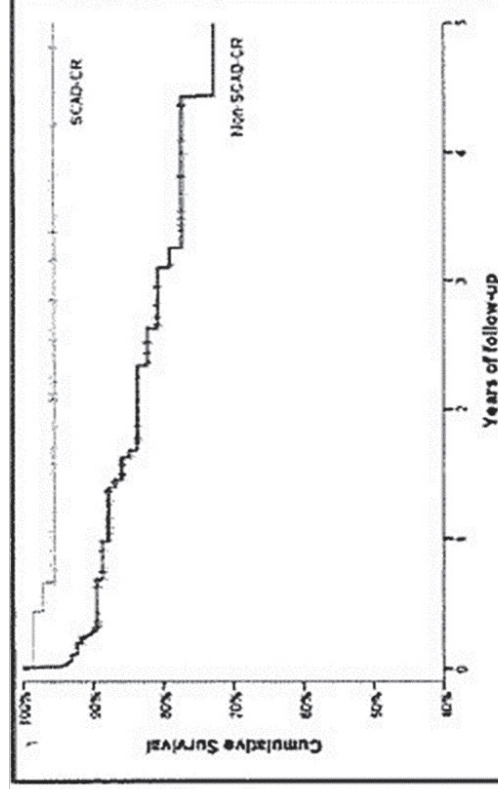
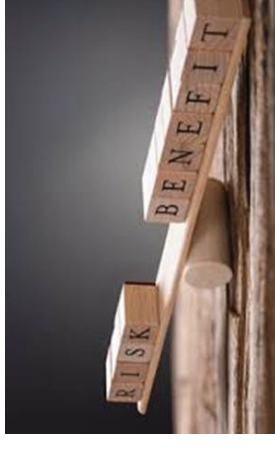


Figure 1. Kaplan-Meier MACE event-free survival curves for the SCAD-CR cohort, and non-SCAD-CR cohort. CR, cardiac rehabilitation; MACE, major adverse cardiac event; SCAD, spontaneous coronary artery dissection.

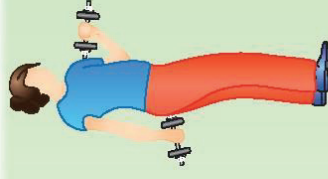
Exercise Recommendations for Patients with SCAD & FMD



- Based on **expert opinion, experience and clinical practice** of the practitioners working with SCAD patients.
- Exercise restrictions **based on an abundance of caution** rather than clinical evidence.
- Hypothesis suggests increase in cardiac contractility and heart rate during exercise will lead to **increased focal shear stress & strain** at high risk segments of vulnerable arteries
- No evidence to prove exercising with heavy loads is harmful, provided proper technique is followed to **prevent straining or Valsalva**
 - ***(VGH SCAD Clinic recommends 20-30lb weight limit for women, up to 50lb for men)***
- Current recommendations for **patients with FMD** are to **avoid resistance training during first 8-12 weeks** after acute carotid or vertebral artery dissections

Recommended:

- Cardiac rehabilitation
- Moderate aerobic exercise
- Interval training
- Weight training with low resistance high repetitions



With Caution:

- Endurance aerobic training
- Muscle building exercises
- Yoga poses without extreme head and neck positions



Avoid:

- Abrupt, high intensity exercise
- Peak weights with prolonged Valsalva
- Contact sports
- Extreme head positions



Expert Tips!

- Ensure sufficient **WARM UP & COOL DOWN**
- Exercise to **RPE 'moderate to somewhat hard'** &/or use the **'TALK TEST'** when exercising
 - **NO STRAINING**
 - **DO NOT HOLD BREATH**
 - **FLUID MOVEMENTS -> Breath Throughout**
- **AVOID** extreme temperatures (ie hot yoga, polar bear plunge)
- **AVOID** competitive sports or HIIT ie. Tough Mudder, Orange Theory style

Methods of Monitoring Intensity

- ⌚ Exercise Heart Rate
- ⌚ Talk Test
- ⌚ Rate of Perceived Exertion
- ⌚ Heart Rate Monitors
- ⌚ Apps
- ⌚ Cardio Machines with Heart Rate Monitors



RPE SCALE	
0	Complete Rest
1	Very Easy
2	Easy
3	Moderate
4	Somewhat Hard
5	Hard
6	
7	Very Hard
8	
9	
10	Maximal

1	Very Light Activity Breathing not changed
2-3	Light Activity Easy to breathe and carry on a conversation
4-6	Moderate Activity Breathing more heavily – can carry on a conversation but it requires more effort
7-8	Vigorous Activity On the verge on becoming uncomfortable - conversation requires maximum effort
9	Very Hard Activity Difficult to maintain exercise or speak
10	Maximum Effort Activity Full out effort – no conversation possible


TALK TEST

Don't rely on your smart watch/heart rate monitor –
if in doubt DO MANUAL PULSE CHECK!

Self check: take your own pulse



Find your pulse



**Count your heartbeat
for 30 seconds**



Double it

Patient Resources

- vanscad.ca
- scad.ubc.ca
- SCADAlliance.org
- FMDSA.org
- SCADBC.com
- SCAD Hope Worldwide FB group
- WomensHeartHub.ca
- CANchat SCAD FB group
- vghcardiacrehab.vch.ca
- [Sunnybrook Hospital SCAD Patient Guide](#)

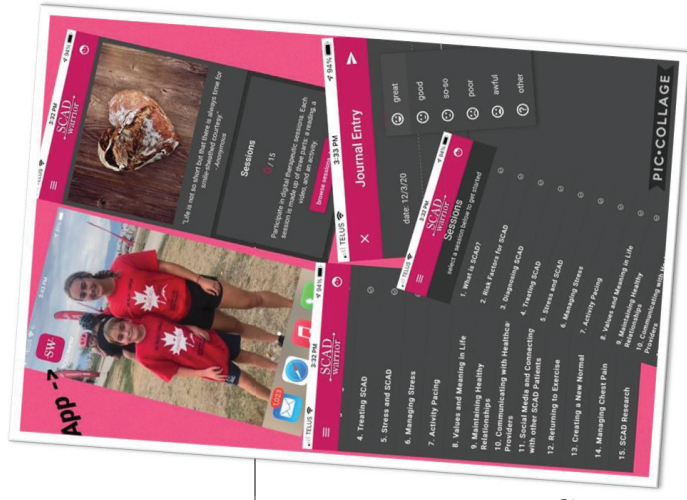


CANADIAN WOMEN'S
HEART HEALTH CENTRE

NATIONAL
ALLIANCE

SCAD Warrior App
<https://www.scadwarrior.com>

The **SCAD Warrior app** was created to help patients recover from SCAD. The app is based on scientific information about SCAD, evidence about what helps people recover from health conditions, surveys of SCAD survivors, and strategies that have been used effectively with SCAD survivors in face to face interventions.





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Vancouver SCAD Program 2022



Thank you!