SESSION 1

# VIR Decoded

## The IR Consult, Preprocedural Planning & Life in the VIR Suite

SCAN TO CONNECT

WCVIS TEXAS

NATIONAL WCVIS

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WHO WE ARE

# About WCVIS

## WCVIS TEXAS

Texas chapter

| | |
|---|---|
| EDUCATE | Educate, recruit, and connect those passionate about VIR. |
| SERIES | Hosts the WCVIS Texas Education Series, including today's session. |
| JOIN | Apply to become an official WCVIS Texas member. |

## WCVIS NATIONAL

West Coast Vascular & Interventional Society

| | |
|---|---|
| MISSION | Educate, recruit, and connect VIRs at every level of training. |
| CAREER | For those pursuing a 100% endovascular and interventional career. |
| SECTIONS | Pre-Medical · Medical Student · Resident · Early Career |

**We are looking for surgically minded people.**

WHAT IS IR?

# Image-guided, minimally invasive care

Interventional radiology uses imaging to guide small instruments through tiny access points to diagnose and treat disease without open surgery.

**TOOLS**

Fluoroscopy, ultrasound, CT

**DOES**

Opens, blocks, drains, ablates

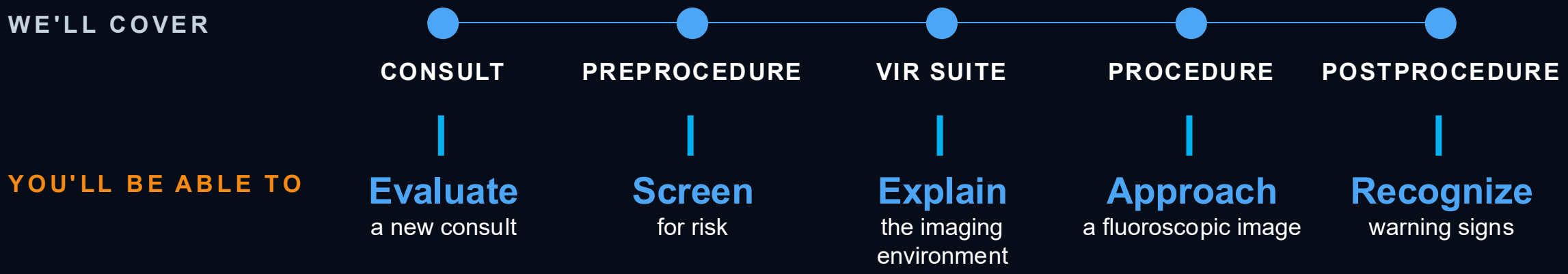
**ROLE**

A clinical specialty: consult, procedure, follow-up

**VIR is a clinical specialty, not simply a procedural service.**

SESSION ROADMAP

# VIR is not a room. It is a clinical workflow.



SECTION

01

# The VIR Consult

CONSULT FRAMEWORK

# The VIR consult checklist

| | | | | |
|---|---|---|---|---|
| 1 | What is the clinical problem? | DISEASE | GOAL | INTERVENTION |
| 2 | How urgent is it? | ROUTINE | URGENT | EMERGENT |
| 3 | Are there better alternatives? | MEDICAL | SURGERY | VIR |
| 4 | Is the procedure technically feasible? | TARGET | ACCESS | ANATOMY |
| 5 | Is it safe? | BLEEDING | CONTRAST | ASPIRATION |

RISK SCREENING

# What to check before the procedure

| | | | | |
|---|---|---|---|---|
| 1 | Check bleeding risk | PLATELETS > 50K | INR < 1.5–2 | PROCEDURE RISK |
| 2 | Review anticoagulants | WHICH DRUG? | WHY TAKEN? | ASK THE TEAM |
| 3 | Screen for aspiration risk | LAST SOLIDS | LAST LIQUIDS | AIRWAY |
| 4 | Screen for contrast risk | PRIOR REACTION | CREATININE | CONSENT |

**Check the numbers and ask the team before holding any medication.**

MEET THE PATIENT

# Mr. R, 68, mail carrier

Six months of left-calf cramping after about 1.5 blocks of walking, relieved by a few minutes of rest. Now he cannot finish his route.

**HISTORY**

Type 2 diabetes, hypertension, hyperlipidemia. Smoker, 40 pack-years.

**MEDS**

Metformin, lisinopril, atorvastatin. No antiplatelet.

**EXAM**

Diminished left femoral and popliteal pulses, absent DP and PT. Foot warm, no ulcers.

**Referral:** **“Suspecting PAD – please evaluate for revascularization”**

DECISION 1 · CONSULT

# What is the first step?

## THE REFERRAL

"Suspecting PAD – please evaluate for revascularization."

Lifestyle-limiting claudication.

No rest pain. No tissue loss.

**The referral asks for a revascularization evaluation. What is the most appropriate FIRST step?**

A Refer directly for surgical bypass

B Diagnostic angiography and possible stenting

C CT angiography runoff to plan intervention

D Resting ankle-brachial index (ABI)

**Vote in the Zoom poll before we reveal.**

REVEAL 1 · CONSULT

# Resting ABI first

D

**Resting ABI**

PAD is diagnosed by history, exam and a resting ABI, not by anatomic imaging.

Imaging is for planning once revascularization is actually being considered.

ABI 0.65 on the left: moderate PAD, non-threatened limb. Start with medical therapy and supervised exercise.

**Appropriate, feasible and safe are three separate decisions.**

COMPLETING THE CONSULT

# Turn information into a plan

01

GATHER

02

ASSESS

03

PRESENT

04

COMMUNICATE


**Focused documentation and clear communication are part of the consultation.**

SECTION

02

# Preprocedure Planning

CONSENT

# Consent for the procedure – and what may follow

## DISCUSS WITH THE PATIENT

| 01 | 02 | 03 | 04 | 05 |
|---|---|---|---|---|
| What will be done | Risks | Benefits | Alternatives | Related procedures |

**Consent for what might follow: lung biopsy → chest tube.**

ANTIBIOTICS, LABS & SEDATION

# Three checks before the case

| | | | |
|---|---|---|---|
| **ANTIBIOTICS** | **CLEAN**<br>Vascular procedures: usually none, but depends | **CONTAMINATED**<br>Hepatobiliary, GU, GI | **CHECK**<br>Is the patient already on antibiotics? |
| **LABS** | **BLEEDING**<br>Platelets and INR before access | **KIDNEYS**<br>Creatinine and eGFR set the contrast plan | **ALSO**<br>Hemoglobin. Pregnancy test if relevant |
| **SEDATION** | **PLAN**<br>Decide before the patient enters the suite | **MATCH**<br>Local for simple cases. Sedation to keep still | **TELL**<br>Withholding sedation? Tell the attending |

DECISION 2 · PREPROCEDURE

# Best preprocedure plan?

## CASE CONTINUES

Three months of supervised exercise and optimized medical therapy. Still cannot finish his route.

Shared decision: endovascular revascularization.

eGFR 42 (CKD 3b) · Platelets 210k · INR 1.0

On aspirin, took it this morning.

**Mr. R took his aspirin this morning and has an eGFR of 42. What is the best preprocedure plan?**

A. Cancel until the eGFR normalizes

B. Hold aspirin for days before arterial access

C. Continue aspirin, hydrate, limit contrast, obtain consent

D. Add routine antibiotics for the arterial puncture

**Vote in the Zoom poll before we reveal.**

REVEAL 2 · PREPROCEDURE

# Continue, hydrate, consent

C

**Continue aspirin, hydrate, limit contrast, consent**

eGFR 42 is planned around, not a reason to cancel: hydrate and limit contrast volume.

Do not hold aspirin. Single-agent aspirin continues through arterial access.

No routine antibiotics. Consent covers balloon → provisional stent and access-site complications.

SECTION

03

# Life in the VIR Suite

THE IMAGING ROOM

# Know the tools in the room

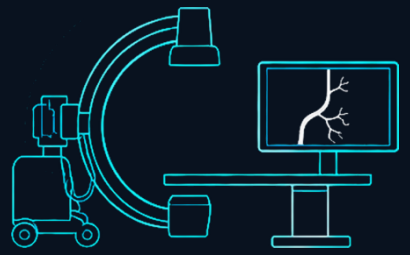
01



**ULTRASOUND**

Vessel access

02



**FLUOROSCOPY**

Real-time X-ray

03



**CT**

Biopsies, drains, ablations

CONTRAST

# Iodinated vs $CO_2$

| | IODINATED | $CO_2$ |
|---|---|---|
| TYPE | Positive | Negative |
| KIDNEYS | Nephrotoxic in low GFR | Not nephrotoxic |
| DELIVERY | Hand or power injector | Hand injection only |
| INDICATIONS | Most studies; the default | Low GFR or contrast reaction; below the diaphragm |

RADIATION SAFETY

# Time. Distance. Shielding.

## Time

Foot off the pedal. Look at the screen.

## Distance

Step back. Don't lean on the patient.

## Shielding

Lead on, curtain down, detector close.

## Patient

Collimate. Magnify less. **ALARA**.

DECISION 3 · VIR SUITE

# Which contrast?

## ON THE TABLE

Time-out done. Ultrasound-guided access planned.

eGFR 42.

The cabinet has iodinated contrast and a $CO_2$ injector.

**For this run in a patient with eGFR 42, what is the best contrast strategy?**

A. Full-volume iodinated contrast, no planning at all

B. $CO_2$ as primary agent, minimal iodinated contrast

C. Cancel and get gadolinium MRA instead

D. Low-volume iodinated run + saline hydration, counsel him

**Vote in the Zoom poll before we reveal.**

REVEAL 3 · VIR SUITE

# Proceed with caution

D

**Low-volume iodinated + hydration**

Iodinated AKI risk has been overstated. ACR: little evidence of independent risk at eGFR 30 or above.

Still plan: saline for a diabetic with intra-arterial contrast, least volume, no NSAIDs.

Not defensible: cancelling for gadolinium MRA, or no planning at all.

SECTION

04

# The Procedure

IN THE ROOM

# Be ready, then be useful

1. **Gear up**
   Cap, mask, glasses, lead. Gown and gloves ready in the room.

2. **Listen to the time-out**
   Name, procedure, side, allergies, labs, sedation, antibiotics.

3. **Be useful**
   Know the catheters and wires. Learn the equipment. **Anticipate the next step**.

READING THE IMAGE

# A three-step interpretation framework

## 1 | WHAT STUDY IS THIS?



- Find the catheter
- Follow its course
- Name the opacified structure

**Right renal angiogram**
Catheter in the right renal artery

## 2 | WHAT IS ABNORMAL?



**Look for:**

- Extravasation
- Stenosis
- Occlusion
- Filling defect

**Leg angiogram**
**Anterior tibial artery occluded**

## 3 | WHAT DISEASE EXPLAINS IT?

**PAD**

In the second image the anterior tibial artery is occluded. Blood flow is blocked.

Connect the pattern to the clinical problem.

DECISION 4 · THE PROCEDURE

# How would you treat it?



## WHAT WE SEE

**Study:** leg angiogram (DSA).

**Abnormal:** the SFA is occluded.

**Disease:** PAD, behind his calf claudication.

**What is the most appropriate endovascular treatment of this SFA occlusion?**

A. Balloon angioplasty; stent only if suboptimal

B. No intervention: abort and send for bypass

C. Primary covered stent across the whole SFA

D. Primary atherectomy of the entire vessel

**Vote in the Zoom poll before we reveal.**

REVEAL 4 · THE PROCEDURE

# Balloon first, stent if needed

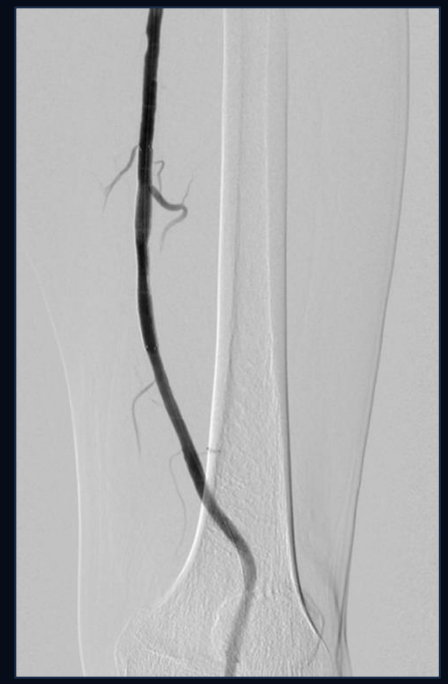
**A**

**Angioplasty and provisional stent**

An SFA occlusion: balloon angioplasty first.

Stent selectively, for a flow-limiting dissection or significant residual stenosis.

Endovascular first. Bypass is not warranted.



After treatment: flow restored in the SFA

SECTION

05

# Postprocedure Care

AFTER THE PROCEDURE

# Now it's your patient

| | |
|---|---|
| **Orders** | Labs, activity, diet, fluids, imaging. You follow up on what you order. |
| **Document** | What was done, what you found, any complications, the plan. |
| **Call** | Tell the referring team what happened and what to watch for. |
| **Respond** | If the nurse calls about a problem, go see the patient. |
| **Round** | Follow the outcome, not just the procedure. |

EXPECTED OR DANGEROUS?

# Common symptoms can hide uncommon complications

| Complaint | Could be expected | Must consider |
|---|---|---|
| **Dyspnea** | Pain / splinting | Pneumothorax, air embolism |
| **Pain** | Procedural discomfort | Hemorrhage / hematoma |
| **Access-site bleeding** | Superficial bleeding | Vascular injury |
| **Hypotension** | Dehydration / medications | Hemorrhage, rupture, tamponade |

DECISION 5 · POSTPROCEDURE

# How do you respond?

### THREE HOURS LATER

Angioplasty successful, palpable DP pulse.

The floor nurse calls: Mr. R is hypotensive, tachycardic and diaphoretic, with new vague back and groin discomfort.

The left femoral access site looks only slightly oozy.

**How should this call be interpreted and handled?**

A. Likely vasovagal: recheck vitals in an hour

B. Expected post-sedation hypotension: fluids, reassure by phone

C. Expected access discomfort: add analgesia, keep monitoring

D. Access-site or retroperitoneal hemorrhage until proven otherwise: go see the patient now

**Vote in the Zoom poll before we reveal.**

REVEAL 5 · POSTPROCEDURE

# Go see the patient

D

**Hemorrhage until proven otherwise**

Worsening hypotension + tachycardia after an arterial procedure is a severe complication until proven otherwise.

A modest external look does not exclude retroperitoneal hemorrhage.

Do not manage it by phone: ABCs, resuscitate, labs and type-and-screen, manual pressure, CT or ultrasound as indicated.

**Available. Affable. Able. Now it is your patient.**

FIVE TAKEAWAYS

# The Basics of VIR

1. Start with the problem, not the procedure.
2. Appropriate, feasible, safe are separate decisions.
3. Know the imaging room: fluoro, contrast, radiation.
4. Read every image systematically.
5. Responsibility continues after the procedure.

JOINING US FOR Q&A

# Dr. Sunny Murthy, MD, MS



PGY-3 IR-Integrated Resident

UVA Radiology & Medical Imaging

THANK YOU

# Scan to connect

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# SOURCES

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