The Intravenous Drug Addict

Vascular Access Challenges in the Injection Drug User

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Outline

- The IV Drug Use Epidimic
- Current Trends
- Vascular Access Options

Case 1

- 22yo M found in a car with cyanosis and a respiratory rate of 5 breaths per minute
- Pulse is 30 BPM, weak and thready
- Pupils are pinpoint
- EMS attempts IV access but …

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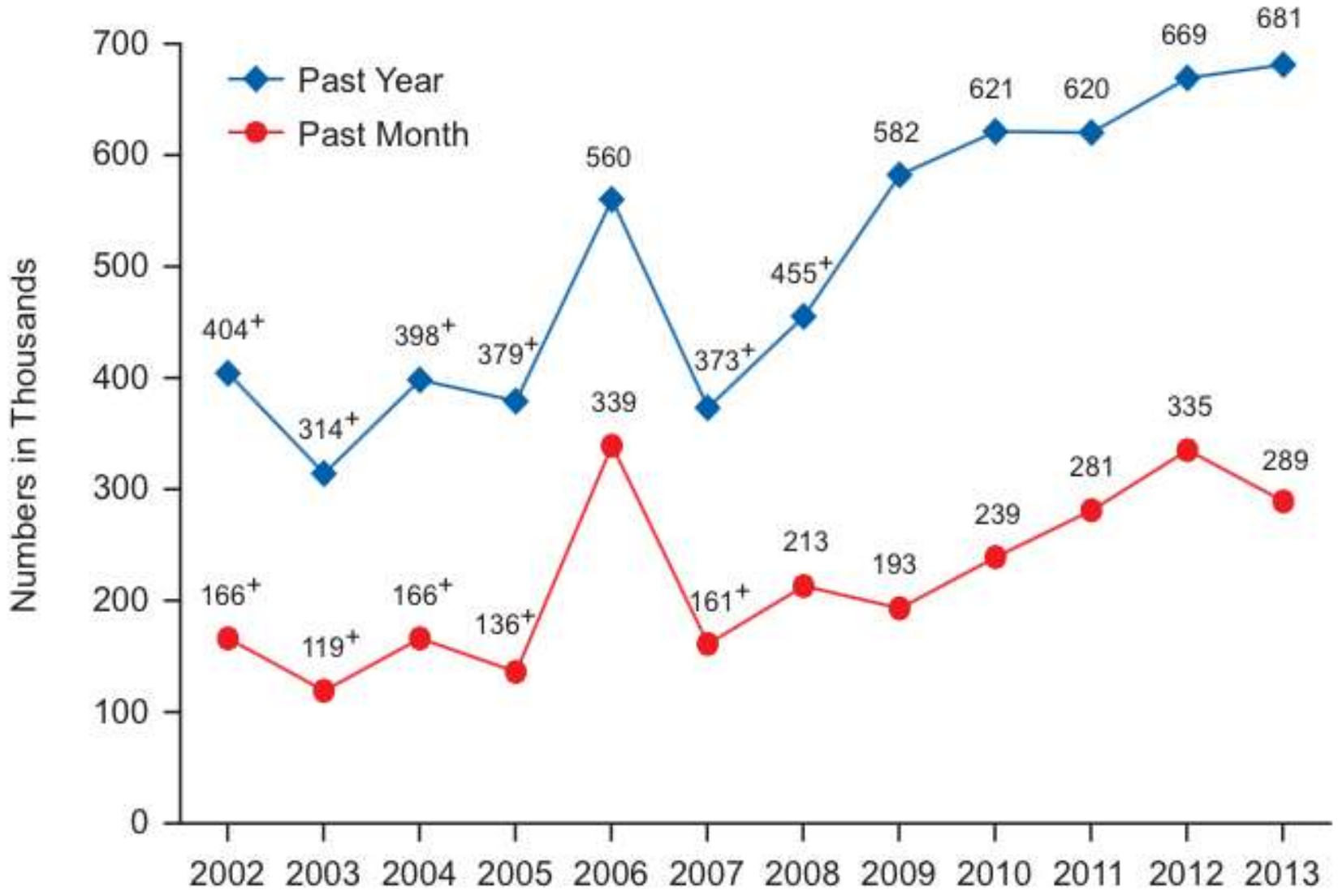
Options

- What options exist to establish vascular access in this patient?
- What options exist to treat this patient?

Case 2

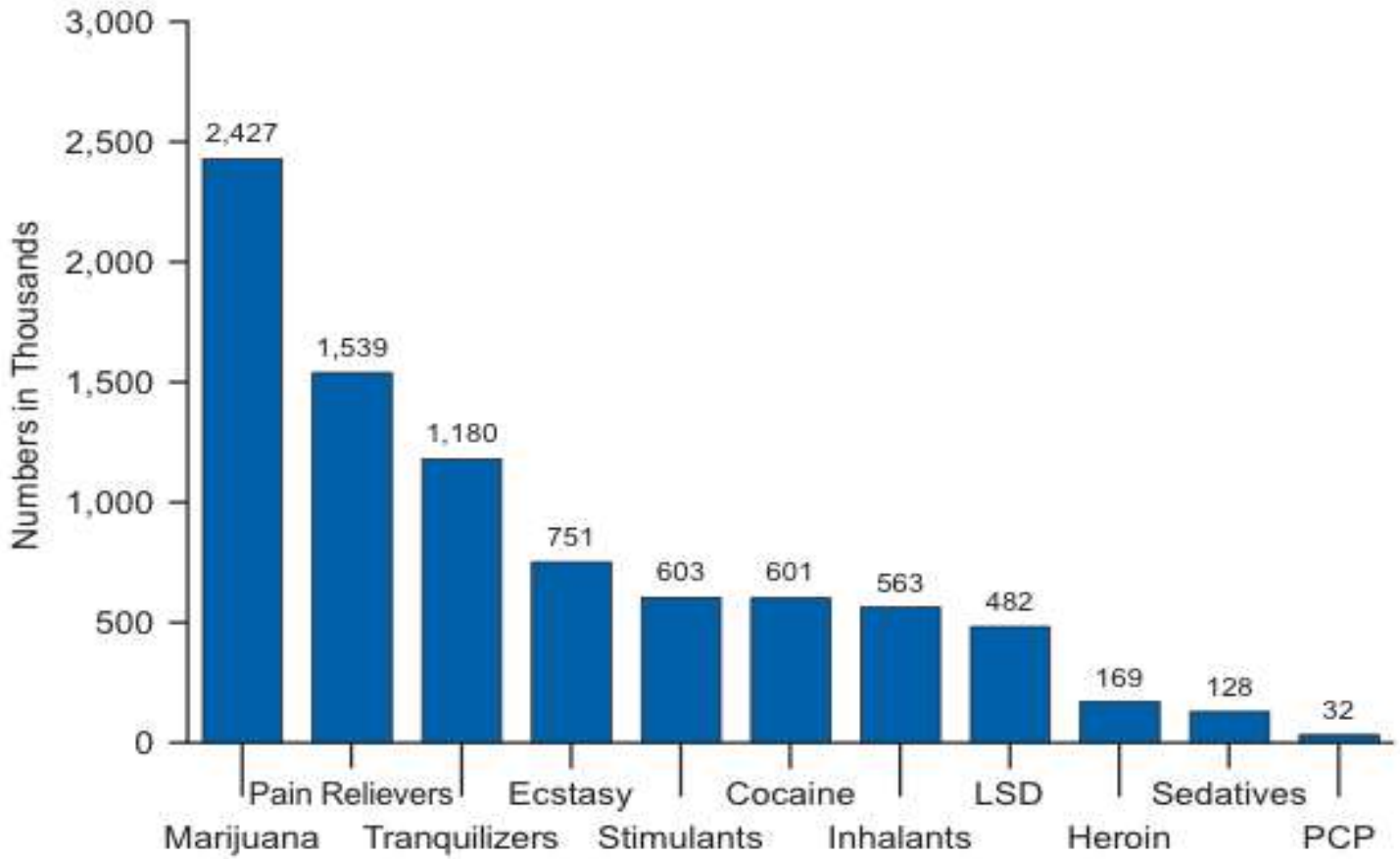
- A 35yo female with a history of injection drug use presents with fever and severe back pain to the ED
- She is having difficulty walking and reports an episode of incontinence
- 5 failed traditional PIV attempts
- What are possible choices for short and long term access?

Figure 2.4 Past Month and Past Year Heroin Use among Persons Aged 12 or Older: 2002-2013



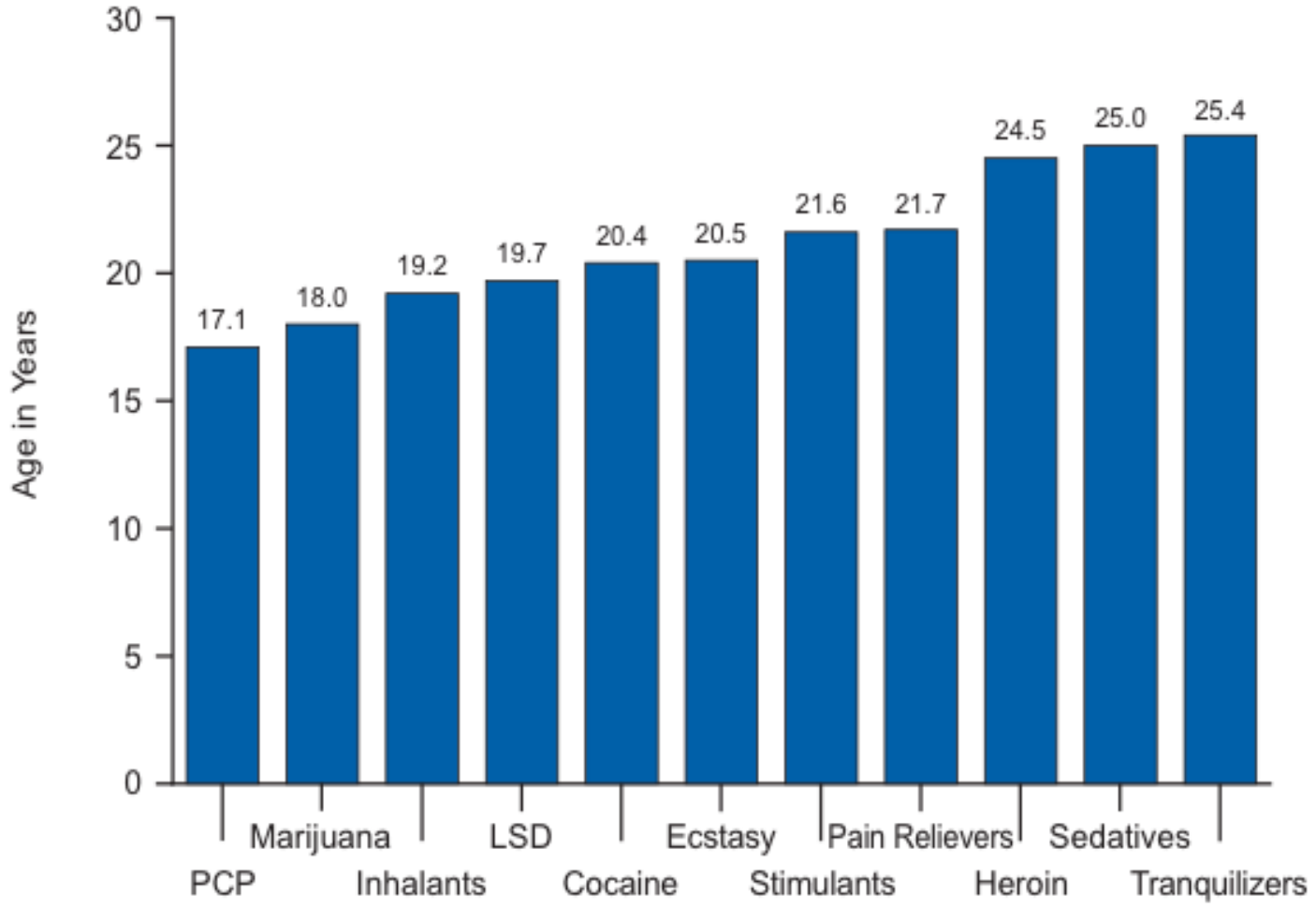
+ Difference between this estimate and the 2013 estimate is statistically significant at the .05 level.

Figure 5.2 Past Year Initiates of Specific Illicit Drugs among Persons Aged 12 or Older: 2013



Note: Numbers refer to persons who used a specific drug for the first time in the past year, regardless of whether initiation of other drug use occurred prior to the past year.

Figure 5.3 Mean Age at First Use for Specific Illicit Drugs among Past Year Initiates Aged 12 to 49: 2013



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Two Pieces of Literature

- 1980 - 100 word letter to the NEJM describing how use of narcotics for cancer pain in end-of-life patients was safe and did not lead to long term addiction.

- 1986 - A case series of 38 patients published in Pain that in the short term with carefully selected patients narcotics can be used for non-cancer pain safely.

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american academy of pain management

NO LIFE LIMITED BY PAIN

American Pain Society

RESEARCH

EDUCATION

TREATMENT

ADVOCACY

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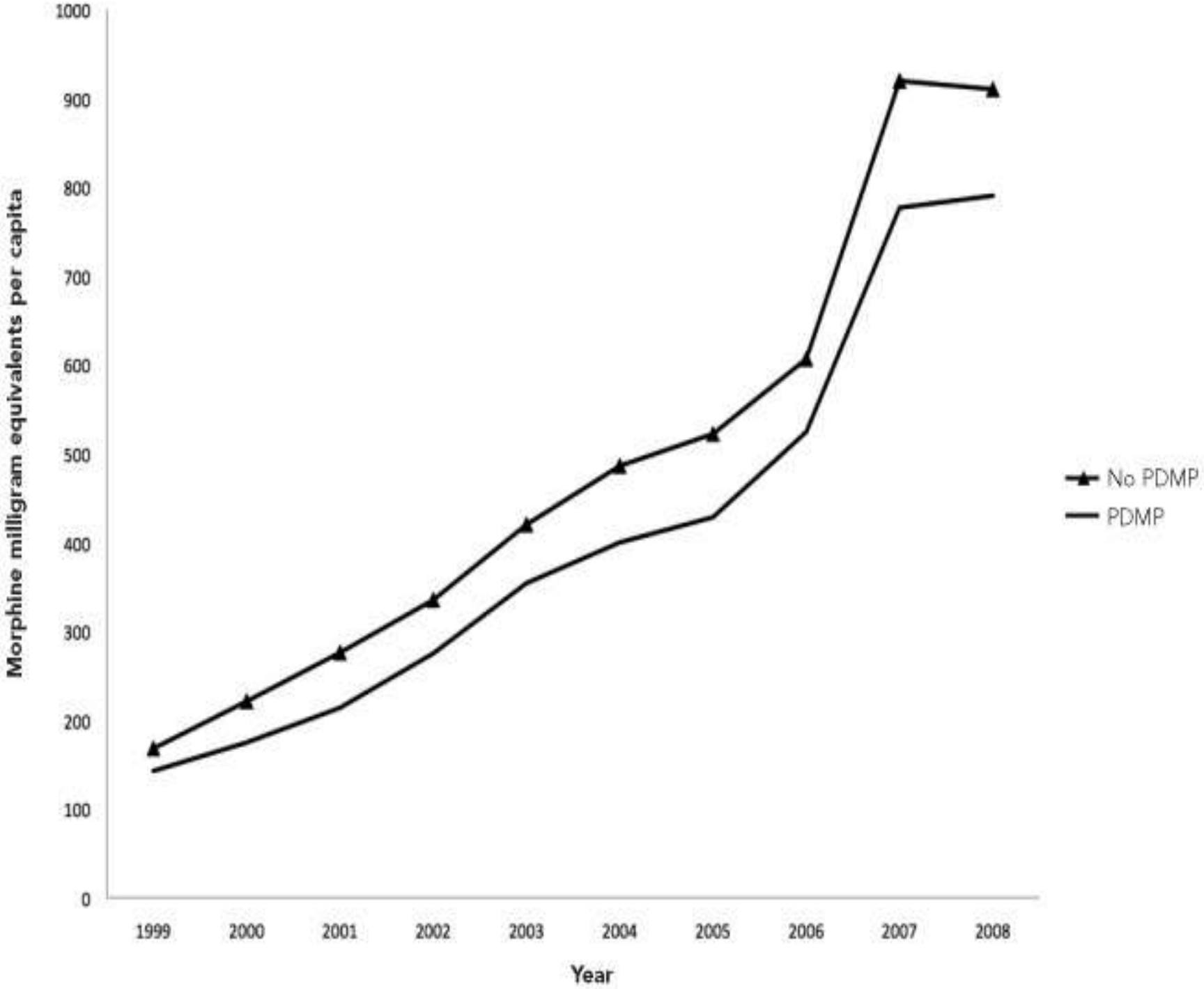
The Joint Commission

- Issued pain management standards in 2001
- Organized a pain management educational program that was partially funded by … Purdue.
- Federation of State Medical Boards reportedly accepted money from pharma to produce and distribute narcotic prescriving guidelines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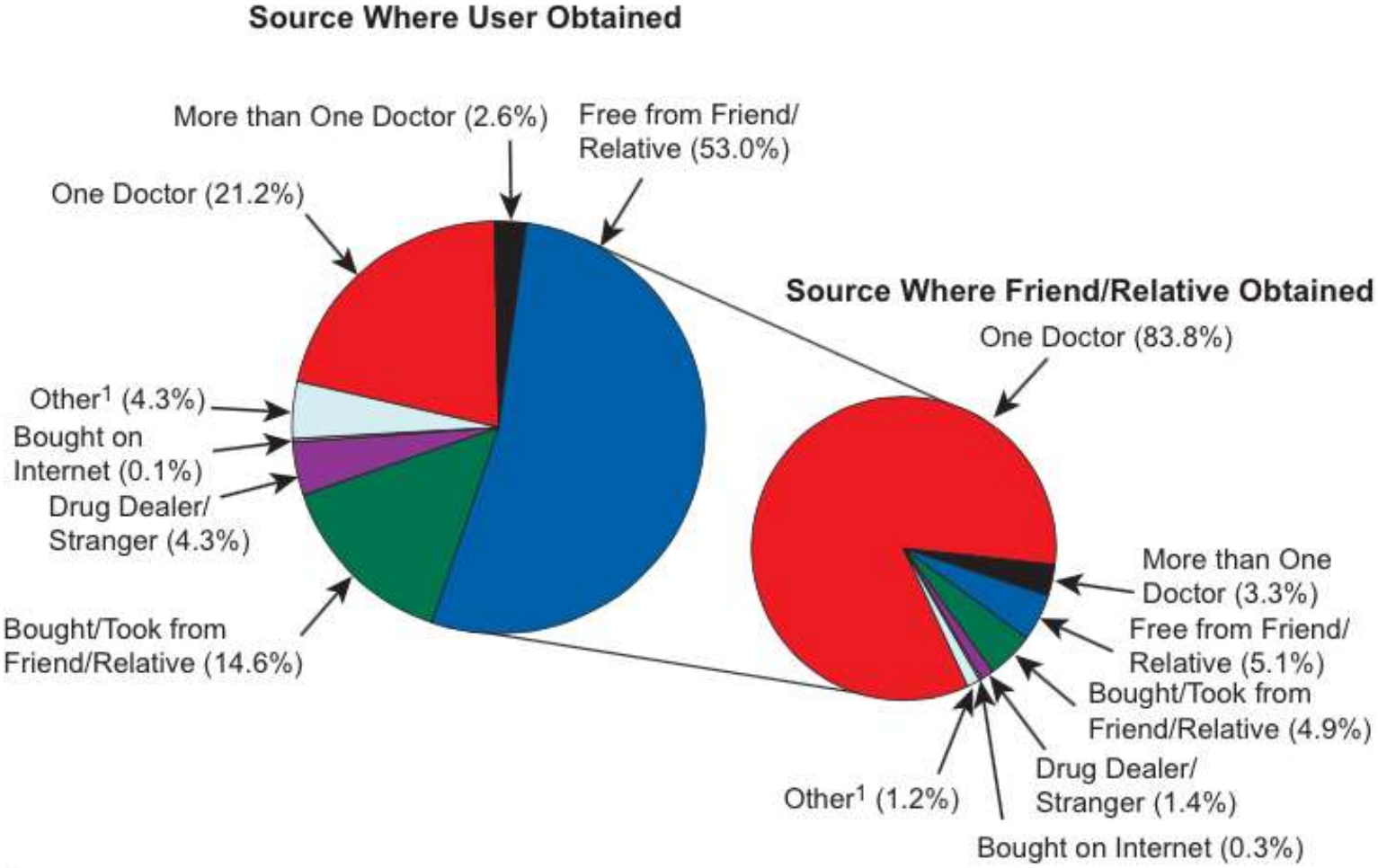
PDMP

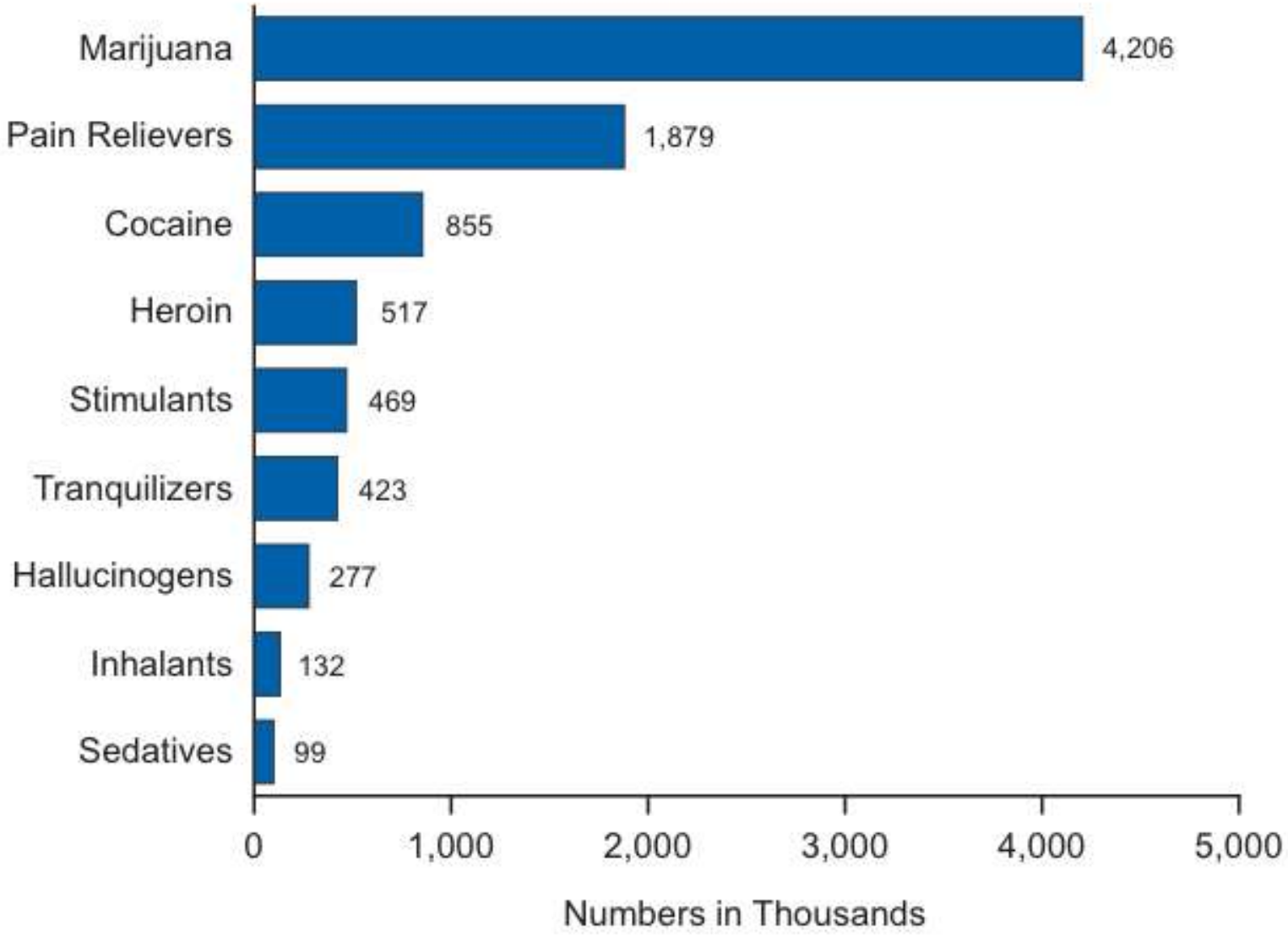
Figure 2.16 Source Where Pain Relievers Were Obtained for Most Recent Nonmedical Use among Past Year Users Aged 12 or Older: 2012-2013



[1] The Other category includes the sources "Wrote Fake Prescription," "Stole from Doctor's Office/Clinic/Hospital/Pharmacy," and "Some Other Way."

Note: The percentages do not add to 100 percent due to rounding.

Figure 7.2 Specific Illicit Drug Dependence or Abuse in the Past Year among Persons Aged 12 or Older: 2013



Backlash

- Justice Department, FDA and Senate Finance Committee investigates
- 2007 Purdue pleads guilty to misleading the FDA, doctors and patients about risk of Oxycontin
- 2010 Purdue reforumates Oxycontin
- 2014 Chicago sued fived pharma companies for pushing consumer use of opiates, causing addition and costs

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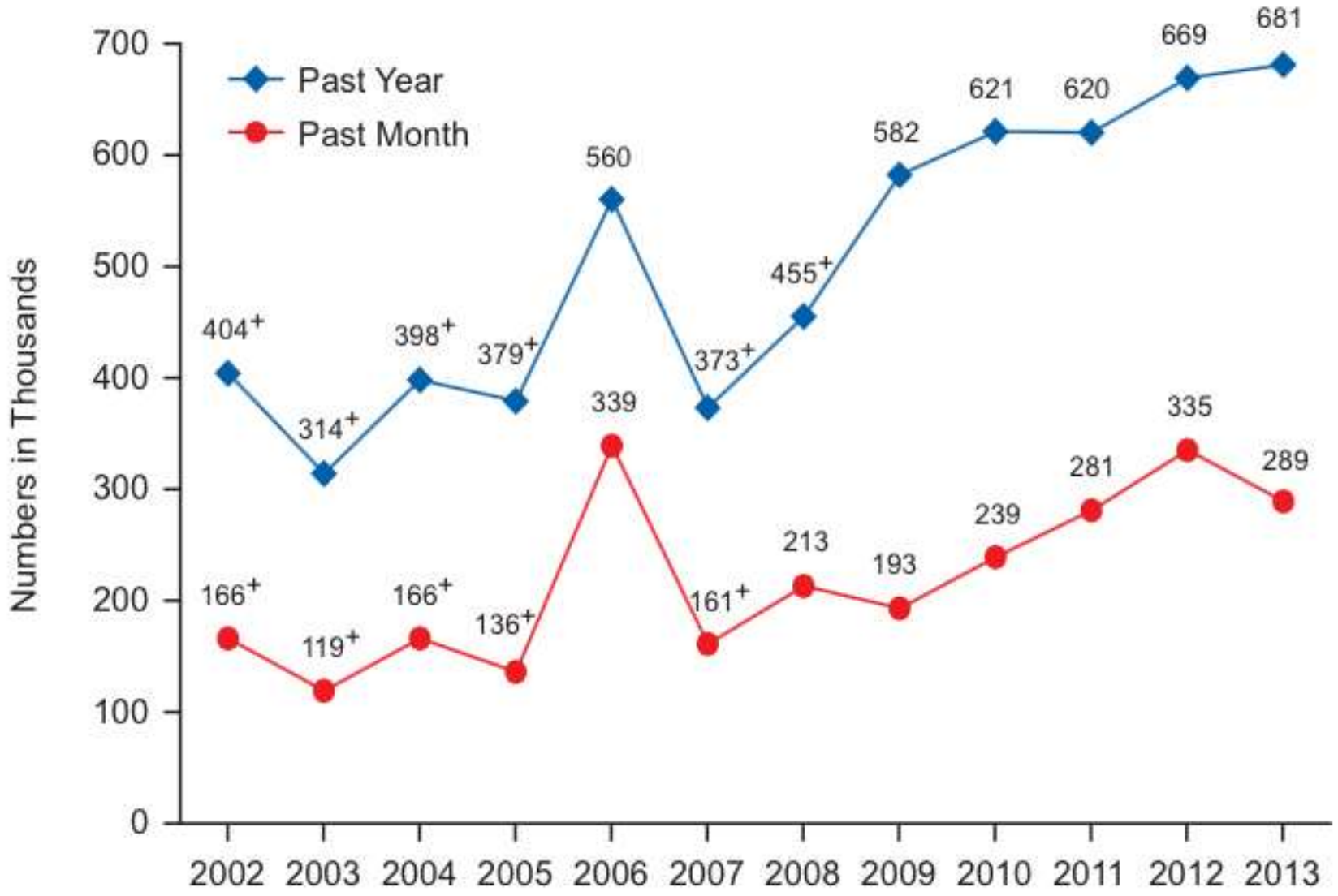
Figure 2.4 Past Month and Past Year Heroin Use among Persons Aged 12 or Older: 2002-2013



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Not all injection = IV

- Subcutaneous injection – “Skin popping”
- Intramuscular injection – “Muscling”
- Intravenous injection – “Main lining”, “Shooting up”, “Pinning”, “Jacking up”, “Banging” and “Slamming”
- Users may evolve to different sites and types

Most Common Drugs Injected

- Heroin
- Cocaine
- Crystal Methamphetamines
- Amphetamines
- Opiates/Prescription Drugs

Complications

- Vascular Injury
  - "Collapsed Veins"
  - Chronic Venous Disease
  - Thrombosis
- Infection
  - Skin & Soft Tissue (Cellulitis / Abscess)
  - Endocarditis, Osteomyelitis, Epidural Abscess
  - HIV, Hep B & C

Collapsed Veins

- Scarring
- Repeated Use of same vein
- Bad needles (blunt)
- Improper Technique, “Digging”
- Injection of caustic substances

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Chronic Venous Disease

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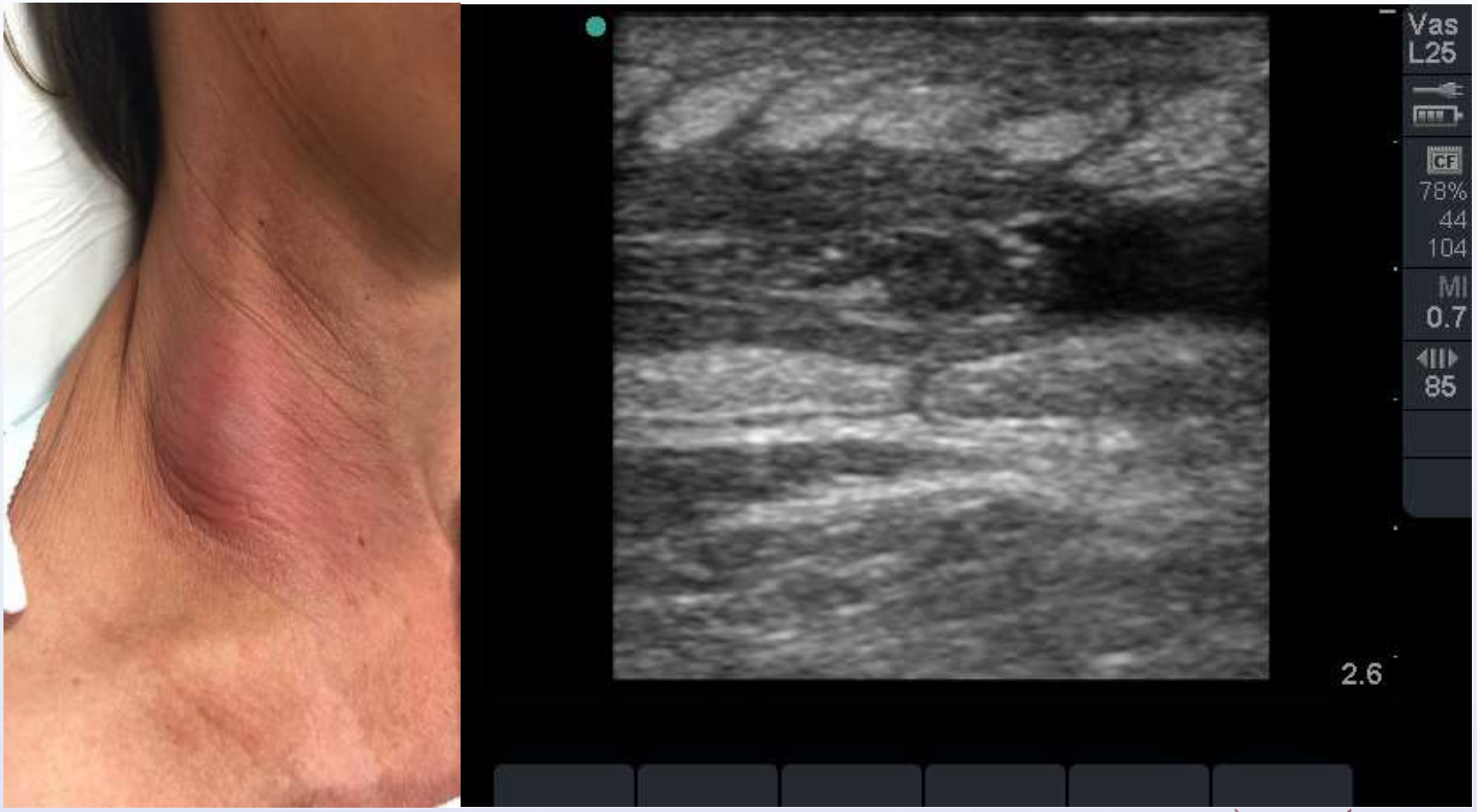
Thrombophlebitis



Cellulitis / Abscess

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Injection Drug Use = Difficult Veins

Table 2
Adjusted ORs of significant factors associated with DVA

Condition	Adjusted OR	95% CI
Diabetes	2.1	1.3-3.4
IVDA	2.4	1.1-5.3
SCD	3.5	1.4-8.4

- Options:
  - EJ or Ultrasound Guided PIV
  - Central Venous Access
  - Intra-osseus

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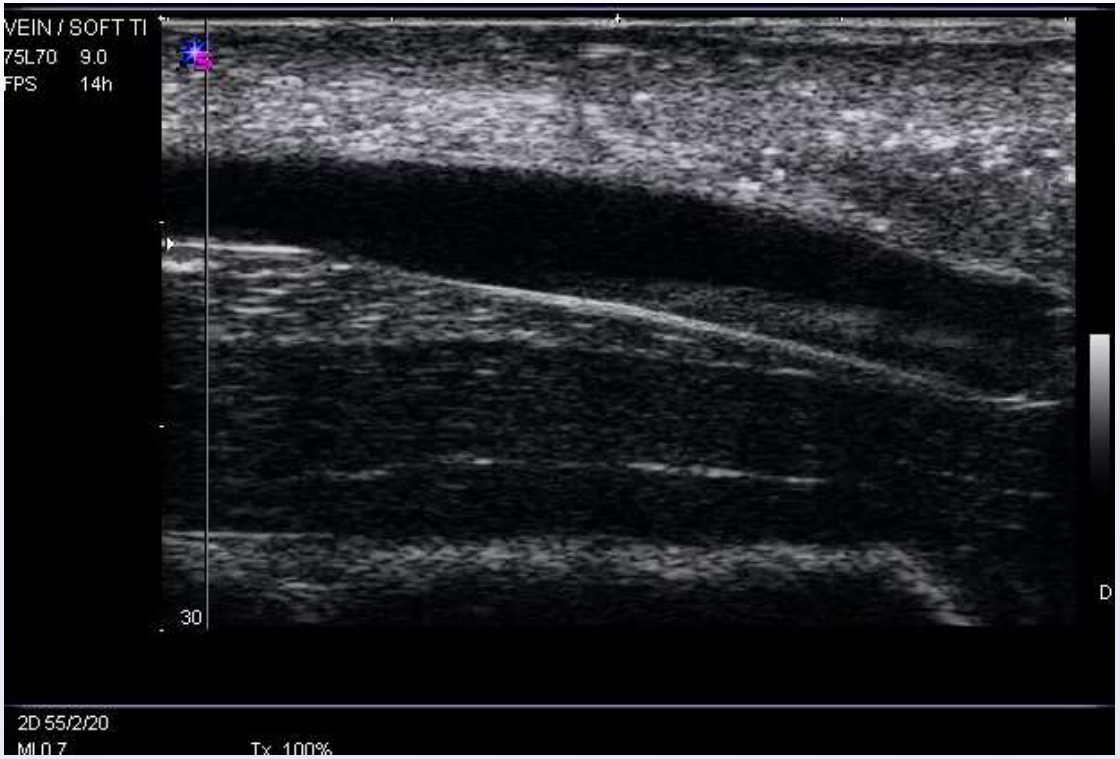
Central Venous Access

- Common Sites
  - Internal Jugular
  - Subclavian/ Axillary
  - Femoral



CVC Complications

Table 2. Frequency of Mechanical Complications, According to the Route of Catheterization.*

Complication	Frequency		
	Internal Jugular	Subclavian	Femoral
		percent	
Arterial puncture	6.3–9.4	3.1–4.9	9.0–15.0
Hematoma	<0.1–2.2	1.2–2.1	3.8–4.4
Hemothorax	NA	0.4–0.6	NA
Pneumothorax	<0.1–0.2	1.5–3.1	NA
Total	6.3–11.8	6.2–10.7	12.8–19.4

* Data are from Merrer et al.,[5] Sznajder et al.,[6] Mansfield et al.,[8] Martin et al.,[22] Durbec et al.,[23] and Timsit et al.[24] NA denotes not applicable.

USGIVs = a game changer

Ultrasound-Guided Peripheral Intravenous Access Program Is Associated With a Marked Reduction in Central Venous Catheter Use in Noncritically Ill Emergency Department Patients

Hamid Shokoohi, MD, MPH, RDMS, RDCS; Keith Boniface, MD, RDMS, RDCS; Melissa McCarthy, ScD; Tareq Khedir Al-tiae, MD; Mehdi Sattarian, MD, MBA; Ru Ding, MS; Yiju Teresa Liu, MD, RDMS; Ali Pourmand, MD, MPH, RDMS; Elizabeth Schoenfeld, MD, RDMS; James Scott, MD; Robert Shesser, MD;

80% REDUCTION

De f

ultrasound guidance for peripheral intravenous catheters ☆

Arthur K. Au MD [a,*], Masashi J. Rotte MD [a], Robert J. Grzybowski [b], Bon S. Ku MD, MPP [a], J. Matthew Fields MD [a]

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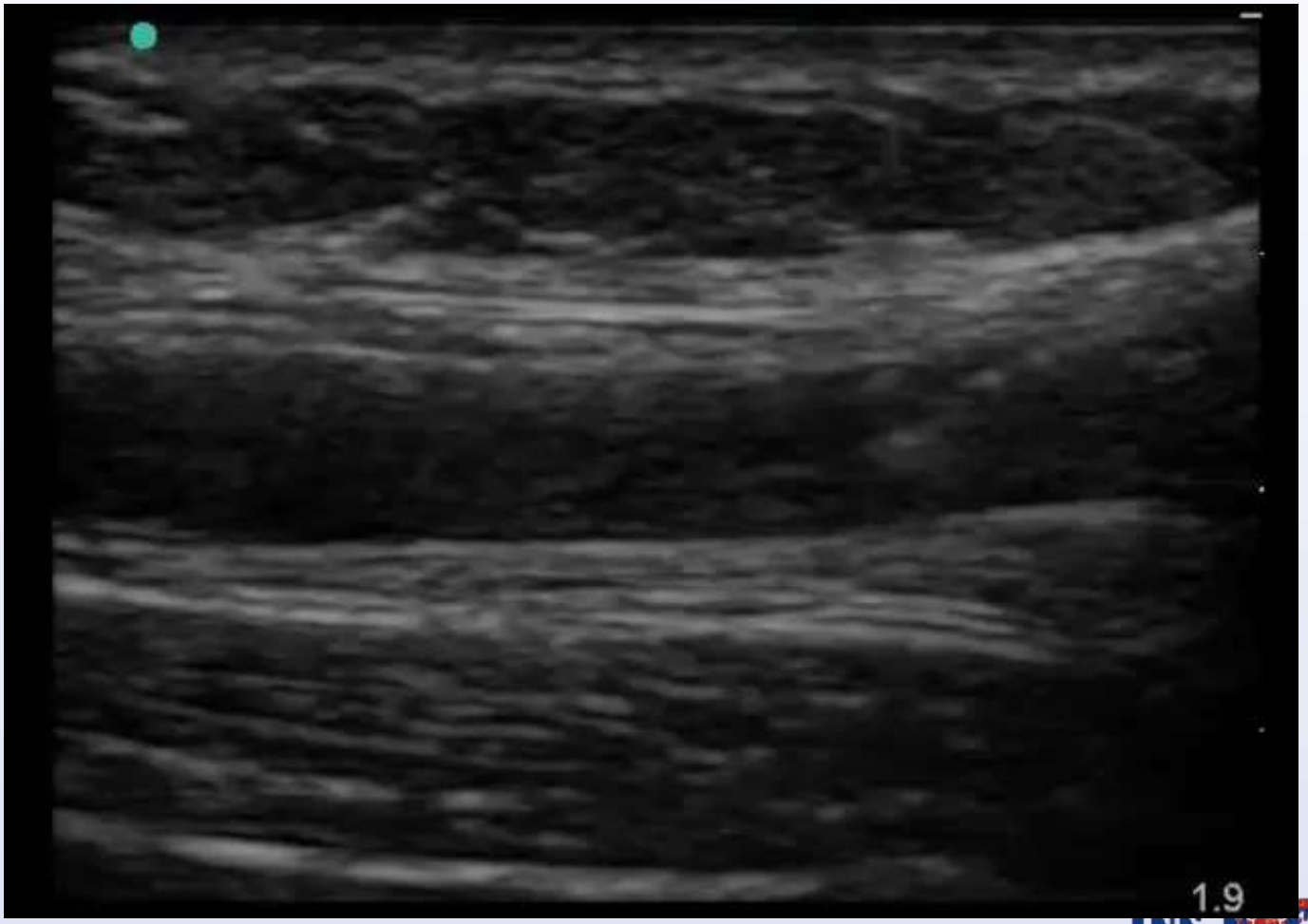
USGIV Placement



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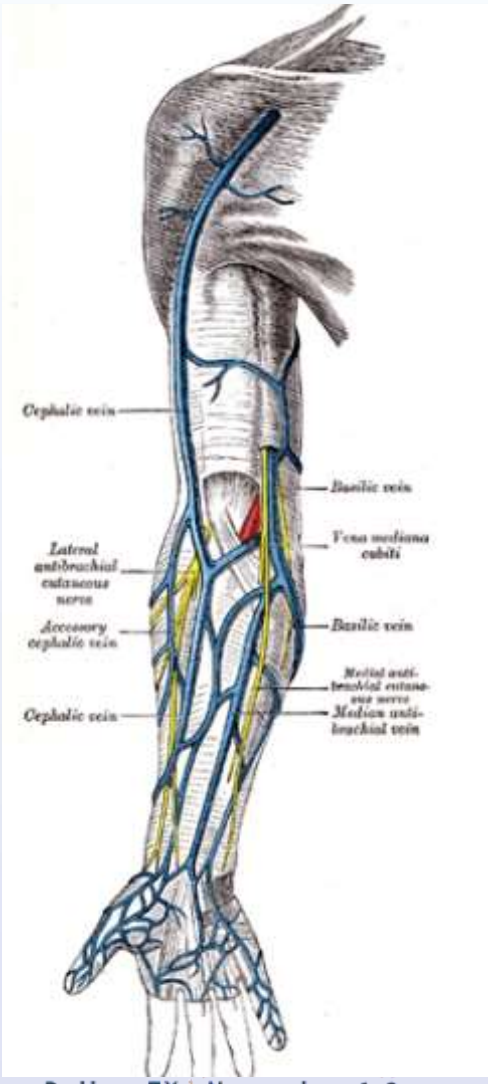
USGIVs – How I do it.

- 1. Tourniquet
- 2. Scan the arm, forearm & AC
- 3. Cephalic is a nice target if present
- 4. Forearm > AC > Arm
- 5. < 1 cm deep (if deeper get a midline)
- 6. Avoid veins in a NV bundle



Example Vessels

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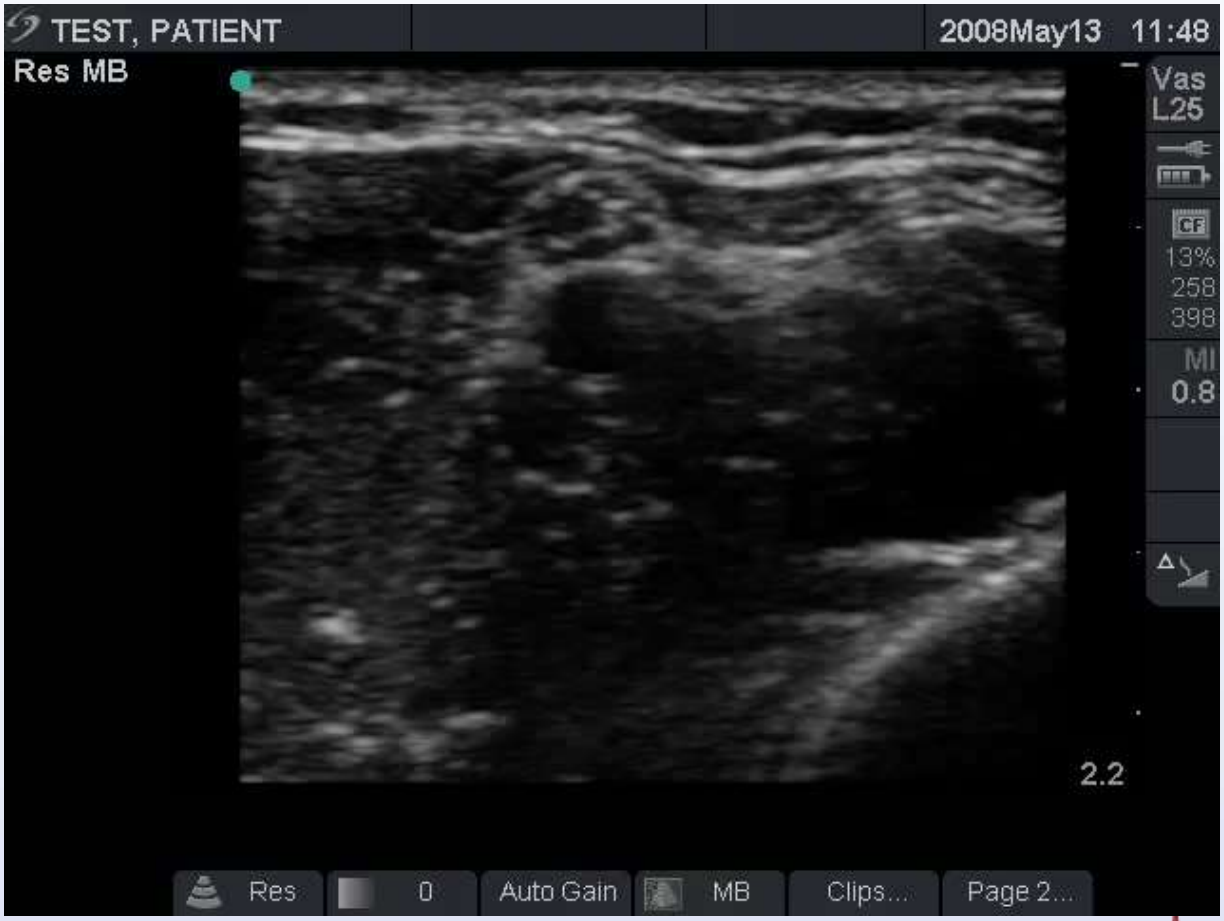
Nerves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Clips...
Page 2...

Make a circle with the needle

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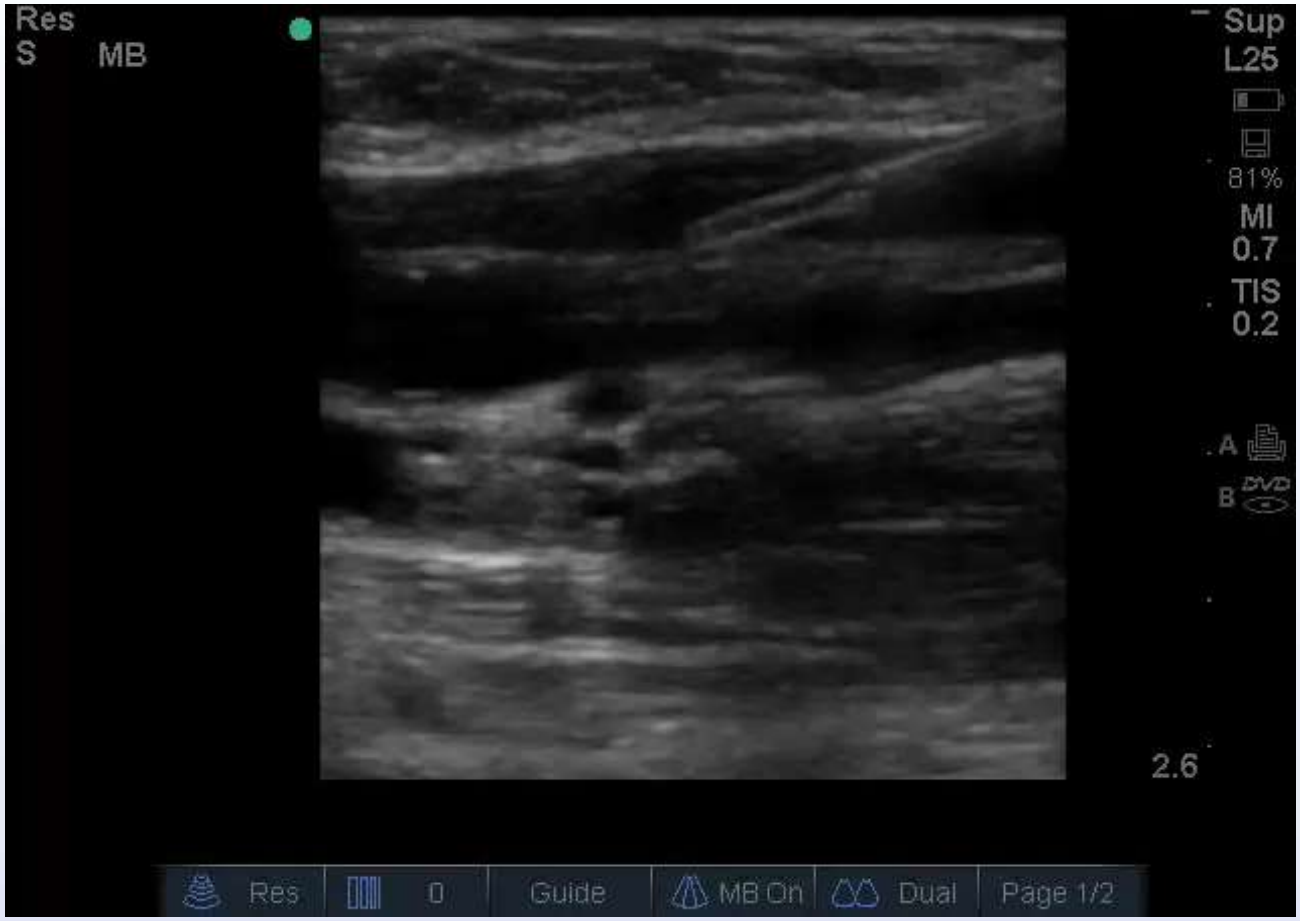
A less than ideal USGIV

Floating the catheter



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External Jugular

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External Jugular

ULTRASOUND-GUIDED PERIPHERAL VENOUS ACCESS VS. THE EXTERNAL JUGULAR VEIN AS THE INITIAL APPROACH TO THE PATIENT WITH DIFFICULT VASCULAR ACCESS

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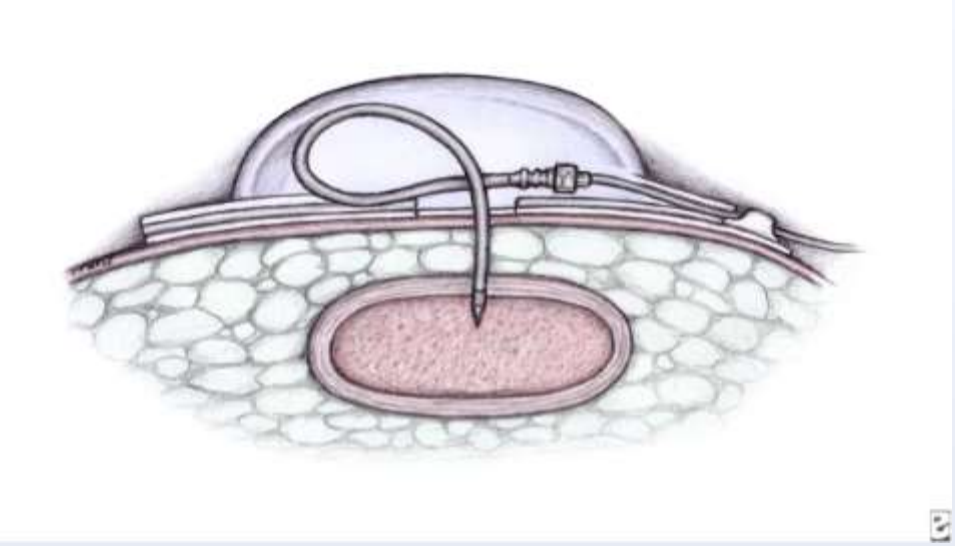
USGIV 84% Success
EJ 50% Success

Intra-osseous

- First used in 1934
- Replaced by IV catheter
- Rediscovered in 1980s
- Reaches central circulation in < 1 second



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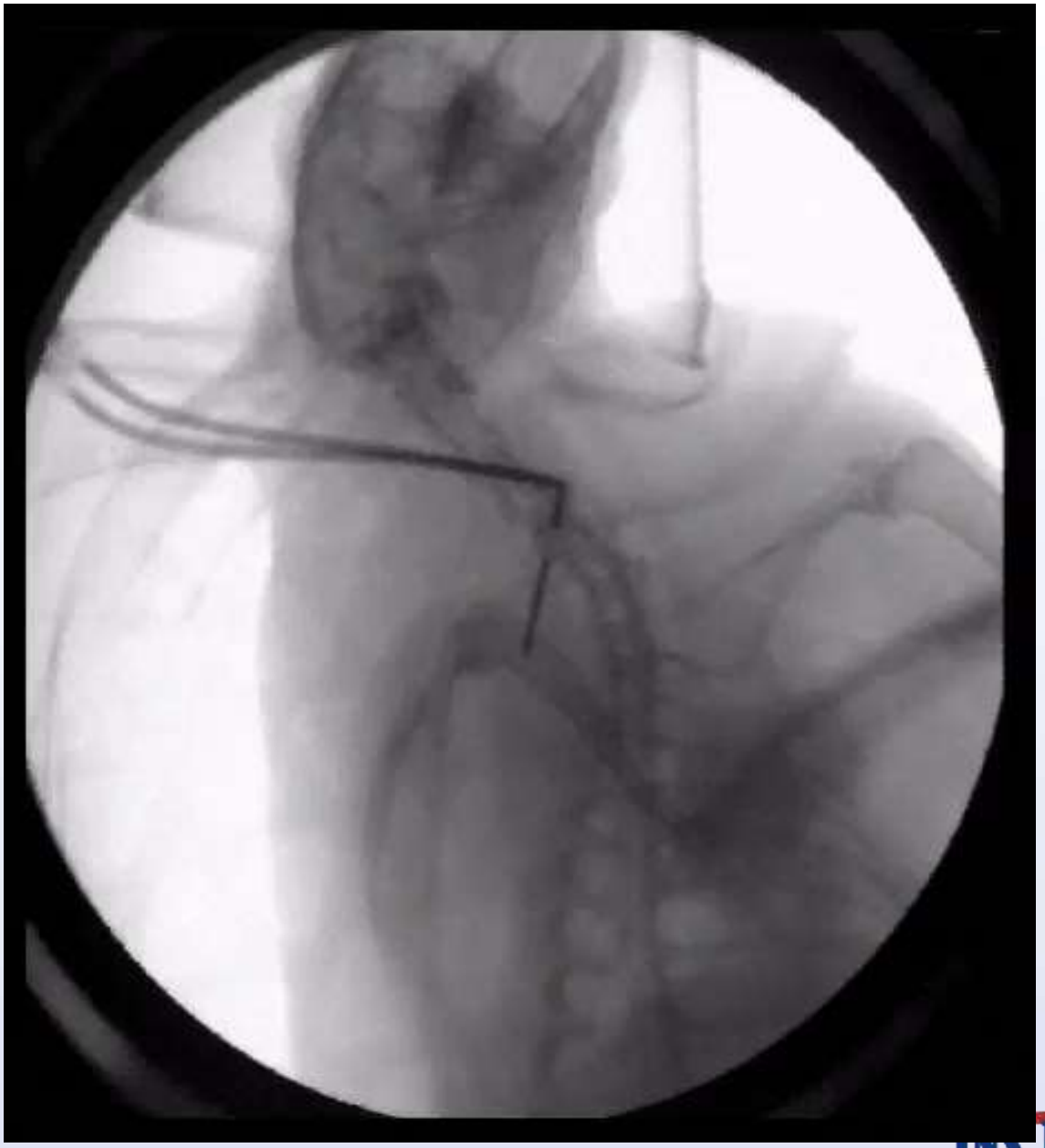
Intra-osseous



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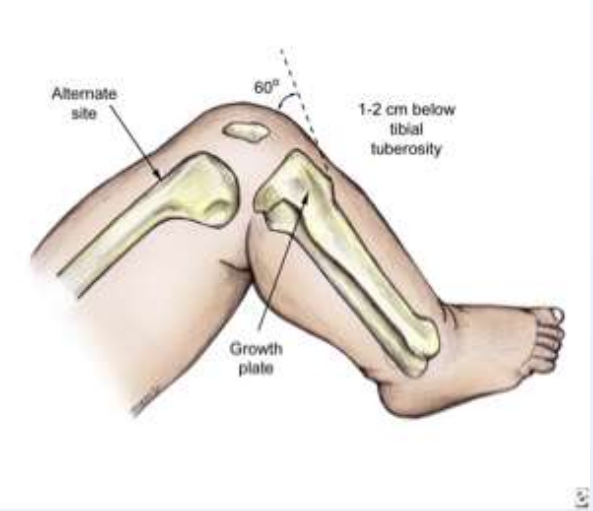
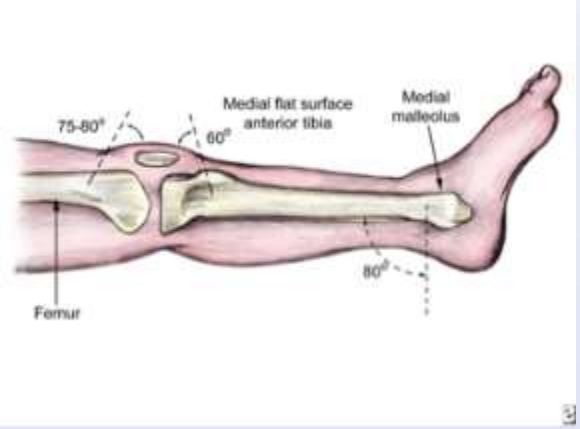
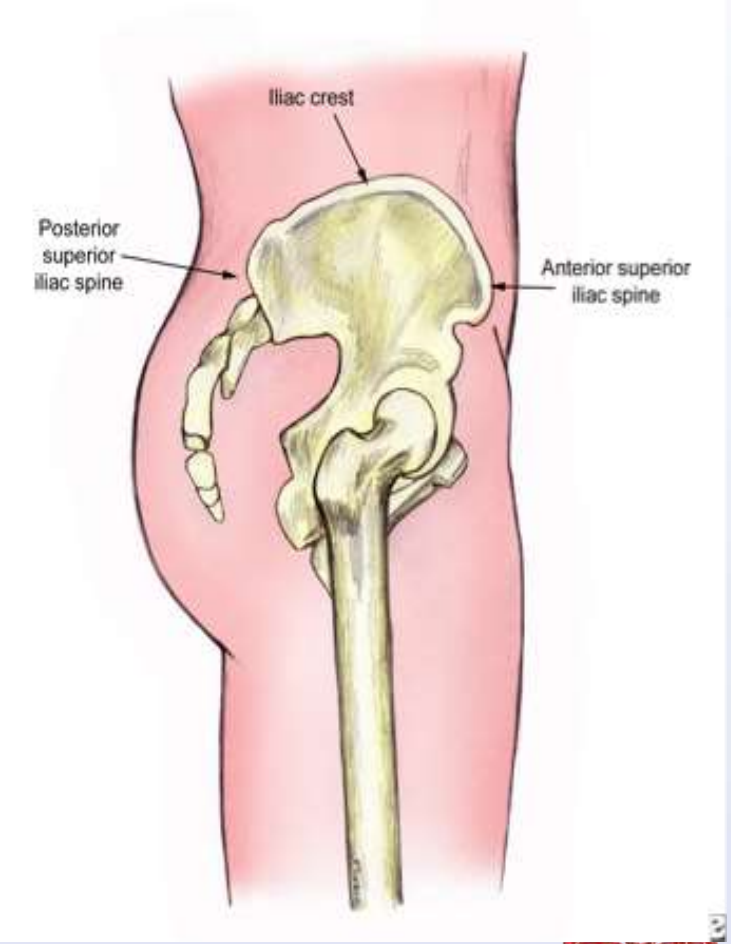
Intra-osseous Access







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Intra-osseous Access

- May be left in place 72-96 hours
- Most medications
- Contraindicated in fractures, previously used site, bone conditions, overlying infection
- Potential complications: infection, compartment syndrome (due to extravasation), hematoma, pain, fat embolus

Avoid Vascular Access

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Can medications be given orally?

- Many antibiotics can be given orally
- Heparin? → Lovenox
- IV Pain meds → Oral equivalents or IM

An at risk group

- Higher rates of AMA
- Addiction
- Stigmatization
- Risk to providers
- Higher mortality when leaving AMA

Long Term Vascular Access?

- Can injection drug users go home with IV access?
- Ho et al – case series of 29 patients safely treated in an outpatient parental antibiotic treatment program with PICC lines
- No deaths, 6 readmissions

Midlines

- Nice alternative
- 28 day dwell time
- Similar to USGIV placement

Case 1 Follow-up

- A nearly dying patient with inability to obtain IV access
- Next step?
  - Intranasal Naloxone
  - USGIV
  - CVC
  - Intra-osseous

Case 1 Follow-up

- Narcan given – no effect
- En route to ED pt goes into PEA arrest
- In the ED IV access not obtainable and IO placed
- ACLS provided and patient has return of spontaneous circulation

Case 1 Follow-up

- IJ central line placed for ongoing access
- The patient recovers after 3 days in the ICU
- Signs out AMA

Why didn't narcan work?

- Patient had heroin which tested positive for Fentanyl
- Requires 2-3x usual Naloxone dosing

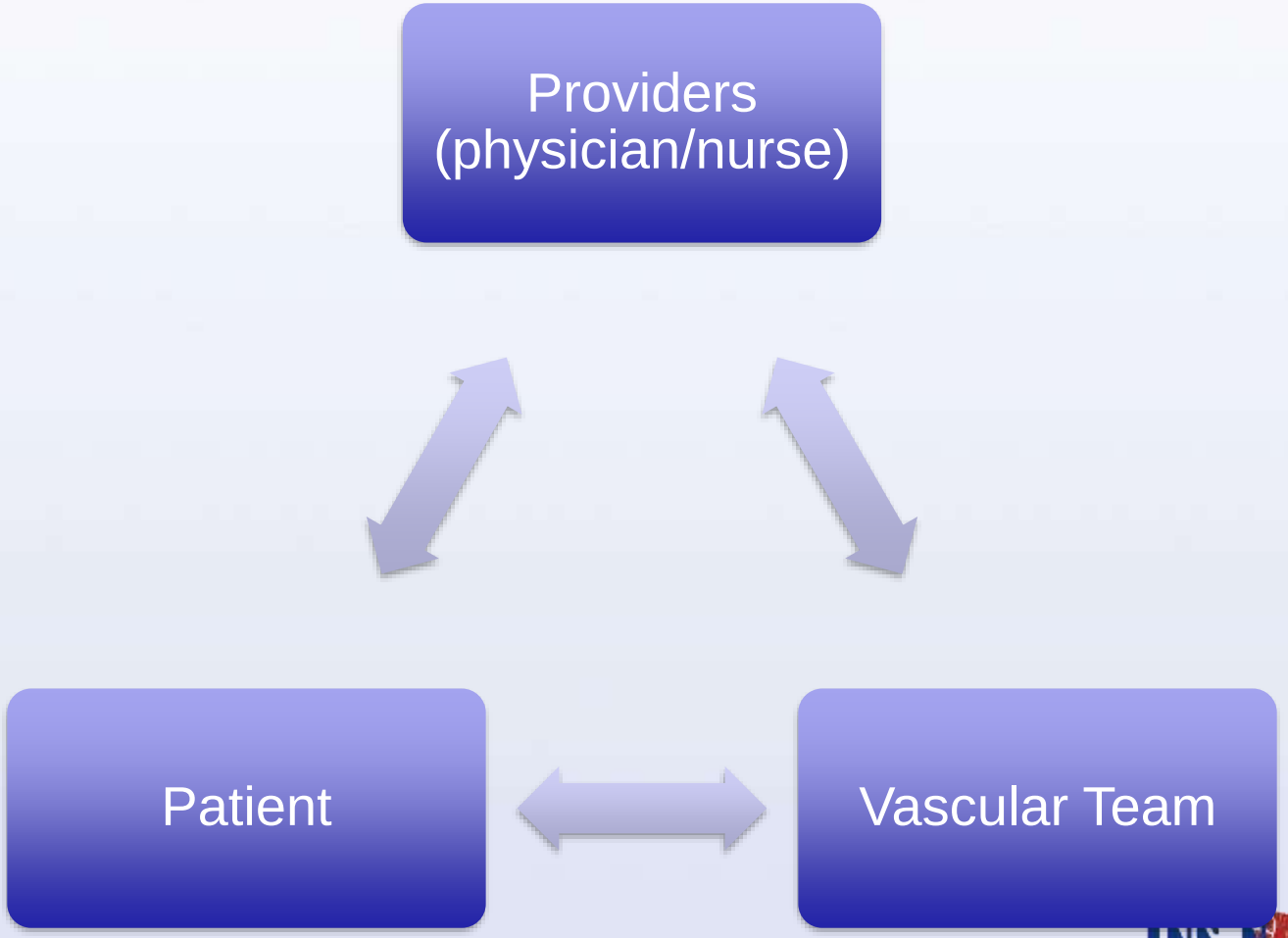
Case 2 Follow-up

- Young female clinically stable with concern for epidural abscess
- Short term options:
  - USGIV
  - CVC
  - Intra-osseous
  - No vascular access

Case 2 Follow-up

- Team went for no vascular access as IV access wasn't critical
- PO Tylenol for fever
- MRI
- After USGIV placed
- PICC line and skilled nursing facility

Consider Team Approach



Summary

- Injection drug use is an epidemic
- Many complications
- Ultrasound guided IV use should be expanded to reduce CVCs
- Consider a team approach to short term and long term access

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Questions?