

Hot Pockets:

Management of Cardiac Device Infections

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Disclosures

- I have no financial conflicts of interest to disclose



Case: 67-year-old man

- History of CAD, VT, complete AV block
- Fever 2 weeks prior; drainage from ICD pocket



What is the next step?

- A. Place a fancy dressing on it
- B. Treat with oral antibiotics for 3 months
- C. Sew the hole back together
- D. Take the generator out, sew the hole back together, place a fancy dressing on it, and treat with antibiotics for 3 months
- E. Take the entire system out (generator and leads)



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2017 HRS Guidelines

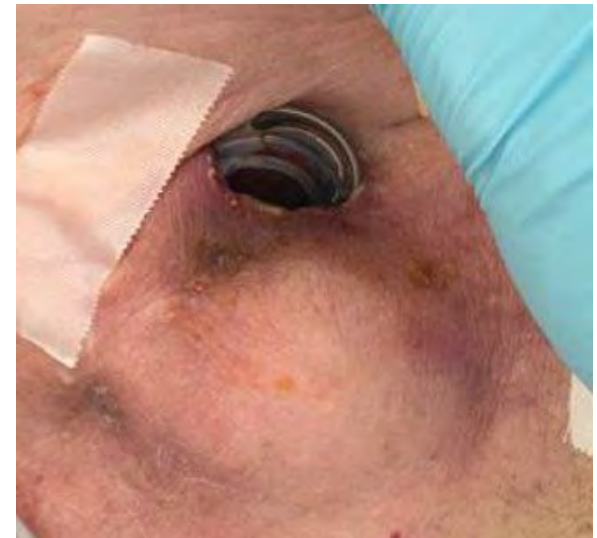
Complete extraction of the device and leads is recommended for all patients with definite CIED infection.

Definite CIED Infection:

- Deep pocket infection
- Pocket erosion (metal visible)
- Recurrent bacteremia (even if TEE negative)
- Evidence of endocarditis



That Means We Extract:



11/17/2022 09:57	Direct blo	!	Abnormal
11/17/2022 09:57	Blood cul	Methicillin Resistant Staphylococcus aureus (The Infectious Diseases Service may be consulted regarding treatment options for patients colonized or infected with methicillin-resistant Staphylococcus aureus.)	Abnormal
11/17/2022 09:30	Blood cul		Abnormal
11/15/2022 04:18	Blood cul		Abnormal
11/15/2022 04:18	Blood culture aerobic and anaerobic	Blood, Perip... Completed - Final ...	Abnormal



Whom Do We Extract?

Complete extraction of the device and leads is recommended for **all patients** with definite CIED infection.

All patients!

Whom Do I Not Extract?

- Hospice referral (shared decision making)
- Patients without **definite** CIED infection



Uncertain Situations

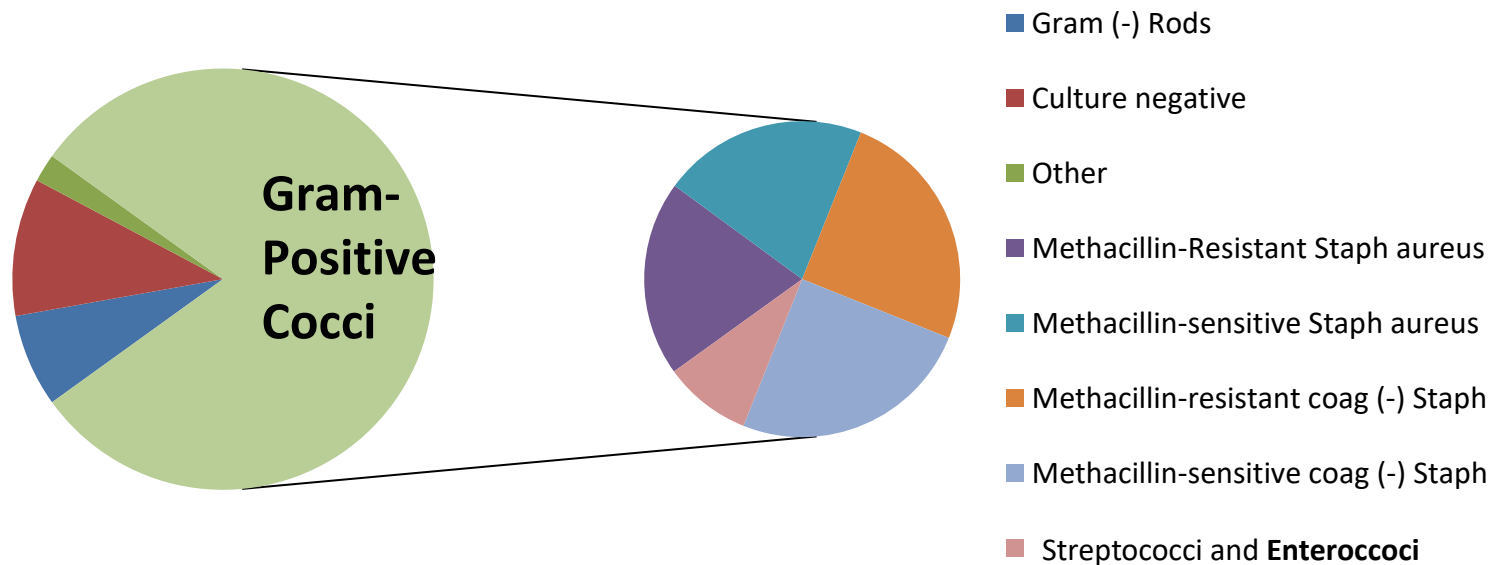
- Superficial versus deep pocket infection
- Single blood cultures, unusual organisms

The Answer to Uncertainty is **Close Follow-up!**



The Usual Suspects

Organisms



Adapted from Hussein AA et al. JACC EP 2016



Next Steps:

- Hospitalization versus Outpatient
- Blood Cultures and other labs
- Chest X-Ray
- Transesophageal Echocardiogram (TEE)
- Call us!

402-559-8888



Time Affects Outcomes

	Early (≤ 7 Days)	Delayed (>7 Days)
In-Hospital Mortality	3.5%	8.3%
In-Hospital Mortality with Systemic Infection	7.5%	10.4%

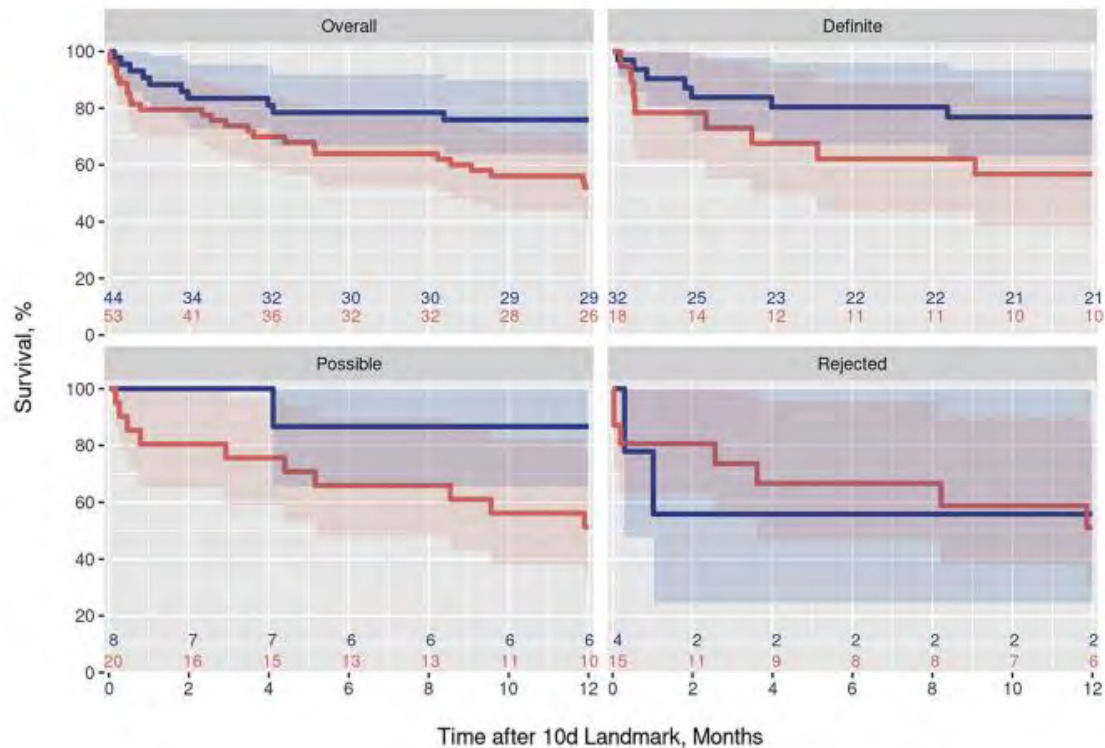
Lee JZ, et al. Heart Rhythm 2022;19:768-775.



The Worst: *Staphylococcus*

Device infection in 80% of patients with *Staph* bacteremia

Complete extraction within 10 days of onset of *Staph* bacteremia: 83% reduction in risk of 1-year mortality



S Chesdachai et al. HeartRhythm 2021;19(570-77)



Hospitalization?

- If in doubt, send them to the ER at a hospital that does extractions
- If no systemic symptoms, expedited outpatient management does not mean "next available"
- Either way, feel free to **call me or Dr. Faris Khan**

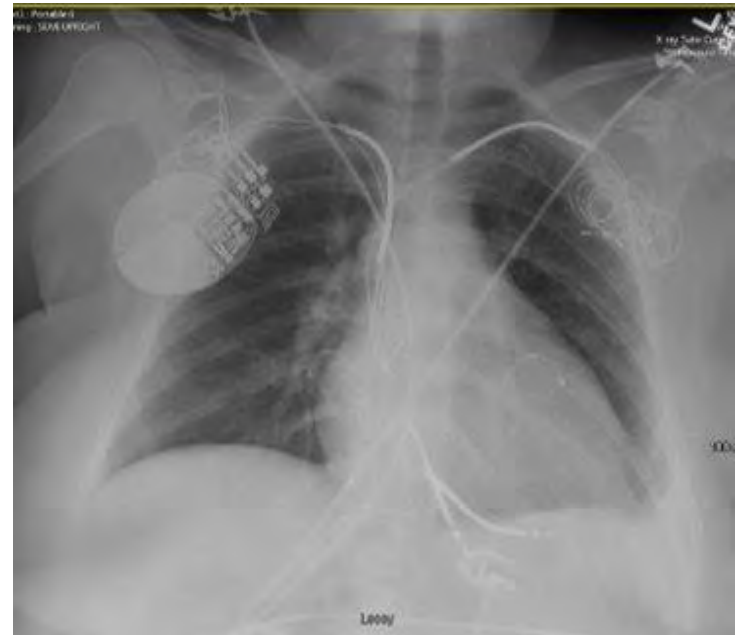


Chest X-Ray Shows All

Our Case:



Another Surprise:



Role of TEE



The Tools:

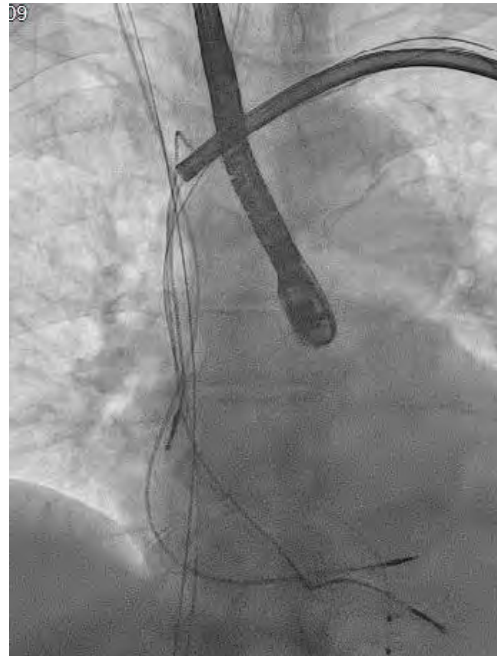
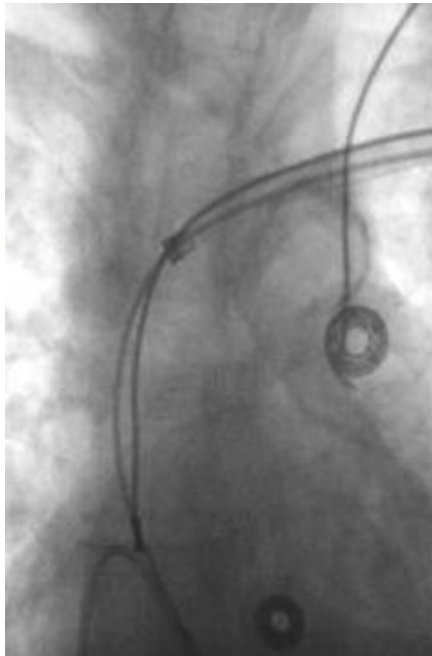
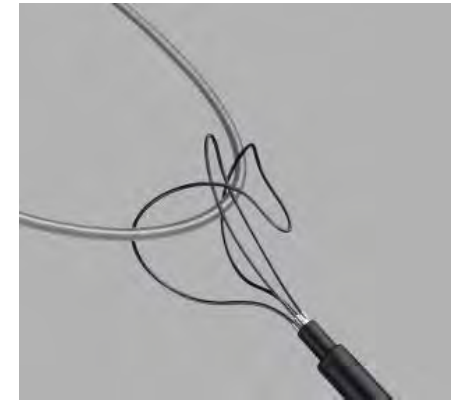
Laser



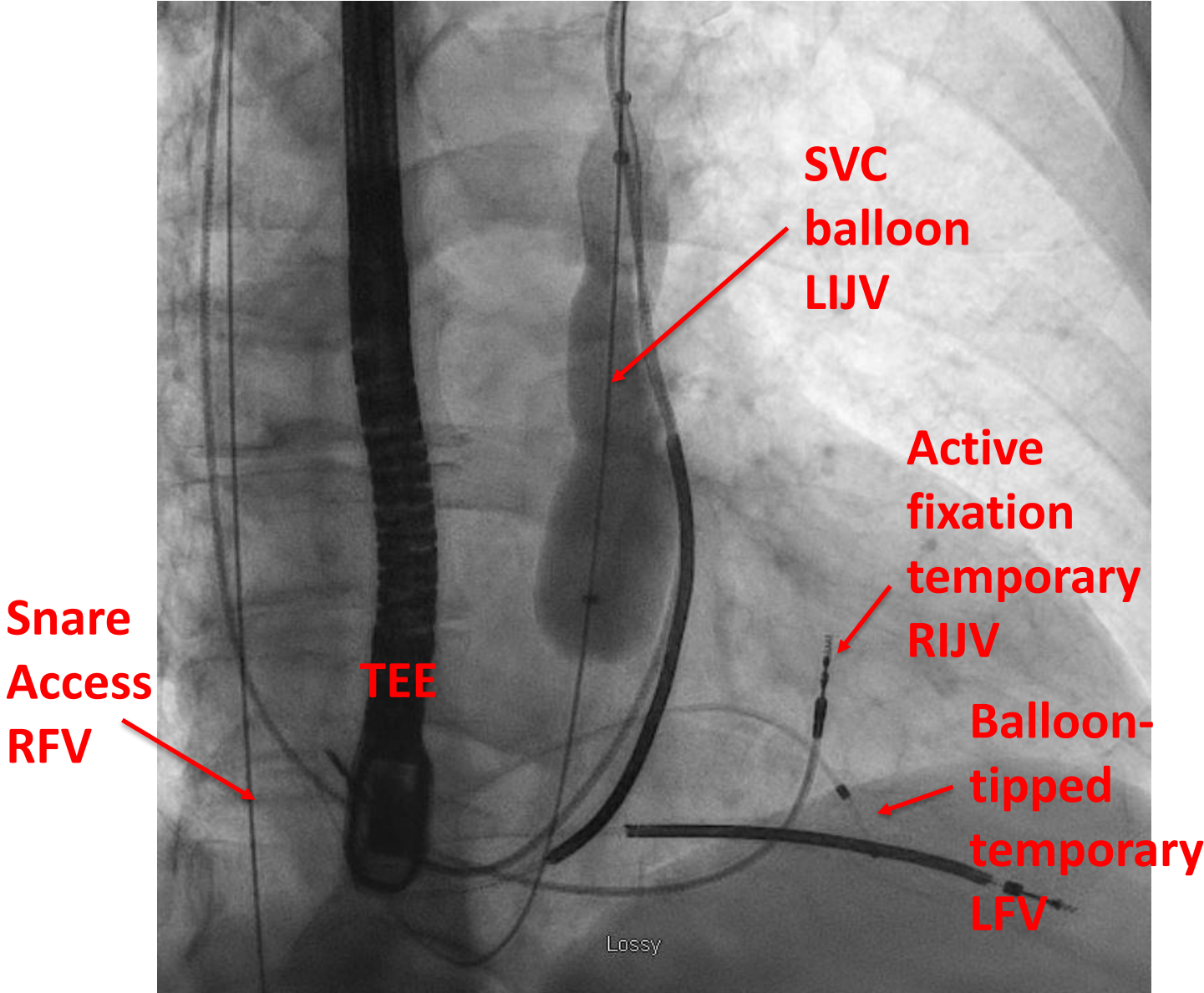
Rotational Cutting



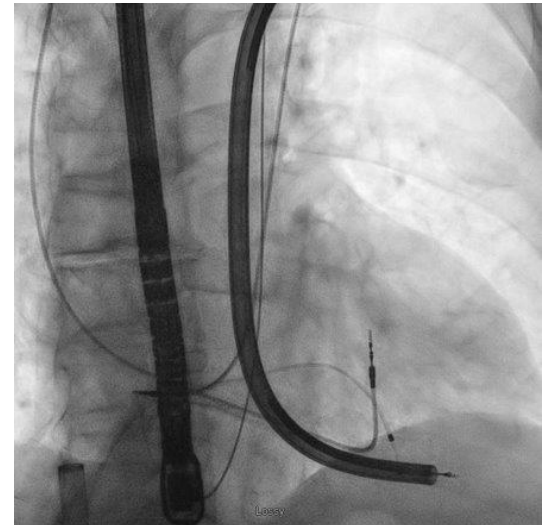
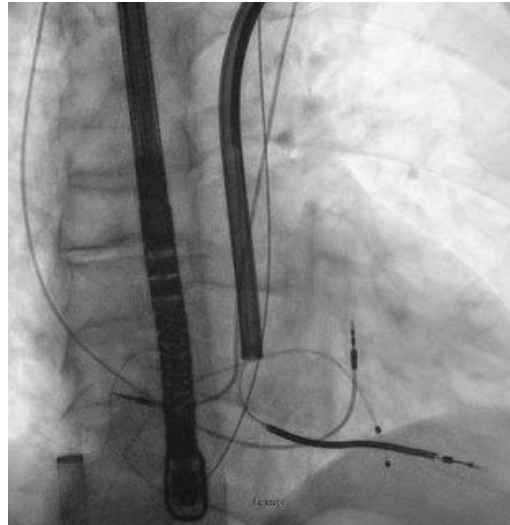
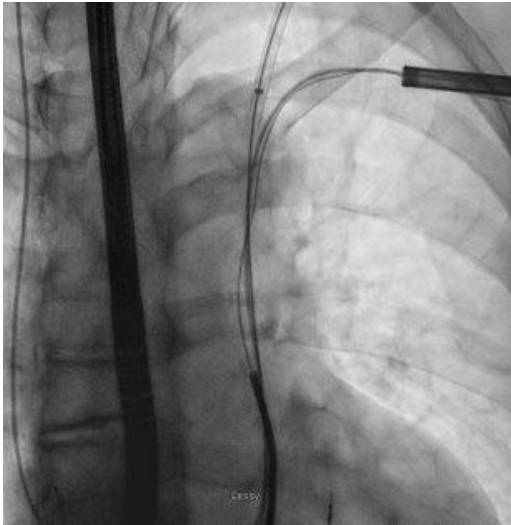
Snares



Our Case: Tools:



Our Case: Techniques



Our Data

2012-2018

- 16+/-4 extractions/yr
- 83% complete success
- 94% clinical success
- 8.4% major complications

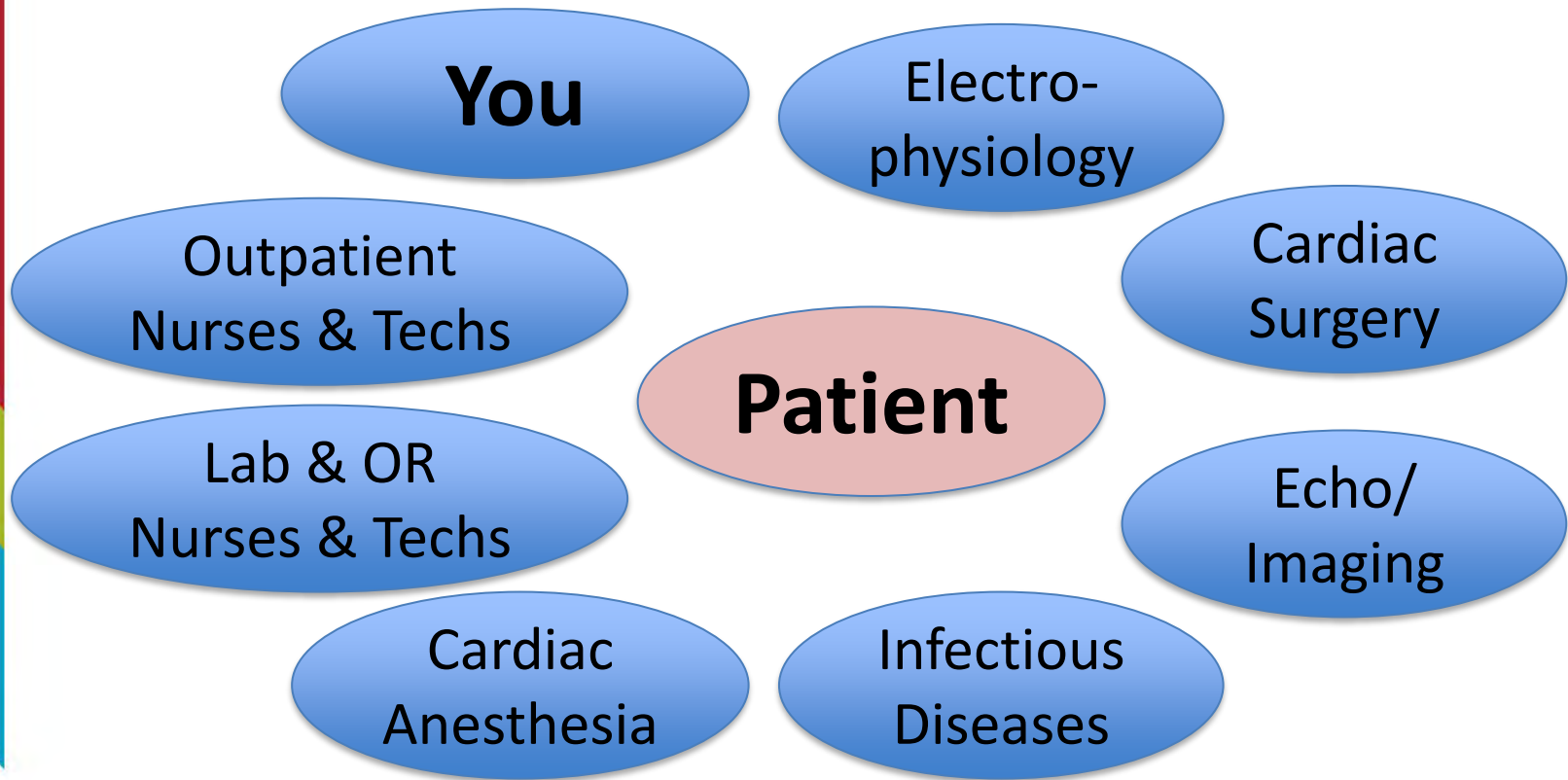
2019-2021

- 41+/-2 extractions/yr
- 85% complete success
- 96% clinical success
- 2.4% major complications

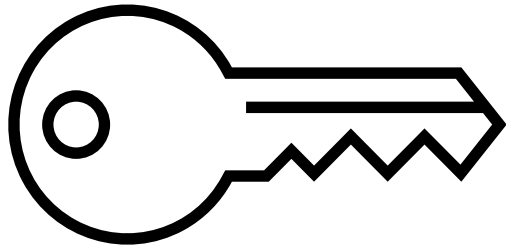
	Group 1 (2012-18)	Group 2 (2019-21)	P Value
Age (years)	62.0±14.7	61.9±17.4	0.93
Female	28.9%	36.2%	0.22
BMI (kg/m ²)	31.7±7.3	30.0±7.3	0.07
Ejection Fraction (%)	35.4±16.3	42.9±14.7	<0.001
Prior Sternotomy	33.9%	21.3%	0.03
Mean Lead Dwell Time (years)	5.7±4.1	6.6±5.1	0.06
Infectious Indication	33.1%	35.4%	0.69
Pacing Lead	66.7%	70.7%	0.38
Dual Coil ICD Leads	84.4%	46.0%	<0.001



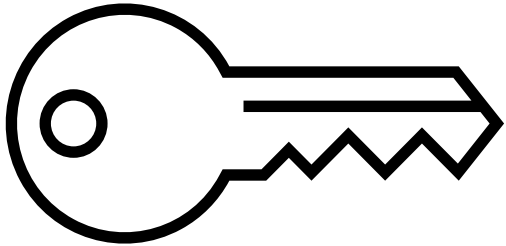
Team



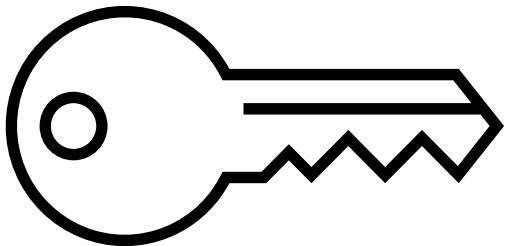
Keys to Survival



Identification of Infection



Timely Referral



Coordinating the Extraction





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