ICDS FROM THE PATIENT'S PERSPECTIVE

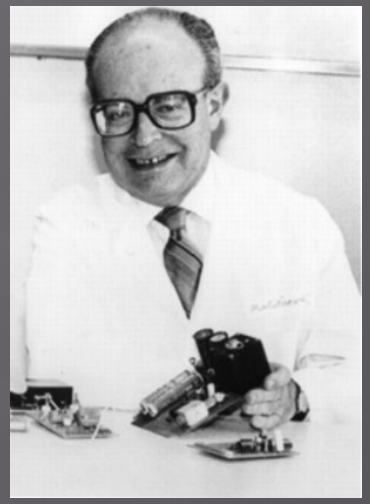
Melissa Czarapata, APRN, CCDS

Objectives

- Understand basic indications for ICD placement
- Describe possible complications related to ICDs
- State psychological disturbances associated with ICDs
- Explain treatment options for psychological disturbances seen in ICD patients

History of ICDs

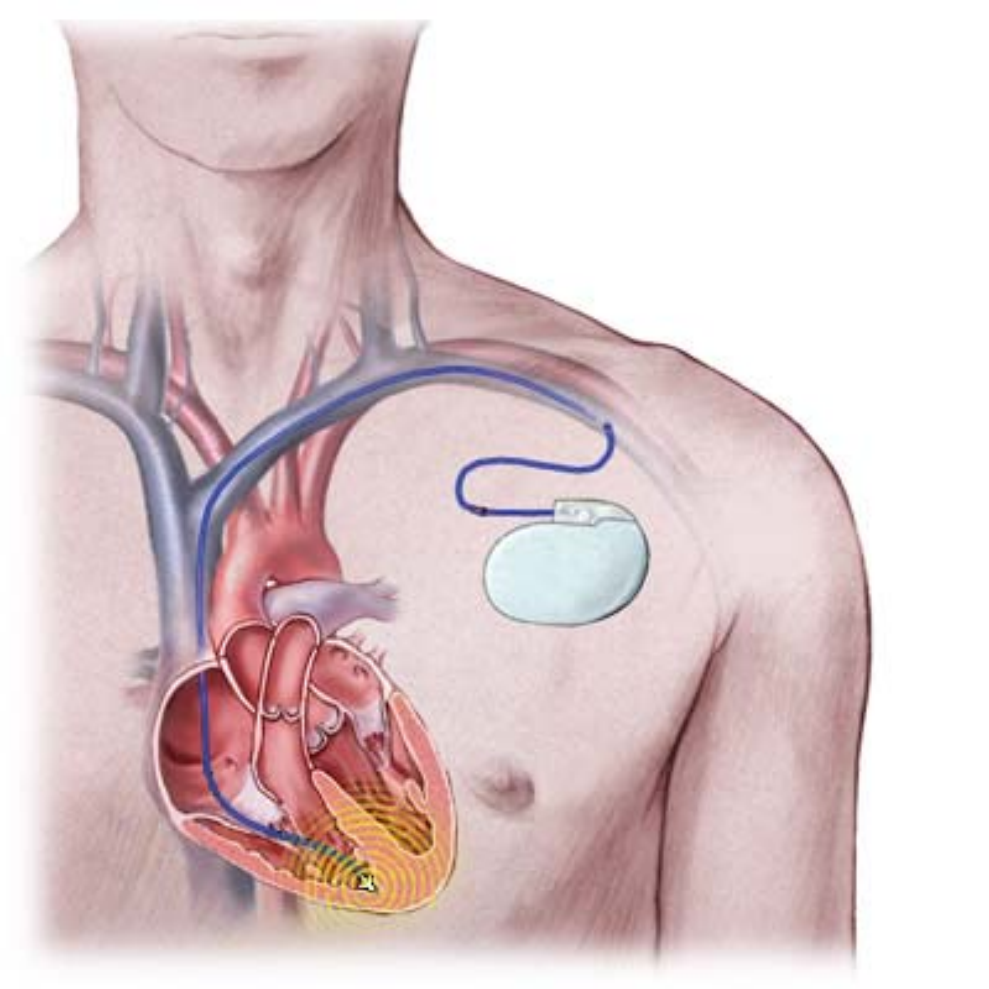
Developed by Michel Mirowski, MD



Initially, patients must survive cardiac arrest not caused by an MI *twice*.
Early generators took 400 hours to build by hand!

The original implants were done with thoracotomy approach and consisted of patches on the epicardium.

Basic ICD Function



Intervals

- In Electrophysiology we work with intervals which is also known as cycle length
- To convert beats per minute to intervals in milliseconds you can count the "boxes" or:

$$\frac{60{,}000}{\text{bpm}}$$

$$\frac{60{,}000}{60\text{bpm}} = 1{,}000 \text{ ms}$$

$$\frac{60{,}000}{70 \text{ bpm}} = 857 \text{ ms}$$

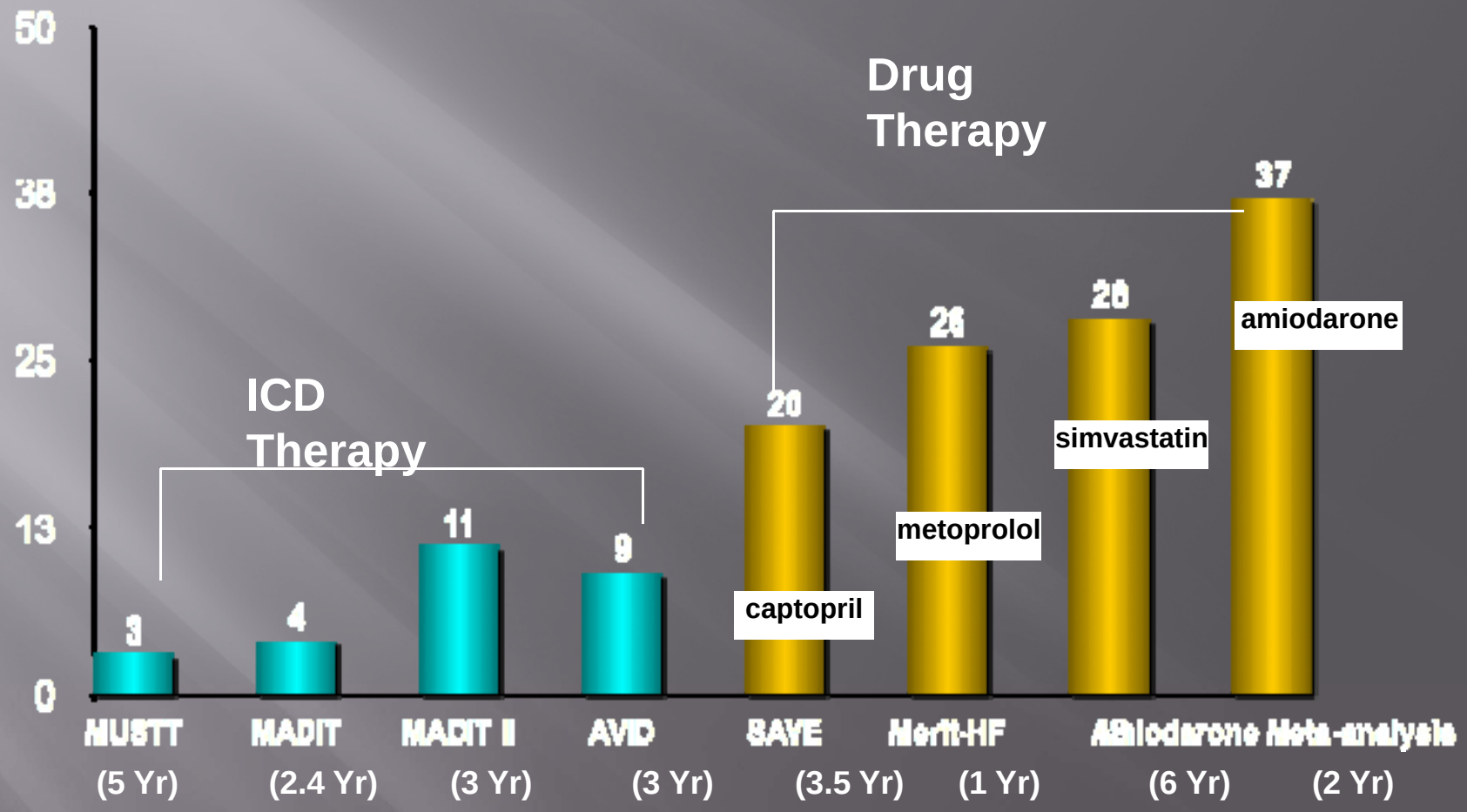
$$\frac{60{,}000}{80 \text{ bpm}} = 750 \text{ ms}$$

$$\frac{60{,}000}{100 \text{ bpm}} = 600 \text{ ms}$$

Indications

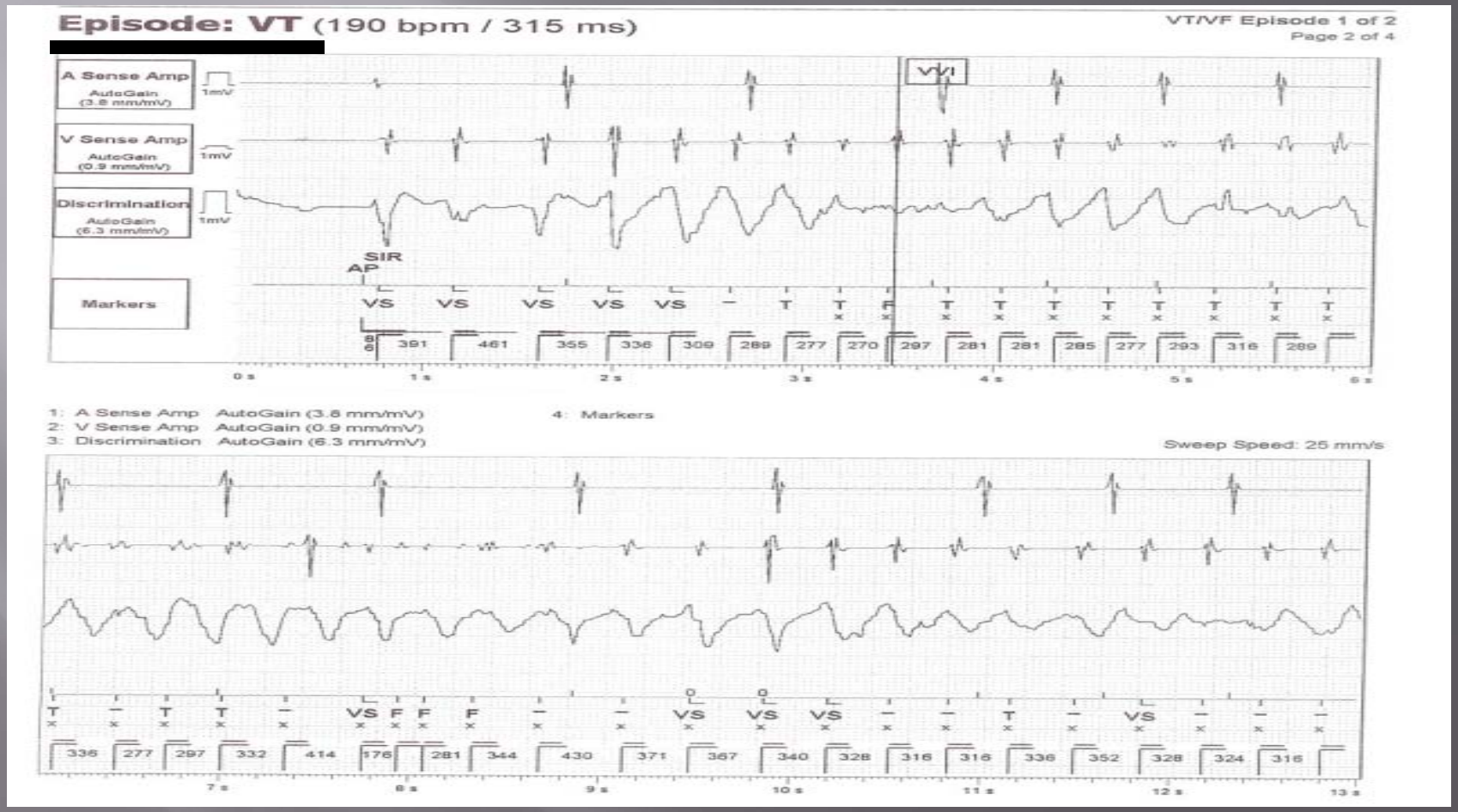
- Primary prevention
  - Ischemic cardiomyopathy with EF ≤30%, more than 40 days post MI or more than 90 days post revascularization
  - LVEF ≤ 35%, NYHA class II or III
  - LVEF ≤ 40% due to prior MI, inducible VT or VF at EPS
- Secondary prevention
  - Survived sudden cardiac arrest due to VT or VF

Number Needed to Treat

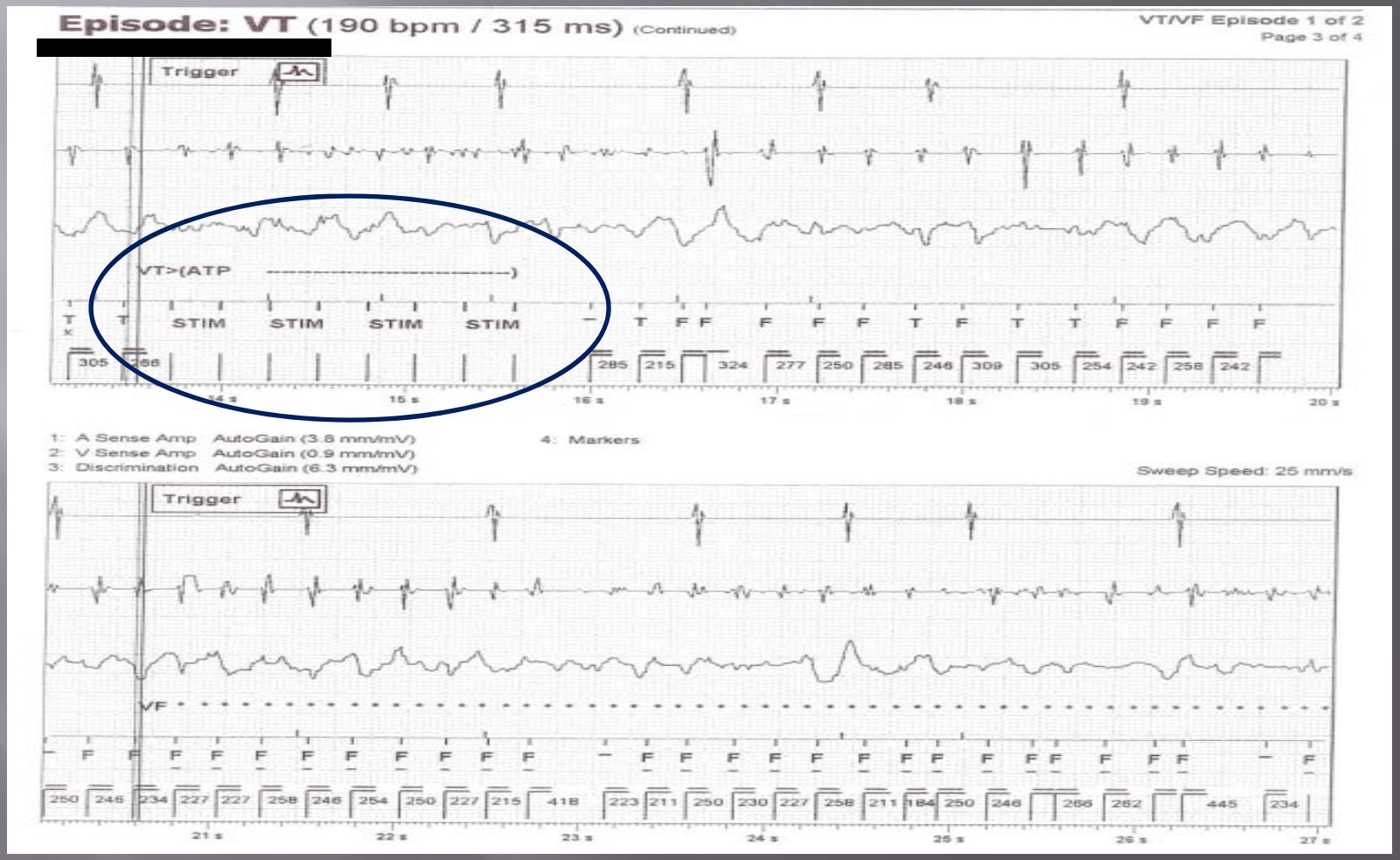


$NNT_{x\ years}$ = 100 / (% Mortality in Control Group – % Mortality in Treatment Group)

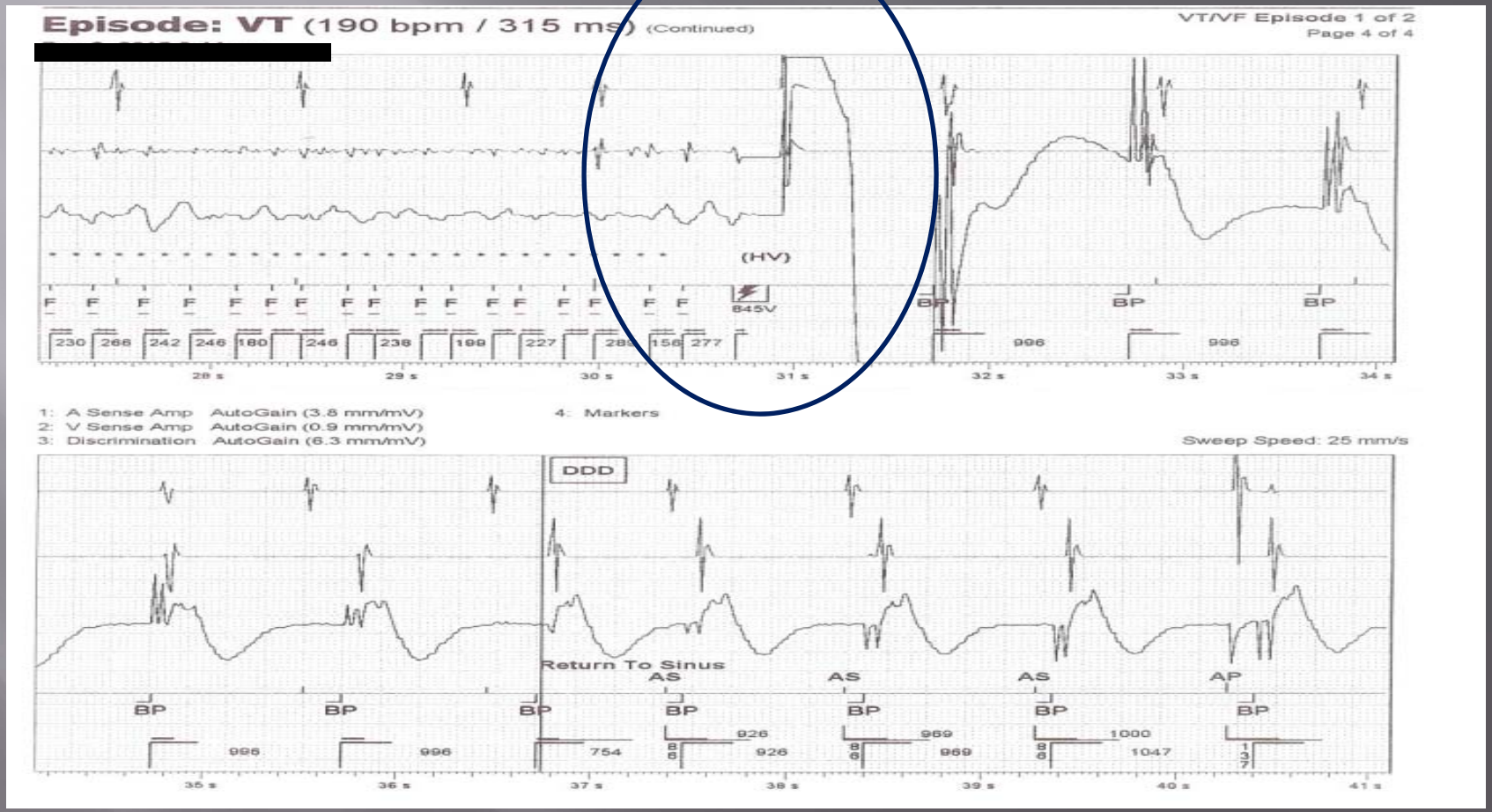
Appropriate Therapy



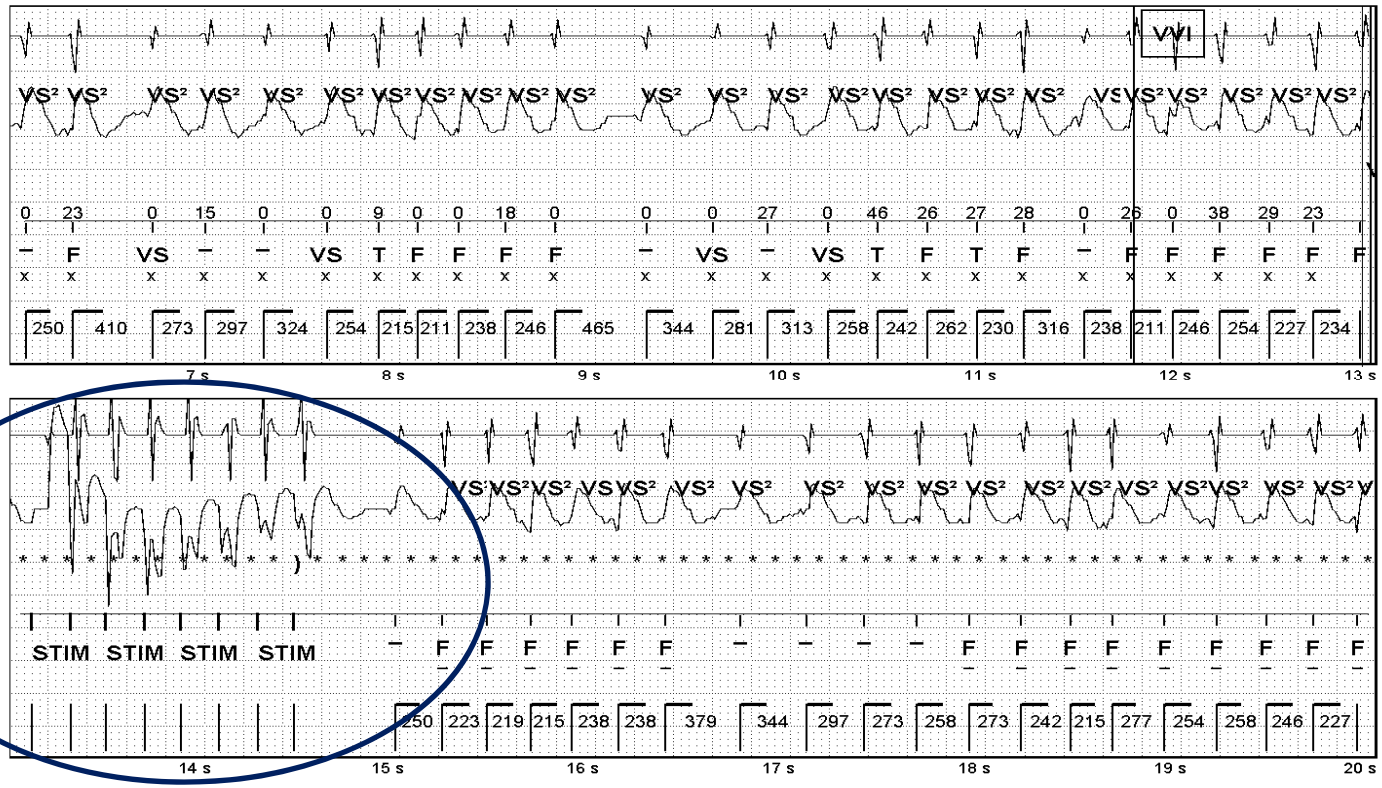
Appropriate Therapy



Appropriate Therapy

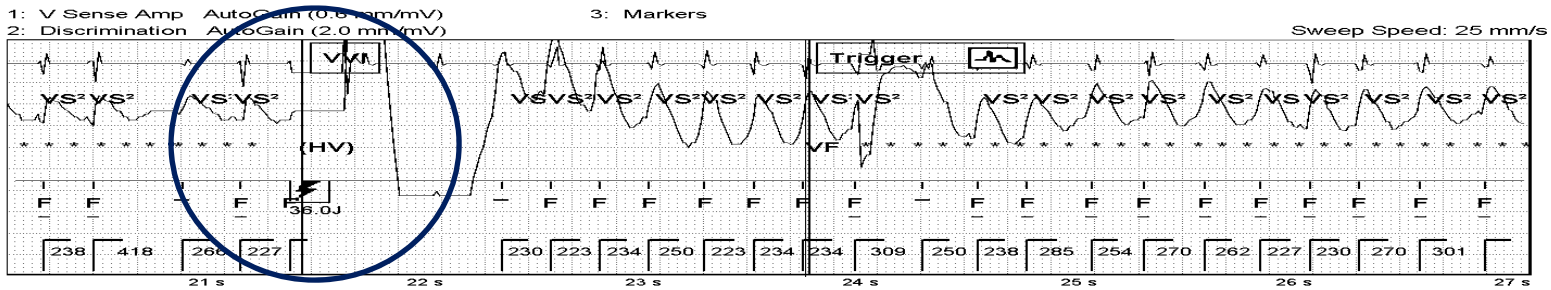


Inappropriate therapy

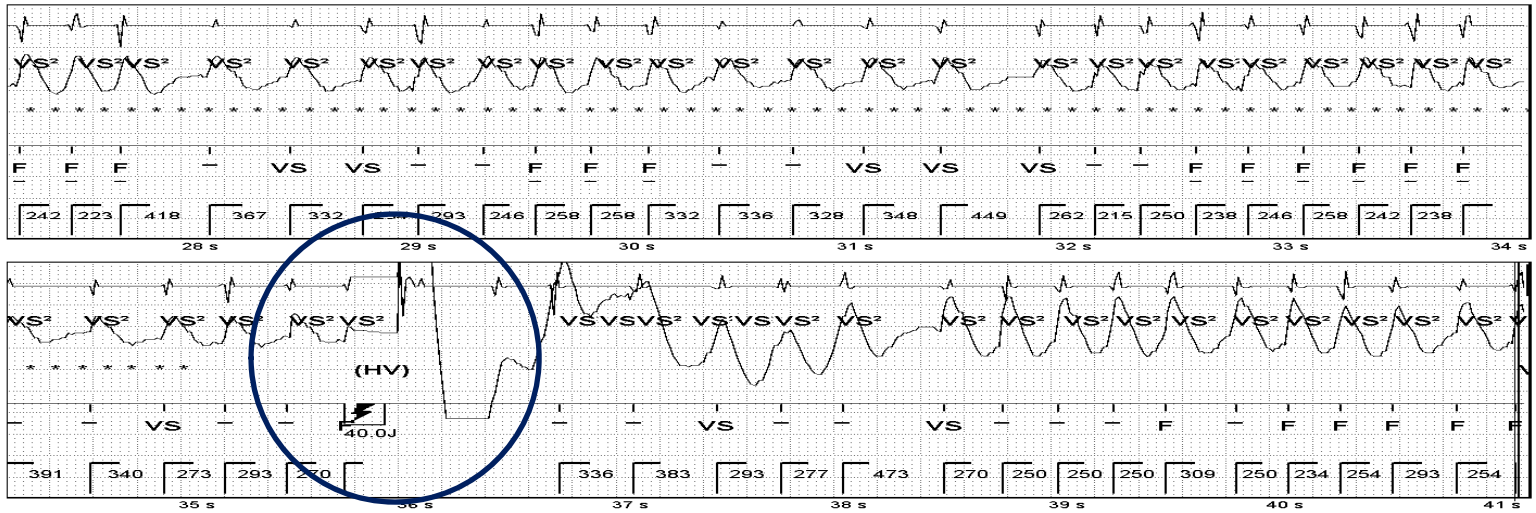


ATP therapy

Inappropriate therapy

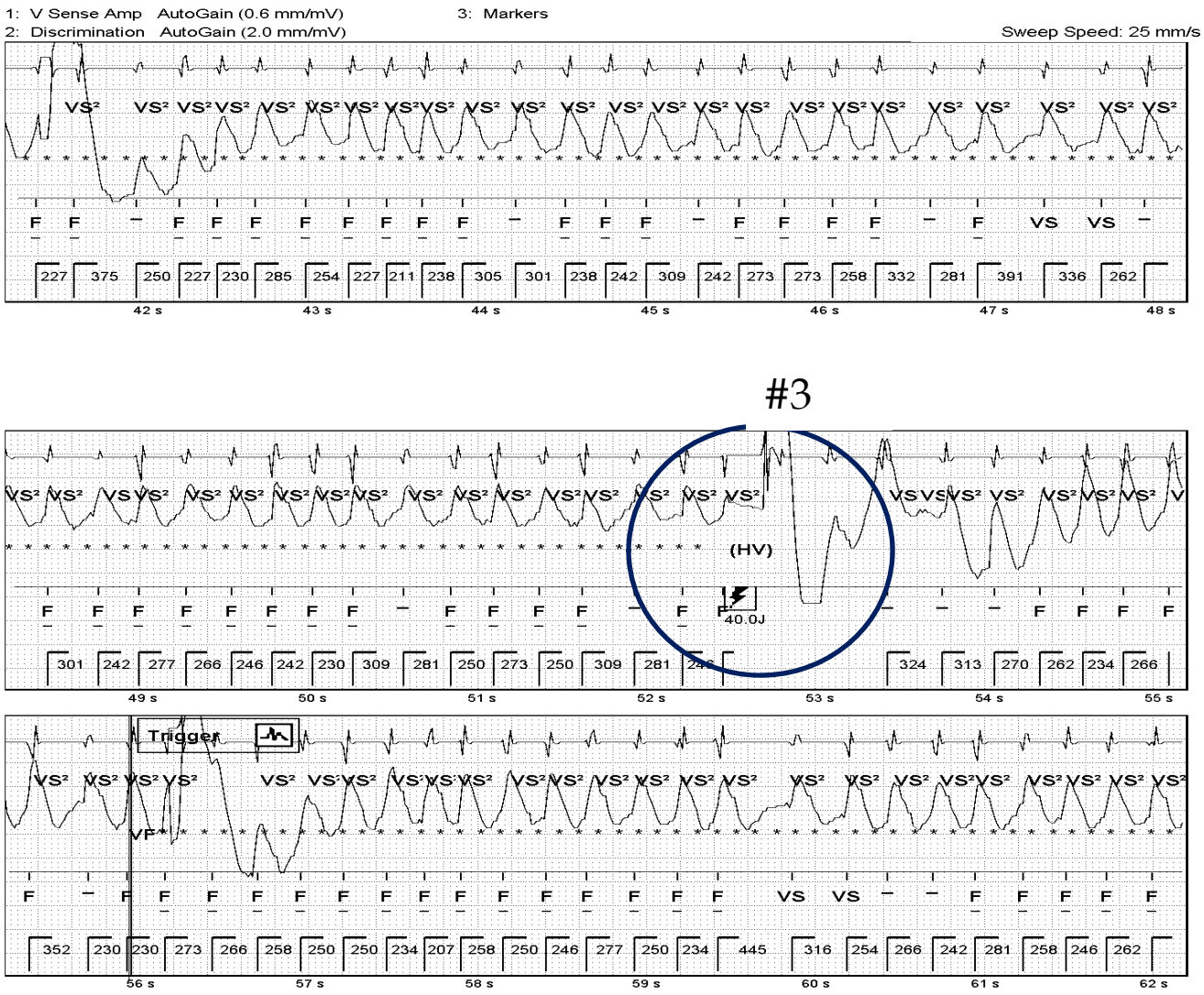


#1

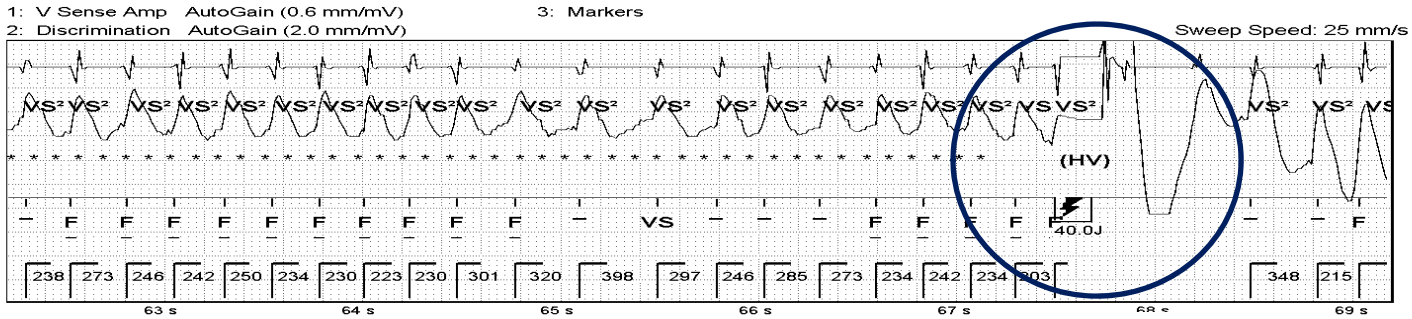


#2

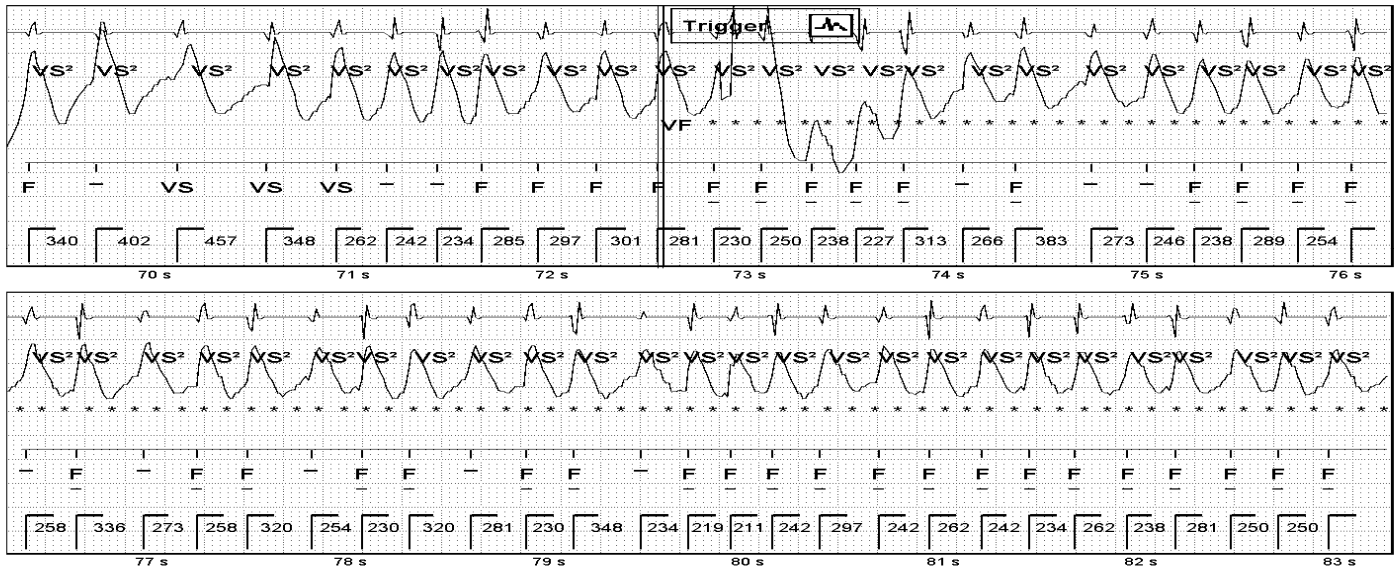
Inappropriate therapy



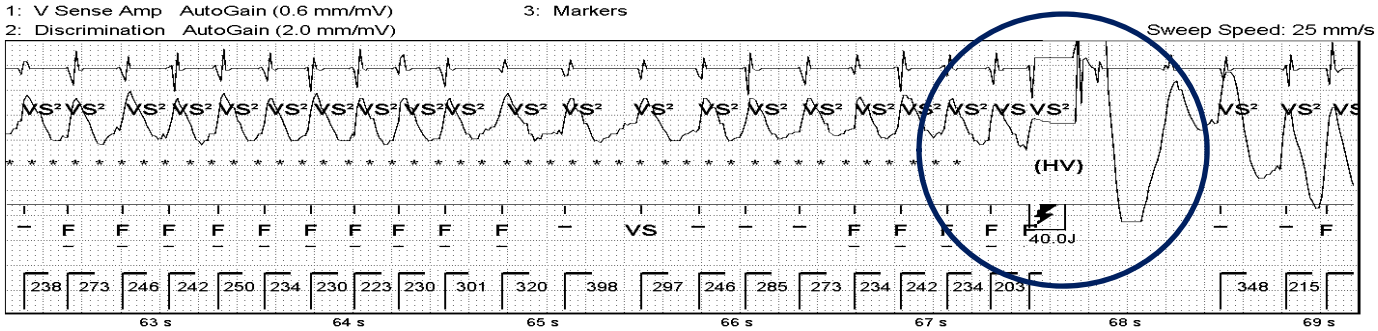
Inappropriate therapy



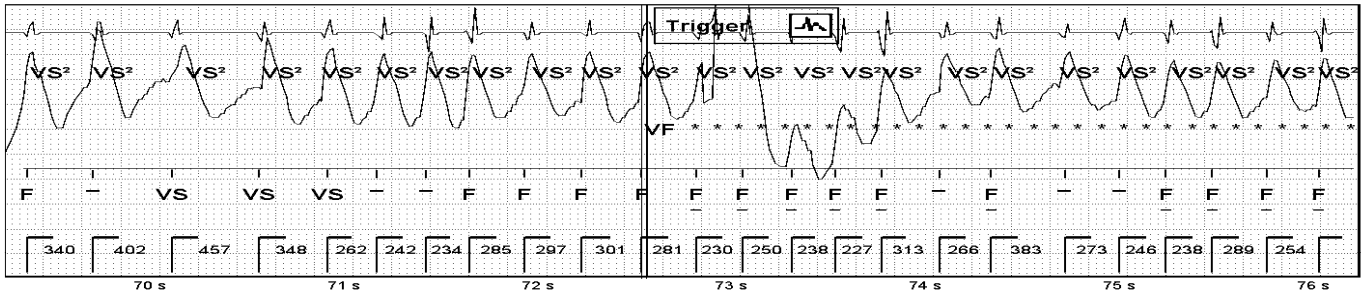
#4

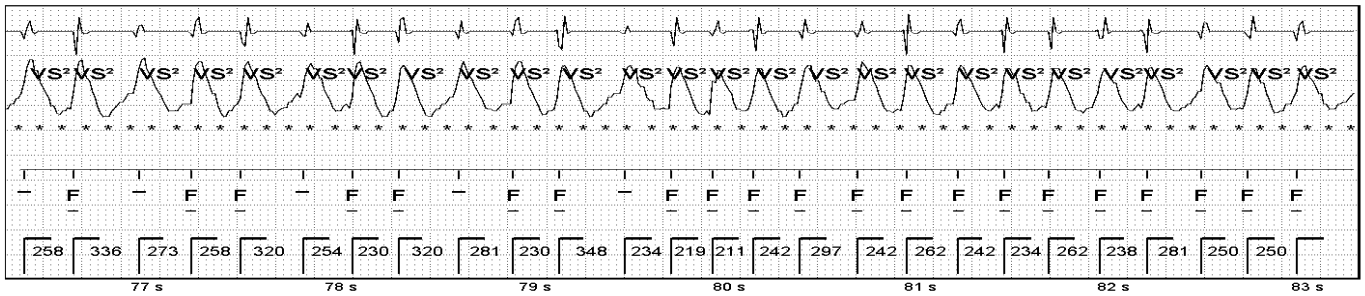


Inappropriate therapy

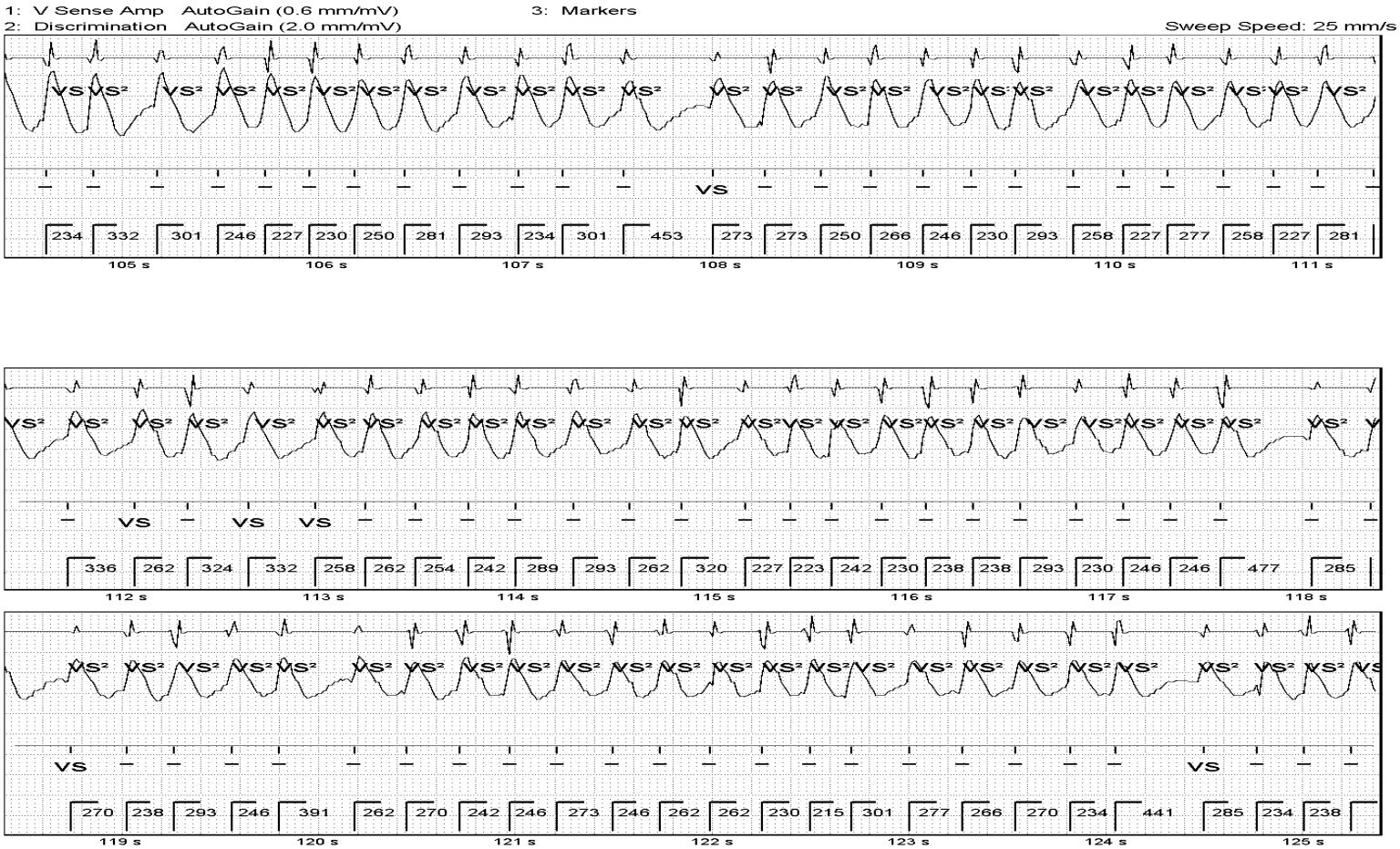


#5





Inappropriate therapy



Complications

THE LEGAL EXAMINER

Charlottesville, Virginia

Riata Defibrillator Lead Recall by St. Jude Medical Causing a Stir

Posted by Greg Webb
March 7, 2012 8:00 AM

The Legal Examiner Charlottesville is brought to you by MichieHamlett

MichieHamlett
(800) 451-1288
www.michiehamlett.com/
500 Court Square
Suite 300

Figure 1: A fluoroscopic image of externalized conductor defect in a St. Jude Medical Riata defibrillator lead.

Guidant recalls heart defibrillators

More than 38,000 implanted devices could malfunction

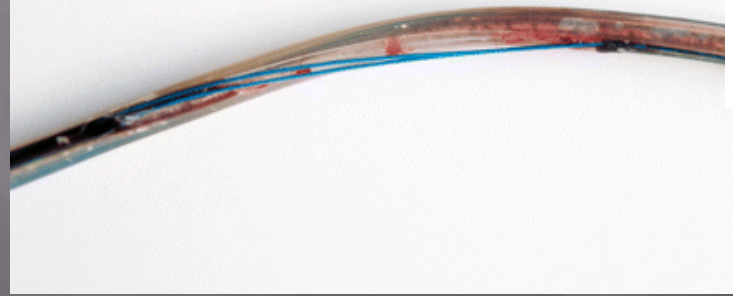
U.S. Department of Health & Human Services

U.S. Food and Drug Administration
Protecting and Promoting Your Health

Class 2 Device Recall Boston Scientific TELIGEN ICD

BUSINESS DAY

Medtronic Links Device for Heart to 13 Deaths



Journal of the American College of Cardiology
© 2011 by the American College of Cardiology Foundation
Published by Elsevier Inc.

Vol. 58, No. 3, 2011
ISSN 0735-1097/$36.00
doi:10.1016/j.jacc.2011.03.027

Heart Rhythm Disorders

Impact of Implanted Recalled Sprint Fidelis Lead on Patient Mortality

Thomas B. Morrison, MD,* Paul A. Friedman, MD,‡ Linda M. Kallinen, BS,§ David O. Hodge, MS,† Daniel Crusan, BS,† Kapil Kumar, MD,‖ David L. Hayes, MD,‡ Robert F. Rea, MD,‡ Robert G. Hauser, MD§

Rochester and Minneapolis, Minnesota; and Boston, Massachusetts

Psychological Impact

- Wide range of rates
  - Anxiety 13-63%
  - Depression 5-41%
- No difference in those implanted for primary vs secondary prevention
- Inconsistent results reported in studies regarding impact of shocks. Decreased QOL with $\geq$ 5 shocks
- Decreased psychological distress over time in some reports.

Psychological Impact

- Anxiety at baseline often continues post-implant.
- Type D personality, diabetes, and the need for cardiac resynchronization have been found to be statistically significant predictors of anxiety specifically.
- Younger age, women, other comorbid conditions, and lack of social support are also factors that increase the risk of psychological distress.
- Arrhythmias can be potentiated by anxiety.

Psychological Impact

- Device recalls
  - Patients appreciate frank in person discussion on issue
  - Alert patient of the possibility ***prior*** to implant
  - Most can tolerate and accept the information
  - More distress if the recall results in an inappropriate shock
- Inappropriate shocks and VT storm are also anxiety producing
- A single appropriate shock sometimes increased security

PTSD

- Post traumatic stress disorder is also an issue in cardiac patients.
- ~20% prevalence depending on study
- Increased risk if a survivor of out of hospital arrest.
- Studies differ on whether this improves or worsens over time
- May manifest as 'phantom shock'
- Better described as "Post-ICD shock reaction"

Psychoeducational Interventions

- Generally help more with anxiety than depression
- Goal is to increase knowledge and teach coping skills
  - Cognitive behavioral therapy
  - Support groups-no concrete evidence for or against, likely due to small sample sizes and study design.
  - Cardiac rehab/exercise-mixed results in the three studies completed.

Management of Psychological Distress

- Sears et al recommend a step wise approach
  - ID patients based on risk factors
  - Screen and refer
  - Optimize medications and programming
- Cognitive behavioral therapy to prepare the patient on a shock plan has demonstrated some effectiveness.
- Pharmacological measures have low response rates

Final Thoughts

- Thorough discussion of risks and benefits prior to implant should include
  - possibility of device recall
  - future procedures in the case of erosion or infection
  - appropriate versus inappropriate shocks
  - inability of the ICD to increase QOL
- Identify those at risk early on after implantation
- At each device visit, assess whether referral to psych is appropriate

Conclusion

- ICDs and their indications have come a long way since the first implant in the 1980's
- Remember to address the whole person as many patients may not want to admit they need emotional help
- Allow time for discussion regarding the device and plans in case of a shock

Questions

References

- Baura, G. (2012). Chapter 5-Implantable cardioverter defibrillators. In *Medical device technologies* (pp. 103-120). http://dx.doi.org/10.1016/B978-0-12-374976-5.00005-0
- Dunbar, S. B., Dougherty, C. M., Sears, S. F., Carroll, D. L., Goldstein, N. E., Mark, D. B., ... Zeigler, V. L. (2012, September 24). Educational and psychological interventions to improve outcomes for recipients of implantable cardioverter defibrillators and their families: A scientific statement from the American Heart Assocation. *Circulation*, *126*, 2146-2172. http://dx.doi.org/10.1161/CIR.0b013e31825d59fd
- Edelman, S., Lemon, J., & Kidman, A. (2003, July/August). Psychological therapies for recipients of implantable cardioverter defibrillators. *Heart & Lung*, *32*, 234-240. http://dx.doi.org/10.1016/S0147-9563(03)00037-2
- Flemme, I., Johansson, I., & Stromberg, A. (2011). Living with life-saving technology-coping strategies in implantable cardioverter defibrillator recipients. *Journal of Clinical Nursing*, *21*, 311-321. http://dx.doi.org/10.111/j.1365-2702.2011.03847.x
- Gollob, M. H., & Seger, J. J. (2001, April). Current status of hte implantable cardioverter-defibrillator. *Chest*, *119*, 1210-1221. http://dx.doi.org/10.1378/chest.119.4.1210
- Heatherly, S. J., Simmons, T., Fitzgerald, D. M., & Mitchell, M. (2011, June). Psychological effects of implantable cardioverter-defibrillator leads under advisory. *PACE*, *34*, 694-699. http://dx.doi.org/10.1111/j.1540-8159.2011.03046.x
- Jacq, F., Foulldrin, G., Savoure, A., Anselme, F., Baguelin-Pinaud, A., Cribier, A., & Thibaut, F. (2009). A comparison of anxiety, depression, and quality of life between device shock and nonshock groups in implantable cardioverter defibrillator recipients. *General Hospital Psychiatry*, *31*, 266-273. http://dx.doi.org/10.1016/j.genhosppsych.2009.01.003
- Liu, J., Brumberg, G., Rattan, R., Jain, S., & Saba, S. (2012, August 2012). Class I recall of defibrillator leads: A comparison of the Sprint Fidelis and Riata families. *Heart Rhythm*, *9*, 1251-1255. http://dx.doi.org/10.1016/j.hrthm.2012.04.003
- Magyar-Russell, G., Thombs, B. D., Cai, J. X., Baveja, T., Kuhl, E. A., Singh, P. P., ... Ziegelstein, R. C. (2011). The prevalence of anxiety and depression is adults with implantable cardioverter defibrillators: A systematic review. *Journal of Psychometric Research*, *71*, 223-231. http://dx.doi.org/10.1016/j.psychores.2011.02.014
- Manzoni, G. M., Castelnuovo, G., Compare, A., Pagnini, F., Essebag, V., & Proietti, R. (2015, February). Psychological effects of implantable cardioverter defibrillator shocks. A review of study methods. *Frontiers in Psychology*, *6*(39), 1-27. http://dx.doi.org/10.3389/fpsycg.2015.00039
- Pedersen, S. S., Van der Broek, K. C., Theuns, D. A., Erdman, R. A., Alings, M., Meijer, A., ... Denollet, J. (2009, November 6). Risk of chronic anxiety in implantable defibrillator patients: A multi-center study. *International Journal of Cardiology*, *147*, 420-423. http://dx.doi.org/10.1016/j.jicard.2009.09.549
- Pedersen, S. S., Van Domburg, R. T., Theuns, D. A., Jordaens, L., & Erdman, R. A. (2005, April). Concerns about the implantable cardioverter defibrillator: A determinant of anxiety and depressive symptoms independent of experienced shocks. *American Heart Journal*, *149*, 665-669. http://dx.doi.org/10.1016/j.ahj.2004.06.031
- Sears, S. F., Hauf, J. D., Kirian, K., Hazelton, G., & Conti, J. B. (2011). Posttraumatic stress and the implantable cardioverter defibrillator patient: What the electrophysiologist needs to know. *Circulation: Arrhythmia and Electrophysiology*, *4*, 242-250. http://dx.doi.org/10.1161/CIRCEP.110.957670
- Swerdlow, C. D., Kalahasty, G., & Ellenbogen, K. A. (2016, March 22). Implantable cardiac defibrillator lead failure and management. *Journal of the American College of Cardiology*, *67*, 1358-1368. http://dx.doi.org/10.1016/j.jacc.2015.12.067