Device detected VT: How much VT is significant and is VT ablation the answer?

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What is VT (in this context)?

What is VT?

- Ectopics
  - How relevant?
- ‘Slow’ VT
  - How much
  - symptoms
- ‘Fast’ VT

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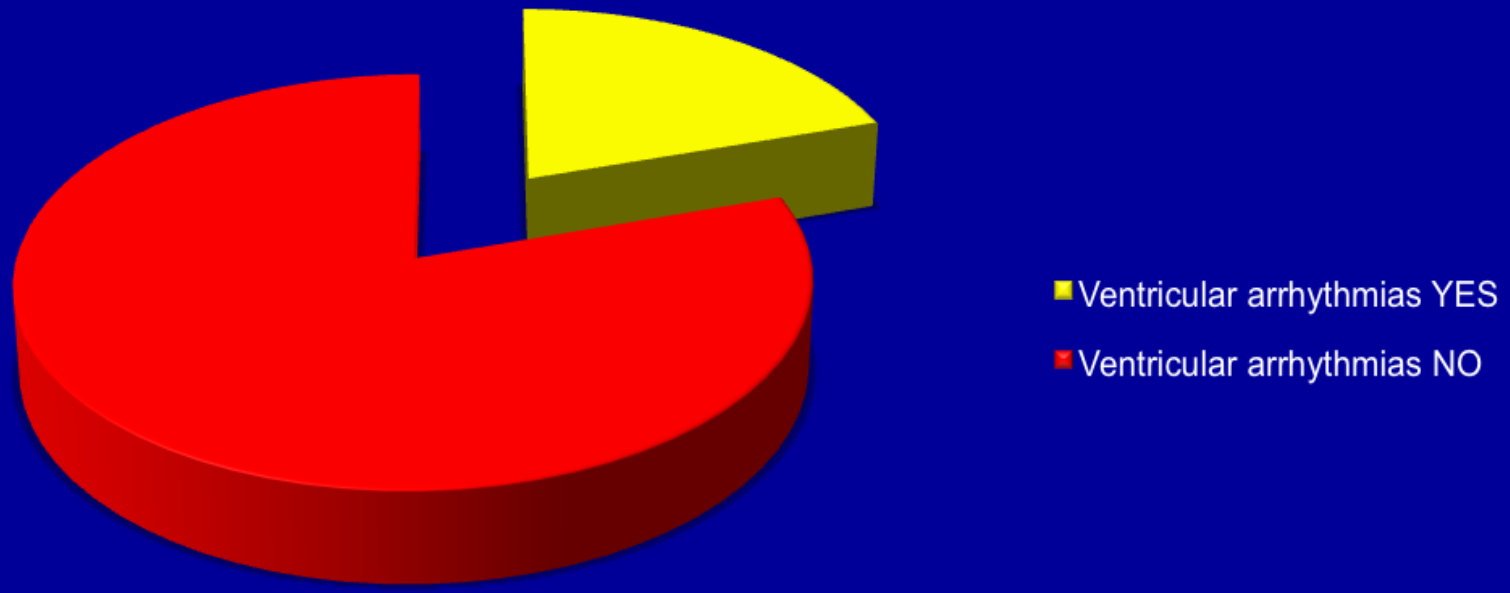
What is VT?

- Ectopics
  - Increasing burden
  - A lot
  - From the same place
  - From different places
  - Why worry?
    - May still be symptomatic
    - ?BiV pacing %age

Ventricular arrhythmias in BiV <90%



Ectopics- really benign?

- Good evidence that VE ablation leads to increase in EF (Heart Rhythm. 2015 Dec;12(12):2434-42)
- Reduced EF leads to HF admissions and worsen prognosis
- Seems intuitive that VE burden, therefore, *may* worsen prognosis

‘Slow’ VT

What is VT?

- ‘Slow’ VT
  - How much, how fast?
  - Symptoms?
  - Lusebrink et al. Europace 2012
    - 200 consecutive patients with VT up to 186bpm (slow?!)
    - Mean FU 509 days ± 308
    - 473 VT in 36 patients, 131 in 30 patients; VT in 40 patients in total
    - ‘slow’ VT in only 12 patients
    - Appear not to convey significant risk(?)

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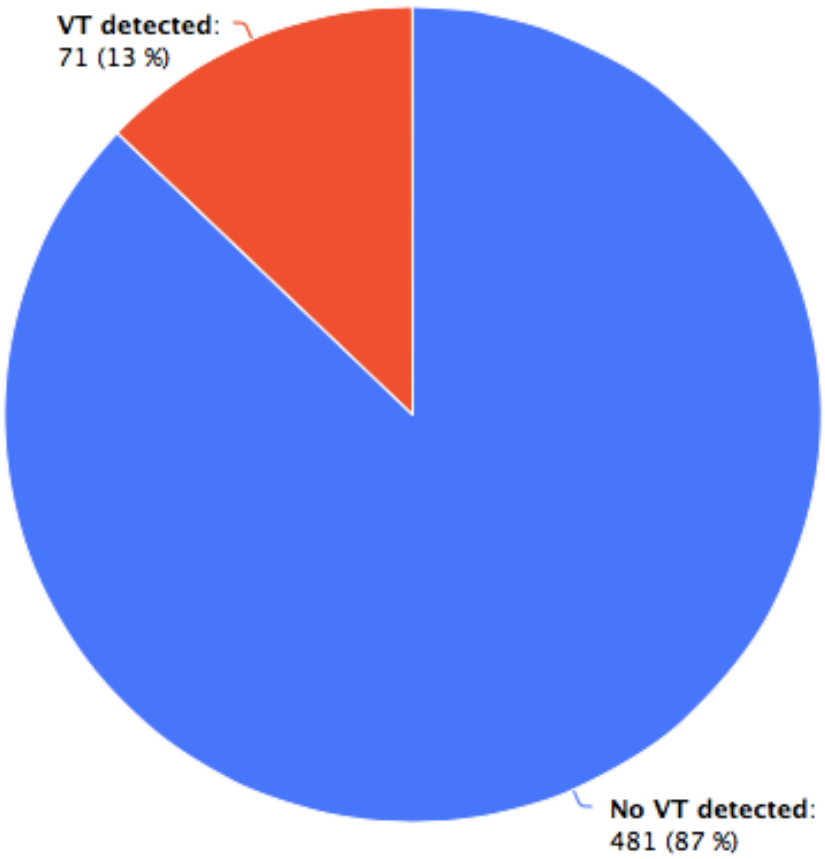
How many patients had a VT episode detected?



71 patients experienced a total of 1531 episodes of VT.

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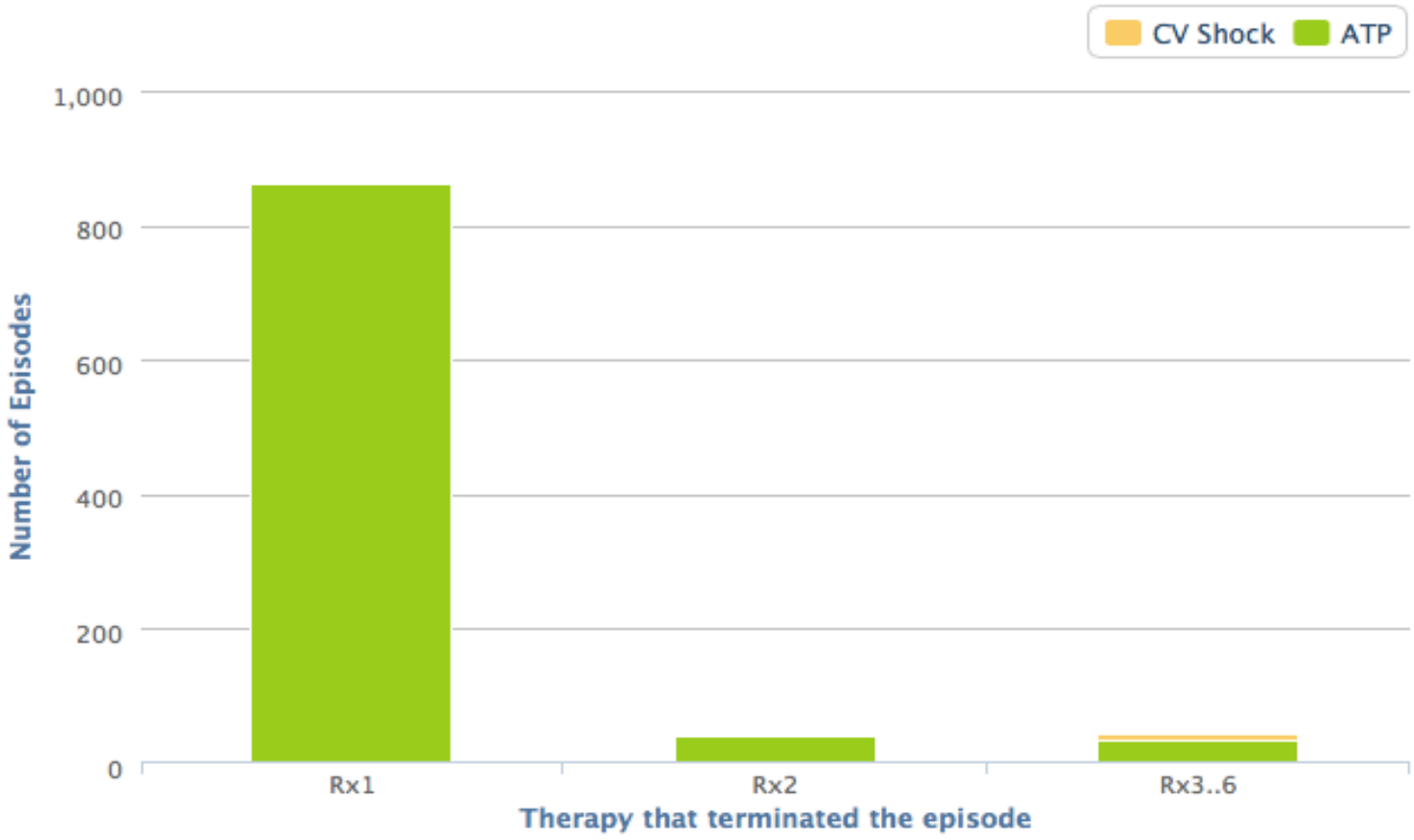
How were VT episodes terminated?



54 episodes were self-terminated

Only episodes detected and terminated in the same classification are included

What is VT?

- ‘Fast’ VT
  - Frequency may influence inclination towards interventional strategy?
  - More sinister?

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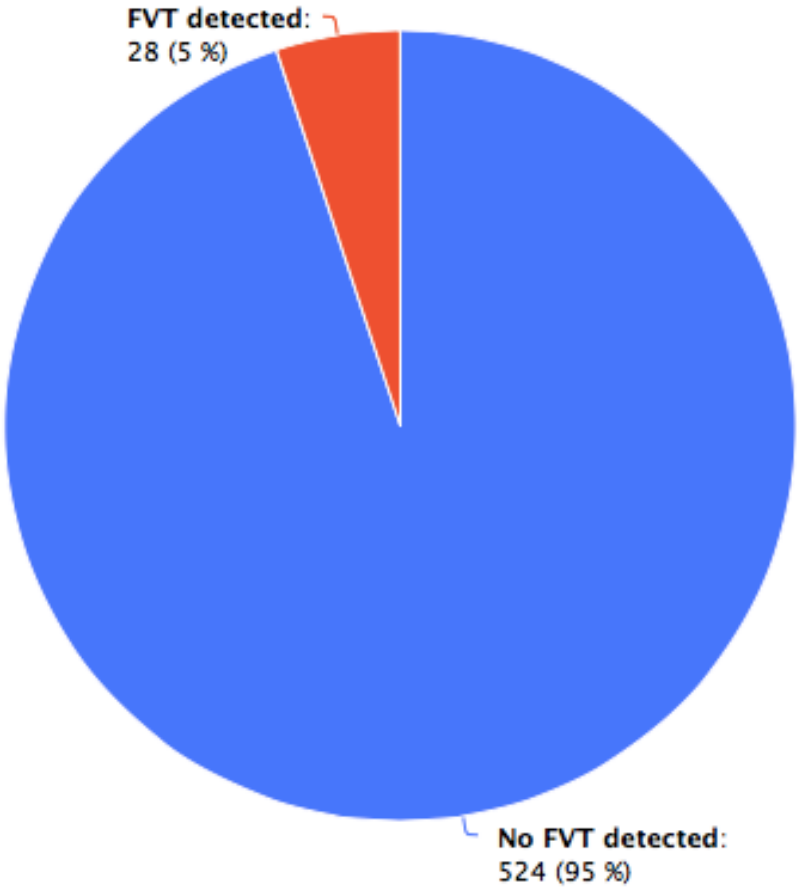
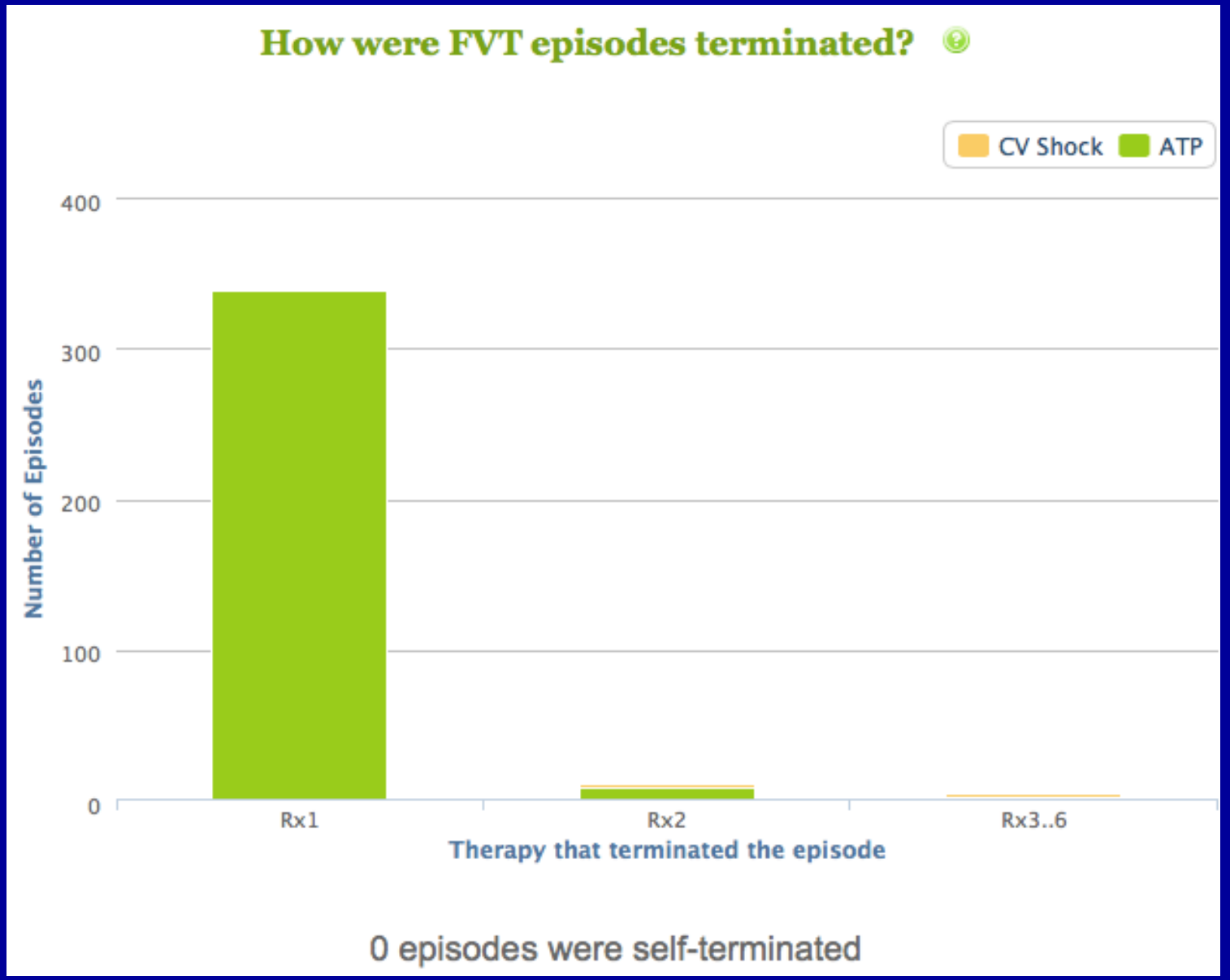
How many patients had a FVT episode Detected



28 patients experienced a total of 422 episodes of FVT.


How were FVT episodes terminated?
CV Shock
ATP
400
300
200
100
0
Number of Episodes
Rx1
Rx2
Rx3..6
Therapy that terminated the episode
0 episodes were self-terminated

What is VT?

- ‘Fast’ VT
  - Frequency?
  - More sinister?
    - Is it more sinister?
      - More likely to be symptomatic therefore perhaps more clinically relevant
      - May portend worse prognosis

May be more complex……

More arrhythmias may indicate poorer prognosis

BUT

More therapies may drive worse prognosis

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VT bad or therapies bad?

- Kutyifa et al. subset analysis of MADIT-CRT (Heart Rhythm 2013) 1789 pts.
- Slow (<200bpm) or fast VT/VF associated with increased risk of HF or death in CRT patients with LBBB
- Those receiving therapies much less likely to remodel- do the therapies drive this or does response or otherwise indicate poorer prognosis
- Possible that therapies, including ATP, may actually influence prognosis (Supported by MADIT-RIT)

Heart Rhythm. 2013 Jul;10(7):943-50

VT bad or therapies bad?

- Fast VT/VF associated with more HF/death in CRT-D pts. without LBBB, but not slow VT
- Neither slow nor fast VT associated with total mortality in this group

VT bad or therapies bad?

- Arrhythmias didn't appear to influence prognosis in the non-CRT ICD group
- At odds with MADIT-II and SCD-HeFT for this group
- Overall, slow VT predictive of subsequent fast VT/VF

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I assume we're talking about patients with an ICD?!

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VT in pacemaker patients

- How much is too much?
- Context- underlying cardiac disease e.g.HCM
- Co-morbidities (including age)
- LV function- have we picked up somebody at risk (has there been occult decline in LV function)?
- Nature of the ‘VT’

What to do?

- The drugs don’t work?
  - Beta blockers
  - Amiodarone
  - Mexiletine
  - flecainide

What to do?

- Beta blockers
  - Are they already on one?
  - Could they tolerate more?
  - Is it the right one?
  - Sotalol?

What to do?

- Amiodarone
  - Are they already intolerant?
  - If not, do we want to ‘condemn’ the patient to it?
  - Already on it- is there merit in taking more?

What to do?

- Mexiletine
  - ‘oral lignocaine’
  - Can be effective
  - Patients sometimes intolerant
    - Nausea and vomiting
    - Hand tremor
    - unsteadiness

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Is there a role for ablation?

‘VT’ ablation

- Symptomatic
  - Easier to justify
  - Multiple therapies
    - Not pleasant
    - Run battery down

‘VT’ ablation

- Asymptomatic
  - Harder to justify (though may be reasonable)
    - *Clinical* arrhythmias confined to small number of morphologies
    - High, or growing, burden of arrhythmias
    - Failure to achieve appropriate BiV pacing despite adequate beta-blockade

High, or growing, burden of arrhythmias

	+Holter NSVT	≥2 Risk factors	≥6% 5-yr risk on HCM SCD risk score	+RNSVT	≥2 episodes of RNSVT
Sensitivity (%)	78	78	56	78	78
Specificity (%)	47	55	58	72	84
PPV (%)	21	23	20	33	47
NPV (%)	92	93	88	95	96
Accuracy (%)	52	58	58	73	83

Viswanathan et al. Pacing Clin Electrophysiol. 2016 Jul;39(7):642-51

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High, or growing, burden of arrhythmias

Arrhythmia Episode List: 14-Mar-2016 13:06:34 to 13-Jul-2016 01:52:04

Only specified episodes shown below.

Type	ATP Seq	Shocks	Success	ID#	Date	Time hh:mm	Duration hh:mm:ss	Avg bpm A/V	Max bpm A/V	Activity at Onset
VF	0	6		206	13-Jul-2016	01:50		(Episode in progress)		
VT-NS				205	13-Jul-2016	01:50	:02	133/258		Rest
VT-NS				204	13-Jul-2016	01:50	:01	182/188		Rest
VT-NS				203	12-Jul-2016	16:08	:01	68/207		Rest
VT-NS				202	11-Jul-2016	23:54	<:01	71/200		Rest
VT-NS				201	11-Jul-2016	21:53	:01	79/186		Rest
VT-NS				200	11-Jul-2016	21:19	<:01	154/188		Rest
VT-NS				199	11-Jul-2016	16:01	:01	81/202		Rest
VT-NS				198	09-Jul-2016	03:50	:01	83/205		Rest
VT-NS				197	05-Jul-2016	23:23	:01	61/188		Rest
VT-NS				196	04-Jul-2016	15:21	:01	65/194		Rest
VT-NS				195	03-Jul-2016	08:01	<:01	69/176		Rest
VT-NS				194	02-Jul-2016	23:10	:01	80/186		Rest
VT	1		Yes	193	28-Jun-2016	22:53	:09	78/194	- - -/194	Rest
VT-NS				192	20-Jun-2016	07:48	<:01	63/194		Rest
VT-NS				191	17-Jun-2016	16:09	<:01	81/182		Rest
---------- Last Programmer Session 14-Jun-2016 ----------										
VT-NS				190	09-Jun-2016	16:13	<:01	133/185		Rest
---------- Last Medtronic CareLink Monitor Session 14-Mar-2016 ----------										

Is ablation superior to drugs?

- Recent meta-analysis (Heart Rhythm 2016, n = 2695)
  - No statistically significant difference in reduction of appropriate therapies
  - Amiodarone reduced inappropriate therapies (not sotalol) cf. other medical therapy
  - No mortality benefit with either strategy

Santangeli et al. Heart Rhythm 2016;13:1552–1559

Whom to ablate?

- Clear that arrhythmias and/or are bad
- Still lack of evidence that ablation will change this
- Currently seems reasonable to ablate for specific indications

Whom to ablate?

- Arrhythmic (VE/VT) burden hampering effective delivery of CRT
- ‘Asymptomatic’ VT driving haemodynamic decompensation
- Symptomatic VT not controlled by drugs or drugs causing intolerable side-effects

Conclusions

- Implantable devices allow us to know about asymptomatic arrhythmias as well as symptomatic ones
- We know they're associated with worse prognosis
- We don't know that intervention will influence this
- VT ablation likely to play an increasing role, but sems reasonable to target approach